FINAL REPORT
FOR
REMEDIATION OF THE NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILLCAP CONSTRUCTION PROJECTS

Prepared for

Alcoa Inc.
Pittsburgh, Pennsylvania

February 15, 2006
Revised February 12, 2007

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ACRONYMS

AMSL	Above Mean Sea Level
AO	Agreed Order
ASTM	American Society for the Testing of Materials
BMPs	Best Management Practices
BNSF	Burlington Northern Santa Fe
CA Plan	Cleanup Action Plan
COC	Chain of Custody
CQCP	Construction Quality Control Plan
CQA	Construction Quality Assurance
CY	Cubic Yard
FS	Feasibility Study
GCL	Geosynthetic Clay Liner
HDPE	High Density Polyethylene
JARPA	Joint Aquatic Resources Permit Application
OZ/SY	Ounce Per Square Yard
MTCA	Model Toxics Control Act
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
QA/QC	Quality Assurance/Quality Control
RI	Remedial Investigation
ROW	Right of Way
TSCA	Toxic Substances Control Act
USACE	United States Army Corps of Engineers
WAC	Washington Administrative Code
WDOE	Washington Department of Ecology
WDOT	Washington Department of Transportation
WDNR	Washington Department of Natural Resources
WDFW	Washington Department of Fish and Wildlife

ENGINEER'S CERTIFICATION

"To the best of my knowledge, information and belief, I, Patrick J. Sullivan, Jr., a registered professional engineer in good standing in the State of Washington, hereby certify that construction of the East Landfill and remediation of the North and North 2 Landfills, located at the Former Vancouver Works in Clark County and in the City of Vancouver, Washington was performed in accordance with current professional industry standards. I also hereby certify that this Report and all attachments and appendices were prepared under my direction and supervision and fulfills the requirements of the Washington Administrative Code (WAC), Section 173-340-400(6)(b). As to the portions of this Report for which I cannot personally verify their truth and accuracy, I certify to the best of my knowledge and belief that the collection and submission of information is true and accurate and was performed by qualified personnel under my direct supervision."

Name, Engineer's Seal and Date: _____

1.0 INTRODUCTION

This Final Construction Report (Report) for the Remediation of North and North 2 Landfills and East Landfill Cap Construction Project (East Landfill Project) at the Former Vancouver Operations (Site) in Vancouver, Washington has been prepared for Alcoa Inc. (Alcoa) to fulfill the requirements of the Washington Administrative Code (WAC), Section 173-340-400(6)(b). This Report has also been developed to fulfill the requirements presented in the Agreed Order (AO), Number DE 03 TCPIS-5737 issued by the Washington Department of Ecology (WDOE) to Alcoa in September of 2003. This report summarizes and presents the data and data reporting procedures that are representative of the work performed. This Report provides the following information:

- A brief discussion of the background of the Site and the East Landfill Project , including history, location and a general overview of previous investigative activities;
- North, North 2 and East Landfill Construction Activities;
- Construction Quality Assurance Activities;
- As-Built topographic surveys;
- Summary of work performed.

Once approval of this Report has been received by Alcoa from WDOE, post-closure care for the East Landfill Project will commence in accordance with the applicable requirements stated in WAC 173-340-410.

This Report is being submitted upon completion of the work to address repairs to the toe of the precast concrete revetment along the shoreline of the Columbia River. This work was performed in January of 2007, and a discussion of this work is included in this Report. Section 6.0 of this Report discusses the repairs along the toe of the Columbia River.

2.0 FACILITY BACKGROUND

2.1 FACILITY HISTORY

Alcoa completed construction of an aluminum manufacturing facility (Former Vancouver Operations) at the Site in 1940 that consisted of a smelter plant on the western portion of the Site. In the early 1940's, the entire eastern portion of the Site was filled with dredge sands from the Columbia River. Between 1944 and 1970, a number of fabrication operations were added to the facility to form aluminum into finished goods such as wire, rod, and extrusions. Alcoa operated the entire facility for approximately 45 years, until 1985. In 1985, Alcoa began to remediate, close and sell parcels of property associated with the aluminum manufacturing facility. In 1985, the cable mill operation was sold to ACPC, Inc. who leased the property from Alcoa until 1997. In 1987, Alcoa sold the aluminum smelter to Evergreen, formerly known as VANALCO, Inc. and retained title to the extrusion (VANEXCO) section of the property, which was closed in 1992. In 1994, Alcoa sold a parcel of property known as the North Parcel to Clark County Public Utility for construction of a cogeneration plant. In 1997, an area known as the Northeast Parcel was remediated to facilitate the sale of the property to Clark County, for construction of a minimum security jail. Remediation of the Northeast Parcel was conducted in accordance with the WDOE AO number DE97 TE-I032. Alcoa still maintains the river dock located between the smelter plant and the Columbia River.

Alcoa currently owns small parcels of property at the Site that were formerly part of the aluminum manufacturing facility. One of these parcels is 11.7 acres in size and contains a 4.9-acre area known as the East Landfill. Within the East Landfill is a 0.75-acre area known as the Temporary Storage Area. The remaining 6.8 acres consists of access roads, shoreline and residual areas outside the limits of the East Landfill. Two additional parcels owned by Alcoa include a 1.5-acre parcel known as the North Landfill, and 1-acre parcel known as the North 2 Landfill, both located north of the East Landfill.

2.2 FACILITY BACKGROUND

The Site is located in Clark County and in the City of Vancouver, on the north bank of the Columbia River, approximately three miles northwest of downtown Vancouver, Washington. The project is located in both the NE ¼ of Section 20, T2N, R1E and the NW ¼ of Section 20, T2N, R1E near river mile 103.4 along the Columbia River.

The East Landfill is bounded to the south by the Columbia River, to the east by property occupied by the Port of Vancouver, to the north by property occupied by Clark County and to the west by property occupied by the Former Vancouver Operations. The East Landfill is formerly a series of 15 to 20 foot deep areas, which emptied into the Columbia River. Alcoa filled the narrow area with carbon bake oven furnace brick, aluminum and steel wire and miscellaneous small volumes of solid and industrial wastes.

The North Landfill is located approximately 600 feet northwest of the East Landfill. It is bounded to the east by property owned by Clark County and to the west by the Former Vancouver Operations and Evergreen Aluminum Company, Inc. (Evergreen). The North 2 Landfill is located immediately north of the North Landfill. The boundaries of the North and North 2 Landfills are delineated by railroad track spurs extending from the main tracks of the Burlington-Northern and Sante Fe railroad (BNSF) into the Site. The areas were used by the United States Army Corps of Engineers (USACE) in the 1940's and 1950's to dispose of dredged materials from the Columbia River. Alcoa filled these two areas with materials containing polynuclear aromatic hydrocarbons (PAHs), construction materials, including

concrete and refractory brick and fill materials generated during operation of the smelter, extrusion and wire mills at the Site (Waste Soils).

The Northeast Parcel is bounded to the north and to the west by the main tracks of the BNSF railroad, to the east by property occupied by the Port of Vancouver, to the south by property occupied by Clark County. The Northeast Parcel is approximately 1200 feet north-northeast of the East Landfill and the Temporary Storage Area. Alcoa used this area to dispose of miscellaneous small volumes of polychlorinated biphenyls (PCBs) and PAH contaminated wastes.

Figure 2-1 presents a vicinity plan of the Site and includes the subject areas listed above.

2.3 EAST LANDFILL PROJECT HISTORY

Since 1990, Alcoa has worked closely with the WDOE to determine the nature and extent of contamination within or resulting from the operation of the landfill and to select a remedial measure(s) that would effectively address this contamination under the Model Toxics Control Act (MTCA). A Remedial Investigation (RI) consisting of several intrusive investigations was performed and the landfill was found to contain wastes consisting of construction debris (e.g. refractory/furnace brick), off-spec product (e.g. scrap steel wire) and wastes containing volatile and semi-volatile organic chemicals.

The East Landfill is within a highly industrialized area and meets the MTCA definition of an industrial property. This designation results in the applicability of soil cleanup standards based on industrial land use as the reasonable maximum exposure scenario (WAC 173-340-745). Accordingly, decisions regarding remediation of the East Landfill were based on these standards.

In 1994, Alcoa performed a Feasibility Study (FS) to identify the optimum remedial solution for the East Landfill and for the 1.5-acre area known as the North Landfill. A total of eight remedial alternatives, consisting of a variety of containment, excavation, on and off site treatment and on and off site disposal were evaluated in this study, all of which would meet the general requirements of a MTCA cleanup action. Subsequent to the completion of the feasibility study, Alcoa internally performed a similar analysis of the 1-acre area known as the North 2 Landfill. Given the proximity of the East, North and North 2 Landfills to each other, and the relatively small volume of materials in the North and North 2 landfills compared to the volume in the East Landfill, Alcoa performed a feasibility study and selected a remedy, which consolidates and contains impacted soils on-site. Specifically, the remedy consisted of the excavation of materials exceeding MTCA Method A Industrial levels in the North and North 2 Landfills and consolidation of materials into the East Landfill prior to closing the landfill with an Engineered Barrier system. In September of 2003, WDOE issued AO Number DE 03 TCPIS-5737 instructing Alcoa to excavate materials exceeding MTCA Method A Industrial levels from the North and North 2 Landfills and consolidate them into the East Landfill prior to closing the East Landfill with an Engineered Barrier system.

In September of 1997, Alcoa successfully implemented the consolidation technology when it excavated 17,100 cubic yards of soil with elevated levels of polynuclear aromatic hydrocarbons (PAHs) from a 2.3-acre area adjacent to the East Landfill known as the Northeast Parcel. The PAH soils were placed in a selected area within the East Landfill parcel, called the Temporary Storage Area and covered with 12-inches of certified clean fill. The PAH soil concentrations were above the cleanup level specified for the Northeast Parcel remediation but below those that would classify the material as a Dangerous Waste in Washington. The work was performed under the requirements of AO number DE97 TC-I032, however, AO Number DE 03 TCPIS-5737 superceded the original AO closing the Temporary Storage Area with an Engineered Barrier, in conjunction with the East Landfill.

2.4 SHORELINE PROJECT HISTORY

The 1,000 foot long section of moderate to steep sloping shoreline adjacent to the East Landfill Area has been deteriorating due to the dynamic action of the waters of the Columbia River. Approximately one-half of the existing shoreline consists of dredged sand placed by the USACE in the late 1950's covered by industrial rip-rap and spent refractory brick from the facility. The remaining half of the shoreline simply consists of the dredged sand. The existing conditions present at the shoreline meet three categories defined by various WAC guidance documents that indicate shoreline erosion problems:

- Toe Erosion: Several significant storm events during the mid to late 1990's, in conjunction with the normal tidal fluctuations of the Columbia River, have eroded portions of the shallow sloping, narrow sand beach located at the water's edge. The erosion of this sand has weakened the toe of the steep sloping embankment that acts as a barrier between the Columbia River and the East Landfill Area.

- Steep Slope Instability: Portions of the bank covered by brick, though currently stable, are exhibiting signs of instability due to the erosion of a buttressing toe. The continued toe erosion may result in the movement of the existing steep sloping bank, which may expose portions of the waste material within the East Landfill Area to the tidal actions of the Columbia River or may result in complete slope failure.

- Shoreline Retreat: The position and shape of the shoreline has changed over the previous several years.

Accordingly, the existing shoreline must be stabilized and covered to support the construction of the Engineered Barrier system, to prevent erosion from typical river flow velocities and wave action from the high volume of shipping traffic in the area. Part of the remedy discussed above includes shoreline improvement measures consisting of reconstruction of a portion of shoreline with fill imported from off-site and the installation of a precast concrete flexible armament over the fill is proposed to protect the shoreline by deflecting wave energy and to retain a failing area of shoreline. The armament is proposed because it reduces the erosive action of water, it secures and reinforces the erosion and potential failure of the steep sloping bank, is constructed to aesthetically blend in with existing shoreline, and provides the ability to promote vegetative growth.

In April of 2002, MFG Inc. prepared a report entitled "Stability Assessment Report for the Proposed Remedial Action Closure Plan". The report concluded that the shoreline embankment as constructed possesses a static factor of safety of at least 1.5, which meets certain professional industry standards and the USACE factor of safety of 1.4, as presented in EM 1110-2-1913. The report also recommended monitoring of the ground surface of the East Landfill for horizontal and vertical movement, due to the potential impact of a seismic event on the Engineered Barrier at the East Landfill.

A Joint Aquatic Resources Permit Application (JARPA) document was submitted in August of 2000 to obtain all necessary permits required to perform the shoreline stabilization component of the landfill closure. WDOE has provided significant input into the closure design and has tentatively approved the approach to closure, pending permit approvals.

3.0 DESIGN OVERVIEW

In August of 2002, Alcoa contracted Bergmann Associates of Wexford, Pennsylvania to complete the engineering design of the East Landfill project and to provide quality assurance services during construction. A majority of the design for the East Landfill Project was performed by IT Corporation and was completed in March of 2001. In April of 2001, the design was presented to WDOE. The drawings and specifications generated provided a design that would result in an open, relatively level site and allow Alcoa to solicit proposals from site developers or real estate personnel to utilize the area for future commercial and industrial purposes. Alcoa engaged in said discussions with various public and private agencies over the site for approximately one year. In June of 2002, Alcoa received approval of the JARPA from WDOE, allowing for construction of the shoreline portion of the remedy. A copy of the approval letter is presented in Attachment A. Also during the year 2002, Alcoa arranged for funding the construction of the project for the year 2003.

3.1 CLEANUP ACTION PLAN

As part of the design and in accordance with WAC 173-340-380, Bergmann prepared a Draft Cleanup Action Plan (CA Plan) for the East Landfill Project. The CA Plan provided a general description of the proposed cleanup action and set forth functional requirements that the cleanup must meet for cleanup levels specified for the Site. The CA Plan was submitted to WDOE in November of 2002. In September of 2003, WDOE issued an AO No. DE 03 TCPIS-5737 (Order) incorporating the CA Plan. Construction of the East Landfill Project will occur under the legal framework of the AO between WDOE and Alcoa. A copy of the AO and the Interim Action Work Plan for the East Landfill Site is included in Appendix A.

The CA Plan included the following:

- A summary of Site conditions, including Site location and history, existing geology and hydrogeology, an overview of intrusive investigations, the nature and extent of contamination and exposure pathways.
- A summary of the cleanup standards, including the contaminants to be addressed and their concentrations, the media to be remediated and the applicable laws and regulations.
- Detailed discussion of the proposed cleanup, the institutional controls and monitoring associated with the cleanup and the conceptual cleanup alternatives considered but not selected.
- Discussion of the soil and groundwater compliance monitoring to be performed.
- A summary of restrictive covenants and institutional controls.
- Justification for the selected cleanup alternative, and
- A schedule for Remedial Action.

3.2 STORMWATER POLLUTION PREVENTION PLAN

In conjunction with the preparation of the CA Plan, Bergmann prepared a Site Stormwater Plan for the East Landfill project. The plan provided a detailed discussion of the applicable Minimum Requirements for stormwater management at construction sites and a general description of the proposed Best Management Practices (BMPs) to minimize erosion of the ground, to control the quantity and quality of stormwater in areas disturbed by construction activities and to protect receiving waters. It included a narrative report entitled “Stormwater Site Plan for the Landfill Areas at the Former Vancouver Operations, Vancouver, Washington” and drawings, numbered A-046130-WW through A-046135-WW

inclusive, entitled "Site Stormwater Plan for Landfill Areas, Former Vancouver Operations, Vancouver, Washington were prepared. The plan was submitted to the City of Vancouver in July of 2003.

3.3 CONSTRUCTION DRAWING AND SPECIFICATION PACKAGE

Prior to the preparation of the Site Stormwater Plan, Bergmann finalized the construction drawing and specification package for remediation of the North and North 2 Landfills and East Landfill Cap Project. The work consisted of modification of drawings and specifications prepared and submitted in draft format in April of 2001. It also consisted of the addition of information to the Construction Quality Control Plan (CQCP). Additional information added to the package and to the CQCP included design of a sprinkler system for the shoreline, design of an operation/storage building, modification of the shoreline embankment cross-section (organic layer) and design of biodiffuser trench. The Drawings, numbered A-046100-WW through A-046123-WW inclusive, entitled "Remediation of North and North 2 Landfills and East Landfill Cap Construction Projects, Former Vancouver Operations, Vancouver, Washington and the specification booklet entitled “Specifications For Remediation Of North And North 2 Landfills And East Landfill Cap Construction Projects” Former Vancouver Operations Vancouver, Washington were completed in July of 2003 and was used in the solicitation of bids.

3.4 CITY OF VANCOUVER PRE-APPLICATION CONFERENCE

On July 18, 2004, Bergmann submitted drawings, specifications and narratives associated with the design of the East Landfill project and the Site Stormwater Plan along with a request for meeting to the City of Vancouver. On July 24, 2003, WDOE, Alcoa, Bergmann and Anchor Environmental met with professionals from the City of Vancouver to discuss the project and the applicable permits and/or requirements needed to initiate construction. Based upon the city review, comments from several departments within the City were compiled and provided to Alcoa. Bergmann addressed the comments, the majority of which discussed the need for several permits and requested modifications to drawings and specifications. The modified design, which was used in bid preparation process, was submitted to the City in September of 2003. On October 24, 2003, the City of Vancouver approved the project. A copy of the approval letter is presented in Attachment A.

3.5 HEALTH AND SAFETY PLAN

The Site Health and Safety Plan (HASP) prepared by ICF Kaiser Engineers, Inc. in April of 1998 was referenced within the Technical Specifications. Alcoa-specific health and safety information was provided in Section V – Site Conditions And Mandatory Health And Safety Standards. Using the HASP for reference, a Site-specific health and safety plan was prepared by the construction contractor for the work at the North, North 2 and East Landfills.

4.0 CONSTRUCTION ACTIVITIES

4.1 PRE-CONSTRUCTION ACTIVITIES

In July and August of 2003, Alcoa initiated the bidding process to select a construction contractor for the East Landfill Project. The invitation to bid was issued on or about July 18, 2003. The bid package included the information discussed in Section 3.1, 3.2 and 3.3 above. A prebid meeting and site visit was conducted on July 24, 2003. Professionals from Alcoa, Bergmann Associates and interested construction companies were present to review site conditions and ask questions. Bids were received from 4 Alcoa prequalified earthmoving construction companies on August 13, 2004. On August 18, 2004, Alcoa selected the Portland, Oregon branch office of Envirocon, Inc. as the successful bidder. A pre-construction meeting was conducted at the site on September 17, 2003 and work began on September 22, 2003.

In August of 2003, Alcoa contracted with CH2M Hill of Portland, Oregon to perform specialized Quality Control (QC) activities for the East Landfill Project. The work would be performed in accordance with the Construction Quality Control Plan for the East Landfill Remediation Project (CQCP), prepared by Bergmann Associates and dated September 15, 2003. A copy of sections of the CQCP, pertaining specifically to QA and QC oversight, is included in Appendix B to this Report. Alcoa would provide QC oversight for earthmoving activities and Bergmann would provide QA oversight in accordance with the CQAP. CH2M subcontracted Carlson Testing of Portland Oregon to provide field and laboratory testing services during the course of construction.

Also in August of 2003, an archaeological survey of the North, North 2 and East Landfill was conducted by Applied Archaeological Research. The survey included a background literature review consisting of environmental setting, history and prehistory, a cartographic survey and a site field survey. The results of the archaeological survey determined that native soils would only be encountered during final excavation at the North and North 2 Landfills and recommended that an archaeologist be present during those time periods. A copy of the abstract for the report is presented in Attachment B.

In September of 2003, Anchor Environmental conducted a tree survey at the Site. The survey was required by the City of Vancouver's Tree Conservation Ordinance 20.96.050 and was identified during the pre-application conference discussed in Section 3.4, above. The survey consisted of the identification of trees at the North, North 2 and East Landfill designated to be protected and remain and trees designated to be removed. It also presented a plan for planting new trees and shrubs at the East Landfill. A copy of the permit application and plan drawings presenting the location of new and existing trees is provided in Attachment B.

Envirocon constructed the East Landfill Project in accordance with the scope of work presented in Technical Specifications for the East Landfill project, Vancouver, Washington, dated July 15, 2003. A copy of the specifications is attached as Appendix C. The scope of work associated with the construction of the Landfill cap was divided into six phases of work and consisted of the following tasks:

1. Phase I - Site Preparation

a. Mobilization
b. Staging Areas, Access Roads and Railroad Crossings
c. Construction Layout and Surveys
d. Erosion and Sediment Control
e. Decontamination/Liquids Management

f. Building/Wall Demolition and Pipe Plugging
g. Existing Fence Removal
h. Sprinkler System/Waterline
i. Storage/Operations Building

2. Phase II - South Bank Area of Concern

a. Clearing and Grubbing
b. Confirmation Sampling Overview
c. Excavation
d. Backfill

3. Phase III – Shoreline Rehabilitation

a. Clearing and Grubbing
b. Grading
c. Spread/Compact Random Fill
d. Concrete Revetment
e. Planting and Vegetation

4. Phase IV - North and North 2 Landfill

a. Clearing and Grubbing
b. Waste Soil Excavation and Handling
c. Confirmation Sampling
d. Grading
d. Spread/Compact Random Fill
e. Vegetation

5. Phase V - East Landfill Construction

a. Clearing and Grubbing
b. Anchor Trench Platform/Embankment Construction
c. Waste Soil Placement
d. Engineered Cap Construction
e. Geomembrane Inspection and Testing
f. Vegetation
g. Fencing
h. Monitoring Well Extension/Protection

6. Phase VI - Additional Fill Outside Limits of East Landfill

a. Spread/Compact Random Fill
b. Vegetation

Two Drawing packages were prepared to complement the Technical Specifications. :

- Drawings, numbered A-046100-WW through A-046123-WW inclusive, entitled "Remediation of North and North 2 Landfills and East Landfill Cap Construction Projects, Former Vancouver Operations, Vancouver, Washington", prepared by Bergmann Associates, issued for construction in September 7, 2003.

- Drawings, numbered A-046130-WW through A-046135-WW inclusive, entitled "Site Stormwater Plan for Landfill Areas, Former Vancouver Operations, Vancouver, Washington", prepared by Bergmann Associates, issued for construction in September 7, 2003..

Envirocon procured the services of several subcontractors to complete portions of the work associated with the East Project. These subcontractors included the following:

- Abovo Landscaping: Sprinkler System subcontractor
- Texas Environmental Plastics, Inc.: HDPE welding subcontractor
- W&H Pacific: Surveying subcontractor
- Williamette Fencing: Fence subcontractor
- Taylor Trucking: Borrow Material subcontractor
- H&H Wood Recyclers: Mulch Material subcontractor
- Mofford Company: Electrical subcontractor
- Briar Group: Hydroseeding
- Cascade Drilling Monitoring Well Extensions

4.2 CHANGE ORDERS

During the construction process, modifications to the East Landfill Project drawings and/or Technical Specifications were proposed as a result of changed field conditions, value engineering and use of substitute materials. These modifications were proposed by Envirocon, appointed subcontractors or QC personnel. Proposed modifications were presented to the design engineers using a change order form. A total of 5 change orders were generated for review, comment and approval by Alcoa. The first change order was submitted on August 2003 and the last change order was submitted on July, 2004. A summary of the change orders is as follows:

Change Order No.1 - Jersey Barrier Relocation. Envirocon was tasked to relocate the sediment jersey barriers farther to the south to allow for the layout of the toe of the reconstructed embankment adjacent to the East Landfill. The existing topography along the shoreline had changed slightly from the topography presented on the drawings that was surveyed in 1997.

Change Order No. 2 – Shoreline Embankment Soils. Envirocon was tasked to purchase and deliver cohesive soil for construction of the shoreline embankment. The original specifications proposed sand for embankment construction, but the uniform gradation and non-angular appearance of the material raised potential stability concerns. An outer shell was constructed using the cohesive soil.

Change Order No. 3A – Anchor Trench Embankment. Envirocon was tasked to purchase and deliver cohesive soil for construction of the top 3 feet of the anchor trench platform. The original specifications proposed sand for embankment construction, but the uniform gradation and non-angular appearance of the material raised potential concerns relative to maintaining the shape of the anchor trench during geomembrane installation.

Change Order No. 3B – Railroad Track Alignment. Envirocon was tasked to correct the alignment of the railroad tracks that were crossed by trucks hauling Waste Soils on the contaminated material haul road. The continual impact of the truck loads shifted the rails and altered the gauge distance, resulting in a derailing of an engine in September of 2004.

Change Order No. 4 - Additional Site Work. Several tasks were performed to address concerns arising from the construction process. These tasks included construction of an access road to monitoring wells, installation of an underground airline to shoreline monitoring wells and installation of flush mount monuments. The work was performed by Envirocon.

A discussion of the work performed to complete each of the above tasks begins in Section 4.4 of this Report.

4.3 AS-BUILT DRAWINGS AND RECORD SURVEYS

Topographic record surveys were performed during various phases of construction at the North, North 2 and East Landfills by W&H Pacific of Portland Oregon. The surveying was conducted on a fixed grid with intermediate shots taken at significant locations such as the toe and crest of slopes, structure locations, high and low elevations, edges of roads, geosynthetic seam locations, trench locations and at changes in surface features, i.e., soil-gravel or soil-revetment interface. The results of the survey present the critical intermediate and final elevations of all earthwork and geosynthetic work associated with the Remediation of the North and North 2 Landfills and the East landfill Cap Construction Project. Using the record surveys, Bergmann Associates developed as-built drawings for the project, which are presented in Attachment C. The drawings are numbered A-046140-WW through A-046148-WW inclusive and entitled "As-Built Conditions - North and North 2 Landfills and East Landfill Cap" Former Vancouver Operations, Vancouver, Washington. These drawings are referenced throughout the discussion of the construction activities, below.

4.4 PHASE I - SITE PREPARATION

4.4.1 Staging Areas, Access Roads and Railroad Crossings

During construction of the East Landfill Project, an existing site access road on the north side of the east Landfill connecting to Northwest Gateway Avenue and an existing access road on the southeast side of the North Landfill connecting to the Clark County Jail site were maintained. These roads were designated as 'clean' access roads.

To facilitate the transportation of Waste Soils from the North and North 2 Landfill to the East Landfill, Envirocon constructed a 'Contaminated Material Haul Road'. Construction of the road began on April 1, 2004. The 20 feet wide road extended from the west side of the North 2 Landfill through the west edge of the North Landfill, to an existing double gate at the northwest corner of the East Landfill property. Once on the East landfill property, the road was extended to the center of the west side of the limits of the East Landfill. Construction of this road required Envirocon to cross railroad tracks owned and operated by Burlington Northern-Sante Fe (BNSF). Stone aggregate meeting the gradation requirements of ASTM D448, size number 357 was installed up to and between the track rails to accomplish this task. To delineate the road as contaminated, Envirocon installed 4 feet high metal posts on 25 to 25 feet centers on both sides of the road and strung a line of yellow rope between each post. The top of the posts were covered with yellow caps for visibility and to prevent impalement. The road was completed on April 2, 2004. The approximate location of the Contaminated Material Haul Road is shown on Drawing A-046144-WW.

Envirocon also constructed a contractor staging area for employee parking, deliveries and for the site trailer. The staging area was constructed at the northeast corner of the site, adjacent to Northwest Gateway Avenue. The location also provided access to City of Vancouver electric and water utilities. The site trailer was installed on or about October 8, 2004. Electric for the trailer was installed on October 13, 2003 and approved by the Clark County PUD on October 15, 2003.

All of the work discussed herein was performed in accordance with applicable sections of the Technical Specifications or current industry standards and/or codes. Applicable sections of the work were documented in accordance with the CQCP.

4.4.2 Construction Layout and Surveys

Throughout the construction process, Envirocon utilized W&H Pacific from Portland, Oregon to perform initial layout work and conduct periodic surveys to verify the progress and layout ongoing work. W&H utilized the information presented on the construction drawings for reference. Of particular importance was the two monuments installed by Olson Land surveyors in 1996 to create the construction survey baseline used for all construction activities at the Site. All of the work associated with the East Landfill project was tied into the baseline.

During initial layout, W&H Pacific identified an elevation difference of 0.35 feet between the original elevation of Benchmark #2 and the current elevation. The elevation of Benchmark #1 remained unchanged. A decision was made by Alcoa and Bergmann to utilize the elevation of Benchmark #1 as the controlling elevation for the project. The change of elevation of Benchmark #2 was attributed to the location of the benchmark near a steep slope or the potential for earthquakes that have frequented the area to liquefy the sand supporting the benchmark. The benchmark information utilized throughout the construction process is as follows:

Benchmark No. 1	Benchmark No. 2	Benchmark No. 11
Brass Disc in Concrete	Brass Disc in Concrete	Brass Disc in Concrete
Station 10+87.15, 0.0 RT/LT.	Station 2+00, 0.0 RT/LT.	Station -0+20.75, 325.61RT.
Northing 122,006.609	Northing 121,927.8	Northing 121,583.82
Easting 1,071,707.901	Easting 1070,824.3	Easting 1,070,633.323
Elevation 38.04 feet	Elevation 37.89 feet	Elevation 30.08 feet

W&H Pacific also performed the topographic and reconnaissance survey to generate the as-built drawings for the East Landfill project. All surveying activities were performed in accordance with project requirements, under the guidance of a registered Washington surveyor and within the industry accepted standards for the profession. The location of the benchmarks is shown on Drawing A-046141-WW.

4.4.3 Erosion and Sediment Control

Erosion and sedimentation controls were installed by Envirocon at strategic locations throughout work areas of the East Landfill Project and were maintained throughout construction. The controls consisted of sediment fence, an infiltration basin and a jersey barrier silt fence. The work was performed in accordance with the drawings and specifications for the project and under permit PRJ2003-00991 issued by the City of Vancouver. The work was conducted in the first two weeks of October 2003.

The sediment fence was installed along selected perimeters of the North and North 2 Landfill areas adjacent to existing railroad tracks. Even though excavation of the Waste Soils resulted in ground surface elevations lower than the sediment fence, the fence acted as a safety barrier, identifying the top of the excavated slope. Sediment fence was also installed along the eastern property line of the East Landfill and near the northern property line of the East Landfill. Both fences protected areas lower in elevation than the East Landfill.

The infiltration basin was constructed on the east side of the East Landfill. A vegetated and forested natural depression was utilized for this purpose. The depression was modified on the east side using random fill to create additional volume needed for collection and dissipation of surface water runoff

during construction. A spillway was constructed on the south side to outlet stormwater in excess of the design storm volume. Riprap was used to protect the spillway against excess water velocities. The spillway tied into an existing drainage swale that directed the flow towards the Columbia River. The location of the infiltration basin is shown on Drawing A-046141-WW.

The jersey barrier sediment fence was installed over a distance of 1,100 linear feet at the waters edge of the Columbia River. The jersey barriers were placed directly on the sand or refractory brick along the shoreline. Filter fabric was anchored to the ground surface and extended up the upstream face of the barrier. It was secured at the top of the barrier with adhesive. The straw wattles were anchored to the ground at the upstream face of the barrier. A detail of the barrier is shown on Drawing A-046148-WW.

All of the erosion and sediment control activities were performed in accordance with the technical specifications or the referenced manufacturer's installation guide and the construction drawings and checked for completeness or compliance in accordance with the CQCP.

4.4.4 Building/Wall Demolition

Demolition of an unsided loadout building and a concrete retaining wall were performed by Envirocon on October 5 and 6, 2003. Prior to demolition, an engineering survey was conducted in accordance with 29CFR 1926.850 and OSHA to determine a safe demolition procedure. Following development of the survey, demolition was conducted according to the prepared procedure and in accordance with requirements of the HASP. Debris generated during demolition, consisting primarily of concrete, wood and steel was broken or bent into manageable pieces, placed in an existing, below-grade loadout area adjacent to the shed building and covered with fill. The fill was placed in a controlled manner to sift into open spaces of the debris, thereby reducing the risk of future settlement. Removal of concrete and steel was performed to a depth of 3 feet below existing ground surface, so as not to interfere with other facets of proposed work. Dust was controlled during demolition. The former location of the building and the burial location of the debris is shown on Drawing A-046141-WW. The work was performed in accordance with the technical specifications and the engineering survey and quality control was performed in accordance with the CQCP.

4.4.5 Fence Removal

Perimeter galvanized and barbed wire fencing was removed by Envirocon prior to construction activities commencing in that area. An existing barbed wire perimeter fence on the east side of the property, from the Columbia River to the contractor's entrance was removed during construction of the infiltration basin, which occurred on November 19, 2003. Chain link fencing around production wells adjacent to the North and North 2 Landfill were removed in April of 2004, prior to Waste Soil excavation. The removed metal fencing was disposed at a permitted off-site location. Concrete was disposed at the East Landfill. All work was performed in accordance with the technical specifications and quality control was performed in accordance with the CQCP.

4.5 PHASE II - SOUTH BANK AREA OF CONCERN

4.5.1 General

Remediation activities at the South Bank Area of Concern began on October 8, 2003. Envirocon performed clearing of vegetation from the eight proposed excavation areas (Areas X-1 through X-8) and extended the clearing 50 feet beyond the circumferential limits of the composite excavation area, to allow for additional excavation if needed. Clearing was conducted in a manner that avoided slope stakes previously installed by W&H Pacific that identified center points and maximum limits of excavation .

After clearing was completed, safety fence was installed around the entire excavation area, to warn on-site personnel of the below-grade excavations. Cleared material was disposed at a temporary location in the northeast corner of the East Landfill.

On October 9, 2003, Waste Management, Inc. (WMI) or their appointed transporter, Riverside Transporter Services, LLC delivered the first of several dozen roll-off-boxes for disposal of Waste Soils containing PCBs with concentrations exceeding 50 mg/kg (PCB Wastes). The procurement of roll-off boxes and the preparation of manifests for transportation were performed by Alcoa. Alcoa also incurred the costs associated with the Transportation and Disposal (T&D) of PCB Wastes to the WMI facility in Arlington, Oregon; however, the management of the roll-off boxes (delivery and pick-up) was performed by Envirocon. Alcoa personnel signed the manifests and documented the ID numbers for the roll-off boxes that were delivered to the site, filled with Waste Soils and transported to WMI for disposal. Staging of the roll-off boxes was directed by Envirocon or boxes were staged at the top of the slope adjacent to the South Bank Area of Concern.

4.5.2 Overview of Confirmation Sampling and Analysis of Soils

The Confirmation Sampling Plan adopted for the South Bank Area of Concern utilized immunoassay field screening techniques and verification grab sample methods. Immunoassay field screening was conducted by CH2M Hill during excavation activities to provide qualitative indications of the PAH concentrations in soil and to delineate the limits of excavation of Waste Soils with PCB concentrations over 50 mg/kg (PCB Wastes) from the limits of Waste Soils with PCB concentrations less than 50 mg/kg and greater than 10 mg/kg. The screening also provided a basis for the collection of PAH and PCB verification grab samples.

Verification grab sampling was conducted by CH2M after all excavation activities at the South Bank Area of Concern were completed. Analytical testing was performed by the Applied Sciences Group of CH2M Hill and results were compared with cleanup levels to document removal of all Waste Soils at each of the identified areas. If results of verification samples exceeded cleanup levels, additional excavation was performed in accordance with the procedures discussed in the Specifications.

The Model Toxics Control Act (MTCA) numerical standard for a routine cleanup action for Industrial Properties was identified as applicable for the South Bank Area of Concern. The Method A soil cleanup standards for PAHs (carcinogenic) and PCB Mixtures as discussed in Table 3 of WAC 173-340-745 were documented in the AO. The information is shown below and was used as the cleanup level at the South Bank Area of Concern:

Substance	Location	Cleanup Level
PAHs (carcinogenic)	North LF, North 2 LF and South Bank	20.0 mg/kg
PCB Mixtures	North LF, North 2 LF and South Bank	10.0 mg/kg

The Confirmation Sampling Plan is presented in Section VI of the Technical Specifications, which is provided in Appendix C.

4.5.3 Waste Soil Excavation and Sampling

South Bank excavation activities began at Excavation Area X-4, the second largest and easternmost area on October 8, 2003. The location of the eight excavation areas is shown on Drawing A-046141-WW. Material removed from this the east side of this area was verified by field screening as Waste Soils, therefore, Envirocon disposed of the material at a temporary location in the northeast corner of the East

Landfill. Final placement of these soils within the East Landfill would not be performed until excavation of the Waste Soils from the North and North 2 Landfills was performed, as discussed in Section 4.7.3 of this Report. Excavation was performed using a long reach excavator, to minimize travel through the areas and to offset the effects of the excavation located on embankment slopes. Excavation was performed to depths indicated on the design drawings. Drawing A-046146-WW presents the actual depths excavated.

At the center of Excavation Area X-4, Waste Soils excavated contained PCBs with concentrations exceeding 50 mg/kg (PCB Wastes). This material was segregated from other Waste Soils, dumped into roll-off boxes, covered with a tarp and staged until transportation for disposal. The WMI facility in Arlington, Oregon is an Alcoa approved and permitted Toxic Substances Control Act (TSCA) facility.

Waste soil removal from Excavation Areas X-3 and X-8 began on October 9, 2003. In conjunction with the work in Excavation Area X-4, screening of soils was conducted at elevations identified by historical sampling results. Waste Soils (less than 50 mg/kg) and PCB Wastes (greater than 50 mg/kg) were segregated during excavation. Excavation alternated between each of the three areas to allow for one to two day turnaround times associated with the analysis of quantitative grab soil samples.

Work at Excavation Area X-1 began on October 13, 2003 and movement of Waste Soils at Excavation Areas X-2, X-6 and X-7 began on October 16, 2003.

Between October 9, 2003 and November 3, 2003, Immunoassay screening and analysis of soil grab samples was conducted on all excavation areas except Excavation Area X-5, where work was not started until November 17, 2003. Once immunoassay screening confirmed removal of Waste Soils, grab samples were collected from specific locations. The verification grab samples were shipped by CH2M Hill to their Applied Science Group located in Corvallis, Oregon for analysis. Results were returned to Envirocon and forwarded to Alcoa. Results were reviewed to determine if contaminant concentrations in the excavation area were below those stated above, thereby allowing for backfill, or if additional excavation was required. If additional excavation was required, the depth of excavation was as documented in the technical specifications. On November 3, 2005, results of the confirmation samples for Excavation Area X-1 through X-4 and Excavation Area X-6 through X-8 indicated that clean-up levels had been achieved, thereby allowing for the backfill process to commence.

Earthmoving at Excavation Area X-5, the largest area began on November 17, 2003. Immunoassay screening at Excavation X-5 was performed through November 25, 2003. Confirmation samples were collected on December 1, 2003 and submitted to the CH2M Hill laboratory. On December 5, 2003, results of the confirmation samples indicated that clean-up levels had been achieved, thereby allowing for the backfill process to commence.

Waste Soil and PCB Waste excavation was performed in accordance with the technical specifications and quality control was performed in accordance with the CQCP.

4.5.4 Off-site Disposal of PCB Wastes

Transportation of roll-off boxes from the Site containing PCB Wastes began on October 30, 2003 and was completed on December 5, 2003. A total of eighteen (18) roll-off boxes were transported and disposed at Landfill 12 at the WMI facility in Arlington, Oregon during this time period. One (1) roll-off box was characterized as non-regulated material and disposed at Landfill 13 at the Arlington, Oregon facility. The hazardous waste manifest log prepared by Alcoa, the manifest application prepared by Alcoa and the certificate of disposal provided by WMI are presented in Appendix D.

4.5.5 South Bank Backfilling

Backfill of the Excavation Areas began on October 27, 2003 after quality assurance review of all verification sampling confirmed that the cleanup levels referenced in Section 4.5.2 of this Report had been achieved. The Technical Specifications stated that the material to be used as backfill was to be classified by the Unified Soil Classification System (USCS) as a silty or clayey gravel, a well graded sand or a silty or clayey sand.

Envirocon identified several borrow sources to provide fill proposed in construction of the shoreline embankment. To minimize costs, the borrow sources identified were located within a short driving distance from the site, resulting in the use of sand, commonly found in the Vancouver area, as the fill material. On October 21, 2003, Envirocon obtained geotechnical laboratory results for a sand borrow material provided by Glacier Sand and Gravel (Glacier Material), whose stockpile facilities were located on the parcel of property directly east of the Site. A review of the information by Bergmann on October 23 concluded that the sand, which was uniformly graded, lacked sufficient fines to fill in the voids between the uniform particle size and that as a result of the absence of fines, the shear strength of the material was not sufficient for use in construction of the embankment. A sample from a second borrow source on October 24 was classified by visual observation as sand with a uniform gradation. Envirocon informed Alcoa that borrow sources containing varying percentages of cohesive material (silt or clay) were available 10 to 20 miles west of the Site. Alcoa instructed Envirocon to locate a borrow source with percentages of cohesive material suitable for use in the embankment application or for mixing with the Glacier Material.

Envirocon identified a source of silt material in Gresham, Washington on October 27, 2003, approximately 25 miles away that was tentatively accepted by Alcoa for use in embankment construction. A sample of the soil was submitted to the laboratories of Carlson Testing, Inc. in Tigard, Oregon for geotechnical testing. On October 29, 2003, approximately 500 tons of this material was delivered to the site. However, on that same day, Envirocon identified a borrow source 5 miles from the Site that by visual observation contained greater percentages of silt and clay. The borrow source, an area of excavation along U.S. Interstate 5 (I-5 Material) was immediately accepted by Alcoa and Bergmann for use in constructing the embankment. Costs were significantly reduced due to the location of the borrow area and the material provided better cohesive and shear strength characteristics. On October 30, 2003, Envirocon established a contract with Taylor Trucking of Vancouver, Washington to deliver the Interstate 5 soils to the Site and collected a sample of the soil to obtain density and moisture values. The Interstate 5 soils were exclusively utilized in backfill of the Excavation Areas along the embankment, however upon delivery of wet soils from the Interstate 5 borrow area, dry sand from Glacier Site was used in equal proportions with the I-5 Material to reduce moisture content.

Backfill of Excavation area X-4 was completed on November 5, 2005. Backfill of remaining Excavation Areas (except X-5) occurred between November 5 and November 10, 2003 upon completion of quality assurance review. Excavation Area X-5 was backfilled the first week of December, 2003.

The backfill was spread and compacted in accordance with the requirements of the Technical Specifications and quality control was performed in accordance with the requirements of the CQCP. Density testing was performed in accordance with ASTM D-2922. Maximum dry densities and optimum moisture content for the soils were obtained in accordance with ASTM D698. The results of the density and moisture content testing confirm compaction to at least 90% of the maximum dry density of the backfill material. Field density and moisture content results, as well as results of laboratory testing for backfill of the South Bank Area of Concern are provided in Appendix E of this Report.

4.6 PHASE III - SHORELINE REHABILITATION

While performing excavation activities at the South Bank Area of Concern, Envirocon initiated work associated with the reconstruction of the shoreline adjacent to the East Landfill. Shoreline rehabilitation consisted of the construction of an earthen embankment, the installation of precast concrete revetment and the planting of native shrubs and vegetation. A section of the shoreline is shown on Drawing A-046148-WW. Construction of the various components of the shoreline adjacent to the East Landfill were designed to provide the following:

- To protect the toe of shoreline by deflecting wave energy associated with boat/barge traffic or typical wave runup from the natural flow of the Columbia River;
- To eliminate areas of instability by creating a uniform, stable slope, as analyzed and discussed in Section 2.4 of this Report;
- To reclaim some of the land area that had previously sloughed away as a result of the erosive actions of the Columbia River; and
- To upgrade the ecological and aesthetic conditions along the shoreline.

Each of these tasks is discussed below.

4.6.1 Clearing, Grubbing and Wire Removal

Clearing and grubbing of the shoreline area began on October 13, 2003. The majority of the clearing was performed within a 300 foot region near the western end of the shoreline, from the water's edge to the top of the slope. Trees with trunk diameters ranging from 2-inches to 6-inches were removed by Envirocon using excavation equipment that pulled the tree trunk and the root ball simultaneously. Beneath the tree canopy, the ground surface was covered with construction debris (furnace/refractory brick and scrap steel wire) disposed by Alcoa but independent of the same materials found within the East Landfill during RI activities. During the operations, the scrap steel wire on the slope became intertwined with the trees, thereby facilitating its removal from the slope (removal would have eventually been performed later in construction to permit grading of in-situ soils and refractory brick). The wire was stockpiled on the surface of the East Landfill, where it eventually would be buried prior to Waste Soil placement. Tree trunks were cut into manageable pieces and staged in the northeast corner of the East Landfill, adjacent to the Waste Soils from the South Bank Area of Concern. Clearing was completed on October 16, 2003.

4.6.2 Grading

Envirocon initiated grading activities on the western half of the shoreline on October 16, 2003. Refractory brick, soil and rocks in this area that had formed a relatively steep slope were graded and moved to the eastern half of the shoreline, where the topography was shallow sloping and where the existing slope was located 50 to 100 feet from the water's edge of the Columbia River. The graded material was spread at the toe of the embankment in horizontal loose lifts 12 to 15-inches thick and 10 to 20 feet wide. The material was compacted using a dozer until non-movement of the material was observed beneath compaction equipment during compaction operations. Conventional compaction equipment was not used based on the irregular ground surface created by the fill materials. Density testing was not performed due to the irregularity of the materials being used as fill. Grading at the western half of the shoreline was extended approximately 8 to 10 feet (measured horizontally) beyond the proposed limits of the final embankment slope to allow for the placement of suitable fill for concrete revetment installation, as described later in this section. Approximately 2,000 cubic yards of fill was

graded. The approximate location of graded material and the area utilized for fill placement is shown on Drawing A-046141-WW. Grading of existing materials was completed on October 22, 2003.

4.6.3 Borrow Materials

In conjunction with grading activities, Envirocon contracted with H&H Wood Recyclers of Vancouver, Washington to begin delivery of compost for use in the construction of the 24-inch thick outer shell of the shoreline embankment. This shell was required to support and aid in the growth of the various vegetative species proposed for planting within the concrete revetment between elevation 7.0 AMSL and elevation 18.0 AMSL. The compost delivery began on October 24, 2004.

On October 30, Envirocon began mixing of the compost with the I-5 Material and the Glacier Material delivered to the Site during backfilling of the South Bank Area of Concern. A discussion of these borrow materials is presented in Section 4.5.5 of this Report. Mixing was performed in equal portions. The mix was staged on the surface of the East Landfill until construction of the 24-inch outer shell commenced.

4.6.4 Fill Placement-Water's Edge to 18 ft. AMSL

Upon completion of grading, Envirocon commenced with shoreline fill activities. The fill activities commenced at approximate elevation of 7 feet AMSL at the west end of the embankment. At this elevation and location, a bench was excavated into the in-situ soils and some stone material left over from access road construction was used in construction. The stone was needed to create the bench at locations where high tide from the Columbia River had temporarily covered and saturated the existing in-situ soils. Use of the stone was recommended by Bergmann Associates to provide adequate bearing capacity for the soils to be placed upon the bench and to provide a foundation on which soil can be compacted. After excavation to create the bench but prior to stone placement was completed, woven filter fabric was installed in one horizontal panel over the bench. The I-5 Material was exclusively utilized in fill placement activities over the filter fabric to achieve adequate slope stability and to meet the proposed contours and slopes presented in the design drawings. The I-5 material was end-dumped from the top of the existing slope, at approximate elevation 30 ft. AMSL. The material was spread by dozer into loose lifts 8 to 10-inches thick in accordance with the technical specifications.

Fill placement activities associated with the westernmost 300 feet of the embankment were performed in an expeditious manner, to avoid saturation of the fill by tidal waters. At no time was I-5 Material spread and compacted over saturated fill material. Once at this location, grading and excavation of the embankment was not required as the existing embankment shoreline was located farther to the north, creating a beach area between the toe of the embankment and the water's edge. Fill placement activities were conducted in this reach with minimum interference from water. Installation of filter fabric and placement and compaction of fill was performed as discussed above. The I-5 Material was spread in loose lifts and compacted using smooth drum rollers. Testing of the compacted lifts was performed in accordance with ASTM D2922 and the CQCP. Compaction of the soil to at least 90% of the maximum dry density, obtained in accordance with ASTM D698 was performed. Density and moisture content tests were performed at least once for every 500 cubic yards of soil spread. Field density and moisture content results, as well as results of laboratory testing for construction of the shoreline embankment are provided in Appendix E. Fill placement activities associated with the embankment were temporarily suspended at an elevation of 18 ft. AMSL, to allow for installation of the Armorflex concrete revetment panels as discussed below. Approximately 3,800 cubic yards of fill was used to construct this portion of the embankment.

In conjunction with the lift construction using the I-5 Material, the 24-inch thick outer shell of the embankment was constructed using the sand–compost mix. The mix was dumped by excavator at

specified locations and spread in loose horizontal layers over a horizontal width of approximately 5 feet. This width accounted for approximately 50% of the width of the dozer blade used by Envirocon to spread fill; the remaining dozer blade width spread the I-5 Material. The sand-compost mix was only utilized in fill placement activities between elevation 8 ft. and 18 ft. AMSL. The sand-compost mix was lightly compacted. After fill placement was completed, the finished ground surface was tight bladed to create a smooth surface. This smooth surface was necessary to facilitate installation of the filter fabric and precast concrete revetment as discussed in section 4.6.5 of this Report.

4.6.5 Concrete Revetment Installation

Upon completion of fill placement activities to elevation 18 ft. AMSL, including the construction of the 24-inch thick outer shell comprised of the sand-compost mix, installation of the concrete revetment panels and associated appurtenances was performed.

In August of 2003, Alcoa awarded a contract to Armortec, located in Bowling Green, KY to provide 62,000 square feet of Armorflex. Armorflex is a series of precast interlocking concrete blocks connected together with galvanized polyester cables. The blocks are 18 inches wide, 24 inches long and 6 inches deep. The concrete used in the formation of the blocks has a compressive strength of 4000 pounds per square inch (psi) and is treated to resist sulfates and improve durability. The blocks are formed with open areas, or cells within their interior and around their perimeter, which aid in relieving hydrostatic uplift. Armorflex was selected because of its ability to protect the shoreline against the detrimental impacts of wave action and hydraulic forces such as water velocity and peak flows, while also providing environmental benefits for vegetation as discussed below.

The edges of each block are beveled to allow angular distortions between blocks up to 18 degrees, which allows flexibility in the anchorage procedures for the mats. A typical mat is 8 feet wide, 40 feet long and weighs about 8 tons. The cables used in the formation of the mats are continuously threaded through the blocks, forming a series of semicircular loops at two ends of the mat. The loops are located along the 8 foot width of the mats.

Armortec contracted with Contech Construction Products of Tualatin, Oregon, a concrete manufacturing firm to cast the Armorflex blocks and assemble the panels using their patented forms and materials. The assemblage of the panels began in October of 2003.

Delivery and installation of the Armorflex began on November 6, 2003. Prior to installation of Armorflex, the 2.5 horizontal to 1.0 vertical (2.5H:1V) slope was inspected for the presence of large stones and debris. Following the inspection, a layer of woven filter fabric was installed on the slope. The fabric selected was GTF-200, as manufactured by Northwest Linings and Geotextile Products, Inc. The geotextile is required by Armortec to increase the shearing resistance of the soil. The geotextile was installed perpendicular to the water's edge with adjacent panels overlapped by a minimum of two feet. In the absence of an anchor trench, the geotextile was extended a minimum of 5 feet over the horizontal bench at 18 ft. AMSL, to correspond with the placement of the Armorflex panels on the same bench.

The Armorflex panels were delivered to the Site on flatbed trucks. Four Armorflex panels were delivered on each truck. The trucks were directed to park on the crest of the East Landfill at elevation 30 ft. AMSL for unloading. Envirocon provided a 200 ton crane fitted with a 20 to 25 feet wide spreader bar to remove the Armorflex panels from the trucks. The spreader bar attached to the Armorflex mats at the 8-foot wide ends.

Installation began at the west end of the embankment and proceeded eastward. The panel was lifted directly from the truck and lowered into place over the filter fabric with one 8-foot end parallel to the

water's edge (the 40 feet long edge [longitudinal] is perpendicular to the water's edge). The elevation of the edge of Armorflex at the bottom of the embankment was approximately 7 ft. AMSL. The opposite end of the panel was established at approximate elevation 18 ft-AMSL. At the bench elevation, approximately 4 to 6 feet of panel was laid on the horizontal bench. Ensuing panels were butted to the longitudinal edge of the initial mat. No connection of mats on the longitudinal edges was performed, as per the manufacturer's installation guide.

Envirocon installed the first panel on the finished embankment surface approximately 4 feet from the proposed location indicating the limits of the Armorflex. This was performed to allow for the construction of a longitudinal anchor trench, extending 3 feet deep from the top of the finished 2.5H:1V slope and extending from elevation 7 ft. AMSL to elevation 30 ft. AMSL. This trench was required to anchor the last downstream panel, to minimize for the potential disturbance of consecutive panels. One Armorflex panel would be installed halfway into the trench and halfway on the final embankment surface, abutting the full Armorflex panel. After installation, the trench was backfilled with cement. The same procedure was performed on the final upstream mat, to aid in pullout from the downstream velocity of water.

To maintain the mat at its location on the bench, three 'Helix' anchor screw were drilled approximately 3.5 feet apart into the embankment approximately 12-inches away from the end of the mat. The screw anchors are provided with an eyehook that attaches to the top of the anchor. Using this eyehook and the cable loops at the end of the mat, a length of No. 5 reinforcing bar was threaded through the loops and the eyehooks, connecting the two appurtenances. Approximately 600 anchor screws were used to secure approximately 100 panels at elevation 18 ft. AMSL and 100 panels at elevation 30 ft. AMSL. W&H Pacific conducted a random spot check of anchor screws. The location of the anchor screws checked and elevations of the anchor screws is shown on Drawing A-046143-WW.

At two locations, two taperered mats were installed, to allow for a change in the orientation of the embankment surfaces. The mats were installed using the same procedure as whole rectangular mats, except that cement was placed between the adjacent mats due to the abnormal spaces between individual blocks.

The Armorflex installation was completed in December of 2003. The installation of the Armorflex was performed in accordance with the requirements of the Technical Specifications and quality control was performed in accordance with the requirements of the CQCP. A Certificate of Compliance for the Armorflex mats for the installation is provided in Attachment D.

4.6.6 Fill Placement-18 ft. AMSL to 30 ft. AMSL

After installation of Armorflex panels had proceeded 500 to 600 feet to the east from the west starting point, Envirocon continued construction of the embankment from the bench elevation of 18 ft. AMSL to the proposed top of the embankment at elevation 30 ft. AMSL. The fill placement activities proceeded in the same manner as discussed in Section 4.6.4 of this Report. Cohesive soil was spread in loose lifts 8 to 10 inches thick and compacted to 90% of the maximum dry density of the material. Placement of the fill eliminated the bench at elevation 18 ft. AMSL and covered the horizontal portion of the Armorflex panels installed previously. The placement of fill at this elevation did not include a sand-compost outer layer, as required for the lower elevation portion of the embankment. In conjunction with fill placement, the finished embankment surface was tight bladed to allow for proper installation of filter fabric and Armorflex. Fill placement activities associated with the shoreline embankment were completed on or about November 14, 2003.

Installation of Armorflex panels at this higher elevation was performed using the same procedures as discussed in Section 4.6.5 of this Report. The anchor screws were installed at approximate elevation 30 ft. AMSL. The final orientation of the panels on the slope is shown on Drawing A-046142-WW.

4.6.7 Open Cell Soil Infill

On November 10, 2003, in conjunction with the construction of the earthen embankment above elevation 18 ft. AMSL, Envirocon began to fill in the open spaces of the Armorflex precast blocks installed over the embankment between elevation 8 ft. and 18ft. AMSL. A sand-compost mix that was prepared the previous week was spread over the concrete revetment using a long-reach excavator. The bucket of the excavator was 'shaken' in an attempt to distribute the fill uniformly over the revetment panels, however, the process resulted in non-uniform coverage. Envirocon personnel were tasked with using brooms and shovels to manually distribute the fill evenly within the open spaces and to remove excess from the surface of the panels. Filling of the open spaces on the lower portion of the revetment began at the west end of the shoreline and proceeded eastwards. Filling was performed in a continuous operation over the 600 linear feet and was completed on November 12, 2003.

Spreading of the sand-compost mix within the revetment open spaces for the upper layer of revetment began in the afternoon on November 12. The spreading of fill was not performed continuously; portions of the embankment were still under construction and revetment panels at the east end of the shoreline were not yet installed. The procedure used to fill the open spaces was the same as discussed above. The filling of all open spaces within and between the panels was completed on November 18, 2003.

4.6.8 Willow Stakes and Shrub Planting

Planting of the vegetation was performed between January 13 and January 19, 2004. Envirocon contracted with Abovo Landscaping of Vancouver, Washington to perform the planting of willow stakes and native shrubs within selected open spaces of the revetment. Planting was delayed until this time to allow for harvesting of the willows during their dormant period, which occurs in December and January.

Planting of willow stakes was performed in the lower portion of the revetment, between elevation 8 ft. and 18 ft. AMSL. Prior to the planting of the willow stakes, preparation of the live stakes was performed in accordance with the specifications. This consisted of the soaking of the stakes in water for two weeks (specifications required one week minimum). Ends to be buried in soil were trimmed to a tapered point while the end to remain above the ground surface was cut flat. The length of the willow stakes was at least two feet and diameters ranged from ½-inch to 2-inches. Some of the willows were segregated and removed when an inspection observed a surface disease on the bark.

Planting commenced at the east end of the revetment and proceeded west. In accordance with the specifications, the filter fabric beneath the revetment was punctured and an awl was used to create a pilot hole in the soil. The hole was created vertically and not perpendicular to the surface of the revetment. Creating the pilot hole was relatively easy, due to the sand-mulch shell placed 24-inches beneath the revetment surface as previously discussed. The center to center spacing of the holes was increased from 24-inches in the specifications to 36-inches to conform with center to center spacing of open cells between two Armorflex blocks. After creating the hole, the willow stakes were driven 12-inches to 18-inches into the ground. If necessary, a mallet was used to obtain the proper depth. Care was taken to protect the live stakes from damage such as splitting, bark peeling, and bud breakage during installation. Once in place the soil was tamped around the plant and the flat tip of the willow was cut at an angle facing south, to allow the willow to dry, thereby minimizing the potential for the willow to become disease infected.

Problems encountered during planting included planting of the willow stakes upside down and difficulty driving naturally bent willow stakes. Alcoa educated Abovo in identification of the top and bottom of the willow stakes and allowed Abovo to create larger holes to manually insert bent willows. The planting of the willow stakes was completed on January 16, 2004.

Immediately after willow stake planting, Abovo initiated planting of bare root shrubs. Planting of the shrubs was performed along the upper tier of the concrete revetment, between the elevations of 18 ft. AMSL and 30 ft. AMSL. Five varieties of plants were recommended in the specifications; an equal number of each variety were acquired. The species were randomly arranged to provide variety. The spacing of each plant was established at approximately 5 feet in a horizontal direction and 2 feet in a vertical direction. On January 15, Abovo staked the location of the shrubs with pin flags. Five colors of flags were used; each color identified a specific species of shrub to be planted at that location. The soil in the open cell was completely removed and the filter fabric beneath the revetment was cut in the form of an 'X.' An additional 6-inches of soil was removed from the hole and the shrub root was gently inserted into the hole. The shrub was planted with the root crown (the point where the roots and stems meet) at finished grade (the top of the concrete revetment). The hole was then backfilled with sand-mulch mix and tamped. To determine if soil was adequately tamped around the shrub, moderate pressure was applied in an attempt to pull out the shrub. Non-movement indicated adequate tamping. Shrub planting was completed on January19, 2004.

The planting of the willow stakes and native shrubs was performed in accordance with the requirements of the Technical Specifications and quality control was performed by CH2M Hill and Alcoa personnel in accordance with the requirements of the CQCP.

4.7 PHASE IV – NORTH AND NORTH 2 LANDFILL

Remediation of the North and North 2 Landfills consisted of the removal of approximately 38,000 cubic yards of Waste Soils from areas identified by historical investigations and the grading of in-situ soils to create stable and safe slopes for easy maintenance. The excavation of these soils would create certified clean areas and provide fill for use in establishing the subgrade slopes needed for construction of the Engineered Barrier, as discussed in Section 4.7.4 of this Report. The work associated with the North and North 2 Landfills is discussed below.

4.7.1 Clearing and Grubbing

Remediation activities at the North and North 2 Landfill began on April 2, 2004. Envirocon performed clearing of trace amounts of vegetation from the landfill areas and removed selected debris from the areas designated for excavation. Envirocon also removed chain link fencing surrounding two production wells located within the excavation area and created a Contaminated Material Haul Road from the landfill areas to the East Landfill. Along the road, No. 357 stone was used to create access across two railroad spurs. After clearing was completed, sediment fence was installed around the entire excavation area, to warn on-site personnel of the below-grade excavations. Cleared material was disposed at a temporary location in the northeast corner of the East Landfill.

On or about April 8, 2004, WMI delivered two roll-off-boxes for disposal of Waste Soils containing PCBs with concentrations exceeding 50 mg/kg (PCB Wastes) from the North Landfill. Using the same responsibilities as established during work at the South Bank Area of Concern, the management of the roll-off boxes (delivery and pick-up) was performed by Envirocon. Alcoa personnel managed the manifests. The roll-off boxes were staged at an area designated by Envirocon south of the North 2 Landfill.

4.7.2 Confirmation Sampling

The Confirmation Sampling Plan adopted for the North and North 2 Landfills utilized the same immunoassay field screening techniques and verification grab sample methods as the South Bank Area of Concern, discussed in Section 4.5.2 of this Report. However, in addition to identifying Waste Soils with PAH concentrations greater than 20 mg/kg and PCB concentrations greater than 50 mg/kg and greater than 10 mg/kg, the screening identified TCE concentrations greater than 0.5 mg/kg.

4.7.3 Excavation

Excavation activities at the North 2 Landfill began on April 6, 2004. Envirocon used a 3 cubic yard, track mounted hydraulic excavator and two 20 ton Volvo off-road trucks to transport Waste Soils from the North 2 Landfill to the East Landfill. The location of trucks and excavators were established on the existing ground surface; at no time did equipment enter the excavation. The excavator loaded the trucks to a capacity that minimized spillage during hauling.

Excavation at the North 2 Landfill was performed to the depths indicated on the plan drawings. However, upon reaching the proposed depth at one location at the North 2 Landfill, the color of the Waste Soils turned from dark grey to brown. It was concluded that the brown soils represented in-situ, non-contaminated sand. The depth that this change occurred was approximately 1 to 2 feet lower than the proposed excavation contours. After conferring with Alcoa and Bergmann Associates, Envirocon was instructed to excavate to the brown soils became visible and to use the excavation plan presented in the drawings as a guide.

During excavation of the North 2 Landfill, two areas identified by historical sampling containing PCB Wastes were excavated. This soil was placed in roll-off boxes supplied by WMI on April 13, 2004. The boxes were staged adjacent to the North 2 Landfill until confirmation sampling confirmed that the material excavated was PCB Wastes and arrangements for pick-up could be finalized. Waste Soils above and below the depth indicated above were excavated and stockpiled on the ground surface for screening by CH2M Hill for characterization as either PCB Wastes or Waste Soils.

Major excavation at the North 2 Landfill was completed on April 13, 2004. Upon completion of excavation, CH2M Hill conducted immunoassay screening to qualitatively confirm removal of Waste Soils. The locations for screening were developed using a 50 feet square grid and staggered locations. Soil was collected at 12-inch depths below the excavated ground surface. A plan of the grid sampling is presented in Appendix F.

In conjunction with immunoassay screening at the North 2 Landfill, excavation of the Waste Soils at the North Landfill commenced. Excavation alternated between the two landfills to allow for one to two day turnaround times associated with the analysis of quantitative grab soil samples. Procedures for excavation at the North Landfill were the same as those established for the North 2 Landfill. Major excavation at the North Landfill was completed on April 23, 2004. The plan of the North and North 2 Landfill immediately after Waste Soil excavation is shown on Drawing A-046144-WW.

The PCB Waste placed in roll-off boxes on April 13, 2004 was picked up by Waste Management and transported off site on April 16, 2004. Also on that date, test results for the soil adjacent to the PCB Waste that was temporarily stockpiled on April 13 were received that characterized the soil as Waste Soil. This soil was transported to the East Landfill.

Between April 16, 2004 and May 19, 2004 immunoassay screening and grab sampling was conducted by CH2M Hill at various locations within the North and North 2 Landfills to verify removal of all Waste

Soils with concentrations of PCB, PAH and TCE in excess of the levels stated in the specifications and in Section 4.7.2 of this Report. The grab samples were collected after additional excavation was performed by Envirocon to remove Waste Soil identified by a previous round of immunoassay screening. The additional soil was excavated to a depth of 30-inches at the test result location and 12-inches at adjacent perimeter test result locations. This Waste Soil was transported to the East Landfill for disposal. The results of immunoassay screening and grab samples are provided in Appendix F.

On April 30, 2004, CH2M Hill conducted a limited soil gas investigation at the North and North 2 Landfills, after excavation of Waste Soils had been completed. The purpose of the investigation was to identify TCE vapor concentrations in the in-situ, brown sandy soil that were designated to remain. The results of the analysis of the soil gas samples concluded that TCE vapor concentrations in the soils were below the cleanup levels for TCE discussed in Section 4.7.2 above. The soil gas report is presented in Attachment B.

On May 14, 2004, the test results of grab sample taken at three problematic areas at the North Landfill were received by Envirocon and documented that cleanup levels have been achieved. On May 19, 2004, a singular test result of a grab sample at one problematic area at the North 2 Landfill was received by Envirocon and documented that cleanup levels have been achieved.

On April 16 and May 17, 2004, four (4) roll-off boxes were transported and disposed at Landfill 12 at the WMI facility in Arlington, Oregon. PCB Waste in these boxes was obtained from isolated areas at the North and North 2 Landfill. The hazardous waste manifest log prepared by Alcoa, the manifest application prepared by Alcoa and the certificate of disposal provided by WMI are presented in Appendix D.

4.7.4 Disposal of Waste Soils at East Landfill

The trucks hauling Waste Soils from the North 2 Landfill and the North Landfill to the East Landfill utilized the Contaminated Material Haul Road to traverse between locations. The Contaminated Material Haul Road entered the East Landfill from the west side, through an at-grade opening in the anchor trench embankment constructed around the perimeter of the East Landfill. The Waste Soils were dumped at the northern end of the East Landfill; the initial loads were located adjacent to the Waste Soils excavated and temporarily stockpiled from excavation activities at the South Bank Area of Concern in November of 2003. After dumping at the East Landfill, a dozer spread the waste soils into loose lifts approximately 12-inches thick, in accordance with the technical specifications. A smooth drum roller compacted the soils. .

Because of the variability of the Waste Soils, which consisted of sand rock, refractory brick and miscellaneous debris, a soil sample that could be considered ‘representative’ could not be collected and submitted for testing in accordance with ASTM D698, to determine maximum dry density and optimum moisture content. Therefore, Bergmann Associates instructed Envirocon to utilize an area of the east Landfill to construct a test fill using Waste Soils from the North Landfill. The test fill was constructed on April 6, 2004. A modified procedure for the test fill was obtained from the USEPA technical document entitled “Final Covers on Hazardous Waste Landfills and Surface Impoundments,” July 1989. After a lift of Waste Soil was spread, the smooth drum compactor traveled forward and backward over the surface. Several density tests were taken to establish an average actual density of the material. The compactor then traveled over the same area two more times and the density testing was repeated. Results were compared with the first round of tests. The process was then repeated for a third and fourth time. Based on the percentage increase in density testing results, it was determined that passing of the compactor three times (forward and backward) over the spread Waste Soils would provide sufficient compactive effort to create a stable fill area while minimizing labor time. Based on Bergmann Associates’ visual observation of the Waste Soils, a qualitative value of compaction based on the results of three passes was estimated to

be between 87% and 92% of the maximum dry density of the variable soil. The eight (8) density results of the test fill are included in Appendix G.

The Waste Soils were spread by dozer beginning at the northern perimeter of the east Landfill in loose lifts 8 to 10-inches thick in accordance with the technical specifications and compacted using smooth drum rollers. Testing of the compacted lifts was performed in accordance with ASTM D2922 and the CQCP. Density and moisture content tests were performed at least once for every 500 cubic yards of soil spread. Field density and moisture content results for the placement of the Waste Soils at the East Landfill provided in Appendix G.

The decision to excavate to the brown, in-situ sand soils at the North and North 2 Landfills and the additional Waste Soils removed as part of confirmation sampling resulted in a total of 38,000 cubic yards of Waste Soils excavated and hauled to the East Landfill. This volume, which was confirmed by survey on May 13, 2004, exceeded the original quantity estimates developed from the excavation plan drawings by 10,000 cubic yards. As a result of the increase in volume, the proposed plan presenting the topography for the surface of the Waste Soils at the East Landfill was modified. On April 22, 2004, Envirocon and Alcoa determined that raising the elevation of the anchor trench platform and the elevations of the Waste Soils by 0.5 feet from the proposed elevations shown on the design drawings would generate the needed volume to accommodate the additional Waste Soils. However, at that time, the total volume increase was not recognized. On April 29, it was determined that additional volume would be required to accommodate the Waste Soils. Bergmann Associates and Envirocon decided to increase the elevation of the top of the fill by approximately 1.5 feet. The increase in elevation increased the slopes of the surface on which the geosynthetics would be installed from 3.3% as shown on the design drawings up to 5% at selected locations. The additional slope would not affect the construction of the Engineered Cap, as WAC regulations allow for slopes up to 5%.

The final grading of the Waste Soils at the East Landfill was completed on April 29, 2004. In conjunction with grading, Envirocon initiated spreading of a 3-inch to 6-inch thick layer of sand over the Waste Soils. It was determined that this layer was needed to protect the geosynthetics installed as part of the Engineered Cap from the miscellaneous debris contained within the Waste Soils. The debris could not be graded smooth at the surface without complete removal and a concern arose that tearing of the geosynthetics may occur. The sand was obtained from the reconstruction of the anchor trench embankment, which is discussed in Section 4.8.2 of this Report. Installation of the sand layer, which included minor compaction was completed on May 1, 2004.

4.7.5 Grading

Upon completion of Waste Soil excavation, Envirocon performed general grading of the 2H:1V slopes at the North and North 2 Landfill formed from the excavation activities. The purpose of the grading was to create shallow slopes (approximately 4H:1V) that would meet Alcoa requirements for maintenance. Fill generated by grading at the top of the slopes was spread and compacted at the base of the slope. Grading was performed on or about May 18, 2004. The final topography of the North and North 2 Landfill is shown on Drawing A-046145-WW.

4.7.6 Vegetation

Vegetation of the North and North 2 Landfills was performed by Briar Group during the week of September 13, 2004. The area was hydroseeded using a mix native to the Vancouver area and used by the Washington Department of Transportation (WDOT). The mix consisted of 40% Perennial Rye, 40% Creeping Red Fescue, 10% Highland Bent and 10% White Clover. The seed was applied at a rate of 80 to 120 pounds per acre. Fertilizer was incorporated into the seed slurry at a rate of 250 pounds per acre of

21-7-14 (N-P-K). .After completion of the hydroseeding, straw mulch was applied at a rate of 2000 pounds per acre. Asphaltic emulsion was used to secure the mulch on the ground surface.

4.8 PHASE V – EAST LANDFILL CONSTRUCTION

4.8.1 Clearing and Grubbing

Clearing of the East Landfill was performed during the first two weeks in October of 2003. Clearing consisted of the cutting of trees near the ground surface. Grubbing of the ground surface was not performed. The clearing was performed at this time to allow access to the shoreline for embankment construction, which was discussed in detail in Section 4.6.4 of this Report. Clearing was also performed to facilitate temporary stockpile of Waste Soils with PCB concentrations less than 50 mg/kg that were excavated from the South Bank Area of Concern. This work was discussed in detail in Section 4.5.3 of this Report. The clearing process was also needed to delineate a depression in the East Landfill into which wire and refractory brick removed from the shoreline grading activities was disposed. Trees cut from the surface of the East Landfill were also disposed in this depression.

4.8.2 Anchor Trench Embankment Construction

Construction of the anchor trench embankment platform began on November 20, 2003. Glacier Material was delivered to the site and dumped near the southeast corner of the East Landfill. Envirocon began the construction of the embankment at that location and proceeded in a westerly direction, along the top of the shoreline embankment. Embankment slopes and crest widths were constructed in accordance with the technical specifications and as shown on the drawings. Upon construction of the southern perimeter, Envirocon continued construction along the west perimeter and then along the northern perimeter.

In accordance with the drawings, a 30 feet wide, at-grade opening was left in the center of the western segment of the anchor trench embankment to allow trucks hauling Waste Soils from the North and North 2 Landfill to access the surface of the East Landfill via the Contaminated Material Haul Road. An opening was also created in the north segment of the embankment platform to permit non-truck hauling vehicles to enter the East Landfill area. The eastern embankment was the final segment constructed. The embankment was completed on December 5, 2003.

On April 13, 2004, Envirocon and Alcoa personnel became concerned over the ability of the anchor trench embankment soil to maintain its geometry during excavation of the anchor trench. The sand used for construction was uniformly graded and contained no fines. Alcoa discussed the issue with Bergmann Associates and on April 16, 2004, a decision was made to replace the top three feet of the anchor trench embankment platform with a clay material. On April 20, 2004, Envirocon identified a local residential borrow source in Vancouver and collected two soil samples for testing to determine the classification of the soil and to verify that it was ‘certified clean’. Visual inspection of the soil by Alcoa concluded that a sufficient amount of clay existed. On April 21, 2004, Envirocon and Bergmann Associates decided to remove the top three feet of the existing anchor trench embankment constructed using sand and replace that material with the subject clay material.

On April 26, 2004, Envirocon began excavating the sand from the anchor trench embankment. The sand was spread by front end loader over the Waste Soils within the East Landfill. As discussed in Section 4.7.4 of this Report, a cushion layer was required to protect the geosynthetics of the Engineered Barrier from debris unable to be smoothly compacted at the surface of the East Landfill. After removing the sand, the clay material from the Vancouver residential borrow source was used to rebuild the anchor trench embankment. Construction of the embankment using clay would aid in maintaining the side slopes of the embankment at the proposed 1 horizontal to 1 vertical (1H:1V) side slopes and would also permit

the anchor trench to be cut into the top of the platform to the required geometry (vertical side slopes). Taylor Trucking transported the soil to the East Landfill.

The anchor trench clay soils were spread by dozer in loose lifts 8 to 10-inches thick in accordance with the technical specifications and compacted using smooth drum rollers. Testing of the compacted lifts was performed by Carlson Testing Inc. in accordance with ASTM D2922 and the CQCP. Density and moisture content tests were performed at least once for every 500 cubic yards of soil spread. Field density and moisture content results for the placement of the soils provided in Appendix G.

Completion of the anchor trench platform construction using clay was completed on May 3, 2004.

4.8.3 Engineered Barrier Construction

4.8.3.1 General

The Engineered Barrier was designed in accordance with The Model Toxics Control Act (MTCA) for Industrial Properties and applicable sections of the WAC. It was designed to cover Waste Soils obtained from the North and North 2 Landfills and from the South Bank Area of Concern that were spread within the limits of the anchor trench embankment to establish the subgrade elevations needed for construction of the Engineered Barrier. The Engineered Barrier consists of the following:

1. A multi-layer impermeable barrier consisting of a geosynthetic clay liner (GCL) covered with a 60-mil thick textured HDPE geomembrane. These geosynthetic layers are constructed on a sand layer spread over the Waste Soils to create a smooth surface.
2. A synthetic drainage net with non-woven geotextile attached on both sides, to promote drainage of surface water infiltrating the upper soil layers.
3. An 18-inch thick layer of random fill soil was spread and compacted over the geosynthetics of the Engineered Barrier.
4. A 6-inch thick soil cover layer was spread over the Random Fill Layer.

The Engineered Barrier also included the construction of an anchor trench and an integral subsurface drainage system with cleanouts. The installation and subsequent Quality Assurance testing were performed and completed in accordance with the Technical Specifications and the CQCP, unless otherwise noted in this section.

4.8.3.2 Preconstruction

Construction of the Engineered Barrier began on Monday May 24, 2004. Texas Environmental Plastics (TEP) arrived on that morning and attended a safety briefing meeting conducted by Alcoa. Envirocon and Alcoa personnel walked the surface of the East Landfill to perform a final check for unsuitable materials protruding from the cushioning sand layer. Envirocon personnel had removed all unsuitable material from the surface during an inspection on May 20, 2004.

On that same day Bergmann Associates, Alcoa and CH2M Hill personnel attended a meeting to discuss documentation requirements for the installation of the various layers of the Engineered Barrier. Review of the CQCP was also performed. Bergmann Associates also provided additional information on geomembrane elongation values and minimum weld values. During the meeting a modification of the geomembrane panel layout plan was also approved. TEP suggested that geomembrane installation could be simplified if panels could enter anchor trench at 70˚angle. The CQCP stipulated entering the anchor

trench at a 90˚angle; this requirement was waived. CH2M would act as the primary quality control inspector and Alcoa would provide Quality Assurance.

Delivery of geosynthetics for use in constructing the Engineered Barrier began on May 5, 2004. Geosynthetic Clay Liner (GCL) manufactured by Colloid Environmental Technologies Company (CETCO) was shipped from their facility in Arlington heights, Illinois and arrived in panel trucks. The rolls were stockpiled in the ACPC Building located northwest of the East Landfill. On May 19, 2004, deliveries of geomembrane began. The geomembrane was shipped by GSE from their facility in Houston, Texas.

4.8.3.3 Anchor Trench Excavation

Excavation of the anchor trench began on Tuesday, May 25, 2005. The trench was excavated by Envirocon using a mini trackhoe assembly to the 24-inch depths indicated on the drawings. The excess clay material was stockpiled on site. The side slopes were excavated vertically; the presence of the clay material allowed this approach to be implemented. The modification from sloping sidewalls shown on the design drawings to vertical sidewalls was approved by Bergmann Associates. Anchor trench excavation began on the west side of the East Landfill; TEP requested that geosynthetic installation begin on this side. Anchor trench excavation continued during deployment of geosynthetics and was completed on June 4, 2004.

4.8.3.4 Geosynthetic Clay Liner

Installation of the geosynthetic clay liner (GCL) began on the morning of Tuesday, May 25. GCL panels were unrolled in an east-west direction, beginning at the west perimeter of the East Landfill. The length of the panels varied from a minimum of 12 feet at the northwest corner to 100 feet at the southwest corner, with several intermediate panels extending 125 feet. The purpose of the length variation was to create a straight line that TEP could use to place panels in a north and south direction, while meeting the 70˚ angle requirement for geosynthetics in an anchor trench. A total of 33 panels were installed in the east-west direction. The GCL rolls were 12.5 feet wide. The GCL rolls entered the west anchor trench at an angle of 70˚or at an angle of 80˚.

Panels were installed using a front end loader with a spreader bar assembly attached to the bucket. The front end loader positioned itself over the anchor trench at the west or north perimeter of the East Landfill and raised the spreader bar containing a roll of geosynthetic to a height of 10 to 15 feet. The end of the geosynthetic was then unrolled from the spreader bar and pulled across the landfill ground surface. Pulling was performed by manual labor or by attaching the end of the roll to a truck or ATV. Most of the rolls were pulled using the ATV. CH2M Hill documented the placement of each panel in accordance with the requirements of the CQCP. The checklist for GCL panel installation is presented in Appendix H.

The north-south panel installation began on May 26, 2004. Since the GCL roll length was only 150 feet, three GCL rolls were needed to cover the landfill surface between the north and south anchor trench. The rolls were installed in the south anchor trench at a 90˚ angle and in the north anchor trench at a 75˚ angle. Adjacent rolls were overlapped 5-inches; a dashed line provided on the geotextile surface of the GCL allowed the contractor to maintain the overlap. Prior to placement of the overlapping panel and in accordance with the manufacturer's installation guide, a bead of granular bentonite was installed to create a bond between the adjacent panels.

The installation of GCL panels generally followed the geomembrane panel placement plan. TEP installed 280, 172 square feet of GCL at the East Landfill. An as-built drawing of the panel placement is provided in Appendix H.

4.8.3.5 High Density Polyethylene Geomembrane Installation

Installation of the 60 mil High Density Polyethylene (HDPE) geomembrane began on May 26, 2004. It was necessary to protect the GCL from exposure to rain, therefore geomembrane installation was initiated after a sufficient area of GCL had been installed. Only one crew was available to install geosynthetics, therefore GCL installation was suspended when HDPE geomembrane installation proceeded. The orientation of the HDPE geomembrane panels was identical to the orientation of the GCL panels on which they were placed. However, the 22.5 feet width of the HDPE geomembrane rolls reduced the number of panels needed to cover same area as GCL rolls.

HDPE panels were installed using a front end loader with a spreader bar assembly attached to the bucket, the same process used in GCL installation. Pulling was performed by attaching the end of the roll to a truck. CH2M Hill documented the placement of each panel in accordance with the requirements of the CQCP. The checklist for HDPE Geomembrane installation is presented in Appendix H.

A total of 19 HDPE geomembrane panels were installed in an east-west direction. After the first geomembrane panel was installed in a north-south direction and over a portion of all of the east-west installed panels, a cut was made to all of the east-west installed panels to create 5-inch geomembrane overlap needed for welding. Waste associated with the east-west panels was left in place beneath the first north-south panel. During north-south panel installation, the eastern panel always overlapped the western panel. Because HDPE geomembrane rolls were 560 feet long, it was possible to unroll geomembrane across the entire width of the landfill surface, which varied from 400 feet at the west end to 500 feet at the east end. However, the frictional resistance between the GCL and the textured surface of the HDPE geomembrane made unrolling over this distance difficult. Therefore, TEP utilized the surface of a previously installed HDPE geomembrane in deployment of adjacent HDPE panels. Unrolling of a geomembrane panel was performed over a previously placed geomembrane panel. After a sufficient length was deployed from the spreader bar, manual labor pulled the panel off of the geomembrane and into its final place over the GCL. The frictional resistance present for a pull of only 22 feet was far less than that of several hundred feet.

When HDPE panel deployment covered nearly all of the GCL, the HDPE installation was suspended and GCL installation resumed. The quantity of GCL geosynthetic deployed was based upon the time of day and predictions for weather for the following day, as it was necessary to minimize GCL exposure for purposes previously presented.

Throughout the deployment of GCL and HDPE panels, Envirocon continued to excavate the anchor trench, to stay ‘ahead’ of the installation process. With only one excavator possessing a two feet wide bucket, Envirocon alternated locations, excavating 50 to 75 feet of the north perimeter anchor trench and then mobilizing to the south anchor trench to excavate 100 to 125 feet. The process was repeated, moving from west to east across the landfill.

The installation of HDPE panels generally followed the revised geomembrane panel placement plan, which allowed panels to enter the anchor trench at a 70˚ angle, as discussed above. TEP installed 285,218 square feet of geomembrane. An as-built drawing of the panel placement is presented on Drawing A-046142-WW.

4.8.3.6 High Density Polyethylene Geomembrane Seaming

In conjunction with the deployment of the HDPE geomembrane, TEP activated three welding machines for use in seaming adjacent HDPE geomembrane panels. In accordance with manufacturer’s installation guide, trial welds were performed on each machine to determine the proper settings to efficiently weld

panels. These settings consist of temperature, speed and pressure. After a trial weld is performed, the weld is tested in a tensiometer. Values of peel strength and shear strength are obtained and compared to tabular values for specific geomembrane thicknesses. Only after results are obtained and documented is seaming of the geomembrane panels on the landfill permitted. Operators are only permitted to operate the machine that they used to create the trial welds. Changing of operators or machines is prohibited. A detailed discussion of the testing process in presented in Section 5.6 of this Report.

4.8.3.7 Synthetic Drainage Netting

Installation of the synthetic drainage netting/geotextile composite began on May 28, 2005. The panels of the drainage netting, which are 12 feet wide were deployed in directions different than the GCL and the HDPE geomembrane. At the west end of the landfill, the panels were deployed in a northeast-southwest direction. In the center of the landfill, the panels were deployed in a north-south direction. At the east end of the landfill, the panels were deployed in an east-west direction for the northern half and in a north-south direction for the southern half. The changes in direction were based upon the areas where HDPE geomembrane installation was completed, on areas where destructive testing results of the HDPE geomembrane were received and accepted and on weather conditions for the day.

Drainage Netting/geotextile composite panels were installed using a front end loader with a spreader bar assembly attached to the bucket, the same process used in GCL and HDPE installation. Pulling was performed by attaching the end of the roll to a truck. CH2M Hill documented the placement of each panel in accordance with the requirements of the CQCP. The checklist for installation is presented in Appendix H.

Adjacent drainage netting panels were overlapped a minimum of 6-inches at longitudinal joints and two feet at transverse joints. At panel overlaps, several tasks were performed in accordance with the manufacturer's installation guide and the CQAP. First the overlap of netting was verified. After overlap white strap ties were used to secure the overlapped netting. The ties were installed every two feet along the longitudinal joints and every 6-inches along the transverse joints. The white color allows for ease of QC inspection against the black netting. After documenting the connection, the geotextile from adjacent panels was shaped to form a prayer seam (the fabric from adjacent panels is pulled together and the excess protudes vertically into the air). The seam is then stitched together with en electric stitching machine and folded onto the surface of the geotextile. An as-built drawing of the synthetic drainage netting was not prepared, but the panels generally followed the panel placement plan of the geomembrane.

Connection of adjacent panels is not performed in this manner until all quality control for seaming of the geomembrane beneath the netting has been received and approved. TEP installed 318,452 square feet of drainage composite.

4.8.3.8 Anchor Trench Drain

Construction of the anchor trench drain was performed after drainage netting was installed on the surface of the East Landfill. The drainage netting was extended from the landfill surface into the trench and installed along the vertical sideslope and bottom of the anchor trench. The geotextile was maintained against the netting. After drainage netting installation, corrugated plastic tubing with slotted perforations was installed along the approximate centerline of the anchor trench. The tubing was covered with coarse aggregate with a maximum stone size of 1.5-inches and containing little or no fines. The depth of aggregate was maintained at 18-inches or greater. After aggregate installation, a layer of non-woven filter fabric was installed over the trench, to prevent migration of soil fines into the drain.

At seven locations along the anchor trench, a wye was installed in the tubing to facilitate construction of a clean-out pipe extending from the drain to the ground surface of the East Landfill. Quality Assurance material testing and installation testing performed during the construction of these facilities were completed in accordance with Technical Specifications and the CQAP. The locations of the cleanout pipes is shown on Drawing A-046142-WW. A detail of the cleanout is shown on Drawing A-046147-WW.

4.8.3.9 Random Fill and Soil Cover

The 18-inch thick Random Fill layer construction began on Tuesday, June 1, 2005. The random fill consisted of Glacier Material; the initial deliveries of sand were used to create an access route to the southern and eastern lengths of the anchor trench, so that trucks could deliver aggregate directly to the locations where it could be used as backfill in the anchor trench, without driving directly on the installed geosynthetics. Construction of this access route was completed on June 8, 2005. General fill placement of sand over the drainage netting of the East Landfill began on June 10, 2005. Initial loads of the sand, which were delivered in 25 ton triaxial dump trucks, were dumped adjacent to the anchor trench, since heavy equipment was prohibited to drive directly on the geosynthetics. After dumping, a dozer spread the sand in a loose lift thickness of 12-inches over the ground surface. The direction of spreading was limited to the direction of geotextile installation; an attempt was made to spread sand parallel to the direction of the geotextile seams, so that stretching or displacement of adjacent panels was minimized. As sand was spread over the surface of the geosynthetics, trucks were permitted to drive within the limits of the East Landfill, but access was still restricted to the extent possible to avoid damaging the geosynthetics. Construction of the Random Fill layer was interrupted several times in June and July, due to an insufficient supply of sand from Glacier Sand and Gravel; however, Envirocon continued work on several other project tasks, including construction of the 6-inch thick Soil Cover layer, as discussed below. Installation of the Random Fill layer was completed on Wednesday July 14, 2005.

Delivery of soil for the Soil Cover layer began on May 19, 2004. Envirocon contracted with a local construction firm to deliver topsoil from a site west of Vancouver. The topsoil was stockpiled at a designated area on the west side of the East Landfill. Prior to delivery, a sample of the topsoil was subjected to analytical testing to verify that the soil was 'certified clean'.

Construction of the 6-inch thick Soil Cover layer began on Friday June 11, 2004. Construction of this layer was performed periodically, since it was being performed in conjunction with construction of the Random Fill layer beneath it. Spreading of the soil was performed in a west to east direction. Envirocon used front end loaders to haul the soil to specific locations where it was then dumped and spread by dozer to the 6-inch thickness. No compaction was performed, except for routing of hauling equipment and dozer tracking, which was random. Construction of the Soil Cover layer was performed on June 11, June 17, June 25 and July 1, 2004. Work was temporarily suspended on July 1 after Envirocon exhausted the supply of soil used in construction of the Soil Cover layer.

On July 2, Envirocon began accepting delivery of topsoil from a new residential borrow source north of Camas, Washington. The topsoil was tested to document that the soil was 'certified clean'. This soil was spread over the the eastern areas of the East Landfill between July 6 and July 16, 2004 as discussed above. The Soil Cover layer was completed on July 16, 2004. The final topography of the East Landfill after soil cover installation is shown on Drawing A-046143-WW.

4.8.4 Sprinkler System

The sprinkler system at the East Landfill was designed to provide water to the vegetation located within the Armorflex precast concrete revetment along the reconstructed embankment of the Columbia River.

The design incorporates 13 sprinkler heads spaced on 60 feet centers at the top of the embankment. The total area which can be watered by the sprinklers is over 800 feet long and 125 feet wide and includes a 50 feet width (in an east-west direction) of the grassed surface of the East Landfill, located north of the sprinklers. The system operates by distributing water using 3 or 4 sprinkler heads assigned to 4 individual regions; each region possesses separate valve controls. The sprinkler heads specified for the project and manufactured by Rainbird, Inc. can spray water up to a horizontal distance of 60 feet; however, with the sprinkler heads located at the top of the shoreline embankment slope, the spray can reach a distance of 75 feet if the ground surface elevation is 20 feet below the sprinkler head elevation. Water is provided from the City of Vancouver and obtained from a city waterline located at the northeast corner of the Site. Approximately 850 linear feet of pipe was installed to provide water to the shoreline sprinkler system. A maintenance building was constructed to house the automated sprinkler controls, in additional to other ancillary items required for maintenance of the East Landfill.

Envirocon contracted with Abovo Landscaping to install the sprinkler system. Construction began on Monday, July 12, 2004. Trenching for the 4-inch diameter waterpipe was completed on July 13 and pipe along the embankment was installed on July 14. Sprinklers and valve boxes were installed on July 15 and the pipe on the east side of the East Landfill extending from the sprinkler system to the proposed location of the maintenance building was installed on July 16. Work was completed on July 19, 2004 with the backfilling of the pipe trenches.

On July 12, 2004, the City of Vancouver visited the Site to stake out the proposed location of the 2-inch diameter water main that would extend from the water meter pit to the 12-inch diameter waterline located parallel to Northwest Gateway Avenue, a distance of approximately 50 feet. The city also reviewed with Alcoa the proposed location of the water meter pit, which would be located at the extreme northeast corner of the Site and 20 feet from Northwest Gateway Avenue. On July 20 the city installed the pipeline and the meter.

On July 26, 2004, Abovo relocated to the Site to install the waterline from the maintenance building to the water meter pit, a distance of approximately 200 feet. Trenching, pipe installation and backfill were completd with a day. The final connection between the 4-inch diameter water pipe and the water meter was completed on July 30, 2004. The approximate location of the sprinkler heads and waterline is shown on Drawing A-046143-WW. A detail of the sprinkler head is shown on Drawing A-046148-WW.

4.8.5 Operations-Storage Building

The operations-storage building was designed to provide protection of the various utilities required to operate the sprinkler system. This includes the automated timing devices for the sprinklers, the electrical power needed to operate the sprinkler control valves, the emergency shut-off valve, the backflow preventer and a hose bib for accessing potable water. The building also provides storage for equipment needed to sample the monitoring wells on site, file space for maintaining landfill records, a a small work space and interior lighting. The technical specifications required a pre-engineered metal building with dimensions of 16 feet by 12 feet and founded on a concrete pad. Envirocon contracted HCI Steel Building Systems, Inc to provide the building materials and the certifications needed for construction of the building within the City of Vancouver/Clark County boundary limits.

Construction of the maintenance building began on July 16, 2004. Envirocon excavated, formed and poured a 16.5 feet by 12.5 feet by 12-inch thick foundation for the building. The foundation was poured after the pipe for the waterline was installed and an opening in the foundation floor to accept the pipe from the sprinkler system and from the water meter was provided. Anchor bolts were preset in the concrete to facilitate building construction. Assemblage of the metal building was begun by Envirocon on July 23, 2004. After adjustment of the location of the anchor bolts was performed, Envirocon installed

the columns and the wall and roof framing on July 27, 2004. Wall and roof sheeting were installed by July 29, 2004.

On July 30, Envirocon excavated a trench for establishing electrical power from the electric meter at the northeast corner of the Site to the building. Trench depth was established at 3.5 feet to meet code requirements. Work was then suspended on the building until August 3, 2004 so that other tasks could be completed. Trims and finishing hardware were installed and the building was completed on August 5, 2004. On August 6, Mofford Electric installed an electrical panel, established underground electrical utilities from the building to the electric meter and provided electrical service to the building. The location of the Operations-Storage Building is shown on Drawing A-046142-WW. The documentation associated with the construction of the Building is included in Appendix I.

4.8.6 Fencing

Boundary fencing at the East Landfill was established on the east and west sides of the landfill. The fencing extended from the existing fencing at the north perimeter of the east Landfill to the top of the embankment along the Columbia River. The fencing on the west side of the East Landfill consisted of 6 feet high fencing with galvanized chain link fabric. No barbed wire was installed. The fencing along the east side of the east Landfill consisted of six feet high fencing with PVC coated chain link fabric and 3 strands of barbed wire. A double swing gate was erected within the limits of both fence lines. The eastern gate was established at the north end of the fencing, to allow access to the storage operations building. The western gate was established at the approximate center of the fenceline, to allow access to monitoring wells for sampling. This access will also provide Alcoa direct access to the Site from Lower River Road without use of adjacent property. The fencing was installed by Williamette Fence of Portland, Oregon. Fence alignment was established by Envirocon and Alcoa on August 5, 2004. Fence installation began on Monday, October 4, 2004. Line posts and end posts were set in concrete for the west fence on October 5 and for the east fence on October 6. Top rails and gates were installed on October 7 and 8. Fabric and barbed wire were installed on October 11 and 12; the fabric was installed on the side of the posts nearest the adjacent property owners. The fence was completed on October 12, 2004.

4.8.7 General Grading Outside Limits of East Landfill

To facilitate safe and shallow slopes adjacent to the north and west side of the East Landfill, Envirocon performed grading of existing soils and imported approximately 2,000 cubic yards of structural fill. The grading of existing soils was performed on the west side, in the area formerly occupied by the open sided shed loadout building. Structural fill was used on the north side of the East Landfill and was spread primarily to increase the elevation of the area occupied by the gravel access road, to reduce the slope between the road and the surface of the East Landfill. The fill placement also allowed for the construction of an eastward sloping drainage swale to control surface water runoff from the East Landfill. Fill placement operations began on July 14, 2004 and were completed on July 22, 2004.

4.8.8 Vegetation

Vegetation at the Site was performed on September 13 and 14, 2004 by the Briar Group. The hydrodeeding process was utilized to establish vegetation. The seed, fertilizer and mulch quantities and rates selected for revegetation was the same as used at the North and North 2 Landfills and is discussed in Section 4.7.6 of this Report. Hydroseeding was performed at the regraded North and North 2 Landfills, the South bank Area of Concern, the open spaces of the Armorflex revetment and the final fill surface of the East Landfill and adjacent graded areas.

4.8.9 Monitoring Well Modifications

Seven monitoring wells located within the limits of the East Landfill were physically modified to create a 'flush mount' condition. The steel casing of the monitoring wells was temporarily extended to an elevation 5 feet above the proposed grade of the East Landfill at the monitoring well location. After construction of the soil cover layer was completed, Cascade drilling of Portland, Oregon was mobilized to the site to construct a cover at the ground surface. The construction consisted of the cutting of the 4-inch diameter PVC pipe with the steel casing and the installation of a locking flush mount cover over the monitoring well. A 4 feet by 4 feet by 6-inch thick concrete pad was constructed around the well. The modifications to the monitoring wells took approximately 1 week and were completed in July of 2004. A detail of the monitoring well is shown on Drawing A-046147-WW.

4.8.10 Settlement Plates

Following installation of the Soil Cover, W&H Pacific surveyors installed three settlement plates near the highest elevation of the East Landfill. The location of the plates is shown on Drawing A-046143-WW. The plates were installed to monitor the horizontal and vertical movement of the East Landfill, based on recommendations contained in the stability assessment report, discussed in Section 2.4 of this Report. After installation, the vertical and horizontal data for the three plates was recorded and tied into the construction baseline at the site. The baseline data is as follows.

SP-1 (westernmost)	SP-2 (center)	SP-3 (easternmost)
Sta. 365+92	Sta. 465+41	Sta. 568+09
198.61' Rt.	193.80' Rt.	188.09' Rt

4.9 PHOTOGRAPHIC SUMMARY

A photographic summary of the East Landfill Project is presented in Appendix J. The photographic summary consists of pictures which capture the significant work efforts associated with the East Landfill Project and which illustrate significant changes to the topography of the site. The pictures are arranged in chronological order.

5.0 CONSTRUCTION QUALITY ASSURANCE

All construction quality assurance and quality control was performed in accordance with Section 5.0 of the Construction Quality Control Plan for Remediation of the North and North 2 Landfills and East Landfill Cap Construction Project, dated September 2003. The objective of this document was to anticipate the specific operating requirements of the project and to establish procedures to document that the construction quality met technical design specifications. A copy of Section 5.0 of the CQCP is provided in Appendix B. CH2M Hill was subcontracted by Alcoa to provide daily quality control inspections during sampling activities at the South Bank Area of Concern and at the North and North 2 landfill and during installation of geosynthetics associated with the Engineered Barrier at the East Landfill. Alcoa provided daily quality control inspections during excavation of the North and North 2 Landfills, during grading and fill placement activities at the East Landfill and the shoreline embankment and during excavation activities at the South Bank Area of Concern. The daily field reports prepared by CH2M Hill and by Alcoa for the duration of the project are presented in Appendix K. Offsite analytical and geotechnical testing during all quality control inspection activities was performed by CH2M Hill. Bergmann Associates provided on-site quality assurance inspection activities during the entire construction process. Based upon the scope activities discussed in Section 4.0 of this report, several tasks required specific oversight and documentation. These tasks included the following:

-Soil Compaction Testing
-Geotextile
-Hydroseeding
-Geomembrane
-Geocomposite
-Off-site Laboratory Testing

5.1 FIELD MOISTURE DENSITY TESTING

Moisture-density testing was conducted during placement of Waste Soils at the East Landfill, construction of the Soil Cover Layer at the East Landfill, construction of the anchor trench embankment and construction of the shoreline embankment. The frequency of moisture-density testing conformed with the technical specifications, for the specific area being tested.

Field density and soil moisture testing was performed using a CPN-MC3 Nuclear Gauge. Carlson Testing Inc. of Tigard Oregon, a subcontractor to CH2M Hill provided the technician and the gauge. Specific times and dates of visits to the East Landfill were established by CH2M Hill.

In the event that a density test failed, remedial work was undertaken within the area represented by the failed test. Remedial work typically consisted of working with a disc or adding water to the fill material followed by recompaction. After the remedial work was complete, the area was re-tested. This sequence was repeated until a passing result was achieved.

5.4.1 Waste Soils

During placement of the Waste Soils within the East Landfill, 90 field density tests were performed between April 7 and April 23, 2004. All of the tests performed met fill placement specifications. Appendix G presents the summary of the tests numbered 1 through 90.

5.4.2 Anchor Trench Embankment

During placement of the fill to construct the anchor trench embankment, 8 field density tests were performed on April 27, 2004. All of the tests performed met fill placement specifications. Additional testing was performed to check the compaction of the cohesive soil used to replace the granular soil in the top three feet of the anchor trench embankment. Appendix G presents the summary of the tests numbered 91 through 98.

5.4.3 Shoreline Embankment

During placement of the granular and cohesive soil used to construct the shoreline embankment prior to installation of the Armorflex, 39 field density tests were performed between November 1 and December 2, 2003. All of the tests performed met fill placement specifications. Appendix E presents the summary of the tests numbered 1 through 39.

5.4.4 Random Fill of East Landfill

During placement of the granular soils comprising the Random Fill layer of the East Landfill, 27 field density tests were performed between June 4 and July 12, 2004. All of the tests performed met fill placement specifications. Appendix G presents the summary of the tests numbered 99 through 125.

The above mentioned tests were performed during fill placement activities discussed in section 4.0 of this Report. Each of the above tasks was performed in accordance with applicable sections of the CQCP or with the Technical Specifications.

5.2 GEOTEXTILE

5.3.1 Geotextile Manufacturer's Quality Control Certification

Manufacturer's quality control certifications were submitted to CH2M HIll for all geotextile delivered to the East Landfill. The certifications were reviewed to verify that the minimum average roll values of the material delivered conform with the technical specifications. Geotextile manufacturer's quality control certifications are presented in Appendix H.

5.3.2 Geotextile Inventory Control Log

A geotextile inventory control log was completed by CH2M Hill upon delivery of geotextile to the East Landfill. The inventory log contains the type of geotextile, the geotextile lot identification number and any defects in the physical appearance of the geotextile roll. The geotextile inventory control log is presented in Appendix H.

5.5 HYDROSEEDING

5.5.1 Hydroseeding Material Quality Control Information

Hydroseed manufacturer's quality control information was collected as required by technical specifications. Hydroseed specifications were reviewed to verify that material used was in compliance with project specifications. Hydroseed information is presented in Attachment E.

5.6 GEOMEMBRANE

5.6.1 Geomembrane Manufacturers' Quality Control Certifications

Manufacturer's quality control certifications were submitted to Bergmann Associates for all geomembranes delivered to the East Landfill. The certifications were reviewed and compared with the minimum average roll values presented in the Technical Specifications. Upon review, it was determined that the property values shown on the certifications conformed or exceeded the requirements detailed in the Technical Specifications. Copies of the quality control certifications for the geomembrane are presented in Appendix H.

5.6.2 Geomembrane Inventory Control Log

A geomembrane inventory control log was completed by CH2M Hill personnel upon delivery of all geomembrane to the East Landfill. The inventory log contains the type of geomembrane, the geomembrane lot identification number and any defects in the physical appearance of the geomembranee roll. The geomembrane inventory control log is presented in Appendix H.

5.6.4 Ambient Air Temperature Logs

Ambient air temperature data was collected during geomembrane seaming activities to ensure conformance to the project technical specifications. The ambient air temperature log is presented in Appendix H.

5.6.5 Landfill Subgrade Certification

Prior to deployment of the geomembrane panels on the East Landfill, TEP submitted a subgrade certification of acceptance to Alcoa. The certification indicates that the finished subgrade on which the geomembrane was deployed was smooth and free of any sharp objects or debris, provided a firm foundation, possessed rounded edges and was fine graded. The subgrade certification is located in Appendix H.

5.6.6 Geomembrane Panel Placement Log

Geomembrane panel placement logs were completed by CH2M Hill personnel to document the successful deployment of geomembrane rolls over the approved subgrade. Information presented on the geomembrane panel placement log included: geomembrane panel alignment, panel overlap distance with adjacent panels, panel surface quality, roll and panel identification number and a correlation between the identification numbers mentioned and the lot identification number from the inventory log. Each panel received a unique roll and panel identification number. The geomembrane panel placement log is presented in Appendix H.

5.6.7 Geomembrane Trial Seam Testing

TEP personnel conducted geomembrane trial seaming to check the adequacy of the seaming apparatus, operators, and procedures. Trial seaming was conducted at the beginning of each work shift (twice a day) or when a new welding apparatus was utilized. After constructing a trial seam, samples of each trial seam were taken and subjected to field testing by TEP personnel. The field testing consisted of peel adhesion (peel) and bonded seam (shear) for both double wedge fusion welding and extrusion welding. The trial seaming was observed and documented by CH2M Hill Quality Control personnel. Summaries of the trial

seam results for both the double wedge fusion method and extrusion methods are presented in Appendix H.

5.6.8 Geomembrane Non-Destructive Seam Testing

Non-destructive testing was conducted on all welded seams to verify the adequacy of the seaming procedure. Double wedge fusion welded seams were non-destructively tested using the air pressure method and extrusion welds were non-destructively tested using the vacuum box method. The procedures for the above mentioned test methods are presented in the Technical Specifications and the CQCP. Results of all non-destructive seam testing are presented in Appendix H.

5.6.9 Geomembrane Destructive Seam Testing

Destructive test samples were collected by TEP Personnel and subjected to laboratory testing to verify the adequacy of the field peel and shear testing conducted by TEP personnel. Destructive seam sampling logs were completed by CH2M Hill Quality Control personnel to document the collection and location of the destructive seams. Information presented on the destructive seam sampling log included: destructive sample identification number, the sample location, repair status and results of laboratory testing. Appended to the sampling log are the destructive sample Chain of custody forms and the actual laboratory results. The destructive sample logs are located in Appendix H.

5.6.10 Patch Location Log (Vacuum Box Testing)

As geomembrane installation proceeded, repairs to damaged portions of the geomembrane or geomembrane subjected to destructive testing were implemented in accordance with the technical specification requirements. All geomembrane repair patches were extrusion welded; additionally, several problematic panel seams were also extrusion welded. The extrusion welds were non-destructively tested using the vacuum box method. A patch location log was completed by CH2M Hill Quality Control personnel that identified the position of each repair/extrusion weld and the respective vacuum box test result. The patch location log is presented in Appendix H.

5.7 GEOCOMPOSITES

5.7.1 Geocomposite Manufacturers' Quality Control Certifications

Manufacturer’s quality control certifications were submitted to Bergmann Associates for all geocomposites delivered to the East Landfill. The certifications were reviewed and compared with the minimum average roll values presented in the Technical Specifications. Upon review, it was determined that the property values shown on the certifications conformed or exceeded the requirements detailed in the Technical Specifications. Copies of the quality control certifications for the geocomposite are presented in Appendix H.

5.7.2 Geocomposite Inventory Control Log

A geocomposite inventory control log was completed by CH2M Hill Quality Control personnel upon delivery of all geocomposite to the East Landfill. The inventory log contains the type of geocomposite, the geocomposite lot identification number and any defects in the physical appearance of the geocomposite roll. The geocomposite inventory control log is presented in Appendix H.

5.7.3 Geocomposite Panel Placement Log

A geocomposite panel placement log was not completed by CH2M Hill personnel, however, observations during installation documented the successful deployment of geocomposite rolls over the geomembrane.

5.8 OFF SITE SOIL LABORATORY TESTING

Laboratory testing was performed to characterize fill materials used in construction. Standard proctor samples were performed on these samples. Frequency of sample submissions was conducted in accordance with technical the specifications. Earthfill laboratory testing results are presented in Appendix E and Appendix G.

6.0 REVETMENT REPAIRS ON COLUMBIA RIVER

6.1 GENERAL

In June of 2004, while construction of the Engineered Barrier of the East Landfill progressed, engineering professionals associated with the construction observed areas of minor erosion below the toe of the Armorflex concrete revetment, adjacent to the water's edge. The erosion had removed excess soil placed at the toe of the precast concrete block revetment and a portion of the soil supporting the first row of Armorflex block along several hundred feet of the shoreline. The erosion continued over the next 6 months. It was anticipated that the erosion resulted from the following factors.

- Tidal Fluctuations: Normal tidal influences during the year resulted in river elevations that fluctuated near the bottom of the precast concrete revetment, contributing to the removal of soils.

- Wave Action: The use of the Columbia River as a major navigable waterway results in numerous large shipping vessels traversing the shipping lane. Although the lane is several hundred feet from the shoreline, the waves created by the vessels exert an erosive force perpendicular to the revetment. Armorflex provides the greatest protection against high water velocities parallel to its installation.

- Location of Embankment: A preliminary inspection of the orientation of the Columbia River upstream of the Site identifies the Site location within a gradual outside bend of the river. Upon closer inspection, the reconstructed embankment where erosion is occurring extends out into the Columbia River further than the adjacent embankments upstream and downstream.

The design to address the erosion consisted of the construction of a riprap toe and key at the bottom of the concrete revetment to prevent scour erosion or sloughing of the embankment and to deflect or attenuate erosion energy of wave action and tidal fluctuations along the Columbia River. In addition to the riprap providing protection against the erosive forces of the Columbia River, the riprap will act as a buttress to assist in supporting the toe of the entire embankment. Bergmann began the design for the riprap toe and key in December of 2004.

In March of 2005, Anchor Environmental submitted a revised JARPA and Biological Evaluation (BE) addendum to USACE. The purpose of the JARPA and the BE addendum was to provide the detailed information to the USACE, the United States Fish and Wildlife Services (USFWS), and the National Marine Fisheries Services (NMFS) of proposed corrective measures that are required as a result of unanticipated shoreline erosion and to request an amendment to the concurrence letters previously issued by NMFS and USFWS. The BE addendum incorporated the preliminary design mentioned above and attached the associated construction drawings and specifications.

In conjunction with the JARPA and BE submission, Bergmann and Alcoa initiated the bid procurement process, to identify a construction firm to perform the work. Original schedules anticipated construction in May of 2005.

On or about May 15, 2005, WDFW provided comments on the design. The comments primarily focused on providing increased habitat function for the fish and wildlife species utilizing the shoreline of the Columbia River. The design was modified to address WDFW concerns in the following manner:

- The in-situ sand material that is to be excavated to create the key for the riprap will be spread over the riprap and permitted to settle in the void spaces. This sand will be supplemented with a gravel material imported from offsite, to increase the gradation of the infill material and 'soften' the appearance of the shoreline.
- The gradation of the riprap will be increased to provide a wider variety of rock diameters. After installation, the variable rock sizes will provide a roughened surface of the installed riprap, again providing a friendlier atmosphere for fish species.
- The proposed top elevation of the installed riprap provides a small vertical strip of Armorflex in a sloughed position. A row of live stakes will be installed in a horizontal direction across a vertical strip of Armorflex located above the top elevation of the riprap. The stakes will eventually grow out over the riprap, camouflaging the riprap and providing shade to the water's edge. The live stakes may sprout new veins and eventually grow through the upper portions of the riprap.
- Finally, several large diameter logs will be installed in a horizontal orientation in conjunction with the riprap to soften the appearance of the riprap face and create a haven for fish species. Appropriate WDFW guidance documents were referenced.
- It was specified that the work may only occur between November 1 and February 28 of any calendar year.

Bergmann Associates modified the design drawings and technical specifications to incorporate the WDFW comments in July of 2005. Upon modification of the drawings and specifications, Bergmann submitted the design to the City of Vancouver to obtain a grading permit. In September and October of 2005, Bergmann prepared response letters addressed to WDFW providing additional information and clarification of responses to specific comments. On October 5, 2005, representatives of WDFW visited the site to observe the shoreline conditions. On October 17, 2005, the WDFW approved the BE addendum. A copy of the approval letter and the construction drawings attached to the BE addendum are provided in Attachment F.

In May of 2006, the City of Vancouver requested final drawings and specifications for construction. In July of 2006, the city provided the grading permit. Copies of the drawing request and final grading approval are also included in Attachment F.

The shoreline upon which the riprap will be installed was recently deeded by Alcoa to the WDNR, and appropriate agency approvals and permission to access the property were required prior to work. Before these approvals were obtained, it was determined by Alcoa that construction could not be performed and completed in time for planting of live stakes, which are to occur in January. A decision was made to postpone construction of the riprap toe and key and reschedule for November of 2006.

In July of 2006, Alcoa re-issued bid documents to selected contractors to solicit bids to perform the work. In August, Alcoa awarded the contract for shoreline repairs to Soggy Bottoms of Colville, Washington.

6.2 CONSTRUCTION

Construction of the revetment repairs began on October 2, 2006. Soggy Bottoms mobilized a hydraulic excavator to first create an access ramp from the former location of the South Bank Area of Concern to the shoreline, then to excavate the shoreline soils for the purpose of creating the bench into which riprap would be placed. The soils generated by excavation were stockpiled at the waters edge, to create a temporary berm that reduced drainage into the bench area.

Upon completed excavation of the bench, the larger stones contained within the riprap (stone diameters of 24-inches) were segregated from the riprap stockpile and placed in one uniform layer within the bench, to create a base foundation for equipment movement. This task was deemed necessary as the excavation

near or below the water elevation of the Columbia River resulted in soft subgrade conditions. A layer of filter fabric was placed prior to riprap stone installation and any refractory brick excavated was segregated and removed. Approximately 50 tons of minus 10-inch stone was spread over the large riprap to create a relatively smooth surface for the front end loader to place the remaining riprap.

In conjunction with the placement of the large riprap stone, seven (7) root wads were installed at the base of the excavation, in accordance with the request of the WDFW. The root wads were spaced on 50 feet centers and anchored in their location with two concrete ecology blocks. Each block weighed approximately 4000 pounds and was installed on either side of the rootwad. The blocks were secured to the rootwad at two locations with heavy duty wire rope.

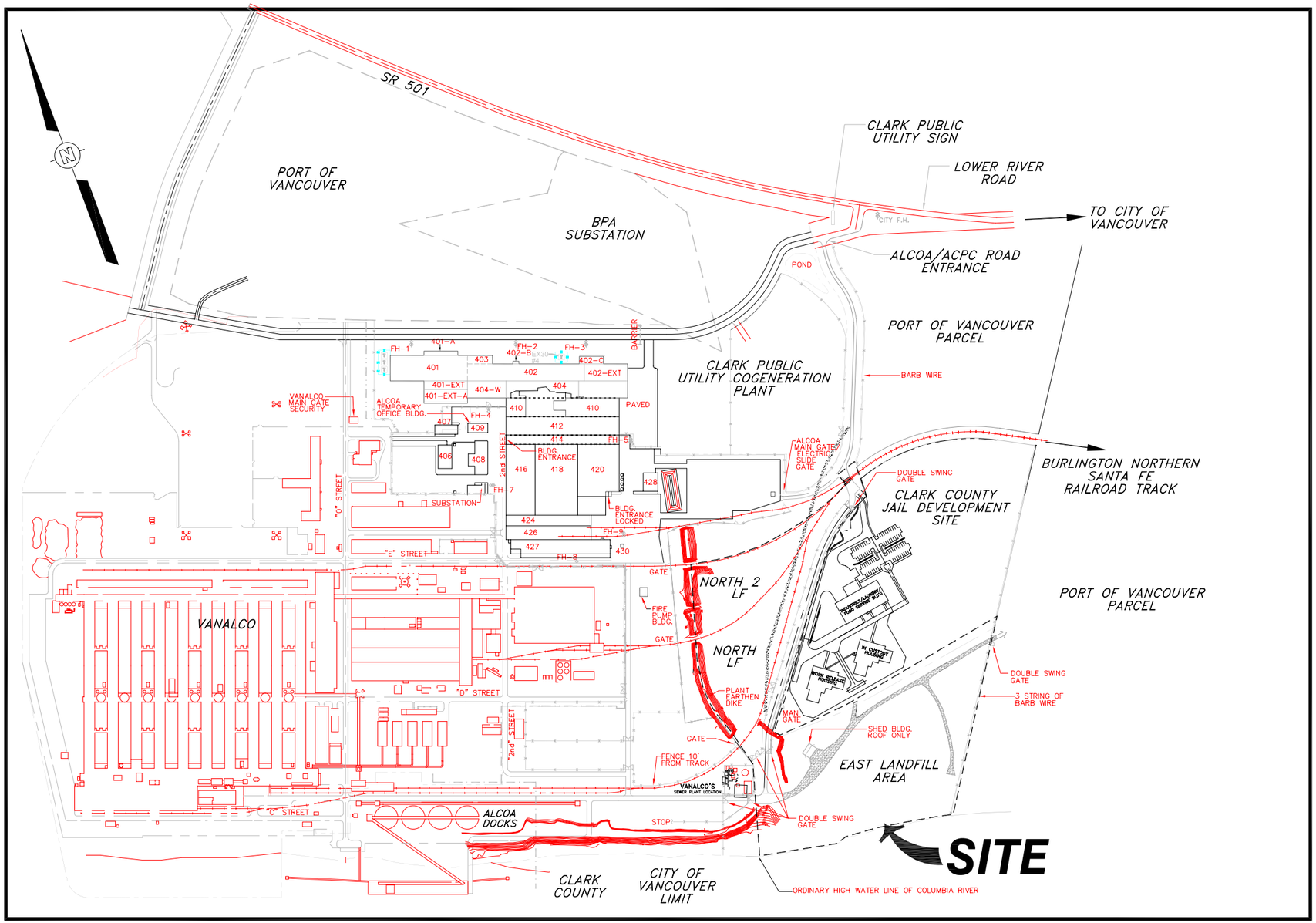
The remaining riprap was installed on the shoreline using a front end loader. The riprap stockpiled at the former location of the South Bank Area of Concern was hauled down the access ramp and across the temporary riprap road to the extreme east end of the repair area, where the riprap was dumped and shaped to conform to the cross-sections presented on the proposed drawings. After the riprap was shaped, the soils associated with the temporary berm were re-excavated and cast over the riprap, to create a 'soft' appearance, per the request of WDFW. Following completion of the toe repairs, the temporary access road up the slope was reclaimed. The shoreline repair work was completed on October 18, 2006.

On January 29, 2007, the planting of the live stakes/willows commenced. The live stakes were installed on 24-inch centers across the entire 600 feet length of riprap repairs. The stakes were installed through the lowest exposed opening of the Armorflex revetment block in a nearly horizontal direction, so that upon maturation, would extend over the riprap. The approximate elevation of these live stakes varies from 6 ft. to 7 ft. AMSL. This work was completed on January 31, 2007. On February 1, 2007, the City of Vancouver conducted a final inspection of the shoreline work. A copy of the inspection report approving the shoreline work is included in Attachment F.

Photographs of the shoreline repair activities are presented in Appendix J and as-built drawings are presented in Attachment C.

7.0 SUMMARY

Bergmann Associates provided technical consulting and construction quality assurance services during the Remediation of North and North 2 Landfills and East Landfill Cap Construction Project (East Landfill Project) at the Former Vancouver Operations (Site) in Vancouver, Washington. Services provided by Alcoa and CH2M Hill on-site staff included the management and quality control monitoring of the following: sampling activities at the South Bank Area of Concern and at the North and North 2 landfill, installation of geosynthetics associated with the Engineered Barrier at the East Landfill, excavation of the North and North 2 Landfills, grading and fill placement activities at the East Landfill, the shoreline embankment and excavation activities at the South Bank Area of Concern and the riprap repairs along the toe of the embankment adjacent to the Columbia River. Offsite analytical and geotechnical testing during all quality control inspection activities was performed by CH2M Hill. The results of the quality assurance activities undertaken by Bergmann Associates and a review of the data collected during quality control activities described in this Report indicate that the construction of the East Landfill Project was performed in accordance with the documents discussed in Section 3.0 of this Report and AO Number DE 03 TCPIS-5737, established by WDOE.



SITE VICINITY MAP

SCALE

0 500 1000 FEET

FIGURE 2–1
SITE VICINITY MAP

APPENDIX A

AGREED ORDER AND INTERIM ACTION WORK PLAN FOR THE EAST LANDFILL SITE

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

September 16, 2003

Mr. Mark Stiffler
Alcoa
201 Isabella St
Pittsburgh, PA 15212-5858

Dear Mr. Stiffler:

Enclosed is the original Agreed Order (DE 03 TCPIS-5737) for the interim remedial action at the East Landfill Site in Vancouver, Washington. Could you please have the proper signature affixed to the signature page of the document and return it to the Industrial Section for final signature. The Department will mail you the complete document after signature.

If you have any questions concerning the Agreed Order, please call or email me at the Department of Ecology (360) 407-6949 or psky461@ecy.wa.gov.

Sincerely,

Paul Skyllingstad
Industrial Section

PES:

Enclosure.

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by: ALCOA INC.(f/k/a ALUMINUM COMPANY OF AMERICA) VANCOUVER WORKS 5701 NORTHWEST RIVER ROAD VANCOUVER, WASHINGTON	)	MODEL AGREED ORDER No. DE 03 TCPIS-5737

TO: Mr. Mark Stiffler
Alcoa Inc.
201 Isabella St.
Pittsburgh, PA 15212-5858

I.

Jurisdiction

This Agreed Order ("Order") is issued pursuant to the authority of RCW 70.105D.050(1).

II.

Findings of Fact

Ecology makes the following Findings of Fact, without admission of such facts by Alcoa Inc., f/k/a/ Aluminum Company of America, (Alcoa).

1. Alcoa owned and operated a primary aluminum smelter and fabrication facility in Vancouver, Washington for approximately 45 years.

2. While Alcoa has sold or discontinued all operations and divested much of the property owned by the Company in Vancouver since 1987, Alcoa currently owns three landfill areas on the former aluminum smelter property. These landfill areas are known as the East Landfill, the North Landfill, and the North 2 Landfill, and are located in Clark County on the north bank of the Columbia River approximately three miles northwest of

downtown Vancouver, Washington. The East Landfill southern boundary is the Columbia River. Alcoa also currently owns the land generally located to the south and southwest of the East Landfill area, including the bank of the Columbia River and the land located alongside a Clark County Public Utilities (CPU) outfall line, (hereinafter "South Bank" or "South Bank Area"). In addition, Alcoa owns a portion of "wetted tidelands" located along the river border of the former smelter property.

3. The entire eastern portion of the smelter complex was filled in the early 1940's with dredge sands from the Columbia River. The East Landfill was formed by the filling of a 15 to 20 foot deep, drainage valley which emptied into the Columbia River.

4. Alcoa filled the valley with carbon bake oven furnace brick, scrap aluminum, alumina, steel wire and miscellaneous volumes of solid and industrial wastes. These wastes contain volatile organic compounds (primarily trichloroethylene-TCE), polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls, and petroleum hydrocarbons.Alcoa also filled two other smaller areas known as North and North 2 Landfills with similar industrial waste.

5. In late 1990, under an Ecology order (DE90–I053), Alcoa initiated a remedial investigation (RI) to determine the source of TCE found in water wells serving the VANALCO (Evergreen) aluminum facility. Existing ground water monitoring wells were sampled for TCE and a review of historical waste handling practices at the smelter were reviewed. The RI revealed two potential sources of the TCE contamination, the East Landfill and the North Landfill. Since that time, Alcoa has conducted numerous studies to characterize these landfills. During the investigations two other areas impacted with PCBs, PAHs, metals, and hydrocarbons were identified to the north of the East Landfill. These areas were identified as the North 2 Landfill and the Northeast Parcel.

6. In 1997, the Northeast Parcel Site was remediated under Ecology Agreed Order DE97 TC-I032 to facilitate the sale of the property to Clark County. The scope of the Northeast Parcel Site remediation included excavation and off-site disposal of 3,902 yd^3 of PCB impacted soil and the excavation of 17,105 yd^3 of PAH impacted soil with placement of this material into the East Landfill. The Northeast Parcel PAH soils were placed in a selected area within the East Landfill, called the Temporary Storage Area, and covered with 12-inches of certified clean fill. Under the terms of this Agreed Order and Interim Action Work Plan, the Temporary Storage Area will be closed with an Engineered Barrier in conjunction with the East Landfill, and the Agreed Order for this interim action will supercede Agreed Order DE97 TC-I032 with respect to the Temporary Storage Area.

7. Also in 1997, PCBs were discovered in three Columbia River sediment samples collected by the Clark County Public Utility (CPU) as part of the NPDES permitting requirements for a non-contact cooling water discharge installed approximately 300 feet west of the East Landfill. Alcoa initiated a soil and ground water investigation of the entire bank/shore of the East Landfill. This work indicates that the East Landfill is not the primary source of the PCBs in the Columbia River sediments. An area of elevated PCBs in soil was discovered on the river bank to the south and southwest of the East Landfill area, adjacent to the CPU outfall line. This is thought to be the major source of the PCB contamination found in the Columbia River adjacent to the cooling water discharge.

8. The soil conditions at the East, North, and North 2 Landfills were analyzed for volatile organic compounds (VOCs), inorganics (metals), polychlorinated biphenyls (PCBs), semi volatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and pH. Volatile organic analytical results indicated the presence of trichloroethene (TCE), vinyl chloride, tetrachloroethene (PCE), 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,2-dichloroethene (DCE), 1,1,1-trichloroethane, 1,1,2-trichloroethane,

methylene chloride, and chloroform. Inorganic compounds that were detected include cyanide, fluoride, arsenic, and lead. Specific aroclor compounds detected from the PCB analysis include aroclor 1242, aroclor 1248, and aroclor 1254. Semivolatile organic compounds mainly include polynuclear aromatic hydrocarbons (PAHs). Specific SVOCs include carbazole, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, and pyrene. Total petroleum hydrocarbons are associated with heavy oil compounds. Detections of pH in soil ranged from 5.78 to 8.99.

9. The East Landfill area is a well-defined area that contains approximately 150,000 yd^3 of waste materials. An estimated 53,000 yd^3 of this material has concentrations of TCE, PAHs, and PCBs that exceed the MTCA Method A Industrial cleanup standards. A portion of the PAH waste that exceeds MTCA A Industrial standards would be considered dangerous waste under Washington State dangerous waste regulations if it were moved out of the landfill complex.

10. As part of the Northeast Parcel remediation, approximately 17,000 yd^3 of PAH impacted soil was placed adjacent to the East Landfill in an area designated as the Temporary Storage Area. This material contains PAHs above the MTCA A cleanup level but below dangerous waste designation limits.

11. The North Landfill contains approximately 15,000 yd^3 of material that exceeds the MTCA Method A Industrial Cleanup levels for either PCBs or PAHs. Although this area was suspected to be the source of the TCE contamination in groundwater, only 2 of the 6 soil samples contained detectable concentrations of TCE and both detections were below the MTCA Method A Industrial standard of 0.03 ppm.

12. The North 2 Landfill is similar to the North Landfill in that chemicals identified were predominantly PAHs and PCBs. An estimated 10,000 yd^3 of material exceeding MTCA Industrial cleanup levels for one or more of these chemicals is contained in the North 2 Landfill.

13. PCBs found in soils in the South Bank Area adjacent to the East Landfill were below the MTCA Method A industrial cleanup level. However, the South Bank Area near the PUD outfall includes approximately 2,500 yd^3 of soil impacted with PCBs at concentrations above the MTCA Method A Industrial cleanup level. This material is localized around the location of the CPU outfall to a depth of approximately 15 feet. Adjacent to and further down stream from the CPU outfall the sediments of the Columbia River are contaminated with PCBs.

14. The Site is situated on the flood plain of the nearby Columbia River. The hydrogeology of the area has been characterized by numerous borings in the vicinity of the three landfills. The ground water system in the area can be divided into four general hydrogeologic units: the shallow zone, the intermediate zone, the deep zone, and the aquifer zone. The predominant ground water flow direction beneath the Site is toward the Columbia River in the deeper hydrogeologic units. The shallow zone consists of dredged sand placed on the Site during the late 1940s and early 1950s. A perched water table is located in the shallow zone during the wetter months of the year. The direction of the movement of water in the saturated portions of the shallow zone beneath the Site varies with the time of year and the amount of precipitation. The intermediate zone consists of sandy silt with clay lenses. The deep zone consists of fine to medium sand while the aquifer zone consists of sandy gravel.

15. There are currently 19 ground water monitoring wells located on or near the East Landfill area, installed for specific investigation purposes between the early 1980s and

the present. Four of the 25 wells are in the shallow zone, six of the wells are installed in the intermediate zone, eight are installed in the deep zone, and one is installed in the aquifer zone. The intermediate zone acts as a semi-confining layer.

16. Historic ground water samples collected from monitoring wells near the East Landfill area were analyzed for VOCs and SVOCs. No samples were analyzed for PCBs, inorganics, TPH or pH. VOC detections include TCE, DCE, 1-1 dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, methylene chloride, 1,1,1-trichloroethane, and vinyl chloride. SVOC detections include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene.

17. Site investigations have documented that ground water contamination originating from the East Landfill Area exists in the shallow, intermediate, and deep zones. Analytical results indicate that TCE and its degradation products and PAHs exist at levels above MTCA Method A (5 ug/l – TCE, 0.1 ug/l – PAHs). Levels of TCE above the drinking water standard (200 ug/l) are found in one aquifer production well which serves the VANALCO Smelter.

18. On September 12, 2003 Ecology published a draft Interim Action Work Plan, which is attached to this Agreed Order as Exhibit B. The selected interim action consists of consolidating the waste from the three landfill areas and the South Bank into one landfill area, the East Landfill; capping the East Landfill with a RCRA Subpart C dangerous waste double lined cover; executing stabilization and protection measures on the river bank, and conducting ground water and engineered cap monitoring. The remedial action performed under the Interim Action Work Plan is designed to be consistent with the final clean-up of the Site. Final cleanup of the East Landfill Site, including cleanup of impacted Columbia River sediments, will occur in the future under a Consent Decree.

III.

Ecology Determinations

1. Alcoa is a former "owner or operator" and a current owner as defined at RCW 70.105D.020(12) of a "facility" as defined in RCW 70.105D.020(4). As defined in RCW 70.105D.040(1)(c), Alcoa formerly "owned or possessed" a hazardous substance and "arranged for disposal" at the facility. Alcoa is also a "generator" as described in RCW 70.105D.040(1)(c), of a hazardous waste which was disposed of, or has otherwise come to be located at, the "facility."

2. The facility is known as the East Landfill Site ("Site") and is located at 5701 Northwest Lower River Road, Vancouver, Washington. The Site, as further described in Exhibit A, includes the areas known as the North, North 2 and East landfill areas. The Site also includes areas of contamination located along the CPU outfall pipe and the Columbia River bank to the south and southwest of the East landfill area (the "South Bank Area" or "South Bank"), the extent of the contaminated groundwater plume underlying the Site, and adjacent impacted river sediments, as shown in Exhibit A-1 and A-2.

3. The substances found at the facility as described above are "hazardous substances" as defined at RCW 70.105D.020(7).

4. Based on the presence of these hazardous substances at the facility and all factors known to the Department, there is a release or threatened release of hazardous substances from the facility, as defined at RCW 70.105D.020(20).

5. By letter dated November 13, 1996, Ecology notified Alcoa of its status as a "potentially liable person" under RCW 70.105D.040 after notice and opportunity for comment. Alcoa did not object to Ecology's proposed finding within the thirty (30) days provided by law. By letter dated December 16, 1996, Ecology notified Alcoa of its determination that Alcoa is a PLP.

6. Pursuant to RCW 70.105D.030(1) and 70.105D.050, the Department may require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

7. Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest.

IV.

Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that Alcoa take the following remedial actions and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein.

A. The Scope of Work. Alcoa, through its contractor and subcontractor as necessary, shall accomplish the following work at the Site:

1. Execute the interim action as provided for in the Interim Action Work Plan, attached as Exhibit B. The Interim Action Work Plan is herein incorporated by reference and provides an integral and enforceable part of this Agreed Order.

2. Obtain any and all state, federal or local permits required by applicable law before work on-site can continue.

3. Prepare a Site health and safety plan in accordance with the most recent OSHA, WISHA rules and their implementing regulations.

4. Develop for approval, a soil sampling and analysis plan that meets the requirement of WAC 173-304-820. The Sampling and Analysis Plan (SAP) shall describe the methods and analytical procedures to analyze soil samples and the plan shall include justification for location and frequency of sampling. The SAP shall specify procedures that ensure sample collection, handling, and analysis will result in data of

sufficient quality to plan and evaluate the scope and nature of the remedial actions at the Site.

5. Submit for approval by Ecology a ground water monitoring and cap maintenance plan for the East Landfill Site. The ground water monitoring plan shall contain a description of the location and construction of the monitoring wells, and a sampling and analysis plan that meets the requirements of WAC 173-340-820 and WAC 173-340-830. The plan shall also provide that all analyses of soil and water performed pursuant to this Agreed Order be conducted by a laboratory accredited under chapter 173-50 WAC. The plan shall describe the sample frequency of each Analyte at each well. The cap maintenance plan will discuss methods used to inspect and maintain the cap and the shoreline arm system.

6. Submit to Ecology for approval a project completion report that includes final "as built" drawings. Submit report 270 days after the installation of the East Landfill cover.

B. Schedule. The schedule for implementation of the Scope of Work is attached as Exhibit C, is herein incorporated by reference, and provides an integral and enforceable part of this Agreed Order.

V.

Terms and Conditions of Order

1. Definitions. Unless otherwise specified, the definitions set forth in Chapter 70.105D RCW and Chapter 173-340 WAC shall control the meanings of the terms used in this Order.

2. Public Notices. RCW 70.105D.030(2)(a) requires that, at a minimum, this Order be subject to concurrent public notice. Ecology shall be responsible for providing such public notice and reserves the right to modify or withdraw any provisions of this Order

should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

3. Remedial Action Costs. Alcoa shall pay to Ecology costs incurred by Ecology pursuant to this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). Alcoa shall pay the required amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided upon request. Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges.

4. Designated Project Coordinators. The project coordinator for Ecology is:

Name: Paul Skyllingstad

Address: Industrial Section
Department of Ecology
P.O. Box 47706
Olympia, WA 98504-7706

The project coordinator for Alcoa is:

Name Mark Stiffler

Address Alcoa Inc.
201 Isabella Street
Pittsburgh, PA 15212-5858

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and Alcoa, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinator(s). Should Ecology or Alcoa change project coordinator(s), written notification shall be provided to Ecology or Alcoa at least ten (10) calendar days prior to the change.

5. Performance. All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or hydrogeologist, or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup. Alcoa shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the Site. Alcoa shall provide a copy of this Order to all agents, contractors and subcontractors retained to perform work required by this Order and shall ensure that all work undertaken by such agents, contractors and subcontractors will be in compliance with this Order.

Except where necessary to abate an emergency situation, Alcoa shall not perform any remedial actions at the East Landfill Site outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

The "construction" to be performed on the Site will be under the supervision of a professional engineer registered in Washington.

6. Access. Ecology or any Ecology authorized representative shall have the authority to enter and freely move about the Site at all reasonable times for the purposes of, inter alia: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this

Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by Alcoa. By signing this Agreed Order, Alcoa agrees that this Order constitutes reasonable notice of access, and agrees to allow access to the Site at all reasonable times for purposes of overseeing work performed under this Order. Ecology shall allow split or replicate samples to be taken by Alcoa during an inspection unless doing so interferes with Ecology's sampling. Alcoa shall allow split or replicate samples to be taken by Ecology and shall provide seven (7) days notice before any sampling activity.

7. Public Participation. Alcoa shall prepare and/or update a public participation plan for the site. Ecology shall maintain the responsibility for public participation at the site. Alcoa shall help coordinate and implement public participation for the site.

8. Retention of Records. Alcoa shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of Alcoa, then Alcoa agrees to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

9. Dispute Resolution. Alcoa may request Ecology to resolve disputes which may arise during the implementation of this Order. Such request shall be in writing and directed to the signatory, or his/her successor(s), to this Order. Ecology resolution of the dispute shall be binding and final. Alcoa is not relieved of any requirement of this Order

during the pendency of the dispute and remains responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

10. Reservation of Rights/No Settlement. This Agreed Order is not a settlement under Chapter 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any Ecology rights or authority. Ecology will not, however, bring an action against Alcoa to recover remedial action costs paid to and received by Ecology under this Agreed Order. In addition, Ecology will not take additional enforcement actions against Alcoa to require those remedial actions required by this Agreed Order, provided Alcoa complies with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the Site should it deem such actions necessary.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the releases or threatened releases of hazardous substances from the East Landfill Site.

In the event Ecology determines that conditions at the Site are creating or have the potential to create a danger to the health or welfare of the people on the Site or in the surrounding area or to the environment, Ecology may order Alcoa to stop further implementation of this Order for such period of time as needed to abate the danger.

11. Transference of Property. No voluntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Site shall be consummated by Alcoa without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest Alcoa may have in the site or any portions thereof, Alcoa shall serve a copy of this Order upon any prospective purchaser,

lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, Alcoa shall notify Ecology of the contemplated transfer.

12. Compliance with Other Applicable Laws.

A. All actions carried out by Alcoa pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in paragraph B of this section.

B. Pursuant to RCW 70.105D.090(l), the substantive requirements of chapters 70.94, 70.95, 70.105, 75.20, 90.48, and 90.58 RCW and of any laws requiring or authorizing local government permits or approvals for the remedial action under this Order that are known to be applicable at the time of issuance of the Order have been included in the Interim Action Work Plan, Attachment B, and are binding and enforceable requirements of the Order.

Alcoa has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(l) would otherwise be required for the remedial action under this Order. In the event Alcoa determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify Ecology of this determination. Ecology shall determine whether Ecology or Alcoa shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, Alcoa shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by Alcoa and on how Alcoa must meet those requirements. Ecology shall inform Alcoa in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of

this Order. Alcoa shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

Ecology shall ensure that notice and opportunity for comment is provided to the public and appropriate agencies prior to establishing the substantive requirements under this section.

C. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(l) would result in the loss of approval from a federal agency which is necessary for the state to administer any federal law, the exemption shall not apply and Alcoa shall comply with both the procedural and substantive requirements of the laws referenced in RCW 70.105D.090(l), including any requirements to obtain permits.

VI.

Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon Alcoa's receipt of written notification from Ecology that Alcoa has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Agreed Order have been complied with.

VII.

Enforcement

1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to the Site.

C. In the event Alcoa refuses, without sufficient cause, to comply with any term of this Order, Alcoa will be liable for:

(1) up to three times the amount of any costs incurred by the state of Washington as a result of its refusal to comply; and

(2) civil penalties of up to $25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under Section 6 of Chapter 70.105D RCW.

Effective date of this Order: _____

ALCOA INC.

By: _____

Mr. Robert Bear
Director Remedial Operations

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By: _____

Ms. Carol Kraege, P.E.
Industrial Section Manager
Solid Waste and Financial Assistance Program

EXHIBIT A

SURFACE AND SUBSURFACE SITE MAPS

EXHIBIT B

INTERIM ACTION WORK PLAN

Agreed Order

September 2003

DRAFT

INTERIM ACTION WORK PLAN FOR THE EAST LANDFILL SITE AT THE FORMER ALCOA VANCOUVER OPERATIONS, VANCOUVER, WASHINGTON

ISSUED BY:

WASHINGTON STATE DEPARTMENT OF ECOLOGY

SOLID WASTE AND FINANCIAL ASSISTANCE PROGRAM

INDUSTRIAL SECTION

September 2003

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EXECUTIVE SUMMARY

Alcoa Inc. (Alcoa) owned and operated a primary aluminum smelting and fabrication facility in Vancouver, Washington for approximately 45 years, until 1985. While Alcoa has sold or discontinued all operations and divested much of the property owned by the Company in Vancouver since 1987, Alcoa currently owns the land areas associated with the East Landfill Site that are the subject of this Interim Action. The East Landfill Site consists of the East Landfill, North Landfill, and North2 Landfill areas, the area along an outfall pipe and a portion of the Columbia River bank to the south and southwest of the East Landfill ("South Bank Area of Concern" or "South Bank"), the extent of the contaminated groundwater plume underlying these areas, and adjacent impacted river sediments, as shown in Figure 2-1 and 2-2, supra. All three landfills were used to dispose a variety of industrial wastes during Alcoa's operation of the Vancouver Plant. Under this Work Plan, Alcoa will perform an interim action to consolidate contaminated soils at the East Landfill Site. Excavation of soils in the North Landfill, North2 Landfill, and the South Bank with contaminant concentrations above remediation levels set forth in this Work Plan will be excavated, placed in the East Landfill, and capped. In addition, protective measures will be taken to stabilize the shoreline and protect the Columbia River from contamination from the landfill areas.

Since 1990, Alcoa has worked with the Washington Department of Ecology (Ecology) to determine the nature and extent of contamination within or resulting from the operation of the landfills and to select a remedial measure(s) that would effectively address this contamination under the Model Toxics Control Act (MTCA). A Remedial Investigation (RI) consisting of soil and ground water investigations was performed and the East Landfill area was found to contain wastes consisting of construction debris (e.g. furnace brick), off-spec product (e.g. scrap steel wire), wastes containing volatile and semi-volatile organic chemicals and petroleum hydrocarbons.

In 1994, Alcoa performed a Feasibility Study (FS) to identify the optimum remedial solution for the East Landfill area and for the 1.5-acre area known as the North Landfill. A total of eight remedial alternatives, consisting of a variety of containment, excavation, on and off site treatment and on and off site disposal were evaluated in this study. Subsequent to the completion of the feasibility study, Alcoa internally performed a similar analysis of the 1-acre area known as the North 2 Landfill. Given the proximity of the East, North and North 2 Landfills to each other, the large volume of material in the East Landfill, and the relatively small volume of materials in the North and North 2 landfills compared to the volume in the East Landfill, Alcoa selected a remedy that consolidates and contains impacted soils on-site. Specifically, to remediate the upland portion of the Site Alcoa intends to excavate materials exceeding MTCA Method A Industrial levels in the North and North 2 Landfills and the South Bank, and consolidate them into the East Landfill prior to closing the East Landfill with an Engineered Barrier system consisting of a landfill cover and river bank armoring. The remedial action performed under this Work Plan is designed to be

consistent with the final cleanup of the Site. Cleanup of the adjacent impacted Columbia River sediments will be conducted in the future under a Consent Decree as part of a final cleanup action for the Site.

In September of 1997, Alcoa successfully implemented consolidation technology when it excavated 17,100 cubic yards of soil with elevated levels of polynuclear aromatic hydrocarbons (PAHs) from a 2.3-acre site known as the Northeast Parcel Site, located adjacent to the East Landfill Site. Under Agreed Order DE 97 TC-I032, the Northeast Parcel PAH soils were placed in a selected area within the East Landfill, called the Temporary Storage Area and covered with 12-inches of certified clean fill. Under this Work Plan issued by Ecology and Alcoa, the Temporary Storage Area will be closed with an Engineered Barrier, in conjunction with the East Landfill.

The East Landfill is situated immediately adjacent to the shoreline of the Columbia River near River Mile 103.4. Landfill waste is exposed in the shoreline of the river. Accordingly, the existing shoreline must be stabilized and covered to support the construction of the Engineered Barrier system, to prevent erosion from typical river flow velocities and wave action from the high volume of shipping traffic in the area. A Joint Aquatic Resources Permit Application (JARPA) document has been submitted to obtain all necessary permits required to perform the shoreline stabilization component of the landfill closure. Ecology has provided significant input into the closure design and has tentatively approved the approach to closure, pending permit approvals. Alcoa received approval from the U. S. Army Corps of Engineers via a Corps 404 Permit (2002-2-01106) on June 26, 2002, and also received approval from the Washington Department of Fish and Wildlife through the issuance of a Hydraulic Project Approval.

1.0 INTRODUCTION

This document presents the Interim Action Work Plan (Work Plan) for the East Landfill Site ("Site") at the former Vancouver Operations in Vancouver, Washington. The East Landfill Site consists of the East Landfill, North Landfill, and North2 Landfill areas, the area along an outfall pipe and a portion of the Columbia River bank to the south and southwest of the East Landfill ("South Bank Area of Concern" or "South Bank"), the extent of the contaminated groundwater plume underlying these areas, and adjacent impacted river sediments, as shown in Figure 2-1 and 2-2.

Under this Work Plan, Alcoa will perform an interim action to consolidate contaminated soils at the East Landfill Site. The Interim Action Work Plan provides a general description of the proposed interim remedial action, and sets forth remediation levels applicable to the action. It has been prepared by Alcoa Inc. (Alcoa), and reviewed and commented on by Ecology to satisfy the requirements of the Model Toxics Control Cleanup Act (MTCA) administered by the Department of Ecology (Ecology) under Chapter 173-340-360 WAC. The remedial action (RA) selected for the Site will occur under an Agreed Order signed by both Ecology and Alcoa.

1.1 Purpose

The purpose of the Interim Action Work Plan is to:

- Describe the Site, including a summary of its history and extent of contamination;
- Identify the specific remediation levels that will be applied
- Identify and describe the remedial action (RA) alternative selected for the Site;
- Present the schedule for implementing the interim action;
- Discuss applicable state and federal laws for the proposed interim action

Following this Introduction, the Interim Action Work Plan is organized as follows:

Section 2.0 summarizes Site conditions, including Site location and history, existing geology and hydrogeology, an overview of intrusive investigations, the nature and extent of contamination and exposure pathways.

Section 3.0 summarizes remediation levels to be applied under the interim action, including the contaminants to be addressed and their concentrations, the media to be remediated and the applicable laws and regulations.

Section 4.0 provides a detailed discussion of the proposed interim action

Section 5.0 discusses the soil and groundwater monitoring to be performed.

Section 6.0 provides the justification for the selected alternative, and

Section 7.0 provides the schedule for the interim action.

2.0 SUMMARY OF SITE CONDITIONS

The following section provides a Site background and discusses the nature and extent of contamination at the Site. Exposure pathways identified for the Site are also briefly described. An extensive number of diverse investigative activities have been conducted by Alcoa at the Site and the significant amount of information obtained from the activities has been documented in various reports. The investigations were performed and reports prepared in coordination with the Washington Department of Ecology (Ecology) using a MTCA agreed order (DE90–I053). For the purposes of this Work Plan, the discussion of the investigative activities, the data obtained and conclusions and recommendations are summarized; and the document providing detailed information is referenced.

2.1 Site Location

The upland portion of the Site is located in Clark County and in the City of Vancouver, on the north bank of the Columbia River, approximately three miles northwest of downtown Vancouver, Washington. The project is located in both the NE ¼ of Section 20, T2N, R1E and the NW ¼ of Section 20, T2N, R1E near river mile 103.4 along the Columbia River.

Alcoa has retained ownership of certain parcels of smelter property. One of these parcels is 11.7 acres in size and contains a 4.9-acre area known as the East Landfill and a 0.75-acre area known as the Temporary Storage Area. Two additional parcels include a 1.5-acre parcel known as the North Landfill, and 1-acre parcel known as the North 2 Landfill. Figure 2-1 shows the East Landfill Site, including the East Landfill, North Landfill, and North 2 Landfill areas, the South Bank Area of Concern, and contaminated Columbia River sediments, in relation to the other smelter properties.

The East Landfill is bounded to the south by the Columbia River, to the east by property occupied by the Port of Vancouver, to the north by property occupied by Clark County and to the west by property occupied by the former Vancouver Operations now known as Evergreen Aluminum. The East Landfill is formerly a series of 15 to 20 foot deep areas, which emptied into the Columbia River. Early airphotos show a small stream drainage along the Columbia River flood plain. Alcoa filled the narrow area and some of the flood plain with carbon bake oven furnace brick, aluminum and steel wire and miscellaneous small volumes of solid and industrial wastes.

The North Landfill is located approximately 600 feet northwest of the East Landfill. It is bounded to the east by property owned by Clark County and to the west by the former Vancouver Operations and Evergreen Aluminum Company, Inc. (Evergreen). The North 2 Landfill is located immediately north of the North Landfill. The boundaries of the North and North2 Landfills are delineated by railroad track spurs extending from the main tracks of the Burlington-Northern and Sante Fe railroad (BNSF) into the Site. Alcoa filled these two areas with materials containing polynuclear aromatic hydrocarbons (PAHs), construction materials, including concrete

and refractory brick and fill materials generated during operation of the smelter, extrusion and wire mills at the Site (contaminated soils). The areas were also used by the United States Army Corps of Engineers (USACE) in the 1940's and 1950's to dispose of dredged materials from the Columbia River.

The South Bank area is located on the northern edge of the Columbia River bank adjacent to the southwest corner of the East Landfill area. The contaminated area is found on either side of an NPDES outfall line owned by Clark County PUD. The South Bank contains approximately 2,500 cubic yards of PCB contaminated soils.

The contaminated Columbia River sediments are found adjacent to and down stream from an NPDES outfall owned by the Clark County Public Utility District. The effected sediments continue down stream for approximately 1,500 feet. The sediments are bounded by the river on the south side and the smelter river bank on the north.

Figure 2-1 presents a vicinity plan of the Site and includes the subject areas listed above.

2.2 Site History

Alcoa constructed an aluminum smelter plant on the western portion of the Site in 1940. In the early 1940's, the entire eastern portion of the Site was filled with dredge sands from the Columbia River. Between 1944 and 1970, a number of fabrication operations were added to the facility to form aluminum into finished goods such as wire, rod, and extrusions. Alcoa operated the entire facility for approximately 45 years, until 1985 when it was closed. Alcoa then began to remediate, close and sell portions of the manufacturing facility and the undeveloped property that surrounds the smelter complex. In 1985, the cable mill business was sold to ACPC, Inc. who leased back the property from Alcoa until 1997. In 1987, Alcoa sold the smelter to VANALCO, Inc. and retained title to the extrusion (VANEXCO) section of the property. The extrusion portion of the property was closed in 1992. A portion of the extrusion mill property was independently cleaned up and sold to the local Public Utilities District. A gas fired power plant was constructed on the property during the 1990s. Alcoa still maintains the dock and alumina loading facility located between the smelter plant and the Columbia River. The dock is currently closed and will remain closed until other Alcoa smelter operations in the Northwest are restarted. VANALCO has since been sold to Evergreen Aluminum (Glencore).

In 1997, the Northeast Parcel Site was remediated (Ecology Agreed Order DE 97 TC I-032) to facilitate the sale of the property to Clark County. The scope of the remediation included the excavation and off-site disposal of 3,900 cubic yards of PCB-impacted soil and the excavation of 17,100 cubic yards of soils containing PAHs and general industrial solid waste. The PAH soils were placed adjacent to the East Landfill in an area designated as the Temporary Storage Area.

The Temporary Storage Area is on the same parcel of property as the East Landfill. The PAH soil concentrations were above the residential MTCA cleanup level specified for the Northeast Parcel remediation but below those that would classify the material as a Dangerous Waste in Washington. Miscellaneous solid waste found in the landfill consisted of alumina, carbon, plant floor sweepings, aluminum metal, bricks, rubble (pallets and conveyor belts), drums and other general plant waste. Clark County built a jail on the uncontaminated section of the property after the remediation was complete.

2.3 Site Geology and Hydrogeology

There are four distinct hydrogeologic units at the East Landfill. They are designated as the Shallow, Intermediate, Deep and Aquifer units.

The Shallow unit consists of the dredge spoil fill placed at the Site in the early 1940's. The thickness of the unit is approximately 10 feet. Portions of the East Landfill intersect this unit. Perched groundwater is found in the shallow unit during the winter and spring months but is typically dry during the remainder of the year.

The Intermediate unit is located below the Shallow unit and consists of a 30-40 feet thick layer of silt with lenses of clay and fine sand. The top of this unit was the original ground surface in the East Landfill Area before placement of the dredge sands. This zone is a relatively low transmissivity unit that is hydraulically connected to the River. Because of a large downward gradient at the Site, groundwater flows downward through this unit with a velocity roughly equal to the horizontal flow velocity (approximately 20 feet/year). The intermediate unit forms a semiconfining layer above the Deep unit.

The Deep unit is located below the Intermediate unit and consists of a 40 to 60 feet thick layer of uniform, fine to medium sand. It is a relatively transmissive unit and also is hydraulically connected to the River. The gradient in the unit near the East Landfill is typically towards the Columbia River.

The Aquifer unit is located below the Deep unit and consists of a coarse sand and gravel unit known regionally as the Upper Troutdale formation. The production wells serving the Evergreen Aluminum plant are located in this unit. Pumping of these wells can locally reverse the gradient of groundwater flow, which is typically towards the Columbia River under normal conditions.

There are currently 19 groundwater-monitoring wells located at the East Landfill and 8 groundwater monitoring wells located at the North and North 2 Landfills that are part of the

Groundwater Monitoring Program for the Landfills. The monitoring wells were installed for specific investigation purposes between the early 1980's and the present. Four of the 19 wells are installed in the Shallow groundwater unit, 6 of the wells are installed in the Intermediate groundwater unit, 8 of the wells are installed in the Deep unit and 1 well is installed in the Aquifer unit. Additional information on the Groundwater Monitoring Program is contained in the following report:

1. *Groundwater Monitoring Plan*, prepared by IT Corporation, July 2001.

2.4 Site Investigations

Since 1990, Alcoa has worked with Ecology to determine the nature and extent of contamination within or resulting from the operation of the subject upland landfills and to select a remedial measure(s) that would effectively address this contamination under the Model Toxics Control Act (MTCA). In 1990, Alcoa initiated a Remedial Investigation (RI) as part of an agreed order (DE 90 I-053) with Ecology to determine the source of trichloroethylene (TCE) found in process water wells serving the Evergreen plant and operating Alcoa facilities. The trichloroethylene contamination was discovered during the National Priority Listed (NPL) site remedial investigation. Between 1991 and 1994, Alcoa performed four site investigations (Hart-Crowser Investigations), consisting of the advancement of test borings, the installation of monitoring wells and the excavation of test pits at the North, North2 and East Landfills. The primary purpose of these investigations was to locate the source of the TCE contamination.

In 1996 and 1997, Alcoa conducted two additional site investigations (ICF Kaiser Investigations) at the three landfills and at two additional areas adjacent to the landfills; the property owned by Clark County and the Northeast Parcel. These areas are also shown on Figure 2-1. The purpose of these investigations was to determine the horizontal extent of contamination and to provide supplemental data to estimate the volume of contamination present. The investigation consisted of the excavation of test pits at the landfills and on the Clark County property and the advancement of Geoprobe borings and the excavation of test pits at the Northeast Parcel.

In 1999, two investigations were performed in the area on the southwest side of the East Landfill, hereinafter referred to the South Bank (South Bank Investigations). Test borings were advanced to delineate limits of PCB contamination. Further PCB investigations of the Columbia River sediments adjacent the smelter complex have been on going since 1999.

In conjunction with the performance of these investigations, reports were prepared to present the findings and to provide recommendations for future remedial actions. The Columbia River sediments will be cleaned up under a separate final Consent Decree for the Site. A list of the

Reports is presented in Appendix A. An overview of results from critical reports is presented below.

2.4.1 Hart-Crowser (TCE) Investigation

The results of the Hart-Crowser Investigations indicated that soils in the East Landfill contain concentrations of chlorinated solvents (primarily TCE) and carcinogenic PAHs (cPAHs). The North Landfill also contains soils with elevated cPAH concentrations. Groundwater below both landfill areas contain concentrations of chlorinated solvents, principally TCE and cPAHs. The groundwater contamination from the East Landfill was reported to not be impacting existing water supplies, but the groundwater contamination from the North Landfill was reported to be impacting the water supply aquifer in the vicinity of the North Landfill.

The Hart-Crowser Investigation identified contaminated soils in the East Landfill at depths of 15 feet, portions of which are in contact with the shallow (seasonally perched) groundwater table. The average depth of contaminated soils in the North Landfill is approximately 6.5 feet, which is a depth slightly above the elevation of shallow groundwater table. The volume of contaminated soils at the East Landfill is approximately 57,100 cubic yards, while the volume of contaminated soils at the North landfill is approximately 12,600 cubic yards.

Preliminary ground water modeling initiated by Hart Crowser indicated that the TCE found in the smelter production water well could be explained by a reversal of ground water flow direction caused by the pumping the contaminated industrial well. In technical meetings regarding the East Landfill contamination it was reported to Ecology that the source of the TCE groundwater contamination was probably the East Landfill. The groundwater model, which predicted this result, was never formally submitted to the Department of Ecology.

A detailed discussion of the Hart-Crowser Investigations can be found in the following Reports:

1. *Phase II A Monitoring Wells and Borings, TCE Remedial Investigation*, prepared by Hart Crowser, J-2250-05, October 10, 1991.
2. *Phase II B Test Pits and Groundwater Level Monitoring, TCE Remedial Investigation*, prepared by Hart Crowser, J-2250-06, July 6, 1992.
3. *Phase II C Test Pits, TCE Remedial Investigation*, prepared by Hart Crowser, J-2250-06, January 4, 1993.
4. *Additional Landfill Site Characterization*, prepared by Hart Crowser, J-5352, December 6, 1994.

5. *Draft Focused Feasibility Study, Former ALCOA Facility, Vancouver, Washington,* prepared by Hart Crowser, J-5352, December 6, 1994.

2.4.2 ICF Kaiser Investigation

The results of the ICF Kaiser Investigations, test pits and Geoprobe borings, concluded that the material in the North 2 Landfill consisted of a layer of brick rubble, gravel, asphalt chunks, and alumina overlying dredge sand. These materials were encountered to a depth of 7 feet. Horizontal limits were also established for the landfill, using longitudinal test pits extending from the reported limits into uncontaminated material. A water table was not encountered. From analytical results of laboratory testing of selected soil samples, PCBs, PAHs and Target Analyte List (TAL) Metals were identified at the North 2 Landfill.

At the North Landfill, the materials encountered consisted mainly of dredge sand with lenses of alumina. Small areas of brick rubble, cable, wire and metal piping were also encountered. Analytical testing of soil samples was restricted to PCBs and TAL Metals, based on previously obtained PAH results. Those two contaminants were detected at the North Landfill.

At the Northeast Parcel a layer of brick rubble, concrete, plastic, paper, wire, a granular black material and alumina was located beneath a silty sand cover layer but over a dredge sand layer. The materials at the Northeast Parcel consisted of contaminated waste and construction debris; contaminated waste was restricted to a depth three feet below the ground surface, while construction debris extended to a depth greater than seven feet. Horizontal limits were established based on a test pit grid pattern of sampling. Laboratory testing of selected samples identified PCBs, PAHs and TAL Metals at the Northeast Parcel.

The materials in the East Landfill consisted of a layer of brick rubble, cable, wire, metal piping, and alumina overlying dredge sand. These materials were encountered to a depth of 15 to 20 feet. Horizontal limits were also established for the landfill, using seven feet deep longitudinal test pits extending from the reported limits into uncontaminated material. Results of laboratory testing on soil samples identified TAL Metals and Total Petroleum Hydrocarbons (TPH) at the East Landfill. TCE and cPAH testing were not performed; the presence of these contaminants at the East Landfill is documented from previous investigations.

The property occupied by a Clark County jail complex, with the exception of one location, exhibited no signs of contamination. The Northeast Parcel landfill contamination was located on the northern half of the property.

A detailed discussion of the ICF Kaiser Investigations can be found in the following Reports:

1. *Site Characterization Report Landfill and Surrounding Areas*, prepared by ICF Kaiser, July26, 1996.
2. *Supplemental Site Characterization Report*, prepared by ICF Kaiser, May 28, 1997
3. *Northeast Parcel Remedial Action Report*, prepared by ICF Kaiser, October 31, 1997.

2.4.3 South Bank Investigations

The South Bank is located on the northern edge of the Columbia River. The South Bank Investigations were focused to determine whether PCB contamination found in Columbia River sediments at the Clark County Public Utilities process water outfall was originating from the East Landfill or another unknown source. The results of the South Bank Investigations concluded that the contamination was limited and scattered from the landfill and another source, contaminated fill from an NPDES outfall installation was probably the source of the PCB contamination. Materials in the bank consisted of loose sands covering landfill rubble. Below the landfill rubble, loose fine to coarse sands were identified above native silts and clays. Results of laboratory testing on soil samples identified PCBs and TPH in the soils between depths of 2 and 14 feet. The results of the soil testing from the bore holes show a PCB source near the Clark County Public Utility NPDES outfall. The location of high PCB samples near the Clark County Public Utility NPDES outfall pipe is consistent with PCB sediment sampling in the Columbia River and further soil sampling to the north of the river bank. Samples directly adjacent to the East landfill contained PCBs as high as 7.92 mg/kg in one drill hole at the top of the bank. The majority of the samples showed non-detection of PCBs. The detection limit of the soil samples was in the ug/kg range. Results of laboratory testing on groundwater samples also identified PCBs and TPH, however the groundwater samples were obtained from the soil borings and not from monitoring well locations. The bore hole samples were not filtered in the field but centrifuged in the laboratory to eliminate the majority of suspended solids that could mask the results of an analysis for PCBs possibly present in the groundwater. The centrifuging process did not eliminate all of the suspended solids from the samples collected. Consequently, the detections of PCBs in the South Bank borehole samples do not necessarily reflect dissolved water conditions but PCBs absorbed onto suspended solids not removed via centrifuging. Samples collected from monitoring wells along the South Bank do not show PCBs. In was concluded from the soil and water studies that the East Landfill was not the primary source of the PCBs found in the Columbia River adjacent to the smelter. It was theorized that PCB contamination in the river sediments originated from the soils moved during the installation of the upland NPDES outfall line. What caused the original PCB hot spot was never determined in the investigations.

A detailed discussion of the 1999 Investigations can be found in the following Reports:

1. *Site East Landfill South Bank Phase I Sampling Results*, prepared by ICF Kaiser, March 5, 1999
2. *East Landfill South Bank Phase II Sampling Results,* prepared by ICF Kaiser, September 23, 1999

2.5 Nature and Extent of Contamination

2.5.1 Soil

Soil samples that were collected from the East Landfill, the North Landfill and the North 2 Landfill during the Hart-Crowser Investigations were analyzed for TCE, cPAHs and vinyl chloride. These contaminants were specifically selected to justify results of a 1989 investigation that identified TCE beneath the Site. Each of the compounds was detected.

Soil samples collected from the East Landfill, the North Landfill and the North 2 Landfill during the ICF Kaiser Investigations were analyzed for volatile organic compounds (VOCs), inorganics, polychlorinated biphenyls (PCBs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbon (TPH), and pH. VOC analytical results indicated the presence of the following contaminants:

trichloroethene (TCE)	vinyl chloride
tetrachloroethene (PCE)	1,1-dichloroethene
cis-1,2-dichloroethene	trans-1,dichloroethene
1,2-dichloroethene (DCE)	1,1,1-trichloroethane
1,1,2-trichloroethane	methylene chloride
chloroform	

SVOC analytical results indicated the presence of the following contaminants:

Carbazole	Acenaphthene
Anthracene	benzo(a)anthracene
benzo(a)pyrene	benzo(b)fluoranthene
benzo(k)fluoranthene	chrysene
dibenzo(a,h)anthracene	dibenzofuran
fluoranthene	fluorene
indeno (1,2,3-cd)pyrene	pyrene

TPH detections were associated with heavy oil compounds. Inorganic detected compounds include cyanide, fluoride, arsenic, and lead. Specific aroclor compounds detected from the PCB analytical analysis include aroclor 1242, aroclor 1248, and aroclor 1254. Detected SVOCs mainly include polyaromatic hydrocarbons (PAHs). Detections of pH in soil ranged from 5.78 to 8.99.

Soil samples from the South Bank Investigation were analyzed for PCBs, TPH and Total Organic Carbon (TOC). Each of these contaminants was detected.

A summary of detected compounds in soils sampled in these areas and the concentrations is presented in Table 2-1. A discussion comparing the contaminant concentrations summarized for each investigation to Method A soil cleanup levels for residential and industrial sites as set forth in Ecology's Model Toxic Control Act (MTCA) is provided in Section 2.5.3 of this Work Plan.

2.5.2 Groundwater

Historic groundwater samples collected from monitoring wells positioned within the East Landfill Area were analyzed for VOCs and SVOCs. No samples collected were analyzed for PCBs, inorganics, TPH or pH. VOC analytical testing results indicated the presence of the following contaminants:

TCE	DCE
1,1-dichloroethene	cis-1,2-dichloroethene
trans-1,2-dichloroethene	methylene chloride
1,1,1-trichloroethane	vinyl chloride

SVOC analytical testing results indicated the presence of the following contaminants:

benzo(a)anthracene	benzo(a)pyrene
benzo(b)fluoranthene	benzo(k)fluoranthene
chrysene	dibenzo(a,h)anthracene
indeno(1,2,3-cd)pyrene	

Site investigations have documented that groundwater contamination originating from the East Landfill Area exists in the shallow, intermediate and deep zones. Levels of TCE which are at the groundwater quality limit have also been detected in the nearby aquifer zone production wells serving the Evergreen smelter plant. Alcoa is separately working with Evergreen to address this issue. A summary of detected compounds in groundwater monitoring wells in the vicinity of the East Landfill is presented in Table 2-2. A summary of detected compounds in groundwater in the vicinity of the North and North 2 Landfills is presented in Table 2-3. A discussion comparing the contaminant concentrations summarized for each investigation to Method A soil cleanup levels for residential and industrial sites as set forth in MTCA is provided in Section 2.5.3 of this Work Plan.

Alcoa is in the process of designing a monitoring well network for the Landfill Areas that will be used to monitor groundwater conditions in each aquifer for an appropriate post-remediation period. The Groundwater Monitoring Program includes several new wells that are to be installed

and several existing wells that will be abandoned. The monitoring network for all of the Alcoa properties at the Vancouver smelter will be addressed using the Work Plan for this cleanup and amendments of existing orders and consent decrees issued by the Department of Ecology.

2.5.3 Summary of Nature and Extent of Contamination

The East Landfill is a well-defined area containing approximately 150,000 cubic yards of waste materials. An estimated 57,000 cubic yards of this material exhibit concentrations of TCE, PAHs and PCBs that exceed the MTCA Method A Industrial cleanup standards of 0.03 mg/kg, 20 mg/kg and 10 mg/kg for these chemicals, respectively. This volume does not include the Temporary Storage Area, as discussed below. The volume of materials which are above the MTCA Method A unrestricted land use levels was not determined. PCBs were randomly detected in the shoreline embankment soils adjacent to the East Landfill with ten samples between the MTCA Method A cleanup standard of 1 mg/kg and the MTCA Method A Industrial standard of 10 mg/kg and one sample (11.69 mg/kg) above the MTCA Method A Industrial standard of 10 mg/kg. PCBs were not detected in South Bank monitoring well groundwater samples but were detected at low levels in borehole water samples. The borehole sample detections were attributed to sediment contamination in the water samples and not dissolved PCBs in the groundwater.

The Temporary Storage Area, located adjacent to the East Landfill contains 17,100 cubic yards of soil with concentrations of PAHs that exceed the MTCA Method A Industrial cleanup level but are below Dangerous Waste levels for the State of Washington. These soils were removed from the Northeast Parcel Site and placed in the East Landfill Area under Agreed Order DE TC97-I032 between Ecology and Alcoa, which recognized this placement as temporary/short term. This area will now be closed in conjunction with the East Landfill, and the Agreed Order for this interim action will supercede Agreed Order DE TC97-I032 with respect to the Temporary Storage Area.

The North Landfill contains approximately 15,000 cubic yards of material exceeding MTCA Method A Industrial cleanup levels of 2.0 mg/kg and 10 mg/kg for PAHs and PCBs, respectively. Although the North Landfill was suspected to be a source of TCE identified in groundwater, soil samples containing detectable concentrations of TCE were below the MTCA Method A Industrial Standard of 0.03 ppm. The PAH soil concentrations are below Dangerous Waste levels for the State of Washington

The North 2 Landfill contains an estimated 10,000 cubic yards of material comprised predominately of PAHs and PCBs that exceed MTCA Method A Industrial cleanup levels but are below Dangerous waste levels for the State of Washington.

The South Bank Area of Concern includes approximately 2,500 cubic yards of soil impacted with PCBs at concentrations above the MTCA Method A Industrial cleanup level. This material is located near the Clark Public Utilities (CPU) NPDES outfall for non-contact cooling water, down to a depth of approximately 15 feet.

Analytical results of groundwater samples from the East Landfill indicate that TCE and its degradation products and PAHs exist at levels exceeding MTCA Method A cleanup levels of 5 micrograms per liter (ug/l) (TCE) and 0.1 ug/l (PAHs), respectively.

2.6 Exposure Pathway

Based on the information presented in the above referenced reports and as summarized above, two pathways, 'Soil Direct Contact' and 'Groundwater Contact' were identified as applicable to the East Landfill.

All soil with contaminant concentrations exceeding MTCA Method A remediation levels presented in Section 3.0 of the Work Plan will require appropriate remedial measures. As discussed in Section 4.0, consolidation and containment technologies will be utilized at the Landfill Areas. These controls will eliminate direct contact with the wastes after construction is complete and remove any surface water infiltration pathway through the waste to the groundwater. Direct contact with the contaminated soils will occur during construction, workers will need to comply with the requirements of the Project Health and Safety Plan. This Work Plan requires Alcoa to conduct periodic groundwater monitoring and maintenance inspections.

3.0 SUMMARY OF REMEDIATION LEVELS.

3.1 Remediation Action Levels

Remediation levels will apply to three areas of the Site where soil excavation is proposed as the preferred interim action (see Section 4.4). These area are the North and North 2 landfill areas, and the South Bank area. The remediation levels that will be applied are MTCA Industrial Level soil standards for PCBs (10.0 mg/kg) and PAHs (2.0 mg/kg) and MTCA Method A levels for TPH (2,000 mg/kg) and TCE (0.03 mg/kg), used in conjunction with other physical criteria. These other physical criteria include native soil and the groundwater table, and are explained further below. The thresholds chosen for PAHs and PCBs as remediation levels are justified because the post-excavation remedies call for measures that will eliminate the surface exposure pathway. It is expected that future cleanup activity required at this Site will result in the North and North 2 Landfills area being re-graded and backfilled with several feet of material that is in compliance with MTCA industrial standards, and therefore any potential surface exposure pathway will be terminated. In the South Bank area, riprap armoring will be placed over a geotextile fabric post-excavation. These protective measures will prevent both a surface exposure pathway as well as the potential for soil runoff into the Columbia River.

In the North and North 2 Landfills, the fill, and its associated PAH contamination, was placed in a manner such that a clear demarcation above native soils is present. Therefore, excavation will occur to a depth that removes the fill down to the native soil. The remaining native soil will be tested to ensure it is below the remediation levels. If residual soil concentrations are below the remediation level, the excavation will be deemed complete. If residual soil concentrations exceed the remediation levels, further excavation will occur until concentrations are below the cleanup levels, or until the groundwater table is encountered. If groundwater is encountered, no further excavation will be required below that elevation to the impracticability of removing further soils.

In the South Bank area, the nature of the fill is heterogeneous and it is difficult to distinguish the fill from native soils. Therefore, excavation will occur to depths that are consistent with RI data that indicate PCB levels will be below the remediation level. Following excavation, the residual soils will be tested and compared against the soils remediation level of 10.0 mg/kg PCBs. If residual soil concentrations are below the remediation level, the excavation will be deemed complete. If residual soil concentrations exceed the remediation level, further excavation and re-testing will occur until soil concentrations are below the remediation level, or until the groundwater table is encountered.

4.0 DESCRIPTION OF PROPOSED INTERIM ACTION

4.1 Remedial Action

The proposed interim action for the upland landfills consists of excavation of waste from the North and North 2 Landfills, consolidation of the excavated waste at the East Landfill, the construction of an engineered double lined cap at the East Landfill, excavation of PCB contaminated soil hot spot in the South Bank area along the Columbia River, reconstruction of the shoreline adjacent to the East Landfill, and groundwater monitoring and deed restriction. Specifically the interim action will proceed in six phases:

Phase I – Site Preparation: This phase consists of activities performed prior to the major remediation tasks and includes mobilizing equipment, constructing staging areas and access roads, performing construction surveys and layout, installing erosion and sediment control features, constructing decontamination areas, surveying and demolishing existing abandoned structures and removing existing fencing.

Phase II – South Bank Area of Concern: This phase consists of the excavation and handling of contaminated soils from the subject area, the performance of sampling to confirm cleanup and the backfilling of the subject area.

Phase III – Shoreline Rehabilitation: This phase consists of the work associated with the reconstruction of the shoreline adjacent to the East Landfill. It includes the grading of existing shoreline, the placement of clean fill, the installation of concrete revetment protection and the planting of native vegetation.

Phase IV – North and North 2 Landfill: This phase consists of the excavation and handling of contaminated soils from the subject area, the performance of sampling to confirm cleanup and the grading and revegetation of the subject area. It also consists of the sealing of selected monitoring wells in the area. The pits that remain following excavation will be used for disposal of impacted sediment from the Columbia River located adjacent to the Site.

Phase V – East Landfill Engineered Barrier Construction: This phase consists of the construction of the multi-layer Engineered Barrier, beneath which the contaminated soils from the South Bank Area of Concern and the North and North 2 Landfills will be placed. Contaminated in-situ soils associated with the East Landfill and the Northeast Parcel will also be capped within the same area. Construction quality control will also be addressed.

Phase VI – Additional Fill Outside Limits of East Landfill Barrier: This phase consists of the placement of fill in areas adjacent to the East Landfill Engineered Barrier to transition between existing and proposed grades.

Each of the phases of work associated with the interim remedial action is discussed in detail below.

4.1.1. Phase I – Site Preparation

After the written notice to proceed is received from the Owner, the Owner's Contractor will provide all of the necessary equipment, materials, labor and work to perform the Remedial Action. The equipment will be staged at specified locations. A job trailer will also be mobilized and located near access to public utilities. The staging areas will be constructed or delineated near a primary roadway system, so that delivery of materials can proceed easily and without interruption.

Once equipment is mobilized, a list of preconstruction tasks will be performed. Erosion and sediment control, consisting of silt fence or straw bales will be established at the necessary low elevation locations. The silt fence along the Columbia River shoreline will be anchored and reinforced to prevent sediment discharge into the river and to withstand river water velocities. A decontamination area and a Contaminated Material Haul Road will be constructed for use by vehicular equipment during transportation of contaminated soils to the East Landfill. Storage tanks for containing decontamination fluids will be staged adjacent to the decontamination area.

Portions of existing fencing and the concrete supporting the posts will be removed to facilitate construction of the remedial action. Some portions of fencing along the property boundary between Alcoa and the Port of Vancouver will be removed and replaced. Two abandoned buildings and their foundations will also be removed from the Site.

4.1.2. Phase II – South Bank Area of Concern

Work at the South Bank will begin with the clearing of trees and brush from the area designated for excavation of PCB contaminated soils. Alcoa will establish the limits of clearing and excavation. During clearing operations, Excavation Debris, which is objectionable material, rubbish, debris, stumps, brush, roots, rotten wood, concrete rubble, concrete slabs or wood utility poles will be removed. The Contaminated Material Haul Road will be used to haul the subject material to the East Landfill for disposal. No burning of cleared material or any other material (e.g., chipped brush) is allowed.

After clearing, PCB contaminated soils will be excavated to specified horizontal and vertical limits. These limits were developed using analytical results of testing conducted on soil samples collected from previous investigations. Excavation will terminate when field screening techniques and the collection and subsequent laboratory analysis of soil samples associated with a Confirmational Sampling Program indicates that all PCB contaminated soil has been removed to concentrations below the remediation levels, or until groundwater has been encountered.

PCB soils with concentrations over 50 mg/kg will be segregated from other soils with concentrations less than 50 mg/kg and treated as Toxic Substances Control Act (TSCA) waste. TSCA PCB contaminated soils will be placed in the roll-off boxes and transported/disposed to/at an approved permitted facility rather than being disposed in the existing East Landfill. Confirmation sampling will be performed to guide the contractor in the removal of the lower level PCB contaminated soils and TSCA PBC contaminated soils. Excavation of PCB contaminated soils will not begin until confirmational sampling has verified removal of all TSCA PCB contaminated soils and equipment has been decontaminated.

The lower level PCB contaminated soils will be covered with a tarp and transported to the East Landfill. Trucks will utilize the Contaminated Material Haul Road constructed between the subject Excavation Area and the East Landfill to transport these soils. At the East Landfill, PCB contaminated soils from the South Bank shall be stockpiled at the north end of the East Landfill and temporarily covered with plastic sheeting.

After results of the Confirmation Sampling Program have confirmed that all PCB affected soils have been removed from the subject Excavation Area, backfill of the subject Excavation Area will be performed. Backfill will be placed and compacted to the elevations needed to construct the Engineered Barrier.

4.1.3. Phase III – Shoreline Rehabilitation

Work at the Shoreline will begin with the clearing of trees and brush from the area designated for grading and fill placement. Excavation Debris will be managed as discussed in Section 4.1.2 above, except that the Contaminated Material Haul Road will not be used.

Grading will be performed to meet the slopes and elevations needed for installation of the concrete shoreline revetment. The material generated by grading will be classified as Fill and shall include soil, rocks, refractory brick, concrete and inorganic debris. Steel or wire encountered during the removal of fill will be cut, removed and stockpiled. The majority of the grading will occur at the downstream end of the shoreline, with excess material placed at the upstream end of the shoreline. Compaction of graded material will be performed in areas designated for fill placement.

Upon completion of grading activities, fill placement activities to construct the shoreline embankment to the necessary lines and grades will begin. The existing clean gravel access road will be used to transport fill from the off-site borrow source to the crest of the embankment shoreline. Placement of fill will begin at locations of lowest elevation and will be keyed into the sideslope of the existing material of the shoreline embankment. As discussed above, the majority of the fill placement will occur at the upstream end of the shoreline embankment.

Placement and compaction of fill will be temporarily suspended at a selected elevation to facilitate installation of geotextile and the first row of concrete revetment. Placement of fill will proceed after installation of the first row of concrete revetment is completed or the continued fill placement will not interfere with concrete revetment installation.

Concrete revetment panels will be delivered to the Site by the manufacturer prior to installation. The panels are 8 feet wide and 30 to 40 feet long and will be unloaded at the contractor's material and equipment staging area. The panels have open spaces within and adjacent to the individual blocks that comprises the panel. These open spaces will be used to establish vegetation on the embankment, as discussed below. The contractor will transport the panels from the staging area to the shoreline for installation. The Owner will provide a spreader bar for moving the concrete panels.

Two rows of revetment panels will be installed. The first row of panels will be installed beginning at the upstream end of the Site and at the water's edge. The first upstream and last downstream panels will be installed in an anchor trench constructed parallel to the direction of slope. Interior panels will be secured against movement using screw anchors secured to polyester cable loops extending from the 8 feet width of each mat. The first row of panels will be installed using the bench constructed from fill placement activities.

Upon complete installation of the first row of mat, and the complete placement and compaction of the fill to meet embankment contours, construction of the second row of revetment panels will commence. Installation of revetment panels will be performed as described above, including installation of geotextile and screw anchors. Revetment panel installation will terminate near the top of the embankment.

After the panels have been installed, the open spaces between the concrete revetment blocks will be filled with Organic Material. Live stake cuttings taken from mature trees will then be planted within the organic material. Pilot holes equal to the diameter of the live stake cutting and perpendicular to the slope will be created in the center of selected openings. Care will be taken to protect the live stakes from damage such as splitting, bark peeling, and bud breakage during installation.

In conjunction with the planting of the live stake cuttings, bare root shrubs will also be planted. The hole will be of sufficient depth and width to accommodate all the roots of the shrub. The shrub will be planted with the root crown (the point where the roots and stems meet) at finished grade (the top of the concrete revetment). After shrub installation, the Contractor will backfill the hole with Organic Material and tamps the soil to create contact between shrub and soil. Bare root

shrubs will be watered after planting and adjusted to proper grade if settling occurs. Fertilizer and mulch will be used to promote proper growth of the vegetation.

4.1.4. Phase IV – North and North 2 Landfill

Work at the North and North 2 Landfills will begin with the clearing of trees and brush from the area designated for excavation and grading, and the removal of Excavation Debris. These activities will be performed as discussed in Section 4.1.2. Excavation and transportation of contaminated soils to the East Landfill will also be performed as discussed in Section 4.1.2 using the Contaminated Material Haul Road. No PCB soils above MTCA Method A levels are present at the North and North 2 Landfills. The placement of contaminated soils at the East Landfill is discussed in Section 4.1.5.

After excavation is completed, confirmational sampling will be performed to verify the removal of all contaminated soils to concentrations below the remediation levels. Additional excavation will be performed as needed if results of sampling indicate the concentration of contaminated soils is above the remediation levels. The additional excavation will either be to a depth that provides a surface soil concentration below the remediation level, or to a depth where groundwater is encountered – whichever comes first. After confirmational sampling, grading will be performed to create slopes that are stable and easily maintained. Grading will only be performed on existing soils; no additional fill will be required. Slopes of approximately 25% will be created. Compaction will be performed in areas where fill accumulates; this is expected to occur at the bottom of the excavation. Upon completion of grading, the finished slopes will be seeded, fertilized and mulched.

4.1.5. Phase V – East Landfill Engineered Barrier Construction

4.1.5.1. Subgrade Construction

Work at the East Landfill will begin with the clearing of trees and brush from the area designated for fill placement. Excavation Debris shall be managed as discussed in Section 4.1.2 above, except that the Contaminated Material Haul Road shall not be used. After clearing, the ground surface will be proofrolled using equipment suitable for the topography of the area and recommended for the type surface soils being compacted.

To isolate the contaminated soils from the North, North 2 and South Bank, an Anchor Trench Platform/Waste Soil Embankment will be constructed around the perimeter of the proposed Engineered Barrier. The Contractor will use the existing clean gravel access road to transport fill from an off-site borrow source to the perimeter of the East Landfill. The fill will be spread and compacted.

Contaminated soils from the North and North 2 Landfills and previously stockpiled contaminated soils from the South Bank will be used to construct the subgrade of the East Landfill. Trucks transporting contaminated soils from the North and North 2 Landfills will use the Contaminated Material Haul Road to access the East Landfill and dump their loads as near as possible to areas where placement and compaction shall occur. An at-grade opening in the Anchor Trench Platform/Waste Soil Embankment will be provided to permit trucks to enter the East Landfill to dump contaminated soils. Waste Soil placement will begin along the North boundary of the Anchor Trench Platform/Waste Soil Embankment. Positive drainage of the ground surface of contaminated soils at the East Landfill will be maintained to the south for as long a period as possible to meet stormwater requirements during construction. Any stormwater generated during placement of contaminated soils at the East Landfill will be collected at low elevation areas along the south boundary of the Anchor Trench Platform/Waste Soil Embankment and managed accordingly.

After all contaminated soils from the South Bank and the North and North 2 Landfills have been transported to the East Landfill, the Contaminated Material Haul Road will be excavated and removed.

During placement of contaminated soils at the East Landfill, the Contractor will use the appropriate measures necessary to reduce dust emissions during transportation, dumping, spreading and compaction. These measures may consist of tarping the trucks, wind fencing or wetting or spraying of the contaminated soils. As wetting may also aid in the compaction of the material, it is the preferred method.

4.1.5.2. Engineered Barrier Construction

Work will begin with the preparation of the ground surface on which the geosynthetic liner will be placed. All rocks, stones, sticks, roots, sharp objects, or debris of any kind will be removed. No sudden, sharp or abrupt changes or break in grade and no standing water or excessive moisture will be allowed.

After the geosynthetic clay liner (GCL) surface has been prepared and approved, the GCL will be installed in accordance with the manufacturer's installation guide, which includes complete written instructions for storage, handling, seaming, quality control and repairs. The geosynthetic clay liner sheets will be held in place over the area to be capped using the perimeter located anchor trench and will be installed with a minimum 6-inch overlap at material joints, with the upslope sheet overlapping the downslope sheet.

After installation of the geosynthetic clay liner (GCL) has been completed and approved, the geomembrane will be installed by qualified personnel in accordance with the manufacturer's

installation and QA/QC guide, which includes complete written instructions for the storage, handling, installation, seaming, quality control and repair of the geomembrane. The geomembrane sheets will be held securely in place over the area to be capped using the circumferential anchor trench and will be installed with a minimum 5 inch overlap at material joints, with the upslope liner sheet overlapping the downslope liner sheet.

The synthetic drainage netting/geotextile composite will be installed by the Contractor in accordance with the manufacturer's installation guide.

As mentioned previously, a perimeter anchor trench aids in securing the geosynthetics to the surface of the East Landfill. The anchor trench is excavated on the crest of the Anchor Trench Platform/Waste Soil Embankment, into Compacted Fill material. The geosynthetic clay liner, HDPE geomembrane and drainage netting will be placed in the anchor trench. A perforated pipe that collects water infiltrating into the Engineered Barrier is installed at the bottom of the anchor trench. Granular material, such as sand or gravel is used as backfill around the pipe. The material is lightly compacted to reduce potential damage to the pipe.

After installation of the geosynthetic clay liner, geomembrane and synthetic drainage netting, Compacted Fill will be placed in designated fill areas to construct one of the soil components of the Engineered Barrier.

The existing clean gravel access roads will be used to transport the soil from the off-site borrow source to the East Landfill. Dump trucks delivering Compacted Fill and Soil Cover to the East Landfill will not be permitted to drive over any installed geosynthetics. Compacted Fill will be placed and compacted using equipment with ground pressures that do not exceed 5 pounds per square inch.

After Compacted Fill installation, Soil Cover will be spread in one uniform horizontal layer 6 to 8 inches thick, measured when loose, across the entire width or length of the area to be filled, using low contact pressure equipment. The material will be lightly compacted.

After construction of the Soil Cover layer has been completed, vegetation of the ground surface will be performed. Vegetation will be performed as discussed in Section 4.4.4 above.

New fencing will be constructed around the two production wells at the North and North 2 Landfills after completion of all excavation and fill placement activities.

Thirteen (13) of the sixteen monitoring wells within the limits of the East Landfill will be extended prior to fill placement. Monitoring well extensions will be performed in accordance with applicable WAC guidelines.

4.1.6. Phase VI – Additional Fill Outside Limits of East Landfill Barrier

Selected areas around the perimeter of the East Landfill Engineered Barrier will be backfilled with clean soil imported from an offsite location to create slopes that are stable and easily maintained. After surveying, vegetation of the backfilled ground surface will be performed. The vegetation will be performed as discussed in Section 4.1.3 above.

4.2 Engineered Barrier and Compliance Monitoring

Alcoa will implement the Compliance Monitoring Plan to evaluate the integrity of the Engineered Barrier and shoreline work and report these findings to Ecology as outlined in the Schedule.

Following construction, as outlined in the Schedule, periodic inspections would be performed as outlined in the Compliance Monitoring Plan to verify that the Interim Action achieves its intended design objectives. Details, frequency, duration and rationale for the compliance monitoring are contained in the Compliance Monitoring Plan.

5.0 JUSTIFICATION OF PROPOSED INTERIM ACTION

In 1995 Alcoa performed a Feasibility Study (FS) to identify the solution for the cleanup of the East Landfill and for the 1.5 acre area known as the North Landfill. A total of eight remedial alternatives, consisting of a variety of containment, excavation, on and off site treatment and on and off site disposal were evaluated. Subsequent to the completion of the feasibility study, Alcoa internally performed a similar analysis of a 1 acre area known as the North 2 Landfill. Alcoa and Ecology selected excavation, consolidation, and capping of the North, North2, and East Landfills as the remedy for the upland portions of the Site. In addition to the consolidation of the three landfills, protective measures will be taken to stabilize the Columbia River shoreline and protect the Columbia River from the landfill areas.

The preferred remedial action that will be performed under this Interim Action Work Plan will complete a partial cleanup of hazardous substances from the upland portion of the East Landfill Site. As discussed in Section 4.0 of this work plan, this interim action is designed to be consistent with the final cleanup for the Site. Under WAC 173-340-370, the Department recognizes the need to use consolidation and containment options on Sites where a large volume of material with relatively low levels of hazardous substances exist.

By conducting this interim remedial action Alcoa will significantly reduce soil direct contact pathway and thereby reduce an ongoing threat to human health and the environment. The protective measures taken on the southern edge of the East Landfill will correct an existing problem that could become substantially worse with flooding of the Columbia River. The interim action is necessary at the East Landfill Site to protect the Columbia River from further PCB contamination and reduce the infiltration pathway from the North, North2 and East Landfills to the aquifer below. Alcoa currently has an Army Corps of Engineer permit to do in water work in the Colombia River. The permit for in water and shoreline work expires in 2004. Delaying the interim action cleanup work until the details of a final cleanup action are chosen for the complete Site would result in a more expensive cleanup action that would be delayed for several years. Consequently, this remedial action meets the requirements for an interim action under WAC 173-340-430.

6.0 COMPLIANCE MONITORING

The Compliance Monitoring Plan will be implemented in accordance with WAC 173-340-410, Compliance Monitoring Requirements. The Compliance Monitoring Plan may be amended during remedial design and construction work.

Since contaminated soils will be contained on site and a contaminated groundwater plume exists below the Site, a Compliance Maintenance and Monitoring Plan will be implemented as part of the interim action. The Compliance Monitoring Plan contains discussions on duration and frequency of monitoring and the trigger for contingency response action at the Site. The Compliance and Monitoring plan shall discuss activities necessary for the inspection and repair of the engineered cap, Columbia River shoreline arming, and groundwater monitoring.

Within 90 days of the completion of the engineered cap, Alcoa shall submit for approval by Ecology a groundwater monitoring plan for the Site. Monitoring the conditions found in the groundwater at the Site will be accomplished by using a monitoring network consisting of monitoring wells up and down gradient of the final consolidated landfill. Within 90 days of the completion of the engineered cap, Alcoa shall submit for approval by Ecology a landfill cap and shoreline arm maintenance plan. The cap maintenance plan will discuss methods used to inspect and maintain the cap and the shoreline arm system. Both plans shall discuss what appropriate triggers are for a contingency response action.

7.0 CONSTRUCTION WORK

The Engineering Design Report and Construction Plans and Specifications will provide the necessary technical drawings and specifications to allow a contractor to implement the methods described in the Final Interim Action Work Plan for remediation of the Site. Quality Assurance (QA) and Quality Control (QC) procedures will be implemented to document construction, including any changes or modifications that were necessary during the course of implementing the remedial action. The Construction Quality Assurance Plan (CQAP) will incorporate the protection and performance monitoring requirements contained in Section 4.0 of this Work Plan to confirm that human health and the environment are adequately protected during construction, in addition to the QA/QC monitoring requirements to confirm that the remedial action attains cleanup goals.

The Operation, Maintenance and Monitoring Plan (OMMP) will also discuss protection monitoring to confirm that human health and the environment are adequately protected during the operation and maintenance period of the interim action.

Schedules to submit the Remedial Design (RD), including the Construction Plans and Specifications and to begin work under this Work Plan are contained in Attachment I. Alcoa will submit a Remedial Design Report as outlined under WAC 173-340-400 (4) (a) and a Work Construction and Specification Plan as outlined under WAC 173-340-400 (4) (b) to Ecology for review and the work will be conducted under a Health and Safety Plan prepared under WAC 173-340-810.

Within 270 days of the completion of the final cover on the East Landfill Alcoa will submit for Ecology approval a final completion report. The final completion report will describe the interim remedial action and supply "as built" drawings to the Department.

8.0 SCHEDULE FOR IMPLEMENTATION

Attachment I contains an outline of the schedule for the remedial design and implementation activities. As outlined in the schedule, specifics on detailed analysis may be needed to complete the remedial design. Ecology will review and approve these documents and the public will have an opportunity to participate in each milestone through the minimum 30-day public comment period.

9.0 REFERENCES

1. *Northeast Parcel Remedial Action Report*, prepared by ICF Kaiser, October 31, 1997.

2. *Groundwater Monitoring Plan*, prepared by IT Corporation, July 2001.

3. *Draft Focused Feasibility Study, Former ALCOA Facility, Vancouver, Washington,* prepared by Hart Crowser, J-5352, December 6, 1994.

4. *Site Characterization Report Landfill and Surrounding Areas*, prepared by ICF Kaiser, July26, 1996.

5. *Supplemental Site Characterization Report*, prepared by ICF Kaiser, May 28, 1997

6. *Joint Aquatic Resources Permit Application (JARPA) for Alcoa – Former Vancouver Operations*, prepared by IT Corporation, August 9, 2000

TABLE 2-1
DETECTED COMPOUNDS IN SOIL ORTH, NORTH 2 AND EAST LANDFILLS

Soil Samples

Reference	EAST LANDFILL 1, 4, 5, 6, 7						NORTH LANDFILL 1, 6, 7						NORTH 2 LANDFILL 1, 2, 3, 4, 5, 6, 7					
PARAMETER	Min	Max	Max location	Ref	#Samples	# Hits	Min	Max	Max Location	Ref	#Samples	# Hits	Min	Max	Max Location	Ref	#Samples	# Hits
Volatile Organics																		
Trichloroethene	0.001 U	690	TP-32	6	56	39	0.011	0.19	TP-45	6	2	2	0.002 U	0.092	TP-17	5	4	2
Acetone	0.001	1.70 B	TP-3	5	25	16	-	-	-	-	-	-	0.012	0.200 B	TP-14	5	4	4
Benzene	0.001 U	0.15 U	MW-91-5D	4	23	6	-	-	-	-	-	-	0.002 U	0.012	MW-91-3D	4	2	1
Chloroform	0.001 U	0.16	TP-32	6	17	1	-	-	-	-	-	-	0.002 U	0.093	TP-46	1	10	1
1,1-Dichloroethene	0.001 U	0.43	TP-32	6	29	6	-	-	-	-	-	-	0.002 U	0.002 U	*	4	2	0
1,1-Dichloroethane	0.001 U	0.54	TP-94-10	7	26	7	-	-	-	-	-	-	0.002 U	0.002 U	*	4	2	0
trans-1,2-Dichloroethene	0.001 U	0.18	TP-27	6	23	6	0.002	0.002	TP-48	6	2	1	0.002 U	0.002 U	*	4	2	0
cis-1,2-Dichloroethene	0.001 U	22	TP-32	6	29	20	0.047	0.19	TP-45	6	3	3	0.002 U	0.054	TP-17	5	3	2
Total 1,2-Dichloroethene	0.001 U	22	TP-32	6	17	9	-	-	-	-	-	-	0.002 U	0.003	MW-91-3D	4	2	1
1,2-Dichloroethane	0.001 U	0.18	TP-94-8	7	18	2	-	-	-	-	-	-	0.002 U	0.002 U	*	4	2	0
Ethylbenzene	0.001 U	0.43	TP-32	6	22	8	-	-	-	-	-	-	0.002 U	0.004	TP-14	5	4	1
Methylene Chloride	0.001 U	0.96 B	TP-94-9	7	30	20	0.002 B	0.19	TP-45	6	2	2	0.002 U	0.007 B	TP-14	5	4	3
Toluene	0.001 U	2.9	TP-3	6	22	10	-	-	-	-	-	-	0.002 U	0.002 U	*	4	2	0
Vinyl Chloride	0.001 U	1.6	TP-94-10	7	22	6	-	-	-	-	-	-	0.002 U	0.002 U	*	4	2	0
2-Butanone	0.002 J	0.021	TP-29	6	18	5	0.003 U	1.3 B	TP-45	6	2	1	0.002 U	0.025	TP-14	5	2	1
Tetrachloroethene	0.001 U	2.4	TP-32	6	19	7	0.008	0.008	TP-48	6	2	1	0.002 U	0.004	TP-14	5	2	1
1,1,1-Trichloroethane	0.001 U	0.2	TP-32	6	8	1	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	0.001 U	0.27	TP-32	6	8	1	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Disulfide	0.001 U	0.005	TP-32	6	8	1	-	-	-	-	-	-	-	-	-	-	-	-
Total Xylene	0.001 U	2.9	TP-32	6	24	13	0.001 U	1.5	TP-45	6	2	1	0.002 U	0.017	TP-14	5	4	1
Inorganics																		
Aluminum	1900	16000	TP-16	1	14	14	7.7	13000	TP-18	1	5	5	1300	60000	TP-46	1	10	10
Arsenic	0.9	5	TP-16	1	14	14	1.8	6.4	TP-21	1	5	5	0.5 U	7	TP-46	1	10	9
Barium	35	190	TP-16	1	14	14	5.5	150	TP-18	1	5	5	11	82	TP-47	1	10	10
Beryllium	1 U	1.2	TP-7	1	14	1	-	-	-	-	-	-	1 U	1	TP-45	1	8	1
Cadmium	2 U	3	TP-10A	1	14	1	2 U	2	TP-19	1	5	1	-	-	-	-	-	-
Calcium	1600	7300	TP-7	1	14	14	2400	4200	TP-18	1	5	5	460	7900	TP-47	1	10	10
Chromium	10 U	21	TP-16	1	14	5	10 U	19	TP-18	1	5	3	10 U	320	TP-45	1	8	3
Cobalt	10 U	27	TP-14	1	14	2	10 U	14	TP-18	1	5	3	13	15	TP-50	2	2	2
Copper	10 U	220	TP-5	1	14	8	10 U	28	TP-18	1	5	4	10 U	7600	TP-45	1	8	7
Iron	6.7	27000	TP-16	1	14	14	6500	22000	TP-18	1	5	5	1600	22000	TP-47	1	10	10
Lead	2.5	3200	TP-10A	1	14	14	2.9	40	TP-19	1	5	5	2.6	280	TP-45	1	10	10
Magnesium	690	6200	TP-16	1	14	14	1200	5300	TP-18	1	5	5	190	9500	TP-45	1	10	10
Manganese	38	470	TP-16	1	14	14	120	380	TP-18	1	5	5	22	220	TP-45	1	10	10
Mercury	-	-	-	-	-	-	-	-	-	-	-	-	0.1 U	0.4	TP-45	1	8	1
Nickel	10 U	39	TP-11	1	14	6	10 U	17	TP-18	1	5	4	10 U	130	TP-45	1	8	6
Potassium	10 U	1700	TP-16	1	14	13	400	2300	TP-18	1	5	5	58	830	TP-46	1	10	10
Selenium	0.5 U	1.9	TP-16	1	14	6	0.5	1.6	TP-18	1	5	5	0.5 U	4.3	TP-46	1	8	7
Sodium	210	3200	TP-7	1	14	14	460	1100	TP-20	1	5	5	470	9700	TP-45	1	10	10
Thallium	0.5 U	0.7	TP-10A	1	14	1	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	17	67	TP-11	1	14	14	14	50	TP-19	1	5	5	19	37	TP-46	1	10	10
Zinc	29	280	TP-11	1	14	14	25	200	TP-19	1	5	5	18	260	TP-45	1	10	10
PCB's																		
Aroclor-1242	0.034 U	550	TP-10A	1	15	1	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1248	0.034 U	17	TP-12	1	15	5	0.047 U	0.062	TP-20	1	5	1	0.042 U	180	TP-48	1	21	8
Aroclor-1254	-	-	-	-	-	-	-	-	-	-	-	-	0.019 U	4.2	?	?	21	3
Aroclor-1260	-	-	-	-	-	-	0.012 U	0.018	TP-20	1	5	1	-	-	-	-	-	-

TABLE 2-1
DETECTED COMPOUNDS IN SOIL ORTH, NORTH 2 AND EAST LANDFILLS

Soil Samples

Reference	EAST LANDFILL 1, 4, 5, 6, 7						NORTH LANDFILL 1, 6, 7						NORTH 2 LANDFILL 1, 2, 3, 4, 5, 6, 7					
PARAMETER	Min	Max	Max location	Ref	#Samples	# Hits	Min	Max	Max Location	Ref	#Samples	# Hits	Min	Max	Max Location	Ref	#Samples	# Hits
Semivolatile Organics																		
acenaphthene	0.38	3500	TP-23	6	59	17	0.018 U	10	TP-94-2	7	13	1	2.2 U	213 U	TP-44	1	8	3
anthracene	0.026 J	9400	TP-5	5	36	23	0.026 J	37	94-B-3	7	16	10	2.2 U	213 U	TP-44	1	8	3
benzo(a)anthracene	0.59	12000	TP-23	6	36	23	0.018 U	300	TP-45	6	16	14	0.059	943	TP-46	1	12	8
benzo(a)pyrene	0.026 J	6400	TP-5	5	36	23	0.018 U	300	TP-45	6	16	15	0.076	1204	TP-46	1	10	7
benzo(b)fluoranthene	0.55	15000	TP-5	5	36	23	0.018 U	500	TP-45	6	16	13	0.059	1134	TP-46	1	12	8
benzo(g,h,i)perylene	0.16 U	3000	TP-5	5	36	22	0.018 U	150	TP-45	6	16	15	0.053	672	TP-46	1	10	5
benzo(k)fluoranthene	0.019 U	15000	TP-5	5	36	19	0.018 U	160	TP-45	6	16	13	0.038	721	TP-46	1	10	7
carbazole	1700	1700	TP-5	5	1	1	-	-	-	-	-	-	-	-	-	-	-	-
chrysene	0.078 B	19000	TP-5	5	36	21	0.018 U	250	TP-45	6	16	12	0.07	1173	TP-46	1	12	8
dibenzo(a,h)anthracene	0.13 U	1500	TP-5	5	36	11	0.036 U	10	TP-94-3	7	16	10	1 U	123 J	TP-44	1	8	4
dibenzofuran	2000	2000	TP-5	5	1	1	-	-	-	-	-	-	-	-	-	-	-	-
fluoranthene	0.37	41000	TP-5	5	36	23	0.018 U	390	TP-45	6	16	14	0.11	1564	TP-46	1	12	8
fluorene	0.34 U	2400 J	TP-23	6	36	20	0.018 U	15	94-B-3	7	13	4	2.2 U	213 U	TP-44	1	8	1
indeno(1,2,3-cd)pyrene	0.65	2900	TP-5	5	36	23	0.018 U	220	TP-45	6	16	14	0.05	779	TP-46	1	12	7
2-methylnaphthalene	250	250	TP-5	5	1	1	-	-	-	-	-	-	-	-	-	-	-	-
naphthalene	3.1	290 J	TP-23	6	18	6	-	-	-	-	-	-	-	-	-	-	-	-
phenanthrene	0.14	39000	TP-5	5	36	23	0.14	190	94-B-3	7	16	14	2.2 U	880	TP-46	1	10	5
pyrene	0.41 B	65000	TP-23	6	36	23	0.018 U	470	TP-45	6	16	13	0.12	2097	TP-46	1	12	8
Total Cyanide	0.25 U	50	TP-7	1	14	7	-	-	-	-	-	-	0.25 U	23	TP-46	1	10	4
TPH by weight	43 U	80000	TP-27	6	60	10	10 U	5590	TP-45	6	12	3	43 U	2495	TP-47	1	8	4
pH (std.units)	5.78	8.99	TP-11	1	14	14	7.07	7.49	TP-20	1	5	5	6.86	8.34	TP-47	1	8	8

NOTES

All units are mg/kg.
U - Not Detected.
J - Estimated
B - Detected also in lab blank
NA - Not Available
- - Value not reported
* - Max Location is 91-B-1, 91-B-2, and MW-91-3D

REFERENCES

1. Site Characterization Report Landfill and Surrounding Areas, ICF Kaiser, July 26, 1996
2. Supplemental Site Characterization Report, ICF Kaiser, May 28, 1997
3. Soil and Ground Water Investigation Status Report, Sweet-Edwards/EMCON, Inc., May 4, 1989
4. Phase IIA Monitoring Wells and Borings, Hart Crowser, October 10, 1991
5. Phase IIB Test Pits and Groundwater Level Monitoring, Hart Crowser, July 6, 1992
6. Phase IIC Test Pits, Hart Crowser, July 4, 1993
7. Additional Landfill Site, Hart Crowser, December 6, 1994
8. Model Toxic Control Act (MTCA), Washington Administrative Code, WAC 173-340-740 and WAC 173-340-745
9. Region IX Preliminary Remediation Goals (PRGs) 1996, USEPA, August 1, 1996, Industrial Soil/Soil Screening Level Migration to Groundwater DAF 20
10. Universal Treatment Standard - 40 CFR 268.48
11. Toxicity Characteristic Criteria - 40 CFR 261

EXHIBIT C

SCHEDULE

EXHIBIT C

Alcoa Project Schedule for East Landfill, N &N 2

	2003					2004												2005	
Project Steps	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN-SEP	
Finish Work Plan & Agreed Order	X	X																	
Public Notice SEPA & Agreed Order		X																	
Build Columbia River Revetment			X	X	X														
Move North & North2 Landfills									X	X	X								
Move Bank PCB Hot Spot				X	X	X													
Build Engineered Cover										X	X	X							
Finish Site Grading											X	X	X						
Establish Environmental Re-vegetation														X	X	X	X	One Year O&M by Contractor	
Submit Final Report																X	X	XXX	

APPENDIX B

CONSTRUCTION QUALITY CONTROL PLAN (ABBREVIATED)

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

CONSTRUCTION QUALITY CONTROL PLAN

FOR

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS

VANCOUVER, WASHINGTON

Prepared for

ALCOA REMEDIATION MANAGEMENT INC.
ALCOA REMEDIATION WORK GROUP
201 ISABELLA STREET
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Prepared by

Bergmann Associates
875 Greentree Road - Seven Parkway Center - Suite 1025
Pittsburgh, Pennsylvania 15220

September, 2003

CONSTRUCTION QUALITY CONTROL PLAN

FOR

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS

VANCOUVER, WASHINGTON

Prepared for

ALCOA INC.

Prepared by

Bergmann Associates

September, 2003

TABLE OF CONTENTS

1.0 INTRODUCTION

This Construction Quality Assurance Project Plan (CQAP) has been developed for the Remedial Action (RA) of the North and North 2 Landfills and the construction of a cap over the East Landfill at Alcoa's Former Vancouver Facility in Vancouver, Washington (Site). This CQAP satisfies Construction quality assurance program requirements for Dangerous Waste facilities as specified in Washington Administrative Code (WAC) 173-303-355 and Construction Quality Assurance requirements and standards related to construction activities as specified in the EPA Technical Guidance Document, "Quality Assurance and Quality Control for Waste Containment Facilities," EPA/600/R93/182, September, 1993. The overall Quality Assurance (QA) objective is to develop data and data reporting procedures that will be representative of the work performed and will provide legal documentation, if required. The overall Quality Control (QC) objective is to establish quality-oriented protocols for the project, and to establish procedures to ensure that the construction quality meets technical design specifications. The objective is addressed by providing details for the following:

- Project QA objectives.
- Staff organization and responsibility.
- Project communication, documentation, and record keeping procedures.
- Specific project activities and descriptions of the procedures to be used in sampling, implementation, review, approval, and documentation.
- QC procedures, including observations and tests that will be used to ensure that work meets or exceeds all design criteria.
- Certification of Construction requirements;
- Equipment Calibration; and
- Corrective Action (CA) Procedures.

2.0 PROJECT DESCRIPTION

2.1 SITE LOCATION

The facility is located in Clark County approximately three miles northwest of downtown Vancouver, Washington at 5509 NW Lower River Road. The East Landfill is located on the north bank of the Columbia River at River Mile 103.4. It is bounded to the North by property owned by Clark County, to the east by property owned by the Port of Vancouver and to the west by a right-of-way owned by the Clark County Public Utilities. The Clark County Public Utilities easement is for an underground pipeline that carries non-contact cooling water from their processes north of the Site to the Columbia River. The area of concern is west and adjacent to the East Landfill. It straddles the easement.

The North Landfill is located northwest of the East Landfill. It is triangular in shape and covers an area of 3.3 acres. It is bounded to the south by the right-of-way owned by the Clark County Public Utilities, to the North by the North2 Landfill and to the west by Vanalco property. The North2 Landfill is located adjacent to the North Landfill. It is also triangular in shape and covers an area of 2.8 acres. It is bounded to the north by property owned by Alcoa and to the west by Vanalco property.

2.2 SITE HISTORY

Alcoa Inc. (Alcoa) constructed the smelter complex at the Site in 1940. Between 1944 and 1970, a number of fabrication operations were added to the facility to form aluminum metal into finished goods such as wire, rod, and extrusions. Alcoa operated the entire facility until 1985. In 1985, the cable mill operation was sold to ACPC, Inc. and the property was leased from Alcoa. In 1987, Alcoa sold the smelter to VANALCO, Inc. and retained title to the extrusion (VANEXCO) section of the property, which was closed in 1992. Since 1987, Alcoa has been remediating, closing and selling portions of the remaining manufacturing facility and property.

The entire eastern portion of the Alcoa property was filled in the early 1940's with dredge sands from the Columbia River. The East Landfill Area was formed by the filling of a 15 to 20 foot deep, narrow area, which emptied into the Columbia River. Alcoa filled the narrow area with carbon bake oven furnace brick, aluminum and steel wire and miscellaneous small volumes of solid and industrial wastes impacted with volatile organic compounds (VOCs) (primarily TCE), PAHs and PCBs. In 1990, Alcoa initiated a Remedial Investigation (RI) to determine the source of TCE found in process water wells serving the VANALCO and operating Alcoa facilities. This RI identified two potential sources of TCE contamination; the East Landfill and in a landfill located about 900 feet northwest of the East Landfill, known as the North Landfill. Since that time, Alcoa has conducted numerous studies to characterize these landfills. During these investigations, two other areas impacted with PAHs, PCBs and metals were discovered to the north of the East Landfill. These areas were identified as the North 2 Landfill and the Northeast Parcel. In 1997, the Northeast Parcel was remediated to facilitate the sale of the property to Clark County. The scope of the Northeast Parcel remediation included the excavation and off-site disposal of 3,902 cubic yards (cu. yd.) of PCB-impacted soil and the excavation of 17,105 cu. yd. of PAH-impacted soil with placement of this material into an area at the southeast corner of the East Landfill, referred to as the Temporary Storage Area. Subsequent to this action, the discussions with the State of Washington Department of Ecology (Ecology) related to the East Landfill Area have included the East, North and North 2 Landfills.

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Since 1987, Alcoa has worked closely with Ecology under the voluntary cleanup status program. The extensive investigations and engineering has been conducted to select a remedial measure(s) that would effectively address this contamination under the Model Toxic Control Act (MTCA). Based on the results of numerous site investigations, Alcoa and Ecology have agreed that the optimum remedial solution for the area is an engineered cap system meeting Washington Dangerous Waste closure requirements.

2.3 PROJECT ACTIVITIES

Construction drawings and specifications have been developed to guide the construction contractor in the performance of the work outlined herein. The following documents will be provided by Alcoa to guide the QC Inspector in the performance of their work discussed herein.

Specifications for 'Remediation of the North and North2 Landfills and East Landfill Cap Construction Projects', prepared by Bergmann Associates, dated July 7, 2003 (Specifications).

Construction Drawings entitled 'Remediation of the North and North2 Landfills and East Landfill Cap Construction Projects', prepared by Bergmann Associates, dated July 7, 2003 (Drawings).

2.4 PROJECT SCHEDULE

A schedule for RA is provided in Section III of the Specifications.

3.0 PROJECT ORGANIZATION

Alcoa has the overall responsibility for ensuring that all construction activities fulfill the objectives established by applicable sections of WAC and USEPA Technical Guidance Documents. Alcoa has retained Bergmann Associates (BA) as Engineering Consultants to design the project and to provide Quality Assurance (QA) services during construction activities. A Quality Control (QC) Inspector will provide QC Services and construction monitoring at the Site for the project duration outlined in the Project Schedule.

The overall project organization and the key personnel and their authority and responsibilities with respect to CQAP functions are as follows:

3.1 ALCOA PROJECT COORDINATOR-AL BURBA, ALCOA PITTSBURGH

The Alcoa Project Coordinator will act as a contact with all regulatory agencies for all matters concerning the Landfill and has overall responsibility for the conduct of project activities. The Project Coordinator will verify that corporate standards are applied during the project and will have the overall responsibility to verify the performance of the RA meets all established QA/QC goals. The Project Coordinator will also act as the primary point of contact between Alcoa and the Engineering Consultants (BA).

3.2 QUALITY CONTROL (QC) INSPECTOR-BRUCE RICHARTZ, ALCOA TROUTDALE

Acting under the authority delegated to him by Alcoa, the QC Inspector is the on-site representative and will implement the overall project plans through day-to-day direction of field activities.

The principle responsibilities of the QC Inspector are:

- Establish effective communications with Alcoa, the construction contractor, the project team, and other field personnel through correspondence, meetings, and discussions, as required, to maintain close working relationships.
- Execute the project work plans and implement procedures through overall planning and day-to-day recommendations to the construction contractor of field activities.
- Verify that QC procedures are implemented throughout execution of the work.
- Review Contractor progress reports and payments.
- Develop daily and weekly field activity reports.
- Maintain on-site documentation consisting of procedures, rules and regulations, drawings, survey information, correspondence, meetings, etc.
- Manage and assist other field personnel in overseeing Contractors.

The QC Inspector will also be responsible for the continuous monitoring all construction activities and for conducting the inspections of the specific work. He will properly document all field tests and observations made and all work accomplished, and obtain the results of all applicable testing associated with the project to verify that it is performed in accordance with the plans and technical specifications.

3.3 QUALITY CONTROL (QC) SUPPORT

The Quality Control Support team will provide quality control services to the QC Inspector during the course of work. The QC Inspector will contact the QC Support team the afternoon before their services are needed. It is anticipated that QC Support will be required for the following tasks: Soil sampling, Immunoassay screening, geosynthetic quality control. Responsibilities of the QC Support team will be similar to those described in Section 3.3, above. The QC Support team will provide daily field reports, summary of test result reports and photographs to the QC Inspector within two days of the site visit.

3.4 QUALITY ASSURANCE (QA) OFFICER- PAT SULLIVAN, BA PITTSBURGH

The Quality Assurance (QA) Officer reports to Alcoa and is responsible for review of all design documents and plans before their submittal to Alcoa and the QC Inspector. During design, the QA Officer is responsible for the review of all construction drawings and technical specifications associated with the RA. During construction, the QA Officer, or an appointed representative is responsible for the implementation of the project QA/QC program detailed in this CQAP and will also conduct on-site QA inspections to verify that Work is being performed in accordance with the technical specifications and this CQAP. The QA Officer will verify that all contracted laboratories operate under established and approved QA/QC programs that are within the guidelines of this project. The QA Officer will also prepare the Completion of Construction Report and certify the work as a Washington Professional Engineer. He is also responsible for activity planning, overall QC project team performance and project schedule, budget and communications.

3.5 SITE SAFETY OFFICER

The Site Safety Officer (SSO) is directly responsible to the construction contractor for the development, coordination, and implementation of the Site Health and Safety Plan (HASP) and for the general protection of personnel during RA. This function will include enforcing Contractors' compliance with the HASP and will provide information and needed resources to perform health and safety activities. The SSO shall have the authority to temporarily suspend operations until any unsafe condition is corrected and it is safe to resume work.

The principle responsibilities of the SSO are discussed in the project HASP.

3.6 LABORATORY

The Laboratory selected to perform civil, geotechnical and geosynthetic testing for the project is Geotechnics, Inc of Pittsburgh, PA or an equivalent laboratory approved by the QC Inspector. The laboratory will have a documented quality control program to verify that the laboratory procedures conform to the appropriate American Society for Testing and Materials (ASTM) standards or other applicable standards. They will also be responsible for maintaining chain of custody for samples and for reporting data. A copy of the laboratory's QA/QC program will be provided to the QC Inspector and Alcoa.

The selected laboratory will also have responsibility for all bench level QA/QC, data reduction, reporting, and performance monitoring.

3.7 CONSTRUCTION CONTRACTOR(S)

Selected Contractors will be responsible for performing the work outlined in the construction drawings and technical specifications. This work shall include:

- Site Mobilization and Demobilization.
- Site Preparation.
- Construction Layout and Surveys.
- Construction of an Engineered Barrier.
- Excavation
- Shoreline Reconstruction
- Pre-Engineered Building Construction
- General Fill Placement

4.0 FIELD OPERATIONS

5.0 INSPECTION ACTIVITIES

This section of the CQAP describes QC requirements and standards related to the construction aspects of the work as described in Section 2.0. Additional information relative to the construction QA/QC items included in this section can be obtained from the U.S. EPA Technical Guidance Document EPA/600/R-93/182 published in September 1993, titled "Quality Assurance and Quality Control for Waste Containment Facilities" unless otherwise noted.

The objective of this section is to anticipate specific requirements of the project and establish procedures to verify that the construction quality meets technical design specifications. Specifically, this section of the CQAP will:

- Define construction communication, documentation, and record keeping procedures, including use of standard forms;

- Identify specific construction activities and describe the procedures to be used in sampling, implementation, review, approval, and documentation; and

- Establish QC procedures, including observations and tests that will be used to verify that work meets or exceeds all design criteria.

The QC Inspector will monitor and document the performance of work and will verify that the work is performed according to the Technical Specifications and this CQAP. Where conflicts or variations between information presented in this section of the CQAP and the technical specifications exist, the information presented in the technical specifications shall preside, unless written approval is obtained from the QC Inspector.

The specific QA/QC monitoring requirements for the basic components of the above mentioned construction are discussed below. The sections specify the minimum requirements that must be met and to what extent QA/QC monitoring will be conducted by the QC Inspector.

5.1 SAMPLE NUMBERING SYSTEM

All samples collected and observed during construction shall be recorded in the site logbooks. The QC Inspector will verify that the sample numbering system identified in Section 4.4.1 of this CQAP is used for sample tracking and for reporting purposes. A unique sequential number shall be assigned to each sample taken or observed.

5.2 GENERAL ACTIVITIES

General Activities consist of the maintenance of roads, the control of dust and the management of utilities. The QC Inspector shall periodically inspect the access roads and verify that they are kept clean and shall monitor the use of dust control measures on the roads during construction. These inspections shall be documented. He shall also verify that any public utilities connected and utilized by the Contractor at the Site are routed and connected in accordance with current applicable codes. The QC Inspector shall verify that utilities proposed for demolition are de-energized prior to removal. Appropriate lock-out/tagout procedures shall be documented.

5.3 PHASE I - SITE PREPARATION

Site Preparation will consist of mobilization, access road and staging area construction, surveying, erosion and sediment control installation, pipe plugging and filling, decon area construction and fence removal. QC Activities associated with these items is discussed below.

5.3.1 Mobilization

Mobilization will consist of the delivery, assemblage and proper operation of equipment required by the Contractor to perform the work. The QC Inspector shall verify that all equipment on-site is assembled and operates in accordance with the manufacturer's Operations Manual.

5.3.2 Access Roads and Staging Areas

Access Roads and Staging Areas will be constructed by the Contractor at the locations shown on the drawings. The QC Inspector will verify and document that the roads are constructed to the cross sections indicated and using the materials specified. Documentation shall include that the access roads do not extend over the height of the rails. The QC Inspector shall document the location of the material excavated to facilitate construction of selected portions of the access road.

Aggregate Qualification

Inspection of the granular drainage material shall begin prior to construction of the layer. As material is stockpiled, the QC Inspector shall make a visual inspection of it. He shall determine if it is uniform in nature, if it is free of excessive amounts of fines, inorganic materials, debris and large rocks, and if it meets the classification and property requirements stated in the technical specifications. If the drainage material does not meet the requirements, the QC Inspector can reject the material and direct the Contractor to segregate unsuitable material. Testing of the material may be required to verify conformance with the technical specifications. The following testing requirements shall be used by the QC Inspector to verify that the materials conform to the requirements stated in the technical specifications.

Laboratory Testing

- Particle size analysis - 1 per 5000 cubic yards - ASTM D422, except no hydrometer analyses.
- Moisture Content - 1 per 5000 cubic yards - ASTM D2216.
- Relative Density - 1 per 5000 cubic yards - ASTM D4253 and ASTM D4254 at 60% relative density.

Construction of Aggregate Layers

During construction of the drainage layer, the QC Inspector shall continuously observe the placement of the aggregate material, monitoring and documenting the material and testing results and the procedures for installing the aggregate, as they relate to the material and procedural requirements presented in the technical specifications. To verify the installation of the aggregate, the QC Inspector shall monitor and document the following:

- The thickness and coverage of the aggregate lift as it is placed;
- The compaction process and the testing of the compacted layer to verify conformance with specifications;

- A survey of the completed aggregate layer to verify that specified slopes are obtained;
- The migration of the aggregate into the existing subgrade is prevented by the presence of woven geotextiles.

Since placement of a woven geotextile fabric precedes placement of the aggregate layer, it is also necessary to monitor aggregate layer spreading and compaction operations by heavy equipment to verify that the woven geotextile is not damaged or displaced by the installation equipment.

The QC Inspector shall immediately notify the Contractor if he observes or tests an area of the aggregate layer not meeting the requirements stated in the technical specifications or his interpretation of aggregate placement, based on his observations and the results of the laboratory testing. The Contractor shall then remove the defective or nonconforming area or volume and replace it.

5.3.3 Surveying

During surveying activities, the QC Inspector will verify and document that the work will be performed in accordance with current accepted surveying standards. These shall include the National Standards of Map Accuracy as established by the United States Geological Survey (USGS). The QC Inspector shall periodically inspect permanent benchmarks, temporary benchmarks and stakes and document their condition and function. The QC Inspector shall verify that the surveyor is licensed in the State of Washington or is operating under the direct supervision of a Washington licensed surveyor.

The QC Inspector shall receive a copy of all survey records. The time for delivery of these records shall be agreed upon by the Contractor and the QC Inspector.

5.3.4 Erosion and Sediment Control

Erosion and Sediment Control features shall be installed at the locations shown on the Drawings. The QC Inspector shall verify that these features were installed in accordance with the specifications. He shall verify the size and the installation of the steel plates inserted between the jersey barriers and the frequency and installation of the support pipes behind the barriers. The QC Inspector shall verify the installation of the filter fabric on the upslope side of the barrier, including the nails and the wattles secured over the fabric. He will review the finished construction of the features along the Columbia River and shall make a determination of the adequacy of the structure and its ability to retain sediment.

He shall verify that conventional silt fence is installed in an upright condition, with proper depth and spacing of stakes, proper connection of fence to stakes and proper burial of fabric at the ground surface-fence interface. QC Inspector

5.3.5 Infiltration Basin

During construction of the infiltration basin, the QC Inspector shall verify that only those trees needed to construct the embankment and overflow outlet be removed. He shall also verify and document that the embankment and outlet structure be constructed to the proper elevations. He shall document the location of the drainage swale leading from the infiltration basin to the Columbia River, verifying that the swale is on Alcoa property and will not interfere with Landfill construction. He will verify that the Biodiffusers are installed in accordance with the manufacturer's installation guide, at the proper depth to allow gravity flow of water from the anchor trench drain. The location of the Biodiffusers will not require the removal of any trees in the vicinity of the infiltration basin.

5.3.6 Demolition

Demolition activities will be performed at several locations on the East Landfill and involve, wood and metal structures, wood and metal retaining walls, utility poles and fencing. The QC Inspector will verify that the demolition is done safely and to the below-grade depths indicated in the specifications. He shall verify that all excavation debris be disposed in the areas shown on the Drawings. The height of such debris will be terminated at an elevation at least two feet below proposed grading contours, to allow for a thickness of soil cover greater than 2 feet. He shall verify that Excavation Debris is broken down to the size stated in the specifications. He shall obtain copies of all of the needed permits, manifests, disposal receipts, weigh tickets, etc. The QC Inspector will monitor material disposed at this location for potentially hazardous constituents. He will also monitor dust generated during work activities.

5.3.7 Pipe Plugging/Filling

During pipe plugging and filling, the QC Inspector shall observe the activity, document the procedure used by the Contractor to fill the pipe and verify that the pipe is filled to the volume stated in the specifications.

5.3.8 Decontamination Area

The QC Inspector will verify that the decon pad is constructed to the dimensions and slopes indicated in the drawings. He will verify that the geomembrane is installed and covered with the needed thickness of aggregate.

5.4 PHASE II – SOUTH BANK AREA OF CONCERN

5.4.1 Clearing and Grubbing

During clearing and grubbing, the QC Inspector will verify that the limits of work are established. He will monitor the activities and verify that Excavation Debris is removed and disposed as per the Specifications and that grubbed material is disposed at the East Landfill. He will monitor for dust generated during work activities.

5.4.2 Waste Soil Excavation

The QC Inspector will monitor excavation activities. He will observe the excavation in 12-inch thick layers to the limits shown on the drawings. He will document the segregation of PCB Wastes and Waste Soils and the disposal of each. He will obtain copies of the manifests for shipping the PCB Wastes off site. He will coordinate the excavation of material with confirmational sampling to minimize the volume of material disposed off-site or placed at the East Landfill. He will coordinate with the surveyor to generate mapping that delineate the limits of PCB Waste excavated and Waste Soils excavated.

During transportation of Waste Soils to the East Landfill, the QC Inspector will observe the trucks using the Contaminated Material Haul Road. He will verify the dumping of Waste Soils at the East Landfill and the tarping of the soils, as per the specifications. He will document these activities and address potential problems.

5.4.3 Confirmational Sampling

The QC Inspector will implement the Confirmational Sampling Program in accordance with Section VI of the specifications. Immunoassay screening will be performed in accordance with the instructions provided with the kit.

5.4.4 Random Fill Testing and Installation

The Random Fill is to be used for backfill of excavated areas, to construct the anchor trench platform/embankment, to construct the slope beneath shoreline revetment, to construct the 18-inch thick Random Fill layer over the geosynthetics of the engineered barrier and as backfill material for peripheral areas.

Preconstruction Random Fill Evaluation

Random Fill shall be obtained by the Contractor from an Owner approved off-site source. The quality of the soils shall be evaluated prior to placement to assure that the soils will meet physical parameter requirements of the Technical Specifications. The QC Inspector shall make a visual inspection of the material prior to delivery to the Site to determine if it is uniform in nature, if it is free of roots, stumps, debris, large rocks and clods over four inches in any direction, and if it visually and manually meets the classification and property requirements stated in the technical specifications. If the soil material does not meet these requirements, the QC Inspector can reject the material and recommend to the Contractor to segregate unsuitable material or to excavate at another location within the borrow area. Testing of the material shall be required to verify physical property conformance with the Technical Specifications. The following testing shall be performed by the QC Inspector at the frequencies indicated or with each visual change in the material observed by the QC Inspector. Testing shall be performed using the indicated standard.

Laboratory Testing

Particle size analysis/gradation	1 per 20,000 CY or material change	ASTM D422
Classification	1 per 20,000 CY or material change	ASTM D2487
Moisture-density relationship	1 per 20,000 CY or material changes	ASTM D698
Specific Gravity	1 per 20,000 CY or material changes	ASTM 854
Atterberg Limits	1 per 20,000 CY or material changes	ASTM D4318
Moisture content	1 per 20,000 CY or material changes	ASTM D2216

Shipment of all soil samples shall be performed in accordance with ASTM D4220.

The QC Inspector has the option to modify the frequency of testing and/or the nature of the test if the characteristics of the borrow material change or remain relatively consistent; however he should inform the contractor of such modifications prior to implementation.

Random Fill Installation

During placement of Random Fill, the QC Inspector shall observe the placement of the soil material, monitoring and documenting the following information to verify that the specified material is placed and compacted to the specification guidelines:

- Soil Type
- Moisture Content
- Lift Thickness
- Maximum Particle Size

- Density
- Equipment
- Number of passes with compaction equipment
- Scarification of previously placed lift
- Uniformity of Compaction
- Compaction Area

The QC Inspector shall observe and determine the number of passes performed by the compaction equipment. At least one observation shall be performed per acre per lift. He shall immediately notify the Contractor if he does not obtain the above-mentioned information during his observation or observes conditions relative to the information mentioned above that differ from the technical specifications.

Field testing shall be performed by the QC Inspector and shall consist of moisture and density testing. Testing shall be performed with a nuclear density gauge. Density testing shall be performed in accordance with ASTM D2922 and moisture content shall be determined in accordance with ASTM D3017. Testing shall be performed once for every 1,000 cubic yards of Random Fill placed or once for each six-inch lift of Random Fill spread and compacted, whichever is greater. If a change in the visual or physical characteristics is observed by the QC Inspector during installation, he shall collect a representative sample of the Random Fill and submit the sample for testing to obtain updated optimum moisture and maximum dry density results. The testing shall be performed in accordance with ASTM D698.

If field testing of the Random Fill yields density or moisture results that do not meet the requirements stated in Section VIII, Part D.2.d of the specifications, the QC Inspector can have the test location moved to another area of the region that is being constructed, i.e., within the 500 cubic yard zone or recompact the area and perform the test again. If an acceptable test result is not achieved after two attempts, the QC Inspector shall inform the Contractor of the failed area. The Contractor may either remove the failed area and reinstall with new material, reconstruct the area using the existing material or implement some other method to achieve the required results.

If the QC Inspector observes the deterioration of weather conditions, such as high temperatures, windy conditions or rainfall, and determines that these conditions may affect the construction of the soil layers, he shall immediately notify the Contractor. The Contractor may need to temporarily interrupt construction and implement measures to protect that portion of the Random Fill previously installed and approved by the QC Inspector.

5.5 PHASE III – SHORELINE REHABILITATION

5.5.1 Clearing and Grubbing

Clearing and grubbing activities will be monitored by the QC Inspector in accordance with Section 5.4.1 of this CQAP.

5.5.2 Grading

During grading activities, the QC Inspector will monitor the movement of Random Fill throughout the shoreline area. He will observe the grading and the spreading of the Random Fill. No compaction requirements are needed for Random Fill graded from the shoreline area; compaction testing will be required for imported soil. The QC Inspector shall document locations where Excavation Debris and organic material are removed from the shoreline area and disposed at the East Landfill. He shall also monitor and document soft or compressible soil areas, if encountered.

5.5.3 Random Fill and Organic Material from Borrow Source

Random Fill and Organic Material (used to support willow growth) from an approved off-site borrow source shall be used to complete construction of the shoreline embankment. The QC Inspector shall document delivery and installation of these materials in accordance with Section 5.4.4 of this CQAP.

5.5.4 Revetment

The QC Inspector shall monitor and document installation of the revetment. QC activities associated with this task are discussed in detail in Section 5.14 of this CQAP.

5.5.5 Willow, Shrub and Grass Planting

The Contractor shall provide the QC Inspector with information on the plants to be used for installation along the shoreline. The information shall include the species of plants, the quantity, the nursery from which the plants were acquired and a photograph of the plant and the species label. If the information is not acceptable to the QC Inspector, he shall inform the contractor of the inadequacies, from which the Contractor will make adjustments. The Contractor shall also provide the QC Inspector with a written certification, signed by a responsible party, which certifies that the materials actually delivered meet the requirements stated in the Technical Specifications. The QC Inspector shall verify this requirement.

The Contractor shall review his procedure for planting with the QC Inspector prior to planting. During planting, the QC Inspector shall verify that the plants be handled in accordance with the Technical Specifications. He shall verify that the live stakes are kept in buckets until planting and that the shrubs are kept in moist soil or moist sawdust until planting. The QC Inspector will document that the plants are installed to the proper depths and at the spacing indicated. After planting, the QC Inspector will verify that soil is pushed against the root of the plant to increase plant stability and to reduce the potential for roots to dry out.

5.6 PHASE IV – NORTH AND NORTH2 LANDFILLS

Work at the North and North 2 Landfills will include clearing, Waste Soil excavation and handling, implementation of the Confirmation Sampling Program, grading and vegetation (grass). This work will be monitored and documented by the QC Inspector as discussed in previous sections of this CQAP. The sections to be referenced are as follows:

Clearing	Section 5.5.1
Waste Soil excavation and handling	Section 5.4.2
Confirmational Sampling	Section 5.4.3
Grading	Section 5.5.2
Vegetation	Section 5.5.5

5.7 PHASE V – CONSTRUCTION OF EAST LANDFILL ENGINEERED CAP

5.7.1 Clearing and Grubbing

Clearing and grubbing activities will be monitored by the QC Inspector in accordance with Section 5.4.1 of this CQAP.

5.7.2 Anchor Trench Platform/Embankment

The anchor trench platform and embankment will be constructed to the lines and grades shown on the drawings using random fill imported from an approved borrow area. Placement of the Random Fill will be monitored and documented by the QC Inspector in accordance with Section 5.4.4 of this CQAP.

5.7.3 Waste Soil Placement

Waste Soil Evaluation

Waste Soil shall be obtained by the Contractor from the North, North 2 Landfills and the South Bank. The QC Inspector shall make a visual inspection of the material as it is delivered to the East Landfill to determine if it visually and manually meets the Waste Soil and Excavation Debris requirements stated in the technical specifications. If it does not meet the Excavation Debris requirements, the QC Inspector can reject the material or recommend further management to meet the Excavation Debris requirement. Testing of the material shall be required to meet compaction requirements stated in the Technical Specifications. The following testing shall be performed by the QC Inspector at the frequencies indicated or with each visual change in the material observed by the QC Inspector. Testing shall be performed using the indicated standard.

Laboratory Testing

Classification	1 per 20,000 CY or material change	ASTM D2487
Moisture-density relationship	1 per 20,000 CY or material changes	ASTM D698
Moisture content	1 per 20,000 CY or material changes	ASTM D2216

Shipment of all soil samples shall be performed in accordance with ASTM D4220.

The QC Inspector has the option to modify the frequency of testing and/or the nature of the test if the characteristics of the Waste Soils change or remain relatively consistent; however he should inform the Contractor of such modifications prior to implementation.

Waste Soil Installation

During installation of Waste Soils and Excavation Debris, the QC Inspector shall observe the placement of the material, monitoring and documenting the following information to verify that the material is placed and compacted to the specification guidelines:

- Soil Type
- Moisture Content
- Density
- Equipment
- Number of passes with compaction equipment
- Scarification of previously placed lift
- Lift Thickness
- Maximum Particle Size
- Uniformity of Compaction
- Compaction Area

The QC Inspector shall observe and determine the number of passes performed by the compaction equipment. At least one observation shall be performed per acre per lift. He shall immediately notify the Contractor if he does not obtain the above-mentioned information during his observation or observes conditions relative to the information mentioned above that differ from the technical specifications.

Field testing shall be performed by the QC Inspector and shall consist of moisture and density testing. Testing shall be performed with a nuclear density gauge. Density testing shall be performed in accordance with ASTM D2922 and moisture content shall be determined in accordance with ASTM D3017. Testing shall be performed once for every 1,000 cubic yards of Waste Soils placed or once for each six-inch lift of Waste Soils spread and compacted, whichever is greater. In areas where at least 20% of the Waste Soils can be classified as Excavation Debris, compaction testing will be performed, but results will be interpreted and reviewed by the QC Inspector for acceptance.

If the QC Inspector observes the deterioration of weather conditions, such as high temperatures, windy conditions or rainfall, and determines that these conditions may affect the construction, he shall immediately notify the Contractor. The Contractor may need to temporarily interrupt construction and implement measures to protect that portion of the Waste Soils previously installed and approved by the QC Inspector.

5.8 GEOSYNTHETIC CLAY LINERS

This section describes the QA/QC testing, inspection procedures and documentation to be implemented for Geosynthetic Clay Liner (GCL) installation activities at the East Landfill. Specifically, this section covers the GCL to be placed under the geomembrane at the East Landfill.

Prior to any construction in which geotextiles are used, the Contractor shall provide the QC Inspector with a list of guaranteed Minimum Average Roll Values (MARV) for the GCL, the ASTM Standards used in obtaining MARV and the Manufacturer's QA certification under which the tests are performed. The Contractor shall also provide the QC Inspector with a written certification, signed by a responsible party, which certifies that the GCL actually delivered meet the guaranteed minimum average roll values. The QC Inspector shall verify that the certified values meet the values and testing frequencies required, if any, listed in the technical specifications.

5.8.1 Packaging, Shipping, and Storage

During shipment and storage, the GCL rolls shall be protected from ultraviolet light exposure, puncture, cutting, precipitation or other wetting, mud, dirt, or any other damaging conditions. To prevent damage by ultraviolet exposure, dirt, and wetting, the geotextile rolls shall be shipped and stored in relatively opaque and watertight wrappings. The wrapping should not interfere with the ability of the Contractor to handle the GCL rolls using the central core or slings.

As GCL rolls are delivered to the site, the QC Inspector shall verify that the rolls are handled in a manner that does not damage the GCL or its protective wrapping. He shall observe the rolls being placed in an area, as determined by the Contractor, where water can not accumulate and where rolls shall be elevated off the ground and stacked in a manner that does not crush the cores, damage the GCL or limit the ability to obtain conformance samples. The QC Inspector shall document that the core is stable enough to support the GCL roll while it is being handled by slings or by a spreader bar or by a tapered core rod. The bands preventing the GCL from unrolling shall be intact and show no signs of damaging the GCL. GCL may be stored outdoors if covered completely by a tarpaulin. Outdoor storage of GCL rolls should not exceed 4 weeks.

If any special handling is required, it shall be so marked on the top surface of the GCL wrapping. The QC Inspector shall examine the rolls upon delivery and shall report any variance from the above requirements to the Contractor.

5.8.2 Material Inspection and Conformance Testing

As GCL rolls are delivered to the site, the QC Inspector shall record the following information from the outer wrapping of the roll:

- Manufacturer's name.
- Product identification or style.
- Lot number.
- Roll number.
- Roll dimensions.
- Machine direction of roll fabrication, if available.

After recording the information for each roll, the QC Inspector shall inspect each GCL roll for damage, observing any cuts, punctures and deformations on the geotextile or the outer geotextile wrapping. If any of these deficiencies are observed, the QC Inspector shall document the deficiency and mark the roll as potentially unsuitable. After all GCL rolls have been inspected, the QC Inspector shall review the rolls marked as deficient and determine if said rolls should be accepted, salvaged or rejected completely. If a roll is deemed salvageable, a portion of the roll may be identified that can be separated (by cutting) from damaged portions and utilized in construction. Rejected rolls shall be marked for removal from the site. The Contractor shall be responsible for scheduling the manufacturer to remove rejected GCL rolls.

At his own discretion, the QC Inspector shall select a roll to be sampled for conformance testing. The sample shall be taken from any roll on-site by cutting full-width, 3 feet long samples. Conformance sampling and testing may only be waived by the QC Inspector.

The conformance samples and the information obtained from the outer wrapping of the sampled roll shall be shipped to a testing laboratory selected by and contracted to the QC Inspector and the following tests shall be performed:

GRI GCL1 "Free Swell Conformance Test of Clay Component of a GCL;"

ASTM D 5084 "Hydraulic Conductivity of saturated Porous material Using a Flexible wall Permeameter;"

ASTM D 5261 "Standard Test Method for Measuring Mass per Unit Area of Geotextiles;"

The results of the conformance testing as described above shall be reviewed by the QC Inspector and compared with the typical physical properties or MARV presented in the Technical Specifications. Geotextile material meeting conformance requirements shall be documented by the QC Inspector as accepted prior to the distribution for construction. Non-conforming test results shall be summarized by the QC Inspector and forwarded to the Contractor and Owner. An allotment of geotextile that is represented by a non-conforming test result shall be returned to the geotextile manufacturer. Conformance sampling and testing is not to be performed on any geotextile that is not present on-site.

5.8.3 GCL Installation

Prior to placement of the geomembrane within the landfill area, the QC Inspector and Contractor shall verify and document that all lines and grades of the supporting soil meet the requirements set forth in the design specifications and determine if construction equipment can be used to deploy the GCL without

causing ruts greater than one-inch in depth. In addition, the QC Inspector shall verify that no objects that could harm or damage the geomembrane exist on the surface of the supporting soil.

The QC Inspector shall review for acceptance the GCL panel layout plan, which shall show all field seams. The QC Inspector shall verify that the layout is consistent with the design specifications and the accepted standards of practice, that seams are generally oriented parallel to the line of maximum slope, and that the number of field seams in corners or odd-shaped locations are minimized. Following acceptance of the panel layout by the QC Inspector, panel placement shall begin.

During GCL panel placement, the QC Inspector shall verify that:

- Each liner panel is assigned an identification designation agreed upon by the QC Inspector and Contractor consistent with the panel layout plan;
- The installed locations of the panels are recorded;
- The overlaps of panels are maintained in accordance with the Manufacturer's Installation Guide. In the absence of such data, the minimum overlap shall be 6 to 8 inches on longitudinal or transverse edges
- The panels are free from holes, surface blemishes, scratches or other defects.
- Schedule of panel placement is such that the effects of precipitation and high winds are minimized (i.e., begin panel placement in a drainage collection area and proceed upward and outward with panel overlaps that facilitate drainage of water in the event of precipitation);
- Panel placement is not conducted during adverse weather conditions such as precipitation, excessive moisture (fog, dew), in the presence of excessive winds, or in areas of ponded water;
- Panels are moved and placed in a manner that shall in no way harm the GCL;
- The GCL panels are weighed down by sandbags to prevent uplift by wind. The QC Inspector shall verify that the weights themselves do not damage the GCL
- Personnel working on the GCL do not smoke, wear damaging shoes, or engage in other activities which could damage the GCL;
- The proper amount of moistened bentonite paste or dry bentonite is inserted in the overlap seams in accordance with the Manufacturer's Installation guide.
- Direct contact with the GCL is minimized.

The QC Inspector shall inform the Contractor if the above requirements are not met or if any deficiencies are observed.

The QC Inspector shall also inspect each panel for damage after placement. The QC Inspector shall advise the Contractor which panels, or portions of panels, should be rejected or repaired. Damaged panels or portions of damaged panels which have been rejected shall be marked and their removal from the work area recorded by the QC Inspector. Repairs shall be made according to procedures described herein.

5.8.4 Repairs

The QC Inspector shall observe and document all GCL repairs. Any noncompliance with the requirements presented in this section shall be reported to the Owner.

Holes or tears in the geotextile filter fabric shall be repaired with a GCL patch made of the same material as the original GCL. The patch shall extend at least 12-inches beyond any damaged portion of the GCL. GCL that is placed on slopes shall be repaired by sewing a the patch in place using a double-sewn lock stitch (seams 1/4-inch to 3/4-inches apart and no closer than 1 inch from any edge), by the use of adhesive or by heat bonding, if possible. Bentonite required in seams shall be installed as per standard overlap seaming requirements as detailed above.

The QC Inspector shall document that all necessary repairs are completed in accordance with the procedures specified in this section and in the technical specifications.

5.9 GEOMEMBRANES

This section describes the QA/QC testing, inspection procedures and documentation to be implemented for geomembrane installation activities at the South Landfill Cap.

Prior to delivery of any geomembranes, the Contractor shall provide the QC Inspector with a list of guaranteed MARV for the geomembrane, the ASTM Standards used in obtaining MARV and the Manufacturer's QA certification under which the tests are performed. The Contractor shall also provide the QC Inspector with a written certification, signed by a responsible party, which certifies that the materials actually delivered meet the guaranteed minimum average roll values. The QC Inspector shall verify that the certified values meet the values listed in the technical specifications.

5.9.1 Packaging, Shipping, and Storage

During shipment and storage, the geomembrane shall be protected from ultraviolet light exposure, puncture, cutting, precipitation or other wetting, mud, dirt, or any other damaging conditions. As an option, to prevent damage by ultraviolet exposure, dirt, and wetting, the geomembrane shall be shipped and stored in relatively opaque and watertight wrappings. The wrapping should not interfere with the handling of the geomembrane rolls using the central core or using slings. The central core should be of sufficient diameter and strength to support the heavy weight of the roll without excessive deflection or buckling.

As geomembrane is delivered to the site, the QC Inspector shall verify that the rolls are handled in a manner that does not damage the roll or its protective wrapping. Dragging, pushing or sliding of the rolls is not permitted. The QC Inspector shall observe the rolls being placed in an area where water can not accumulate and where rolls shall be elevated off the ground and stacked in a manner that does not crush the cores, damage the geomembrane or limit the ability to obtain conformance samples. If outdoor storage of geomembranes is anticipated for greater than 6 months, the rolls shall be covered with a tarpaulin.

If any special handling is required, it shall be so marked on the top exposed surface of the geomembrane. The QC Inspector shall examine the geomembrane rolls upon delivery and shall report any variance from the above requirements to the Contractor.

5.9.2 Geomembrane Inspection and Conformance Testing

As geomembrane is delivered to the site, the QC Inspector shall record the following information from the outer wrapping of the geomembrane.

- Manufacturer's name.
- Product identification.

- Thickness.
- Roller number.
- Roll dimensions.
- Date Manufactured.

After recording this information for each roll, the QC Inspector shall inspect each geomembrane roll for damage, observing any cuts, punctures and deformations on the geomembrane or the outer wrapping. If any of these deficiencies are observed, the QC Inspector shall document the deficiency and mark the roll as potentially unsuitable. After all geomembrane rolls have been inspected, the QC Inspector shall review the rolls marked as deficient and determine if said rolls should be accepted, salvaged or rejected completely. If a roll is deemed salvageable, a portion of the roll may be identified that can be separated (by cutting) from damaged portions and utilized in construction. Rejected rolls shall be marked for removal from the site. The Contractor shall be responsible for scheduling the manufacturer to remove rejected geomembrane roll(s).

In conjunction with the delivery of the geomembrane rolls to the site, the QC Inspector shall select a roll within a lot to be sampled for conformance testing. One sample shall be obtained for every 50,000 square feet of geomembrane. The sample shall be taken from any roll on-site by cutting full-width, 3 feet long samples. All geomembrane delivered to the site shall be sampled for conformance testing at the frequency indicated.

At his own discretion, the QC Inspector shall select a roll to be sampled for conformance testing. The sample shall be taken from any roll on-site by cutting full-width, 3 feet long samples. Conformance sampling and testing may only be waived with the approval of the QC Inspector.

The conformance samples and the information obtained from the outer wrapping of the sampled roll shall be shipped to a laboratory selected by and contracted to the QC Inspector and the following tests shall be performed:

ASTM D 5199 "Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes;"

ASTM D 638 "Standard Test Method for Tensile Properties of Plastics;"

ASTM D 1505 "Test Method for Density of Plastics by the Density-Gradient Technique."

The results of the conformance testing as described above shall be reviewed by the QC Official and compared with the typical physical properties or MARV presented in the Technical Specifications. Geomembrane material meeting conformance requirements shall be documented by the QC Inspector as accepted prior to the distribution for construction. Non-conforming test results shall be summarized by the QC Inspector and forwarded to the Contractor and Owner. An allotment of geomembrane that is represented by a non-conforming test result shall be returned to the geomembrane manufacturer. Conformance sampling and testing is not to be performed on any geomembrane that is not present on-site.

5.9.3 Geomembrane Installation

Prior to placement of the geomembrane within the landfill area, the QC Inspector and Contractor shall verify and document that all lines and grades of the supporting soil meet the requirements set forth in the design specifications. In addition, the QC Inspector shall verify that no objects that could harm or damage the geomembrane exist on the surface of the supporting soil.

The QC Inspector shall review for acceptance the manufacturer's geomembrane panel layout plan, which shall show factory-installed or field-installed seams. The QC Inspector shall verify that the layout is consistent with the design specifications and the accepted standards of practice, that seams are generally oriented parallel to the line of maximum slope, and that the number of field seams in corners or odd-shaped locations are minimized. Following acceptance of the panel layout by the QC Inspector, panel placement shall begin.

During geomembrane panel placement, the QC Inspector shall verify that:

- Each liner panel is assigned an identification designation agreed upon by the QC Inspector and the Contractor consistent with the Contractor's panel layout plan;
- The installed locations of the panels are recorded;
- The panels are free from pinholes, surface blemishes, scratches or other defects, such as nonuniform color, streaking, carbon black agglomerates, regrind, etc.
- Schedule of panel placement is such that the effects of precipitation and high winds are minimized (i.e., begin panel placement in a drainage collection area and proceed upward and outward with panel overlaps that facilitate drainage of water in the event of precipitation);
- Panel placement is not conducted during adverse weather conditions such as precipitation, excessive moisture (fog, dew), in the presence of excessive winds, or in areas of ponded water;
- Panels are moved and placed in a manner that will in no way harm the geomembrane, does not cause scratches, wrinkles, or crimps in the geomembrane and does not damage the underlying Geosynthetic Clay Liner;
- The geomembrane is weighed down by sandbags to prevent uplift by wind. The QC Inspector shall verify that the weights themselves do not damage the geomembrane;
- Personnel working on the geomembrane do not smoke, wear damaging shoes, or engage in other activities which could damage the geomembrane;
- Direct contact with the geomembrane is minimized.

The QC Inspector shall inform the Contractor if the above requirements are not met or if any deficiencies are observed.

The QC Inspector shall also inspect each panel for damage after placement and prior to seaming. The QC Inspector shall advise the Contractor which panels, or portions of panels, should be rejected or repaired. Damaged panels or portions of damaged panels which have been rejected shall be marked and their removal from the work area recorded by the QC Inspector. Repairs shall be made according to procedures described in this CQAP.

5.9.4 Field Trial Seams

Prior to field seaming of the geomembrane panels, trial seams shall be made on pieces of geomembrane to verify that seaming conditions are adequate. Trial seams shall be made at the beginning of each seaming period and at least once every four hours, with additional tests at the QC Inspector's discretion, i.e., changes in personnel, equipment, weather conditions. Each seamer shall make at least one trial seam each day. The trial seam sample shall be made using two geomembrane pieces, each at least four-feet long by one-foot wide with the seam centered lengthwise. A total of two to six specimens, one-inch wide, shall be cut from the trial seam sample by the Contractor using a die. These specimens shall be field-tested for shear and peel, respectively, using a method selected by the Contractor and approved by the QC

Inspector. Results of these tests shall conform to the requirements stated in the technical specifications. If a trial seam fails, the entire operation shall be repeated. If the additional trial seam fails, the seaming apparatus or seamer shall not be accepted and shall not be used for seaming until the deficiencies are corrected and two consecutive successful trial seams are achieved.

The QC Inspector shall observe all field trial seaming operations and testing. The remainder of the successful trial seam sample shall be assigned a number and marked accordingly by the QC Inspector, who shall also log the date, hour, ambient temperature, number of seaming unit, name of seamer, and pass or fail descriptions. Upon acceptance of the field trial seaming operations by the QC Inspector, actual field seaming of the geomembrane panels can commence.

5.9.5 Field Seams

Field seaming shall be performed by a Contractor certified by, and using the extrusion welding and fusion welding guidelines of, the geomembrane manufacturer. The Contractor shall provide the QC Inspector with a copy of his installation certification from the geomembrane manufacturer. Alternate seaming techniques must be acceptable to the manufacturer and the QC Inspector. Each seaming apparatus shall be equipped with gauges providing information on apparatus performance, such as the temperature of the welding apparatus and rate of seaming. Prior to seaming, the Contractor shall provide the QC Inspector with the panel layout drawing and a seam numbering system shall be instituted for documentation purposes. No seaming shall be performed at ambient conditions outside of those noted in the technical specifications unless the Contractor demonstrates and certifies to the QC Inspector that the seaming methods produce seams that are equivalent to seams produced within the preferred temperature range.

The QC Inspector shall verify that the seam area is clean and free of moisture, dust, dirt, and debris of any kind. If seam overlap grinding is required (for extrusion welding), the QC Inspector shall verify that it is completed no more than one-half (1/2) hour before seaming and is performed in a manner that does not significantly reduce the thickness and/or strength of the geomembrane.

During seaming, the QC Inspector shall log apparatus temperatures, ambient temperatures, and geomembrane temperatures. The QC Inspector shall also verify that:

- The Contractor maintains on-site the number of spare operable seaming units agreed upon at a preconstruction meeting and that equipment used for seaming is not likely to damage the geomembrane;
- Electric generators are placed on a smooth base such that no damage occurs to the geomembrane. Otherwise, electric generator shall not be placed on the membrane;
- If required, a firm substrate shall be provided by using a flat board or similar hard surface directly under the seam overlap to achieve proper support;
- A smooth insulating plate or fabric is placed beneath the welding apparatus after usage until the apparatus cools;
- The procedure used to temporarily bond adjacent panels together does not harm the geomembrane, and the temperature of any hot-air spot welding apparatus is controlled so that the geomembrane is not damaged; and
- The panels of the geomembrane have a finished overlap of at least four inches (4”) for extrusion welding and fusion welding, and all welds shall occur at least one inch (1”) from the edge of the overlying geomembrane panel.

5.9.6 Destructive Seam Strength Testing

The QC Inspector shall select locations where seam samples shall be cut out for field and laboratory destructive seam strength testing. Additional test locations may be determined during seaming at the QC Inspector's discretion. Selection of such locations may be prompted by suspicion of excess crystallinity or contamination in the weld, offset welds, or any other potential cause of imperfect welding. The QC Inspector shall direct the Contractor to cut samples as the seaming progresses so that laboratory test results can be obtained before completion of geomembrane installation. The Contractor shall not be informed in advance of the locations where the seam samples shall be taken.

Each cut sample shall be at least 36-inches long and 18-inches wide, with the seam centered along the sample length. Each sample shall be subjected to both field and laboratory testing. For field testing, ten specimens, each one-inch wide shall be cut from the sample (by hand, die or tensiometer) and subjected to peel and shear testing using a field tensiometer. Five of the samples shall be tested for peel and five of the samples tested for shear. Four of the five specimens shall not fail for peel or for shear. The remaining portion of the seam sample shall be cut into two sections at least one-foot long. One portion shall be sent to an independent testing laboratory, contracted to the QC Inspector, for laboratory testing, and one portion shall be retained by the Owner for archiving.

The QC Inspector shall:

- Observe sample cutting, assign a number to each sample, and mark the sample accordingly;
- Record sample location on the layout drawing and the reason for taking the sample at this location (e.g., statistical routine, suspicious feature of the geomembrane);
- Log the date, time, ambient temperature, number of seaming unit, name of seamer, welding apparatus temperatures and pressures, field test pass/fail description, and attach a copy to each sample portion.

All holes in the geomembrane resulting from destructive seam sampling shall be immediately repaired in accordance with repair procedures described herein. The continuity of the new seams in the repaired area shall be non-destructively tested according to the methods described herein.

Each day, the QC Inspector shall forward the destructive seam strength test samples for testing to a designated testing laboratory. The QC Inspector shall verify that sample packaging and shipping methods are acceptable. Testing for seam shear and seam peel shall be performed in accordance with ASTM D4437 "Standard Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes."

The testing laboratory shall provide test results to the QC Inspector by fax, at a minimum, within 24 hours of the time the samples are received. The QC Inspector shall review the laboratory test results as soon as they become available, compare the results to the recommended criteria and forward the results to the Project Engineer and the QA/QC Team. He shall also make appropriate recommendations to the Contractor.

If the sample fails by film tear bond (FTB) through the laboratory destructive test, the Contractor has two options:

- The Contractor can reconstruct the seam between the failed location and any passed test locations; or
- The Contractor can retrace the welding path to intermediate locations at least 10 feet from the location of the failed test and take small samples for additional field tests. If these additional samples

pass the test, then laboratory samples are taken. If the laboratory samples pass destructive testing, the seam is reconstructed between the sample locations. If either sample fails, then the process is repeated.

FTB is defined by the National Sanitation Foundation (NSF) standard number 54 as "Failure of one of the parts of ply by tearing, instead of separating from the other part of the specimen at the separation line." This is further defined as a "failure of one of the bonded seams (or one ply if the HDPE liner is a reinforced laminate) by tearing or breaking prior to complete separation to the bonded area."

All acceptable seams shall be bounded by the single location from which the laboratory destructive strength test sample was obtained. The QC Inspector shall document all actions taken on a destructive test failure.

5.9.7 Non-Destructive Seam Continuity Testing

To check the continuity of seams, the Contractor shall non-destructively test all field seams over the full length using either a vacuum test unit, an air pressure test (for double fusion seams only), or other method approved by the QC Inspector. Testing methods are described in the Manufacturer's installation guidelines. Continuity testing shall be done as the seaming work progresses, not at the completion of all field seaming.

All extruded seams and geomembrane repairs shall be vacuum tested by the Contractor. Testing shall be performed using a vacuum box assembly consisting of a transparent viewing window, a soft neoprene base gasket, a vacuum hose assembly leading to a vacuum pump, and a vacuum gauge. A strip of the seam or repair to be tested shall be wetted with a soapy solution, and the vacuum box shall be placed over the wetted area and energized. A vacuum of (approximately 5 psi) shall be achieved in the vacuum box and maintained for at least 15 seconds, and the geomembrane shall be examined through the viewing window for the presence of soap bubbles. Areas where soap bubbles appear shall be marked and repaired according to the methods described in Section 5.5.8.

Air pressure testing may be performed on seams in which a double seam with an enclosed air space exists. Testing shall be performed by sealing both ends of the seam length, inserting a pressure feed needle into the enclosed air space created by the double fusion weld, and creating a pressure of between 25 and 30 psi (gauge) in the enclosed air space using an air pump. The pressure source valve shall then be closed for ten minutes. If the pressure loss exceeds 4 psi during a period of ten minutes, the seam shall be vacuum tested to locate the faulty area.

The QC Inspector shall:

- Observe all continuity testing and record the location, date, test unit number, name of tester, and all test results; and
- Inform the Contractor of any required repairs.

Seams that cannot be quantitatively tested for seam continuity shall be qualitatively tested for edge bonding using a blunt instrument, such as a screwdriver. The QC Inspector shall run the blunt instrument along the edge of the seam to find obvious unbounded areas. Care shall be taken to not puncture or damage the seam or geomembrane. The seam shall also be visually inspected by the QC Inspector for air bubbles or other discontinuities. In addition, all seams that cannot be quantitatively tested for continuity shall be cap-stripped with the same geomembrane.

5.9.8 Defects and Repairs

All seams and non-seam areas of the geomembrane shall be inspected by the QC Inspector for identification of defects, holes, blisters, undispersed raw materials, and any sign of contamination by foreign matter. Any area that fails non-destructive or destructive testing shall be marked and logged by the QC Inspector and repaired by the Contractor.

Repair procedures shall be agreed upon between the Contractor and the QC Inspector at the preconstruction meeting. Unless otherwise agreed, the procedures shall be as follows:

- Defective seams shall be repaired by reconstruction, capped, or, for long fusion seams, removed and replaced with a strip of new geomembrane welded into place.
- Small tears, localized flaws, or pinholes shall be repaired by seaming or patching.
- Blisters, larger holes, undispersed raw materials, and contamination by foreign matter shall be repaired by patching or capping.

Seams or surfaces of geomembrane that are to be patched, capped, or spot-welded shall be abraded no more than one-half (1/2) hour before the repair. All repairs shall be made using an approved field seaming method and shall be subjected to the non-destructive seam testing described in Section 5.9.7 above. Each patch and cap shall be numbered, logged and located by the QC Inspector. Patches and caps shall be made of the same geomembrane, round or oval in shape (so that all corners are rounded with a radius of at least six inches), and extend a minimum of 6 inches (6") beyond the edge of defects.

The Contractor shall provide all of his documentation covering the installation of the geomembrane to the QC Inspector no later than 14 days after all operations have been completed. The Contractor shall not reference the QC Inspector's documentation.

5.9.9 Prefabricated Geomembrane

If the geomembrane or part of the geomembrane is delivered to the Site in a prefabricated form, the seam testing discussed in Sections 5.9.4, 5.9.5, 5.9.6 and 5.9.7 shall not be required for the prefabricated portion of the geomembrane. The Contractor, however, shall obtain certificates from the geomembrane manufacturer stating that these tests were performed on the prefabricated FML assembly and met the minimum requirements. Field seams shall not be required unless the QC Inspector identifies a flaw in the geomembrane as discussed in Section 5.9.8. Procedures within that section shall then be implemented.

5.10 SYNTHETIC DRAINAGE MEDIA

This section describes the QA/QC testing, inspection procedures and documentation to be implemented for installation of the synthetic drainage media consisting of synthetic drainage net at the South Landfill. The purpose of synthetic drainage media is to transport or remove water which infiltrates into it by utilizing the hydraulic conductivity of the media.

Prior to any construction in which synthetic drainage media is used, the Contractor shall provide the QC Inspector with a list of guaranteed Minimum Average Roll Values (MARV) for the drainage net and the geotextile combination, the ASTM Standards used in obtaining MARV and the Manufacturer's Quality Assurance certification under which the tests are performed. The Contractor shall also provide the QC Inspector with a written certification, signed by a responsible party, which certifies that the materials actually delivered meet the guaranteed minimum average roll values. The QC Inspector shall verify that the certified values meet the values listed in the technical specifications.

5.10.1 Packaging, Shipping, and Storage

Packaging, shipping and storage of synthetic drainage media shall be implemented as discussed in Section 5.8.1 of this CQAP.

5.10.2 Material Inspection and Conformance Testing

Material Inspection of the synthetic drainage media shall be implemented as discussed in Section 5.8.2 of this CQAP.

At his own discretion, the QC Inspector shall select a roll to be sampled for conformance testing. The sample shall be taken from any roll on-site by cutting full-width, 3 feet long samples. Conformance sampling and testing may only be waived by the QC Inspector.

The conformance samples and the information obtained from the outer wrapping of the sampled roll shall be shipped to a testing laboratory selected by and contracted to the QC Inspector and the following tests shall be performed:

ASTM D 1505 or 792 "Density of Plastics by the Density-Gradient Technique;"

ASTM D 5199 "Measuring Nominal Thickness of Geotextiles and Geomembranes

ASTM D 5261 "Standard Test Method for Measuring Mass per Unit Area of Geotextiles;"

ASTM D 4716 “Constant Head Hydraulic Transmittivity (In-Plane Flow) of Geotextiles and Geotextile Related Products;”

Conformance Testing of the geotextiles heat bonded to the drainage media shall be performed in accordance with Section 5.11.2 of this CQAP.

The results of the conformance testing as described above shall be reviewed by the QC Inspector and compared with the typical physical properties or MARV presented in the Technical Specifications. Synthetic Drainage Media material meeting conformance requirements shall be documented by the QC Inspector as accepted prior to the distribution for construction. Non-conforming test results shall be summarized by the QC Inspector and forwarded to the Contractor and Owner. An allotment of drainage media that is represented by a non-conforming test result shall be returned to the geotextile manufacturer. Conformance sampling and testing is not to be performed on any geotextile that is not present on-site.

5.10.3 Synthetic Drainage Media Installation

Synthetic drainage media shall be installed using the procedures presented in Section 5.8.3 of this CQAP. The QC Inspector shall inform the Contractor if he observes the following:

- Geotextile or synthetic drainage layer slippage resulting from improper placement or seaming;
- Stress damage to the material from improper placement; and
- Improper material function because of wrinkles in the material, inadequate seam overlap, improperly made seams, clogging of the material by fine particles, or damage to the material from weather conditions, human traffic, or equipment.

Seaming of drainage media shall be made in accordance with methods recommended by the manufacturer or as stated in the technical specifications. The QC Inspector shall verify that all overlaps and seams conform to the technical specifications. During the overlap and seaming of the synthetic drainage net, the QC Inspector shall verify that the overlap along the edges of adjacent net panels is at least 4 inches and the overlap along the ends is at least 8 inches. He shall also verify that plastic ties, colored white or yellow are used to tie adjacent panels. Metal ties shall not be used. The spacing of ties shall be a maximum of 5 feet along the edges of the panels and 0.5 feet along the ends of the panels and 12 inches in toe drains or cutoff trenches. The QC Inspector shall document that no seams are present perpendicular to the slope. This requires that the length of the geonet roll be at least as long as the distance from the top of the slope to the bottom.

5.10.4 Synthetic Drainage Media Repairs

Holes or tears in geonet shall be repaired by placing a geonet patch that extends at least 12-inches beyond the edge of the hole or tear. The patch should be tied to the original installed geonet at 6-inch intervals. If a tear equal to 50% of the width of the geonet (typically 5 to 6 feet) is present on a side slope, the entire roll shall be replaced. Repairs to the geotextile portions of synthetic drainage media shall be made using the procedures presented in Section 5.11.4 of this CQAP. Each repair shall be numbered, logged and located by the QC Inspector.

5.11 GEOTEXTILE FABRICS

This section describes the QA/QC testing, inspection procedures and documentation to be implemented for geotextile installation activities at the Waste Management and Shoreline Improvement Area. Specifically, this section covers the geotextile to be placed under the shore line mats, the geotextile use as a reinforcement layer and the geosynthetic erosion control material for stormwater channels.

Prior to any construction in which geotextiles are used, the Contractor shall provide the QC Inspector with a list of guaranteed Minimum Average Roll Values (MARV) for the geotextile, the ASTM Standards used in obtaining MARV and the Manufacturer's QA certification under which the tests are performed. The Contractor shall also provide the QC Inspector with a written certification, signed by a responsible party, which certifies that the materials actually delivered meet the guaranteed minimum average roll values. The QC Inspector shall verify that the certified values meet the values and testing frequencies required, if any, listed in the technical specifications.

5.11.1 Packaging, Shipping, and Storage

During shipment and storage, the geotextile rolls shall be protected from ultraviolet light exposure, puncture, cutting, precipitation or other wetting, mud, dirt, or any other damaging conditions. To prevent damage by ultraviolet exposure, dirt, and wetting, the geotextile rolls shall be shipped and stored in relatively opaque and watertight wrappings. The wrapping should not interfere with the ability of the Contractor to handle the geotextile rolls using the central core or slings.

As geotextile is delivered to the site, the QC Inspector shall verify that the rolls are handled in a manner that does not damage the geotextile or its protective wrapping. He shall observe the rolls being placed in an area, as determined by the Contractor, where water can not accumulate and where rolls shall be elevated off the ground and stacked in a manner that does not crush the cores, damage the geotextile or limit the ability to obtain conformance samples. The QC Inspector shall document that the core is stable enough to support the geotextile roll while it is being handled by slings or by a spreader bar or by a core rod. The bands preventing the geotextile from unrolling shall be intact and show no signs of damaging the geotextile. Outdoor storage of geotextiles should not exceed 6 months.

If any special handling is required, it shall be so marked on the top surface of the geotextile filter fabric. The QC Inspector shall examine the rolls upon delivery and shall report any variance from the above requirements to the Contractor.

5.11.2 Material Inspection and Conformance Testing

As geotextile material is delivered to the site, the QC Inspector shall record the following information from the outer wrapping of the geotextile roll:

- Manufacturer's name.
- Product identification or geotextile style.
- Lot number.
- Roll number.
- Roll dimensions.
- Machine direction of roll fabrication, if available.

After recording the information for each roll, the QC Inspector shall inspect each geotextile roll for damage, observing any cuts, punctures and deformations on the geotextile or the outer geotextile wrapping. If any of these deficiencies are observed, the QC Inspector shall document the deficiency and mark the roll as potentially unsuitable. After all geotextile rolls have been inspected, the QC Inspector shall review the rolls marked as deficient and determine if said rolls should be accepted, salvaged or rejected completely. If a roll is deemed salvageable, a portion of the roll may be identified that can be separated (by cutting) from damaged portions and utilized in construction. Rejected rolls shall be marked for removal from the site. The Contractor shall be responsible for scheduling the manufacturer to remove rejected geotextile roll.

At his own discretion, the QC Inspector shall select a roll to be sampled for conformance testing. The sample shall be taken from any roll on-site by cutting full-width, 3 feet long samples. Conformance sampling and testing may only be waived by the QC Inspector.

The conformance samples and the information obtained from the outer wrapping of the sampled roll shall be shipped to a testing laboratory selected by and contracted to the QC Inspector and the following tests shall be performed:

ASTM D 4533 "Standard Test Method for Trapezoidal Tearing Strength of Geotextiles;"

ASTM D 4632 "Standard Test Method for Breaking Load and Elongation of Geotextiles (Grab Method);"

ASTM D 4833 "Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products

ASTM D 5261 "Standard Test Method for Measuring Mass per Unit Area of Geotextiles;"

ASTM D 3786 "Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics;"

ASTM D 4491 “Water Permeability of Geotextiles by Permittivity.”

The results of the conformance testing as described above shall be reviewed by the QC Inspector and compared with the typical physical properties or MARV presented in the Technical Specifications.

Geotextile material meeting conformance requirements shall be documented by the QC Inspector as accepted prior to the distribution for construction. Non-conforming test results shall be summarized by the QC Inspector and forwarded to the Contractor and Owner. An allotment of geotextile that is represented by a non-conforming test result shall be returned to the geotextile manufacturer. Conformance sampling and testing is not to be performed on any geotextile that is not present on-site.

5.11.3 Geotextile Installation

Prior to geotextile placement, the QC Inspector shall verify that the supporting soil (either graded to specifications or existing ground surface) is relatively smooth, and is free from objectionable material or sharp protrusions. All defective or non-conforming areas shall be addressed and the QC Inspector shall verify that continuity is maintained between the repaired area and undisturbed areas. The QC Inspector shall also verify that the manufacturer's certification and test results have been received and conform to the design criteria provided in the technical specifications. No geotextile shall be placed without the QC Inspector's approval.

Prior to installation, the QC Inspector shall verify that the geotextile sections are not exposed to precipitation or direct sunlight for more than the time noted on the shipping and storage instructions, or 3 months whichever is shorter. The QC Inspector shall also verify that the Contractor handles all geotextile so that the sections are not damaged in any way, and that:

- the geotextile is placed so that all design specifications are met and all specified areas are covered;
- the geotextile is unrolled so that it remains free of tension, stress, folds, wrinkles, or creases;
- all geotextile sections are weighted with sandbags (or equivalent) immediately following placement and the tops of sideslopes are installed in an anchor trench;
- during placement of geotextile sections, care is taken not to entrap in the geotextile any stones, soil, or moisture that could damage or clog the geotextile filter fabric.

Where necessary to provide seams, the overlap and seam shall be made in accordance with methods recommended by the manufacturer or as stated in the technical specifications. If seam information is not provided, a 'Prayer' seam or a 'J' seam may be used. The QC Inspector shall verify that all overlaps and seams conform to the technical specifications or the manufacturer. No testing of seams shall be performed.

5.11.4 Geotextile Repairs

The QC Inspector shall observe and document all geotextile repairs. Any noncompliance with the requirements presented in this section shall be reported to the Owner.

Holes or tears in the geotextile filter fabric shall be repaired with a geotextile patch which shall be spot-seamed over the defect with a minimum of 24-inch overlap in all directions. Geotextile that is placed on slopes shall be repaired by sewing a geotextile patch in place using a double-sewn lock stitch (seams 1/4-inch to 3/4-inches apart and no closer than 1 inch from any edge). Should any tear exceed 50 percent of the width of the roll, the roll shall be removed and replaced. For geotextile placed in areas that are not sloped, a geotextile patch shall be spot-seamed in place.

The QC Inspector shall document that all necessary repairs are completed in accordance with the procedures specified in this section and in the technical specifications.

5.12 FINAL VEGETATIVE COVER

This section describes the QA/QC testing, inspection procedures to be implemented for installation of the final vegetative cover on the Engineered Barrier. The purpose of the final cover system is to impede erosion, promote surface water runoff and vegetative growth, accommodate the root systems of selected vegetation and protect the various cap layers beneath it.

The final vegetative cover consists of a 4 to 6-inch thick topsoil layer that has no material requirements and no quantitative compaction requirements. Qualitative compaction of this layer will be performed by routing grading equipment or trucks over the subject soil until relative nonmovement of the soil beneath the equipment or trucks is observed by the QC Inspector. The areas will then be seeded.

5.12.1 Material Inspection - Vegetative Soil

As vegetative soil is stockpiled, the QC Inspector shall make a visual inspection of the material, noting if it is reasonably free of stumps, roots, rocks, brush, weeds or any other material that might prevent the formation of a suitable seed bed. The Contractor shall provide the QC Inspector with certification stating that the soil meets the requirements stated in the technical specifications. If the soil does not meet these requirements, the QC Inspector can reject the material or direct the Contractor to segregate the unsuitable material or to supplement the material to meet the stated requirements.

5.12.2 Material Inspection - Seed

During shipment and storage, the seed will be kept in containers that will protect if from precipitation, wetting, sunlight, mud, dirt or any other damaging conditions. On each seed container the following information will be displayed:

- Seed name;
- Lot number;
- Net weight;
- Percentages of purity and of germination; and
- Percentages of maximum weed seed content for each kind of seed.

Prior to any seed being dispersed, the Contractor shall provide the QC Inspector with a certificate from the seed vendor, stating that each lot of seed has been tested by a recognized seed testing laboratory within 6 months of delivery. The certificate shall include the following:

- The name and address of the laboratory;
- The date of seed testing(s);
- The lot number of each seed; and
- Test results, to include seed name, percentage of purity, percentage of germination, percentage of weed content and mixture proportions, if applicable.

The QC Inspector will verify that the seed conforms to the requirements stated in the technical specifications.

5.12.3 Material Inspection – Fertilizer and Limestone

During shipment and storage, the fertilizer and limestone will be kept in containers that will protect if from precipitation, wetting, sunlight, mud, dirt or any other damaging conditions. On each container of fertilizer or limestone, the following information will be displayed:

- Material name;
- Lot number;
- Net weight;
- Fineness gradation;
- Calcium carbonate equivalent (limestone only);
- Ratio of nitrogen (N), Phosphorus (P) and Potassium (K) (fertilizer only).

Prior to any fertilizer or lime being dispersed, the Contractor shall provide the QC INSPECTOR with a certificate from the vendor, stating that each lot of fertilizer or limestone has been tested by a recognized laboratory within 6 months of delivery. The certificate shall include the following:

- The name and address of the laboratory;
- The date of testing(s);
- The lot number of fertilizer or limestone tested; and
- Test results, including but not limited to the information presented above.

The QC Inspector will verify that the fertilizer and limestone conform to the requirements stated in the technical specifications.

5.12.4 Vegetative Soil

During construction of the topsoil layer, the QC Inspector shall monitor and document the uniformity of the topsoil application process. The QC Inspector will observe the placement procedure to verify that the topsoil is not overly compacted, measure the thickness and the slope of the layer, and verify that the procedures conforms with those presented in the technical specifications. The QC Inspector will document that all vents, standpipes or other penetrations extending through the cover are not damaged by the soil spreading.

5.12.5 Seed, Fertilizer and Limestone

Before the sewing or hydroseeding process commences, the Contractor will supply the QC Inspector with the results of the nutrient testing performed on the vegetative soil cover that indicate required amounts of soil supplements. The QC Inspector will inspect the finished surface. The QC Inspector will immediately notify the Contractor if he observes or tests the following:

- Less-than-specified thickness or coverage resulting from failure to observe, monitor, and control soil placement and compaction operations.
- Deleterious materials such as stones, debris or organic matter that may impede spreading and compaction operations.
- Erosion or desiccation of the soil resulting from failure to provide temporary protection when construction is interrupted or final protection after layer completion.
- The slope of the final surface is not in conformance with the design requirements.

The QC Inspector will then direct the Contractor to remove the defective or nonconforming area or volume and replace them.

If seed is to be sown, the QC Inspector will measure the tilling depth and observe the application rate of limestone, fertilizer, mulch and related additives to verify conformance with the technical specifications.

If the hydroseeding process is to be used, the QC Inspector will document the quantities of seed, mulch, fertilizer, water and dye placed in the mixing tank and the mix time. The QC Inspector will observe the dispersion of the slurry over the subject area and verify that the area of coverage is in accordance with the volume of slurry in the tank. The QC Inspector will document that all areas were covered.

The QC Inspector will document that all vents, standpipes or other penetrations extending through the cover are not damaged by the tilling and seeding processes. He will also verify that the application equipment is appropriate for the seeding procedure stated in the technical specifications.

5.12.6 Weather Conditions

If the QC Inspector observes the deterioration of weather conditions, such as high temperatures, windy conditions or rainfall, and determines that these conditions may affect the construction of the soil layers, he may need to temporarily interrupt construction and implement measures to protect that portion of the Work previously completed and approved.

5.13 SPRINKLER SYSTEM PIPE

This section describes the QC testing and inspection procedures to be implemented for the construction of the sprinkler system. The sprinkler system extends from the pre-engineered building at the northeast corner of the East Landfill and consists of a pipeline with 13 sprinkler heads controlled using three valve boxes. The valve boxes and sprinkler heads are located along the crest of the reconstructed shoreline. The sprinkler system will provide water to the vegetation installed along the shoreline during dry seasonal periods.

Prior to delivery of any pipe or fittings, the Contractor shall provide the QC Inspector with a list of the physical properties for the pipe, the ASTM Standards used in obtaining the properties and the Manufacturer's QA certification under which the tests are performed. The Contractor shall also provide the QC Inspector with a written certification, signed by a responsible party, which certifies that the pipe actually delivered meet these properties.

5.13.1 Pipe Inspection

Prior to the delivery to the site, the pipe manufacturer will provide the QA Officer with written certification, signed by a representative of the pipe manufacturer, stating that the pipe possesses material properties that have been determined in accordance with the following requirements:

ANSI/AWWA Standard C 906-90 "_____"
ASTM D 4218 "_____"

The QA Officer will verify that the results stated in the tests meet the minimum or average values stated in the technical specifications.

5.13.2 Pipe Packaging Handling and Storage

No specific packaging requirements are anticipated for the pipe. Generally, small diameter pipe over 18 inches are bundled on a pallet and can be moved with a forklift or hoisted using a crane and slings. Ancillary equipment, such as fittings, valves, valve boxes, sprinkler heads and wiring, will be packaged in

a crate, box or net. Handling of pipe will be conducted in a manner that will not damage the pipe barrel or the pipe ends. If any special handling is required, it will be so marked on the pipe or on the delivery ticket. Pipe will be stored on level ground, in an area where ponding will not occur. The pipe shall not be stacked and will not be permitted to be stored outside for more than 6 months.

5.13.3 Pipe Inspection

As pipe material is delivered to the site, the QC Inspector will record the following information:

The lot number of the pipe and the number of pipe lengths in that lot; and

The information printed on the exterior of the pipe. This may include the ASTM designation and physical information, such as standard dimension ratio, length, wall thickness.

After recording this information for each pipe, the QC Inspector will inspect each pipe for damage. He will observe any cuts, nicks, abrasions, punctures, deflections and deformations on the inside or outside of the pipe. If any of these deficiencies are observed, the QC Inspector will document the deficiency and mark the pipe as potentially unsuitable. After all pipes in the lot have been inspected, the QC Inspector will review the pipes marked as deficient and determine if said pipes should be accepted, salvaged or rejected completely. If a pipe is deemed salvageable, a portion of the pipe may be identified that can be separated (by cutting) from damaged portions and utilized in construction. Rejected pipe will be marked for removal from the site. The Contractor will be responsible for scheduling the manufacturer to remove rejected pipe. This inspection process will also be performed on the ancillary pipe equipment (elbows, reducers, valves, gaskets, etc.).

At his own discretion, the QC Inspector shall select a pipe for conformance testing. The testing performed will be determined by the QA Officer.

5.13.4 Pipe Installation

Installation of the pipe and ancillary equipment will proceed in accordance with the technical specifications, which recommend following the Manufacturer's Guidelines. These guidelines present procedures for pipe handling, welding, gluing and backfilling around pipe. The QC Inspector will be responsible for observing and documenting numerous conditions, consisting of the following:

The QC Inspector will observe the preparation of the area where the pipe will be placed and the installation of the foundation soil materials that will be used to support the pipe, verifying if the existing ground surface is of adequate bearing to support the pipe and its surrounding supporting soils. Soft or compressible materials present in the pipeline right-of-way will be brought to the attention of the Contractor. The QC Inspector will observe the placement of bedding and haunching materials that directly support the pipe. Prior to the delivery to the site, the Contractor shall provide the QC Inspector with written certification, signed by the supplier of the materials, stating that the pipe bedding and haunching materials meet the technical specification requirements.

The QC Inspector will verify that the results stated in the tests meet the minimum or average values stated in the technical specifications. As installation of the pipe proceeds, the QC Inspector will verify that the pipe is properly supported and handled during the placement in the haunch material, in a manner that precludes damage. The QC Inspector will also verify that the haunched material is in continuous contact with the outside diameter of the pipe. Any void spaces or high mounds in the haunch material will be addressed. In areas where pipes are to be placed in parallel with other pipes, the QC Inspector will verify

that pipes previously placed are not disturbed or displaced from their haunching by the placement operations of an adjacent pipe.

The QC Inspector will monitor the backfill operations, ensuring that the placement is performed in accordance with the technical specifications. The lift thickness of the material and the compaction effort will be monitored to ensure that the compaction method does not damage or displace the pipe and the number of density tests by nuclear methods and by conventional methods will be monitored for compliance with the frequency of tests presented in the Technical Specifications. The QC Inspector will verify that the lift of soil material placed between pipe sections is free of voids and that the compaction of such material does not displace the pipe from its haunching. The results of the density and moisture testing will be compared with the results of the standard or modified proctor tests to ensure compliance with the requirements stated in the technical specifications.

After backfill has completely covered the pipe, the QC Inspector will verify that the contact ground pressure of the compaction equipment does not cause excessive deflection of the pipe. After all backfill has been placed, the QC Inspector will verify that the height, sideslopes and crest dimensions of backfill above ground surface is in conformance with the construction drawings.

For additional information on backfill operations, the QC Inspector will refer to ASTM D 2321 "Underground Installation of Thermoplastic Pipe for Sewers and other Gravity Flow Applications

5.14 PRECAST CONCRETE REVETMENT

This section describes the QC testing, inspection procedures and the QA oversight to be implemented for the construction of the precast concrete revetment. The system consists of a series of interlocked fabricated concrete blocks installed along a reconstructed shoreline adjacent to the East Landfill.

Prior to the delivery to the site, the revetment manufacturer shall provide the QC Inspector with written certification, signed by a representative of the manufacturer, stating that the revetment possesses the material properties stated in the Technical Specifications. The QC Inspector shall verify the values on the certification. The screw anchor manufacturer shall provide the QC Inspector with written certification stating that the screws possess the necessary properties stated in the Technical Specifications. The QC Inspector shall verify the values on the certification.

5.14.1 Packaging, Handling and Storage

No specific packaging requirements are anticipated. As revetment is delivered to the site, the QC Inspector shall verify that it is handled in a manner that does not damage the panel and using a spreader bar acceptable to the revetment manufacturer. The instructions supplied with the spreader bar shall be referenced and followed for all forms of revetment attachment, equipment attachment, assembly (if required) and means of usage. Dragging, pushing or sliding of the rolls is not permitted. The QC Inspector shall observe the revetment being placed in a flat area where they can not be damaged. No more than six (6) revetment panels shall be stacked on each other. If damage is observed on revetment panels, the QC Inspector can reject the panel.

Screw anchors for securing the revetments shall be delivered in lots of a least six screws and in containers/wrappings that allow for easy handling. Screws shall be stored adjacent to revetments panels in a level, dry area.

5.14.2 Material Inspection

As panels are delivered to the site, the QC Inspector shall record the following information:

- The panel identification number and the number of panels delivered in that lot;
- The information provided by the vendor; and
- Special mat geometry

After recording this information for each mat, the QC Inspector shall inspect each mat for damage. He shall observe any cracks, abrasions, breakage, deflections and deformations of the mat. If any of these deficiencies are observed, the QC Inspector shall document the deficiency and mark the mat as potentially unsuitable. After all mats in the lot have been inspected, the QC Inspector and the Contractor shall review the mats marked as deficient and determine if said mats should be accepted, salvaged or rejected completely. If a mat is deemed salvageable, a portion of the mat may be identified that can be separated (by cutting) from damaged portions and utilized in construction. Rejected mats shall be marked for removal from the site. The Contractor shall be responsible for scheduling the manufacturer to deliver and remove rejected mats.

As anchor screws are delivered to the site, the QC Inspector shall record the lot number of the container and any other information supplied by the vendor. He shall inspect each lot of screws for damage, using the same identification procedure as presented for revetment panels, above. Rejected screws shall be removed from the site.

5.14.3 Installation

Filter Fabric and Anchor Trench

Prior to placement of the revetment, the QC Inspector and Contractor shall verify and document that all lines and grades of the supporting soil meet the requirements set forth in the design specifications. In addition, the QC Inspector shall verify that no objects that could harm or damage the filter fabric exist on the surface of the supporting soil.

The filter fabric shall be installed beneath the revetment in accordance with the procedures presented in Section 5.11 of this CQAP. The QC inspector shall verify that the anchor trenches are constructed at the locations and to the width and depth shown on the drawings. Anchor trenches shall not extend onto adjacent property. The QC Inspector shall verify that fabric extends into the anchor trench at least one foot.

Revetment Panels

The QC Inspector shall review the revetment panel layout plan. The QC Inspector shall verify that the layout is consistent with the design specifications and the accepted standards of practice and that joints are generally oriented parallel to the line of maximum slope. Following acceptance of the panel layout by the QC Inspector, panel placement shall begin.

During geomembrane panel placement, the QC Inspector shall verify that:

- Each panel is assigned an identification designation agreed upon by the QC Inspector and the Contractor consistent with the panel layout plan;
- The installed locations of the panels are recorded;

- The panels are free from scratches, cracks or other defects;
- Panel placement begins at the upstream end within the anchor trench;
- Panel placement is not conducted during adverse weather conditions such as precipitation, excessive moisture (fog, dew), in the presence of excessive winds, or in areas of ponded water;
- Panels are moved and placed in a manner that will in no way harm the filter fabric;
- The filter fabric is weighed down by sandbags to prevent uplift by wind prior to panel installation. The QC Inspector shall verify that the weights themselves do not damage the geomembrane;
- Direct contact with the filter fabric is minimized.

The QC Inspector shall inform the Contractor if the above requirements are not met or if any deficiencies are observed.

The QC Inspector shall also inspect each panel for damage after placement. The QC Inspector shall advise the Contractor which panels, or portions of panels, should be rejected or repaired. Damaged panels or portions of damaged panels which have been rejected shall be marked and their removal from the work area recorded by the QC Inspector. Repairs shall be made according to procedures described in this CQAP.

5.14.4 Anchors Screws

The QC Inspector shall review the anchor screw layout plan. The QC Inspector shall verify that the layout is consistent with the design specifications and the accepted standards of practice and that screw anchor orientation is generally perpendicular to the ground surface. Following acceptance of the layout by the QC Inspector, the screw anchor pull out test shall begin.

During the screw anchor pull out test, the QC Inspector shall verify that:

- The equipment and procedure used to install the anchor is the same as that which will be used during actual screw anchor installation
- The soil material into which the screw anchor is inserted is the same as the soil where actual installation will take place.
- The equipment used to measure pull out resistance is functioning properly and has been calibrated in the last 60 days. The contractor shall provide a certificate of calibration verification to the QC Inspector.
- The depth to which the anchor is installed is the same as that required for actual screw anchor installation and is verified from the design.
- The screw anchor manufacturer's installation guide is referenced and followed as needed to aid in a successful installation.

If the results of the pullout test do not meet the requirements stated in the Technical Specifications, the Contractor shall make adjustments to the method of installation or to appurtenances on the screw anchor. Additional depth of screw anchors and variation of orientation shall be permitted with approval of the QA Officer. After results of a successful pull out test have been obtained and verified by the QC Inspector, screw anchors shall be installed. During actual installation, the QC Inspector shall verify that:

- Each screw anchor is assigned a unique identification number by the Contractor consistent with the screw anchor layout plan;
- The installed locations of the screw anchors are recorded;
- The screw anchors are free of damage and are not damaged during installation
- The proper length of rod extensions and couplings are used to achieve the required depth.
- The proper eyehook is securely attached to the end of the last extension and connection between the eyehook and the revetment is performed in accordance with the Technical Specifications.
- Any modifications to the procedures previously established are documented and accepted by the QC Inspector.

6.0 CONSTRUCTION CONTROLS/DOCUMENTATION ACTIVITIES

Construction activities shall be documented by the QC Inspector to verify for parties unable to observe the work was performed to the quality stated in applicable documents and this CQAP. The documentation shall also be used to generate a "Completion of Construction" report to document the work activities. This documentation shall be obtained by utilizing the following reporting techniques:

- Pre-Construction Meetings;
- Non-Compliance Report and Compliance Resolution Report;
- Progress Meetings;
- Daily Inspection Progress Reports;
- Daily Summary Reports;
- Inspection and Testing Reports;
- Chain-of-Custody;
- Site Photographs;
- As-Built Design Drawings; and
- Document Control.

Each of these techniques is described below.

6.1 PRE-CONSTRUCTION MEETING

A pre-construction meeting shall be held at the Site prior to the performance of the work. The date of the meeting shall be established at a time amenable with the applicable parties, but after Contract Documents between the Owner and Contractor have been executed. If possible, the meeting shall be held concurrently with mobilization. The Owner or their appointed representative shall conduct the meeting. Mandatory meeting attendees include:

- The Design Engineer,
- The Contractor's Construction Manager,
- The Owner,
- The Contractor's Site Safety Officer (SSO),
- The QC Inspector, and
- A representative from the identified Subcontractors scheduled to conduct on-Site work.

A meeting agenda consistent with this section of the CQAP shall be provided to the attendees three days in advance of the meeting.

In general, the pre-construction meeting shall be used to:

- Review Site access protocols, Site security, Site working hours and Owner safety standards;

- Review pertinent information from applicable documents including: the HASP, the Specifications and Drawings and this CQAP.

- Review communication lines among the on-Site personnel;
- Review the responsibilities and the authority of work-related personnel and organizations.
- Review reporting and documentation procedures;
- Review the construction schedule, including critical sequencing and potential problems; and
- Finalize and confirm a list of action items and questions created as a result of the meeting.

The Engineer shall document the pre-construction meeting and distribute minutes to the attending organizations.

6.2 NON-COMPLIANCE REPORT AND COMPLIANCE RESOLUTION REPORT

The QC Inspector or the Engineer shall generate a non-compliance report if he observes defective material or field workmanship that does not meet the requirements of the plans, specifications or CQAP. The QC Inspector shall submit the non-compliance report to the Owner and the Contractor. The non-compliance report should contain, at a minimum, the following information:

- Location and description of the problem, with sufficient detail, possibly including sketches and/or photographs to adequately describe the problem;
- Identification numbers, including station or construction baseline and offset numbers for appurtenances that were located and constructed using the same;
- Probable cause of the problem;
- When the problem was discovered, how long has it existed and how the problem was discovered;
- Concerns raised by the Engineer and the Contractor relative to the cause of the problem and whether a problem actually exists;
- Schedule for resolution.

In conjunction with the Non-Compliance Report, the QC Inspector shall prepare a Compliance Resolution Report. This report should discuss the corrective action that was taken to remedy the problem, if any, and when the corrective action was implemented. The report should also discuss preventative measures to minimize recurrence of the problem. The Compliance Resolution Report shall be signed by the QC Inspector or the Engineer and attached to the Non-Compliance Report.

6.3 PROGRESS MEETINGS

Progress meeting shall be held monthly, or more often if necessary during the performance of work. The meetings shall maintain lines of communication, resolve problems, identify action items, handle scheduling conflicts and refine management techniques. The intervals at which the meetings are held can be adjusted, based upon the performance of critical aspects of work or an increase in the volume of work. It shall not be necessary for a representative of each aspect of work to be presented at the progress meetings unless the topics for discussion include his particular facet of work. The QC Inspector, the Contractor and the Engineer shall attend the progress meetings, either in person or via a teleconference connection.

6.4 DAILY INSPECTORS PROGRESS REPORT

Daily inspection progress reports shall be used to record activities observed by the Engineer or the QC Inspector and shall be prepared by the same. The logs shall contain, at a minimum the following information:

- Project Name and location, Date, and name of reviewing QC Inspector.
- Morning and afternoon weather conditions.
- Meetings or conversations between participating parties and the decisions thereof.
- Discussion of work activities.
- Areas inspected and tests performed, with the attached inspection and testing form.
- Description of materials received and any quality confirmation documentation.
- Non-conforming materials or workmanship and resolution (if applicable).
- Equipment and personnel being utilized in the work, including subcontractors.
- Photographic record of the day's activities.
- Signature of QC Inspector or Engineer and title.

A blank Daily Inspectors' Progress Report is included as Attachment A to this CQAP.

6.5 INSPECTION AND TESTING REPORT

Inspection and testing forms shall be used to record the results of the field tests and the on-site or off-site laboratory tests. The inspection and testing forms shall document information on the following: summary of in-place density tests, geotechnical laboratory test results, manufacturer's quality control certifications, and a general inspection/testing form for other miscellaneous field tests. They shall be prepared by the QC Inspector or the Engineer and shall contain, but not be limited to, the following information:

- The description or title of the inspection activity.
- Location of the inspection activity or the location from which the sample was obtained.
- Type of inspection and procedure used, including materials and equipment.
- Data generated from the test and results, when compared to specifications (pass/fail).
- Identified non-compliance issues and resolution.
- Signature of QC Inspector or Engineer.

A blank inspection and testing form is included as Attachment B to this CQAP.

6.6 CHAIN OF CUSTODY

Samples submitted for laboratory analysis shall consist of the Verification Samples, soil cover materials, decontamination waters and various geosynthetics. Documentation of samples collected and submitted shall be performed using chain of custody forms, as detailed in Section 4.0 of this CQAP.

6.7 SITE PHOTOGRAPHS

Photographs shall be taken of construction activities, inspection items, installation procedures, finished products, problem areas and resolution of non-conforming activities to assist in RA documentation activities. Video footage may also be collected for additional documentation of critical RA activities. These photographs shall serve as a pictorial record of these items. They shall be kept sequentially in a permanent protective file or album. The QC Inspector or the Engineer shall be responsible for development of the protective file or album. A photographic record shall also be written to correspond with the photographs taken. The photographic record shall be prepared by the perspective photographer for inclusion into the protective file or album and shall include the following information:

- A unique identifying number which corresponds to the respective photograph.
- The date, time, and location where the photograph was taken.
- Location, orientation, and description of the subject matter or the work being performed.

6.8 AS-BUILT DRAWINGS AND REPORT

Upon the completion of the construction activities and a final inspection of the work by the Owner, the QA Officer shall prepare a set of as-built drawings to document the actual lines, grades and conditions of each component of the construction activities. The as-built drawings shall indicate the locations, dimensions and elevations of the components of work. For this project, the as-built drawings shall provide information on excavation, fill placement, areas of capping, site drainage, and vegetation.

The Contractor shall engage a Registered Professional Land Surveyor or the Engineer, who is experienced in land survey work and who is registered in the State of Washington (and approved by the Owner) to perform these services. This professional shall utilize the highest standards accepted within his profession to generate the as-built drawings, then register his seal and sign the as-built drawings to certify that work performed on the project is accurately portrayed on the drawings. A copy of the Surveyor's certification statement is included in Attachment C to this CQAP.

The QA Officer shall submit copies of these as-built drawings to Alcoa, the QC Inspector to review. These as-built drawings should reflect the same level of detail and accuracy as shown within the drawings.

Within 45 days of the completion of demobilization by the Contractor, the Engineer shall submit to the Owner for review a draft Construction Completion Report. The Contractor shall cooperate with the QA Officer and assist in developing this report. The report shall contain documentation that the work was performed in accordance with design specifications and the appropriate closure requirements. The report shall be submitted 60 days after final inspection.

The report shall incorporate discussion of the following items:

- Work Permits and Borrow Source Pre-Construction Testing;

- Site Preparation;
- Mobilization;
- Access Roads Construction Layout and Surveys;
- Erosion and Sediment Control;
- Decontamination Pads;
- Clearing/Grubbing;
- Waste Material Excavation and Handling;
- Shoreline:
- Verification Sampling;
- Capping Construction;
- Grading/Leveling Waste Material;
- Construction Water Treatment;
- Random Fill Layer Construction (with geotechnical testing information to be supplied by the Owner's Representative);
- Vegetative Cover Layer Construction;
- Vegetation;
- Fence;
- Monitoring Well Extension/Protection;
- Construction Quality Assurance Activities;
- Decontamination Procedures (personnel and equipment) and Management of Decontamination Liquids and Solids;
- Site Cleanup and Damage Repair and Maintenance of Revegetated Areas;
- Health and Safety Procedures and Monitoring Results (ambient air monitoring, personnel monitoring, etc.);
- Non-Compliance Reports;
- Compliance Resolution Reports; and
- Waste Hauling Reports.

The report shall include as-built drawings. The testing results (e.g., soil geotechnical testing, compaction testing, etc.) shall be included in the report.

6.9 DOCUMENT CONTROL

During the execution of work, a strict documentation control procedure will be maintained by the QC Inspector or QA Officer. Submittals, change orders or modifications to a section or portion of this CQAP or the Design Drawings and Technical Specifications will receive a coded document control number that indicates the type of change, date, or revision number, as needed. A list of these coded numbers will remain on file for use by the QC Inspector and for easy cross-referencing to original approved documents.

APPENDIX C

CONSTRUCTION SPECIFICATIONS

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

SPECIFICATIONS FOR
"REMEDIATION OF NORTH AND NORTH 2 LANDFILLS
AND
EAST LANDFILL CAP CONSTRUCTION PROJECTS"

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

CORPORATE ENVIRONMENTAL ASSESSMENT TEAM (CEAT) NO. 2
COST NODE NO. 358R000448

ALCOA REMEDIATION MANAGEMENT INC. (ARMI)
ALCOA REMEDIATION WORK GROUP (RWG)
201 ISABELLA STREET
PITTSBURGH, PA 15212-8585

Prepared by

Bergmann Associates
875 Greentree Road - Seven Parkway Center
Pittsburgh, Pennsylvania 15220

BA Project No. 5726.00

July 16, 2003

SPECIFICATIONS FOR
REMEDIATION OF NORTH AND NORTH 2 LANDFILLS
AND
EAST LANDFILL CAP CONSTRUCTION PROJECTS

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

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Pittsburgh, Pennsylvania 15220

BA Project No. 5726

July 16, 2003

CERTIFICATION STATEMENT

"To the best of my knowledge, information and belief I certify that the information contained in or accompanying this detailed design is true, accurate and complete, as to the portion of this document for which I cannot personally verify their truth and accuracy, I certify to the best of my knowledge, information and belief as the authorized representative having supervisory responsibility for the persons who, acting under my direct instructions, made the verification, that this information is true, accurate and complete."

Washington Professional Engineer Seal _____

Signature _____ **Date** _____

**SPECIFICATIONS FOR
REMEDIATION OF NORTH AND NORTH 2 LANDFILLS
AND
EAST LANDFILL CAP CONSTRUCTION PROJECTS**

**FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON**

**Corporate Environmental Assessment Team (CEAT) No. 2
Cost Node No. 358R000448
Purchase Order No. _____**

**Alcoa Remediation Management Inc. (ARMI)
Alcoa Remediation Work Group (RWG)**

TABLE OF CONTENTS

I. SCOPE OF WORK/SPECIAL PROVISIONS

A. GENERAL

These Specifications and the Construction Drawings (Drawings) referenced herein present the work (Work) associated with the Remedial Action (RA) at the Former Vancouver Operations (Site) in Vancouver, Washington. The RA consists of the excavation of soils with elevated levels of Trichlorethylene (TCE) [Waste Soils] from an area hereinafter known as the North Landfill and the excavation of soils with elevated levels of Polyaromatic Hydrocarbons (PAHs), Polychlorinated Biphenyls (PCBs), and metals [Waste Soils] from areas hereinafter known as the North 2 Landfill and the South Bank Area of Concern. Excavation limits (horizontal and vertical) and depth of excavation cuts will be directed by the Owner's Representative. After confirmation soil sampling and analyses (conducted by the Owner's Representative) have confirmed the complete removal of Waste Soils from the subject areas, the areas will be backfilled with a certified clean soil and graded to promote positive drainage to existing low elevation areas containing permeable soils. All Waste Soils will be transported to an area south of the North Landfill, hereinafter known as the East Landfill and used as fill to establish positive sloping subgrade elevations.

Prior to the placement of the Waste Soils within the limits of the East Landfill, the existing shoreline along the Southern boundary of the East Landfill will be regraded and stabilized using concrete revetment. A perimeter anchor trench platform/embankment will then be constructed at the East Landfill. All Waste Soils will then be placed, spread and compacted at the East Landfill, and a multi-layer Engineered Cap consisting of geosynthetic and natural soil materials will be constructed over the sloping Waste Soils. Natural soil materials will be obtained from an off-site borrow source(s). The final Engineered Cap surface and all disturbed areas at the Site will be graded, then revegetated. The RA described above has been divided into six phases of work; the scope of each phase is presented in SECTION II – BASIS OF PAYMENT. The phases of work are as follows:

Phase I – Site Preparation
Phase II – South Bank Area of Concern
Phase III – Shoreline Rehabilitation
Phase IV – North and North 2 Landfills
Phase V – East Landfill Construction
Phase VI – Additional Fill Outside Limits of East Landfill

Drawings showing the Work covered by these Specifications are listed in SECTION IV- NUMERICAL LIST OF DRAWINGS. Refer to Part D of SECTION VIII – GENERAL WORKMANSHIP

SPECIFICATIONS for detailed procedures to implement each of the six phases of work at the North Landfill, North 2 Landfill, South Bank Area of Concern and East Landfill.

This Section of the Specifications provides a general project overview; remaining sections in these Specifications include the following:

- SECTION II – BASIS OF PAYMENT;
- SECTION III - CONSTRUCTION SCHEDULE;
- SECTION IV – NUMERICAL LIST OF DRAWINGS;
- SECTION V – SITE CONDITIONS AND MANDATORY HEALTH AND SAFETY STANDARDS;
- SECTION VI – ENGINEERING, INSPECTION AND TESTING;
- SECTION VII – GENERAL MATERIALS SPECIFICATIONS AND STANDARDS;
- SECTION VIII – GENERAL WORKMANSHIP SPECIFICATIONS AND STANDARDS; and
- SECTION IX – GENERAL TERMS AND CONDITIONS.

Any questions on the interpretation of, or any conflicts with, any portion of these Specifications shall be directed to and resolved by Alcoa Inc. (Alcoa), or its appointed representative, at the pre-bid meeting or in an addendum issued after the pre-bid meeting.

It is the Owners requirement that all communication for this project be in electronic format so that appropriate information can be distributed and communicated rapidly. All documents shall be in electronic format, approved by Alcoa, so the files can be transferred and stored on CDs at the end of the project.

The Contractor and Owner shall meet formally on a weekly basis to review the project status. The Contractor shall provide a report showing construction status including safety performance and a 3-week look ahead at scheduled work.

The Contractor shall provide a monthly status report providing a narrative summary of the overall status of work and address the following items: Safety performance, updated schedule that highlights critical path activities, cost report, procurement status, and site photos showing progress for the month.

B. BACKGROUND

The Site is located in Clark County, City of Vancouver on the north bank of the Columbia River approximately three miles northwest of downtown Vancouver, Washington. The smelter complex at the Site was constructed in 1940. Between 1944 and 1970, a number of fabrication operations were added to the facility to form aluminum metal into finished goods such as wire, rod, and extrusions. Alcoa operated the

entire facility until 1985. In 1985, the cable mill operation was sold to ACPC, Inc. and the property was leased from Alcoa. In 1987, Alcoa sold the smelter to VANALCO, Inc. and retained title to the extrusion (VANEXCO) section of the property, which was closed in 1992. Since 1987, Alcoa has been remediating, closing and selling portions of the remaining manufacturing facility and property.

The entire eastern portion of the Alcoa property was filled in the early 1940's with dredge sands from the Columbia River. The East Landfill Area was formed by the filling of a 15 to 20 foot deep, narrow area, which emptied into the Columbia River. Alcoa filled the narrow area with carbon bake oven furnace brick, aluminum and steel wire and miscellaneous small volumes of solid and industrial wastes impacted with volatile organic compounds (VOCs) (primarily TCE), PAHs and PCBs. In 1990, Alcoa initiated a Remedial Investigation (RI) to determine the source of TCE found in process water wells serving the VANALCO and operating Alcoa facilities. This RI identified two potential sources of TCE contamination; the East Landfill and in a landfill located about 900 feet northwest of the East Landfill, known as the North Landfill. Since that time, Alcoa has conducted numerous studies to characterize these landfills. During these investigations, two other areas impacted with PAHs, PCBs and metals were discovered to the north of the East Landfill. These areas were identified as the North 2 Landfill and the Northeast Parcel. In 1997, the Northeast Parcel was remediated to facilitate the sale of the property to Clark County. The scope of the Northeast Parcel remediation included the excavation and off-site disposal of 3,902 cubic yards (cu. yd.) of PCB-impacted soil and the excavation of 17,105 cu. yd. of PAH-impacted soil with placement of this material into an area at the southeast corner of the East Landfill, referred to as the Temporary Storage Area. Subsequent to this action, the discussions with the State of Washington Department of Ecology (Ecology) related to the East Landfill Area have included the East, North and North 2 Landfills.

Several reports have been developed that describe in detail the environmental conditions at the Site. All of the Reports are on file with Ecology and may be reviewed or reproduced for additional Site information. A list of the Reports is presented in Appendix A.

C. CONTRACTOR QUALIFICATIONS

The Contractor shall be prequalified by Alcoa and shall have been in the Environmental Remediation business for a minimum of five (5) years and meet the Owner's general terms and conditions for prequalification. The Contractor's Site Superintendent in charge of excavating and grading operations shall have had a minimum of five (5) years' practical experience in this trade. The resume for that individual, plus the most recent Statement of Qualifications (SOQ) for the Contractor shall be submitted with the Contractor's bid. The Contractor selected for this Work shall provide all materials (unless otherwise noted),

labor, supervision, tools, construction plant and equipment, loading, unloading, storing and hauling services, taxes, insurance and all other things necessary to complete the Work. The Contractor and his subcontractors shall also comply with the mandatory Health and Safety requirements presented in Part I – Health and Safety of this Section and in SECTION V - SITE CONDITIONS AND MANDATORY HEALTH AND SAFETY STANDARDS.

D. REASONABLY IMPLIED PARTS OF THE WORK SHALL BE DONE ALTHOUGH NOT SPECIFICALLY CITED IN THESE SPECIFICATIONS

Specific tasks not mentioned or completely detailed in these Specifications that are necessary or normally required as a part of the Work described shall be performed by the Contractor as incidental work without extra cost to the Owner, as if fully detailed in these Specifications. The expense of such incidental work shall be included in the applicable lump sum or unit prices for the Work described.

E. PROJECT POINT OF CONTACT

The Owner's primary point of contact for this project is Mr. Albert Burba of Alcoa Remediation Management Inc. (ARMI), Remediation Work Group, 201 Isabella Street, Pittsburgh PA 15212-8585 (412-553-2007 or 412-553-4545). An Owner's Representative will be designated by the Owner to direct excavation of Waste Soils, conduct confirmation sampling, perform inspections, review work performed by the Contractor on-site, and review as-built data.

F. SITE ACCESS AND PERMITS

All required access and construction permits required by Federal or State agencies, Clark County and the City of Vancouver, WA to perform the Work shall be obtained and paid for by the Contractor prior to the initiation of the Work. The Owner or the Owner's Representative will assist the Contractor in completing this task if requested, but this assistance shall not eliminate the Contractor's responsibility. If the procurement of any easement or access permit is delayed, the Contractor shall schedule the Work in such a way that confines his operations to areas where easements or access permits have been obtained or are not required, or delay the Work until such as time when the access permit has been secured. At a minimum, an Earth Disturbance/Grading Permit and a monitoring well certification shall be acquired by the Contractor prior to initiating the Work. An Erosion and Sediment Control permit from Clark County or the City of Vancouver will be acquired by the Owner. Work shall also be performed in accordance with the State Environmental Policy Act (SEPA).

The Owner will provide the Contractor with physical access to the Site. The Contractor shall access the Site using a gate located near 5509 Lower River Road and a 1,500 feet long clean gravel access road. The location of the gate and access road are shown on Drawing A-046101-WW. The Contractor's employees and subcontractors shall be required to sign in at the guardhouse each day Work is to be performed.

G. LOCATING UTILITIES

The Contractor shall be responsible at all times for coordinating with the appropriate private and public utility companies in locating underground and overhead utility lines such as water, sewer, electric, gas, and telephone lines prior to the performance of Work. The Owner or the Owner's Representative will assist the Contractor in completing this task if requested, but this assistance shall not eliminate the Contractor's responsibility. If the presence of underground utilities or other underground obstructions requires a modification of the proposed Work, the Owner's Representative will determine the necessary changes. Additional information relative to utilities is presented in Part C of SECTION VIII - GENERAL WORKMANSHIP SPECIFICATIONS AND STANDARDS.

H. EMERGENCY/CONTINGENCY PROCEDURES

In the event of an on-site emergency, the Contractor shall follow the emergency procedures as outlined in the Site Health and Safety Plan and as discussed in SECTION V – SITE CONDITIONS AND MANDATORY HEALTH AND SAFETY STANDARDS.

I. HEALTH AND SAFETY PLAN

One week after receiving "Notice to Proceed" the Contractor shall prepare and submit for Owner's review in concept, his own detailed, Site-specific Health and Safety Plan which shall describe specific procedures for the protection of on-Site personnel. A copy of the overall Site Health and Safety Plan, prepared by ICF Kaiser Engineers, Inc. (April 1998), will be available for review at the bid meeting. Specific health and safety information regarding this Work is provided in SECTION V – SITE CONDITIONS AND MANDATORY HEALTH AND SAFETY STANDARDS. The guidelines presented in this Specification provide an overview of the minimum health and safety components required in the Contractor's Site-specific health and safety plan. Alcoa will only review the Contractor's Site-specific health and safety plan and provide recommendations, if necessary; Alcoa will not assume responsibility associated with approval.

The Contractor must designate one person on Site as the project Health and Safety Officer to verify compliance with the Health and Safety Plan by all on-Site personnel. The project Health and Safety Officer shall also interact with the safety personnel of the Owner as required to update project status.

J. SCOPE OF WORK

The Work associated with the RA consists of multiple tasks. Materials used in performing the Work are presented in SECTION VII – GENERAL MATERIAL SPECIFICATIONS AND STANDARDS and construction procedures are described in detail in SECTION VIII – GENERAL WORKMANSHIP SPECIFICATIONS. A summary listing of the tasks and subtasks is as follows:

1. Phase I - Site Preparation

a. Mobilization
b. Staging Areas, Access Roads and Railroad Crossings
c. Construction Layout and Surveys
d. Erosion and Sediment Control
e. Decontamination/Liquids Management
f. Building/Wall Demolition and Pipe Plugging
g. Existing Fence Removal
h. Sprinkler System/Waterline
i. Storage/Operations Building

2. Phase II - South Bank Area of Concern

a. Clearing and Grubbing
b. Waste Soil Excavation and Handling
c. Confirmation Sampling
d. Spread/Compact Random Fill

3. Phase III – Shoreline Rehabilitation

a. Clearing and Grubbing
b. Grading
c. Spread/Compact Random Fill
d. Concrete Revetment
e. Planting and Vegetation (To be performed after Phase VI)

4. Phase IV - North and North 2 Landfill

a. Clearing and Grubbing
b. Waste Soil Excavation and Handling
c. Confirmation Sampling
d. Grading
d. Spread/Compact Random Fill
e. Vegetation

5. Phase V - East Landfill Construction

a. Clearing and Grubbing
b. Anchor Trench Platform/Embankment Construction
c. Waste Soil Placement
d. Engineered Cap Construction

e. Geomembrane Inspection and Testing
f. Vegetation
g. Fencing
h. Monitoring Well Extension/Protection

6. Phase VI - Additional Fill Outside Limits of East Landfill

a. Spread/Compact Random Fill
b. Vegetation

7. Borrow Area (Off-Site)

8. Site Cleanup and Damage Repair and Maintenance of Revegetated Areas

9. Final Project Inspections and Demobilization

II. BASIS OF PAYMENT

The Contractor shall be reimbursed for Work covered by these Specifications on the following unit cost and lump sum basis. The Contractor shall utilize the bid quantities listed herein to arrive at his total not to exceed estimated price to perform the Work. These bid quantities form the basis from which the Owner can accurately evaluate the schedule of values. This schedule of values shall be used by the Contractor to submit his bid.

A. SCHEDULE OF VALUES

ITEM NO.	DESCRIPTION	(Bid) QUANTITY	UNITS	UNIT PRICE	Total Price
1.	Phase I - Site Preparation				
a.	Mobilization	Job	Job	Lump Sum	$_____
b.	Staging Area, Access Roads, Rail Crossing	Job	Job	Lump Sum	$_____
c.	Construction Layout and Surveys	Job	Job	Lump Sum	$_____
d.	Erosion/Sediment Controls				
	(1) Jersey Barrier/Wattles on Shoreline	1,100	LF	$_____/LF	$_____
	(2) Silt Fence	900	LF	$_____/LF	$_____
	(3) East Drainage Swale	250	LF	$_____/LF	$_____
	(4) Biodiffuser Trench	Job	Job	Lump Sum	$_____
	(5) Infiltration Basin	Job	Job	Lump Sum	$_____
e.	Decontamination/Liquids Management	Job	Job	Lump Sum	$_____
f.	Building/Wall Demolition & Pipe Plugging	Job	Job	Lump Sum	$_____
g.	Existing Farm Fence Removal-East	550	LF	$_____/LF	$_____
h.	Sprinkler System/Waterline/Wiring	1375	LF	$_____/LF	$_____
i.	Storage/Operations Building	Job	Job	Lump Sum	$_____
2.	Phase II – South Bank Area of Concern				
a.	Clearing and Grubbing	1.5	Acres	$_____/Acre	$_____
b.	Waste Soil Excavation and Handling	2,500	CY	$_____/CY	$_____
c.	Confirmation Sampling	By Owner's Representative/Project Inspector			
d.	Spread/Compact Random Fill	2,500	CY	$_____/CY	$_____

ITEM NO.	DESCRIPTION	(Bid) QUANTITY	UNITS	UNIT PRICE	TOTAL PRICE
3.	Phase III – Shoreline Rehabilitation				
a.	Clearing and Grubbing	5.5	Acres	$_____/Acre	$_____
b.	Grading	2,000	CY	$_____/CY	$_____
c.	Spread/Compact Random Fill	7,000	CY	$_____/CY	$_____
d.	Concrete Revetment (Purchase of material by Alcoa)				
	(1) Woven Filter Fabric	63,500	SF	$_____/SF	$_____
	(2) Anchor Screws	636	Each	$_____/each	$_____
	(3) Revetment Installation	57,800	SF	$_____/SF	$_____
e.	Planting and Vegetation	57,800	SF	$_____/SF	$_____
4.	Phase IV - North and North 2 Landfills				
a.	Clearing and Grubbing	5.0	Acres	$_____/Acre	$_____
b.	Waste Soil Excavation and Handling	27,800	CY	$_____/CY	$_____
c.	Confirmation Sampling	By Owner's Representative/Project Inspector			
d.	Grading	4,000	CY	$_____/CY	$_____
e.	Spread/Compact Random Fill	2,000	CY	$_____/CY	$_____
f.	Revegetation	6.0	Acre	$_____/Acre	$_____
5.	Phase V - Construction of East Landfill Engineered Cap				
a.	Clearing and Grubbing	6.6	Acres	$_____/Acre	$_____
b.	Anchor Trench Platform/Embankment	6,050	CY	$_____/CY	$_____
c.	Waste Soil Placement	27,800	CY	$_____/CY	$_____
d.	Engineered Cap Construction				
	(1) GCL	304,000	SF	$_____/SF	$_____
	(2) Geomembrane	301,000	SF	$_____/SF	$_____
	(3) Drainage Net/Filtration Geotextile	315,250	SF	$_____/SF	$_____
	(4) Anchor Trench	2,020	LF	$_____/LF	$_____
	(5) Spread/Compact Random Fill	15,315	CY	$_____/CY	$_____
	(6) Spread Select Soil Cover	5,292	CY	$_____/CY	$_____
e.	Geomembrane Inspection and Testing	By Owner's Representative/Project Inspector			
f.	Vegetation	6.6	Acre	$_____/Acre	$_____
g.	Fencing	1,150	LF	$_____/LF	$_____
h.	Monitoring Well Extension/Protection	13	Wells	$_____/Well	$_____

ITEM NO.	DESCRIPTION	(Bid) QUANTITY	UNITS	UNIT PRICE	Total Price
6.	Phase VI - Additional Fill Outside Limits of East Landfill				
	a. Spread/Compact Random Fill	6,000	CY	$_____/CY	$_____
	b. Vegetation	2.0	Acres	$_____/Acre	$_____
7.	Borrow Area				
	a. Purchase/Transport Random Fill	42,750	CY	$_____/CY	$_____
	b. Purchase/Transport Soil Cover	5,555	CY	$_____/CY	$_____
8.	Site Cleanup, Damage Repair and Maintenance of Revegetated Areas	Job	Job	Lump Sum	$_____
9.	Final Project Inspections and Demobilization	Job	Job	Lump Sum	$_____
10.	All Applicable Taxes (Estimate)	Job	Job	Lump Sum	$_____

TOTAL NOT TO EXCEED ESTIMATED PRICE (Items 1 through 10) $_____

B. UNIT PRICES FOR CHANGED CONDITIONS

1. Purchase, transportation to Site, spread and compact Random Fill from an approved off-site vendor borrow area $_____/CY
2. Excavation and Transportation of Waste Soils from North and North 2 Landfill to East Landfill if total quantity exceeds 30,500 cubic yards. $_____/CY
3. Excavation and Transportation of Waste Soils from South Bank Area of Concern to East Landfill if depth of Waste Soils exceeds estimated depth. $_____/CY
4. Elevated PCB Soil handling and storage (T&D by Alcoa) $_____/CY

C. MEASUREMENT OF QUANTITIES

The estimate of quantities of work to be done and/or materials to be furnished in the Schedule of Values are only approximate in-place quantities and form the basis from which the Owner can accurately evaluate bids. Lump Sum items will not indicate a quantity value and shall be measured as a 'job.' It shall be the Contractor's responsibility to determine the near-exact quantities required for construction. The unit prices prepared by the contractor and inserted in his schedule of values will apply to the quantities listed herein, provided the contractor's calculation of quantities is within 10% of the listed quantity. If the contractor calculates a quantity that is 10% higher or lower than quantity listed herein, he

shall notify the Owner. If the quantity is verified by the Owner's Representative, the Owner will issue an addendum to correct the quantity and the contractor shall provide his unit cost for the revised quantity. If, during construction, the quantity increases or decreases as a result of changed conditions, the contractor shall be reimbursed at the unit price provided in his bid.

During construction, the Contractor shall be responsible for accurately developing material and work quantity amounts for billing and payment of Contract unit items as shown on the attached schedule of values. These quantities will be verified by the Owner's Representative. All Work completed under this contract has been measured by the Engineer during design or will be measured by the Owner's Representative in the field according to United States standard weights and measures. The following terms apply:

1. **Linear Feet**. All items measured by the linear foot, such as pipe, ditches, trenches, etc., shall be measured along or parallel to the centerline and/or base upon which such items are placed or constructed, unless specified otherwise on the Drawings or otherwise expressly set forth in these Specifications. Incidentals such as fittings, geotextiles, backfill, overlaps at connections, or joining materials shall be included in the overall measurements.
2. **Surface Area**. Surface area, when used in these Specifications, shall mean the actual area of exposed surface taking into account lengths and widths measured as slope distances. Adjustments for waste, overruns or overlap are not included.
3. **Plane Area**. Plane area, when used in these Specifications, shall mean the area of a projection of the surface area on a horizontal plane. For the purpose of ascertaining quantities, the planimeter shall be considered an instrument of sufficient precision adapted to the measurement of areas. Adjustments for waste, overruns or overlap are not included. Unless otherwise noted, any reference to a unit of measure for area shall be interpreted to mean plane area.
4. **Weight**. When weight is used as the measurement standard, certified tickets, invoices, or tags for such items shall be furnished to the Owner's Representative. (When used, the term "ton" shall mean 2,000 pounds.)
5. **Volumes**. All items measured by the cubic feet or cubic yard, such as regions consisting of excavations and fill placements, shall be measured in their final position using initial and final surveyed cross sectional measurements and the end-area method for calculating volume. Adjustments for swell, compaction or settling are not included.

D. BASIS OF PAYMENT

The quantity of work done will be paid at the contract bid price or lump sum price, which price and payment will be full compensation for doing all the work herein described in a workmanlike manner, including funishing all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work.

E. SUBSTITUTE MATERIALS

Materials to be used and details of construction for the Work to be performed are specified in the Specifications and on the Drawings. Materials with equivalent or superior performance characteristics may be substituted for those specified by providing written notice to the Owner and the Owner's Representative. The written notice shall include a certification by the Contractor that the performance of the substitute material shall be equivalent or superior to that of the specified material. Any applicable testing shall be included with the certification. The Contractor shall be solely liable for the cost of replacing materials and/or substitute materials that do not have performance characteristics equivalent or superior to those of specified materials. Approval of substitutions by the Owner and the Owner's Representative shall not eliminate this liability.

F. PRECISION AND ACCURACY

Unless otherwise approved in writing by the Owner, the following standards of precision and accuracy shall apply.

- All Site grading and construction work shall be performed to an accuracy of plus or minus 0.1 feet of the lines and grades shown on the Drawings.
- Surveying, performed within the limits of work, shall be performed with enough care and precision to insure horizontal and vertical accuracy to within plus or minus 0.1 feet of actual field locations. Quantity measurements shall be accurate to within 1% of the actual quantity obtained from field survey measurements.
- Any changes to the plans proposed by the Engineer and approved in writing by the Owner do not relieve the Contractor of these requirements.

III. CONSTRUCTION SCHEDULE

The Contractor shall begin Work on or after Tuesday September 9, 2003. Bids shall be due on August 8, 2003 to Patti Kaulback, Alcoa Inc., 201 Isabella Street, Pittsburgh, PA 15212. The bid must include a hard copy of the completed SECTION II – BASIS OF PAYMENT from these Specifications; this form shall not be modified and no other bid summaries shall be accepted. The Contractor shall provide the following submittals with the bid:

(1) Corporate Health and Safety Plan and/or Manual;

(2) A detailed time line schedule identifying all important milestones for the project (i.e., mobilization, clearing and grubbing, North and North 2 excavation and backfill, East Landfill fill placement, Engineered Cap construction, vegetation, etc.);

(3) A list of all Subcontractors;

(4) The resume for the Contractor's Site Superintendent for this Work; and

(5) The most recent Contractor's SOQ.

Failure by the Contractor to provide these submittals to the Owner will result in the disqualification of the bid. One week after receiving notice to proceed, the Contractor shall also submit a detailed Site-specific HASP and detailed project manpower and equipment usage schedules showing build-up requirements for maintaining the overall schedule, or suppliers, and any additional items requested in the invitation to bid. After acceptance by Owner, the Contractor shall comply with the schedule during the execution of this Work. In the event, for any reason, the Contractor fails to meet the detailed schedule, the Owner has the right to require the Contractor to resort to other means to return the Work to the previous agreed upon schedule. The Contractor shall not, however, perform any Work on a scheduled overtime basis without prior written consent of the Owner's Representative. See SECTION IX - GENERAL TERMS AND CONDITIONS for additional information. The following schedule, which includes important activities and the dates of those activities, has been established:

Activity	Date
■ Contractor Bid Meeting – Site walk	July 23, 2003
■ Contractor Bids due to Alcoa	August 11, 2003
■ Contractor receives "Notice to Proceed" from Alcoa	August 18, 2003
■ Contractor submits Site-specific HASP for Alcoa review	August 29, 2003
■ Alcoa and Contractor acquires all Work permits including Grading, E&S and vegetation Permit	September 8, 2003

■ Contractor submits final Site-specific HASP modified based on Alcoa conceptual reviews	September 8, 2003
■ Contractor submits pre-construction testing results of borrow source for Engineered Cap materials to Alcoa	September 8, 2003
■ Preconstruction/Safety Meeting (must include WDOE and CQA firm)	September 8, 2003
■ Contractor begins work	September 9, 2003
■ Project Closeout Site Walk and Punchlist	~June 1, 2004
■ Pre-Final Construction Conference (must include WDOE)	~June 15, 2004
■ Pre-Final Construction Inspection by WDOE	~June 15, 2004
■ Contractor completes Work	~June 30, 2004
■ Final Inspection (must include WDOE)	~July, 2004
■ Contractor submits as-built drawings and field reports	~July, 2004
■ Contractor begins one year Maintenance Agreement	~July, 2004

IV. NUMERICAL LIST OF DRAWINGS

The following list of drawings for the Former Vancouver Operations, Excavation of North and North 2 Landfills and East Landfill Cap Construction Project, hereinafter referred to as Drawings, cover the Work to be performed by this Contractor as described in these Specifications.

Alcoa Dwg. No.	Sheet No.	Drawing Title
A-046100-WW	T-2	Title Sheet
A-046101-WW	C-1	Existing Conditions Plan, Site Map, and Property Boundary
A-046102-WW	C-2	East Landfill Area – Existing Conditions and Investigative Activities
A-046103-WW	C-3	North and North 2 Landfills - Site Preparation Plan
A-046104-WW	C-4	North and North 2 Landfills – Waste Isopach Map
A-046105-WW	C-5	North and North 2 Landfills – Excavation Plan
A-046106-WW	C-6	North and North 2 Landfills – Fill Placement Plan
A-046107-WW	C-7	South Bank Area of Concern – Excavation Plan
A-046108-WW	C-8	South Bank Area of Concern - Fill Placement Plan
A-046109-WW	C-9	North and North 2 Landfills - Sections
A-046111-WW	C-10	East Landfill Area – Site Preparation and Shoreline Construction Plan
A-046112-WW	C-11	East Landfill Area – Concrete Revetment Panel Plan
A-046113-WW	C-12	East Landfill Area - Construction Sequence for Shoreline Protection: Steps I, II and III
A-046114-WW	C-13	East Landfill Area - Construction Sequence for Shoreline Protection: Steps IV, V and VI
A-046115-WW	C-14	East Landfill Area – Anchor Trench Platform Plan
A-046116-WW	C-15	East Landfill Area – Initial Grading Plan
A-046117-WW	C-16	East Landfill Area – General Fill Plan Outside Limits of Landfill Area
A-046118-WW	C-17	East Landfill Area – Final Grading Plan
A-046119-WW	C-18	East Landfill Area – Shoreline and Cap Construction Sections
A-046110-WW	C-19	North and North 2 Landfills and South Bank Area of Concern- Details
A-046120-WW	C-20	East Landfill Area – Details (Sheet 1 of 4)
A-046121-WW	C-21	East Landfill Area – Details (Sheet 2 of 4)
A-046122-WW	C-22	East Landfill Area – Details (Sheet 3 of 4)
A-046123-WW	C-23	East Landfill Area – Details (Sheet 4 of 4)

Reference drawings are listed on Drawing A-046100-WW.

V. SITE CONDITIONS AND MANDATORY HEALTH AND SAFETY STANDARDS

The Contractor and his employees shall conform to the safety rules and regulations of the Federal Construction Safety Standards, the Occupation Safety and Health Act (OSHA) and any other applicable standards enacted by Washington, Federal and local governing authorities having jurisdiction as referenced in this Specification. The Contractor and his employees shall also conform to the "Alcoa Engineering Standard 33.051, Contractor, Subcontractor, and Contracted Services Environment, Health and Safety Process," as referenced herein and/or as supplemented below.

A. PURPOSE

The purpose of this section is to describe the Contractor's Environmental and Health and Safety (EHS) responsibilities for this project. These responsibilities include committing to Alcoa's EHS Value and Policy principles. All Contractors and Vendors are expected to understand and comply with the following EHS Value and its related Policy.

EHS Value: Alcoa will work safely in a manner that promotes the health and well being of the individual and the environment.

EHS Policy: It is Alcoa's policy to operate worldwide in a safe, responsible manner which respects the environment and the health of our employees, our customers, and the communities where we operate. We will not compromise environmental, health or safety values for profit or production.

The Contractor's Management is accountable for the safety and health of the Contractor's employees. The Contractor is also accountable for the impact that the actions of his employees and subcontractors may have on the safety and health of others.

B. PERMITS/COMPLIANCE WITH REGULATIONS

This Contractor and his employees shall conform to the safety rules and regulations of the Federal Construction Safety Standards, to any applicable standards enacted by the State, to Alcoa Engineering Standard 33.051, and other rules as referenced herein and/or as supplemented below. All work shall also conform to the Federal OSHA.

The Contractor will obtain the necessary permits and licenses required by Federal, State, or local agencies prior to initiating the Work. In Addition, the Contractor shall obtain and provide the following:

- Business License (Washington State Department of Revenue)
- Federal Taxpayer ID (Internal Revenue Service)

It shall be the Contractor's sole responsibility to make himself aware of these regulations and to comply with them. The Owner shall not be liable for any citations received by the Contractor as a result of his failure to comply with applicable regulations.

All activities shall be performed in a manner that will reduce interference with normal Plant and Rail operations. The Contractor shall keep roads clear so as not to interfere with plant operations. If there is any reason to work in areas of plant operation, the Contractor shall provide barriers and flagmen as required by the Owner. Roads shall be kept clear of debris, soil, mud, or other material from equipment.

The Owner will provide the Contractor with physical and legal access to areas. The Contractor shall confine his operations to the areas indicated on the Figures and Drawings in Section IV.

C. PRE-JOB MEETING

A "CONTRACTED PROJECT" PLANNING MEETING shall be conducted by the Owner's Representative in which all aspects of the project are discussed with the Contractor. Scope of Work, Safety, Health and Environmental concerns, scheduling and interface with Operations personnel shall be determined and documented in a CONTRACTED PROJECT PLANNING CHECKLIST.

All work shall have a PRE-JOB SAFETY CHECKLIST that includes a list of safety hazards, safety equipment, materials and equipment needed to do the job. This Checklist shall list designated Competent Persons, as identified in COMPETENT PERSON/TASK MATRIX, for specific work such as monitoring, excavation, etc. A Tool Box Safety Meeting shall be held to review this information with the crew prior to starting work.

The Contractor shall prepare a Contractor Job Safety Plan prior to the meeting. This job plan will be reviewed by the Alcoa Responsible Person(s) and all EHS aspects of the project will be discussed. The meeting will also address materials and equipment required to perform the job. The Contractor Job Safety Plan shall be reviewed with the crew prior to starting work. All documentation of Pre-Job meetings shall be maintained by the Contractor and made available to Owner's Representative upon request.

D. ORIENTATION

The Contractor shall attend and complete orientation. Orientation attendees shall include all Contractor, Subcontractor, and Vendor employees. **No one may work on-site without successfully completing an orientation.**

The orientation will be presented by the Alcoa Responsible Person(s), or by safety or Security Personnel. Information on EHS aspects of the job or task, Site conditions, emergency procedures, permit requirements,

traffic patterns, adjacent operating production equipment, and waste disposal will all be included in the orientation. The orientation will be documented and a Photo ID, or other appropriate means of employee identification, will be presented to employees who have successfully completed the Contractor orientation.

E. ENVIRONMENTAL EXPECTATIONS

The Contractor is expected to operate in a manner, which protects the environment and the health of his employees and the citizens of the surrounding community. The Contractor shall take measures to control visible emissions from the site during all phases of work to comply with the State of Washington air regulations. Appropriate environmental controls shall be employed to prevent the spread of dust and other contamination to adjacent areas of the Owners property and other adjoining properties.

Releases to the environment, including spills, gas releases, explosions, etc., are considered a serious matter. A release constitutes potential for ground water contamination, surface water contamination, or releases of hazardous materials into the atmosphere, even if the material released is not generally considered hazardous.

Releases that could be encountered at the location include, but are not limited to the following:

1. Oil/Petroleum Spills (diesel, gasoline, etc.)
2. Hazardous Substance Spills/Releases.
3. Fires or Explosions related to any of the above.

Contractor shall provide impermeable secondary containment in storage areas where flowable materials are subject to spilling.

If a release occurs, the Contractor shall take the following steps:

1. Attempt to contain the release, if possible, without risking bodily harm. If there is immediate danger, evacuate the area.
2. Immediately contact the Local Emergency Response Teams and Alcoa's Emergency Coordinator and provide them with the details of the release, even if the material involved is not considered hazardous.

When notifying the response personnel, provide the following information:

1. Exact location of the release.
2. Type and description of released material.
3. Estimated amount of material released or size of the fire.
4. Extent of injury or property damage occurring.
5. Extent of actual or potential environmental damage, if known.

6. What actions, if any, have been taken to control the release.

The Alcoa's Emergency Coordinator will take appropriate action according to the Vancouver Works Release Prevention, Control and Countermeasure Plan.

The Contractor is required to comply with the Emergency Planning and Community Right-to-Know Law and all applicable State Right-to-Know Laws. Alcoa will make the Contractor aware of any location specific environmental concerns.

Disposal of Contractor generated batteries, engine oil, transmission fluids, hydraulic fluids, filters, radiator fluids, tires and fluorescent light bulbs shall be in accordance with Alcoa's Environmental Waste Disposal Plan. The Contractor shall be responsible for the collection and disposal of any hazardous or non-hazardous waste generated by the Contractor at the job site.

F. HEALTH AND SAFETY

The Contractor shall be aware that work may take place in a hazardous environment and that Contractor shall be responsible for the health and safety of employees of the contractor as well as those of any Subcontractor. All work completed as part of these specifications shall be performed in accordance with Federal, State, and Alcoa requirements pertaining to worker safety. This shall include, but not be limited to, 29 CFR 1910 (General Industry Standards) and 29 CFR 1926 (Construction Industry Standards). In addition, Contractor shall also comply with Owner's contractor pre-qualification standards, Sections 33.055.1.

All operations have the potential for encountering contaminated conditions and Level D shall be the minimum protection allowed. To adequately protect personnel in areas of higher potential contaminant exposure, an upgrade to Level C may be required if action levels are exceeded. Contractor's Site Health and Safety Officer shall be responsible for monitoring conditions and upgrading protection equipment as required. Contractor shall supply properly trained personnel with approved safety equipment. Contractor shall be aware of slip, trip, and fall hazards associated with the Work.

1. Conduct of Contractor's Employees:

   In addition to the items listed in the ALCOA ENGINEERING STANDARDS FOR GENERAL SITES, while on the Owner's property, the Contractor's employees shall not engage in any dangerous, illegal or outrageous conduct, including but not limited to the Rules of Good Conduct presented in the Contract's Terms and Conditions.

2. Housekeeping:

- Good housekeeping practices are an absolute necessity in Alcoa's goals to achieve a safe and healthy work place and are consistent with Construction's goals for "ZERO INJURIES".
- Good housekeeping practices increase productivity and increase the quality of services rendered.
- Housekeeping is the responsibility of each Contractor, Superintendent, General Foreman, and Craftworker collectively and independently.

The following areas shall be monitored weekly by the Contractor utilizing the Housekeeping Audit Checklist.

a. Immediate Work Areas:

- All supplies and materials shall be safely and neatly stacked in appropriate containers, or in bins, racks or on pallets. All excess containers and scrap materials shall be disposed of immediately in proper receptacles and/or areas.
- All tools and equipment shall be in good working order, free of excess oil, grease, dirt, mud, metal shavings, tailings, or filings. Absorbent material containers shall be used where appropriate.
- All tool boxes, hand tools, and cabinets shall be placed in a safe and orderly fashion, free of access hazards. Gang box or cabinet doors and lids shall be operable and closed when not being accessed.
- Upon completion of each shift, all tools and/or equipment shall be returned to its proper storage area or place. All abandoned, used, surplus or spent materials shall be stored or disposed of in appropriate areas, luggers, or receptacles. The area shall be left clean and hazard free for use by the next or returning shift.
- All mobile equipment shall be free of excess oil and grease and in good working order. All leaks shall be fixed and any spillage shall be properly remediated and disposed of in approved containers and/or areas.
- All mobile equipment shall be free of asbestos during entrance to and exit from the Site.
- Contractor Vehicles shall be free of access hazards, trash, surplus, spent or damaged materials when being used to transport personnel.

b. Temporary Storage or Lay Down Areas:

- All materials should be stored according to project, type, or function; in appropriate containers or on pallets and off the ground on adequate dunnage.

- All materials shall be stored only in approved locations, out of traffic areas and away from all vent doors, ladders, and walkways.
- Materials shall be stored so as to allow reasonable access to all items.
- All surplus materials shall be so noted and appropriate personnel notified for final disposition of materials.
- Equipment and/or tools of the trade shall be removed from these areas when not in use.

c. Field Offices:

- All areas in and around Contractor buildings and structures shall be maintained in a neat and orderly fashion. All equipment and tools of the trade shall be arranged in an orderly way. Holding bins, shelves, or racks shall be used for placement or storage of materials within these structures. As an example; choker and shackles on the ground or in corners is not considered proper storage. Electrical conduit on ground or stacked on pallets is not considered proper storage.
- All electrical appliances and/or connections shall be of adequate size and/or proper specifications and maintained in a responsible manner at all times.
- Contractor office areas shall be free of access hazards. These areas should not be used for storage of materials.
- All non-dangerous debris and rubbish suitable for disposal shall be hauled directly to a landfill that has been approved for use by the Owner.
- All scrap materials, removed equipment, and surplus equipment shall be hauled to areas designated by the Owner's Engineer.

3. Emergency Plan:

Emergency planning shall be developed prior to starting work and agreed to by Contractor and Owner's representative. Report emergencies such as tornado, chlorine spill, propane spill, or fire immediately to the Alcoa Emergency Coordinator (Albert Burba at 412/553-2007) and to 911. Notify all employees in your department as to nature of emergency and issue explicit instructions as to location of shelter zones or evacuation procedures.

Emergency procedures shall be in written form and prominently posted in the clean change area and equipment room of the worker decontamination area. Everyone prior to entering the work area must read and sign these procedures to acknowledge receipt and understanding of work site layout, location of

emergency exits and emergency procedures.

Emergency planning shall include written notification of police, fire and emergency medical personnel of planned activities, work schedule and layout of work areas--particularly barriers that may affect response capabilities.

Emergency planning shall include considerations of fire, explosion, toxic atmospheres, electrical hazards, slips, trips and falls, confined spaces and heat related injury. Written procedures shall be developed and employee training in procedures shall be provided.

Employees shall be trained in evacuation procedures in the event of workplace emergencies.

For non-life-threatening situations - employees injured or otherwise incapacitated shall decontaminate following normal procedures with assistance from fellow workers if necessary, before exiting the workplace to obtain proper medical treatment.

For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, remove him from the workplace and secure proper medical treatment.

Telephone numbers of all emergency response personnel shall be prominently posted in the clean change area and equipment room, along with the location of the nearest telephone.

4. Hazardous Material Handling:

   a. Contractor Employee Exposures: Contractor shall apprise all workers, supervisory personnel, sub-contractors, and consultants who will be at the job-site of the seriousness of the hazard and of proper work procedures which must be followed. The Contractor shall document the compliance with this section.

      The Contractor shall apprise all workers of the physical hazards associated with work conducted at this site. The Contractor shall document compliance with this section.

   b. Health and Safety Plans: The Contractor is responsible for developing a site-specific Health and Safety Plan (HASP) for the Work. The Contractor may review the overall HASP prepared for the Former Vancouver Operations to prepare his site-specific HASP; the overall Site HASP was prepared by ICF Kaiser Engineers, dated January, 1996. Several amendments have been added to the original HASP, the most recent occurred in June, 1998.

      Characterization of the Waste Soils from the North and North 2 Landfills that will be excavated and placed as fill in this project are presented/summarized in several documents. A list of these documents is presented in Appendix A. Summarizing the characterization data for Waste Soils, the

constituents of interest for this Work were as follows:

- At the North Landfill and the North 2 Landfill, Waste Soils exceeding MTCA Method A Industrial Cleanup levels for PAHs and PCBs of 20 mg/kg and 10 mg/kg, respectively.
- At the South Bank Area of Concern, Waste Soils exceeding MTCA Method A Industrial Cleanup levels for PCBs.
- At the East Landfill, Waste Soils shall not be disturbed.

At a minimum, the Contractor shall prepare his HASP to require modified Level D personnel protection (hard hats, safetyboots with steel toes , work gloves, safety glasses, and a tyvek suit) for excavation of Waste Soils. However, that level of protection must be based on compliance with certain air monitoring procedures and specified limits for air contaminants. The Contractor must develop a HASP that includes personnel and perimeter air monitoring, and the Contractor must also perform real-time dust monitoring. The Contractor must specify procedures for upgrading the level of protection, including specifying at what concentration (based on the real-time dust monitoring) such upgrades will occur. PAH and PCB concentrations up to 19,000 and 550 milligrams/kilogram (mg/kg), respectively, were detected in Waste Soils.

The Contractor shall also incorporate air monitoring procedures for VOCs and semi volatile organic compounds (SVOCs) into his Site-specific HASP, as the potential for these constituents may be encountered within the Waste Soils to be excavated during the performance of this Work. The Contractor may perform screening analyses for VOCs using a photoionization detector (PID) with an 11.7 eV probe and a flame ionization detector (FID) to monitor breathing zone organic vapor concentrations during intrusive activities. Detector tubes sensitive to vinyl chloride shall also be used in the breathing zone if organic vapor readings are detected above 1 part per million (ppm) with either the PID or the FID. In his HASP, the Contractor shall provide action levels at which the level of personnel protection will be modified and/or engineering controls implemented.

The Contractor shall also include in his HASP procedures for implementing activities near the active railroad line at the North Landfill. This shall include at a minimum: the responsibilities of personnel, specifically the flagman; clothing requirements, to include high visibility vests; equipment and personnel crossing procedures; and performance of work around rail crossings.

5. Substance Abuse and Work Place Impairment:

The Contractor shall provide personnel that have met the guidelines and requirements for substance abuse and work place impairment presented in SECTION IX: GENERAL CONDITIONS.

G. FIELD OFFICE AND UTILITY SERVICES FOR CONTRACTOR

The Contractor shall provide an office trailer, storage, and other plant facilities necessary to complete all of the Work covered by this Contract. Office requirements are detailed in these Specifications. The Contractor shall, insofar as possible and reasonable, have a representative at this office during working hours for the purpose of escorting visitors, such as vendors, onto the Site according to the Owner's regulations. All other temporary buildings shall be located as approved by the Owner's Representative and be in accordance with Alcoa Engineering Standard 33.051, dated 2001 April. At his discretion, the Contractor shall provide security measures for his equipment and materials located at the Site. The Owner will provide security at the Site from 4:00 PM until 11:59 PM Monday through Thursday. Upon completion of this Contract, all of the Contractor's facilities shall be removed and the area cleared and leveled.

1. Entrance:

   The entrance to the job site for all equipment and materials will be off Lower River Road, using a private asphalt road 700 feet long and the Owner's gravel access road 1,100 feet long, as shown on the Drawings. The Contractor's vehicles and equipment will be allowed to use roads and parking areas as designated on the Drawings.

2. Storage:

   Material shall be stored in areas designated by the Owner's Representative. All products, which are proposed to be used by the Contractor, will have to be pre-approved by Alcoa's Environment, Health, and Safety (EHS) prior to being brought on site for use. The approval process will include submittal of Material Safety Data Sheets (MSDSs) for all proposed products prior to products being brought on site. The Contractor shall store materials and equipment in a manner that minimizes exposure to weather and prevent contamination of storm water runoff. The Contractor shall manage materials and equipment in a manner that prevents contamination of Owner's Site through spills, leaks, overfilling, poor housekeeping, or any other means. Any temporary tankage shall have integral secondary containment.

3. Railroad Access:

   Railroad trackage is available for unloading the Contractor's materials. Arrangements for use may be made by contacting the owner and operator, Burlington Northern and Santa Fe railroad.

H. LOCATING UTILITIES

1. Electric Power:

   Power for the construction office will be available through the Clark Public Utilities Division (CPUD),

8600 NE 117th Avenue, Vancouver, Washington 98668. Contact at CPUD is Ed Fisher (360-992-8808). The Contractor at his own expense shall acquire permits, install the required distribution lines, transformers, meters and other appurtenances and pay for any connection fees and his own electricity usage. Upon the completion of this Contract, all distribution lines, transformers, and other appurtenances installed by the Contractor shall be removed by the Contractor at his own expense to the satisfaction of the Owner's Representative.

2. Temporary Power:

   Temporary power will not be available in job site areas unless specifically noted in the Scope of Work.

3. Compressed Air:

   The Owner will not furnish compressed air. Any appurtenances required shall be furnished and installed by the Contractor at his own expense and shall be removed at the end of each working day.

4. Water:

   Non-potable water will be supplied to the Contractor free of charge from existing fire hydrants located on-site, near the Contractor's staging area. The Owner's Representative will provide the nearest location for obtaining water. If water is not available from this on-site location at the time the Work is to be performed, the Contractor shall make arrangements with the local water company to obtain water from a source on Lower River Road, near the entrance to the Site. The Contractor shall provide, at his own expense, any distribution lines or meters required and shall at the completion of this Contract, remove same to the satisfaction of the Owner's Representative. There are no drinking water facilities available in the Contractor's Area. The Contractor shall provide, at his own expense, the drinking water facilities for his employees and the Owner and the Owner's Representative.

5. Telephone:

   Telephone service arrangements for the Contractor's use shall be made directly by the Contractor with US West Telephone Company.

6. Chemical toilets:

   Chemical toilets shall be provided by the Contractor in sufficient numbers in accordance with the applicable OSHA Standards for the Contractor's personnel, plus the Owner and the Owner's Representative and at locations throughout the Work area, and the Contractor shall properly maintain the chemical toilets.

7. First Aid:

The Contractor shall be responsible for supplying first aid facilities and supplies for his employees.

8. Roll-off box:

The Contractor shall provide a roll-off box at the Contractor's staging area for disposal of non-hazardous materials at a location meeting the approval of the Owner's Representative and easily accessible to the disposal carrier. The Contractor shall be responsible for generating the appropriate paperwork and the disposal of the contents of the roll-off box at an owner approved facility.

I. GENERAL CODES, SPECIFICATIONS AND STANDARDS

The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, Sate, and local regulations pertaining to the protection of the environment, workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by applicable Federal, State, and local regulations, and shall hold the Owner harmless for failure to comply with any applicable safety or health regulation on the part of himself, his employees, or his sub-contractors.

All contract work shall be completed in accordance with the latest edition of standard codes and regulations as published and adopted by the governing authority and any applicable Alcoa Labor, Health and Safety Standards. If a conflict occurs between government adopted codes or regulations and these Contract Documents, the most stringent standard shall apply. Nothing in these Specifications shall be construed to permit work not conforming with governing codes and regulations. The Contractor is responsible for complying with any requirements of the herein before mentioned codes, standards, regulations, and specifications.

1. Applicable U.S. Environmental Protection Agency (EPA) Standards:

   - EPA National Emissions Standards for Hazardous Air Pollutants (NESHAPS)-Code of Federal Regulations (CFR) Title 40 part 61, Subparts A and M. (Required)

2. Applicable U.S. Department of Labor Occupational Safety and Health Administration (OSHA) Regulations:

   - 29 CFR 1910 (General Industry Regulations)
   - 29 CFR 1910.134 (Respirator Regulations)
   - 29 CFR 1910.300-399 (Electrical Regulations)
   - 29 CFR 1910.1200 (Hazard Communication Regulations)
   - 29 CFR 1926 (Construction Safety Regulations)

- 29 CFR 1926 Subpart T (Demolition)
- 29 CFR 1926.400-449 (Electrical Regulations)

3. Applicable Department of Transportation (DOT) Standards:

   - 49 CFR 171, 172, and 177.844.

4. Applicable American National Standards Institute (ANSI) Standards:

   - ANSI Z9.2 – Fundamentals Governing the Design and Operation of Local Exhaust Systems.
   - ANSI Z88.2-1980 – American National Standards Practice for Respiratory Protection.
   - ANSI Z117.1-1989 – Safety Requirements for Confined Spaces.
   - ANSI Z87.1-1980 – Practice for Occupational and Educational Eye and Face Protection.
   - ANSI/CGA G7.1-1989 – Commodity Specifications for Air.
   - ANSI/CGA C-4-1878 – Method of Marking Portable Compressed Gas Containers to Identify the Material Contained.

5. Applicable Washington Administrative Code (WAC) - State Occupational Safety and Health Regulations:

   - WAC 296-62-071 to 07121 Respiratory Protection
   - WAC 62-9015 to 9055 Hearing Conservation
   - WAC 296-62-145 to 14529 Confined Spaces
   - WAC 296-155-426 to 462 Electrical
   - WAC 296-155-475 Ladders, Scaffolds, and Elevating Work Platforms Fall Protection
   - WRD 80-16 Directive Respirable Air Supplied by Oil Lubricated Compressors
   - WED 87-2 Directive Special Respirable Protection Requirements for Negative Pressure Enclosures

6. Alcoa Labor, Health and Safety Standards:

   - Alcoa Engineering Standard 15.1, Material Handling Slings dated 1997 March.
   - Alcoa Engineering Standard 16.13, Compressed Air Distribution System Specifications dated 2003 April.
   - Alcoa Engineering Standard 18.1, Overview of Entering and Working in Confined Spaces dated

2001 September.

- Alcoa Engineering Standard 18.1.1, Respiratory Protection dated 2001 October.
- Alcoa Engineering Standard 18.1.2, Entering and Working in Confined Spaces dated 2001 September.
- Alcoa Engineering Standard 18.2, Fall Protection dated 2001 September.
- Alcoa Engineering Standard 18.3, Tagout and Lockout Procedures dated 2001 September.
- Alcoa Engineering Standard 18.6.1, Safe Handling of Compressed Gases dated 1998 August.
- Alcoa Engineering Standard 18.17R, Project Environment, Health and Safety Review .
- Alcoa Engineering Standard 18.17.1C, Equipment and Process Safety Evaluation Worksheet dated 1996 June.
- Alcoa Engineering Standard 18.17.2C, Process Safety Management Worksheet dated 1996 June.
- Alcoa Engineering Standard 18.19, Excavation, Trenching and Shoring dated 1996 June.
- Alcoa Engineering Standard 18.20.3, Lead Hazard Control Checklist dated 1998 June.
- Alcoa Engineering Standard 18.24.1, Improving Driving Safety dated 2001 November.
- Alcoa Engineering Standard 18.26, Fire Protection and Detection dated 2001 November.
- Alcoa Engineering Standard 18.28.1, Personal Protective Equipment dated 2001 April.
- Alcoa Engineering Standard 30.2.18.1, Hoist System Safety Requirements dated 2001 September.
- Alcoa Engineering Standard 30.3.1, Noise Control Specifications dated 1998 August.
- Alcoa Engineering Standard 30.3.2, Sound Level Requirements for Purchased, Leased, or Rented Vehicles dated 1998 August.
- Alcoa Engineering Standard 32.64.1, Electrical Grounding of Low Voltage (750 volts and below) Industrial Systems and Equipment dated 1998 December.
- Alcoa Engineering Standard 33.051, Contractor, Subcontractor and Contracted Services Environment, Health and Safety Process dated 2001 April.
- Alcoa Engineering Standard 33.055.1, Contracted Services Safety Prequalification questionnaire dated 1999 November.
- Alcoa Environmental Remediation Health and Safety Program Document dated 2002 August 28.

Upon award of Contract for the Work by Alcoa, contractor is required to comply with these Standards until the Work has been completed. These Standards are provided in Appendix A.

7. Contractor's Mobile Equipment and Motor Vehicles:

All Motor Vehicles and Mobile Equipment shall comply with OSHA and the Owner's Standards and shall meet standards as outlined in the – CONTRACTED SERVICES FREE MOVING MOBILE EQUIPMENT CHECKLIST.

Contractors shall insure OPERATORS are trained and CERTIFIED in the operation of vehicles/equipment and must demonstrate operating abilities consistent with Owner's expectations.

A PRE-OPERATIONAL INSPECTION shall be completed by each operator prior to operating equipment. Immediate action shall be take on items noted that pose serious safety concerns.

VEHICLE PASSENGERS may ride only where a seat is permanently affixed to the vehicle. SEAT BELTS shall be used where provided. Contractor employees are permitted to be transported in the bed of a pickup truck provide they sit in the bed of the pickup truck.

VEHICLES/EQUIPMENT shall be maintained in safe operating condition, free of oil leaks, and with necessary guarding of moving parts in compliance with OSHA guidelines. Routine inspections of vehicles/equipment shall be conducted by Contractor Safety Representative. Vehicles that travel public roadways shall be inspected by a certified Vehicle Inspection Station Annually.

LOADING/UNLOADING OF TRUCKS shall be done in compliance with Department of Transportation (DOT) regulations. It is the responsibility of the driver to SECURE UNSTABLE LOADS. Good visibility shall be maintained by operators of fork trucks while moving loads in reverse. Equipment in unsafe condition shall not be off-loaded. Entrance to the job site for all equipment and materials will be at the main gate, near the security guard house, as designated by the Owner's Engineer. The contractor's vehicles and equipment will be allowed to use roads and parking areas as designated on the Drawings.

Material shall be loaded and stored in areas designated by the Owner's Engineer. All products, which are proposed to be used by the Contractor, will have to be pre-approved by Alcoa's Environment, Health, and Safety (EHS) prior to being brought on site for use. The approval process will include submittal of Material Safety Data Sheets (MSDSs) for all proposed products prior to products being brought on site. The Contractor shall store materials and equipment in a manner that minimizes exposure to weather and prevent contamination of storm water runoff. The Contractor shall manage materials and equipment in a manner that prevents contamination of Owner's Site through spills, leaks, overfilling, poor housekeeping, or any other means.

VEHICLES/EQUIPMENT shall be maintained for high visibility. IN TRANSIT, HEADLIGHTS AND BACK LIGHTS SHALL BE ILLUMINATED. BACK-UP ALARMS are required on all applicable

vehicles/mobile equipment.

VEHICLES/EQUIPMENT shall be kept free of waste soils/contaminated material and OPERATORS shall ensure that VEHICLES/EQUIPMENT do not track waste soils/contaminated material throughout the site.

No Contractor, shall supply or dispense any diesel fuel for use in MOTOR VEHICLES as defined by (40CFR85.1703(a)) unless the diesel fuel: has a sulfur percentage, by weight, no greater than 0.05 percent; has an acetane index of at least 40; or has a maximum aromatic content of 35 volume percent; and is **free of visible evidence of: the dye 1,4-dialkylamino- anthraquinone. (i.e.:** autos, vans, buses, pool trucks, bucket trucks, dump trucks, vacuum trucks, water trucks, lugger trucks). Diesel powered trucks and other equipment that meet the definition of motor vehicles are required to use low sulfur diesel fuel, even if used only in a construction site.

No Contractor, shall supply or dispense any diesel fuel for use in MOBILE EQUIPMENT as defined by (40CFR85.1703(a) Exclusions) unless the fuel contains the dye solvent red 164; and it is used in a manner that is tax-exempt as defined under 4082 of the Internal Revenue Code. (i.e.: tractors (farm type), forklifts, skid steer loaders, powered aerial lifts, mobile cranes, graders / excavators, scrapers, dozers, backhoes, front end loaders).

40CFR SUBPART R 85.1703(a) Definition of Motor Vehicle: "A vehicle which is self-propelled and capable of transporting a person or persons or any material or any permanently or temporarily affixed apparatus shall be deemed a motor vehicle, unless any one or more of the criteria set forth below are met.

Exclusions in which case the vehicle shall be deemed not a motor vehicle and excluded from the operation of the Act:

- 85.1703(a)(1) The vehicle cannot exceed a maximum speed of 25 miles per hour over level, paved surfaces; or
- 85.1703(a)(2) The vehicle lacks features customarily associated with safe and practical street or highway use, such features including, but not being limited to, a reverse gear (except in the case of motorcycles), a differential, or safety features required by state and/or federal law; or
- 85.1703(a)(3) The vehicle exhibits features which render its use on a street or highway unsafe, impractical, or highly unlikely, such features including, but not being limited to, tracked road contact means or an inordinate size."

Violators shall be subject to dismissal from the site.

8. Free Moving Mobile:

   FREE MOVING MOBILE CRANE PROCEDURES shall be followed as outlined in Exhibit 8.

9. Material Handling:

   a. Rigging Equipment for Material Handling: Rigging equipment for material handling shall be maintained and used according to Alcoa Engineering Standard 15.1.

      Rigging equipment shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service.

      Rigging equipment shall not be loaded in excess of its recommended safe working load, as prescribed in Tables H-1 through H-20 in subpart 1926.251(a)(2), following 1926.252(e) for the specific equipment.

      Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to employees.

      Special custom design grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures and similar materials, shall be marked to indicate the safe working loads and shall be proof-tested prior to use to 125 percent of their rated load.

   b. Slings: Slings shall be maintained and used according to Alcoa Engineering Standard 15.1 and in compliance with OSHA 29 CFR 1910.184.

      Whenever any sling is used, the following practices shall be observed:

      - Slings that are damaged or defective shall not be used.
      - Slings shall not be shortened with knots or bolts or other makeshift devices.
      - Sling legs shall not be kinked.
      - Slings shall not be loaded in excess of their rated capacities.
      - Slings used in a basket hitch shall have the loads balanced to prevent slippage.
      - Slings shall be securely attached to their loads.
      - Slings shall be padded or protected from the sharp edges of their loads.
      - Suspended loads shall be kept clear of all obstructions.
      - All employees shall be kept clear of loads about to be lifted and of suspended loads.
      - Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.

- Shock loading is prohibited.
- A sling shall not be pulled from under a load when the load is resting on the sling.
- Inspections: Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service. Documentation of sling inspections shall be made upon request by the Owner's Representative.

c. Equipment Specifications: Aerial Lifts, Extensible Boom Platforms, Aerial Ladders, and Articulating Boom Platforms (JLGS), and Movable Scaffolding used To Elevate Personnel Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to job-sites above ground: (i) Extensible boom platforms, (ii) aerial ladders, (iii) articulating boom platforms, (iv) vertical towers, and (v) a combination of any of the above. They shall be designed and constructed in conformance with the applicable requirements of the American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969, including appendix. Aerial lifts acquired before the effective date of this section, which do not meet the requirements of ANSI A92.2-1969, may not be used after January 1, 1976, unless they shall have been modified so as to conform with the applicable design and construction requirements of ANSI A92.2-1969. Aerial personnel lifts must be maintained and operated in compliance with OSHA 29 CFR 1926.556. Documented inspection by a qualified inspector must be maintained and made available to Owner's representative upon request.

   Boom and basket load limits specified by the manufacturer shall not be exceeded. The insulated portion of an aerial lift shall not be altered in any manner that might reduce its insulating value.

   Articulating boom and extensible boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Upper controls shall be in or beside the platform within easy reach of the operator. Lower controls shall provide for overriding the upper controls. Controls shall be plainly marked as to their function. Lower level controls shall not be operated unless permission has been obtained from the employee in the lift, except in case of emergency.

   Movable Scaffolding shall be maintained in accordance with Alcoa Engineering Standard 33.051 dated 2001 April, documented inspection is required. Documentation shall be maintained by the Contractor, and made available to the Owner's Representative upon request.

d. Personnel Lift Operator Safety: Persons operating Aerial Lifts, Extensible Boom Platforms, Aerial

Ladders, Articulating Boom Platforms (JLGS) Used To Elevate Personnel Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to job-sites above ground: (i) Extensible boom platforms, (ii) aerial ladders, (iii) articulating boom platforms, (iv) vertical towers, and (v) a combination of any of the above must:

- Only trained and authorized persons shall operate an aerial lift.
- A daily inspection shall be performed prior to operation of personnel lift equipment.
- Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.
- Tying off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.
- Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.
- A full body harness shall be worn and a lanyard attached to the boom or basket while traveling in or working from an aerial lift.
- Climbers shall not be worn while performing work from an aerial lift.

e. Ladders/Scaffolding: In accordance with Alcoa Engineering Standard 33.051, a quarterly, documented inspection is required. Documentation shall be maintained by the Contractor, and made available to the Owner's Representative upon request.

J. SUBMITTALS AND NOTICES

Approval by the Owner one week prior to site remediation work is required of the following information and materials. Details in the submittal package shall be site specific. Incomplete submittal packages will be returned to the Contractor for revision and resubmittal.

Prior to project commencement, the following items shall be submitted by the Contractor:

- A list of all equipment, tools, and materials proposed for use on this project. Include certification by manufacturers that all HEPA equipment meets ANSI Z9.2.
- MSDSs and product data sheets for each chemical proposed for use on the site, including storage locations.
- A statement of the qualifications of the workforce. Include at a minimum the following:
  - A description of the qualifications and experience of all supervisors proposed for his project.
  - Provide evidence that at least two workers on each shift have current first aid and CPR training.

- A copy of the Contractor's Personal Protective Equipment Program including the Respiratory Protection Program. Minimal qualifications are as specified in 29 CFR 1926.1101.
- A description of the Contractor's medical surveillance program for the employees. Minimal qualifications shall be as specified in 29 CFR 1926.1101 and WAC 296-62-07725.
- Health and Safety Plan

VI. ENGINEERING, INSPECTION AND TESTING

Engineering, inspection and testing requirements for the Work covered by these Specifications shall be performed in accordance with the Alcoa Engineering Standards under SECTION VIII - GENERAL WORKMANSHIP SPECIFICATIONS and in accordance with Article 4, "Inspections and Tests" under SECTION IX - GENERAL TERMS AND CONDITIONS. Work shall also be performed in accordance with the Washington State Department of Transportation 2000 Standard Specifications for Road, Bridge and Municipal Construction (Washington Standard Specifications). The Contractor shall also be aware that all Work is to be completed in accordance with these Specifications and will meet the quality assurance and quality control requirements detailed in the Construction Quality Assurance Plan (CQAP), attached as Appendix B to these Specifications.

A. GENERAL

This Contractor shall furnish, at his own expense, all materials and all labor that may be required to execute the Work as described herein, unless otherwise noted. Benchmarks and surficial reference features for construction purposes are located on Drawing A-046102-WW. If, for any reason, these monuments are disturbed during the progress of Work, it shall be the responsibility of this Contractor to re-establish them without cost to the Owner, as directed by the Owner's Representative. The Owner's Representative may require that construction Work be suspended at any time when location and limit marks established by the Contractor are not reasonably adequate to permit inspection of completed Work or Work in progress. The Contractor shall cooperate with the Owner's Representative when tests are performed and sampling is conducted.

B. CONFIRMATION SAMPLING PLAN

1. General: This Confirmation Sampling Plan provides the approach, the cleanup standard, the sampling design, and the decision-making process that will be implemented during the excavation of Waste Soils at the North and North 2 Landfills and the South Boundary Area of Concern. The Confirmation Sampling Plan will be conducted by the Owner's Representative during construction activities.

   The limits of excavation to remove Wastes Soils from the three areas described above is shown on Drawings A-046105-WW and A-046107-WW. The excavation areas were designed using information obtained during previous investigations at the Site. Several reports have been developed that describe in detail the environmental conditions at the Site. A list of the Reports is

presented in Appendix A. The Confirmation Sampling Plan will be performed in an iterative manner to promote the efficient assembly of data needed to make decisions relative to cleanup of Waste Soils from the Site.

The Confirmation Sampling Plan incorporates immunoassay field screening techniques and verification grab sample methods. Immunoassay field screening will be conducted at the North 2 Landfill and the South Bank Area of Concern to guide the limits of excavation, providing qualitative indications of the PAH or PCB concentrations in soil. It will qualitatively confirm the limits of PAH and/or PCB contamination obtained from previous investigation programs. Immunoassay field screening will also delineate the limits of excavation of soils with PCB concentrations over 50 mg/kg (PCB Wastes) from the limits of Waste Soils with PCB concentrations less than 50 mg/kg and greater than 10 mg/kg at the two areas previously mentioned. The screening will also provide a basis for the collection of PAH and PCB verification grab samples.

Verification grab sampling will be conducted after all excavation activities at the North and North 2 Landfills and the South Bank Area of Concern have been completed. The Owner's Representative will submit verification samples for analytical testing and compare the analytical results with cleanup levels to document removal of all Waste Soils at each of the identified areas. If results of verification samples exceed cleanup levels, additional excavation will proceed as discussed herein. Verification grab sampling will be used exclusively at the North Landfill to document removal of Waste Soils, in the absence of immunoassay field screening procedures for TCE.

A drawing or figure presenting the proposed locations of verification grab samples will be provided to the Owner’s Representative and the Contractor. The Owner’s Representative will locate the samples using the drawing after the limits of excavation have been reached.

The Owner’s Representative may suspend backfill activities or hold excavation work in an area for a maximum of one week (7 days) to await results of verification sample results or to perform field screening. If verification sampling results indicate that additional Waste Soils needs to be excavated, the Owner’s Representative will coordinate with the Contractor to establish a time for excavation that does not interfere with his overall excavation efficiency.

2. Cleanup Standards: The Model Toxics Control Act (MTCA) numerical standard for a routine cleanup action for Industrial Properties is applicable. The Method A soil cleanup standards for PAHs (carcinogenic), PCB Mixtures, and TCE as discussed in Table 3 of WAC 173-340-745 and as

shown below will be used as the cleanup level at the North and North 2 Landfills and the South Bank Area of Concern:

Substance	Location	Cleanup Level
PAHs (carcinogenic)	North LF, North 2 LF and South Bank	20.0 mg/kg
PCB Mixtures	North LF, North 2 LF and South Bank	10.0 mg/kg
TCE	North Landfill	0.5 mg/kg

Waste Soils exceeding these concentration levels shall be excavated and disposed by the Contractor at the East Landfill in accordance with applicable portions of SECTION VIII – GENERAL WORKMANSHIP SPECIFICATIONS AND STANDARDS. Waste Soils excavated from the North 2 Landfill and the South Bank Area of Concern containing PCBs with concentrations exceeding 50 mg/kg (PCB Wastes) will be excavated, segregated from other Waste Soils and disposed off-site at an Owner approved and permitted Toxic Substances Control Act (TSCA) facility. Procurement of roll-off boxes and transportation and Disposal (T&D) costs associated with PCB Wastes will be paid for by the Owner. The management of the roll-off boxes (delivery/pick-up, manifests) shall be performed by the Contractor.

3. Definitions: The definitions of PAHs and PCB Mixtures, as presented in WAC 173-340-200, are as follows:

PAHs (carcinogenic) - means those PAHs substances identified as A (known human) or B (probable human) carcinogens by the United States Environmental Protection Agency. These include benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cy)pyrene.

Polychlorinated biphenyls or PCB mixtures - means those aromatic compounds containing two benzene nuclei with two or more substituted chlorine atoms. For the purposes of this chapter, PCB includes those congeners which are identified using the appropriate analytical methods as specified in WAC 173-340-830 (for solid waste the analytical method is Method 1 - "Test Methods for Evaluating Solid Waste", USEPA, SW-846 and any revisions or amendments thereto.)

4. North 2 Landfill: The removal of Waste Soils containing PCBs and PAHs shall proceed as shown on Drawings A-046103-WW through A-046106-WW and in accordance with these Specifications. Based on analytical results from previous investigations, one location within the North 2 Landfill, (TB-48) exhibited PCB concentrations over 50 mg/kg at a depth of 7 feet (21 ft. AMSL). The

Contractor will delineate an area 20 feet square around this location. When the Contractor has excavated to a depth of approximately 2 feet within the square, to an elevation of 26 ft. AMSL, the Owner's Representative will perform immunoassay screening at the center of the 20 foot square to verify concentrations of PCB less than 50 mg/kg. The Owner's Representative will repeat the procedure at elevation 24 ft. AMSL. If concentrations of PCBs do not exceed 50 mg/kg at either elevation, the Contractor will excavate to elevation 22 ft. AMSL. At elevation 22 ft. AMSL, the contractor will excavate and segregate the PCB Wastes within the 400 square feet area. Segregation will continue to elevation 20 ft. AMSL. If concentrations of PCBs exceed 50 mg/kg at either 26 ft. or 24 ft. AMSL, the contractor will excavate and segregate the PCB Wastes within the 400 square feet area. Segregation will continue to elevation 20 ft. AMSL. At elevation 20 ft. AMSL, the Owner's Representative will perform immunoassay screening to document removal of PCB Wastes with concentrations of PCBs greater than 50 mg/kg. If concentrations of PCBs exceed 50 mg/kg, an additional two feet of PCB Wastes within the 400 square feet area will be excavated and the immunoassay screening will be repeated until results indicate PCB concentrations less than 50 mg/kg, or groundwater is encountered.

When the Contractor reaches the excavation contours shown on the Drawings for the remaining area of the North 2 Landfill, immunoassay field screening will be performed by the Owner's Representative to document removal of Waste Soils with PCB concentrations greater than 10 mg/kg and PAHs concentrations greater than 20 mg/kg and to qualitatively determine if cleanup levels have been achieved. Field screening locations for PCBs will be established at 25 foot spacing intervals along section station lines spaced 25 feet apart as shown on Figure 5-1 of the CQAP presented in Appendix C. Field screening locations for PAHs will be established at 50 foot spacing intervals along section station lines spaced 50 feet apart as shown on Figure 5-1 of the CQAP presented in Appendix C. The existing construction baseline will be used to establish the section lines. The number of screening points along one station line will be maximized, based on the width of the excavation at the station. If initial field screening results indicate concentrations of PCB greater than 10 mg/kg or PAH concentrations greater than 20 mg/kg, an additional one foot of soil will be excavated and the field screening will be repeated. The additional one foot of excavation will extend to the nearest adjacent clean sample locations. Excavation will cease if groundwater is encountered. Once the immunoassay field screening for PCBs and PAHs have qualitatively indicated that the Waste Soils soil has been removed, verification grab samples will be collected to quantitatively verify that Waste Soils have been removed from the North 2 Landfill and cleanup

levels have been achieved. A discussion of PCB and PAH verification sampling is presented in Section VI, Part 7, below.

5. North Landfill: The removal of Waste Soils containing PCBs and PAHs shall proceed as shown on Drawing A-046105-WW and in accordance with these Specifications. When the Contractor reaches the excavation contours shown on the Drawings for the remaining area of the North Landfill, immunoassay field screening will be performed by the Owner's Representative to document removal of Waste Soils with PCB concentrations greater than 10 mg/kg and PAHs concentrations greater than 20 mg/kg and to qualitatively determine if cleanup levels have been achieved. Field screening locations for PCBs will be established at 25 foot spacing intervals along section station lines spaced 25 feet apart as shown on Figure 5-1 of the CQAP presented in Appendix C. Field screening locations for PAHs will be established at 50 foot spacing intervals along section station lines spaced 50 feet apart as shown on Figure 5-1 of the CQAP presented in Appendix C. The existing construction baseline will be used to establish the section lines. The number of screening points along one station line will be maximized, based on the width of the excavation at the station. If initial field screening results indicate concentrations of PCB greater than 10 mg/kg or PAH concentrations greater than 20 mg/kg, an additional one foot of soil will be excavated and the field screening will be repeated. The additional one foot of excavation will extend to the nearest adjacent clean sample locations. Excavation will cease if groundwater is encountered. Once the immunoassay field screening for PCBs and PAHs have qualitatively indicated that the Waste Soils soil has been removed, verification grab samples will be collected to quantitatively verify that Waste Soils have been removed from the North 2 Landfill and cleanup levels have been achieved. Verification grab samples will be analyzed for PAHs, PCBs and TCE.

6. South Bank Area of Concern: The excavation of PCB Wastes (soils with PCB concentrations over 50 mg/kg) shall proceed to the lines, grades and elevations shown on Drawing A-046107-WW and in accordance with the Technical Specifications. At several locations, an area of 400 square feet (20 ft. by 20 ft.) has been established at the elevation where previous investigations indicate concentrations of PCB greater than 50 mg/kg (PCB Wastes). Once excavation of PCB Wastes has reached this elevation, the Owner's Representative will perform immunoassay screening to document removal of PCB Wastes with concentrations of PCBs greater than 50 mg/kg. If concentrations of PCBs exceed 50 mg/kg, an additional two vertical feet of PCB Wastes within the 400 square feet area will be excavated and the immunoassay screening will be repeated until results

indicate PCB concentrations less than 50 mg/kg, or groundwater is encountered.

Following removal of the PCB Wastes, the Contractor shall excavate Waste Soils with concentrations of PCBs less than 50 mg/kg and greater than 10 mg/kg and PAHs. The excavation shall proceed to the lines, grades and elevations shown on the Drawings and in accordance with the Technical Specifications. When the Contractor reaches the excavation contours shown on the Drawings for the remaining area of the South Bank Area of Concern, immunoassay field screening will be performed by the Owner's Representative to document removal of Waste Soils with PCB concentrations greater than 10 mg/kg and PAHs concentrations greater than 20 mg/kg and to qualitatively determine if cleanup levels have been achieved. Field screening locations for PCBs will be established at 25 foot spacing intervals along section station lines spaced 25 feet apart as shown on Figure 5-2 of the CQAP presented in Appendix C. Field screening locations for PAHs will be established at 50 foot spacing intervals along section station lines spaced 50 feet apart as shown on Figure 5-2 of the CQAP presented in Appendix C. The existing construction baseline will be used to establish the section lines. The number of screening points along one station line will be maximized, based on the width of the excavation at the station. If initial field screening results indicate concentrations of PCB greater than 10 mg/kg or PAH concentrations greater than 20 mg/kg, an additional one foot of soil will be excavated and the field screening will be repeated. The additional one foot of excavation will extend to the nearest adjacent clean sample locations. Excavation will cease if groundwater is encountered. Once the immunoassay field screening for PCBs and PAHs have qualitatively indicated that the Waste Soils soil has been removed, verification grab samples will be collected to quantitatively verify that Waste Soils have been removed from the North 2 Landfill and cleanup levels have been achieved. A discussion of PCB and PAH verification sampling is presented in Section VI, Part 7, below.

7. Verification Grab Samples at North 2 Landfill and South Bank Area of Concern: - A grid for establishing locations of verification grab samples at the North 2 Landfill and the South Bank Area of Concern is presented in Figures 5-3 and 5-4 of the CQAP presented in Appendix C. The grid utilizes the existing construction baseline at the site to establish sampling lines spaced every 50 feet perpendicular to the baseline. Sample points on each sampling line are spaced 30 feet apart. Sample points on adjacent sampling lines will be staggered by 15 feet, so that every sample point bisects the midpoint between two sample points on an adjacent sample line. This method creates a hexagonal grid sample design which is recommended in the USEPA reports, "Verification of PCB Spill Cleanup by Sampling and Analysis" (USEPA, 1985) and "Field Manual for Grid Sampling of

PCB Spill Sites to Verify Cleanup" (USEPA, 1986). The proposed distances between samples meets the criteria for row and sample spacing recommended in these documents. The hexagonal grid sampling design will be laid out within a sample circle centered on each of the excavation areas, and extending just beyond its boundaries. The following 7 steps as identified in the "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup" (USEPA, 1996) will be referenced as needed:

Step 1: Diagram the Cleanup Site,
Step 2: Diagram All Cleanup Surfaces in the Same Plane,
Step 3: Find the Center and Radius of the Sampling Circle,
Step 4: Determine the Number of Grid Sample Points to Use,
Step 5: Lay Out the Sampling Points on the Diagram Constructed in Step 2,
Step 6: Lay Out the Sampling Locations on the Site, and
Step 7: Consider Special Cases and Use Judgment for Sample Points.

When the Contractor reaches the excavation contours shown on the Drawings, and immunoassay field screening indicates that cleanup levels have been qualitatively achieved, verification grab samples will be collected to quantitatively document removal of Waste Soils with PCB concentrations greater than 10 mg/kg and PAHs concentrations greater than 20 mg/kg. If initial verification sample results indicate concentrations of PCBs greater than 10 mg/kg or PAHs greater than 20 mg/kg, an additional one foot of soil will be excavated and the verification grab sample process will be repeated. The additional one foot of excavation will extend to the nearest adjacent clean sample locations for the exceeded constituent. Excavation will cease if groundwater is encountered.

8. Verification Grab Samples at North Landfill – Verification sampling at the North Landfill will be conducted by the Owner's Representative in the same manner as verification sampling at the North 2 Landfill and the South Bank Area of Concern, as discussed above. However, in addition to PAH and PCB analysis, the verification grab samples will be analyzed for TCE concentrations less than 0.5 mg/kg to quantitatively determine if cleanup levels have been achieved. If initial verification sample results indicate concentrations of TCE greater than 0.5 mg/kg, an additional one foot of soil will be excavated and the verification grab sample process will be repeated.

9. Sampling Activities and Quality Assurance/Quality Control - The CQAP in Appendix C provides a discussion of the sampling activities and quality assurance/quality control (QA/QC) activities that

will be performed as part of the Confirmation Sampling Plan.

10. Decision Making Process - The process involved in making the decision as to whether the soil concentrations at the South Bank Area of Concern and the North and North 2 Landfills meet the cleanup standard is shown in Figure 2 and is based on the WDOE guidance document titled, "Statistical Guidance for Ecology Site Managers" (WDOE, 1992).

C. GEOTECHNICAL TESTING

Pre-construction testing of the Random Fill and Backfill shall be conducted by the Contractor to verify that the proposed off-site borrow source meets the requirements stated in these Specifications. The testing to be performed is discussed in the Construction Quality Assurance Plan, attached as Appendix C to these Specifications.

During Waste Soil placement, in-place densities and moisture contents will be performed by the Owner's Representative once for every 1,000 cubic yards of soil placed, in accordance with ASTM D2922 and D3017 respectively. During Random Fill installation, in-place densities and moisture contents will also be performed (in accordance with the above ASTM methods) by the Owner's Representative at least five times per acre per lift or for every 1,000 cubic yards, whichever is more frequent.

The Contractor shall conduct a pull-out test on the screw anchor selected for use with the concrete revetment. The test shall be conducted in accordance with the manufacturer's recommended procedures for conducting the test. The Owner's Representative will be present during the performance of the test.

D. SURVEYING

The Contractor shall make periodic survey checks during the performance of Work and shall make a final survey check at the end of the job. Surveys shall be made available to the Owner or the Owner's Representative upon completion so that any discrepancies can be resolved in the field. All quantities shall be approved/verified by the Owner's Representative before payment.

The Contractor shall install three (3) settlement plates on the East Landfill after construction of the Engineered Cover is completed. The location of the settlement plates will be established by the Owner's Representative. The Contractor shall also establish an at-grade survey monument at the top of the embankment slope near the concrete revetment. Horizontal and vertical coordinates shall be established for this monument and included as part of the Remedial Action Report.

E. AS-BUILT DRAWINGS

Forty-five days after completion of Remedial Action, the Contractor shall provide the Owner's Representative with as-built drawings that shall include the following:

- Horizontal and vertical extent of Waste Soils removed from the North and North 2 Landfills and the South Bank Area of Concern;
- Horizontal and vertical extent of Waste Soils placed and compacted at the East Landfill;
- Horizontal and vertical extent of soil and volume of Random Fill (obtained from the offsite borrow source) placed as backfill at the North and North 2 Landfill and as fill in the Engineered Cover of the East Landfill;
- Horizontal and vertical extent of the soil cover and volume of Soil Cover (obtained from the offsite borrow source) placed as fill in the Engineered Cover of the East Landfill;
- Volume of Random Fill graded during rehabilitation of the shoreline;
- Horizontal and vertical extent and volume of Random Fill (obtained from the offsite borrow source) placed as backfill during rehabilitation of the shoreline;
- Horizontal and vertical extent and volume of Random Fill (obtained from the offsite borrow source) placed as additional fill outside the limits of the East Landfill;
- Mat layout plan of concrete revetment placed along the shoreline during rehabilitation;
- Panel layout plan of geomembrane installed as part of the Engineered Cover of the East Landfill;
- Final topography of the North and North 2 Landfill;
- Final topography of the Engineered Cover constructed over the East Landfill;
- Location of the Anchor Trench Platform, the completed anchor trench and the anchor trench drainage pipe outlets;
- Limits and locations of aquatic vegetation planted within the concrete revetment along the shoreline;
- Final topography of the shoreline areas covered by concrete revetment;
- Location of new Monitoring Wells;
- Location of the construction baseline relative to each items presented above;

The request for information presented above shall be presented in either a section or plan format. Sections shall be performed at a minimum of 50-foot intervals. The Owner's Representative will provide design drawings in electronic format to the Contractor for reference, if needed.

F. REMEDIAL ACTION REPORT

Within 45 days of the completion of demobilization for RA at the Containment Area by the Contractor, the Owner's Representative will submit to the Owner for review a Draft RA Report. The Contractor shall cooperate with the Owner's Representative and assist in developing this report. The report will contain documentation that the RA was performed in accordance with design specifications and the appropriate closure requirements of Alcoa and WDOE. The report shall be submitted to WDOE 60 days after WDOE's final inspection.

The report shall include a discussion and associated documentation of the following items:

1. Work Permits and Borrow Source Pre-Construction Testing

2. Site Preparation

a. Mobilization
b. Staging Areas, Access Roads and Railroad Crossings
c. Construction Layout and Surveys
d. Erosion and Sediment Control
e. Decontamination policy and procedure
f. Building/Wall Demolition and Pipe Plugging
g. Existing Fence Removal
h. Sprinkler System/Waterline Installation
i. Storage/Operations Building Construction

3. South Bank Area of Concern

a. Clearing and Grubbing
b. Waste Soil Excavation and Handling
c. Confirmation Sampling
d. Spread/Compact Random Fill

4. Shoreline Rehabilitation

a. Clearing and Grubbing
b. Grading
c. Spread/Compact Random Fill
d. Concrete Revetment Placement
e. Plants and Vegetation

5. North and North 2 Landfill

a. Clearing and Grubbing
b. Waste Soil Excavation and Handling
c. Confirmation Sampling
d. Grading
e. Spread/Compact Random Fill
f. Vegetation

6. East Landfill Construction

a. Grading/Leveling
b. Construction of Anchor Trench Platform/Waste Soil Embankment
c. Waste Soil Placement
d. Engineered Cap Construction
e. Geomembrane Inspection and Testing
f. Vegetation
g. Fencing
h. Monitoring Well Extension/Protection

7. Additional Fill Outside Limits of East Landfill

a. Spread/Compact Random Fill
b. Vegetation

8. Borrow Area

9. Site Cleanup and Damage Repair and Maintenance of Revegetated Areas

10. Construction Quality Assurance Activities and daily work logs (to be supplied by the Owner's Representative)

11. Health and Safety Procedures and Monitoring Results (ambient air monitoring, personnel monitoring, etc.)

The report shall include as-built drawings. All testing results (e.g., soil geotechnical testing, soil nutrient analyses, compaction testing, air monitoring, etc.) shall be included in the report.

VII. GENERAL MATERIAL SPECIFICATIONS AND STANDARDS

A. GENERAL

All materials required for the Work covered by these Specifications shall be as specified in the following Alcoa Engineering Standards, Washington State Department of Transportation 1994 Standard Specifications for Road, Bridge and Municipal Construction (Washington Standard Specifications) and/or as supplemented herein.

Alcoa Engineering Standard Number	Description
33.121.7	Specifications for Cast-in-Place Concrete Materials
33.121.7A	Specifications for Concrete Materials-Appendix
33.4001.7	Specifications for Site Waste Water Disposal Piping Materials
33.2601.7	Steel Fence Materials (1996 June)
33.2601.7A	Steel Fence Materials-Appendix (1996 June)
33.192.7	Specification for Grouting Materials dated 1997 September.
33.213.7	Specification for Pre-Engineered Metal Building System-Materials dated 1997 May.
33.213.7A	Specification for Pre-Fabricated Metal Building Manufacturers-Appendix dated 1997 May.
33.252.7	Standard Specifications for Steel Doors and Frames-Materials dated 1998 July.
33.252.7A	Standard Specifications for Steel Doors and Frames-Materials-Appendix dated 1998 July.
33.252.7.1	Standard Specifications for Finish Hardware-Materials dated 1998 July.
33.252.7.1A	Standard Specifications for Finish Hardware-Materials-Appendix dated 1998 July.
33.3201.7	Specification for Site Water Distribution Systems-Materials dated 1997 December.

B. OWNER-FURNISHED MATERIALS

The Owner will provide the following materials for use by the Contractor in performing the Work as described in Section VIII – GENERAL WORKMANSHIP SPECIFICATIONS AND STANDARDS. locations where the Contractor may access and connect to electric and water utilities. The cost to connect to these utilities shall be incurred by the Contractor.

1. **Precast Concrete Revetment for Shoreline Protection:** The precast concrete revetment (Revetment) for protecting the shoreline at the Site will be provided by a supplier designated by the Owner. The revetment will be manufactured using concrete with a minimum compressive strength of 3,500 pounds per square inch and admixtures for sulfate resistance.

A vendor specification for the Revetment is provided in Appendix C.

Anchorage and geotextile used in conjunction with the Revetment shall be supplied by the Contractor. The Revetment will be supplied by the Owner. Transportation and delivery costs will be paid for by the Owner. Spreader bars for unloading and placement of Revetment will be obtained from the manufacturer by the Contractor. The Contractor shall provide equipment and labor for unloading, storage, and placement of the Revetment. The Owner will provide a staging area for the Revetment. The management of the Revetment (delivery/staging, etc.) and installation shall be performed by the Contractor.

2. **Utility Connection Locations:** The Owner will provide or indicate locations where the Contractor may access and connect to electric and water utilities. The cost to connect to these utilities shall be incurred by the Contractor.

3. **Roll-off boxes for PCB Wastes:** The roll-off boxes for PCB wastes will be minimum 20 cubic yard boxes obtained by the Owner from Waste Management Inc. (WMI) in Arlington Oregon. The Owner will provide the Contractor with his Waste Identification number. The roll-off boxes will be equipped with interior plastic liners with a minimum thickness of 10 mils and a tarpaulin for covering the PCB wastes after placement in the box. The management of the roll-off boxes (delivery/pick-up, manifests) shall be performed by the Contractor.

C. CONTRACTOR-FURNISHED MATERIALS

This Contractor shall furnish all other materials necessary for the Work, in accordance with Part D of this Section of these Specifications, unless specifically noted otherwise under Part B of this Section of these Specifications.

D. SUPPLEMENTAL SPECIFICATIONS

The materials used in performing this Work shall conform to the material specifications listed in this section. Prior to installation of materials specified in this section, the Contractor shall submit a certificate from the manufacturer or material supplier for approval by the Owner's Representative certifying that the materials are free of contamination and meet all requirements stated in these specifications.

1. **PHASE I - Site Preparation**. Materials to be used in preparing the site shall meet the following requirements:

a. Mobilization

(1) Field Trailers: Field Trailers shall be of sufficient size to accommodate the Contractor's personnel and shall have an area dedicated, with a desk and chair and access to telephone and facsimile, for Owner's Representative and the Owner. The trailer shall also have an area for conducting sit down meetings attended by a maximum of 12 people.

(2) Roll-off Boxes: Roll-off boxes for disposal of trash, spent PPE, and other ancillary materials shall have a capacity of at least 10 cubic yards and the capability to be easily removed by the transportation carrier. The boxes shall be equipped with interior plastic liners with a minimum thickness of 6 mils and shall be obtained from an Owner approved disposal facility.

(3) Equipment: Equipment to perform the Work shall meet the requirements of applicable Alcoa Engineering Standards. Fuel for equipment shall be of the proper grade and shall be stored and dispensed in accordance with applicable codes.

b. Staging Areas, Access Roads and Railroad Crossings

(1) Crushed Stone: Crushed stone for haul and access roads, staging areas, construction entrances and rail crossings shall meet the requirements of the American Society for Testing and Materials (ASTM) D448 "Classification of Sizes of Aggregate for Road and Bridge Construction," size number 357 or an equivalent stone approved by the Owner's Representative. The stone shall be angular in shape and free of any organic and deleterious materials. It shall meet the following gradation requirements:

Sieve Size	Percent Passing
2-1/2 in.	100
2 in.	95-100
1 in.	35-70
1/2 in.	10-30
No. 4	0-5

(2) Filter Fabric: The filter fabric used in constructing access roads shall be Mirafi 500X, manufactured by The TC Mirafi (706-693-2226) or an equivalent filter fabric approved by the Owner's Representative. The following Minimum Average Roll Values (MARV) shall be met:

Weight	4.0 oz.
Thickness	20 mil
Grab Tensile Strength	200 lb.
Grab Tensile Elongation	15% (MD) 10% (CD)

Trapezoidal Tear Strength	75 lb.
Mullen Burst Strength	400 psi
Puncture Resistance	90 lb.
Apparent Opening Size	50

c. Construction Layout and Surveys. Materials to be used shall meet the following requirements:

(1) Survey Stakes: Survey stakes shall be wooden or metal stakes or flags meeting the approval of the Owner's Representative.

(2) Safety Fencing: Safety fencing to be used around the excavated areas shall be Alpi orange safety fence, 4 ft. high or an equivalent fence approved by the Owner's Representative.

d. Erosion and Sediment Control: Material to be used shall meet the following requirements:

(1) Jersey Barrier and Wattles on Shoreline:

a. Jersey Barriers: Jersey Barriers to be used for erosion control along the shoreline shall be concrete and meet the cross sectional geometry shown on the Drawings. Minimum length of the barriers shall be 8 feet. The barriers shall be connected in series using a method that prevents translational movement.

b. Straw Wattles: Straw wattles to be used for erosion control along the shoreline and at other locations on the Site shall be BioD-Watl12 manufactured by RoLanka International (800-760-3215) or an equivalent coir fiber wattle approved by the Owner's Representative. The wattle shall be a minimum of 12-inches in diameter and shall possess a minimum unit weight of at least 4 pounds per linear feet. The netting surrounding the coir fiber shall possess a minimum tensile strength of 60 pounds.

c. Anchor Posts: Anchor Posts for the Jersey Barriers along the shoreline shall be minimum 2.0-inch diameter schedule 40 steel posts, 6 feet long, with an embedment below ground surface of at least 3.5 feet.

(2) Silt Fence:

a. Material: The Silt Fence to be used to control erosion and sedimentation shall be SI F104 manufactured by Synthetic Industries (423-899-0444) or an equivalent filter fabric approved by the Owner's Representative. The fabric shall be provided in 12 foot widths and shall meet the following Minimum Average Roll Values (MARV):

Weight	ASTM D5261	5.9 oz.
Thickness	ASTM D5199	13 mil
Grab Tensile Strength	ASTM D4632	370 lb.(MD) 250 lb.(CD)
Grab Tensile Elongation	ASTM D4632	15% (MD) 10% (CD)
Trapezoidal Tear Strength	ASTM D4533	100 lb.(MD) 70 lb.(CD)
Mullen Burst Strength	ASTM D3786	480 psi
Puncture Resistance	ASTM D4833	120 lb.
Apparent Opening Size	ASTM D4751	70
Water Flow Rate	ASTM D4491	18 gpm/sq. ft.

b. Anchor Posts: Anchor posts for supporting the Silt Fence shall be wood or steel, and be long enough to extend the full height of the fence fabric and embed 36-inches into the ground. Wood posts shall be a nominal 2 inches square; steel posts shall be 1.25 inches by 1.0 inches in the shape of a T-section. 12-gauge wire or 1/4 inch diameter rope shall be strung between the anchor posts to maintain them in an upright position.

c. Wire Mesh: Wire mesh for attachment to the downstream side of the silt fence shall be 17 gage steel with a mesh size not to exceed two inches.

d. Fasteners: Silt Fence shall be fastened to anchor posts using No. 9 staples, 1.5 inches long, or metallic coated tie wires, constructed of 17 gage steel and of an appropriate length. Silt fence shall be attached to the ground surface along the shoreline using No. 9 gauge wire staples, 10-inches long.

e. Stone: Stone for anchoring silt fence to the ground surface shall meet the requirements of the American Society for Testing and Materials (ASTM) D448 “Classification of Sizes of Aggregate for Road and Bridge Construction,” size number 1 or 2, or an equivalent stone approved by the Owner’s Representative.

(3) East Drainage Swale: Erosion control matting to be installed in ditches shall be BioD-Mat40 as manufactured by RoLanka International or an equivalent erosion control mat approved by the Owner’s Representative. The following MARV shall be met:

Weight	ASTM D3776	13.0 oz.
Wet Tensile Strength (MD)	ASTM D4595	620 lb./ft.
Wet Tensile strength (CD)	ASTM D4595	600 lb./ft.
% Open Area	calculated	60%
Thickness	ASTM D1777	0.35 inches

Recommended Shear Stress	calculated	3 lbs./sq. ft.

Staples shall be 11 gauge metal with an embedment length of 6-inches.

(4) Biodiffuser Trench: The leaching chamber for collecting and dispersing water from the anchor trench drain shall be Biodiffuser Model No. 2200BD, manufactured by Advanced Drainage Systems, Inc. Three biodiffusers shall be used in series. Soil used in backfilling the trench shall be sand fill obtained from an on-site source or material generated during the excavation of the biodiffuser trench.

(5) Infiltration Basin:

a. Riprap: Riprap for the overflow outlet of the infiltration basin shall be hard durable, angular in shape and resistant to weathering and to water action. The breadth or thickness of a single stone shall be more than one-third or its length. Shale and stone with shale seams shall not be acceptable. The minimum weight of the stone shall be 155 pounds per cubic feet. The riprap shall meet the following Class I gradation:

Weight of Stone (lbs.)	Equivalent Cube Dimension (in.)	Percent to Total Smaller Than the Given Size
33	7	100
22	6	80
11	5	50
1	2	10

b. Embankment Fill: Embankment Fill shall be a random fill meeting the requirements of Part D.2.d. of these Specifications.

e. Decontamination: Material to be used shall meet the following requirements:

(1) Geomembrane – Geomembrane for containing decon fluids shall be a High density polyethylene (HDPE) material with a minimum thickness of 40 mils and factory seams to obtain the required size.

(2) Berm Material – Material for creating sideslopes of the decon pad shall be soil, railroad ties, sandbags or a material selected by the Contractor and approved by the Owner's Representative. The berm material shall permit a smooth ingress and egress of vehicles to the decon pad.

(3) Open Top Tank and Polytank: The open top tank shall be designed such that liquids and solids, generated during equipment decontamination, can be separated and removed. The polytank shall be used for managing the potentially contaminated clear liquids generated from the open top tank. The polytank shall be selected by the Contractor and approved by the Owner's Representative and shall be round or square with a diameter not to exceed 60-inches and a capacity not less than 500 gallons. The Owner's Representative will dispose of water transferred to the polytank.

f. Building/Wall Demolition and Pipe Plugging:

(1) Low Density Cellular Fill: Fill for sealing of specified subsurface pipes shall be a low density cellular concrete manufactured by Maxflow Environmental Corporation (828-669-4875) or an equivalent cellular concrete or fill approved by the Owner's Representative. The cellular concrete shall attain a minimum point-of-placement density of 25 pounds per cubic feet and a minimum compressive strength of 50 pounds per square inch.

The plug for the pipe shall be composed of a material capable of supporting the weight of the fill material within the pipe given the elevation differences of the pipe shown on the Drawings.

(2) Demolition Material: Demolition materials generated by the removal of specified appurtenances shall consist of concrete, wood and metal.

g. Fence Removal: No Material Specifications.

h. Sprinkler System/Waterline

(1) Water meter: The water meter shall be of commercial grade with a fitting capable of accepting a water supply line of 2.0-inches. It shall be fitted with connections to facilitate the use of galvanized steel pipe for water supply and distribution. The meter shall provide a maximum water flow rate of 50 gallons per minute (gpm) at a pressure of 65 pounds per square inch (psi).

(2) Backflow Preventer: The backflow preventer shall be an anti-siphon valve with a built-in atmospheric vacuum breaker or a pressure vacuum breaker.

(3) Emergency shut-off valve: This valve shall be a ball valve, disk valve or butterfly valve, constructed from galvanized steel or brass, with a diameter of 2.0 inches.

(4) Control Valve: The control valves used to turn the sprinklers on and off shall be automatic, or electrically remote controlled, and shall also possess manual flow control capabilities and manual on-off valve controls. The valves shall be equipped with unions on each end to allow for easy removal and shall be capable of sustaining pressures in excess of 200 psi.

(5) Rotor Sprinkler Heads and Risers: The rotor sprinkler heads shall be pop-up style; the riser or piston shall possess a minimum pop-up height of 4-inches. The sprinkler head shall be constructed from plastic and shall contain a spring to pull or retract the piston down into the sprinkler assembly when the sprinkler is not operating. Sprinkler pistons that retract using gravity shall not be used. The sprinkler shall also contain a wiper seal around the piston to minimize leakage. The rotor sprinkler shall be capable of maintaining a pressure of 50 PSI at piston. The riser for the sprinkler shall be a PVC rigid arm swing joint.

(6) Wire: Wire for electrical connections shall be solid copper wire, Type UF, approved by Underwriters Laboratories, Inc. for direct burial in the ground. The size of the wire shall be in accordance with the Manufacturer's recommendations, but shall not be less than 14 gauge. Splices for wire shall be constructed using Scotch-Lok Unipack waterproof scaling packets, Pen-Tite connectors or an equivalent splice mechanism approved by the Owner's Representative. An expansion loop of 12-inches shall be provided at each wire splice or directional turn.

(7) Pipe and Fittings: Pipe for use in irrigation mains and laterals shall be Schedule 40 and meet the requirements of ASTM D 1785. Threaded pipe shall not be permitted. The pipe shall be capable of sustaining pressures in excess of 200 psi. Pipe for use in risers to the sprinkler heads shall be Schedule 80, with threaded or non-threaded ends. The riser pipe shall meet the requirements of ASTM D 1785 and shall be capable of sustaining pressures in excess of 200 psi. Fittings for all pipes shall be Schedule 80 and shall meet the requirements of ASTM D2464 (threaded) or ASTM D2466 (non-threaded), as applicable. Solvent for non-threaded pipe and fittings shall meet the requirements of ASTM D2564.

(8) Valve Boxes: Valve boxes for automatic or remote controlled valves shall be precast concrete with a minimum compressive strength of 3,000 psi. The valve boxes shall contain two punchouts or be constructed with two sleeves on opposite sidewalls to accept pipe from both sides of the valve. The diameter of such openings shall be 5-inches. The minimum dimensions of the interior of the valve box shall be 20 inches square by 24 inches high. A lockable, cast

iron or aluminum hinged cover at least 15-inches square shall be formed into the valve box to provide access.

(9) Automatic Control Equipment: The automatic control equipment for the sprinkler system shall consist of a central computer system and all ancillary features to provide fully automated capability to the sprinkler system. The equipment shall be adjustable to allow for variations of sprinkling for specific hours, days and months of the year.

i. Storage/Operations Building

(1) Pre-Engineered Building Structure: The pre-engineered building shall be a minimum of 16 feet long and 12 feet wide with a shed roof and a minimum eave height of 8 feet. The building sheeting shall be minimum 24 gauge corrugated galvanized steel and shall be fabricated in a single continuous length from the floor line to the eave line for wall sheeting and from eave line to eave line for roof sheeting. The sheeting shall meet the requirements of ASTM A653 and the galvanized coating shall conform to G90 standards. All exterior surfaces of galvanized steel shall receive a factory, roller applied paint coating with an exterior thickness of 0.8 to 1.2 mils when dry. The pre-engineered building shall meet the requirements of applicable Alcoa Engineering Standards.

The interior of the pre-engineered building shall contain general lighting for use by the inhabitants, emergency lighting in accordance with applicable codes and a single and a one-inch hose bib for discharging water. Floor drains shall be not be installed. Access to the pre-engineered building shall be through a six-foot wide double door, complete with the necessary hardware. The doors shall be lockable and shall meet applicable Alcoa Engineering Standards.

Lights, switches, wiring and fuse boxes installed within the building shall meet all applicable city, county and National Electrical Code (NEC) requirements. Materials shall be equipped to handle a residential power source.

(2) Cement – Cement for the concrete foundation of the building shall meet the requirements of ASTM C150, Standard Specification for Portland Cement, Type I or Type II.

(3) Fine Aggregate – Fine aggregate for concrete shall meet the requirements of Section 9-03.1(2) of the Washington Standard Specifications.

(4) Coarse Aggregate – Coarse aggregate for concrete shall meet the requirements of Section 9-03.1(3) of the Washington Standard Specifications.

(5) Reinforcement Fabric: Reinforcement fabric shall be "Fibermesh" as manufactured by Synthetic Industries, Inc. or and equivalent reinforcement fabric as approved by the Owner's Representative.

2. PHASE II - South Bank Area of Concern: Materials to implement remedial activities at the Site shall meet the following requirements:

a. Clearing/Grubbing: Cleared material shall include all trees and brush removed from the Site prior to any excavation . Grubbed material shall include any stripped vegetation or tree stumps removed from the South Bank Area of Concern prior to any excavation.

b. Waste Soils Excavation and Handling: Waste Soils shall include all soil, rock, bricks, concrete and debris below grade. The exact nature of the Waste Soils, except for the known constituents of PAHs, PCBs and some elevated levels of metals, is unknown; therefore, the Contractor shall take the necessary precautions during excavation of this material.

c. Confirmation Sampling: No material specifications, conducted by Owner's Representative in accordance with the Construction Quality Assurance Plan and Part B of Section VI.

d. Random Fill: Random Fill shall be a "Clean" soil material obtained from an off-site source, suitable for use by the Contractor for purposes discussed herein and meeting the following requirement:

- Unified Soil Classification System (USCS) symbol of GM, GC, SW, SM, SC, CL or ML;
- At least 30% by weight passes the No. 4 sieve;
- The maximum particle size is 2-inches; and
- The organic matter content of the soil shall not exceed 20% by weight, when tested in accordance with ASTM D2974.

The Contractor shall provide appropriate backup documentation for the Owner's Representative (i.e., gradation, classification or other test results) and documentation that the material is clean (i.e., from a virgin or non-industrial source) in order to obtain approval from the Owner's Representative for use of the material.

3. PHASE III - Shoreline Rehabilitation. Materials to be used in rehabilitation of the shoreline at the Site shall meet the following requirements:

a. Clearing and Grubbing: No Material Specifications.

b. Graded Materials: Graded materials shall include all soil, rocks and non-waste materials along the shoreline removed during the grading operations to create the benches and stable slopes for installation of the concrete revetment.

c. Random Fill: Random fill for constructing the shoreline embankment shall meet the requirements of Section VII, Part D.2.d, of these Specifications. Organic material for use in the top two feet of the embankment at selected locations shall be a compacted fill/compost mix, consisting of at least 30% compost, by weight. The compost shall be a well-decomposed, humus like material derived from well-decomposed yard waste. The compost shall be produced by a permitted solid waste composting facility, with all pieces smaller than one-inch in diameter.

d. Concrete Revetment: Materials to be used shall meet the following requirements:

(1) Filter Fabric: The filter fabric to be installed beneath the concrete revetment shall meet the requirements of Section VII, Part D.1.b.(2) of these Specifications.

(2) Anchorage for Concrete Revetment: Anchors to be used to aid in the support of the concrete revetment on the slope of the shoreline shall be 'Duckbill' or 'Helix' screw anchors or an equivalent anchor approved by the Owner's Representative. Each screw anchor shall posses a minimum pull-out force of 5,000 pounds, as required by the concrete revetment manufacturer.

(3) Concrete Revetment: The concrete revetment will be supplied by the Owner, in accordance with Part B.1. of these Specifications.

e. Planting and Vegetation: Materials to be used shall meet the following requirements:

(1) General: Plant Materials shall meet or exceed following reference standards for quality, size, and condition.

- WSDA Rules Related to Standards for Nursery Stock
- ANSI Z60.1-1990: Nursery Stock
- American Joint Committee for Horticultural Nomenclature: Standardized Plant Names.

- All plant materials shall be nursery grown, per the standards described above. Collected, wild plant materials are unacceptable.

(2) Live Stakes: Live stakes shall be live wood 2-5 years old with smooth bark that is not deeply furrowed. Stakes with split ends, or peeled bark, are unacceptable. The stakes shall be consistently cut so that the top end is square, and the bottom end (planted end) is angled. The cuts shall be clean; branches of stakes shall be trimmed as closely as possible. The top 1-2"of each stake shall be dipped into a 50/50 mix of light colored latex paint and water. Live stakes shall be a minimum of 2 feet tall and a maximum of 3 feet tall. Live stake cuttings shall have been soaked in water for a minimum of 5 days after cutting and prior to delivery to the Site.

(3) Bare Root Shrubs: Bare root shrubs shall be of the size shown on the Drawing A-046121-WW and meeting the reference standards for nursery stock stated above.

(4) Fertilizer: Fertilizer shall conform to referenced FS O-F-24D, Commercial Fertilizers and WSDA Laws. Fertilizer for all shrub plantings shall be "Bio Paks-16-6-8 plus minors and biostimulants" available from Reforestation Technologies International (RTI). 1-800-784-4769.

(5) Mulch: Mulch shall be a well-decomposed humus-like material derived from well-decomposed yard waste. Compost shall be produced by a permitted solid waste composting facility. All pieces shall be smaller than 1" in any direction. Mulch shall be obtained from Cedar Grove Composting (206) 764-1236, or approved equal.

4. PHASE IV - North and North 2 Landfills: Materials to implement remedial activities at the Site shall meet the following requirements:

a. Clearing and Grubbing: No material specification.

b. Waste Soils: Waste Soils shall include all soil, rock, bricks, concrete and debris below grade. The exact nature of the Waste Soils, except for the known constituents of PAHs, PCBs and some elevated levels of metals, is unknown; therefore, the Contractor shall take the necessary precautions during the excavation and handling of this material.

c. Confirmation Sampling: No material specifications, conducted by Owner's Representative in accordance with the Construction Quality Assurance Plan and Part B of Section VI.

d. Graded Materials: Graded materials shall include all soil, rocks and non-waste materials at the North and North 2 Landfills removed during the grading operations to create the stable slopes for final vegetation.

e. Random Fill: Random Fill for constructing the shoreline embankment shall meet the requirements of Section VII, Part D.2.d. of these Specifications

f. Revegetation: Materials to be used shall meet the following requirements:

(1) Seed - Seed to be used to vegetate disturbed areas and backfilled areas shall meet the requirements of Section 9-14.2 of the Washington DOT Specifications dated 2000. The seed mix shall be as follows:

Name	Pure Line Seed per Acre
Kentucky Bluegrass (poa pratensis)	60.0 lbs.
Creeping Red Fescue (festuca rubra)	60.0 lbs.
Annual Ryegrass (lolium multiflorum)	30.0 lbs.
TOTAL	150.0 lbs.

(2) Fertilizer - Fertilizer to be used in vegetating all disturbed areas shall meet the requirements of Section 9-14.3 of the Washington DOT Specifications dated 2000. The fertilizer shall be applied at a rate of 1,000 lbs. per acre using a proportion of 12-12-12 (Nitrogen-Phosphate-Potash (N-P-K)).

(3) Agricultural Limestone - Agricultural limestone to be used in vegetating the disturbed areas shall meet the requirements of Section 9-14.3(1) of the Washington DOT Specifications dated 2000.

(4) Mulching Material - Mulching material to be used in vegetating the Engineered Cap shall meet the requirements of Section 9-14.4 of the Washington DOT Specifications dated 2000. Mulch shall be applied as follows:

	Time Period	
Mulch Material	March 15 thru October 15	October 15 thru March 15
Hay	3 tons/acre	4.5 tons/acre
Straw	2 tons/acre	3 tons/acre

(5) Asphaltic Emulsion - Asphaltic emulsion for holding mulch in place shall meet the requirements of Section 9-14.4(7) of the Washington DOT Specifications dated 1994. Asphaltic emulsion shall be applied at a minimum rate of 60 gallons per ton of mulch.

5. PHASE V - East Landfill Construction

a. Clearing and Grubbing: No Material Specifications.

b. Anchor Trench Platform/Embankment: Random fill for the construction of the Anchor Trench Platform/Embankment shall meet the requirements of Section VII, Part D.2.d. of these specifications.

c. Waste Soils Placement: Waste Soils shall meet the requirements of Section VII, Part D.2.b. of these Specifications.

d. Engineered Cap Construction:

(1) Geosynthetic Clay Liner: The Geosynthetic Clay Liner (GCL) shall be Bentomat ST as manufactured by CETCO Corporation, Arlington Heights, IL (800-527-9948) or an equivalent GCL approved by the Owner's Representative. Certified Property Values for the GCL are listed below:

Property	Test Method	Value	Units
Bentonite Swell Index	ASTM D5890	24	ml/2g (min.)
Mass per Unit Area	ASTM D5993	0.75	lbs./sq. ft.
Grab Strength	ASTM D4632	90	lbs.
Peel Strength	ASTM D4632	15	lbs.
Permeability	ASTM D5084	5.0 x 10-9	cm./sec.
Hydrated Internal Shear Strength	ASTM D5321	500	lbs./sq/ ft. (typ.)

(2) Geomembrane:

a. Materials: The geomembrane shall be a 60-mil thick (0.060-inches) HDPE geomembrane, textured on both sides, manufactured by GSE Lining Technology, Inc., or an equivalent HDPE geomembrane approved by the Owner's Representative. PVC geomembrane shall not be permitted. The HDPE geomembrane shall contain trace amounts of antioxidants and heat stabilizers and no additives, fillers, or extenders. Carbon black 2%± shall be added to the resin for ultra-violet resistance.

The geomembrane material shall be so produced as to be free of holes, blisters, undispersed raw materials, or any sign of contamination by foreign matter. Any such defect shall be repaired using the extrusion fusion welding technique in accordance with manufacturer's recommendations, prior to installation.

The geomembrane material shall be manufactured in seamless minimum widths of 22.5 feet, with a textured surface on both sides. Labels on the roll identifying thickness, length, width, and manufacturer's mark number will be brought to the attention of the Owner's Representative. There shall be no factory seams. Minimum Average Roll Values (MARV) of the HDPE textured geomembrane are listed below:

Property	Test Method	Value	Units
Density	ASTM D1505	0.94	G/cc
Thickness	ASTM D5994		
	(60 mil nominal)	54	Mils
Tensile Properties (each direction)	ASTM D638 Type IV, Dumbell, 2 ipm		
Elongation at Yield (gauge length 1.3 in.)		13	%
Elongation at Break (gauge length 2.0 in.)		150	%
Strength at Yield		130	lb/inch-width
Strength at Break		240	lb/inch-width
Carbon Black Content	ASTM D1603	2.0	%
Puncture Resistance	ASTM D4833	108	lbs. (min)
Tear Resistance	ASTM D1004	42	lbs. (min)
Bonded Seam Strength	ASTM D3083	100%	Visual in both peel & tensile testing Die C

The Contractor shall, at the time of bidding, submit a certificate from the manufacturer of the sheeting, stating that the sheeting meets physical property requirements for the intended application. The Contractor shall also provide documentation from the manufacturer certifying his ability to install the specified geomembrane product.

b. Extrusion Joining Resin: Resin for joining geomembrane sheets and for joining geomembrane to pipe shall be HDPE produced by the same manufacturer as the geomembrane. Physical properties shall be the same as those used in the resin producing the geomembrane sheets. The resin shall be provided in black or natural color. Natural resin shall be colored through the addition of master batch colorant before use.

c. Ancillary Materials: Ancillary materials shall include all boots, clamps, straps and ties needed to facilitate construction of the engineered cover as discussed herein.

(3) Drainage Net/Filtration Geotextile:

a. Synthetic Drainage Netting/Filtration Geotextile Composite: The synthetic drainage netting/filtration geotextile composite shall be TEX-NET TN3002/861, as manufactured by Serrot International, Inc. (800-237-1777), or an equivalent drainage net/filtration geotextile combination approved by the Owner's Representative. The synthetic drainage netting shall be manufactured into a three dimensional structure using extruded high density polyethylene strands. Carbon black 2% ± shall be added to the resin for ultraviolet protection. It shall meet the following typical property values:

Property	Test Method	Value	Units
Carbon Black Content	ASTM D4218	2.0	%
Density	ASTM D1505	0.94	G/cc
Thickness	ASTM D5199	200	Mils
Mass per unit area	ASTM D5261	0.162	lbs./sq. ft.
Transmissivity @ 10000 psf	ASTM D4716	0.0001	sq. meter/sec.
Tensile Strength	ASTM D5035	45	lbs./inch

b. Filtration Geotextile: The polyproplyene filtration geotextile bonded to Serrot synthetic drainage netting or polyethylene filtration geotextile used for other applications shall be Geotex 861 or 1201, manufactured by Synthetic Industries (800-621-0444) or an equivalent geotextile approved by the Owner's Representative. The geotextile shall meet the following typical physical roll values, in the weak principle direction, depending on application:

Application	Test Standard	Value Bonded To TEX Net	Value for other uses
Type		861	1201
Fabric Weight	ASTM D5261	8.0 oz/sy	10.8 oz/sy
Grab Tensile Strength	ASTM D4632	220 lbs.	300 lbs.
Grab Elongation	ASTM D4632		50%
Trapezoid Tear	ASTM D4533		115 lbs.
Puncture Resistance	ASTM D4833	135 lbs.	175 lbs.
Mullen Burst Strength	ASTM D3786		580 psi

(4) Anchor Trench:

a. Drainage Pipe: Drainage pipe to be used in the anchor trench shall be 4-inch diameter corrugated polyethylene plastic tubing manufactured by Advanced Drainage Systems, with caps and fittings, or an equivalent pipe or tubing approved by the Owner's Representative. Pipe shall be supplied in perforated and non-perforated sections. The pipe shall be resistant to rot, decay and any chemical treatment or coating that would adversely react with surface or groundwater runoff and form particulates within the pipe. The pipe shall meet the requirements of AASHTO M252, ASTM F405 and ASTM F667.

b. Granular Material for Anchor Trench: Granular material for anchor trench shall free of any organic or deleterious material and shall conform to the requirements of ASTM D448, size No. 467, or with the following gradation requirements:

Sieve Size	Percent Passing
2.0"	100%
1.5"	90-100%
0.75"	30-70%
0.375"	10-35%
No. 4	0-10%

(5) Random Fill: Random Fill for construction of the 18-inch thick fill layer of the Engineered Cap over the East Landfill shall meet the requirements of Section VII, Part D.2.d of these Specifications.

(6) Soil Cover: Soil to be used for construction of the 6-inch thick Soil Cover layer of the Engineered Cap shall consist of the uppermost layers of fertile and friable soil that contains humus material. The organic content of the vegetative soil shall be not less than 2% and not more than 20% when tested in accordance with ASTM 2974. The soil shall meet a USDA Textural Classification of sandy clay loam, silty clay loam or silt loam and at least 40% by weight shall pass the No. 10 sieve. The maximum particle size of the material shall be two (2) inches. The vegetative soil shall be free of rocks, debris, stumps, roots or other material considered objectionable by the Owner's Representative.

e. Geomembrane Inspection and Testing: No Material Specifications.

f. Vegetation: Vegetative material shall meet the requirements of Section VII, Part D.4.e., of these Specifications.

g. Fencing and Gates: Fencing and Gates to be used in selected areas of the East Landfill shall meet the requirements of Section 9-16.1 of the Washington Standard Specifications and Alcoa Engineering Standard 33.2601.7. Fencing shall be six (8) feet high. The fence opening shall be sixteen feet wide and shall consist of two 8-feet wide double swing gates. Fencing shall have three strands of barbed wire on top. Fencing fabric shall be green PVC coated, in lieu of aluminum or zinc coating.

h. Monitoring Well Extension: - Materials to be used in extending wells shall meet the following requirements:

(1) Pipe and Casing- Material for extending monitoring wells shall be of the same diameter, shape and material as the existing monitoring well. Riser pipe shall be PVC, with the same schedule or SDR as the existing riser pipe. Metal casing shall be of the diameter, wall thickness and metal type capable of being welded or bolted to existing casing. Pipe for protective posts shall be 4-inch diameter, Schedule 40 pipe, 30-inches long with a base plate of sufficient area to allow four bolts to be installed for securing the plate to the concrete pad.

(2) Cement – Cement for pads shall meet the requirements of ASTM C150, Standard Specification for Portland Cement, Type I or Type II.

(3) Fine Aggregate – Fine aggregate for pads shall meet the requirements of Section 9-03.1(2) of the Washington Standard Specifications.

(4) Coarse Aggregate – Coarse aggregate for pads shall meet the requirements of Section 9-03.1(3) of the Washington Standard Specifications.

(5) Reinforcement Fabric: Reinforcement fabric shall be "Fibermesh" as manufactured by Synthetic Industries, Inc. or and equivalent reinforcement fabric as approved by the Owner's Representative.

6. PHASE VI - Additional Fill Outside Limits of East Landfill

a. Random Fill: Random Fill for areas outside the limits of the anchor trench platform of the East Landfill shall meet the requirements of Section VII, Part D.2.d of these Specifications.

b. Vegetation: Refer to Section VII, Part D.4.e of these Specifications.

7. Borrow Area

a. Purchase/Transport Random Fill: The Random Fill shall meet the material requirements of Section VII, Part D.2.d of these Specifications.

b. Purchase/Transport Soil Cover: Soil Cover shall meet the material requirements of Section VII, Part 2.5.d (6) of these Specifications

8. Site Cleanup, Damage Repair and Maintenance of Revegetated Areas: No material specification.

9. Final Project Inspections and Demobilization: No material Specification

10. All Applicable Taxes: No material Specification

VIII. GENERAL WORKMANSHIP SPECIFICATIONS AND STANDARDS

A. STANDARDS

All workmanship covered by these Specifications, and as briefly discussed in Part A of Section I of these Specifications, shall be performed in accordance with the referenced Standards, the following Alcoa Engineering Standards, the Washington Standard Specifications, as noted on the reference drawings and/or as specified in manufacturer's instructions, and/or as supplemented below.

Alcoa Engineering Standard Number	Description
33.121.8	Standard Specification for Cast-in-Place Concrete Workmanship
33.121.8.3	Standard Specification for Hot Weather Concreting
33.121.8.4	Standard Specification for Construction of Slabs-on-Grade
33.121.8.1	Standard Specification for Excavation and Backfill (1997 September)
33.2601.8	Specification for Steel Fence Workmanship
33.4001.8	Specification for Site Wastewater Disposal Piping Workmanship
33.3112.8	Groundwater Monitoring Wells Design, Workmanship, and Operation (1996 June)
33.192.8	Specification for Grouting Materials-Workmanship dated 1997 September.
33.213.8	Specification for Pre-Fabricated Metal Building Systems-Workmanship dated 1997 May.
33.252.8	Standard Specifications for Steel Doors and Frames-Workmanship dated 1998 July.
33.2121.8	Specification for Landscape Planting dated 1996 June
33.2131.8	Specification for Site Grading Operations And Workmanship dated 2003 March
33.3201.8	Specification for Site Water Distribution Systems-Workmanship dated 1997 December.

B. GENERAL

1. Drainage and Road Maintenance: Positive drainage control within the North and North 2 Landfills is not required, and ponding may occur in these areas. Positive drainage control at the East Landfill is not required. Contractor shall maintain access roads and return them to a condition approved by Owner's Representative. Plant roads shall be kept clean and free of mud. Dust shall be controlled by the Contractor during construction through spray application of water from a water truck provided by the Contractor at the Owner's request. Non-potable water is available on-Site from fire hydrants that will be

identified by the Owner's Representative, in accordance with Section V, Part A.2.d. of these Specifications.

2. Changed Conditions. Should the Contractor encounter, during the progress of the Work, physical conditions at the Site that differ from those indicated on the Drawings or in these Specifications, or differ from those generally recognized as inherent in Work of this nature, the Contractor shall promptly notify the Owner's Representative of such conditions before those conditions are disturbed. The Owner's Representative will thereupon investigate the changed conditions and consult with the Owner before recommending changes and/or further Work. If changes are considered significant and are not covered in the scope of Work presented in these Specifications, the Contractor shall submit a Change Order to perform the Work.

3. Soft Soil Conditions. Soft/compressible soils or Unsuitable Materials present beneath areas where fill is to be located shall be brought to the attention of the Owner's Representative before fill placement begins. The Owner's Representative shall then proceed in accordance with Section VIII, Part B.2. of these Specifications. If soft soils are designated for removal, the Contractor shall backfill with materials approved by the Owner's Representative to the required grade before beginning construction in that area. Soft/compressible soils or Unsuitable Materials removed shall be disposed at a location designated by the Owner's Representative.

C. EXISTING UTILITIES

1. Locating, Disconnecting and Protecting Utilities. The Contractor shall be responsible at all times for coordinating with the appropriate private and public utility companies in locating underground and overhead utility lines such as water, sewer, electric, gas, and telephone lines prior to the performance of Work. The Contractor shall locate and protect all utilities in or near the construction area, both above ground and underground, prior to construction, and shall conduct this operation in such a manner as to verify they will not be disturbed or endangered.

   The Contractor shall verify that all power lines within the limits of the North and North 2 Landfill, the East Landfill, the Shoreline Area and the South Bank Area of Concern are de-energized and shall disconnect and remove de-energized electric power lines from power poles. The location of the power poles are shown on the Drawing A-046111-WW. The disconnection shall be performed safely and in accordance with applicable Electrical codes and Alcoa Engineering Standards. Water lines from pumping wells located within the limits of the North and North 2 Landfills shall be protected during the

performance of Work. The fire hydrant and the underground piping located within the limits of the North Landfill shall be removed. The Contractor shall be responsible for terminating the water supply at the source and for sealing pipe not designated for removal. The Contractor assumes full responsibility for any damage resulting to such utilities during construction.

The Owner or the Owner's Representative will assist the Contractor in completing this task if requested, but this assistance shall not eliminate the Contractor's responsibility. If the presence of underground utilities or other underground obstructions requires a modification of the proposed Work, the Owner's Representative will determine the necessary changes.

2. Cooperation with the Public Utilities and Others. Prior to commencing operations and/or during the course of construction, the Contractor shall contact all public and private utilities and others in regard to the exact location of existing overhead and below ground facilities. The Contractor shall make his own arrangements with all public utilities and others affected by the proposed construction in regard to making required adjustments, temporary connections and relocations, and/or permanent connections and relocations of present facilities and installation of new facilities. The Contractor shall be responsible for determining who shall carry out the Work, and the timing and location of Work. Any modification or adjustment to the present facilities of any public utilities or other within the limits of construction which increases the quality and/or quantity of service over and above that which exists prior to construction shall be at the expense and cost of the said public utilities or other affected parties.

   No extra compensation shall be allowed to the Contractor on account of any loss, damage or delay caused to the Contractor, by or on account of such Work or by failure of any utility, or others, to perform the required Work at the proper time.

D. SUPPLEMENTAL WORKMANSHIP SPECIFICATIONS

1. **Phase I - Site Preparation**. Before commencing with Work, the Contractor shall prepare the Site for construction. Site preparation shall consist of equipment and trailer mobilization, access road and staging area construction, establishing construction layout controls, establishing erosion and sediment controls, the establishment of a decontamination area and the removal of existing fencing, as detailed herein. Areas where site preparation activities are to be implemented shall be located outside the limits of grading as indicated on the Drawings. Should the Contractor require additional area to establish facilities incidental to this Work, he shall notify the Owner's Representative of his needs. The Owner's Representative will review the request and recommend changes, if needed.

a. Mobilization –After the Contractor has received a written notice to proceed from the Owner, the Contractor shall provide all of the necessary equipment, materials, labor and work to perform the Work outlined herein. These furnishings shall be staged at the location indicated on the Drawing A-046101-WW. Operators shall be trained and certified in the operation of vehicles and equipment and must demonstrate operating abilities that meet the approval of the Owner's Representative. The Owner's Representative may perform routine inspections of equipment for compliance with applicable Alcoa Engineering Standards presented in Section V of this Specification.. Equipment required to perform clearing and grubbing and to construct (if needed) staging areas shall be mobilized first.

   At least one Site trailer meeting the requirements of Section VII, Part D.1.a. of these Specifications shall be established at the Site, at the location shown on Drawing A-046101-WW. Electrical, water and other utility connections shall be performed in accordance with Section V, Part A.2. of these Specifications. The Contractor shall locate a roll-off box for disposal of trash, spent PPE and other ancillary materials, in accordance with Section V, Part A.2. of these Specifications.

   All Work under this item shall be performed in a safe and professional manner.

b. Staging Areas, Access Roads, Construction Entrances and Rail Crossings – The Contractor shall construct Contaminated Material Haul Roads, clean access roads, construction entrances and staging areas at the locations shown on Drawings A-046103-WW and A-046107-WW. After clearing and grubbing have been performed in accordance with these Specifications, filter fabric meeting the requirements of Section VII, Part D.1.b (2). shall be unrolled directly onto the ground surface where the aggregate is to be placed. A minimum 18-inch overlap shall be maintained at all fabric joints. Aggregate shall then be end dumped onto the fabric and spread in one loose lift 8-inches thick. Compaction shall take place by routing equipment over the stone until nonmovement of the stone is observed by the Owner's Representative below compaction equipment during compaction operations. When completed, haul roads and access roads shall exhibit a cross section similar to that shown on Drawings A-046119-WW, A-046120-WW and A-046123-WW. The Contractor shall maintain these access roads as needed.

   Grading to meet slope requirements for haul roads shall be performed in accordance with Alcoa Engineering Standard 33.2121.8. Excavation shall be performed in accordance with Alcoa Engineering Standard 33.121.8.1 and 18.19. Material generated during excavation and grading shall

be classified as Random Fill and used to adjust road grades, as shown on the Drawing A-046103-WW.

Rail crossings shall be constructed at the locations shown on Drawing A-046103-WW. The placement of aggregate around the rails shall not exceed the height of the rails. Slopes to access the rail crossing may be modified by the Contractor to accommodate equipment using the crossing or existing conditions. Work around the rail crossings shall be performed in accordance with the requirements of Section V, Part B.

c. Construction Layout and Surveys

(1) General - The Contractor may secure the services of a surveyor to perform construction layout work or perform it himself. This work shall include, but not be limited to, establishing the limits of Waste Soil excavation, establishing the limits of the East Landfill construction, and establishing the limits of the shoreline rehabilitation. The Contractor's surveyor shall utilize a plant baseline indicated on Drawing A-046101-WW and established for the Owner by KPFF Consultants of Seattle, Washington in 1997.

(2) Survey Monuments - The Contractor shall locate the Owner's survey monuments and shall establish additional bench marks necessary for proper layout of the Work. The Contractor shall make all calculations involved and shall furnish and place all layout stakes or markers. The Contractor shall exercise care in the preservation of monuments and shall have them re-established at his expense if they are damaged, lost, displaced, or removed.

(3) Survey Stakes - The location of slope stakes for grading work shall be determined by a calculation method. Elevation control hubs with guard stakes shall be set, at a convenient distance outside the construction limits. The centerline station, distance from centerline, and elevation of the hub shall be recorded on each guard stake. The Contractor shall exercise care in the preservation of stakes and bench marks and shall have them reset at his expense if they are damaged, lost, displaced, or removed.

The Contractor shall be responsible for having stakeout work conform to the lines, grades, elevations, and dimensions called for on the Drawings. The Contractor shall be responsible for reporting any discrepancies to the Owner's Representative for clarification. Minor adjustments

to suit field conditions are anticipated and it shall be the responsibility of the Owner's Representative to make decisions regarding adjustments.

(4) Survey Cross Sections and Profiles - The Contractor shall survey cross sections and/or profiles in all areas of excavation and fill placement and shall survey plan areas as necessary to permit accurate determination of pay items quantities and to develop as-built drawings. Locations and spacing of cross sections and profiles shall be as approved or as directed by the Owner's Representative. The Contractor shall develop the necessary cross sections or profiles immediately before and after any excavation and fill placement is performed so that the end area method can be used to determine quantities for payment. When cross-sections do not provide a measurable quantity of Work performed, a plan survey shall be performed. As-built drawing information is discussed in Section VI, Part E of these Specifications.

(5) Survey Records - The Contractor shall furnish a copy of survey field records (i.e., those surveys used to calculate quantities of materials) to the Owner's Representative for review and for the Owner's permanent file. These records shall be furnished as they are completed during the progress of Work. Any inspection or checking of the Contractor's layout by the Owner's Representative and acceptance of all or any part of it shall not relieve the Contractor of responsibility to secure the proper dimensions, grades, and elevations for the required Work.

(6) Inspections and Checking of Work - It is not the intention to delay Work for checking of lines or grades; but, if necessary, construction activities will be suspended for such reasonable time as the Owner's Representative may require for this purpose. No special compensation shall be paid to the Contractor for Work delayed by checking lines and grades or by making other necessary inspection. The Contractor shall keep the Owner's Representative informed, a reasonable time in advance, of the times and places at which he intends to do Work in order that necessary checking or inspections can be made with minimum inconvenience to the Owner's Representative and delay to the Contractor.

(7) Safety Fence - Safety fence shall be installed as per the manufacturer's recommendations around all Waste Soil excavations.

d. Erosion and Sediment Control

(1) Jersey Barriers and Wattles on Shoreline: Jersey barriers along the shoreline shall be installed as shown in plan on Drawing A-046110-WW, in elevation on Drawing A-046112-WW. The angled posts shall be installed on 4-foot centers and extend a minimum of 3.5 feet below ground surface. The fabric shall be installed on the ground surface after installation of the barrier and secured with staples. Excess filter fabric shall be extended over the barrier and secured to the posts. If subsurface material prohibits the installation of staples, the filter fabric shall be buried at least 6-inches below the ground surface. Adjacent barriers shall be connected using metal plates inserted into slots on each longitudinal side of the barrier as shown in detail on Drawing A-046120-WW.

Wattles shall be installed on the upstream side of the jersey barrier as shown in detail on Drawing A-046120-WW, in accordance with the manufacturer's installation guidelines.

Jersey barriers shall be maintained in an erect position. Sediment shall be removed before the depth reaches 8-inches. Wattles shall be replaced if saturated with sediment or if damaged during sediment excavation. Additional requirements for jersey barrier maintenance are presented in the Erosion and Sediment Control Plan. If the jersey barrier is observed in a collapsed position, the sediment and other debris shall be removed and the barrier repaired or replaced. Standing water accumulating behind jersey barriers shall be pumped and managed in accordance with Part D.1.e(2), below.

(2) Silt Fence Installation –The Contractor shall install erosion and sediment control appurtenances in accordance with these specifications and the Erosion and Sediment Control Plan for the Site. Silt Fence with wire mesh backing shall be erected at the locations and in accordance with the details shown on the Drawings immediately after clearing operations have been completed. Anchor posts shall be installed on 8-foot centers and the filter fabric and wire mesh attached to the posts on the upstream side. Wattles and rock shall be installed over silt fence placed on the ground surface, as shown on Drawing A-046120-WW.

Silt Fence shall be maintained in an erect position and cleaned as required to function efficiently. Additional requirements for silt fence maintenance are presented in the Erosion and Sediment Control Plan. If the silt fence bulges by more than 4 inches from sediment buildup, or is observed in a collapsed position due to a buildup of the sediment, the silt and debris shall be removed and the silt fence repaired or replaced.

(3) East Drainage Swale: - The east drainage swale shall be constructed at the location shown on Drawing A-046110-WW. The swale shall begin at the base of the overflow outlet of the infiltration basin and end at the top of the precast concrete revetment along the shoreline. Material excavated to create the swale shall be classified as random fill and used as need at the Site. Upon completion, the swale shall exhibit the cross section shown in detail on Drawing A-046122-WW. Erosion control matting shall be installed in the wetted perimeter of the swale to the limits shown on the Drawing. Installation shall be performed in accordance with the manufacturer's installation guidelines.

(4) Biodiffuser Trench: The leaching chamber shall be installed in plan as shown on Drawing A-046110-WW and in detail as shown on Drawing A-046122-WW. The manufacturer's Installation guide shall be referenced and followed for all aspects of chamber handling, storage and installation. The trench for the leaching chamber shall be excavated with vertical side slopes to the width and depth shown on the Drawings. Excavation shall be performed in accordance with Alcoa Engineering Standard 33.121.7. Material generated during trench excavation shall classified as random Fill and used as backfill. The backfill shall be placed in loose lifts 12-inches thick and lightly compacted. Compaction shall not crush, collapse or indent the leaching chamber. The leaching chamber shall be covered with a minimum of 18-inches of fill.

(5) Infiltration Basin Construction: The infiltration basin shall be constructed at the location and to the lines and grades shown on Drawing A-046110-WW. Trees within the limit of the infiltration basin shall not be cut. Random fill meeting the requirements of Section VII, Part D.2.d of these Specifications shall be used to construct the berm for the overflow outlet structure. Construction shall be performed in accordance with Alcoa Engineering Standard 33.121.8.1.

Upon completion of the overflow outlet structure, riprap shall be installed to the limits as shown on Drawing A-046122-WW. Stone for loose riprap shall be placed by methods that will produce a compact uniform blanket of riprap protection having a reasonably smooth surface along the rip-water face. Riprap shall be placed to its full course thickness in one operation and in a manner to avoid displacing the underlying material. Placing of riprap material by end dumping on the slope or by other methods likely to cause segregation or damage to the slope

will not be permitted. Hand placing or rearranging of individual stones by mechanical equipment may be required to the extent necessary to secure the results specified.

e. Decontamination

(1) Decontamination Areas: The Contractor shall construct temporary decontamination areas adjacent to areas where equipment or personnel decontamination is needed. Potential locations for decontamination areas are shown on Drawing A-046103-WW. The Contractor shall review his method of constructing the pad with the Owner's Representative before proceeding. The geomembrane shall be secured to the berm in a manner that prevents displacement during the movement of equipment over the geomembrane and during wind uplift when it is not being utilized. Decontamination liquids will be managed as discussed below.

(2) Management of Decontamination Liquids. The Contractor shall provide an open tank(s) for managing the potentially contaminated liquids and solids generated as a result of equipment decontamination or other operations. Solids in the open tank or solids remaining in the decontamination areas as a result of decontamination shall be settled from liquids and placed as Waste Soils in the East Landfill, in accordance with these Specifications. Clear liquids shall be transferred from the open tank to a polytank. The location of the open tank and Polytank shall be determined by the Contractor and approved by the Owner's Representative. The cost of collecting samples, sample analysis, and transportation and disposal of the subject liquids will be the responsibility of the Contractor. The Contractor shall minimize to the extent possible, the generation of decontamination liquids.

f. Building/Wall Demolition and Pipe Plugging

(1) Building Demolition: Prior to start of work, Contractor shall engage a competent person to conduct an engineering survey in accordance with the provisions of OSHA, 29 CFR 1926.850 Subpart T. The engineering survey shall be utilized to determine safe demolition procedures to be utilized on this project. Project safety is solely the responsibility of the Contractor

The Contractor shall demolish building structures and their components, including all roofs, walls, slabs, footings, and substructures. All footings, walls and substructures shall be removed to a depth two feet below existing grade. During demolition operations, the Contractor shall remove all Excavation Debris, which is objectionable material, wood, timber, metal, concrete

rubble and concrete slabs using self-selected methods. Excavation Debris shall be broken or cut into pieces no larger than 12-inches, (measured in any direction) and placed as fill at the Loadout Area shown on Drawings A-046103-WW and A-046111-WW, in accordance with these Specifications. Demolition material with recycle value, such as steel and other metal, shall be salvaged in accordance with applicable laws and regulations and recycled by the Contractor at a permitted off-Site location.

The Contractor shall maintain a record of all vehicles departing the site, the destination of vehicles and the quantity and type of material being transported. The Contractor shall be responsible for the preparation and submission of all documentation, including permits, manifests, bills of lading, weight tickets, and disposal site receipts. Copies of all documentation shall be submitted to the Owner's Representative to verify conformance to all applicable Federal, State, and local rules and regulations.

All Work shall be done in accordance with OSHA's Construction Standard. All workers shall be trained in the hazards in accordance with OSHA's Construction Standard. All painted surfaces shall be hydraulically sheared or unbolted. If burning is required, a hot work permit must be approved by Owner's Representative. Lead abatement work or burning of lead painted surfaces shall comply with all lead abatement regulations; including Air Monitoring, PPE, Decontamination Unit, Medical Surveillance, and Employee Training that is currently in effect.

The Contractor shall maintain daily field logs of site activities to verify that the required quality control activities have been performed. These logs shall include the work of subcontractors and suppliers, and shall be on an acceptable form that includes, at a minimum: subcontractor and their area of responsibility, work performed each day, test and/or control activities performed, and materials demolished.

If during demolition operations, visible dust emissions are observed by the Owner's Representative, the Contractor shall implement dust control measures, such as water spraying. Dust control shall be defined as a method effective in preventing visible fugitive dust from leaving the work area during construction.

(2) Pipe Plugging: The Contractor shall install or construct the plug at the location shown on the Drawings. After the plug has been installed and approved by the Owner's Representative, the Contractor shall pump or gravity feed low-density cellular concrete into the pipe at the high

elevation end of the pipe. The Contractor shall use his own methods to convey the low-density cellular concrete to the plugged end of the pipe. Pipe filling shall be completed when the Contractor has installed in its final location within the pipe a volume of low-density cellular concrete greater than or equal to 95% of the volume of the pipe to be filled.

g. Existing Fence Removal: The Contractor shall disassemble and remove chain-link-fabric, line posts and concrete, top rails and barbed wire surrounding the two production wells shown on Drawing A-046103-W and from areas where fence removal is needed to perform the Work outlined within these Specifications. Concrete below grade used to support line posts shall be classified as Excavation Debris and shall be removed and disposed at the East Landfill. Line posts, top rails and chain-link fabric shall be disposed or recycled by the Contractor at an off-Site location.

h. Sprinkler System/Waterline: Two weeks before construction of the sprinkler system and waterline, the Contractor shall provide to the Owner's Representative a shop drawing indicating the layout of the system from the operations building to the end of the system. The drawings shall indicate the field location of pipe segments, pipe fittings and couplings, sprinkler heads, control valves and valve boxes. Water meters, backflow preventers, an emergency shut off valve and automated control systems shall be shown at proposed locations within the operations building. The shop drawings will be reviewed for completeness by the Owner's Representative.

Trenches shall be excavated at the approximate locations shown on Drawing A-046113-WW, in accordance with Alcoa Engineering Standard 18.19. The minimum depth of the trench shall be 18-inches; trench depth shall be adjusted as needed to establish an even grade for support of pipes.

Main pipe segments, pipe laterals and sprinkler head assemblies shall be installed in accordance with the Manufacturer's Installation guide for the Sprinkler System and Alcoa Engineering Standard 33.3201.8. Sprinkler heads shall be attached to laterals or main lines using swing joints, as shown in detail on Drawing A-046123-WW. Pipe and fittings for swing joints shall be Schedule 80.

Valve boxes shall be installed so that the hinged cover is flush with the ground surface before vegetation is established. Seal the annular space between the pipe openings and the main pipe segments with neoprene and caulk to minimize infiltration of soil and water. When installed the valve box shall meet the requirements shown in detail on Drawing A-046122-WW.

i. Operations/Storage Building: The Operations/Storage Building shall be constructed at the approximate location shown on Drawing A-046113-WW. The manufacturer's Installation Guide for the pre-engineered building and Alcoa Engineering Standard 33.213.8 shall be referenced and followed for all aspects of building setup and construction. Construction of the slab-on grade for the operations/storage building shall be performed in accordance with Alcoa Engineering Standards 33.121.8, 33.121.8.3 and 33.121.8.4. The slab shall be constructed to the dimensions shown on Drawing. A-046123-WW. Material generated by the excavation for the concrete slab shall be classified as Random Fill and used at other locations of the Site as needed.

Upon completion of building construction, the contractor shall install the necessary fuse box and make the necessary connections to the nearest electrical utility pole to obtain residential power for general lighting, emergency lighting, electrical outlets and the control panel for the sprinkler system. The lighting, switches, outlets and control panel shall be installed by certified electricians in accordance with the National Electrical Code (NEC) and applicable local and state electrical codes. Lights, switches and outlets shall be attached to the wall framing and not to the wall sheeting. Light shall be installed as high as possible to the eaves. Attachment of appurtenances to any portion of the roof shall be prohibited. Extra wall bracing shall be added as needed. Sprinkler control panels shall be attached to the framing opposite of the door, at a height that allows for ease of operation. Extra wall bracing to support the panels shall be added as needed.

In conjunction with electrical work, the contractor shall make the connection between the city of Vancouver water line and the mainline for the sprinkler system. The connections shall be made by certified plumbers in accordance with the National Plumbing Code (NEC) and applicable local and state codes. The plumber shall provide the support needed to facilitate installation of the piping, water meter, backflow preventer and hose bib. Support shall extend from the wall or from the floor; installation of these appurtenances shall occur in the rear one-half of the pre-engineered building. Quick-release couplings/connections shall be installed between appurtenances to allow for ease of maintenance or replacement, if necessary. The double locking door shall be located on the west side of the building and shall swing inward, as shown on Drawing A-046122-WW. Installation of the door and hardware shall be performed in accordance with Alcoa Engineering Standard 33.252.8.

Bare root shrubs meeting the material requirements of Section VII, Part D.3.e of this Specification shall be planted around the perimeter of the pre-engineered building. Planting shall be performed in accordance with Part D.3.e, below and with Alcoa Engineering Standard 33.2121.8, as applicable.

2. Phase II - South Bank Area of Concern

a. Clearing and Grubbing: Work shall begin with the clearing of the area designated for excavation of Waste Soils. Construction stakes establishing the limits of clearing and excavation shall be located by the Contractor based on Drawings A-046107-WW and A-046108-WW. Clearing shall include tree removal and brush removal.

An additional area around the staked Excavation Area shall be cleared, as illustrated on the Drawings, to permit the Owner's Representative to screen the area for the presence of additional Waste Soils. Should Waste Soils be discovered beyond the limits of the staked Excavation Area as shown on the Drawings, the Owner's Representative will delineate the new area. Excavation of the Waste Soils shall be performed in accordance with these Specifications.

During clearing operations, the Contractor shall cut all trees at a point no more than three inches above the existing ground surface within the limits shown on the Drawings. The cut trees shall be temporarily stockpiled as directed by the Owner's Representative. During clearing operations, the Contractor shall remove all Excavation Debris, which is objectionable material, rubbish, debris, stumps, brush, roots, rotten wood, concrete rubble, concrete slabs, wood utility poles and any other vegetation from the limits of clearing as indicated on the Drawings using self-selected methods. Excavation Debris shall be broken or cut into pieces no larger than 12-inches, (measured in any direction) and placed as fill at the East Landfill, in accordance with these Specifications. The Contractor shall utilize the Contaminated Material Haul Road to haul the subject material to the East Landfill. If during clearing operations, visible dust emissions are observed by the Owner's Representative, the Contractor shall implement dust control measures, such as water spraying. Dust control shall be defined as a method effective in preventing visible fugitive dust from leaving the Excavation Area during construction. The Contractor shall not disturb any areas other than those designated on the Drawings. No burning of cleared material or any other material (e.g., chipped brush) is allowed.

b. Waste Soil Excavation and Handling: The Contractor shall excavate the Waste Soils to the horizontal and vertical limits shown on Drawing A-046107-WW. The limits indicated are based upon analytical results presented in reports from previous investigations and referenced in Section I, Part B. Excavation shall be performed in accordance with Alcoa Engineering Standard 33.121.8.1 and 18.19. Vegetation on the ground surface and within the limits of excavation shall be considered Waste Soils. Waste Soils shall be excavated in 12-inch cuts, unless the Owner's Representative

directs thicker cuts. Excavation shall terminate when Confirmation Sampling indicates that all Waste Soil has been removed, or groundwater has been encountered. If Confirmation Sampling indicates the presence of Waste Soils, the Owner's Representative will establish a new excavation elevation and the Contractor shall excavate to that elevation.

Excavation of PCB Wastes shall be performed before excavation of Waste Soils. Excavation equipment and trucks shall not be permitted within the limits of the PCB Waste Excavation Area. PCB Wastes shall be placed in the roll-off boxes meeting the requirements of Section VII, Part B.3. The location of the PCB roll-off boxes shall be established by the Contractor and approved by the Owner's Representative to expedite his excavation activities. The Contractor shall be responsible for moving PCB roll-off boxes from the drop/pick-up area to the excavation area and for the decontamination of the roll-off box after they have been filled. Transportation and disposal costs of PCB Wastes will be paid for by the Owner. The Owner's Representative will perform Confirmation Sampling in accordance with these Specifications to guide the Contractor in the removal of PCB Wastes.

Steel, wire, Excavation Debris or vegetation encountered during excavation of PCB Wastes at the South Bank Area of Concern shall be classified and disposed as PCB Wastes. Excavation of Waste Soils shall not begin until Confirmation Sampling has verified removal of PCB Wastes and equipment has been decontaminated in accordance with Section VIII, Part D.1.e.

Waste Soil excavation shall be performed using a front-end loader or a hydraulic excavator. Excavation equipment and trucks shall be permitted within the limits of the subject Excavation Area, but shall avoid areas where Waste Soil excavation to the elevations shown on the Drawings has been completed. Excavation equipment shall load trucks on areas where Waste Soils have not yet been excavated. The Contractor shall utilize this method to prevent previously excavated, potentially clean areas from becoming contaminated due to equipment crossing or accidental spills from trucks.

After the trucks have been loaded, the Waste Soils shall be covered with a tarp secured to the truck. The trucks shall then haul the Waste Soils to the East Landfill. The trucks shall utilize the Contaminated Material Haul Road constructed between the subject Excavation Area and the East Landfill to transport Waste Soils. The number of trucks utilized shall be determined by the Contractor, based on his excavation loading time, his truck round trip times and standby time he wishes to accrue. After the Waste Soils have been dumped at the East Landfill, the truck shall return

to the subject Excavation Area using the Contaminated Material Haul Road. Placement of Waste Soils at the East Landfill is detailed in Section VIII, Part D.5.c. and is work associated with Phase V.

The Owner's Representative may delay excavation activities in a specific area for a period of one week to allow for collection and analysis of confirmation samples. If necessary, the Contractor shall mobilize his equipment to excavate Waste Soils at another Excavation Area so as not to delay Work. Excavation equipment shall be decontaminated prior to leaving the subject Excavation Area in accordance with these specifications.

After results of confirmation sampling have confirmed that Waste Soils have been removed from the subject Excavation Area, the Contractor's surveyor shall generate a topographic map of excavation grades, from which the actual volume of Waste Soils removed from the subject Excavation Area can be determined. After surveying, backfill of the subject Excavation Area shall be performed.

The Contractor **shall not** begin construction of the East Landfill using Waste Soils from the South Bank. Waste Soils from the South Bank shall be stockpiled at the north end of the East Landfill at a location designated by the Owner's Representative and temporarily covered with 10-mil thick plastic sheeting, secured to prevent movement from wind. Construction of the East Landfill shall commence with Waste Soils excavated from the North or North 2 Landfill in accordance with Section VIII, Part D.4.b. of these Specifications, after construction of the Anchor Trench Platform is performed in accordance with Section VIII, Part D.5.b. of these Specifications.

c. Confirmation Sampling: In conjunction with the excavation of Waste Soils, the Owner's Representative will implement a Confirmation Sampling Program. This sampling program, which consists of field screening techniques and the collection and subsequent laboratory analysis of soil samples from the subject Excavation Area, will be conducted to guide the horizontal and vertical limits of excavation for the purpose of confirming the removal of Waste Soils or PCB Wastes from the subject Excavation Area. During excavation, field screening will be conducted to verify the elevations of excavation described in the CQAP presented in Appendix C and to provide qualitative data on PCB and PAH content in soil. The point at which sample collection is to commence will be determined by the Owner's Representative, based on the completed excavation limits presented in the Drawings and on the results of field screening conducted by the Owner's Representative. The detailed Confirmation Sampling Program is presented in Section VI, Part B.

d. Random Fill Installation:

(1) General: Upon completion of verification/confirmation sampling, the South Bank Area of Concern shall be backfilled to the grades shown or Drawing A-046108-WW. Random Fill meeting the requirements of Section VII, Part D.2.d of these Specifications shall be used in construction. Placement of fill shall begin at locations of lowest elevation. Fill shall be spread in uniform horizontal layers 8-inches thick, measured when loose, across the entire width or length of the area to be filled, in accordance with Alcoa Engineering Standard 33.2121.8. Each layer, for its full width shall be compacted to not less than 95% of the maximum Standard Proctor Density, as determined by ASTM D698 in accordance with Alcoa Engineering Standard 33.3232.8.

(3) Compaction Testing: The Owner's Representative will be responsible for compaction testing. The Contractor shall control moisture content during compaction to no more than two percent above or below the optimum moisture content. The Contractor shall utilize water spraying to increase moisture contents or discing or harrowing to decrease moisture content, as needed. In-place densities and moisture contents will be performed by the Owner's Representative once for every 1,000 cubic yards of soil placed, in accordance with ASTM D2922 and D3017 respectively. If the densities achieved as determined by the field density tests do not meet the design parameters, modifications to the compaction or spreading procedures will be requested by the Owner's Representative.

3. **Phase III – Shoreline Rehabilitation**

a. Clearing: The Contractor shall cut all trees at a point no more than three inches above the existing ground surface within the limits shown on the Drawing A-046111-WW. The cut trees shall be temporarily stockpiled at a location directed by the Owner's Representative. Excavation Debris and dust shall be managed in accordance with Section VIII, Part D.2.a. of these Specifications, except that the contaminated material haul road shall not be used.

b. Grading: - Grading shall be performed by the Contractor to meet the slopes and elevations needed for installation of the concrete shoreline revetment. The approximate limits of grading are shown on the Drawing A-046110-WW. Grading shall be performed in accordance with Alcoa Engineering Standard 33.2121.8. The material generated by grading shall be classified as Random Fill and shall include soil, rocks, refractory brick, concrete and inorganic debris. Steel or wire encountered during the removal of Random Fill shall be cut, removed and stockpiled at a location designated by the Owner's Representative. Cutting of wire shall not be performed using manual labor. Fill shall be

placed in loose lifts approximately 12-inches thick and compacted using equipment best suited for the various unclassified material encountered. Compaction shall be performed until non-movement of the unclassified material is observed beneath compaction equipment during compaction operations. The approximate location where Random Fill is to be spread and compacted is shown on Drawing A-046110-WW. Organic material shall be removed from the limits of shoreline rehabilitation and staged at the East Landfill, at a location designated by the Owner's Representative.

Following grading, the existing ground surface shall be proofrolled to the extent possible until non-movement of the existing ground surface is observed by the Owner's Representative below the compaction equipment during compaction operations. Soft or compressible soils encountered during proofrolling shall be handled in accordance with Section VIII, Part B.3. of these Specifications.

c. Shoreline Fill Construction:

(1) General - Upon completion of grading activities, the Contractor shall construct the shoreline embankment to the lines, grades and elevations shown on Drawing A-046110-WW. The Contractor shall use the existing clean gravel access road to transport the Random Fill from the off-site borrow source to the crest of the embankment shoreline. Specified lifts of Random Fill shall be keyed into the sideslope of the existing material of the shoreline embankment, as shown on Drawings A-046113-WW and A-046114-WW.

Organic Material (compacted fill/compost mix) shall be spread and compacted to the lines, grades and elevations shown on Drawing A-046113-WW and as discussed below.

Placement and compaction of Random Fill and Organic Material shall be temporarily suspended at elevation 18.0 ft. MSL to facilitate installation of geotextile and the first row of concrete revetment, as shown in plan on Drawing A-046111-WW, in section on Drawing A-046113 and as discussed below. The horizontal construction bench created by the Random Fill shall be at least eight (8) feet wide to accommodate equipment needed to install concrete revetment. Placement of Random Fill shall proceed after installation of the first row of concrete revetment is completed or the Owner's Representative determines that the continued Random Fill placement above elevation 18.0 ft. MSL will not interfere with concrete revetment installation.

(2) Organic Material Placement: Organic Material meeting the requirements of Section VII, Part D.3.c. of these Specifications shall be used in construction. Placement of Organic Material shall begin at locations of lowest elevation. Organic material shall be spread in uniform horizontal layers 8-inches thick, measured when loose, across the entire width or length of the area to be filled, in accordance with Alcoa Engineering Standard 33.2121.8. Each layer, for its full width shall be compacted to not less than 95% of the maximum Standard Proctor Density, as determined by ASTM D698 in accordance with Alcoa Engineering Standard 33.2121.8.

(3) Compaction Testing: The Owner's Representative will be responsible for compaction testing. The Contractor shall control moisture content during compaction to no more than two percent above or below the optimum moisture content. The Contractor shall utilize water spraying to increase moisture contents or discing or harrowing to decrease moisture content, as needed. In-place densities and moisture contents will be performed by the Owner's Representative once for every 1,000 cubic yards of soil placed, in accordance with ASTM D2922 and D3017 respectively. If the densities achieved as determined by the field density tests do not meet the design parameters, modifications to the compaction or spreading procedures will be requested by the Owner's Representative.

d. Concrete Revetment Installation:

(1) Filter Fabric: - Upon completion of fill placement activities, geotextile filter fabric meeting the requirements of Section VII, Part D.3.d. shall be installed over the Random Fill and Organic Material. The geotextile panels shall be unrolled as smoothly as possible on the prepared ground surface in a direction parallel to the direction of slope. No wrinkles or folds shall be present. The geotextile panels shall extend from the horizontal construction bench at elevation 18.0 ft. MSL to the water's edge or elevation 4.0 ft. MSL, whichever occurs first, and then from the top of the embankment at elevation 30.0 ft. MSL to the construction bench at elevation 18.0 ft. MSL. Geotextile shall cover the construction bench, where applicable. No seams perpendicular to the direction of slope shall be present. Adjacent rolls of geotextile installed parallel to the direction of slope shall be overlapped a minimum of 18-inches. Care shall be taken to install the geotextile in intimate contact with the soil, so that no void spaces between the soil and the geotextile. A damaged section of geotextile, as observed by the Owner's Representative, shall result in the removal of the entire panel of geotextile. The installed geotextile shall meet the approval of the Owner's Representative.

(2) Revetment Installation:. The following presents site-specific installation requirements. Concrete Revetment panels will be delivered to the Site prior to installation. The Contractor shall unload the panels and store them at the contractor's material and equipment staging area, located north of the North 2 Landfill, shown on Drawing A-046101-WW. It shall be the responsibility of the Contractor to transport the panels from the staging area to the shoreline for installation. The Contractor shall obtain the spreader bars from the Revetment manufacturer for moving the concrete panels.

Concrete Revetment mats shall be oriented and installed to the lines, grades and over the area shown on Drawing A-046111-WW. Two rows of mat shall be installed, the rows shall be parallel to the water's edge. The row of concrete revetment closest to the water's edge shall be completely installed before beginning installation of the second row at the higher elevation. The bench at elevation 18.0 ft. MSL, created during construction of the embankment, shall be used by the Contractor to stage his equipment and to install the row of concrete revetment panels closest to the water's edge. The manufacturer's installation guide, which includes complete written instructions for the storage, handling, installation, connections and anchorage shall be referenced and followed. The Contractor shall provide a copy of this installation guide to the Owner's Representative.

The mats shall be installed beginning at the upstream end of the Site and at the water's edge. The mats shall be installed with their longitudinal edge (32 to 36 feet long) parallel to the direction of slope. The first upstream mat shall be installed in an anchor trench constructed parallel to the direction of slope, as shown on Drawing A-046111-WW and A-046120-WW. Adjacent mats shall be installed, working downstream, with longitudinal edges butted in accordance with the installation guide. No connection of longitudinal edges of the mat shall be required.

Transverse (short) edges of the mat (8 feet wide) shall extend up the embankment slope and at least five (5) feet across a horizontal bench, as shown on Drawings A-046111-WW and A-046113-WW. On the horizontal bench, the transverse edge of the mat shall be secured against movement using screw anchors. Three anchor screws shall be secured to polyester cable loops extending from the transverse edge of each mat. Methods for attaching anchor screws to polyester cables of the mat are shown on the Drawings. The manufacturer's installation guide, which includes complete written instructions for the handling, installation and activation of the

screw anchor, shall be referenced and followed. One anchor screw shall be installed at the base of the three most upstream mats, near the water's edge, to minimize the potential for uplift from wave action. The final downstream mat shall be installed in an anchor trench excavated parallel to the direction of slope, as shown on the Drawings.

The Contractor shall conduct a field test using the screw anchors selected to verify the pull-out force required in this specification. The field test shall be conducted in soil similar to the soil into which the screw anchors are to be installed and using the equipment and procedures selected for installation. The Owner's Representative will be present during the field test.

Upon complete installation of the first row of mat, and the complete placement and compaction of the Random Fill to meet embankment contours shown on Drawing A-046113-WW, construction of the second row of mat shall commence. Installation of mats shall be performed as described above, including installation of geotextile and screw anchors. Mat installation shall terminate at elevation 30.0 ft. MSL, as shown on the Drawings.

(e) Planting and Vegetation:

(1) Delivery, Storage and Handling: All plants shall be furnished in unopened manufacturer's standard containers bearing original labels showing quantity, analysis and name of manufacturer. The plants shall be protected from sun, weather or other conditions that would damage or impair their effectiveness. All plant material shall be delivered with tags or labels identifying species and variety (as applicable). Incorrect species shall be removed from the site immediately. Deliveries of live stakes and bare root shrub shall be scheduled so that the plants are installed no more than two days after they are delivered to the Site. Planting shall be performed between November 1 and March 1. Bare root stock shall be kept in moist sawdust in shaded areas until installation. Live stakes shall be kept saturated in water until installation. All other plants should be held on-site before planting for an absolute minimum time period. Water plants daily prior to installation.

(2) Surface Preparation: The surface to be planted shall be prepared. All debris and unneeded materials shall be removed. The open spaces between the concrete revetment blocks shall be filled with Organic Material. The Contractor shall perform the necessary survey/layout work to establish the proper spacing for each of the plant species. Wood stakes shall be used to establish bare root plant locations or lines of bare root planting. The Contractor shall use the lesser value

when comparing actual measured field spacing of bare root plants and proposed spacing of bare root plants. Live stakes may be staked out by boundary rather than individual plants. Planting shall not begin until satisfactory conditions are attained.

(3) Live Stake Planting: After concrete revetment and Organic Material have been installed and approved by the Owner's Representative, the Contractor shall install live stakes. Openings within the filter fabric beneath the concrete revetment shall be made by cross-cutting a three-inch diameter 'X' with a knife. An iron bar or rod with a diameter equal to the live stake shall be used to create a pilot hole of sufficient depth in the center of the opening of the concrete block. The hole shall be perpendicular to the slope. The live stakes shall be driven into the hole with a rubber mallet, with the angled bottom end in the ground and at least 2-5 emerging buds exposed at the top end. At least 80% of the live stake shall be installed beneath the ground surface. Care shall be taken to protect the live stakes from damage such as splitting, bark peeling, and bud breakage during installation. After live stake installation, the soil shall be tamped to create contact between live stake and soil. Installation is shown in detail on Drawing A-046121-WW.

(4) Bare Root Shrub Planting:. After concrete revetment and Organic Material have been installed and approved by the Owner's Representative, the Contractor shall install bare root shrubs. Openings within the filter fabric beneath the concrete revetment shall be made by cross-cutting a three-inch diameter 'X' with a knife. A trowel or small narrow shovel shall be used to dig a hole of sufficient depth and width to accommodate the roots of the shrub. The shrub shall be planted with the root crown (the point where the roots and stems meet) at finished grade (the top of the concrete revetment). After bare root shrub installation, the Contractor shall backfill the hole with Organic Material and tamp the soil to create contact between live stake and soil. Bare root shrubs shall be watered after planting and adjusted to proper grade if settling occurs. Installation is shown in detail on Drawing A-046-121-WW.

(5) Fertilizer for Bare Root Shrubs: Prior to completing the backfill of the shrub roots, the Contractor shall place Bio Paks equidistant around the rootball of the shrub. The number of Bio Paks shall be as specified by the manufacturer's installation guidelines. The Bio Paks shall be installed not less than 1" and not more than 4" below the finished grade and approximately 2" from root tips. The Owner's Representative will be present when Bio Paks are installed.

(6) Mulching: After shrubs have been planted and approved by the Owner's Representative and the Organic Material tamped, the Contractor shall apply mulch to the ground surface beneath the shrubs to the depths shown on the Drawings. The thickness of mulch shall approach zero near the trunk of the shrub.

(7) Maintenance and Warranty: Acceptance of sample plants does not constitute acceptance of all plants. Final acceptance of plants shall occur at Owner acceptance of the completed project.

a. Plant Materials: 70% of Live Stakes installed and 80% of Bare Root Shrubs installed shall be warranted to be healthy and thriving based on the number of plants installed at final acceptance:

b. Remove and replace immediately during Guarantee Period: Dead, diseased, dying, broken, or missing plant materials (except as noted below). Use specified plant and plant as specified; guarantee until acceptable, active, healthy growth is evident.

c. Contractor's Responsibility: During Guarantee Period, the contractor shall not be held responsible for replacing plants destroyed or damaged by vandalism, accidents caused by vehicle (other that that of the contractor), or Acts of God, provided that the contractor has exercised due care to protect the work.

d. When required replacement time falls during non-planting season, the contractor may request Owner's permission to defer planting until proper season. If granted, immediately remove dead plants, including roots, from site.

e. Backfill pits properly with topsoil mix. Finish grade and leave in acceptable condition until proper planting season occurs. Replace with plants of same species and size as those originally planted. Plant as originally specified.

The maintenance period shall continue from one year after final acceptance. At a minimum, maintenance shall include: watering, weed and pest control, and temporary barriers as required to ensure healthy, thriving plant growth.

4. Phase IV – Excavation of North and North 2 Landfills

a. Clearing: Clearing at the North and North 2 Landfill and in areas designated for construction of the East Landfill Anchor Trench Platform/Waste Soil Embankment shall be performed in accordance

with Section VIII, Part D.2.a. of these Specifications.

b. Waste Soil Excavation and Handling: Waste Soil Excavation and Handling at the North and North 2 Landfill shall be performed in accordance with Section VIII, Part D.2.b. of these Specifications

c. Confirmation Sampling: Confirmation sampling at the North and North 2 Landfill shall be performed in accordance with Section VIII, Part D.2.c. of these Specifications

d. Grading of North and North 2 Landfill: After a topographic survey of the North and North 2 Excavation Areas has been completed, the Contractor shall grade the North and North 2 Landfill as shown on Drawing A-046106-WW. Graded Material meeting the requirements of Section VII, Part D.4.d. of these Specifications shall be placed and compacted in accordance with Section VIII, Part D.2.d.(2) of these Specifications. Upon completion of backfill, the Contractor's surveyor shall generate a topographic map of final graded elevations, from which the actual volume of grading can be determined. After surveying, vegetation of the ground surface shall be performed. Compaction testing will be performed by the Owner's Representative in accordance with Section VIII, Part D.2.d.(3) of these Specifications.

e. Revegetation: After backfill of the North and North 2 Landfill, seeding shall be performed. The seed selected shall be native to the area and be sown in sufficient quantity to promote an adequate stand of grass. The method of sowing shall be selected by the Contractor and performed in accordance with applicable specifications for the State of Washington. However, hydroseeding, which incorporates seed, mulch and fertilizer in one or two applications is the preferred method. The Contractor shall, with the approval of the Owner's Representative, perform temporary seeding operations in order to maintain finished graded areas until the optimum time for performing permanent seeding.

   Due to the unknown quality of the surface material to be vegetated, the Contractor shall obtain five soil samples from across the subject Site. The samples shall be composited and analyzed at the local Soil Conservation Service (SCS) office, or their selected laboratory prior seeding to verify the minimum requirements of lime and fertilizer as set forth in these Specifications.

   (1) Preparation - Unless otherwise directed by the Owner's Representative, all areas designated for seeding shall be loosened by discing, harrowing, or other approved methods to a depth of 3 inches prior to seeding.

(2) Fertilizing and Liming - Fertilizer and agricultural limestone shall be spread in accordance with Section 8-01.3(4)B and 8-01.3(4)C of the Washington Standard Specifications. Fertilizer shall be applied at a rate of 1000 pounds per acre and limestone shall be applied at a rate of 2000 pounds per acre.

(3) Seeding and Mulching - Seeding and mulching materials shall be spread in accordance with Section 8-01.3(4)A and 8-01.3(5) of the Washington Standard Specifications. Seed shall be applied at a rate of 150 pounds per acre and mulch shall be applied at a rate of two tons (dry weight) per acre.

(4) Maintenance and Repairs - The Contractor shall during construction and prior to acceptance, properly care for all areas mulched to establish growth of the seeded areas. Mulch that becomes displaced shall be reapplied at once, together with any necessary reliming, refertilization, or reseeding, all at no expense to the Owner.

The Contractor shall guarantee an adequate Soil Cover over 80% of all areas vegetated twelve months after initial placement in accordance with these Specifications. A 10% retainage will be withheld from the Contractor's invoices. If the Owner's Representative determines after the one-year inspection that the stand of vegetation is inadequate, the Contractor shall overseed and fertilize using half of the rates originally applied. If the stand of vegetation is over 60% damaged, the Contractor shall re-establish the vegetation following original lime, fertilizer, seedbed preparation and seeding recommendations outlined herein. This cost to overseed or to re-establish vegetation shall not be passed on to the Owner.

5. Phase V – Construction of East Landfill Engineered Cap

a. Clearing: The Contractor shall cut all trees at a point no more than three inches above the existing ground surface within the limits shown on the Drawing A-046115-WW. The cut trees shall be temporarily stockpiled at a location directed by the Owner's Representative. Excavation Debris and dust shall be managed in accordance with Section VIII, Part D.2.a., above except that the contaminated material haul road shall not be used.

b. Anchor Trench Platform/Embankment:

(1) Surface Preparation: After clearing and grubbing, the Contractor shall proofroll the ground surface. Proofrolling shall be performed using equipment suitable for the topography of the

area and recommended for the type surface soils being compacted. Compaction shall be performed until non-movement of the ground surface is observed by the Owner's Representative beneath compaction equipment during compaction operations.

(2) Anchor Trench Platform/Waste Soil Embankment: The Contractor shall construct the Anchor Trench Platform/Waste Soil Embankment to the lines, grades and elevations shown on Drawing A-046114-WW. The Contractor shall use the existing clean gravel access road to transport the Random Fill from the off-site borrow source to the perimeter of the East Landfill. Random Fill shall be placed and compacted in accordance with Section VIII, Part D.3.c. of these Specifications.

Compaction testing will be performed by the Owner's Representative in accordance with Section VIII, Part D.3.c. of these Specifications.

(3) Grades: Slope lines shall generally conform to the lines and grades shown on Drawing A-046115-WW. Where not otherwise indicated, site areas shall be given uniform slopes between points for which finished grades are shown, or between such points and existing established grades. The slopes shall be neatly trimmed, free from hollows or protrusions. Vertical curves or roundings shall be provided at the top and bottom of slopes.

c. Waste Soil Placement: Waste Soils from the North and North 2 Landfills and previously stockpiled Waste Soils from the South Bank shall be used to construct the subgrade of the East Landfill. Trucks transporting Waste Soils from the North and North 2 Landfills shall use the Contaminated Material Haul Road to access the East Landfill and dump their loads as near as possible to areas where placement and compaction shall occur. The Contractor shall minimize the potential for the ground surface of the Anchor Trench Platform/Waste Soil Embankment to become contaminated during transportation of Waste Soils to the East Landfill. The Contractor shall be permitted to maintain an at-grade opening in the Anchor Trench Platform/Waste Soil Embankment to permit trucks to enter the East Landfill to dump Waste Soils. Waste Soil placement shall begin along the North boundary of the Anchor Trench Platform/Waste Soil Embankment. Positive drainage of the ground surface of Waste Soils at the East Landfill shall be maintained to the south for as long a period as possible to meet stormwater requirements during construction. Any stormwater generated during placement of Waste Soils at the East Landfill shall be collected at low elevation areas along the south boundary of the Anchor Trench Platform/Waste Soil Embankment and handled in accordance with Section VIII, Part D.1.e. of these Specifications.

Waste Soils shall be spread in uniform horizontal layers 8-inches thick, measured when loose, across the entire width or length of the area to be filled, in accordance with Alcoa Engineering Standard 33.2121.8. Each layer, for its full width shall be compacted to not less than 95% of the maximum Standard Proctor Density, as determined by ASTM D698 in accordance with Alcoa Engineering Standard 33.2121.8.

After all Waste Soils from the South Bank and the North and North 2 Landfills have been transported to the East Landfill, the Contractor shall excavate and remove the Contaminated Material Haul Road. The gravel and the filter fabric shall be classified as Waste Soil and disposed at the East Landfill in accordance with Section VIII, Part D.4.c. of these Specifications. Confirmation Sampling of the existing ground surface will be performed by the Owner's Representative at 100 feet intervals along the former centerline of the haul road to check for the presence of Waste Soils. Procedures for analysis and decision making of results is discussed in Section VI, Part B. Upon completion of Waste Soil placement at the East Landfill, the ground surface shall exhibit grades and elevations similar to the grades and elevations shown on Drawing A-046116-WW.

Compaction shall be performed using equipment suitable for that purpose or using a dozer with sufficient ground pressure. Precompaction of Waste Soils by routing loaded trucks over the material shall be permitted. Excavation Debris shall be incorporated into specific lifts of Waste Soils and compacted until nonmovement is observed beneath compaction equipment during compaction operations.

Compaction Testing will be performed by the Owner's Representative in accordance with Section VIII, Part D.3.c. of these Specifications.

During placement of Waste Soils at the East Landfill, the Contractor shall use the appropriate measures necessary to reduce dust emissions during transportation, dumping, spreading and compaction. These measures may consist of tarping the trucks, wind fencing or wetting or spraying of the Waste Soils. As wetting may also aid in the compaction of the material, it is the preferred method. A location where water can be obtained by the Contractor to perform this activity is discussed in Section V, Part A.2. of these Specifications.

Upon completion of Waste Soil placement at the East Landfill, the Contractor's surveyor shall generate a topographic map of final Waste Soil elevations, from which the actual volume of Waste Soil used as backfill can be determined.

d. Engineered Cap Construction

(1) Geomembrane and GCL Panel Layout: At least two weeks prior to GCL installation, the Contractor shall submit to the Owner's Representative a geomembrane panel and GCL panel placement drawing. This drawing shall present the orientation of all of the geomembrane sheets and GCL sheets and the type and location of welding to be performed at each geomembrane seam. To the extent possible, overlaps of geomembrane sheets and GCL sheets shall not occur within the anchor trenches. If overlaps of geomembrane sheets or GCL sheets occurs in an anchor trench, the overlap shall be perpendicular to the centerline of the anchor trench, or no more than 20º from perpendicular. GCL installation shall not proceed until the Owner's Representative has reviewed the panel placement drawing.

(2) Surface Preparation for Geosynthetics: The existing ground surface on which the GCL is to be placed shall be prepared. All rocks, stones, sticks, roots, sharp objects, or debris of any kind shall be removed. No sudden, sharp or abrupt changes or break in grade and no standing water or excessive moisture shall be allowed. The final surface shall be smooth and firm, and shall meet the compaction requirements stated in Section VIII, Part D.5.b. of these Specifications. Slopes meeting those indicated on Drawing A-046116-WW shall be verified in accordance with Section VIII, Part D.1.c. of the Specifications. Adjustment to slopes shall be performed under the direction of the Owner's Representative, using Random Fill material meeting the requirements of Section VII, Part D.3.c. of these Specifications or by regrading existing material.

Soft or compressible areas shall be handled in accordance with Section VIII, Part B.3 of these Specifications. Proofrolling of the existing ground surface on which the GCL is to be placed shall be performed only with the approval of the Owner's Representative. The Contractor shall provide the Owner's Representative with certification in writing that the surface on which the GCL is to be installed is acceptable before commencing work.

(3) GCL Installation: After written approval of the GCL surface is received by the Owner's Representative, the Contractor shall proceed with installation of the GCL. The manufacturer's installation guide, which includes complete written instructions for storage, handling, seaming, quality control and repairs shall be referenced and followed for all aspects of preparation and installing GCL panels. The GCL sheets shall be securely held in place over the area to be capped using the perimeter located anchor trench. The GCL shall be

installed in the anchor trench to the extent shown on the Drawing A-046116-WW.

GCL sheets shall be installed with a minimum 6-inch overlap at material joints with the upslope sheet overlapping the downslope sheet. No additional bentonite shall be required at seams unless a substitute to the GCL stated herein is selected by the Contractor.

Field placement and joining of the GCL liner sheets shall be performed when field conditions are favorable. The Contractor shall rely on the experience of the GCL contractor to confirm that all aspects of installation are performed under proper working conditions and meet the quality assurance guidelines for GCLs. The Contractor shall furnish the Owner and Owner's Representative with a copy of a "GCL Installation Certification." or an equivalent proof of installation prepared by the GCL contractor.

(4) Geomembrane Installation: After installation of the GCL has been completed and approved by the Owner's Representative, geomembrane installation shall proceed. The geomembrane shall be installed by qualified personnel experienced and certified in this type of work. The manufacturer's installation and QA/QC guide, which shall include complete written instructions for the storage, handling, installation, seaming, quality control and repair of geomembrane, shall be referenced and followed for all aspects of preparation, cleaning and seaming geomembrane sheets. The Contractor shall provide a copy of this guide to the Owner's Representative.

The geomembrane sheets shall be securely held in place over the area to be capped using the circumferential anchor trench. The geomembrane shall be installed in the anchor trench to the extent shown on the Drawing A-046116-WW. Geomembrane seams that are to be located within an anchor trench shall be seamed prior to installation within the trench, to the extent possible. Remaining widths or lengths of geomembrane sheets not used in the anchor trench shall be extended over the prepared area to be capped.

The geomembrane shall be installed with a minimum 5 inch overlap at material joints, with the upslope liner sheet overlapping the downslope liner sheet. Field seaming shall be performed using the GSE Lining Technology System Hot Wedge Welding Process or an equivalent seaming technique approved by the Owner's Representative. The contact surfaces shall be free of dirt, dust and moisture, including films resulting from condensation due to high humidity.

Field seaming of geomembrane liner shall be performed when weather conditions are favorable. The Contractor shall rely on the experience of his subcontracted geomembrane seaming crew to ensure that all seams and connections are welded under proper working conditions, that the welded seams and connections are of the highest quality and that the seams meet GSE Lining Technology's Quality Control testing guidelines. The Contractor shall furnish the Owner and Owner's Representative with a copy of the "Geomembrane Liner Installation Certification" or an equivalent proof of installation prepared by the geomembrane contractor.

(5) Filtration Geotextile and/or Synthetic Drainage Netting Installation: The synthetic drainage netting/geotextile composite shall be installed by the Contractor in accordance with the manufacturer's installation guide. The drainage netting/geotextile composite shall be installed at the location shown on Drawing A-046116-WW. Care shall be taken to prevent damage to the HDPE geomembrane during installation of the composite. The netting composite shall be installed within the anchor trench in conjunction with installation of the perforated drainage tubing or pipe. Plastic ties shall be used to secure adjoining sheets of drainage netting, as per the installation guide.

Filtration geotextile installed independent of the drainage netting shall be installed in a direction that reduces the potential for movement during placement of soil materials over it. Adjacent panels or sheets of filtration geotextile shall be overlapped a minimum of one foot and shall be sewn together. The Contractor shall utilize a "prayer" seam or a "J" seam in connecting adjacent fabric sheets.

If the geotextile is damaged, a patch of geotextile large enough to cover the damaged section shall be placed on top of the damaged area and sewn to the existing geotextile.

(6) Anchor Trench Construction: Prior to the installation of geosynthetics, excavation of the anchor trench shall be performed. The anchor trench shall be excavated on the crest of the Anchor Trench Platform/Waste Soil Embankment into Random Fill material, at the locations shown on the Drawings. The material generated by anchor trench excavation shall be classified as Random Fill and used at locations approved by the Owner's Representative. The GCL, HDPE geomembrane and drainage netting shall be placed in the anchor trench as shown on Drawings A-046120-WW and A-046121-WW, with installation performed in accordance with these Specifications.

The perforated pipe shall be installed along the centerline of the anchor trench in conjunction with the drainage netting, as shown on Drawing A-046121-WW and in accordance with applicable sections of Alcoa Engineering Standard 33.4001.8. Locate fittings at the specified locations and establish pipe inverts as shown on Drawing A-046115-WW. Outlet the pipe as shown on Drawing A-046115-WW and attach rodent screens at all outlets.

Backfill the bottom 12-inches of the anchor trench and around the pipe with granular material meeting the requirements of Section VII, Part D.5.i. of these Specifications. The material shall be lightly compacted to reduce potential damage to the pipe. After the granular material has been installed, a layer of filtration geotextile shall be placed over the material, as shown on Drawing A-046121-WW. Complete backfill of the anchor trench to the depth shown on the Drawings using Random Fill material. The Random Fill shall be spread in one loose lift and compacted using equipment suited for the small area until nonmovement of the Random Fill is observed beneath the compaction equipment during compaction operations.

(7) Random Fill Layer and Soil Cover: After installation of the GCL, geomembrane and synthetic drainage netting, Random Fill shall be placed in designated fill areas to construct one of the soil components of the engineered cover. Construction of the Random Fill layer over the geosynthetics shall proceed with the approval of the Owner's Representative as soon as an area of installed geosynthetics large enough for the Contractor to efficiently and safely perform the task becomes available and all relative geosynthetic QC documentation has been obtained.

The Contractor shall use the existing clean gravel access roads to transport the soil from the off-site borrow source to the East Landfill. Dump trucks delivering Random Fill and Soil Cover to the East Landfill shall not be permitted to drive over any installed geosynthetics. Random Fill shall be placed and compacted in accordance with Section VIII, Part D.3.c. of these Specifications. Compaction testing will be performed by the Owner's Representative in accordance with Section VIII, Part D.3.c. of these Specifications. The first lift of Random Fill to be placed over the synthetic drainage netting may be increased to 12-inches with approval of the Owner's Representative, to reduce the potential for damage. Density and moisture testing of the 12-inch thick first lift will be performed on the top six-inches and the bottom six-inches of the lift to verify compliance with minimum density and moisture requirements. Ground Pressure of equipment spreading Random Fill material over geosynthetics shall not

exceed 5 pounds per square inch. The completed Random Fill layer shall provide the lines and grades on which the Soil Cover is to be constructed.

After Random Fill installation, Soil Cover shall be spread to meet the final grade contours shown on Drawing A-046118-WW. The material shall be placed in one uniform horizontal layer 6 to 8 inches thick, measured when loose, across the entire width or length of the area to be filled, using low contact pressure equipment. The material shall be lightly compacted.

Random Fill and Soil Cover shall be spread in a direction from lowest elevation to highest elevation, unless this direction results in the placement of soil across a seam or overlap of geosynthetics. Placement in this direction shall meet the approval of the Owner's Representative. Final fill slope lines shall be constructed in accordance with Section VIII, Part D.4.b. of these Specifications.

Upon completion of backfill, the Contractor's surveyor shall generate a topographic map of final backfill elevations, from which the actual volume Random Fill used as backfill can be determined.

The slope of the Soil Cover shall be identical to the slope of the Random Fill Layer. No permeability testing or compaction testing shall be required.

e. Geomembrane Inspection and Testing: The Contractor shall employ on-site physical non-destructive testing on all extrusion welds and wedge welds, and destructive testing on wedge welds at a rate specified in the manufacturer's installation guide. If no rate is specified, destructive testing shall be performed once for every 500 linear feet of wedge welding performed. The destructive sample shall be 12 inches wide and 36 inches long, with the 36-inch length measured along the weld. One-third of the sample, as measured along the weld will be shipped to an independent laboratory, contracted to the Owner or Owner's Representative for testing. The testing will consist of peel and shear testing, in accordance with ASTM D6288. One-third of the sample shall be used by the seaming crew in conducting on-site peel and shear testing and the final one-third of the sample will be retained by the Owner. Test welds shall be performed daily and subject to the appropriate testing, in accordance with the manufacturer's installation guide or quality control manual.

The geomembrane seaming crew's Quality Control representative shall inspect all seams. The

Owner's Representative will randomly inspect seams. Any geomembrane areas that are punctured, distressed, scuffed or damaged in any way shall be marked by the representative and repaired by the geomembrane seaming crew. Repairs shall be performed in accordance with the manufacturer's installation guide. Areas subjected to destructive testing shall be repaired and non-destructively tested by the Contractor in accordance with the manufacturer's installation guide.

The Contractor shall provide copies of all quality control and quality assurance documentation generated during installation of geosynthetics to the Owner's Representative. Refer to the Construction Quality Assurance Plan for additional information.

f. Vegetation - After construction of the Soil Cover layer has been completed, vegetation of the ground surface shall commence. Vegetation shall be performed in accordance with Section VIII, Part D.4.e of these Specifications.

g. Fence - New fencing shall be constructed around the two production wells at the North and North 2 Landfills after completion of all excavation and fill placement activities. New fencing shall also be installed along portions of the north, east and west property boundaries. Fencing shall be installed in accordance with Alcoa Engineering Standard 33.2601.8 and at the locations shown on Drawing A-046106-WW and A-046117-WW. Three strands of barbed wire at the top of the fence shall not be required.

h. Monitoring Well Extension/Protection – Eleven (11) monitoring wells within the limits of the East Landfill and one monitoring well at the North 2 Landfill shall be extended prior to fill placement. The East Landfill monitoring wells are MW-94-2I and 2D; MW-94-1I and 1D; MW-22A, 22S, 22I and 22D; and MW-35S, 35I and 35D. Monitoring Well CP-3 shall be extended at the North 2 Landfill. Monitoring well extensions shall be performed in accordance with applicable WAC guidelines and specifications provided herein. Extension of Monitoring Wells shall occur before fill reaches an elevation five feet below the top of the well casing. The locations of the wells to be extended in height are shown on Drawing A-046110-WW. The extension of the monitoring wells shall result in a flush mount condition upon completion of fill placement activities. All other wells must be protected. Any damage to wells will be the responsibility of the Contractor. Before beginning work on the well, a temporary bladder or seal, approved by the Owner's Representative, shall be inserted in the riser pipe at a depth below the existing concrete pad to be removed. Extension of the monitoring well shall then proceed as shown in the detail Drawings. Concrete from

any existing concrete pad shall be removed and disposed as Excavation Debris at the East Landfill. The installation of the salvaged locking cover and the extension of the well casing shall meet the approval of the Owner's Representative

Once a monitoring well has been extended and fill placement has been completed and approved by the Owner's Representative, the Monitoring Well Pad shall be constructed in accordance with the details in Drawing A-046110-WW and with Alcoa Engineering Standards 33.121.8, 33.121.8.3 and 33.121.8.4. The Contractor shall survey the new well location and elevation and provide this information on the As-Built Drawings. The manufacturer's installation guide shall be referenced and followed for all aspects of fiber reinforcement placement and installation.

6. Phase VI – Additional Fill Outside Limits of East Landfill

a. Random Fill Placement: The Contractor shall backfill areas to the lines, grades and elevations shown on the Drawing A-046117-WW. Random Fill shall be placed and compacted in accordance with Section VIII, Part D.3.c. of these Specifications. Compaction testing will be performed by the Owner's Representative in accordance with Section VIII, Part D.3.c. of these Specifications. Final fill slope lines shall be constructed in accordance with Section VIII, Part D.4.b. of these Specifications. Upon completion of backfill, the Contractor's surveyor shall generate a topographic map of final backfill elevations, from which the actual volume of Random Fill used as backfill can be determined. After surveying, vegetation of the backfilled ground surface shall be performed.

b. Vegetation: Upon completion of Random Fill placement outside the limits of the east landfill, vegetation of the ground surface shall commence. Vegetation shall be performed in accordance with Section VIII, Part D.4.e of these Specifications

7. Borrow Area. The Random Fill and Soil Cover shall be purchased and trucked from a nearby off-site borrow area location(s). The off-site borrow source shall be subject to approval by the Owner, based on results of the geotechnical testing of the borrow material performed by the Contractor or supplied by the borrow area owner. The dump trucks (whether operated by the Contractor or the borrow source operator(s), at the Contractor's direction) shall enter through the main gate of the Site at Lower River Road and haul the borrow material via the clean gravel access road to its needed on-site location at the shoreline, the East landfill or the North and North 2 Landfill. Trucks hauling material from the borrow area to the Site shall take the most direct route. The route shall be selected by the Contractor and reviewed by the Owner's Representative. Deviations from the route shall be reviewed by the Owner's

Representative. During transportation, the Contractor shall take precautions to keep the highway route clean and free of soil. Spills shall be reported by truck drivers to the Contractor and cleaned immediately. Dust shall be controlled using tarping or by wetting of the soil at the borrow area prior to transportation. Trucks shall adhere to highway load restriction requirements and speed limits.

8. **Site Clean-Up, Damage Repair and Maintenance Of Revegetated Areas**. This Work shall include the cleanup of the Site and repair of any incidental damage to the Site as a result of remediation activities. The repair of site roads to preconstruction condition shall also be performed. If any monitoring wells are damaged, the Contractor must identify the wells to the Owner's Representative and repair and/or replace the wells at the determination and discretion of the Owner's Representative. The Contractor shall maintain all revegetated areas in accordance with the requirements of this section until all Work under the contract has been completed and has been accepted by the Owner. The maintenance shall consist of refilling rain-washed gullies, with the same or better type of soils that were eroded, or reseeding, reapplying soil supplements and mulch as directed by the Owner's Representative. Inspections will be conducted by all interested parties to identify problems or concerns. Problems or concerns identified in those inspection(s) will be corrected by the Contractor prior to the Demobilization of his equipment, labor and tools.

   The Contractor shall maintain the revegetated areas for a period of one year, including revegetation of barren areas if necessary, or establish a subcontract with a local vendor to perform this task. Within the one (1) year remedy guarantee period, as specified herein, the Contractor shall reseed or replant in accordance with these Specifications any areas where satisfactory growth has not been obtained, in the opinion of the Owner.

9. **Final Project Inspection and Demobilization:** Prior to Contractor demobilization of all equipment, labor, tools and incidentals required to complete the Work, the Owner will schedule a Pre-Final Construction Conference and WDOE will attend that conference. The Pre-Final Construction Conference shall be scheduled within seven days of the Owner's Representative making a preliminary determination that construction is complete. As part of the Pre-Final Construction Conference, a Prefinal inspection of the project will be conducted by WDOE. The Owner, the Owner's Representative, the Contractor, WDOE and any other interested parties will attend a site walk through to review the Work and to identify any problems or concerns, which will be documented in a punch list by the Owner's Representative and shall be corrected by the Contractor. Within seven days following the Contractor's completion of the punch list, a Final inspection will be scheduled by the Owner's

Representative and WDOE. The Contractor's demobilization activities shall have been completed by the time of WDOE's Final inspection, except for equipment and materials required to complete the punch list. If any items remain deficient or incomplete, the inspection shall be considered a prefinal inspection, a new punch list will be prepared by the Owner's Representative and another final inspection will be scheduled.

A Construction Completion Report will be prepared by the Owner's Representative that will include the Contractor's scope of responsibilities listed in SECTION VI – ENGINEERING, INSPECTION AND TESTING. The Construction Completion Report must be submitted to WDOE within 60 days after the final inspection.

10. <u>All Applicable Taxes (Estimate):</u> No specifications required.

IX. GENERAL TERMS AND CONDITIONS

All pre-bid contractors shall have accepted the terms and conditions of Alcoa. Any exceptions shall be submitted to and reviewed by RWG Purchasing Department:

Patti Kaulback,
ARMI
Alcoa Inc
201 Isabella Street
Pittsburgh, Pennsylvania 15212-8585
Phone: 412-553-1668

APPENDIX A

LIST OF SITE CHARACTERIZATION REPORTS FOR FORMER VANCOUVER OPERATIONS

LIST OF SITE CHARACTERIZATION REPORTS FOR FORMER VANCOUVER OPERATIONS

1. *Soils and Groundwater Status Report*, prepared by Sweet-Edwards/Emcon, Inc., 5/4/89
2. *Groundwater Sampling and Analysis - Phase I: Initial Data Collection - Remedial Investigation Plan,* prepared by Hart Crowser, J-5105, 3/28/91.
3. *Phase II A Monitoring Wells and Borings, TCE Remedial Investigation,* prepared by Hart Crowser, J-2250-05, 10/10/91.
4. *Phase II B Test Pits and Groundwater Level Monitoring, TCE Remedial Investigation*, prepared by Hart Crowser, J-2250-06, 7/6/92.
5. *Phase II C Test Pits, TCE Remedial Investigation,* prepared by Hart Crowser, J-2250-06, 1/4/93.
6. *Additional Landfill Site Characterization,* prepared by Hart Crowser, J-5352, 12/6/94
7. *Draft Focused Feasibility Study, Former ALCOA Facility, Vancouver, Washington,* prepared by Hart Crowser, J-5352, 12/6/94
8. *Site Characterization Report Landfill and Surrounding Areas*, prepared by ICF Kaiser, 7/26/96.
9. *Supplemental Site Characterization Report*, prepared by ICF Kaiser, 5/28/97
10. *East Landfill South Bank Phase I Sampling Results*, prepared by ICF Kaiser, 03/05/99
11. *East Landfill South Bank Phase II Sampling Results,* prepared by ICF Kaiser, 09/23/99
12. *Northeast Parcel Remedial Action Report, Volumes I through V* prepared by ICF Kaiser . 10/31/97
13. *Cleanup Action Plan, prepared by Washington Department of Ecology, May, 2003*

APPENDIX B

CONSTRUCTION QUALITY ASSURANCE PLAN

APPENDIX C

VENDOR CONCRETE REVETMENT SPECIFICATION

DAILY INSPECTION PROGRESS REPORT

Project Name/No.		**Date:**
No. of workers:	**Equipment:**	

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.			
Signed		**Title**	**No.**

Additional Comments/Supporting Calculations	**Date:**

Preparer Initials _____

GENERAL INSPECTION/TESTING FORM
(SUMMARY OF IN-PLACE DENSITY TESTS)

PROJECT NAME: _____ LOCATION: _____

DATE: _____ WEATHER: _____
REPORT BY: _____ TYPE OF COMPACTION: _____
_____ EQUIPMENT USED: _____

TEST NO	ELEV. OR STA. NO.	WET DENSITY (PCF)	WATER CONTENT (%)	DRY UNIT WEIGHT (PCF)	MAX. DRY UNIT WT. (PCF)	OPTIMUM MOISTURE (%)	% OF MAX. DRY DENSITY	MATERIAL TYPE OR PROCTOR NO.

SKETCH

TABLE OF RETESTS

TEST NO.	RETEST OF TEST NO.	TEST NO.	RETEST OF TEST NO.

REMARKS:

GENERAL INSPECTION/TESTING FORM
(MISCELLANEOUS FIELD TESTS)

Project Name/No. _____

Date: _____ **Weather:** _____
Report By: _____ _____

Test Location	Test Type	Sample Name	Parameter	Test Results	Unit

Sketch

Remarks

Signed	**Title**	**No.**

NON-ANALYTICAL CHAIN-OF-CUSTODY

Project Name/No. _____ Project Manager _____ Phone No. _____ Testing Laboratory _____ Address _____ _____ _____ Lab PM _____			Test Parameter			General Notes
Sample ID	Collection Date/Time	Matrix				Specific Remarks
Prepared by: _____ Date:			Received By: _____ ___ Date:			Copies to _____ __
Relinquished by: _____ Date:			Received By: _____ ___ Date:			_____ __

APPENDIX D

WASTE MANIFEST INFORMATION

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

VANCOUVER 2003 HAZARDOUS WASTE MANIFEST LOG

Manifest Number	PCB Unique Number	Weight (pounds, K or T, or gals)		Number of Drums or Containers	Profile Number	Date Shipped	Actual Weight		Comments
✓ 10301	03PCB001	17,272	K	1 CM	CW1234	10/30/03	15,522	K	Discrepancy in weight approved 10/30/03
✓ 10302	03PCB002	12,750	K	1 CM	CW1234	10/30/03	12,474	K	
✓ 10303	03PCB003 03PCB004	30,000	K	2 CM	CW1234	10/30/03	27,025	K	
✓ 10304	03PCB005	12,000	K	1 CM	CW1234	10/30/03	10,850	K	
✓ 10311	03PCB006	15,000	K	1 CM	CW1234	10/31/03	11,567	K	4276
✓ 10312	03PCB007	17,500	K	1 CM	CW1234	10/31/03	17,473	K	42127
✓ 10313	03PCB008	16,950	K	1 CM	CW1234	10/31/03	16,756	K	4284
✓ 11031	03PCB009	15,909	K	1 CM	CW1234	11/3/03	16,066	K	52294
✓ 11032	03PCB010	18,955	K	1 CM	CW1234	11/3/03	18,443	K	4252T
✓ 11033	03PCB011	15,000	K	1 CM	CW1234	11/3/03	14,524	K	42105T
✓ 11041	03PCB012 03PCB013	30,000	K	2 CM	CW1234	11/4/03	25,320	K	
✓ 11051	03PCB014	16,000	K	1 CM	CW1234	11/5/03	14,314	K	
✓ 11191	03PCB015 03PCB016	26,000	K	2 CM	CW1234	11/19/03	22,689	K	
✓ 11241	03PCB017	28,600	K	1 DT	CW1234	11/24/03	28,600	K	
✓ 11242	03PCB018	30,000	K	1 DT	CW1234	11/24/03	30,000	K	
✓ 11243	--	1,500	G	1 TT	CW0934	11/24/03	2,070	G	Non-Regulated Material ✓
✓ 12031	03PCB019 03PCB020	30,000	K	2 CM	CW1234	12/3/03	29,284	K	
✓ 12041	03PCB021	15,000	K	1 CM	CW1234	12/4/03	12,982	K	
✓ 12051	03PCB022	15,000	K	1 CM	CW1234	12/5/03	14,415	K	

VANCOUVER PCB ITEMS REMOVED FROM SERVICE FOR DISPOSAL - 20

Note: All PCB items removed from service for disposal must be included on this form. (PCB items removed from service for reuse do not have to be listed.) Any PCB items received from another Reynolds location and placed into storage for disposal must be included.

Name of Person Making Entry	*Date of Entry*	*Description of PCB Item (e.g. Transformer)*	*Serial Number***	*Est. Weight of PCB Material*** (Kilograms)*		*Date Removed from Service for Disposal*	*Date Placed into Transport for Disposal*	*Date of Final Disposal, if Known*	*Comments*
K. Nadermann	10/30/03	Soil from ELF	03PCB001	17,272	K	10/10/03	10/30/03	10/30/03	No PCB # on original
K. Nadermann	10/30/03	Soil from ELF	03PCB002	12,750	K	10/10/03	10/30/03	10/30/03	No PCB # on original
K. Nadermann	10/30/03	Soil from ELF	03PCB003	15,000	K	10/11/03	10/30/03	10/30/03	
K. Nadermann	10/30/03	Soil from ELF	03PCB004	15,000	K	10/11/03	10/30/03	10/30/03	
K. Nadermann	10/30/03	Soil from ELF	03PCB005	12,000	K	10/13/03	10/30/03	10/30/03	No PCB # on original
K. Nadermann	10/30/03	Soil from ELF	03PCB006	15,000	K	10/13/03	10/31/03	10/31/03	
K. Nadermann	10/30/03	Soil from ELF	03PCB007	17,500	K	10/15/03	10/31/03	10/31/03	
K. Nadermann	10/30/03	Soil from ELF	03PCB008	16,950	K	10/15/03	10/31/03	10/31/03	
K. Nadermann	10/30/03	Soil from ELF	03PCB009	15,909	K	10/16/03	11/3/03	11/3/03	
K. Nadermann	10/30/03	Soil from ELF	03PCB010	18,955	K	10/16/03	11/3/03	11/3/03	
K. Nadermann	10/30/03	Soil from ELF	03PCB011	15,000	K	10/17/03	11/3/03	11/3/03	
J. Ackley	12/1/03	Soil from ELF	03PCB012 03PCB013	30,000	K	10/17/03	11/4/03	11/4/03	
J. Ackley	12/1/03	Soil from ELF	03PCB014	16,000	K	10/21/03	11/5/03	11/5/03	
J. Ackley	12/1/03	Soil from ELF	03PCB015 03PCB016	26,000	K	11/14/03	11/19/03	11/19/03	
J. Ackley	12/1/03	Soil from ELF	03PCB017	28,600	K	11/24/03	11/24/03	11/24/03	
J. Ackley	12/1/03	Soil from ELF	03PCB018	30,000	K	11/24/03	11/24/03	11/24/03	
J. Ackley	12/11/03	Soil from ELF	03PCB019	30,000	K	11/14/03	12/3/03	12/1/03	
J. Ackley	12/11/03	Soil from ELF	03PCB020						
J. Ackley	12/11/03	Soil from ELF	03PCB021	15,000	K	11/14/03	12/4/03	12/4/03	
J. Ackley	12/11/03	Soil from ELF	03PCB022	15,000	K	11/14/03	12/5/03	12/8/03	
				1500		11/24/03			

VANCOUVER TRANSPORTATION VERIFICATION LOG - 2003

Note: PCBs shipped for disposal must be verified as actually being delivered at the PCB designated facility within one business day of the PCB generator receiving the returned, signed manifest.

Name of Person Making Entry	*Date Generator Signed Manifest*	*Manifest Document Number*	*Date Returned, Signed Manifest was Received*	*Date of Verification*	*Method of Verification (phone, fax, email, or agreed upon method)*	*Name of Person Making Verification*
K. Nadermann	10/30/03	10301 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
K. Nadermann	10/30/03	10302 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
K. Nadermann	10/30/03	10303 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
K. Nadermann	10/30/03	10304 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
G. Rutherford	10/31/03	10311 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
G. Rutherford	10/31/03	10312 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
G. Rutherford	10/31/03	10313 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
G. Rutherford	11/3/03	11031 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
G. Rutherford	11/3/03	11032 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
G. Rutherford	11/3/03	11033 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
J. Ackley	11/4/03	11041 ✓	11/25/03	11/25/03	Phone	Jan to Lynn
J. Ackley	11/5/03	11051 ✓	12/09/03	12/09/03	Phone	Jan to Lynn
J. Ackley	11/19/03	11191 ✓	12/09/03	12/09/03	Phone	Jan to Lynn
J. Ackley	11/24/03	11241 ✓	12/22/03	12/22/03	Phone	Jan to Lynn
J. Ackley	11/24/03	11242 ✓	12/22/03	12/22/03	Phone	Jan to Lynn
J. Ackley	12/3/03	12031	12/18/03	12/18/03	Phone	Jan to Lynn
J. Ackley	12/4/03	12041	12/18/03	12/18/03	Phone	Jan to Lynn
J. Ackley	12/5/03	12051	12/22/04	12/22/04	Phone	Jan to Lynn
		11243			Non regulated waste.	

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 370383 CWMI

Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 12051

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206)696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: MP ENVIRONMENTAL SERVICES INC
6. US EPA ID Number: CAT000624247
C. State Transporter's ID
D. Transporter's Phone (861)393-1151

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	15000	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L12 3178OP 14.415Kg

15. Special Handling Instructions and Additional Information PCB UNIQUE ID # D3PCB022 QUANITY IS ESTIMATED
a. CW1234 2000 ERG#171
PCB Out of Service Date: 11-14-03, Weight: 15000, Type: K

EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARTZ	Bruce Richartz	12	05	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
MIKE O'BRIEN FOR MP ENVIRX	Mike O'Brien	12	05	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	12	08	03

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ORIGINAL-RETURN TO GENERATOR

NEW

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	12051
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	370383-01
DATE RECEIVED:	12/8/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	12/8/2003
FINAL DISPOSAL LOCATION:	L12
KILOGRAMS DISPOSED OF:	14,415 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicol D. Wyscaver

CWMNW RECORDS DEPARTMENT

Certificate #	110203
Date	12/11/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 370288 Form Approved, OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 — Manifest Document No. 12031
2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address
ALCOA
509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
4. Generator's Phone (206)96-8661

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: CSU TRANSPORT INC.
6. US EPA ID Number: INR000102921
C. State Transporter's ID
D. Transporter's Phone: (877)329-1877

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone: (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	002	CM	30000	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
CW1234 EAST LANDFILL SOUTH BANK REMOVAL,
RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
D80 64560P 29,284Kg

15. Special Handling Instructions and Additional Information PCB w/wave # ID PCB 019 & PCB 020 15,000K SRS 12-10-03 15,000K
a. CW1234 2000 ERG#171
PCB Out of Service Date: 11 - 14 - 03 Weight: 30000 Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)
4264/42125

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARTZ		12	03	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
SHAWN R MARTIN		12	03	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space
See 15 add individual wts per Kristin Nadeeman/Alcoa, SRS 12-10-03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	12	03	03

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NIN1

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	12031
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	370288-01
DATE RECEIVED:	12/3/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	12/3/2003
FINAL DISPOSAL LOCATION:	L12
KILOGRAMS DISPOSED OF:	29,284 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicol A Wescher

CWMNW RECORDS DEPARTMENT

Certificate #	110195
Date	12/11/2003

370309

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 12041

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name
CSU TRANSPORT INC.

6. US EPA ID Number
INR000102921

C. State Transporter's ID

D. Transporter's Phone (877)329-1877

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709

10. US EPA ID Number
ORD089452353

G. State Facility's ID

H. Facility's Phone
(541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	12982 ~~15,000~~	K	X002
b.				MLM 12-403		
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
42 28620P 12,980K

15. Special Handling Instructions and Additional Information
PCB UNIQUE ID # 03PCB021
a. CW1234 2000 ERG#171
PCB Out of Service Date: 11-14-03, Weight: ~~15000~~ 12982, Type: K
MLM 12403 4248
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
Bruce Richartz	Bruce Richartz	11 20 03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
Shawn R Maetlin	Shawn R Maetlin	11 20 03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

FACILITY

19. Discrepancy Indication Space 13a-corrected total quantity per Bruce Richartz/ Reynolds
MLM 12-403

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
France Bailey	France Bailey	11 20 03

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ORIGINAL-RETURN TO GENERATOR

NOW

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WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	12041
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	370309-01
DATE RECEIVED:	12/04/03
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	12/04/03
FINAL DISPOSAL LOCATION:	LANDFILL 12
KILOGRAMS DISPOSED OF:	12982 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

CWMNW RECORDS DEPARTMENT

Certificate #	110148
Date	12/08/03

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 370151 Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 11243
2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 896-8661

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: MP ENVIRONMENTAL SERVICES INC.
6. US EPA ID Number: CAT000624247
C. State Transporter's ID
D. Transporter's Phone (561)393-1151

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. NON-REGULATED MATERIAL PER 49-CFR, (X004)		001	TT	2070 ~~1500~~	G	X004
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW0934 INVESTIGATION DRIVED WASTE

K. Handling Codes for Wastes Listed Above
SO
STL6A 1780P 2070G

15. Special Handling Instructions and Additional Information
a. CW0934 2000 ERG#N/A
EMERGENCY CONTACT#(800)424-9300(WMI Contract)
QUANTITY IS ESTIMATED
NDW 12-2-03

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name: BRUCE RICHARTZ | Signature: Bruce Richartz | Month Day Year: 12 4 03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: MIKE O'BRIEN FOR MP ENVIRO | Signature: Mike O'Brien | Month Day Year: 12 4 03

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space
6 gallons charged by driver 12-5-03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: Sue McAhren | Signature: Sue McAhren | Month Day Year: 12 5 03

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ORIGINAL-RETURN TO GENERATOR

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NDW

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material:

GENERATOR:	ALCOA
MANIFEST #:	11243
PROFILE #:	CW0934
CWM TRACKING ID:	370151-01
LINE ITEM:	11a
RECEIVED DATE:	11/25/03
DISPOSAL PROCESS(ES):	SOLIDIFICATION FOLLOWED BY LANDFILL
FINAL DISPOSAL LOCATION:	LANDFILL 13
DISPOSAL DATE:	11/25/03
QUANTITY:	17180 P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above-described waste material was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

Becky Turner

CWMNW RECORDS DEPARTMENT
Certificate #: 110009
Date: 12/02/03

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 370135 Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 11242
2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: ENVIRO CON & TRUCKING INC.
6. US EPA ID Number: WAD988516829
C. State Transporter's ID
D. Transporter's Phone (800)887-4206

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	DT	30000	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L12 67300P 30,520Kg

15. Special Handling Instructions and Additional Information PCB UNIQUE ID # 03 PCB 018
a. CW1234 2000 ERG#171
PCB Out of Service Date: 11-24-03, Weight: 30,000, Type: K

EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR — Printed/Typed Name: BRUCE RICHARTZ — Signature: Bruce Richartz — Month Day Year: 11 24 03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name: ROBBI BOND — Signature: Robbi Bond — Month Day Year: 11 24 03

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name — Signature — Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.
Printed/Typed Name: Sue McAthren — Signature: Sue McAthren — Month Day Year: 11 26 03

Style CF 17 LABELMASTER® (800) 621-5808 www.labelmaster.com

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

NOW

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WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	11242
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	370135-01
DATE RECEIVED:	11/24/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	11/24/2003
FINAL DISPOSAL LOCATION:	L12
KILOGRAMS DISPOSED OF:	30,527 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicole D. Wypcaver

CWMNW RECORDS DEPARTMENT

Certificate #	109956
Date	12/2/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 370136 VSW CWMI

Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.
WAD009045279	11241		

GENERATOR

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: ENVIRO CON & TRUCKING INC.
6. US EPA ID Number: WAD988516829
C. State Transporter's ID
D. Transporter's Phone: (800)887-4206

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone: (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	DT	28600	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
628200 28495K U12

15. Special Handling Instructions and Additional Information PCB UNIQUE ID# '03PCB017
a. CW1234 2000 ERG#171
PCB Out of Service Date: 11 - 24 - 03, Weight: 28600, Type: K

EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARTZ	Bruce Richartz	11	24	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Bill Jennings	Bill Jennings	11	24	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	11	24	03

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ORIGINAL-RETURN TO GENERATOR

NDW

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	11241
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	370136-01
DATE RECEIVED:	11/24/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	11/24/2003
FINAL DISPOSAL LOCATION:	L12
KILOGRAMS DISPOSED OF:	28,495 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicol D. Wypcaver

CWMNW RECORDS DEPARTMENT

Certificate #	109957
Date	12/2/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 370003 Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 11911

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
6509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: CSU TRANSPORT INC.
6. US EPA ID Number: INR000102921
C. State Transporter's ID
D. Transporter's Phone (877)329-1877

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	22689 26000	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L12 5090P 22,689Kg

15. Special Handling Instructions and Additional Information UNVQW & PCB # 03 PCB 015 ↳ 11344 K & 03 PCB 016 ↳ 11345 K
a. CW1234 2000 ERG#171
PCB Out of Service Date: 11-14-03, Weight: 26,000, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract) CONTAINER# 42102 - 52258
MLM 11-24-03

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
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Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARTZ		11	19	03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
SHAWN R MARTIN		11	19	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space 15a-added individual Container Weights per Kristin Nademann/Reynolds MLM 11-24-03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren		11	19	03

GENERATOR | TRANSPORTER | FACILITY

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ORIGINAL-RETURN TO GENERATOR

NAW

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WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	11191
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	370013-01
DATE RECEIVED:	11/19/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	11/19/2003
FINAL DISPOSAL LOCATION:	L12
KILOGRAMS DISPOSED OF:	22,689 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicol D. Wyscaver

CWMNW RECORDS DEPARTMENT

Certificate #	109878
Date	12/1/2003

2004-

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Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.
WAD009045279	11051		

GENERATOR

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: RIVERSIDE TRANSPORT SERVICES LLC
6. US EPA ID Number: ORQ0000011668

C. State Transporter's ID

D. Transporter's Phone (541)454-2225

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709

10. US EPA ID Number: ORD089452353

G. State Facility's ID

H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	14134 16000	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K
52328

K. Handling Codes for Wastes Listed Above
L12
31160p 14134K

15. Special Handling Instructions and Additional Information PCB UNIQUE#: 03PCB014
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10-21-03, Weight: 16000 14,134, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARTZ	Bruce Richartz	11	05	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
KERRY D TILLIS	[signature]	11	05	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	11	05	03

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EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

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BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	11051
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369792-01
DATE RECEIVED:	11/5/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	11/5/2003
FINAL DISPOSAL LOCATION:	L12 13-14 O 2B-2C
KILOGRAMS DISPOSED OF:	14134 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT

Certificate #	109490
Date	11/10/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 369718 Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 11033

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: CSU TRANSPORT INC
6. US EPA ID Number: INR000102921
C. State Transporter's ID
D. Transporter's Phone (877)329-1877

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	1500D	K	X002
b. BMS 11-6-03						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K
42105T

K. Handling Codes for Wastes Listed Above
L12 32020P 14,524Kg

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10-17-03, Weight: 15,000, Type: R
EMERGENCY CONTACT#(800)424-9300(WMI Contract) Unique PCB# 03PCB011

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
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Printed/Typed Name	Signature	Month	Day	Year
Greg Rutherford	Greg Rutherford	11	03	03

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Shawn R Martin	Shawn R Martin	11	03	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space Section 12. Added # of containers per Kristin Naderman/Alcoa BMS 11-6-03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	11	05	03

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ORIGINAL-RETURN TO GENERATOR

ALT BMS

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WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	11033
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369718-01
DATE RECEIVED:	11/3/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	11/3/2003
FINAL DISPOSAL LOCATION:	L12 13-14 N 2A-2B
KILOGRAMS DISPOSED OF:	14524 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 109480
Date 11/10/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 369740 CWMI

Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. W A D 0 0 9 0 4 5 2 7 9 | Manifest Document No. 1 0 4 1

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: CSU TRANSPORT INC
6. US EPA ID Number: I N R 0 0 0 1 0 2 9 2 1
C. State Transporter's ID
D. Transporter's Phone: (877)329-1877

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: O R D 0 8 9 4 5 2 3 5 3
G. State Facility's ID
H. Facility's Phone: (541)454-2643

	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	002	CM	25320 30000	K	X002
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
1. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K
42100
4259

K. Handling Codes for Wastes Listed Above
L12 55,820P 25,320K

15. Special Handling Instructions and Additional Information PCB UNIQUE #: 03 PCB 012 & 03 PCB 013
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10 - 17 - 03, Weight: ~~30,000~~ 25,320, Type: F
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARDT	Bruce Richardt	1	1	04

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Shawn R Martin	Shawn R Martin	11	04	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space
Weight changed by driver 11-4-03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Francie Bailey	Francie Bailey	11	04	03

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ORIGINAL-RETURN TO GENERATOR

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BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	11041
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369740-01
RECEIVED DATE:	11/4/2003

DRUM #(S)	DISPOSAL DATE	DISPOSAL LOCATION
03 PCB 012	11/4/2003	L12 13-14 N 2A-2B
03 PCB 013	11/4/2003	L12 13-14 N 2A-2B

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 109474
Date 11/6/2003

1603 369720 CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.
WAD009045279	11032		

GENERATOR

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: RIVERSIDE TRANSPORT SERVICES LLC
6. US EPA ID Number: ORQ0000011668
C. State Transporter's ID
D. Transporter's Phone: (541)454-2226

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone: (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	18955	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
CW1234 EAST LANDFILL SOUTH BANK REMOVAL,
RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L12406060P 18,443Kg

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10-16-03, Weight: 18955, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract) Unique PCB# 03PCB010

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Greg Rutherford	Greg Rutherford	11	03	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Joe Claughton	Joe Claughton	11	03	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	11	03	03

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ORIGINAL-RETURN TO GENERATOR

R 11/3

ALT BMS

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WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	11032
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369720-01
DATE RECEIVED:	11/3/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	11/3/2003
FINAL DISPOSAL LOCATION:	L12 12-13 N 1Z-2A
KILOGRAMS DISPOSED OF:	18443 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT

Certificate #	109435
Date	11/5/2003

2004 369721 V&M CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 11031

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: RIVERSIDE TRANSPORT SERVICES LLC
6. US EPA ID Number: ORQ0000011658

C. State Transporter's ID

D. Transporter's Phone (541)454-2226

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709

10. US EPA ID Number: ORD089452353

G. State Facility's ID

H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	1.5909	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L12 3542DP 16,066kg

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10-16-03, Weight: 15909, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract) Unique PCB# 03 PCB 009

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Greg Rutherford	Greg Rutherford	11	03	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Ron Evans	Ron Evans	11	03	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	11	03	03

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R 11/3

ALT BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	11031
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369721-01
DATE RECEIVED:	11/3/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	11/3/2003
FINAL DISPOSAL LOCATION:	L12 12-13 N 1Z-2A
KILOGRAMS DISPOSED OF:	16066 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT

Certificate #	109436
Date	11/5/2003

2001

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 369689 Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 10313

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: RIVERSIDE TRANSPORT SERVICES LLC
6. US EPA ID Number: ORQ0000011668
C. State Transporter's ID
D. Transporter's Phone (541)454-2226

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	16590	K	X002
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L12 36410P 16756Kg.

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10 - 15 - 03, Weight: 16,590, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract) Waste PCB # 03PCB008

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
Greg Rutherford	Greg Rutherford	10	31	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Ron Evans	Ron Evans	10	31	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAthren	Sue McAthren	10	31	03

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BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	10313
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369689-01
DATE RECEIVED:	10/31/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	10/31/2003
FINAL DISPOSAL LOCATION:	L12 8-9 N 1U-1V
KILOGRAMS DISPOSED OF:	16756 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT

Certificate #	109429
Date	11/5/2003

1602

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Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 — Manifest Document No. 10312

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: RIVERSIDE TRANSPORT SERVICES LLC
6. US EPA ID Number: ORQ0000011668
C. State Transporter's ID
D. Transporter's Phone (541)454-2226

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	17500	K	X002
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L2 38520P 17,473kg

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10-15-03, Weight: 17,500, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract) Unique PCB # 03PCB007

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
Greg Rutherford	Greg Rutherford	10	31	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Joe Claughton	Joe Claughton	10	31	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAthren	Sue McAthren	10	31	03

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ORIGINAL-RETURN TO GENERATOR

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BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	10312
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369682-01
DATE RECEIVED:	10/31/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	10/31/2003
FINAL DISPOSAL LOCATION:	L12 10-11 N 1V-1W
KILOGRAMS DISPOSED OF:	17473 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT

Certificate #	109426
Date	11/5/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 369678 CWMI

Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. W A D 0 0 9 0 4 5 2 7 9 | Manifest Document No. 1031 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: CSU TRANSPORT INC
6. US EPA ID Number: I N R 0 0 0 1 0 2 9 2 1
C. State Transporter's ID
D. Transporter's Phone (877)329-1877

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: O R D 0 8 9 4 5 2 3 5 3
G. State Facility's ID
H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	11567 ~~15000~~	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K
4276

K. Handling Codes for Wastes Listed Above
L12 25500P 11,567K

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10-13-03, Weight: 11567 ~~15000~~K, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract) PCB Unique ID # 3CPCB006

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Greg Rutherford	Greg Rutherford	10	31	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Shawn R Martin	Shawn R Martin	10	31	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space
Weight changed by driver 10-31-03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	10	31	03

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EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

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BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	10311
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369678-01
DATE RECEIVED:	10/31/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	10/31/2003
FINAL DISPOSAL LOCATION:	L12 9-10 N 1V-1W
KILOGRAMS DISPOSED OF:	11567 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 109425
Date 11/5/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 369665 Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 10304
2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: MP ENVIRONMENTAL SERVICES INC.
6. US EPA ID Number: CAT000624247
C. State Transporter's ID
D. Transporter's Phone: (661)393-1151

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone: (541)454-2643

	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	SKS 11.4.03 10,850 ~~12,000~~	K	X002
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K
MLM 10-31-03

K. Handling Codes for Wastes Listed Above
L12 23920P 10,850Kg WEIGHT IS ESTIMATED

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171
PCB Out of Service Date: ~~10-30-03~~ 10-13-03 Weight: 12000, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
BRIAN LARSON		10	30	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
~~BRIAN LARSON~~ MIKE OBRIEN FOR MP ENVIRO		10	30	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space 15a-added OSD per Kristin Nadermann/Reynolds, MLM 10-31-03
11a correct quantity per Kristin Nadermann/Reynolds. SKS 11.4.03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Francie Bailey	Francie Bailey	10	30	03

Style CF 17 LABELMASTER® (800) 621-5808 www.labelmaster.com

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

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BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	10304
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369665-01
DATE RECEIVED:	10/30/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	10/30/2003
FINAL DISPOSAL LOCATION:	L12 8-9 N 2A-2B
KILOGRAMS DISPOSED OF:	10850 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 109422
Date 11/5/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 3699664 Form Approved. OMB No. 2050-0039. CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 10303
2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206)696-8661

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: CSU TRANSPORT INC
6. US EPA ID Number: INR000102921
C. State Transporter's ID
D. Transporter's Phone (877)329-1877

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	002	CM	27,025 ~~30000~~	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

15000K

K. Handling Codes for Wastes Listed Above
L2 59,580 27,025Kg.

15. Special Handling Instructions and Additional Information 03PCB003-10-11-03, 03PCB004-10-11-03 15000K
a. CW1234 2000 ERG#171
PCB Out of Service Date: 10-11-03, Weight: 30000, Type: K

EMERGENCY CONTACT#(800)424-9300(WMI Contract) mlm 10-31-03

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
BRIAN LARSON		1	0	30 05

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
SHAWN R MARTIN		1	0	30 05

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space 15a-added Unique ID #'s + 03D per Kristin Nadermann/Reynolds. MLM 10-31-03
11a correct quantity per Kristin Naderman/Reynolds. SRS 11.4.03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Francie Bailey	Francie Bailey	1	0	30 03

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EPA Form 8700-22 (Rev. 9/88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

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BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	10303
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369664-01
RECEIVED DATE:	10/30/2003

DRUM #(S)	DISPOSAL DATE	DISPOSAL LOCATION
03 PCB 003	10/30/2003	L12 8-9 N 2A-2B
03 PCB 004	10/30/2003	L12 8-9 N 2A-2B

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT
Certificate # 109421
Date 11/5/2003

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) 369671 V&R CWMI

Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.
WAD009045279	10302		

GENERATOR

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: RIVERSIDE TRANSPORT SERVICES LLC
6. US EPA ID Number: ORQ0000116688
C. State Transporter's ID
D. Transporter's Phone (541)454-2225

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	12750	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

MLM 10-31-03

K. Handling Codes for Wastes Listed Above
L12 27500P 12,474KG

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171
PCB Out of Service Date: ~~10-30-03~~ 10-10-03 Weight: 12750, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
BRIAN LARSON		10	30	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Joe Claughton	Joe Claughton	10	30	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space ISa-Corrected OSD per Kristin Nadermann-Reynolds. MLM 10-31-03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	10	30	03

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EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

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BMS

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	10302
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369671-01
DATE RECEIVED:	10/30/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	10/30/2003
FINAL DISPOSAL LOCATION:	L12 8-9 N 2A-2B
KILOGRAMS DISPOSED OF:	12474 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

CWMNW RECORDS DEPARTMENT

Certificate #	109278
Date	11/3/2003

2004 369670 CWMI

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 10301

2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
4. Generator's Phone (206 896-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: RIVERSIDE TRANSPORT SERVICES LLC
6. US EPA ID Number: ORQ0000011668
C. State Transporter's ID
D. Transporter's Phone (541)454-2226

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	15522 ~~17272~~	K	X002
b.					MLM 10-31-03		
c.							
d.							

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K
MLM 10-31-03

K. Handling Codes for Wastes Listed Above
L12 34220P 15,522KC

15. Special Handling Instructions and Additional Information
a. CW1234 2000 ERG#171 10-10-03 15522
PCB Out of Service Date: ~~10-10-03~~ Weight: ~~17272~~, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.
If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
BRIAN CARLSON		10	30	03

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Ron Evans	Ron Evans	10	30	03

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space 13a- Corrected total quantity, 15a- Corrected CSD, both per Kristin Nadermann/Reynolds. MLM 10-31-03

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	10	30	03

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EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

PRINTED ON RECYCLED PAPER USING SOYBEAN INK PRINTED WITH SOY INK

R 10/30

BMS

WASTE MANAGEMENT

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA
MANIFEST #:	10301
LINE ITEM:	11a
PROFILE #:	CW1234
CWM TRACKING ID:	369670-01
DATE RECEIVED:	10/30/2003
DISPOSAL PROCESS(ES):	LANDFILL
DISPOSAL DATE:	10/30/2003
FINAL DISPOSAL LOCATION:	L12 8-9 N 2A-2B
KILOGRAMS DISPOSED OF:	15522 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Becky Sumner

CWMNW RECORDS DEPARTMENT

Certificate #	109423
Date	11/5/2003

VANCOUVER 2004 HAZARDOUS WASTE MANIFEST LOG

	Manifest Number	PCB Unique Number	Weight (pounds, K or T, or gals)		Number of Drums or Containers	Profile Number	Date Shipped	Actual Weight		Comments
✓	04041	04PCB001	12,382	K	1 CM	CW1234	4/16/04	9,798	K	
✓	04042	04PCB002	17,386	K	1 CM	CW1234	4/16/04	10,152	K	
✓	04051	04PCB003	28,500	K	1 DT	CW1234	5/17/04	28,831	K	Actual weight is from Certificate of Disposal
✓	04052	04PCB004	13,636	K	1 DT	CW1234	5/17/04	12,093	K	
								60,874		

VANCOUVER PCB ITEMS REMOVED FROM SERVICE FOR DISPOSAL - 2004

Note: All PCB items removed from service for disposal must be included on this form. (PCB items removed from service for reuse do not have to be listed.) Any PCB items received from another Reynolds location and placed into storage for disposal must be included.

Name of Person Making Entry	*Date of Entry*	*Description of PCB Item (e.g. Transformer)*	*Serial Number***	*Est. Weight of PCB Material*** (Kilograms)*		*Date Removed from Service for Disposal*	*Date Placed into Transport for Disposal*	*Date of Final Disposal, if Known*	*Comments*
J. Ackley	4/20/04	Soil from ELF	04PCB01	12,382	K	4/5/04	4/16/04	4/16/04	
J. Ackley	4/20/04	Soil from ELF	04PCB02	17,386	K	4/5/04	4/16/04	4/16/04	
J. Ackley	6/28/04	Soil from ELF	04PCB03	28,500	K	5/13/04	5/17/04	5/17/04	
J. Ackley	6/28/04	Soil from ELF	04PCB04	13,636	K	5/13/04	5/17/04	5/17/04	

VANCOUVER TRANSPORTATION VERIFICATION LOG - 2004

Note: PCBs shipped for disposal must be verified as actually being delivered at the PCB designated facility within one business day of the PCB generator receiving the returned, signed manifest.

Name of Person Making Entry	*Date Generator Signed Manifest*	*Manifest Document Number*	*Date Returned, Signed Manifest was Received*	*Date of Verification*	*Method of Verification (phone, fax, email, or agreed upon method)*	*Name of Person Making Verification*
J. Ackley	4/16/04	04041	05/03/04	05/04/04	Phone	Jan to Wendy
J. Ackley	4/16/04	04042	05/03/04	05/04/04	Phone	Jan to Wendy
J. Ackley	5/17/04	04051	06/28/04	06/28/04	Phone	Jan to Becky
J. Ackley	5/17/04	04052	06/28/04	06/28/04	Phone	Jan to Becky

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039.

CWMI

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 — Manifest Document No. 04041

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
4. Generator's Phone (206 896-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: MP ENVIRONMENTAL SERVICES INC
6. US EPA ID Number: CAT000624247
C. State Transporter's ID
D. Transporter's Phone (661)393-1151

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

GENERATOR

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, WASTE, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	12382	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK RMVL, PCB'S, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information PCB UNIQUE ID # 04PCB001
a. CW1234 2000 ERG#171
PCB Out of Service Date: 04-05-04, Weight: 12382, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARTZ	Bruce Richartz	04	16	04

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
MIKE O'GRIEN FOR MP ENVIRO	Mike O'Grien	04	16	04

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACIL

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

Style CF 17 LABELMASTER® (800) 621-5808 www.labelmaster.com

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GENERATOR COPY

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MP
MIKE O'B
4/15/04
0700

CWM OF THE NORTHWEST
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812
Driver (1):
Driver (2): MIKE O'BRIEN

Trip Ticket: 000258160 RUN: 0223631 PAGE: 1
Requested by: WM0225GXM
Requested On: 04/15/04
MP ENV SVCS
Load/Unload:

Generator Information: US EPA ID No. WAD009045279 ALCOA 5509 NW LOWER RIVER RD PIK-UP/1 VANCOUVER, WA 98660-1031 Pickup: 04/16/04 08:00 24 HR EMERGENCY AND SPILL ASSISTANCE NUMBERS:	Manifest Document Number(s) 04041 State EPA ID No. NO STATE EPA Phone: (206) 696-8661 ( ) -
Transporter Information: MP ENVIRONMENTAL SERVICES INC 10826 NE 149TH ST BOTHELL, WA 98011-4829	US EPA ID No. CAT000624247 State EPA ID No. NO STATE EPA Phone: (661) 393-1153
Designated Facility Information CWM OF THE NORTHWEST 17629 CEDAR SPRINGS LN ARLINGTON, OR 97812 DISP: 04/16/04 13:00 SC: PLFB	US EPA ID No. ORD089452353 State EPA ID No. NO STATE EPA Phone: (541) 454-2643

US DOT Information: Service Request No.: 0717576 Activity No. 001
Master Service Request No.: 0000000 UN/NA: UN3077 Pkg Grp: III
PROFILE CW1234 EAST LANDFILL SOUTH BANK RMVL Hazard class: 9 HM: Y
DOT Proper Shipping Name: P.O.#:
ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S
Customer Contact: BRUCE RICHARTZ (ALCOA)MANIFEST (509) 680-3682 EXT: 0000

Containers No.	Type	Total Quantity	UWV	UOM DESCRIPTION	Waste Codes
0001	CM	0			
				(Shipped)	

US DOT Information: Service Request No.: 0717576 Activity No. 002
Master Service Request No.: 0000000 UN/NA: Pkg Grp:
SERVICE PIK Pick Up Rolloff Box Hazard class: HM:
DOT Proper Shipping Name: P.O.#:
Customer Contact: BRUCE RICHARTZ (ALCOA)MANIFEST (509) 680-3682 EXT: 0000
PICK-UP only / 1-20YD OT.

Containers No.	Type	Total Quantity	UWV	UOM DESCRIPTION	Waste Codes
0001	CM	0			
				(Shipped)	

CW[illegible] THE NORTHWEST
176[illegible] CEDAR SPRINGS LANE
ARLINGTON, OR 97812

Trip Ticket: 000258160 RUN: 0223631 PAGE: 2
Requested by: WM0225GXM
Requested On: 04/15/04

LOADING DEMURRAGE
DEPART DATE/TIME _____

ADDITIONAL CUSTOMER/SITE

UNLOADING DEMURRAGE
DEPART DATE/TIME _____

Time Summary	
Start	8:00 AM
End	9:30 AM
Total	1 1/2

ARRIVAL DATE/TIME _____

Requirements	
Box In #	N/A.
Box Out #	52328
Wash	Yes / No
Bring Liner	@ 1/2/3

Time Summary	
Start	_____
End	_____
Total	_____

ARRIVAL DATE/TIME _____

LOAD/~~UNLOAD~~ COMMENTS Excavator Had To Move Bin Out To Location I Could P/U

ADDITIONAL COMMENTS/REMARKS: Ground Is Soft

Bin Dropped 4/12/04

Shipper Signature — Date 04/16/04

Transportation Signature — Date 4/16/04

Receiving Signature — Date __/__/__

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA	
MANIFEST #:	04041	
LINE ITEM:	11a	
PROFILE #:	CW1234	
CWM TRACKING ID:	372141-01	
DATE RECEIVED:	4/16/2004	
DISPOSAL PROCESS(ES):	LANDFILL	
DISPOSAL DATE:	4/16/2004	
FINAL DISPOSAL LOCATION:	L12	
KILOGRAMS DISPOSED OF:	1 CM	9798 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicol D. Wypcover

CWMNW RECORDS DEPARTMENT

Certificate #	113370
Date	4/20/2004

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039.

CWM1

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 — Manifest Document No. 04042

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
4. Generator's Phone (206 096-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: RIVERSIDE TRANSPORT SERVICES LLC
6. US EPA ID Number: ORQ000011668

C. State Transporter's ID

D. Transporter's Phone (541)454-2226

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709

10. US EPA ID Number: ORD089452353

G. State Facility's ID

H. Facility's Phone (541)454-2643

	11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.	RQ, WASTE, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	CM	17386	K	X002
b.							
c.							
d.							

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK RMVL, PCB'S, RQ=1LB(0.454)K

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information PCB UNIQUE ID # 04 PCB 002
a. CW1234 2000 ERG#171
PCB Out of Service Date: 04-05-04 Weight: 17386 Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled; and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARDT		04	16	04

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Fred E Fallini		04	16	04

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

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EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

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FILE COPY OR STATE COPY

CTS
FRED F.
4/16/04
0800

CWM OF THE NORTHWEST
17[redacted]9 CEDAR SPRINGS LANE
A[redacted]NGTON, OR 97812
Driver (1): ,
Driver (2): Fred Fahrni

Trip Ticket: 000258161 RUN: 0223632 PAGE: 1
Requested by: WM0225GXM
Requested On: 04/15/04
RIVERSIDE TRANS
Load/Unload:

Generator Information: US EPA ID No. WAD009045279 ALCOA 5509 NW LOWER RIVER RD PIK-UP/1 VANCOUVER, WA 98660-1031 Pickup: 04/16/04 08:00 24 HR EMERGENCY AND SPILL ASSISTANCE NUMBERS:	Manifest Document Number(s) 64643 State EPA ID No. NO STATE EPA Phone: (206) 696-8661 ( ) -
Transporter Information: RIVERSIDE TRANSPORT SERVICES 1395 W 2ND ST ARLINGTON, OR 97812-0095	US EPA ID No. ORQ000011668 State EPA ID No. NO STATE EPA Phone: (541) 454-2226
Designated Facility Information CWM OF THE NORTHWEST 17629 CEDAR SPRINGS LN ARLINGTON, OR 97812 DISP: 04/16/04 13:00 SC: PLFB	US EPA ID No. ORD089452353 State EPA ID No. NO STATE EPA Phone: (541) 454-2643

[redacted]DOT Information: Service Request No.: 0717577 Activity No. 001
Master Service Request No.: 0000000 UN/NA: UN3077 Pkg Grp: III
PROFILE CW1234 EAST LANDFILL SOUTH BANK RMVL Hazard class: 9 HM: Y
DOT Proper Shipping Name: P.O.#: _____
ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S
Customer Contact: BRUCE RICHARTZ (ALCOA)MANIFEST (509) 680-3682 EXT: 0000

Containers No.	Type	Total Quantity	UWV	UOM DESCRIPTION	Waste Codes
0001	CM	0	04	10 04	
		(Shipped)			

US DOT Information: Service Request No.: 0717577 Activity No. 002
Master Service Request No.: 0000000 UN/NA: Pkg Grp:
SERVICE PIK Pick Up Rolloff Box Hazard class: HM:
DOT Proper Shipping Name: P.O.#: _____

Customer Contact: BRUCE RICHARTZ (ALCOA)MANIFEST (509) 680-3682 EXT: 0000
Pick-up 4/20/04

Containers No.	Type	Total Quantity	UWV	UOM DESCRIPTION	Waste Codes
[redacted]1	CM	0			
		(Shipped)			

CW[illegible]F THE NORTHWEST
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

Trip Ticket: 000258161 RUN: 0223632 PAGE: 2
Requested by: WM0225GXM
Requested On: 04/15/04

LOADING DEMURRAGE	ADDITIONAL	UNLOADING DEMURRAGE
DEPART DATE/TIME _____	CUSTOMER/SITE	DEPART DATE/TIME _____
Time Summary Start 8:00 End 9:20 Total _____	Requirements Box In # N/A Box Out # 41295 Wash Yes / No Bring Liner @/1/2/3	Time Summary Start _____ End _____ Total _____
ARRIVAL DATE/TIME _____		ARRIVAL DATE/TIME _____

LOAD/UNLOAD COMMENTS _____

ADDITIONAL COMMENTS/REMARKS: _____

Pick up 4/16/04

Bruce Dilbert — 04/16/04 — Shipper Signature / Date

Joel Fabian — 4/16/04 — Transportation Signature / Date

_____ — __/__/__ — Receiving Signature / Date

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA	
MANIFEST #:	04042	
LINE ITEM:	11a	
PROFILE #:	CW1234	
CWM TRACKING ID:	372142-01	
DATE RECEIVED:	4/16/2004	
DISPOSAL PROCESS(ES):	LANDFILL	
DISPOSAL DATE:	4/16/2004	
FINAL DISPOSAL LOCATION:	L12	
KILOGRAMS DISPOSED OF:	1 CM	10,152 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicole D. Wyscaver

CWMNW RECORDS DEPARTMENT

Certificate #	113371
Date	4/20/2004

372525

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 — Manifest Document No. 04051

2. Page 1 of 1 — Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
4. Generator's Phone (206)696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: ENVIRO CON & TRUCKING INC.
6. US EPA ID Number: WAD988516829
C. State Transporter's ID
D. Transporter's Phone (800)887-4236

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353
G. State Facility's ID
H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	DT	28500	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L12 63,560P 28,831K

15. Special Handling Instructions and Additional Information PCB UNIQUE ID # 04 PCB 003
a. CW1234 2000 ERG#171
PCB Out of Service Date: 05-13-04 Weight: 28,500 Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

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Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARTZ	Bruce Richartz	05	17	04

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Bill Jennings	Bill Jennings	05	17	04

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	05	20	04

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ORIGINAL-RETURN TO GENERATOR

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA	
MANIFEST #:	04051	
LINE ITEM:	11a	
PROFILE #:	CW1234	
CWM TRACKING ID:	372525-01	
DATE RECEIVED:	5/17/2004	
DISPOSAL PROCESS(ES):	LANDFILL	
DISPOSAL DATE:	5/17/2004	
FINAL DISPOSAL LOCATION:	L12	
KILOGRAMS DISPOSED OF:	1 DT	28,831 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicole A Wycoff

CWMNW RECORDS DEPARTMENT
Certificate # 114170
Date 5/20/2004

372522

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039.

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. WAD009045279 Manifest Document No. 04052

2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
ALCOA
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031
4. Generator's Phone (206 696-8661

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: ENVIRO CON & TRUCKING INC.
6. US EPA ID Number: WAD988516829

C. State Transporter's ID

D. Transporter's Phone (800)887-4206

7. Transporter 2 Company Name

8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address
CWMNW, INC.
17629 CEDAR SPRINGS LANE
ARLINGTON OR 97812-9709
10. US EPA ID Number: ORD089452353

G. State Facility's ID

H. Facility's Phone (541)454-2643

11. US DOT Description (Including Proper Shipping Name, Hazard Class and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S, 9, UN3077, III, (POLYCHLORINATED BIPHENYLS), X002	X	001	DT	12.093K ~~13,636~~	K	X002
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
a. CW1234 EAST LANDFILL SOUTH BANK REMOVAL, RQ=1Lb(0.454)K

K. Handling Codes for Wastes Listed Above
L12 2660P 12,093Kg

15. Special Handling Instructions and Additional Information PCB UNIQUE ID # 04 PCB 004
a. CW1234 2000 ERG#171
PCB Out of Service Date: 05-13-04 Weight: 13636, Type: K
EMERGENCY CONTACT#(800)424-9300(WMI Contract)

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
BRUCE RICHARTZ	Bruce Richartz	05	17	04

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Scott W. McDonald	Scott W. McDonald	05	17	04

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space
Weight changed by driver 5-17-04 SM

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year
Sue McAhren	Sue McAhren	05	17	04

GENERATOR

TRANSPORTER

FACIL

Style CF 17 LABELMASTER® (800) 621-5808 www.labelmaster.com

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

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CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST, INC
FEDERAL EPA ID#: ORD089452353
17629 CEDAR SPRINGS LANE
ARLINGTON, OR 97812

ALCOA
WAD009045279
5509 NW LOWER RIVER RD
VANCOUVER WA 98660-1031

CERTIFICATE OF DISPOSAL

Chemical Waste Management of the Northwest, Inc. has received the following waste material and certifies that the material has been landfilled in accordance with 40 CFR part 761 as it pertains to the land disposal of Polychlorinated Biphenyl contaminated materials.

GENERATOR:	ALCOA	
MANIFEST #:	04052	
LINE ITEM:	11a	
PROFILE #:	CW1234	
CWM TRACKING ID:	372522-01	
DATE RECEIVED:	5/17/2004	
DISPOSAL PROCESS(ES):	LANDFILL	
DISPOSAL DATE:	5/17/2004	
FINAL DISPOSAL LOCATION:	L12	
KILOGRAMS DISPOSED OF:	1 DT	12,093 K

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615) I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

Nicole A Wycoff

CWMNW RECORDS DEPARTMENT
Certificate # 114087
Date 5/19/2004

APPENDIX E

FIELD DENSITY AND MOISTURE CONTENT RESULTS AND SOIL LABORATORY DATA

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

Carlson Testing, Inc.

Main Office
P.O. Box 23814
Tigard, Oregon 97281
Phone (503) 684-3460
FAX (503) 684-0954

Salem Office
4060 Hudson Ave., NE
Salem, OR 97301
Phone (503) 589-1252
FAX (503) 589-1309

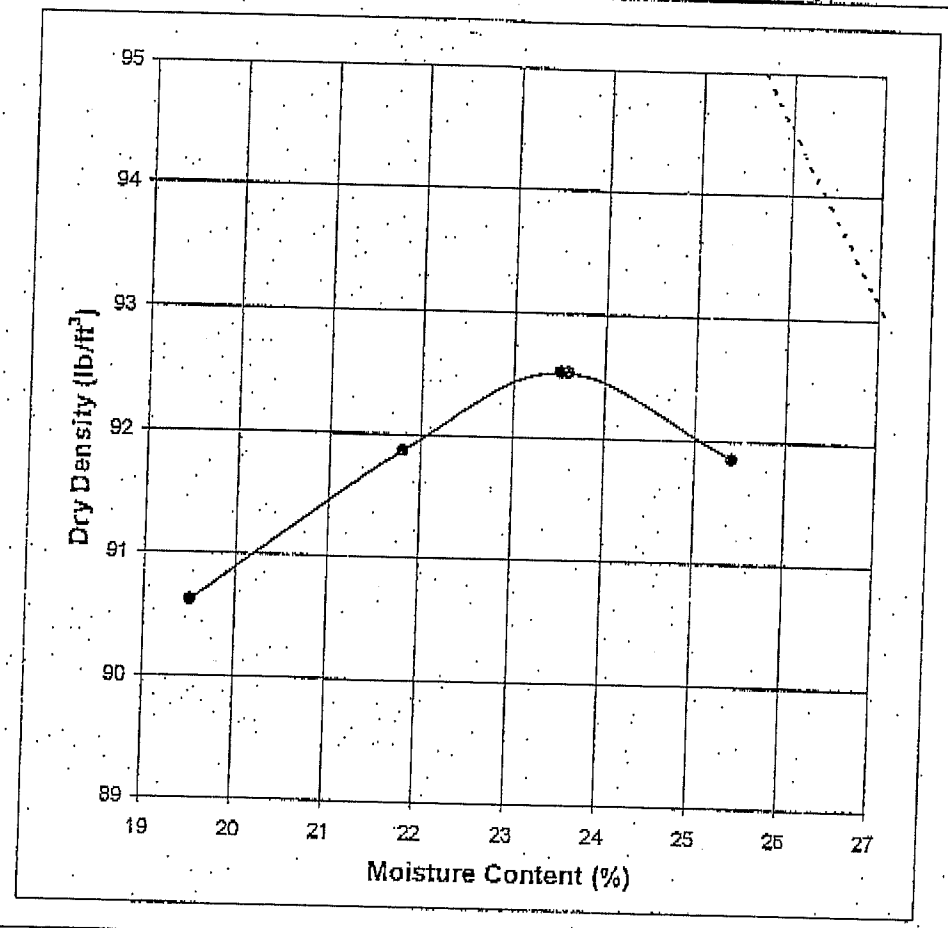
Bend Office
P.O. Box 7918
Bend, OR 97708
Phone (541) 330-9155
FAX (541) 330-

Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
Material Type: Sand with Mulch

10/21/03
Job Number: T0304239
Location: Unknown

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/17/03
Sample Method:	ASTM D-75	**Date Tested:**	10/21/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 23.6%

Max. Dry Density: 92.5 lbs/ft³

Percent Passing #4 Sieve: 97.2%

EMAIL: MARC KREKOS W/CH2M HILL AT MARC.KREKOS@CH2M.COM AND MIKE DREWETT W/CH2M HILL AT MIKE.DREWETT@CH2M.COM

Reviewed By: _____
James F. Nieptas - Laboratory Manager

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FAX (503) 684-0954

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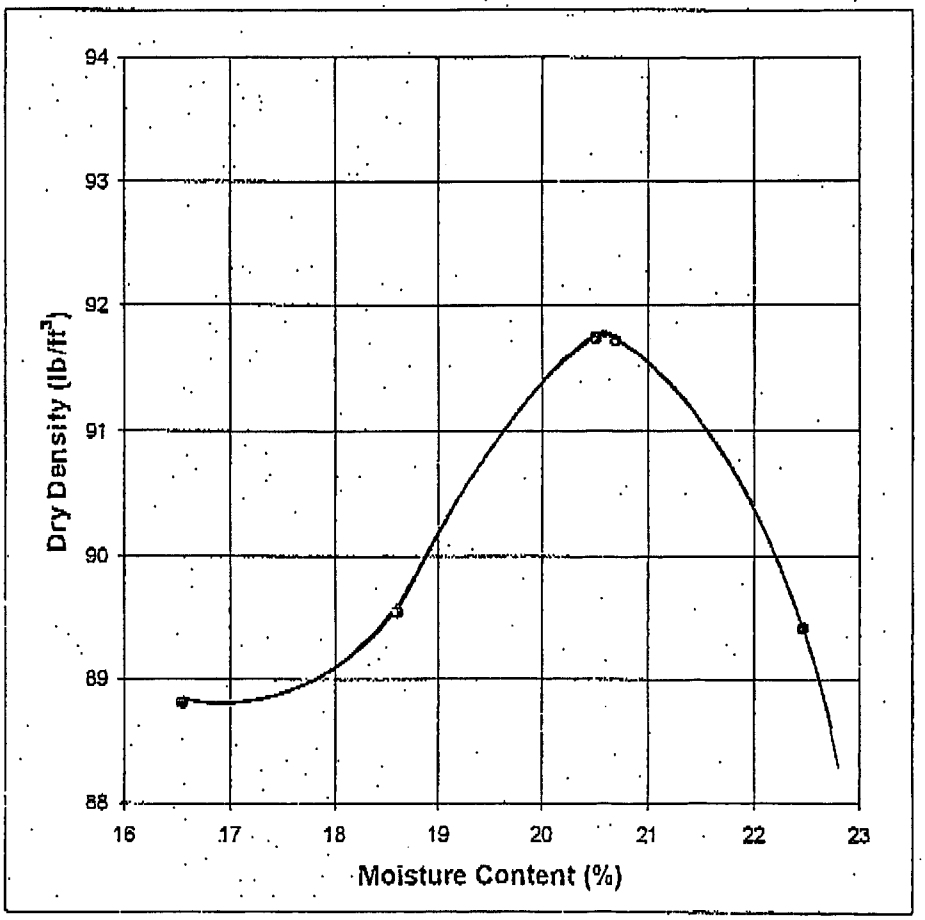
Phone (503) 589-1252
FAX (503) 589-1309

Bend Office
P.O. Box 7918
Bend, OR 97708
Phone (541) 330-9155
FAX (541) 330-9163

Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03 — 10/21/03
Job Number: T0304239
Material Type: Sand from Glacier Northwest — Location: Unknown

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/15/03
Sample Method:	ASTM D-75	**Date Tested:**	10/16/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 20.5% **Max. Dry Density:** 91.7 lbs/ft³

Percent Passing #4 Sieve: 100.0%

NOTE: ZERO VOIDS CURVE PLOTS BEYOND OPTIMUM MOISTURE AND MAXIMUM DRY DENSITY CURVE.

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Reviewed By: _____

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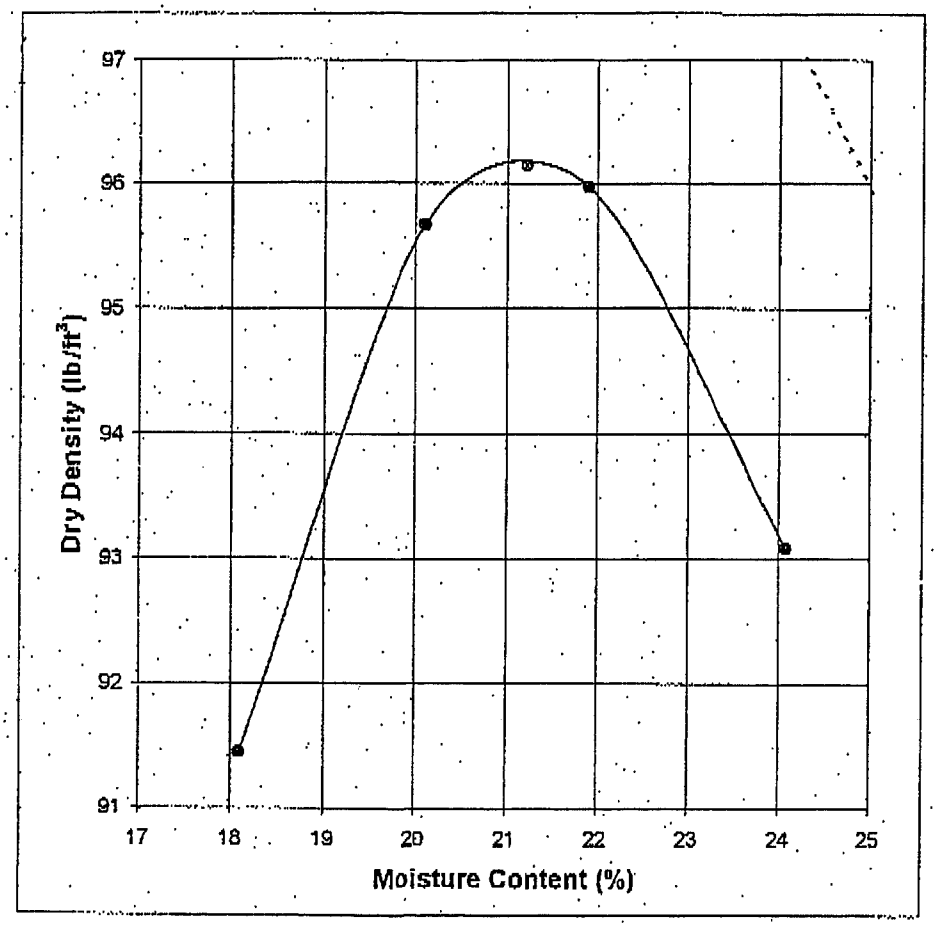
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
11/04/03
Job Number: T0304239
Material Type: Native Light Brown Silt
Location: Cut Bank

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/29/03
Sample Method:	ASTM D-75	**Date Tested:**	10/30/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 21.2% **Max. Dry Density:** 96.1 lbs/ft³

Percent Passing #4 Sieve: 100.0%

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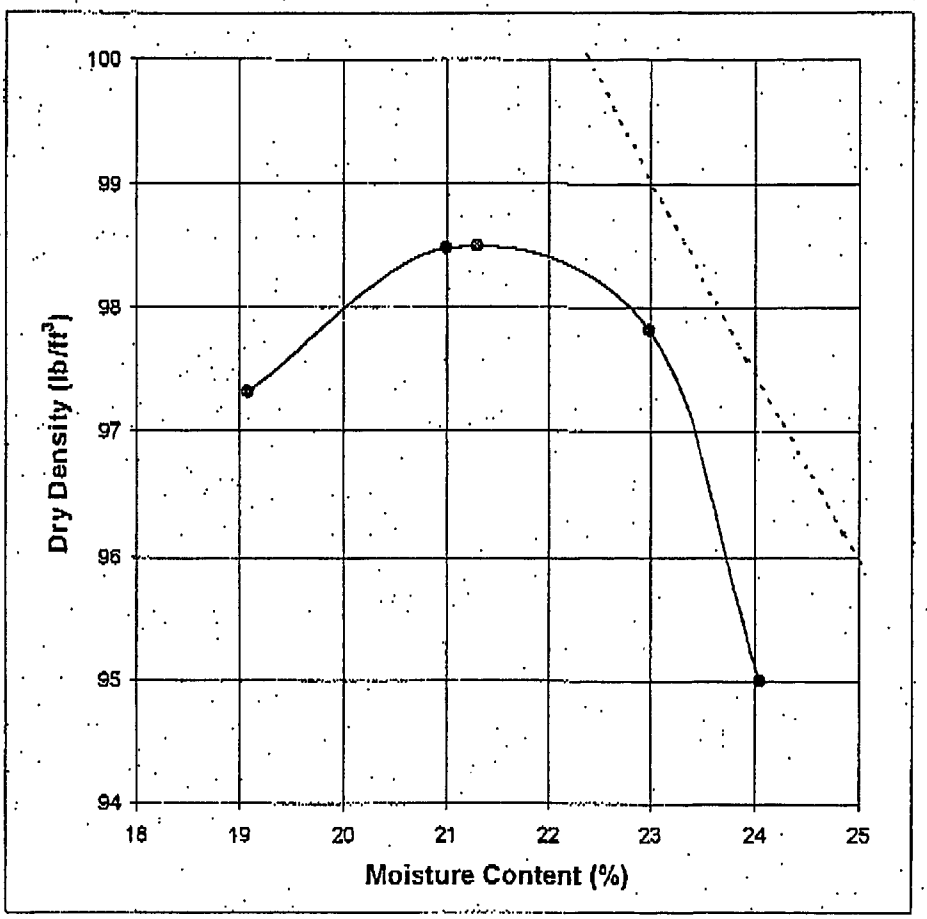
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03 — 11/04/03
Job Number: T0304239
Material Type: Native Black Silt with Gravel
Location: Cut Bank

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/29/03
Sample Method:	ASTM D-75	**Date Tested:**	10/30/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Coarse specific gravity used in adjusted max density computations: 2.486

Optimum Moisture: 21.3% **Max. Dry Density: 98.5 lbs/ft³**

Adjusted Opt Moisture: 19.5% **Adjusted Max Density: 102.7**

Percent Passing #4 Sieve: 88.8%

MAIL: MARC KREKOS W/CH2M HILL AT MARC.KREKOS@CH2M.COM AND MIKE DREWETT W/CH2M HILL AT MIKE.DREWETT@CH2M.COM

Reviewed By: _____

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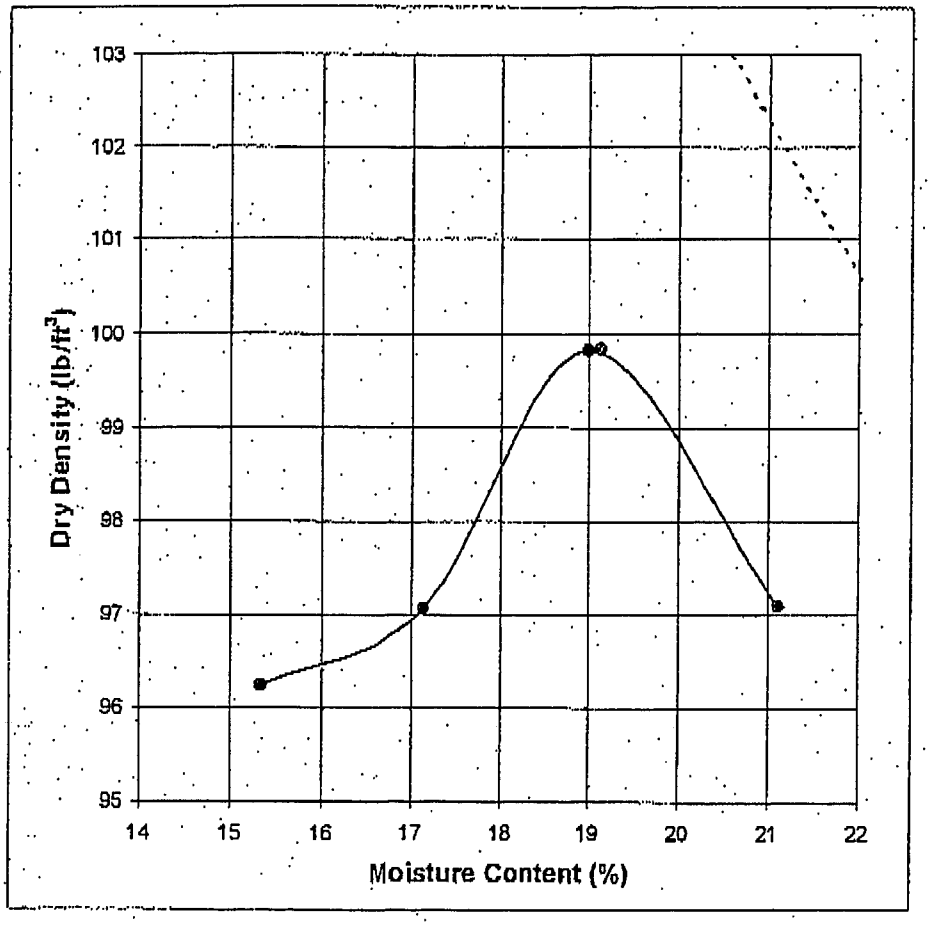
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
11/04/03
Job Number: T0304239
Material Type: Sand with silt (5-1 ratio)
Location: On Site

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	Unknown
Sample Method:	ASTM D-75	**Date Tested:**	10/27/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 19.1% **Max. Dry Density:** 99.8 lbs/ft³

Percent Passing #4 Sieve: 100.0%

NOTE: ZERO VOIDS CURVE PLOTS BEYOND OPTIMUM MOISTURE AND MAXIMUM DRY DENSITY CURVE.

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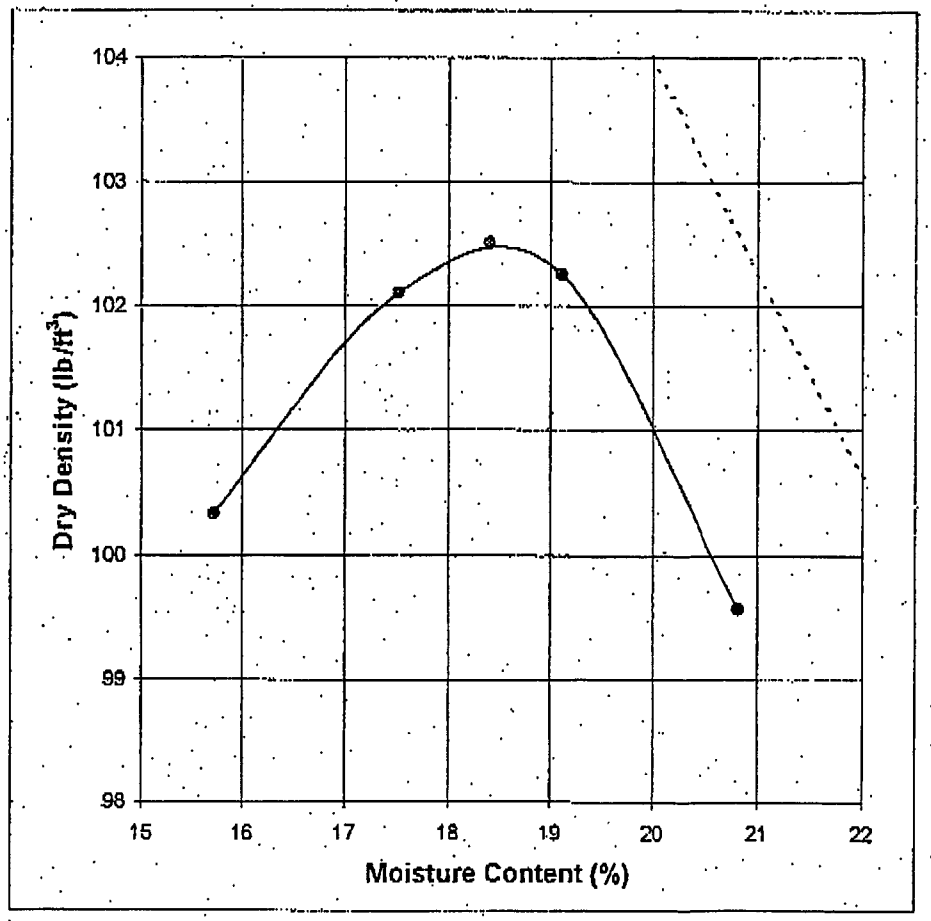
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03 — 11/04/03
Job Number: T0304239
Material Type: Native Sand with Clay
Location: Unknown

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/27/03
Sample Method:	ASTM D-75	**Date Tested:**	10/28/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 18.4% **Max. Dry Density:** 102.5 lbs/ft^3

Percent Passing #4 Sieve: 97.8%

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Reviewed By: _____

James F. Hieptas - Laboratory Manager

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Troxler Model 3440 Calibration Report (Page 1 of 3)

Gauge Model: 03440 A Gauge Serial Number: 024467

Reference standard counts: Density - 2786 Moisture - 614

Calibration Date: 08-14-2003 Print Date: 08-14-2003 Bay - 073

*** Density calibration count data ***

Depth in.	Magnes 1777	Mag/Al 2171	Alumin 2686
BS	1251	878	564
2	4191	2873	1698
4	4250	2772	1521
6	3434	2094	1062
8	2376	1340	616

*** Density performance parameters ***

Pos	A	B*1000	C	'Y'	Slope	Prec
BS	2.820	1.09595	-.03731	2171.0	1.0	8.15
2	8.724	.95563	.12515	2171.0	3.4	4.15
4	11.025	1.08262	.12233	2171.0	3.8	3.70
6	12.856	1.31448	.04632	2171.0	3.4	3.65
8	13.318	1.55415	.01700	2171.0	2.6	3.90

*** Moisture calibration count data ***

Mag 0	Mag/poly 591.0	S R
17	400	387

*** Moisture performance parameters ***

E	F*1000	Rat	Prec	S R	Exerr
.02769	1.05546	3.26	5.16	-20.1	15.3

Troxler Model 3440 Calibration Report (Page 2 of 3)

***** Density Standard Decay Sheet *****

Gauge Model - 03440 A
Serial - 024467

Calibration Date: 08-14-2003
Print Date : 08-14-2003

Ref. std. cnt. = 2786

Range of projected density standard counts at future dates

Date	Lower Limit of Projected density Standard Count	Upper Limit of Projected density Standard Count
09-01-2003	2755	2811
10-01-2003	2750	2805
11-01-2003	2744	2800
12-01-2003	2739	2795
01-01-2004	2734	2789
02-01-2004	2729	2784
03-01-2004	2724	2779
04-01-2004	2718	2773
05-01-2004	2713	2768
06-01-2004	2708	2763
07-01-2004	2703	2758
08-01-2004	2698	2752
09-01-2004	2692	2747
10-01-2004	2687	2742

THE TRUE GRAVIMETRIC DENSITIES OF THE METALLIC BLOCKS USED IN THIS CALIBRATION ARE LISTED ON THE FIRST PAGE OF THIS DOCUMENT. TO ACCOUNT FOR THE INFLUENCE OF THE CHEMICAL COMPOSITION OF THESE BLOCKS ON INSTRUMENT RESPONSE (AS PRESCRIBED IN ASTM D2922, SECTION A1), THESE GRAVIMETRIC DENSITIES ARE MULTIPLIED BY CHEMICAL CORRECTION FACTORS PRIOR TO THE CALCULATION OF THE DENSITY CALIBRATION PARAMETERS. THESE CORRECTION FACTORS ARE 0.988 FOR MAGNESIUM, 0.974 FOR MAGNESIUM/ALUMINUM, AND 0.964 FOR ALUMINUM.

Statement of Traceability

The above referenced equipment has been calibrated by the manufacturer to established and documented procedures. Density values for the standards used in the calibration of this equipment were established using instruments which are traceable to the National Institute of Standards and Technology. Test procedures and supporting documentation are available upon request.

Troxler Model 3440 Calibration Report (Page 3 of 3)

Gauge Model - 03440 A
Serial - 024467

Calibration Date: 08-14-2003
Print Date : 08-14-2003

This instrument was found to be mechanically sound and electronically stable both prior to and after its calibration. All data listed in the preceding pages of this report are applicable to this instrument only. This calibration was performed at

Troxler Electronic Laboratories
11300 Sanders Drive
Suite 7
Rancho Cordova, CA 95742

Special considerations and limitations of use for this device and its calibration are described in the Manual of Operation and Instruction provided with this instrument.

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This instrument was calibrated by ss on 08-14-2003 using the Method 1 calibration.

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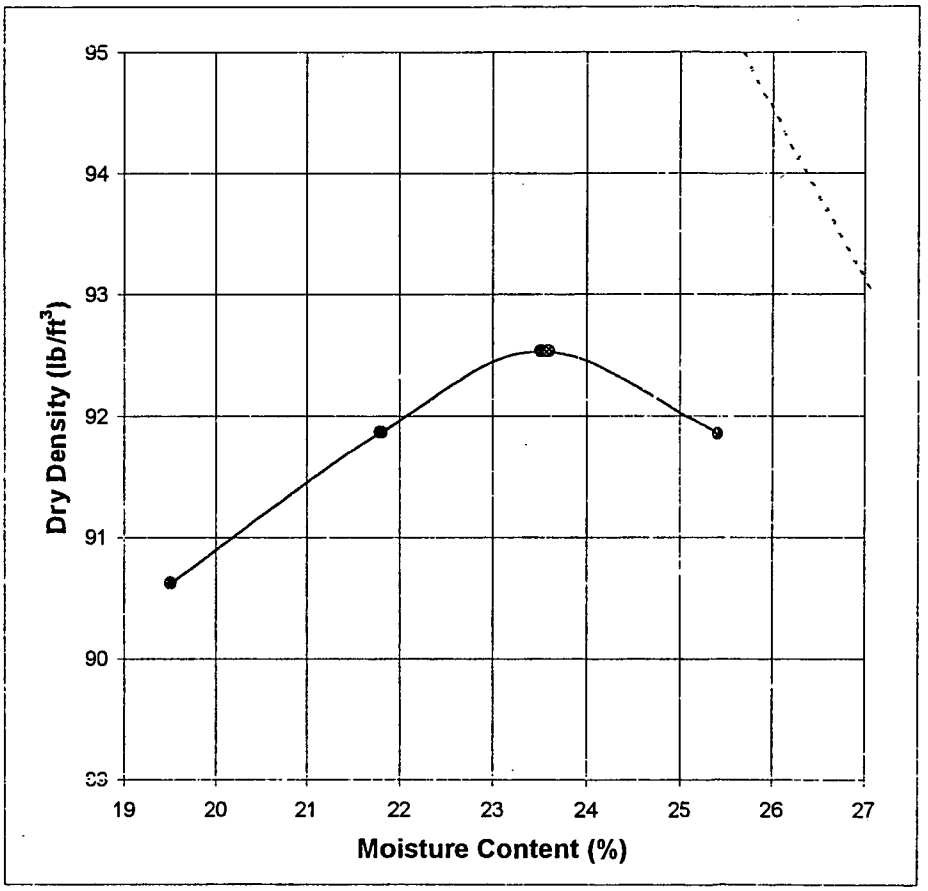
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
10/21/03
Job Number: T0304239
Material Type: Sand with Mulch
Location: Unknown

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/17/03
Sample Method:	ASTM D-75	**Date Tested:**	10/21/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 23.6% **Max. Dry Density:** 92.5 lbs/ft^3

Percent Passing #4 Sieve: 97.2%

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Reviewed By: _____
James F. Nieptas - Laboratory Manager

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Vancouver

M HILL Applied Sciences Laboratory
CHAIN OF CUSTODY RECORD

CVO 2300 NW ut Boulevard
Corvallis, OR 97330-3638
(541) 752-4271 FAX (541) 752-0276

Project/Contact Information	
Project #	184717.01.01.08
Project Name	ALCOA-Vanalco
Report Copy to	Marc Krekos / pdx
Company Name/Contact	CH2MHILL- Mike Drewett/pdx

Sampling		Type		Matrix			Client Sample ID (9 Characters Max)	LAB QC	Total Number of Containers	Requested Analysis: PCB 8082		PAH SW 8270 SIM		6010 B Totals (Lead, Arsenic, Cad)								Alternate Description	Lab ID
Date	Time	Comp	Grab	Water	Soil	Air																	
										Preservative: none	none	none	none	none	none	none	none	none	none	none	none		
10/17/2003	15:30		X		X		SandMulch-101703		2					X								48HR TAT	

Sampled By	Marc Krekos	Relinquished By	Marc Krekos 10-17-03 1630
Received By		Relinquished By	
Received By		Date/Time	
Special Instructions			

THIS AREA FOR LAB USE ONLY	
Lab #	Pg 1 of 6
Lab PM	Custody Review
Log In	LIMS Verification
pH	Cust Seals Y N Ice Y N
QC Level 1 2 3	
Cooler Temperature	

Post-it® Fax Note 7671 Date 10-17 pages 1

To Mike Drewett From Marc Krekos

Co./Dept. Co.

Phone # Phone #

Fax # Fax #

File: CoC-Vanalco.xls

ASTM D2974 or AASHTO T267 $ 250

ORGANIC MATTER CONTENT

Project: VANALCO Date: 10-16-03

Project No: new

Client Name: CH2M Hill

Project Manager:

Sample No: 03-1335

Source: Glacier S+G

Tested By: TMB

Sample Description: Sand

Dish wt. (g)	109.9
Wet Sample wt. + dish (g)	238.4
*Dry Sample wt. + dish (g)	230.5
After burn:	119.7 - without dish
**Dry Sample (g)	120.6 - without dish

NOTES:

* Dry uncovered for at least 16 hours in 105°C or until no change in mass.

** Place dish and sample in a Muffle furnace for approximately 4 hours. Gradually bring the temperature up to 750°C or 455 =/- 10°C according to method used (ASTM D2974 or ASHTO T267)

CALCULATIONS

Ash content, % = (C x 100)/B 99.3 %

where: C = ash (g)
B = oven-dried test specimen (g)

Organic content, % = 100.0 - D 0.7 %

where: D = ash content, % Project Specs. - 20% maximum

TB3

SIEVE ANALYSIS

PROJECT: Vanalco SAMPLE METHOD: Client BILL CODE: 202

CLIENT: CH2M Hill SAMPLED BY: Client DATE: 10-16-03

SUPPLIER: Glacier SAG SAMPLED FROM: ?

MATERIAL TYPE: Sand DATE TEST STARTED: 10/16 DATE FINISHED: 10/17

DATE REC'V. IN LAB: 10-15-03 LAB LOG #: 03-1335 TESTED BY: TMB

BALANCE No.: 737 SHAKER No.: 1380 WASH #200 SIEVE No.: 3334

METHOD OF TESTING

AASHTO T11 ___ AASHTO T27 ___ ASTM C117 X ASTM C136 X

SIEVE SIZES mm	SIEVE SIZES in	SIEVE LOG #	WEIGHT RETAINED	PERCENT RETAINED	ACCUM. % RETAINED	PERCENT PASSING	Project SPECIFICATIONS
50	2	N/A	0	0	0	100	100
37.6	1½		0	0	0	100	
25	1		0	0	0	100	
	¾		0	0	0	100	
12.5	½	↓	0	0	0	100	
9.5	⅜	120	0	0	0	100	
4.75	4	3237	.2	0	0	100	30-100
2.36	8	3486	6.7	.9	.9	99	
1.18	16	2716	44.9	5.7	6.6	93	
.600	30	1990	212.6	27.2	33.8	66	
.300	50	2712	358.8	45.8	79.6	20	
.150	100	750	145.4	18.6	98.2	2	
.075	200	3383	9.1	1.2	99.4	0.6	
	pan		.9				

Weight Wet: n/a Weight Dry: 783.0 % Moisture: — Weight After Wash: 777.4 778.6

Tested in accordance with stated procedures with equipment in current calibration by:

J.M. Bell

Reviewed By: TMB 10/20

Revision: 2 (2/98)

MOISTURE / DENSITY RELATIONSHIP

PROJECT: VANALCO | SAMPLE METHOD: Client | BILL CODE: 200

CLIENT: CH2M Hill | SAMPLED BY: Client | DATE: 10-15-03

SOURCE: Glacier S+G | SAMPLED FROM: ?

MATERIAL TYPE: Sand | DATE TEST STARTED: 10-16 | DATE FINISHED: 10-16

DATE REC'V. IN LAB: 10-15-03 | LAB LOG #: 03-1335 | TESTED BY: TMB

BALANCE #: 737 | MOLD #: 3572 | RAMMER #: 3300 | SCALP SIEVE #: 5/8

METHOD OF TESTING

AASHTO T99 ____	AASHTO T180 ____	ASTM D698 X	ASTM D1557 ____
METHOD "A" X	METHOD "B" ____	METHOD "C" ____	METHOD "D" ____

OPTIMUM MOISTURE 20.5 % | MAXIMUM DRY DENSITY 91.8 PCF

ADJUSTED OPTIMUM MOISUTRE n/a % | ADJUSTED MAXIMUM DRY DENSITY n/a PCF

DATA POINT NUMBER	1	2	3	4	5	6	7
A. WEIGHT OF MOLD + WET SOIL	13.10	13.19	13.34	13.30			
B. WEIGHT OF MOLD	9.65	9.65	9.65	9.65			
C. WEIGHT OF WET SOIL (A - B)	3.45	3.54	3.69	3.65			
D. WET DENSITY (C x 30 or 13.33)	103.5	106.2	110.7	109.5			
E. DRY DENSITY (D / 100 + I) x 100	88.8	89.5	91.7	89.4			
F. WET WEIGHT OF SOIL	231.7	225.0	228.6	230.0			
G. DRY WEIGHT OF SOIL	198.8	189.7	189.4	187.8			
H. WEIGHT OF WATER (F - G)	32.9	35.3	39.2	42.2			
I. % MOISTURE (H / G) x 100	16.5	18.6	20.7	22.5			

PREPARATION METHOD: (Moist) or Dry

COMPACTIVE EFFORT: (Manual) or Mechanical

PERCENT PASSING 3/4" 3/8" (#4) Sieve: 100 %

PERCENT OVERSIZED: 0 %

OVERSIZED MATERIAL: Removed or Replaced

COMPACTION RAMMER: (Circular) or Pie Wedge

B = WEIGHT OF SSD SAMPLE	
C = WEIGHT OF SAMPLE IN WATER	
A = WEIGHT OF OVEN DRY AGG	
B - C	
A - C	
B - A	
BULK SPECIFIC GRAVITY = A / (B - C)	
BULK SPECIFIC GRAVITY SSD = B / (B-C)	
MAX SPECIFIC GRAVITY = A / (A – C)	
% ABSORPTION = (B-A) / A *100	

(Adjusted Calculations – If more than 5% oversize)

Dry Density

$$\frac{100 \times \text{max. density} \times \text{sp. gr.} \times 62.42}{(\text{max. den.} \times \%\ \text{oversize}) + (\text{sp. gr.} \times 62.42 \times \%\ \text{passing})}$$

Moisture

(Opt. Moisture x % passing) + (% Absorption x % oversize)

Tested in accordance with stated procedures with equipment in current calibration by: Tonia Bell

MOISTURE / DENSITY RELATIONSHIP

PROJECT: VaNalco | SAMPLE METHOD: Client | BILL CODE: _____

CLIENT: CH2M Hill | SAMPLED BY: Client | DATE: 10-17-03

SOURCE: Client | SAMPLED FROM: Client

MATERIAL TYPE: Sand w/mulch | DATE TEST STARTED: 10-20 | DATE FINISHED: 10-21-03

DATE RECV. IN LAB: 10-17-03 | LAB LOG #: 03-1346 | TESTED BY: AF

BALANCE #: 2922 | MOLD #: 849 | RAMMER #3300 | SCALP SIEVE #: 5/8

METHOD OF TESTING

AASHTO T99 _____ | AASHTO T180 _____ | ASTM D698 X | ASTM D1557 _____

METHOD "A" X | METHOD "B" _____ | METHOD "C" _____ | METHOD "D" _____

OPTIMUM MOISTURE 23.4 % | MAXIMUM DRY DENSITY 92.6 PCF

ADJUSTED OPTIMUM MOISUTRE _____ % | ADJUSTED MAXIMUM DRY DENSITY _____ PCF

DATA POINT NUMBER	1	2 / 4	3 / 6	4 / 8	5 / 10	6	7
A. WEIGHT OF MOLD + WET SOIL		12.93	13.05	13.13	13.16		
B. WEIGHT OF MOLD		9.32	9.32	9.32	9.32		
C. WEIGHT OF WET SOIL (A - B)		3.61	3.73	3.81	3.84		
D. WET DENSITY (C x 30 or 13.33)		108.3	111.9	114.3	115.2		
E. DRY DENSITY (D / 100 + I) x 100		90.4	91.9	92.6	91.9		
F. WET WEIGHT OF SOIL		298.9	305.0	301.4	300.0		
G. DRY WEIGHT OF SOIL		250.1	250.4	244.0	239.2		
H. WEIGHT OF WATER (F - G)		48.8	54.6	57.4	60.8		
I. % MOISTURE (H / G) x 100		19.5	21.8	23.5	25.4		

PREPARATION METHOD: (Moist) or Dry

COMPACTIVE EFFORT: (Manual) or Mechanical

PERCENT PASSING 3/4" 3/8" #4 Sieve: 97.2 %

PERCENT OVERSIZED: 2.8 %

OVERSIZED MATERIAL: (Removed) or Replaced

COMPACTION RAMMER: (Circular) or Pie Wedge

B = WEIGHT OF SSD SAMPLE	
C = WEIGHT OF SAMPLE IN WATER	
A = WEIGHT OF OVEN DRY AGG	
B - C	
A - C	
B - A	
BULK SPECIFIC GRAVITY = A / (B - C)	
BULK SPECIFIC GRAVITY SSD = B / (B-C)	
MAX SPECIFIC GRAVITY = A / (A – C)	
% ABSORPTION = (B-A) / A *100	

(Adjusted Calculations – If more than 5% oversize)

Dry Density

$$\frac{100 \times \text{max. density} \times \text{sp. gr.} \times 62.42}{(\text{max. den.} \times \% \text{ oversize}) + (\text{sp. gr.} \times 62.42 \times \% \text{ passing})}$$

Moisture

(Opt. Moisture x % passing) + (% Absorption x % oversize)

Tested in accordance with stated procedures with equipment in current calibration by: Art Frank

Carlson Testing, Inc.

Main Office
P.O. Box 23814
Tigard, Oregon 97281
Phone (503) 684-3460
FAX (503) 684-0954

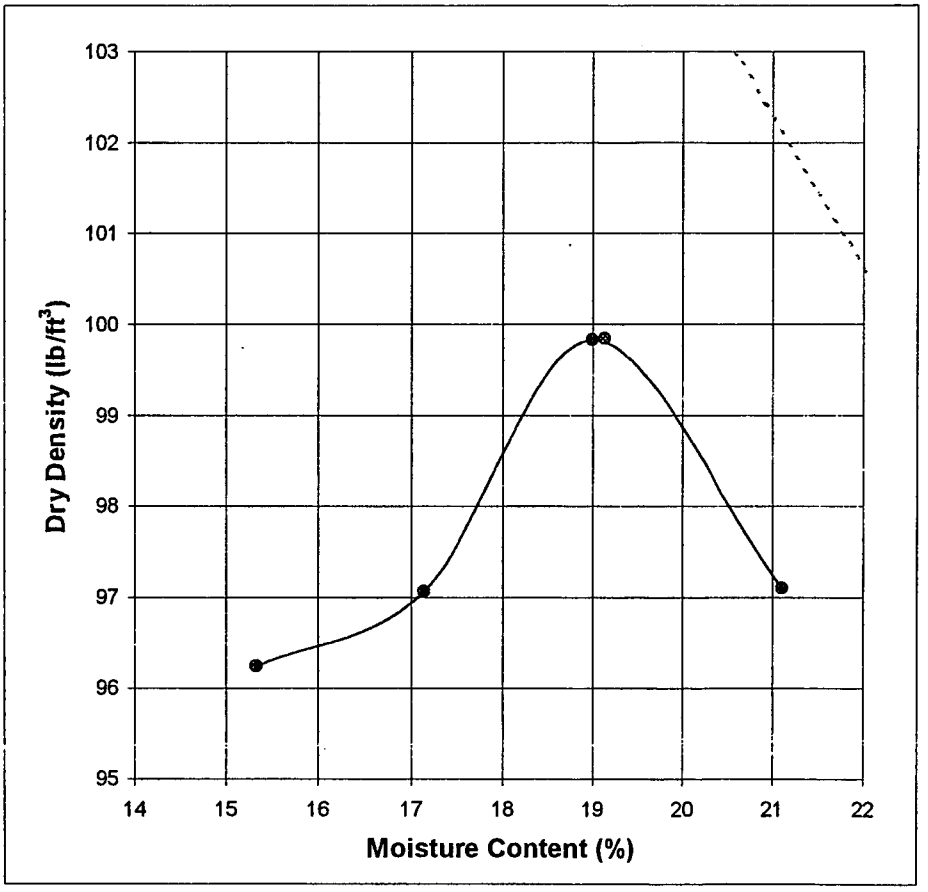
Salem Office
4060 Hudson Ave., NE
Salem, OR 97301
Phone (503) 589-1252
FAX (503) 589-1309

Bend Office
P.O. Box 7918
Bend, OR 97708
Phone (541) 330-9155
FAX (541) 330-9163

Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03 — 10/28/03
Job Number: T0304239
Material Type: Sand with silt (5-1 ratio)
Location: On Site

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	Unknown
Sample Method:	ASTM D-75	**Date Tested:**	10/27/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 19.1% **Max. Dry Density:** 99.8 lbs/ft^3

Percent Passing #4 Sieve: 100.0%

NOTE: ZERO VOIDS CURVE PLOTS BEYOND OPTIMUM MOISTURE AND MAXIMUM DRY DENSITY CURVE.

EMAIL: MARC KREKOS W/CH2M HILL AT MARC.KREKOS@CH2M.COM AND MIKE DREWETT W/CH2M HILL AT MIKE.DREWETT@CH2M.COM

Reviewed By: _____
James F. Heptas - Laboratory Manager

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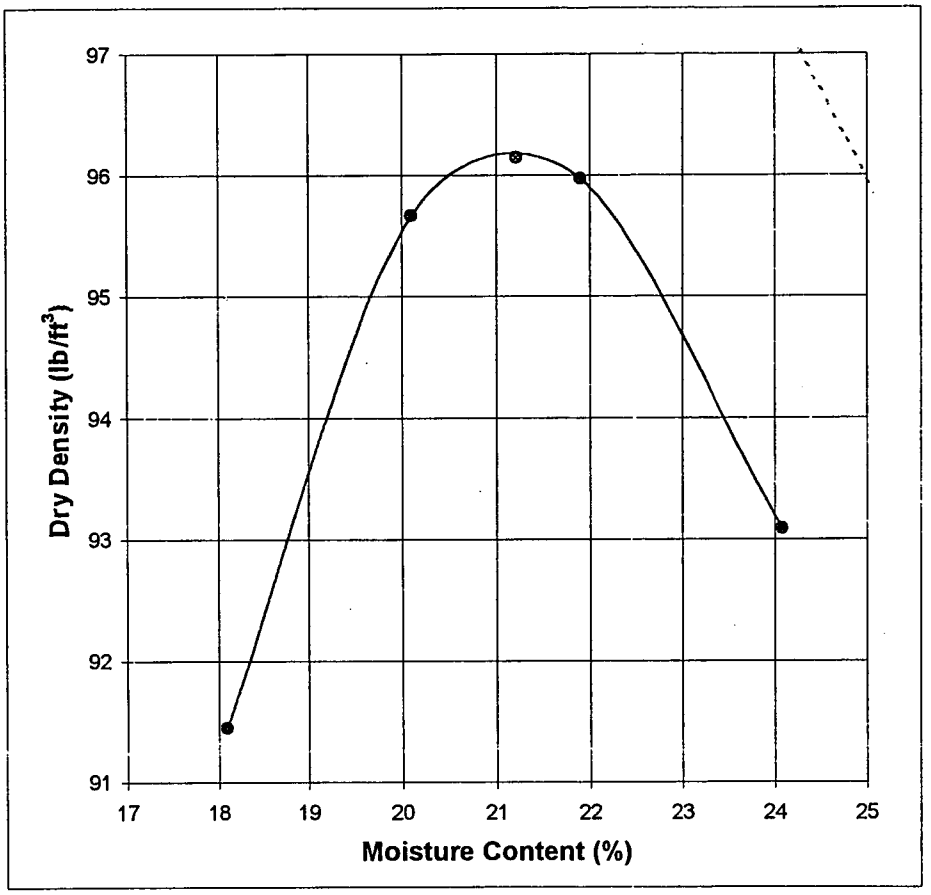
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
10/31/03
Job Number: T0304239
Material Type: Native Light Brown Silt
Location: Cut Bank

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/29/03
Sample Method:	ASTM D-75	**Date Tested:**	10/30/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 21.2% **Max. Dry Density:** 96.1 lbs/ft^3

Percent Passing #4 Sieve: 100.0%

EMAIL: MARC KREKOS W/CH2M HILL AT MARC.KREKOS@CH2M.COM AND MIKE DREWETT W/CH2M HILL AT MIKE.DREWETT@CH2M.COM

Reviewed By: _____
James F. Hieptas - Laboratory Manager

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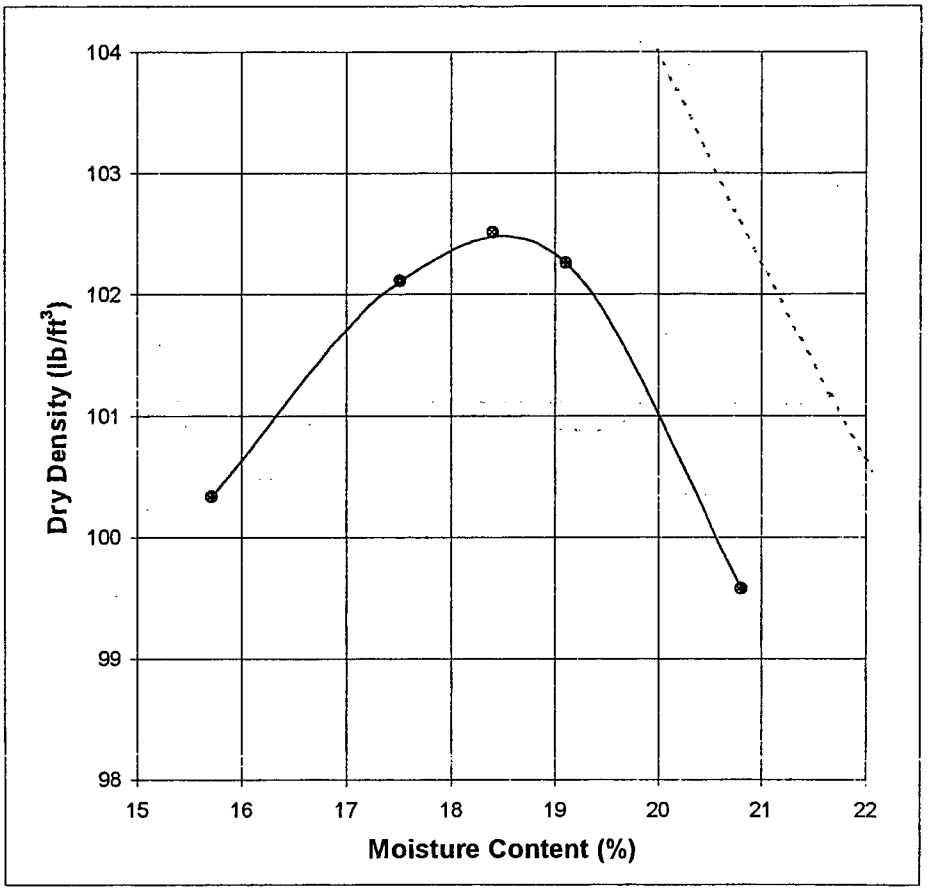
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
10/31/03
Job Number: T0304239
Material Type: Native Sand with Clay
Location: Unknown

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/27/03
Sample Method:	ASTM D-75	**Date Tested:**	10/28/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 18.4% **Max. Dry Density:** 102.5 **lbs/ft^3**

Percent Passing #4 Sieve: 97.8%

EMAIL: MARC KREKOS W/CH2M HILL AT MARC.KREKOS@CH2M.COM AND MIKE DREWETT W/CH2M HILL AT MIKE.DREWETT@CH2M.COM

Reviewed By: _____
James F. Nieptas - Laboratory Manager

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Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
Source: Native
Material Type: Native Sand with Clay
Location: Unknown
Sampled By: Client
Test Method: ASTM D-698 A, C-136, D-2216

Job Number: T0304239
Contractor:
Tested By: LAB
Sample Method: ASTM D-75
Date Sampled: 10/27/03
Date Received: 10/27/03
Date Tested: 10/28/03

	1	2	3	4	5	6
Wgt. of Mold & Wet soil	13.14	13.27	13.33	13.28		
Weight of Mold	9.27	9.27	9.27	9.27		
Weight of Wet soil	3.87	4.00	4.06	4.01		
Wet Density 30	116.1	120.0	121.8	120.3		
Dry Density	100.3	102.1	102.3	99.6		
Wet Weight of Soil	483.7	498.5	496.2	412.1		
Dry Wgt of Soil	418.0	424.2	416.6	341.1		
Weight of Water	65.7	74.3	79.6	71.0		
Moisture (MC)	15.7	17.5	19.1	20.8		
Remarks:						

Optimum Moisture: 18.4%

Max Dry Density: 102.5 lbs/ft^3

Material Selection: ○ ROCK ◉ SOIL
Preparation Method: ◉ MOIST ○ DRY
Compacting Method: ◉ MANUAL ○ MECHANICAL
Oversized Material: ◉ REMOVED ○ REPLACED
Compacting Hammer: ◉ CIRCULAR ○ PIE WEDGE

B = Weight of SSD Sample	
C = Weight of Sample in Water	
A = Weight of Oven Dry Agg.	
Bulk Specific Gravity = A/(B-C)	
Absorption = (B-A) /A)	

Percent Passing Sieve: ◉ #4 ○ 3/8" ○ 3/4" 97.8%

Assumed Specific Gravity: 2.5

NC/10-31

JMC-10-31-03

VER.35988 BES

CH2M HILL Applied Sciences Laboratory
CHAIN OF CUSTODY RECORD

CVO 2300 NW Walnut Boulevard
Corvallis, OR 97330-3638
(541) 752-4271 FAX (541) 752-0276

Project/Contact Information	
Project #	184717.01.01.08
Project Name	ALCOA-Vancouver Operations
Report Copy to	Marc Krekos / pdx
Company Name/Contact	CH2MHILL- Mike Drewett/pdx

Sampling		Type		Matrix			Client Sample ID (9 Characters Max)	LAB QC	Total Number of Containers	Requested Analysis: PCB 8082	PAH SW 8270 SIM		RCRA 8 Metals (Total)								
Date	Time	Comp	Grab	Water	Soil	Air				Preservative: none	none	none	none	none	none	none	none	none	none	none	none
10/30/2003	11:00		X		X		SBAC-S-020		1					X							
10/30/2003	11:10		X		X		SBAC-S-021		1					X							

THIS AREA FOR LAB USE ONLY

Lab # C2356 | Pg 1 | of 1
Lab PM | Custody Review
Log In | LIMS Verification
pH | Cust Seals Y N | Ice Y N
QC Level 1 2 3
Cooler Temperature

Alternate Description	Lab ID
24-48 HR TAT	-1
24-48 HR TAT	-2

Sampled By: Marc Krekos
Received By: Angela Kampert 11/03 1230
Received By:
Special Instructions:

Relinquished By: Marc Krekos 10/31 1400
Relinquished By:
Date/Time:

File: COC ...r.xls

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-021**	**Lab Sample ID:**	**C235602**
Project Name:	ALCOA-Vanalco	Date Received:	11/01/2003
Project Manager:	Mike Drewett/PDX	Report Revision No.:	0
Sampled By:	Marc Krekos	Reported By:	JG
Sampling Date:	10/30/03	Reviewed By:	
Sampling Time:	11:10		
Type:	Grab		
Matrix:	Soil		
Basis:	Dry Weight		

Analyte	MRL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals						
Arsenic, As	2.8	2.9		mg/kg	SW6010B	11/03/03
Barium, Ba	6.9	118		mg/kg	SW6010B	11/03/03
Cadmium, Cd	1.4	1.4	U	mg/kg	SW6010B	11/03/03
Chromium, Cr	2.8	31.8		mg/kg	SW6010B	11/03/03
Lead, Pb	1.4	6.0		mg/kg	SW6010B	11/03/03
Mercury, Hg	0.02	0.02	U	mg/kg	SW7471A	11/04/03
Selenium, Se	8.3	8.3	U	mg/kg	SW6010B	11/03/03
Silver, Ag	2.8	2.8	U	mg/kg	SW6010B	11/03/03

U=Not detected at specified reporting limits

This report has been expedited through our laboratory to meet your request of rapid TAT. This data is classed ***Preliminary*** until you receive the hard copy report which has passed the final review process.

CH2M HILL Applied Sciences Laboratory

Client Information

Client Sample ID: SBAC-S-020

Project Name: ALCOA-Vanalco
Project Manager: Mike Drewett/PDX
Sampled By: Marc Krekos
Sampling Date: 10/30/03
Sampling Time: 11:00
Type: Grab
Matrix: Soil
Basis: Dry Weight

Lab Information

Lab Sample ID: C235601

Date Received: 11/01/2003
Report Revision No.: 0
Reported By: JG
Reviewed By:

Analyte	MRL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals						
Arsenic, As	2.6	5.6		mg/kg	SW6010B	11/03/03
Barium, Ba	6.2	156		mg/kg	SW6010B	11/03/03
Cadmium, Cd	1.2	1.2	U	mg/kg	SW6010B	11/03/03
Chromium, Cr	2.6	19.6		mg/kg	SW6010B	11/03/03
Lead, Pb	1.2	20.3		mg/kg	SW6010B	11/03/03
Mercury, Hg	0.02	0.03		mg/kg	SW7471A	11/04/03
Selenium, Se	7.4	7.4	U	mg/kg	SW6010B	11/03/03
Silver, Ag	2.5	2.5	U	mg/kg	SW6010B	11/03/03

U=Not detected at specified reporting limits

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CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**Sand/Mulch-101703**	**Lab Sample ID:**	**C226801**
Project Name:	ALCOA-Vanalco	Date Received:	10/20/2003
Project Manager:	Mike Drewett/PDX	Report Revision No.:	0
Sampled By:	Mark Krekos	Reported By:	JG
Sampling Date:	10/17/03	Reviewed By:	
Sampling Time:	3:30:00 PM		
Type:	Grab		
Matrix:	Soil		
Basis:	Dry Weight		

Analyte	MRL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals						
Arsenic, As	2.3	3.7		mg/Kg	SW6010B	10/21/03
Cadmium, Cd	1.1	1.1	U	mg/Kg	SW6010B	10/21/03
Lead, Pb	1.1	7.3		mg/Kg	SW6010B	10/21/03

Washington Fill Regts

U=Not detected at specified reporting limits

This report has been expedited through our laboratory to meet your request of rapid TAT. This data is classed ***Preliminary*** until you receive the hard copy report which has passed the final review process.

CH2M HILL Applied Sciences Laboratory

Client Information

Client Sample ID: METHOD BLANK

Project Name: ALCOA-Vanalco
Project Manager: Mike Drewett/PDX
Sampled By: NA
Sampling Date: NA
Sampling Time: NA
Type: QC
Matrix: Soil
Basis: NA

Lab Information

Lab Sample ID: C2268

Date Received: NA
Report Revision No.: 0
Reported By: JG
Reviewed By:

Analyte	MRL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals						
Arsenic, As	2.0	2.0	U	mg/Kg	SW6010B	10/21/03
Cadmium, Cd	1.0	1.0	U	mg/Kg	SW6010B	10/21/03
Lead, Pb	1.0	1.0	U	mg/Kg	SW6010B	10/21/03

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CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-021**	**Lab Sample ID:**	**C235602**
Project Name:	ALCOA-Vanalco	Date Received:	11/01/2003
Project Manager:	Mike Drewett/PDX	Report Revision No.:	0
Sampled By:	Marc Krekos	Reported By:	JG
Sampling Date:	10/30/03	Reviewed By:	
Sampling Time:	11:10		
Type:	Grab		
Matrix:	Soil		
Basis:	Dry Weight		

Analyte	MRL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals						
Arsenic, As	2.8	2.9		mg/kg	SW6010B	11/03/03
Barium, Ba	6.9	118		mg/kg	SW6010B	11/03/03
Cadmium, Cd	1.4	1.4	U	mg/kg	SW6010B	11/03/03
Chromium, Cr	2.8	31.8		mg/kg	SW6010B	11/03/03
Lead, Pb	1.4	6.0		mg/kg	SW6010B	11/03/03
Mercury, Hg				mg/kg	SW7471A	
Selenium, Se	8.3	8.3	U	mg/kg	SW6010B	11/03/03
Silver, Ag	2.8	2.8	U	mg/kg	SW6010B	11/03/03

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CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-020**	**Lab Sample ID:**	**C235601**
Project Name:	ALCOA-Vanalco	Date Received:	11/01/2003
Project Manager:	Mike Drewett/PDX	Report Revision No.:	0
Sampled By:	Marc Krekos	Reported By:	JG
Sampling Date:	10/30/03	Reviewed By:	
Sampling Time:	11:00		
Type:	Grab		
Matrix:	Soil		
Basis:	Dry Weight		

Analyte	MRL	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
Metals						
Arsenic, As	2.6	5.6		mg/kg	SW6010B	11/03/03
Barium, Ba	6.2	156		mg/kg	SW6010B	11/03/03
Cadmium, Cd	1.2	1.2	U	mg/kg	SW6010B	11/03/03
Chromium, Cr	2.6	19.6		mg/kg	SW6010B	11/03/03
Lead, Pb	1.2	20.3		mg/kg	SW6010B	11/03/03
Mercury, Hg				mg/kg	SW7471A	
Selenium, Se	7.4	7.4	U	mg/kg	SW6010B	11/03/03
Silver, Ag	2.5	2.5	U	mg/kg	SW6010B	11/03/03

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November 4, 2003
T0304239.CTI

CH2M Hill Engineers
Attn: Marc Krekos
825 NE Multnomah
Portland, OR 97232

Re: Alcoa Former Vancouver Operations – Project #184717-01-01-03
5509 NW Lower River Road – Vancouver, WA
Atterberg Limits Testing

Gentlemen:

As requested, Carlson Testing, Inc. has completed Atterberg Limits testing on two (2) samples (referenced below) of material sampled by your representative on October 29, 2003 from the bank cut. Testing was completed on October 30, 2003. Following is the test data:

Atterberg Limits – ASTM D4318:

Sample #1: 03-1396.01
Native Black Silt with Gravel
Plastic Limit – NP
Liquid Limit – NP
Plasticity Index – NP
NP – Non Plastic

Sample #2: 03-1396.02
Native Light Brown Silt
Plastic Limit – NP
Liquid Limit – NP
Plasticity Index – NP

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If there are any further questions regarding this matter, please do not hesitate to contact this office.

Respectfully submitted,
Carlson Testing, Inc.

James F. Hieptas
Laboratory Manager

je

P:\Projects\General\T0304239\Labwork\Atterberg.Lablog#03-1396.doc

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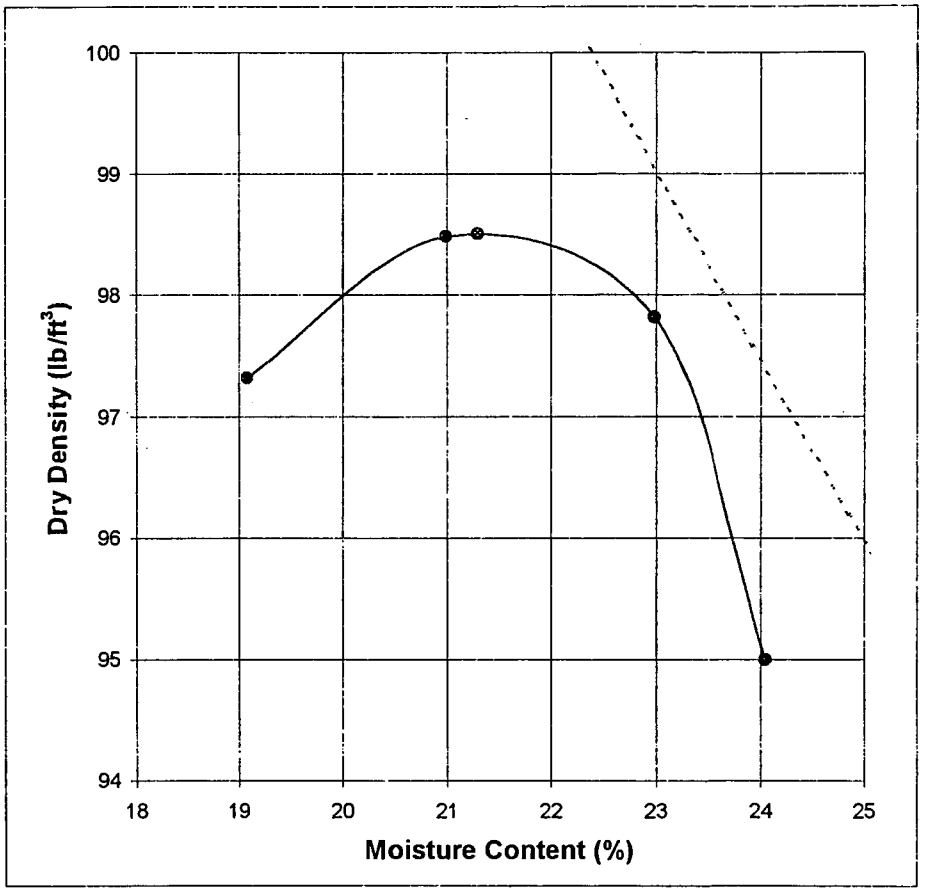
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
11/04/03
Job Number: T0304239
Material Type: Native Black Silt with Gravel
Location: Cut Bank

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	10/29/03
Sample Method:	ASTM D-75	**Date Tested:**	10/30/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Coarse specific gravity used in adjusted max density computations: 2.486

Optimum Moisture: 21.3% **Max. Dry Density: 98.5** **lbs/ft^3**

Adjusted Opt Moisture: 19.5% **Adjusted Max Density: 102.7**

Percent Passing #4 Sieve: 88.8%

EMAIL: MARC KREKOS W/CH2M HILL AT MARC.KREKOS@CH2M.COM AND MIKE DREWETT W/CH2M HILL AT MIKE.DREWETT@CH2M.COM

Reviewed By: _____
James F. Hieptas - Laboratory Manager

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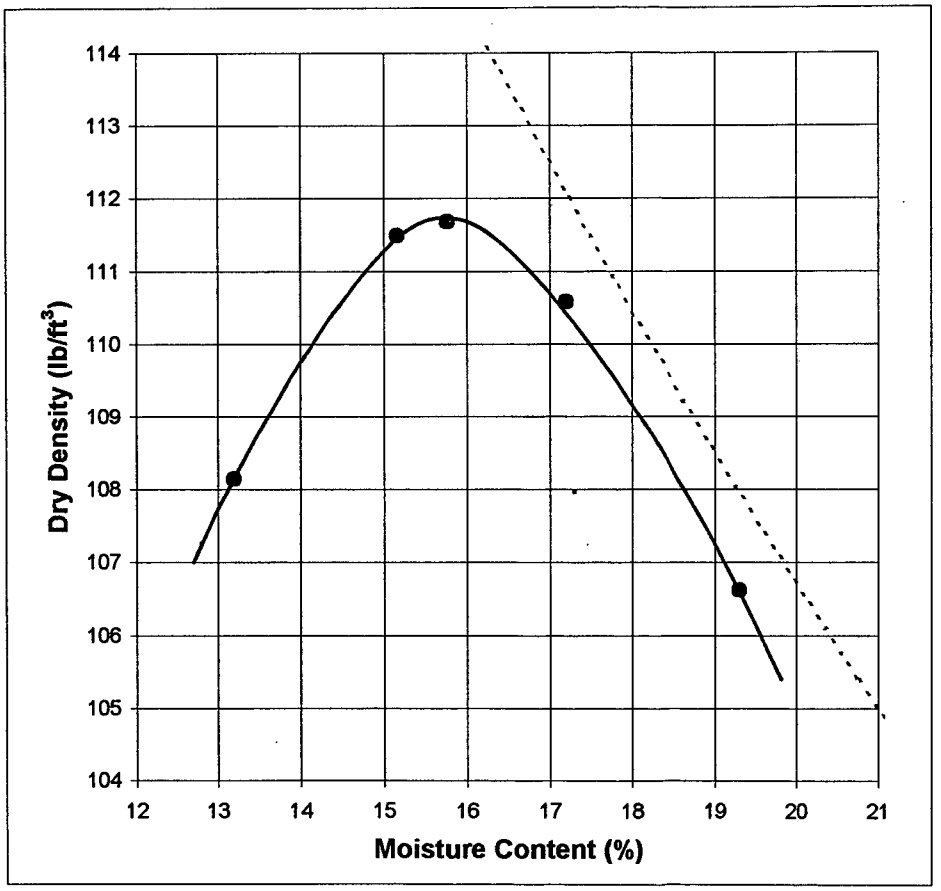
Moisture - Density Relationship

Client: CH2M Hill Engineers - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
Material Type: Silty Sand with traces of gravel

11/12/03
Job Number: T0304239
Location: Onsite (under gauge- composite of tests 1,2,3)

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	11/07/03
Sample Method:	ASTM D-75	**Date Tested:**	11/10/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.600

Optimum Moisture: 15.8% **Max. Dry Density: 111.7 lbs/ft³**
Adjusted Opt Moisture: 14.8% **Adjusted Max Density: 114.4**
Percent Passing #4 Sieve: 92.5%

EMAIL: MARC KREKOS W/CH2M HILL AT MARC.KREKOS@CH2M.COM AND MIKE DREWETT W/CH2M HILL AT MIKE.DREWETT@CH2M.COM

Reviewed By: _____
James F. Hieptas - Laboratory Manager

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Carlson Testing, Inc.

Construction Inspection & Related Tests
Geotechnical Consulting

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FAX (541) 330-9163

T0304239

NOV 03, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:
Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description NATIVE LIGHT BLACK SILT WITH AGGREGATE

Max. Dry Density 102.0 lbs./cu. ft. Optimum Moisture 20.9 % Serial # Troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/30/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
11- 1	1	SF	REVETTMENT FILL - STATION 3+10	2439	260	DT	6"	8.5	20.8	118.5	98.1	96
11- 1	2	SF	REVETTMENT FILL - STATION 4+55	2364	273	DT	6"	8.5	21.8	119.8	98.4	96

Standard Counts - Density: 2177 Moisture: 638 Calibration Data: 04/03

Remarks:

cc:

J. BLACK/MHx

Tested by

Reviewed By
Proj Mngr:

CARLSON TESTING INC.

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Report Of In-Place Density Tests

Date: 01/20/2006 **Job Number:** T0304239.

Permit #:

Client: CH2M HILL (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: NATIVE LIGHT BLACK SILT WITH AGGREGATE

Maximum Dry Density: 102.0 lbs./cu. ft. **Optimum Moisture:** 20.9 % **Required Compaction:** 95 %

Standard Count for Gauge Serial # Troxler 16185 NUC 3440

Method of Test: ASTM D2922,D3017/ ASTM D698

Source of Value Dated 10/30/2003 is project specific.

Standard Counts - Density: 2148 **Moisture:** 641 **Calibration Data:** 04/03

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
11-10	7	SF	REVETTMENT FILL STATION 0+25	1768	208	DT	8"	19.5	16.3	114.5	98.5	96
11-10	8	SF	REVETTMENT FILL STATION 1+20	1860	195	DT	8"	19.5	15.3	112.6	97.7	95
11-10	9	SF	REVETTMENT FILL STATION 2+00	2655	219	DT	8"	19.5	17.4	114.2	97.3	95

Please see reverse side for additional information.

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Report Of In-Place Density Tests

Date: 01/20/2006 **Job Number:** T0304239.

Permit #:

Client: CH2M HILL (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: NATIVE LIGHT BLACK SILT WITH AGGREGATE

Maximum Dry Density: 102.0 lbs./cu. ft. **Optimum Moisture:** 20.9 % **Required Compaction:** 95 %

Standard Count for Gauge Serial # Troxler 16185 NUC 3440

Method of Test: ASTM D2922,D3017/ ASTM D698

Source of Value Dated 10/30/2003 is project specific.

Standard Counts - Density: 2160 **Moisture:** 636 **Calibration Data:** 04/03

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
11-05	3	SF	REVETTMENT FILL- STATION 3+75	1253	273	DT	8"	12	20.2	128	106.5	100+
11-05	4	SF	REVETTMENT FILL- STATION 2+70	1471	228	DT	8"	12	17.1	121.8	104.0	100+
11-05	5	SF	REVETTMENT FILL- STATION 1+85	1544	247	DT	8"	18	19.1	119.9	100.7	99
11-05	6	SF	REVETTMENT FILL- STATION 0+25	1656	196	DT	8"	18	14.8	117.4	102.3	100

Please see reverse side for additional information.

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T0304239

Nov 14, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:
Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description SILTY SAND WITH TRACES OF GRAVEL

Max. Dry Density 114.4 lbs./cu. ft. Optimum Moisture 14.8 % Serial # Troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017

Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 11/10/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11- 7	10	SF	REVETMMENT FILL - STATION 3+50	1331	191	DT	8"	18	13.3	125.9	111.1	97
11- 7	11	SF	REVETMMENT FILL - STATION 4+25	1278	206	DT	8"	18	14.3	127.4	111.5	97
7	12	SF	REVETMMENT FILL - STATION 4+75	1412	200	DT	8"	18	14.3	123.5	108.0	94

Standard Counts - Density: 2156 Moisture: 636 Calibration Data: 04/03

Remarks:

cc:

J. BLACK/MHX

Tested by

Reviewed By
Proj Mngr:

CARLSON TESTING INC.

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November 18, 2003
T0304239.CTI
Permit No.
P.O. No. 72682

FIELD INSPECTION REPORT

DATES COVERED: November 7, 2003

PROJECT: Alcoa Former Vancouver Operations – Project #184717-01-01-03
ADDRESS: 5509 NW Lower River Road – Vancouver, WA
INSPECTOR: M. Carter – COP#661, WABO#CAR626810, ICBO#0160670-85, OBOA#148

11-07-03: As requested, CTI representative was on site to load test (2) ¼" diameter cable anchors to 5000 lbs.

- ❒ Anchor #1 was loaded using a cable clamp supplied by the contractor. The cable achieved a maximum load of 2600 lbs. before breaking the cable at the clamp.

- ❒ Anchor #2 was loaded using the swedged eye of the cable. The cable achieved a maximum load of 2600 lbs. before breaking the cable at the swedge clamp.

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If there are any further questions regarding this matter, please do not hesitate to contact this office.

Respectfully submitted,

CARLSON TESTING, INC.

James F. Hietpas
Operations Manager

MC/sab

cc: CH2M Hill Engineers (Portland) – Marc Krekos

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JOB NO. T0704239

REPORT OF IN-PLACE DENSITY TESTS

Client Clayton Hill // Environcon

Project Alcoa Former Vanc Dps

Material Description Black Silt w/some Aggregate

Max. Dry Density 102.7 lbs./cu. ft. Optimum Moisture 19.4 %. Serial # 16185

Method of Test D698 Required Compaction: 95 %

Source of Proctor Value: ☑ Project Specific, Date: ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11/16/07	1.	SF	Revetment Fill	1768	208	PT	8"	19.5	16.3	114.5	98.5	96
				Station 0+25								
	2			1860	195		8"	19.5	15.3	112.6	97.7	95
				Station 1+20								
	3			2655	219		6"	19.5	17.4	114.2	97.3	95
				Station 2+00								

Standard Counts - Density: 2148 Moisture: 6411 Calibration Data: 4/07

Remarks:

Tested by Jeffrey W. Klein

CARLSON TESTING IN

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JOB NO. T03-425

REPORT OF IN-PLACE DENSITY TESTS

Pg (2)

Client: Chem/Hill

Project: Alcoa Former Vanc. Ops

Material Description: Black Silt / some Ash

Max. Dry Density: 102.7 lbs./cu. ft. Optimum Moisture: 19.4 %. Serial #: 16185

Method of Test: D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11/11/03	5	SF	Southbound EB1	1554	194	DT	8"	30	12.2	119.6	106.7	100+
	6		Station 2+25	1486	220		8"	30	16.1	121.2	104.2	100+
			0+26									

Standard Counts - Density: 246 Moisture: 639 Calibration Data: 4/03

Remarks:

Tested by: [signature]

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JOB NO. T03427

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill Environ

Project Alcoa Former Vanc Ops

Material Description LT Brown Silt

Max. Dry Density 96.1 lbs./cu. ft. Optimum Moisture 21.2 %. Serial # 16183

Method of Test D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11/1/03	1	ST	Rewetted end Fill	2108	205	DT	8"	26	17.2	104.7	89.4	96
			Station 51+00									
	2			2041	179		8"	26.5	14.3	109.1	95.4	99
				4425								
	3			2006	199		8"	30	13.7	102.8	90.5	100+
				3450								
	4			1905	224		8"	30	17.7	115.8	98.4	100+
				1125								

Standard Counts - Density: 2145 Moisture: 639 Calibration Data: 4/03

Remarks:

Tested by L.W. Black

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JOB NO. T070239

REPORT OF IN-PLACE DENSITY TESTS

Client Environ

Project Alcoa Former Vanc OPO

Material Description (*) Silty Sand w/Trace of Gravel

Max. Dry Density (*) 107 lbs./cu. ft. Optimum Moisture (*) 14.4 %. Serial # 16185

Method of Test D698 Required Compaction: 95 %

Source of Proctor Value: ☑ Project Specific, Date: ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11/7/03	1	SF	Revetment Fill Station 3+50	1331	191	DT	8"	18	13.3	~~132~~ 125.9	111.1	(*) ~~100~~
	2		4+25	1278	206		8"	18	14.3	127.4	111.4	
	3		4+75	1412	200		8"	18	14.3	123.5	108.0	

Standard Counts - Density: 2156 Moisture: 636 Calibration Data: 4/03

Remarks: (*) Results pending on sample taken today

Tested by Jeffrey W. Read

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Job [redacted] T0304239

Nov 14, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description NATIVE LIGHT BROWN SILT

Max. Dry Density 96.1 lbs./cu. ft. Optimum Moisture 21.2 % Serial # troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017

Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/30/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
11-11	18	SF	REVETTMENT FILL - STATION 5+00	2108	205	DT	8"	26	17.2	107.7	91.9	96
11-11	19	SF	REVETTMENT FILL - STATION 4+25	2041	179	DT	8"	26.5	14.3	109.1	95.5	99
[redacted]11	20	SF	REVETTMENT FILL - STATION 3+50	2006	174	DT	8"	30	13.7	109.8	96.6	100
11-11	21	SF	REVETTMENT FILL - STATION 1+25	1705	224	DT	8"	30	17.7	115.8	98.4	100+

Standard Counts - Density: 2145 Moisture: 639 Calibration Data: 04/03

Remarks:

cc:

[redacted]

J. BLACK/MHX

Tested by _____

Reviewed By _____
Proj Mngr:

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Job [redacted] T0304239

Nov 14, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description NATIVE LIGHT BLACK SILT WITH AGGREGATE

Max. Dry Density 102.0 lbs./cu. ft. Optimum Moisture 20.9 %. Serial # troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017

Required Compaction: 95 %

Source of Proctor Value: ☒Project Specific, Date: 10/30/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11-11	22	SF	REVETTMENT FILL - STATION 2+25	1554	194	DT	8"	30	14.2	119.6	104.7	100+
11-11	23	SF	REVETTMENT FILL - STATION 0+25	1486	220	DT	8"	30	14.4	121.2	104.1	100+
[redacted]												

Standard Counts - Density: 2145 Moisture: 639 Calibration Data: 04/03

Remarks:

cc:

[redacted]

Tested by J. BLACK/MHX

Reviewed By Proj Mngr:

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[redacted] T0304239

Nov 14, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT Permit No: #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description NATIVE LIGHT BROWN SILT

Max. Dry Density 96.1 lbs./cu. ft. Optimum Moisture 21.2 % Serial #roxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017

Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/30/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
11-12	13	SF	REVETTMENT FILL - STATION 4+50	1954	208	DT	8"	30	16.9	110.7	94.7	99
11-12	14	SF	REVETTMENT FILL - STATION 7+25	2139	187	DT	6"	21	15.4	107.3	93.0	97
[redacted]												

Standard Counts - Density: 2147 Moisture: 641 Calibration Data: 04/03

Remarks:

cc:

[redacted]

J. BLACK/MHX
Tested by

Reviewed By
Proj Mngr:

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Job [redacted] T0304239

Nov 14, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description NATIVE LIGHT BLACK SILT WITH AGGREGATE

Max. Dry Density 102.0 lbs./cu. ft. Optimum Moisture 20.9 %. Serial #Troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017

Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/30/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
11-12	15	SF	REVETTMENT FILL - STATION 5+25	2287	222	DT	6"	30	16.5	120.9	103.8	100+
11-12	16	SF	REVETTMENT FILL - STATION 6+00	1542	232	DT	8"	30	17.7	119.8	101.8	100
[redacted]12	17	SF	REVETTMENT FILL - STATION 6+75	1731	179	DT	8"	30	13.4	115.5	101.9	100

Standard Counts - Density: 2147 Moisture: 641 Calibration Data:

Remarks:

cc:

[redacted]

J. BLACK/MHX

Tested by

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Proj Mngr:

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JOB NO. T0304239

NOV 21, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03 Permit No:
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description SAND WITH SILT (5-1 RATIO)

Max. Dry Density 99.8 lbs./cu. ft. Optimum Moisture 19.1 % Serial # Troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/27/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
11-19	24	SF	EAST LANDFILL AREA SEE DIAGRAM	1716	183	DT	8"	30	13.6	116	102.1	100+
11-19	25	SF	EAST LANDFILL AREA SEE DIAGRAM	1721	225	DT	8"	39	15	115.5	100.4	100+
11-19	26	SF	EAST LANDFILL AREA SEE DIAGRAM	2027	155	DT	8"	37	11.8	109.7	98.1	98

Standard Counts: Density: 2156 Moisture: 646 Calibration Data: 04/03

Checked by: 17 USED AS REFERENCED

Remarks:

cc:

J. BLACK/MHX

Reviewed By Proj Mngr:

Tested by

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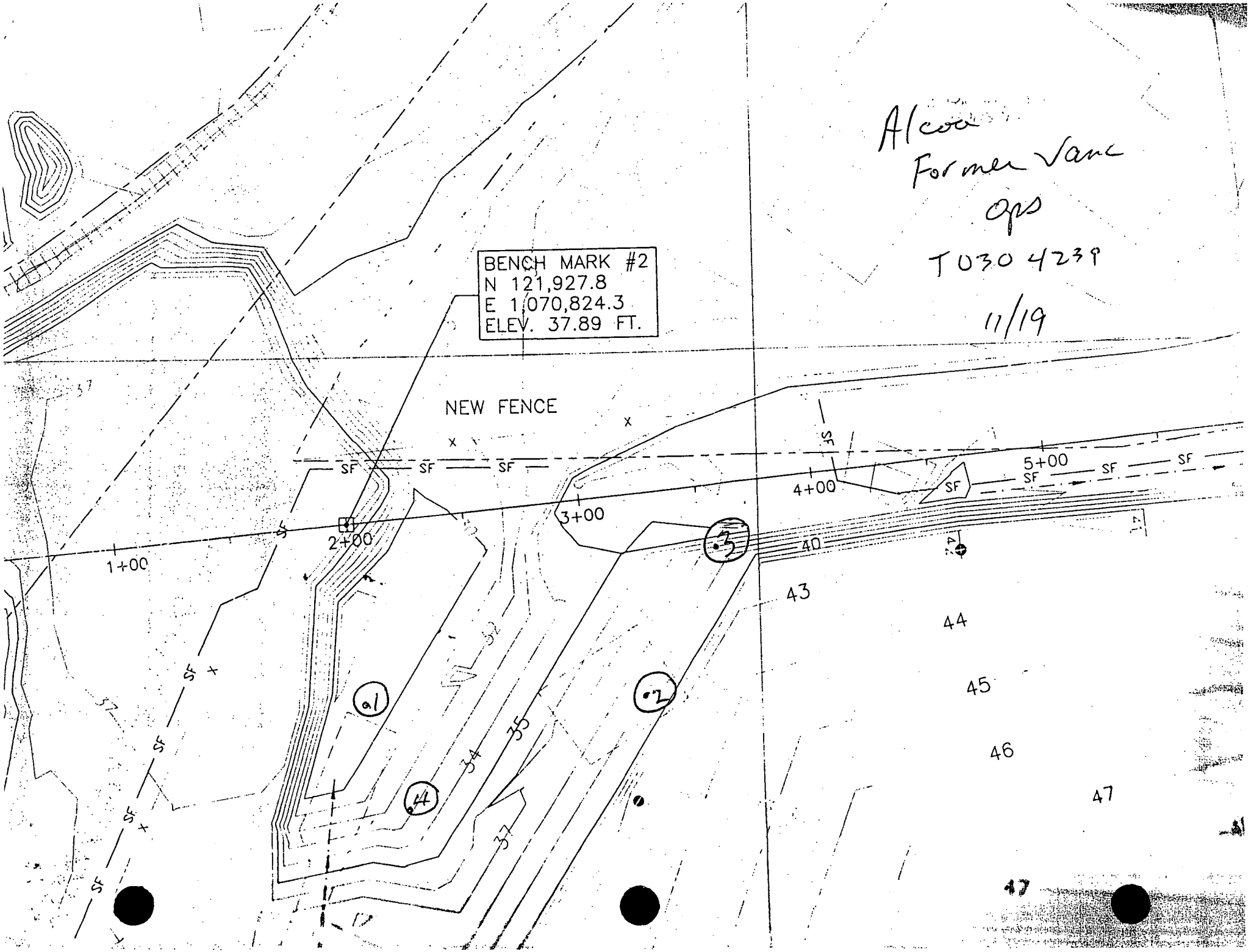
Alcoa
Former Vanc
ops
T030 4239
11/19
BENCH MARK #2
N 121,927.8
E 1,070,824.3
ELEV. 37.89 FT.
NEW FENCE
SF
1+00
2+00
3+00
4+00
5+00
40
43
44
45
46
47
#1
#2
#3
#4

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JOB NO. T0304239

NOV 21, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description NATIVE LIGHT BROWN SILT

Max. Dry Density 96.1 lbs./cu. ft. Optimum Moisture 21.2 %. Serial # Troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/30/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
11-19	27	SF	EAST LANDFILL AREA SEE DIAGRAM	1721	255	DT	8"	33	20.6	115.5	95.8	100

Standard Counts - Density: 2156 Moisture: 646 Calibration Data: 04/03

SEE DENSITY 17 USED AS REFERENCED

Remarks:

cc:

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Reviewed By Proj. Mngr:

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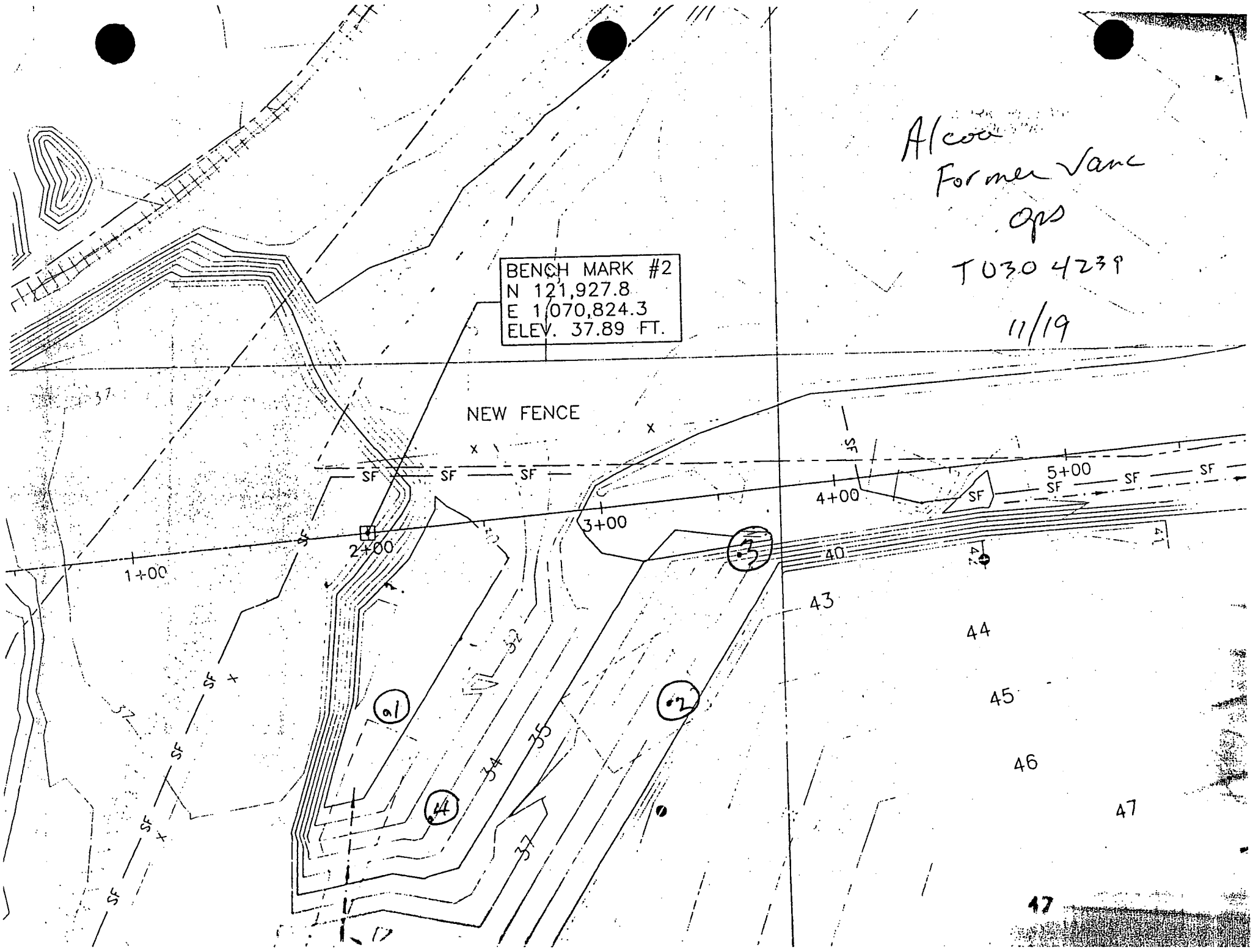
Alcoa
Former Vanc
ops
T0304239
11/19
BENCH MARK #2
N 121,927.8
E 1,070,824.3
ELEV. 37.89 FT.
NEW FENCE
SF
1+00
2+00
3+00
4+00
5+00
40
43
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JOB NO. T0304239

NOV 24, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No.

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description SAND FROM GLACIER NORTHWEST

Max. Dry Density 91.7 lbs./cu. ft. Optimum Moisture 20.5 %. Serial # Troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/16/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
				2742	82	DT	8"	32.5	6	98.5	92.9	
11-21	28	SF	ANCHOR EMBANKMENT - SEE DIAGRAM									100+
				2712	101	DT	8"	32	7.8	98.8	91.7	
11-21	29	SF	ANCHOR EMBANKMENT - SEE DIAGRAM									100
				2620	109	DT	8"	33	8.5	100.1	92.3	
11-21	30	SF	ANCHOR EMBANKMENT - SEE DIAGRAM									100+
				2431	100	DT	8"	33.5	7.4	103	95.9	
11-21	31	SF	ANCHOR EMBANKMENT - SEE DIAGRAM									100+

Standard Counts - Density: 2163 Moisture: 643 Calibration Data: 04/03

Remarks:

cc:

J. BLACK/MHX

Reviewed By Proj Mngr:

Tested by

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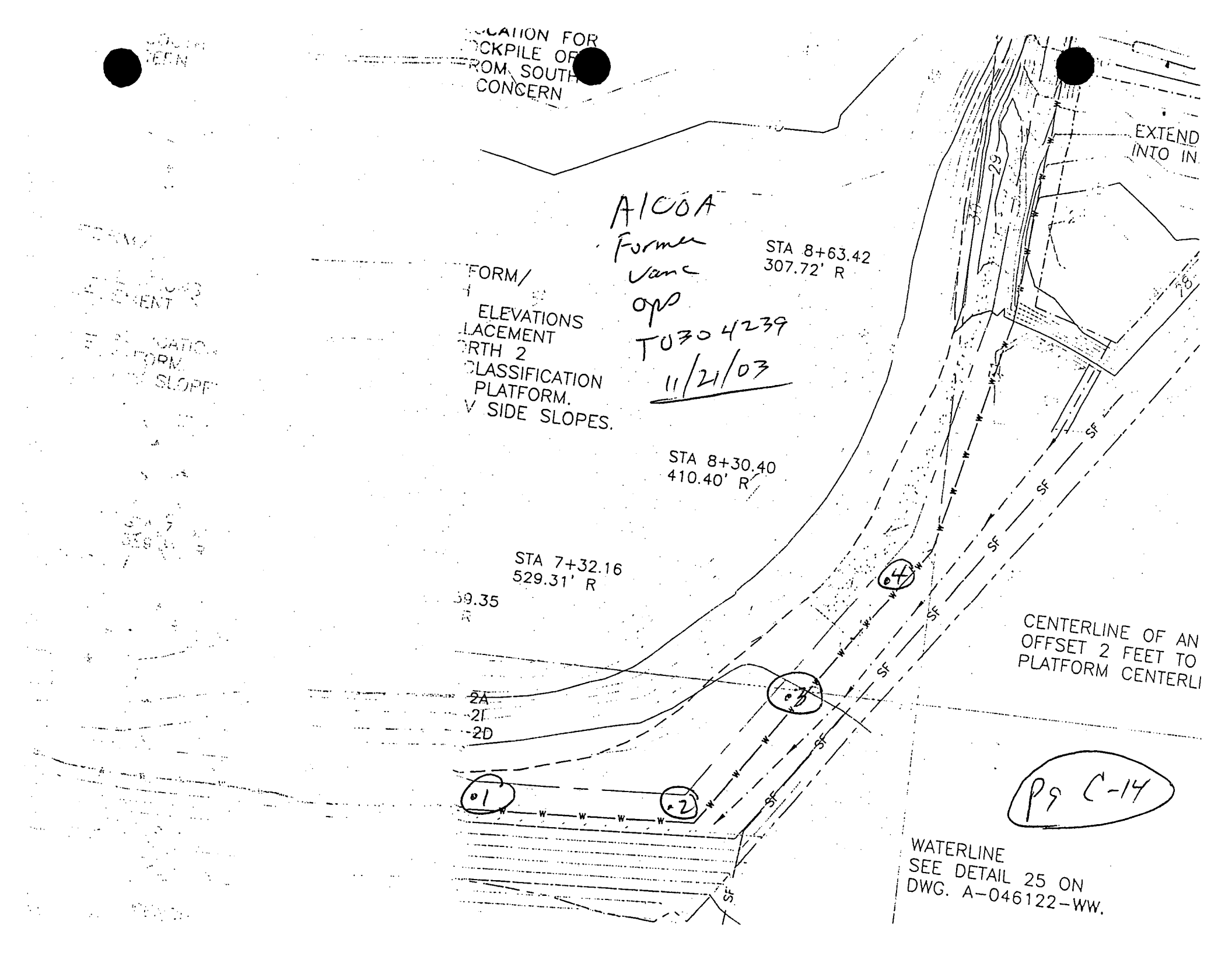
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CKPILE OF
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INTO IN
ALCOA
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Vance
OPP
TU30 4239
11/21/03
STA 8+63.42
307.72' R
FORM/
ELEVATIONS
LACEMENT
RTH 2
CLASSIFICATION
PLATFORM.
V SIDE SLOPES.
STA 8+30.40
410.40' R
STA 7+32.16
529.31' R
59.35
2A
2I
2D
CENTERLINE OF AN
OFFSET 2 FEET TO
PLATFORM CENTERLI
Pg C-14
WATERLINE
SEE DETAIL 25 ON
DWG. A-046122-WW.

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JOB NO. T0304239

Dec 02, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description SAND FROM GLACIER NORTHWEST

Max. Dry Density 91.7 lbs./cu. ft. Optimum Moisture 20.5 % Serial # Troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017

Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/16/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
12- 2	32	SF	ANCHOR TRENCH EMBANKMENT - STATION 4+50, SOUTHSIDE	2520	88	DT	8"	34	6.4	101.6	95.5	100+
12- 2	33	SF	ANCHOR TRENCH EMBANKMENT - STATION 3+25, SOUTHSIDE	2497	78	DT	8"	34	5.5	102	96.7	100+
12- 2	34	SF	ANCHOR TRENCH EMBANKMENT - WESTSIDE	2609	81	DT	8"	37	5.9	100.3	94.7	100
12- 2	35	SF	ANCHOR TRENCH EMBANKMENT - NORTHWEST	2507	84	DT	8"	40	6.1	101.8	95.9	100+
12- 2	36	SF	ANCHOR TRENCH EMBANKMENT - STATION 4+00, NORTHSIDE	2385	94	DT	8"	41	6.8	103.7	97.1	100+
12- 2	37	SF	ANCHOR TRENCH EMBANKMENT - STATION 5+25, NORTHSIDE	2487	103	DT	8"	40	7.8	102.1	94.7	100+
12- 2	38	SF	ANCHOR TRENCH EMBANKMENT - STATION 6+50, NORTHSIDE	2836	76	DT	8"	39	5.6	97.2	92.0	100
12- 2	39	SF	ANCHOR TRENCH EMBANKMENT - STATION 7+75, NORTHSIDE	2454	87	DT	8"	38	6.3	102.6	96.5	100+

Standard Counts - Density: 2159 Moisture: 641 Calibration Data: 04/03

Remarks: TESTS TAKEN AT NEAR FINISH GRADE.

cc:

Tested by: J. BLACK/MHX

Reviewed By Proj Mngr:

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Job [redacted] T0304239

NOV 24, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description SAND FROM GLACIER NORTHWEST

Max. Dry Density 91.7 lbs./cu. ft. Optimum Moisture 20.5 %. Serial # Troxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017 Required Compaction: 95 %

Source of Proctor Value: ☐ Project Specific, Date: 10/16/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11-21	28	SF	ANCHOR EMBANKMENT - SEE DIAGRAM	2742	82	DT	8"	32.5	6	98.5	92.9	100+
11-21	29	SF	ANCHOR EMBANKMENT - SEE DIAGRAM	2712	101	DT	8"	32	7.8	98.8	91.7	100
[redacted]-21	30	SF	ANCHOR EMBANKMENT - SEE DIAGRAM	2620	109	DT	8"	33	8.5	100.1	92.3	100+
11-21	31	SF	ANCHOR EMBANKMENT - SEE DIAGRAM	2431	100	DT	8"	33.5	7.4	103	95.9	100+

Standard Counts - Density: 2163 Moisture: 643 Calibration Data: 04703

Remarks:

cc:

[redacted]

J. BLACK/MHX

Reviewed By Proj Mngr:

Tested by

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JOB NO. T0304239

Nov 14, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description NATIVE LIGHT BLACK SILT WITH AGGREGATE

Max. Dry Density 102.0 lbs./cu. ft. Optimum Moisture 20.9 %. Serial #roxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017

Required Compaction: 95 %

Source of Proctor Value: ☒Project Specific, Date: 10/30/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11-12	15	SF	REVETTMENT FILL - STATION 5+25	2287	222	DT	6"	30	16.5	120.9	103.8	100+
11-12	16	SF	REVETTMENT FILL - STATION 6+00	1542	232	DT	6"	30	17.7	119.8	101.8	100
11-12	17	SF	REVETTMENT FILL - STATION 6+75	1731	179	DT	8"	30	13.4	115.5	101.9	100

Standard Counts - Density: 2147 Moisture: 641 Calibration Data:

Remarks:

cc:

J. BLACK/MHX

Tested by:

Reviewed By
Proj Mngr:

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J[redacted] T0304239

Nov 14, 2003

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Permit No:

Project ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03
5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description NATIVE LIGHT BROWN SILT

Max. Dry Density 96.1 lbs./cu. ft. Optimum Moisture 21.2 %. Serial #roxler 16185 NUC 3440

Method of Test ASTM D698
ASTM D2922,D3017

Required Compaction: 95 %

Source of Proctor Value: ☒Project Specific, Date: 10/30/2003 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
11-12	13	SF	REVETTMENT FILL - STATION 4+50	1954	208	DT	8"	30	14.9	110.7	94.7	99
11-12	14	SF	REVETTMENT FILL - STATION 7+25	2139	187	DT	4"	21	15.4	107.3	93.0	97

Standard Counts - Density: 2147 Moisture: 641 Calibration Data: 04/03

Remarks:

cc:

J. BLACK/MHX
Tested by

Reviewed By
Proj Mngr:

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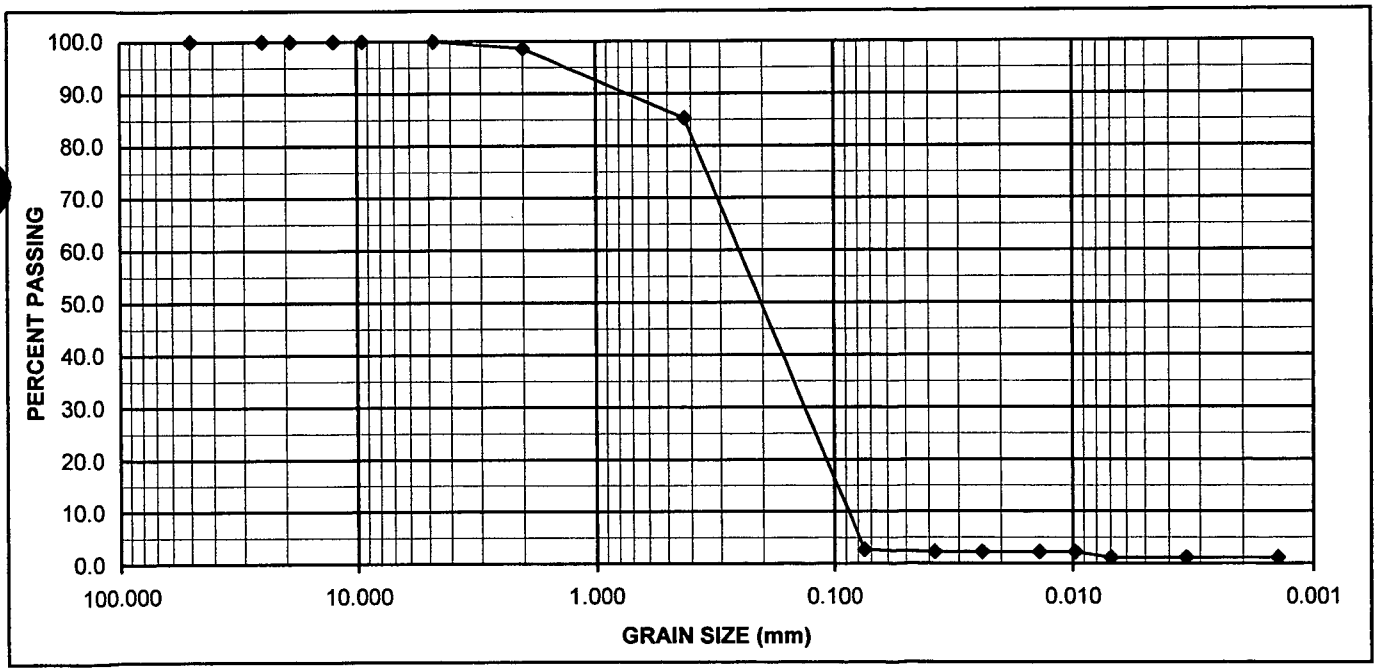
[redacted]nt:	CH2M Hill Engineers - Marc Krekos	Job Number:	T0304239.CTI
[redacted]oject:	Alcoa Former Vancouver Operations	Sampled By:	Client
Sample Description:	Sand	Date Sampled:	
Sample Identification:		Date Received:	11/24/03
Sample Location:	Unknown	Date Tested:	11/26/03
Lab Log Number:	03-1499	Tested By:	Nick Copper

ASTM D422-Particle Size Analysis

SIEVE ANALYSIS			
Sieve Size		Cumulative	Cumulative
US Standard	mm	% Retained	% Passing
2"	50.0	0.0	100.0
1"	25.0	0.0	100.0
3/4"	19.0	0.0	100.0
1/2"	12.5	0.0	100.0
3/8"	9.5	0.0	100.0
#4	4.75	0.0	100.0
#10	2.00	1.4	98.6
#40	0.425	14.7	85.3
#200	0.075	97.4	2.6

HYDROMETER ANALYSIS	
Diameter, mm	% Finer
0.0379	2.2
0.0239	2.2
0.0138	2.2
0.0098	2.2
0.0069	1.1
0.0034	1.1
0.0014	1.1



(1) Gravel, passing 3in and retained on No.4 sieve:	0.0
(2) Sand, passing No.4 and retained on No.200 sieve:	97.4
a. Coarse sand, passing No.4 and retained on No.10 sieve:	1.4
b. Medium sand, passing No.10 and retained on No.40:	13.3
c. Fine sand, passing No.40 and retained on No.200 sieve:	82.6
(3) Silt size, 0.074mm to 0.005mm:	1.6
(4) Clay size, 0.005mm to 0.001mm:	0.0
Colloids, smaller than 0.001mm:	1.1

[redacted]sted in accordance with stated procedures with equipment in current calibration by: Nick Copper

Reviewed By: Date: 12/3/03

Jason S. Bryant, Laboratory Supervisor

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Moisture - Density Relationship

Client:	CH2M Hill Engineers (Portland)	**Job Number:**	T0304239
Project:	Alcoa Former Vancouver Operations - Project#	**Contractor:**	
Source:	Rock Source	**Tested By:**	LAB
Material Type:	Rock	**Sample Method:**	ASTM D-75
Location:	Submitted by Marc Krekos	**Date Sampled:**	11/24/03
Sampled By:	Inspector	**Date Received:**	
Test Method:	ASTM D-698 A, C-136, D-2216	**Date Tested:**	11/24/03

		1	2	3	4	5	6
Wgt. of Mold & Wet soil		13.20	13.21	13.13	13.10	13.02	
Weight of Mold		9.27	9.27	9.27	9.27	9.27	
Weight of Wet soil		3.93	3.95	3.86	3.84	3.75	
Wet Density	30	117.9	118.4	115.8	115.1	112.5	
Dry Density		96.8	96.4	95.9	93.0	94.4	
Wet Weight of Soil		974.4	1794.8	512.2	1804.7	482.5	
Dry Wgt of Soil		800.1	1461.3	424.3	1458.9	404.8	
Weight of Water		174.3	333.5	87.9	345.8	77.7	
Moisture (MC)		21.8	22.8	20.7	23.7	19.2	
Remarks:		The difference in moistures should be 2%					

Optimum Moisture: 22.0%

Max Dry Density: 96.8 lbs/ft^3

lbs/ft^3

Material Selection:	◉ ROCK ○ SOIL
Preparation Method:	◉ MOIST ○ DRY
Compacting Method:	◉ MANUAL ○ MECHANICAL
Oversized Material:	◉ REMOVED ○ REPLACED
Compacting Hammer:	◉ CIRCULAR ○ PIE WEDGE

B = Weight of SSD Sample	
C = Weight of Sample in Water	
A = Weight of Oven Dry Agg.	
Bulk Specific Gravity = A/(B-C)	
Absorption = (B-A) /A)	

Percent Passing Sieve: ◉ #4 ○ 3/8" ○ 3/4" — 97.6%

Assumed Specific Gravity: 2.5

VER.35988 BES

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Moisture - Density Relationship

Client: CH2M Hill Engineers (Portland)

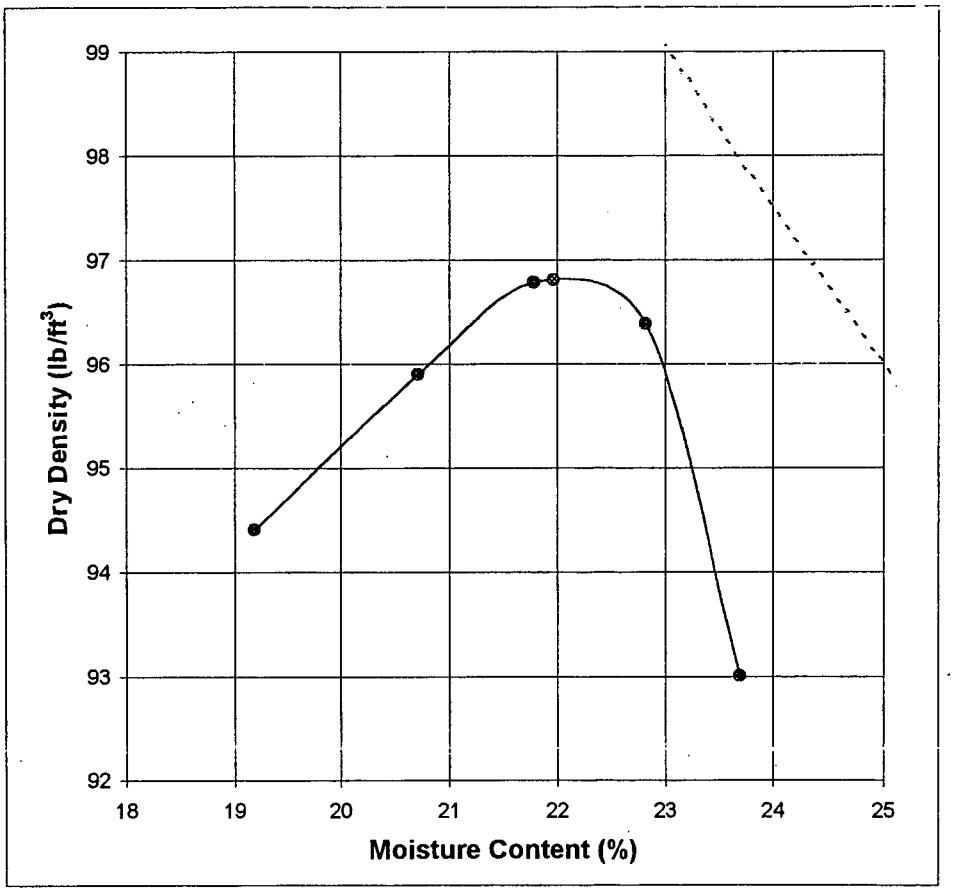
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03 — 12/04/03

Job Number: T0304239

Material Type: Rock

Location: Submitted by Marc Krekos

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	11/24/03
Sample Method:	ASTM D-75	**Date Tested:**	11/24/03
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 22.0% **Max. Dry Density:** 96.8 lbs/ft^3

Percent Passing #4 Sieve: 97.6%

CC:

Reviewed By: _____

James F. Kleptas - Laboratory Manager

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SIEVE ANALYSIS

PROJECT: Tenaleo SAMPLE METHOD: Client BILL CODE: 202

CLIENT: CH2M Hill SAMPLED BY: Client DATE: 10-16-03

SUPPLIER: Glacier SIG SAMPLED FROM: ?

MATERIAL TYPE: Sand DATE TEST STARTED: 10/16 DATE FINISHED: 10/17

DATE REC'V. IN LAB: 10-15-03 LAB LOG #: 03-1335 TESTED BY: TMB

BALANCE No.: 737 SHAKER No.: 1380 WASH #200 SIEVE No.: 3334

METHOD OF TESTING

AASHTO T11 ___ AASHTO T27 ___ ASTM C117 X ASTM C136 X

SIEVE SIZES mm	SIEVE SIZES in	SIEVE LOG #	WEIGHT RETAINED	PERCENT RETAINED	ACCUM. % RETAINED	PERCENT PASSING	Project SPECIFICATIONS
50	2	N/A	0	0	0	100	100
37.6	1½		0	0	0	100	
25	1		0	0	0	100	
19	¾		0	0	0	100	
12.5	½	↓	0	0	0	100	
9.5	⅜	120	0	0	0	100	
4.75	4	3237	.2	0	0	100	30-100
2.36	8	3486	6.7	.9	.9	99	
1.18	16	2716	44.9	5.7	6.6	93	
.600	30	1990	212.6	27.2	33.8	66	
.300	50	2712	358.8	45.8	79.6	20	
.150	100	750	145.4	18.6	98.2	2	
.075	200	3383	9.1	1.2	99.4	0.6	
	pan		.9				

Weight Wet: n/a Weight Dry: 783.0 % Moisture: — Weight After Wash: 777.4 778.6

Tested in accordance with stated procedures with equipment in current calibration by: J.M. Bell

Reviewed By: TMB 10/20

Revision: 2 (2/98)

MOISTURE / DENSITY RELATIONSHIP

PROJECT: VANALCO
CLIENT: CH2M Hill
SOURCE: Glacier S+G
MATERIAL TYPE: Sand
DATE REC'V. IN LAB: 10-15-03
BALANCE #: 737

SAMPLE METHOD: Client
SAMPLED BY: Client
SAMPLED FROM: ?
DATE TEST STARTED: 10-16
LAB LOG #: 03-1335
MOLD #: 3572
BILL CODE: 200
DATE: 10-15-03
DATE FINISHED: 10-16
TESTED BY: TMB
RAMMER #: 3300
SCALP SIEVE #: 5/8

METHOD OF TESTING

AASHTO T99 ____	AASHTO T180 ____	ASTM D698 X	ASTM D1557 ____
METHOD "A" X	METHOD "B" ____	METHOD "C" ____	METHOD "D" ____

OPTIMUM MOISTURE 20.5 % MAXIMUM DRY DENSITY 91.8 PCF
ADJUSTED OPTIMUM MOISUTRE n/a % ADJUSTED MAXIMUM DRY DENSITY n/a PCF

DATA POINT NUMBER	1	2	3	4	5	6	7
A. WEIGHT OF MOLD + WET SOIL	13.10	13.19	13.34	13.30			
B. WEIGHT OF MOLD	9.65	9.65	9.65	9.65			
C. WEIGHT OF WET SOIL (A - B)	3.45	3.54	3.69	3.65			
D. WET DENSITY (C x 30 or 13.33)	103.5	106.2	110.7	109.5			
E. DRY DENSITY (D / 100 + I) x 100	88.8	89.5	91.7	89.4			
F. WET WEIGHT OF SOIL	231.7	225.0	228.6	230.0			
G. DRY WEIGHT OF SOIL	198.8	189.7	189.4	187.8			
H. WEIGHT OF WATER (F - G)	32.9	35.3	39.2	42.2			
I. % MOISTURE (H / G) x 100	16.5	18.6	20.7	22.5			

PREPARATION METHOD: (Moist) or Dry
COMPACTIVE EFFORT: (Manual) or Mechanical
PERCENT PASSING 3/4" 3/8" (#4) Sieve: 100 %
PERCENT OVERSIZED: 0 %
OVERSIZED MATERIAL: Removed or Replaced
COMPACTION RAMMER: (Circular) or Pie Wedge

(Adjusted Calculations – If more than 5% oversize)

Dry Density
100 x max. density x sp. gr. x 62.42
(max. den. x % oversize) + (sp. gr. x 62.42 x % passing)

Moisture
(Opt. Moisture x % passing) + (% Absorption x % oversize)

B = WEIGHT OF SSD SAMPLE	
C = WEIGHT OF SAMPLE IN WATER	
A = WEIGHT OF OVEN DRY AGG	
B - C	
A - C	
B - A	
BULK SPECIFIC GRAVITY = A / (B - C)	
BULK SPECIFIC GRAVITY SSD = B / (B-C)	
MAX SPECIFIC GRAVITY = A / (A – C)	
% ABSORPTION = (B-A) / A *100	

Tested in accordance with stated procedures with equipment in current calibration by: Tonya Bell

Reviewed By: TB 10/20

MOISTURE / DENSITY RELATIONSHIP

PROJECT: VaNalco
CLIENT: CH2M Hill
SOURCE: Client
MATERIAL TYPE: Sand w/mulch
DATE REC'V. IN LAB: 10-17-03
BALANCE #: 2922

SAMPLE METHOD: Client
SAMPLED BY: Client
SAMPLED FROM: Client
DATE TEST STARTED: 10-20
LAB LOG #: 03-1346
MOLD #: 849
RAMMER #3300

BILL CODE:
DATE: 10-17-03
DATE FINISHED: 10-21-03
TESTED BY: AF
SCALP SIEVE #: 3/4

METHOD OF TESTING

AASHTO T99		AASHTO T180		ASTM D698	X	ASTM D1557	
METHOD "A"	X	METHOD "B"		METHOD "C"		METHOD "D"	

OPTIMUM MOISTURE 23.4 %
ADJUSTED OPTIMUM MOISUTRE ____ %
MAXIMUM DRY DENSITY 92.6 PCF
ADJUSTED MAXIMUM DRY DENSITY ____ PCF

DATA POINT NUMBER	1	2 (4)	3 (6)	4 (8)	5 (10)	6	7
A. WEIGHT OF MOLD + WET SOIL		12.93	13.05	13.13	13.16		
B. WEIGHT OF MOLD		9.32	9.32	9.32	9.32		
C. WEIGHT OF WET SOIL (A - B)		3.61	3.73	3.81	3.84		
D. WET DENSITY (C x 30 or 13.33)		108.3	111.9	114.3	115.2		
E. DRY DENSITY (D / 100 + I) x 100		90.6	91.9	92.6	91.9		
F. WET WEIGHT OF SOIL		298.9	305.0	301.4	300.0		
G. DRY WEIGHT OF SOIL		250.1	250.4	244.0	239.2		
H. WEIGHT OF WATER (F - G)		48.8	54.6	57.4	60.8		
I. % MOISTURE (H / G) x 100		19.5	21.8	23.5	25.4		

PREPARATION METHOD: Moist or Dry
COMPACTIVE EFFORT: Manual or Mechanical
PERCENT PASSING 3/4" 3/8" #4 Sieve: 97.2 %
PERCENT OVERSIZED: 2.8 %
OVERSIZED MATERIAL: Removed or Replaced
COMPACTION RAMMER: Circular or Pie Wedge

(Adjusted Calculations - if more than 5% oversize)

Dry Density
$\frac{100 \times \text{max. density} \times \text{sp. gr.} \times 62.42}{(\text{max. den.} \times \%\ \text{oversize}) + (\text{sp. gr.} \times 62.42 \times \%\ \text{passing})}$

Moisture
(Opt. Moisture x % passing) + (% Absorption x % oversize)

B = WEIGHT OF SSD SAMPLE	
C = WEIGHT OF SAMPLE IN WATER	
A = WEIGHT OF OVEN DRY AGG	
B - C	
A - C	
B - A	
BULK SPECIFIC GRAVITY = A / (B - C)	
BULK SPECIFIC GRAVITY SSD = B / (B-C)	
MAX SPECIFIC GRAVITY = A / (A - C)	
% ABSORPTION = (B-A) / A *100	

Tested in accordance with stated procedures with equipment in current calibration by: Art Frock

Reviewed By: ____

ASTM D2974 or AASHTO T267 # 250

GANIC MATTER CONTENT

Project: VANALCO Date: 10-16-03

Project No: new

Client Name: CH2M Hill

Project Manager:

Sample No: 03-1335

Source: Glacier S+G

Tested By: TMB

Sample Description: Sand

Dish wt. (g)	109.9
Wet Sample wt. + dish (g)	238.4
*Dry Sample wt. + dish (g)	230.5
After burn:	119.7 - without dish
**Dry Sample (g)	120.6 - without dish

NOTES:

* Dry uncovered for at least 16 hours in 105°C or until no change in mass.

** Place dish and sample in a Muffle furnace for approximately 4 hours. Gradually bring the temperature up to 750°C or 455 +/- 10°C according to method used (ASTM D2974 or ASHTO T267)

CALCULATIONS

Ash content, % = (C x 100)/B 99.3 %

where: C = ash (g)
B = oven-dried test specimen (g)

Organic content, % = 100.0 - D 0.7 %

where: D = ash content, % Project Specs - 20% maximum

ASTM D2974 - or AASHTO T267 # 250

ORGANIC MATTER CONTENT

Project: VANALCO Date: 10-16-03

Project No: new

Client Name: CH2M Hill

Project Manager:

Sample No: 03-1335

Source: Glacier Stg

Tested By: TMB

Sample Description: Sand

Dish wt. (g)	109.9
Wet Sample wt. + dish (g)	238.4
*Dry Sample wt. + dish (g)	230.5
After burn:	119.7 - without dish
**Dry Sample (g)	120.6 - without dish

NOTES:

* Dry uncovered for at least 16 hours in 105°C or until no change in mass.

** Place dish and sample in a Muffle furnace for approximately 4 hours. Gradually bring the temperature up to 750°C or 458 +/- 10°C according to method used (ASTM D2974 or AASHTO T267)

CALCULATIONS

Ash content, % = (C x 100)/B 99.3 %

where: C = ash (g)
B = oven-dried test specimen (g)

Organic content, % = 100.0 - D 0.7 %

where: D = ash content, % Project Specs. - 20% Maximum

Carlson Testing, Inc.

Main Office
P.O. Box 23814
Tigard, Oregon 97281
Phone (503) 684-3460
FAX (503) 684-0954

Salem Office
4060 Hudson Ave., NE
Salem, OR 97301
Phone (503) 589-1252
FAX (503) 589-1309

Bend Office
P.O. Box 7918
Bend, OR 97708
Phone (541) 330-9155
FAX (541) 330-9163

November 4, 2003
T0304239.CTI

CH2M Hill Engineers
Attn: Marc Krekos
825 NE Multnomah
Portland, OR 97232

Re: Alcoa Former Vancouver Operations – Project #184717-01-01-03
5509 NW Lower River Road – Vancouver, WA
Atterberg Limits Testing

Gentlemen:

As requested, Carlson Testing, Inc. has completed Atterberg Limits testing on two (2) samples (referenced below) of material sampled by your representative on October 29, 2003 from the bank cut. Testing was completed on October 30, 2003. Following is the test data:

Atterberg Limits – ASTM D4318:

Sample #1: 03-1396.01
Native Black Silt with Gravel
Plastic Limit – NP
Liquid Limit – NP
Plasticity Index – NP
NP – Non Plastic

Sample #2: 03-1396.02
Native Light Brown Silt
Plastic Limit – NP
Liquid Limit – NP
Plasticity Index – NP

Our reports pertain to the material tested/inspected only. Information contained herein is not to be reproduced, except in full, without prior authorization from this office.

If there are any further questions regarding this matter, please do not hesitate to contact this office.

Respectfully submitted,
Carlson Testing, Inc.

James F. Hieptas
Laboratory Manager

jfe

P:\Projects\General\T0304239\Lab work\Atterberg.Lablog\03-1396.doc

APPENDIX F

NORTH AND NORTH 2 LANDFILL IMMUNOASSAY AND GRAB SAMPLE DATA

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

Vancouver Landfill Remediation

South Bank Area of Concern

Clean up Correspondence

Richartz, Bruce K.

From: Mike.Drewett@ch2m.com
Sent: Tuesday, November 04, 2003 8:36 AM
To: psullivan@BERGMANNPC.com; Bruce.Richartz@alcoa.com; david.keene@alcoa.com; albert.burba@alcoa.com
Cc: Marc.Krekos@ch2m.com
Subject: Vancouver Operations Site Laboratory Data Summary Table

All,

Attached is summary table for lab data from Vancouver site excavation sampling. Will send hard copies of data sheets in later email. All excavations meet cleanup requirements except X-5 which has not yet been excavated.

Mike

Former Vancouver Operations Site
South Bank Area of Concern

Alcoa	CH2	Lab	Analyses	Sampled	Received	Analyzed	Result
SBAC-S-002	X-1 P2-15	C223602	PAH/SIM	10/13/2003	10/14/2003	10/20/2003	22.5 ppm
SBAC-S-002	X-1 P2-15	C223602	PCB	10/13/2003	10/14/2003	10/15/2003	9.2 ppm
SBAC-S-016	X-1 P2-15	C232701	PAH/SIM	10/24/2003	10/28/2003	10/29/2003	0.3 ppm
SBAC-S-006	X-2 P2-09	C222306	PCB	10/13/2003	10/14/2003	10/15/2003	103 ppm
SBAC-S-015	X-2 P2-09	C229802	PAH/SIM	10/22/2003	10/23/2003	10/24/2003	<0.01 ppm
SBAC-S-015	X-2 P2-09	C229802	PCB	10/22/2003	10/23/2003	10/23/2003	0.01 ppm
SBAC-S-004	X-3 P2-07	C223604	PAH/SIM	10/13/2003	10/14/2003	10/20/2003	0.2 ppm
SBAC-S-004	X-3 P2-07	C223604	PCB	10/13/2003	10/14/2003	10/15/2003	0.05 ppm
SBAC-S-007	X-3 P2-10	C223607	PAH/SIM	10/13/2003	10/14/2003	10/20/2003	6.0 ppm
SBAC-S-007	X-3 P2-10	C223607	PCB	10/13/2003	10/14/2003	10/16/2003	8.1 ppm
SBAC-S-011	X-4 NE Corner	C228703	PAH/SIM	10/21/2003	10/22/2003	10/24/2003	59.4 ppm
SBAC-S-011	X-4 NE Corner	C228703	PCB	10/21/2003	10/22/2003	10/23/2003	63.1 ppm
SBAC-S-017	X-4 NE Corner	C232702	PCB	10/24/2003	10/28/2003	10/29/2003	<0.01 ppm
SBAC-S-019	X-4 NE Corner		PAH/SIM	10/29/2003			<0.01 ppm
SBAC-S-012	X-4 NW Corner	C228704	PAH/SIM	10/21/2003	10/22/2003	10/24/2003	60.0 ppm
SBAC-S-012	X-4 NW Corner	C228704	PCB	10/21/2003	10/22/2003	10/23/2003	7.9 ppm
SBAC-S-018	X-4 NW Corner		PAH/SIM	10/29/2003			<0.01 ppm
SBAC-S-010	X-4 P2-05	C228702	PAH/SIM	10/21/2003	10/22/2003	10/24/2003	<0.01 ppm
SBAC-S-010	X-4 P2-05	C228702	PCB	10/21/2003	10/22/2003	10/23/2003	0.06 ppm
SBAC-S-008	X-4 P2-06	C223608	PCB	10/13/2003	10/14/2003	10/15/2003	45.4 ppm
SBAC-S-009	X-4 P2-06	C228701	PAH/SIM	10/21/2003	10/22/2003	10/24/2003	0.05 ppm
SBAC-S-009	X-4 P2-06	C232701	PCB	10/21/2003	10/22/2003	10/23/2003	0.3 ppm
SBAC-S-005	X-4 P2-11	C223605	PAH/SIM	10/13/2003	10/14/2003	10/20/2003	0.9 ppm
SBAC-S-005	X-4 P2-11	C223605	PCB	10/13/2003	10/14/2003	10/15/2003	0.6 ppm
SBAC-S-003	X-4 SBTB1	C223603	PAH/SIM	10/13/2003	10/14/2003	10/20/2003	3.5 ppm
SBAC-S-003	X-4 SBTB1	C223603	PCB	10/13/2003	10/14/2003	10/15/2003	0.9 ppm
SBAC-S-014	X-6 P2-01	C229801	PAH/SIM	10/22/2003	10/23/2003	10/24/2003	0.8 ppm
SBAC-S-014	X-6 P2-01	C229801	PCB	10/22/2003	10/23/2003	10/23/2003	0.6 ppm
SBAC-S-013	X-7 SBBB1	C228705	PAH/SIM	10/21/2003	10/22/2003	10/24/2003	0.2 ppm
SBAC-S-013	X-7 SBBB1	C228705	PCB	10/21/2003	10/22/2003	10/23/2003	0.01 ppm
SBAC-S-001	X-8 P2-20	C223601	PAH/SIM	10/13/2003	10/14/2003	10/20/2003	6.1 ppm
SBAC-S-001	X-8 P2-20	C223601	PCB	10/13/2003	10/14/2003	10/15/2003	5.0 ppm

Richartz, Bruce K.

From: Sullivan, Patrick [psullivan@BERGMANNPC.com]
Sent: Tuesday, October 07, 2003 7:12 AM
To: Bruce Richartz at Alcoa Troutdale; Gray Keene at Alcoa Troutdale
Cc: Al Burba at Alcoa
Subject: South Bank excavation breakdown

Call after you have had a chance to review. Will get table 5-2 of CQAP to you soon.

Patrick J. Sullivan, Jr.,P.E.
Bergmann Associates
Seven Parkway Center, Suite 1025
875 Greentree Road
Pittsburgh, PA 15220
Ph: 412-928-1790 Ext. 208
Fax: 412-928-0690

Excavation Breakdown of South Bank by Area and Disposal Location October 7, 2003
Former Vancouver Works
Highlighted Borings indicate waste soils less than 50 mg/kg.

Boring	GS Elev	Exc.Depth	Range	Act. Elev	Elev grtr 50	Elev grtr 10	
AREA X-5							
P 2-14	25.5	7	26-19 ft	19.83	19	NA	excavation all greater than 50
P 2-17	26	4	26-22 ft	22.13	23	22	most of excavation greater than 50
P 2-18	28	6	28-22 ft	23.2	23	NA	excavation all greater than 50
P 2-08	27	3	27-24 ft	24.67	NA	24	shallowest excavation- no soil greater than 50
P 2-16	29	5	29-24 ft	24.1	24	NA	excavation all greater than 50

Excavate P 2-08 first. Create 15 ft. by 15 ft. square at elev. 24, side slopes of 2H:1V to elev. 27. Total 53 CY of less than 50 material to East LF.
Everything else in Area X-5 (966.5 - 53 = 913.5 CY from table on Dwg C-7) over 50 material-ship offsite.

AREA X-4

SB-TB-1	25	4	25-21 ft	21.71	NA	21	no soil greater than 50
P 2-05	27	7	27-20 ft	19.99	19	25	small amount of less than 50 above greater than 50
P 2-06	29	3	29-26 ft	27.11	26	NA	excavation all greater than 50
P 2-11	31	3	31-28 ft	28	NA	28	no soil greater than 50

Excavate P 2-11 first. An isolated excavation area, it is all less than 50. Place 53 CY in East LF. Excavate SB-TB-1 second. Create 15 ft. by 15 ft. square at elev. 21, side slopes of 2H:1V to elev. 25. Use 1H:1V side slope above elev. 23 on E side where excavation abuts P 2-05.
Total 85 CY of less than 50 material to East LF. Next, excavate 2 feet deep over P 2-05, 25 feet square. Total 46 CY of less than 50 to East LF.
Everything else in Area X-4 (538 - 53 - 85 - 46 = 354 CY from table on Dwg C-7) is over 50 material-ship offsite.

AREA X-3	All material less than 50-place in East LF (60 CY from Table on Dwg C-7).					
P 2-07	25	3	25-22 ft	22.81	NA	22
AREA X-2	All material greater than 50- ship offsite (18 CY from Table on Dwg C-7).					
P 2-09	24	2	24-22 ft	22.14	22	NA
AREA X-1	All material less than 50-place in East LF (76 CY from Table on Dwg C-7).					
P 2-15	24	4	24-20 ft	20.31	NA	20
AREA X-6	All material less than 50-place in East LF (19 CY from Table on Dwg C-7).					
P 2-01	13	2	13-11 ft	11.6	NA	11

Results from this location are 42 mg/kg, very close to 50. Check with confirmational sampling.

AREA X-7	All material greater than 50- ship offsite (37 CY from Table on Dwg C-7).					
P 2-03	8	6	8-2 ft	2.56	2	NA

Results from this location are 5,000 mg/kg, very high. Potential for expansion of area.

AREA X-8	All material less than 50-place in East LF (17 CY from Table on Dwg C-7).					
P 2-20	36	2	36-34 ft	34.22	NA	34

Richartz, Bruce K.

From: Marc.Krekos@ch2m.com
Sent: Wednesday, November 26, 2003 2:08 PM
To: Mike.Drewett@ch2m.com; Bruce.Richartz@alcoa.com; david.keene@alcoa.com
Subject: Vancouver PCB Screens for X5

Vancouver Daily 11-26_.doc

All the screens for both the 50 and 10 ppm have passed. I will go to Vancouver first thing on Monday to pull the glass conformations to send to the lab for 3 day TAT.
Questions call me on my cell.

Marc Krekos
Construction Management
825 N.E. Multnomah Blvd. Suite 1300
Portland, Oregon 97232
503-789-2077 Mobile
503-235-5000 Portland Office
503-235-5022 ext. 4282 Direct
503-736-2040 Fax
Marc.Krekos@ch2m.com

GENERAL INSPECTION/TESTING FORM
IMMUNOASSAY PCB FIELD SCREENS

Project Name/No. Vancouver Operations South Bank of Concern

Date: 26 November, 2003 **Weather:**

Report By: Marc Krekos

Test Location	Sample Elevation	Test Type	Parameter 10 / 50 ppm	Test Results	Pass / Fail
Standard # 1				0.19	
Standard # 2				0.13	
X5 P218	22		50	0.18	PASS
X5 P216	24		50	0.18	PASS
X5 P214	19		50	0.18	PASS
X5 P217	22		50	0.17	PASS
X5 P218	22		10	0.18	PASS
X5 P216	24		10	0.19	PASS
X5 P214	19		10	0.20	PASS
X5 P217	22		10	0.17	PASS
X5 P208	24		10	0.14	PASS
Sketch	**Remarks**				

All screens passed, Monday Dec. 01 I will collect the final conformation samples to ship to the lab rapid 3 day TAT.

Signed **Title**

Richartz, Bruce K.

From: Mike.Drewett@ch2m.com
Sent: Wednesday, December 10, 2003 9:00 AM
To: Bruce.Richartz@alcoa.com; david.keene@alcoa.com; psullivan@BERGMANNPC.com
Cc: Marc.Krekos@ch2m.com
Subject: X-5 Preliminary Test Results

Bruce,

Preliminary PCB results for all 5 samples from X-5 are less than 1 ppm. Excavation can be backfilled.

P2-17, Elevation 28 = 0.09 ppm
P2-14, Elevation 16 = 0.54 ppm
P2-18, Elevation 23 = 0.37 ppm
P2-08, Elevation 24 = <0.04 ppm
P2-16, Elevation 19 = 0.44 ppm

Will send hard copy when I receive.

Mike

Richartz, Bruce K.

From: Mike.Drewett@ch2m.com
Sent: Tuesday, November 11, 2003 1:12 PM
To: Bruce.Richartz@alcoa.com
Subject: RE: Cleanup levels at East Landfill

Thanks Bruce. Clears things up for South Bank Area of Concern.
Mike

-----Original Message-----
From: Richartz, Bruce K. [mailto:Bruce.Richartz@alcoa.com]
Sent: Tuesday, November 11, 2003 12:33 PM
To: Drewett, Mike/PDX
Subject: FW: Cleanup levels at East Landfill

FYI.
-----Original Message-----
From: Skyllingstad, Paul [mailto:psky461@ECY.WA.GOV]
Sent: Monday, November 10, 2003 1:28 PM
To: Burba, Albert; Stiffler, Mark; Richartz, Bruce K.
Cc: Wigfield, Kim; Harris, William W.
Subject: Cleanup levels at East Landfill

Bruce, Al & Mark:

Al just asked me to specifically define what the contaminates of concern are at the south bank area in the East Landfill project. The interim action plan is confusing, we did not define the areas well enough. In the South Bank, the contaminate of concern is PCB. The cleanup level is 10 mg/kg as per the interim action work plan Section 3.1. The work to be done on the area is described in Section 4.1.2 - Phase Two South Bank Area of Concern. PAH's, TCE or TPH are found in the North and North2 landfills. Hopefully, this will clean things up.

Bruce - Bill Harris and I will be coming down to look at the south bank next Monday November 17, 2003. We plan on getting on site about 11:00. See you then.

Any other questions E-mail me.

Cheers,

Paul Skyllingstad
Industrial Section

Richartz, Bruce K.

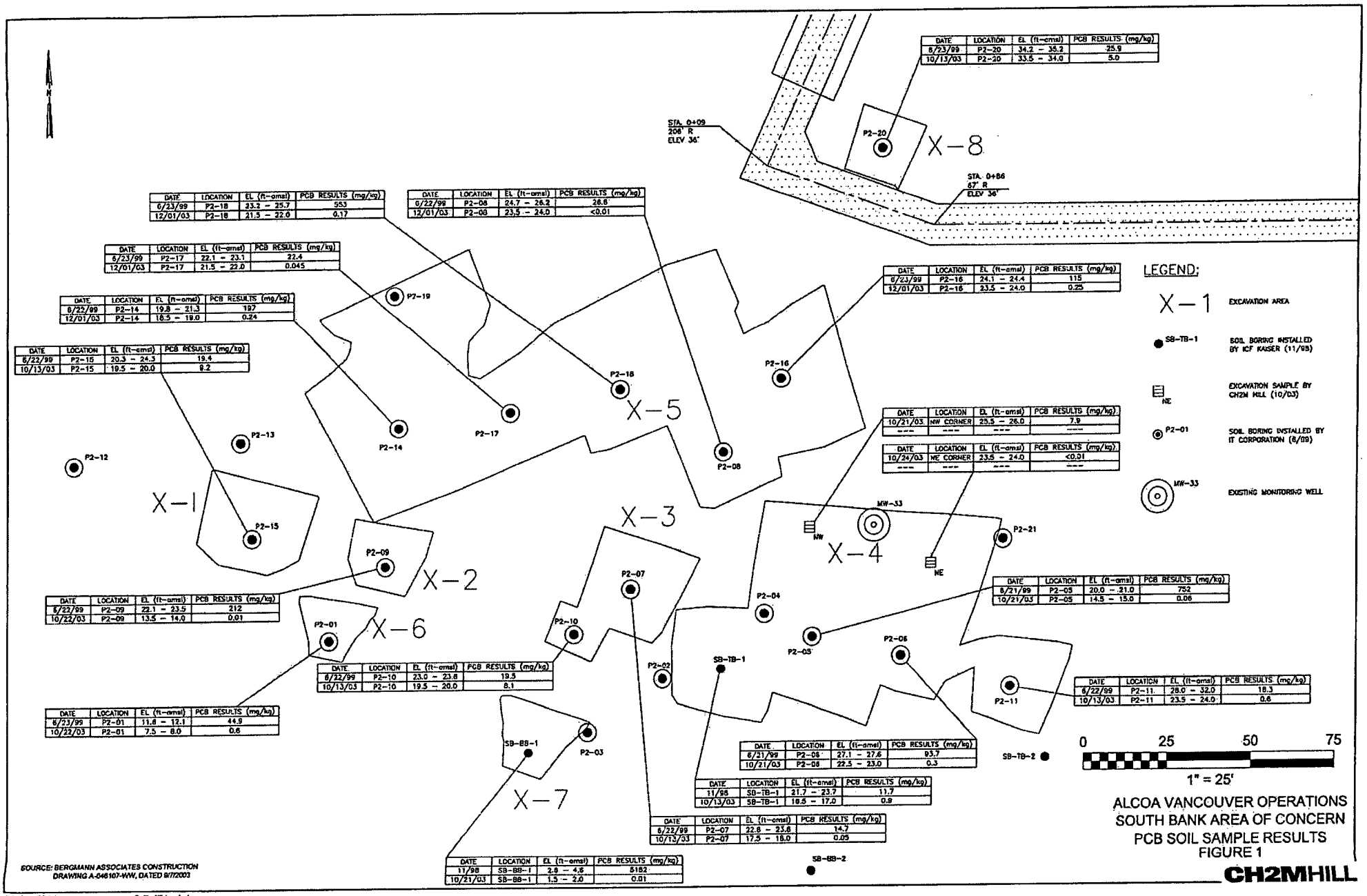
From: Mike.Drewett@ch2m.com
Sent: Tuesday, January 20, 2004 4:44 PM
To: Bruce.Richartz@alcoa.com
Subject: FW: Email from the 14th floor HP 9000L MFP printer

Document.pdf

Bruce,
Here is revised Figure 1 for Vancouver Operations Site. I'll send over an electronic file in ACAD version 14. Do you want me to forward this to Pat or Al?
Mike

-----Original Message-----
From: PDX 14th floor HP 9000L MFP [mailto:umpqua@ch2m.com]
Sent: Tuesday, January 20, 2004 4:26 PM
To: Drewett, Mike/PDX
Subject: Email from the 14th floor HP 9000L MFP printer

Please open the attached document. This document was digitally sent to you using an HP MFP Digital Sending Software.



DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/23/99	P2-18	23.2 - 25.7	553
12/01/03	P2-18	21.5 - 22.0	0.17

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/22/99	P2-08	24.7 - 26.2	26.6
12/01/03	P2-08	23.5 - 24.0	<0.01

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/23/99	P2-17	22.1 - 23.1	22.4
12/01/03	P2-17	21.5 - 22.0	0.045

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/23/99	P2-16	24.1 - 24.4	115
12/01/03	P2-16	23.5 - 24.0	0.25

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/22/99	P2-14	19.8 - 21.3	197
12/01/03	P2-14	18.5 - 19.0	0.24

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/23/99	P2-15	20.3 - 24.3	19.4
10/13/03	P2-15	19.5 - 20.0	8.2

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
10/21/03	NW CORNER	25.5 - 26.0	7.9
---	---	---	---

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
10/24/03	NE CORNER	23.5 - 24.0	<0.01
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DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/23/99	P2-09	22.1 - 23.5	212
10/22/03	P2-09	13.5 - 14.0	0.01

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/21/99	P2-05	20.0 - 21.0	752
10/21/03	P2-05	14.5 - 15.0	0.06

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/23/99	P2-10	23.0 - 23.8	19.5
10/13/03	P2-10	19.5 - 20.0	8.1

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/23/99	P2-01	11.8 - 12.1	44.9
10/22/03	P2-01	7.5 - 8.0	0.6

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/22/99	P2-11	28.0 - 32.0	18.3
10/13/03	P2-11	23.5 - 24.0	0.6

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/21/99	P2-06	27.1 - 27.6	93.7
10/21/03	P2-06	22.5 - 23.0	0.3

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
11/98	SB-TB-1	21.7 - 23.7	11.7
10/13/03	SB-TB-1	18.5 - 17.0	0.9

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
6/22/99	P2-07	22.8 - 23.8	14.7
10/13/03	P2-07	17.5 - 18.0	0.05

DATE	LOCATION	EL (ft-amsl)	PCB RESULTS (mg/kg)
11/98	SB-BB-1	2.8 - 4.5	5182
10/21/03	SB-BB-1	1.5 - 2.0	0.01

SOURCE: BERGMANN ASSOCIATES CONSTRUCTION DRAWING A-046107-WW, DATED 9/7/2003

ALCOA VANCOUVER OPERATIONS
SOUTH BANK AREA OF CONCERN
PCB SOIL SAMPLE RESULTS
FIGURE 1

CH2MHILL

20-Jan-2004 C-7_(E4ps).dwg

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-007**	**Lab Sample ID:**	**C223607**
Project Name:	ALCOA-Vanalco	Date Received:	10/14/2003
Project Manager:	Mike Drewitt	Date Analyzed:	10/20/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/13/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	08:20	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Water	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	3	8	
Acenaphthylene	3	4	
Acenaphthene	3	51	
Fluorene	3	22	
Phenanthrene	3	318	E
Anthracene	3	84	
Fluoranthene	3	746	E
Pyrene	3	841	E
Benzo(a)anthracene	3	560	E
Chrysene	3	650	E
Benzo(b)fluoranthene	3	570	E
Benzo(k)fluoranthene	3	321	E
Benzo(a)pyrene	3	551	E
Indeno(1,2,3-cd)pyrene	3	406	E
Dibenzo(a,h)anthracene	3	182	
Benzo(g,h,i)perylene	3	407	E

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	117	33-141%

X3, 12-10

J=Estimated value
U=Not detected at specified reporting limits

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CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-007 DL**	**Lab Sample ID:**	**C223607DL**
Project Name:	ALCOA-Vanalco	Date Received:	10/14/2003
Project Manager:	Mike Drewitt	Date Analyzed:	10/20/2003
Sampled By:	Mark Krekos	Dilution Factor:	5
Sampling Date:	10/13/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	08:20	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Water	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	13	13	U
Acenaphthylene	13	13	U
Acenaphthene	13	45	
Fluorene	13	19	
Phenanthrene	13	349	
Anthracene	13	80	
Fluoranthene	13	817	
Pyrene	13	931	
Benzo(a)anthracene	13	507	
Chrysene	13	664	
Benzo(b)fluoranthene	13	525	
Benzo(k)fluoranthene	13	394	
Benzo(a)pyrene	13	578	
Indeno(1,2,3-cd)pyrene	13	436	
Dibenzo(a,h)anthracene	13	185	
Benzo(g,h,i)perylene	13	467	

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	113	33-141%

J=Estimated value
U=Not detected at specified reporting limits

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1A

ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **SBAC-S-007**

Lab Name: CH2M HILL/LAB/CVO Contract #: 184717.01.01.08

Lab Code: CVO Case No.: C2236 SAS No.: C2236

Matrix: SOIL

Sample Amt.: 10.1 g

% Moisture: 9 Decanted: Y

Extraction: Sonc

Extract Vol.: 2 ml

Injection Vol.: 3.0 ul

GPC Cleanup: N

SDG No.: C2236

Lab Sample ID: **C223607**

Lab File ID: 011B1101.D

Date Received: 10/14/03

Date Extracted: 10/14/03

Date Analyzed: 10/16/03

Dilution Factor: 100

Sulfur Cleanup: Y

Concentration Units: ug/Kg

CAS #	Analyte	MDL	PQL	Result	Confirm	Q
12674-11-2	PCB-1016	42.2	1080	1080		U
11104-28-2	PCB-1221	104	1080	1080		U
11141-16-5	PCB-1232	72.9	1080	1080		U
53469-21-9	PCB-1242	92.2	1080	1080		U
12672-29-6	PCB-1248	95.7	1080	9230	7000	
11097-69-1	PCB-1254	81.7	1080	1080		U
11096-82-5	PCB-1260	106	1080	1080		U
37324-23-5	PCB-1262	106	1080	1080		U
11100-14-4	PCB-1268	106	1080	1080		U

Surrogate	% Rec.	QC Limits	Qualifier
Decachlorobiphenyl	69	25-143	

Comments:
AROCLOR 1262 + 1268 MDL'S CALCULATED FROM AROCLOR 1260 MDL.

X3, 42-10

CH2M HILL Applied Sciences Laboratory

Client Information

Client Sample ID: SBAC-S-007

Project Name: ALCOA-Vanalco
Project Manager: Mike Drewitt/PDX
Sampled By: Mark Krekos
Date Collected: 10/13/2003
Time Collected: 8:20
Type: Grab
Matrix: Soil-Sediment
Basis: Dry Weight

Lab Information

Lab Sample ID: C223607

Date Received: 10/14/2003
Report Revision No.: 0
Analyzed By: MAS
Reviewed By:

Due to high sample concentrations, Aroclor identification may be incorrect.
Sample dilution and re-analysis is necessary for final report.

Analyte	CAS #	Reporting Limit	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
PCBs as Aroclors							
Aroclor 1016	12674-11-2	9.9	9.9	U	µg/kg	SW 8082	10/15/2003
Aroclor 1221	11104-28-2	9.9	9.9	U	µg/kg	SW 8082	10/15/2003
Aroclor 1232	11141-16-5	9.9	9.9	U	µg/kg	SW 8082	10/15/2003
Aroclor 1242	53469-21-9	9.9	9.9	U	µg/kg	SW 8082	10/15/2003
Aroclor 1248	12672-29-6	9.9	8236	E	µg/kg	SW 8082	10/15/2003
Aroclor 1254	11097-69-1	9.9	9.9	U	µg/kg	SW 8082	10/15/2003
Aroclor 1260	11096-82-5	9.9	590	E	µg/kg	SW 8082	10/15/2003
Aroclor 1262	37324-23-5	9.9	9.9	U	µg/kg	SW 8083	10/15/2003
Aroclor 1268	11100-14-4	9.9	9.9	U	µg/kg	SW 8084	10/15/2003
Decachlorobiphenyl	2051-24-3		84%	SS			

U=Not detected at specified reporting limit
SS=Surrogate standard
E=Estimated value, over range of calibration

X3, P2-10

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CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-009**	**Lab Sample ID:**	**C228701**
Project Name:	ALCOA-Vanalco	Date Received:	10/22/2003
Project Manager:	Mike Drewitt	Date Analyzed:	10/24/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/21/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	13:55	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Soil	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	2	2	U
Acenaphthylene	2	2	U
Acenaphthene	2	2	U
Fluorene	2	2	U
Phenanthrene	2	4	
Anthracene	2	2	U
Fluoranthene	2	6	
Pyrene	2	8	
Benzo(a)anthracene	2	3	
Chrysene	2	5	
Benzo(b)fluoranthene	2	5	
Benzo(k)fluoranthene	2	4	
Benzo(a)pyrene	2	4	
Indeno(1,2,3-cd)pyrene	2	5	
Dibenzo(a,h)anthracene	2	2	U
Benzo(g,h,i)perylene	2	5	

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	118	33-141%

X4 -PLOS

J=Estimated value
U=Not detected at specified reporting limits

This report has been expedited through our laboratory to meet your request of rapid TAT. This data is classed ***Preliminary*** until you receive the hard copy report which has passed the final review process.

1A

ORGANICS ANALYSIS DATA SHEET

Field Sample ID: SBAC-S-009

Lab Name: CH2M HILL/LAB/CVO Contract #: 184717.01.01.08

Lab Code: CVO Case No.: C2287 SAS No.: C2287 SDG No.: C2287

Matrix: SOIL Lab Sample ID: C228701

Sample Amt.: 11 g Lab File ID: 005B0501.D

% Moisture: 5 Decanted: Y Date Received: 10/22/03

Extraction: Sonc Date Extracted: 10/22/03

Extract Vol.: 2 ml Date Analyzed: 10/23/03

Injection Vol.: 3.0 ul Dilution Factor: 10

GPC Cleanup: N Sulfur Cleanup: Y

Concentration Units: ug/Kg

CAS #	Analyte	MDL	PQL	Result		Q
12674-11-2	PCB-1016	3.7	95.4	95.4		U
11104-28-2	PCB-1221	9.2	95.4	95.4		U
11141-16-5	PCB-1232	6.4	95.4	95.4		U
53469-21-9	PCB-1242	8.1	95.4	95.4		U
12672-29-6	PCB-1248	8.4	95.4	334		
11097-69-1	PCB-1254	7.2	95.4	95.4		U
11096-82-5	PCB-1260	9.3	95.4	95.4		U
37324-23-5	PCB-1262	9.3	95.4	95.4		U
11100-14-4	PCB-1268	9.3	95.4	95.4		U

Surrogate	% Rec.	QC Limits	Qualifier
Decachlorobiphenyl	63	25-143	

Comments:
AROCLOR 1262 + 1268 MDL'S CALCULATED FROM AROCLOR 1260 MDL

X4 - P2 - 06

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-010**	**Lab Sample ID:**	**C228702**
Project Name:	ALCOA-Vanalco	Date Received:	10/22/2003
Project Manager:	Mike Drewitt	Date Analyzed:	10/24/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/21/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	14:00	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Soil	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	3	3	U
Acenaphthylene	3	3	U
Acenaphthene	3	3	U
Fluorene	3	3	U
Phenanthrene	3	5	
Anthracene	3	3	U
Fluoranthene	3	3	U
Pyrene	3	3	
Benzo(a)anthracene	3	3	U
Chrysene	3	3	U
Benzo(b)fluoranthene	3	3	U
Benzo(k)fluoranthene	3	3	U
Benzo(a)pyrene	3	3	U
Indeno(1,2,3-cd)pyrene	3	3	U
Dibenzo(a,h)anthracene	3	3	U
Benzo(g,h,i)perylene	3	3	U

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	105	33-141%

X4-P2-05

J=Estimated value
U=Not detected at specified reporting limits

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1A

ORGANICS ANALYSIS DATA SHEET

Field Sample ID: SBAC-S-010

Lab Name: CH2M HILL/LAB/CVO Contract #: 184717.01.01.08

Lab Code: CVO Case No.: C2287 SAS No.: C2287 SDG No.: C2287

Matrix: SOIL Lab Sample ID: C228702

Sample Amt.: 10.1 g Lab File ID: 003B0301.D

% Moisture: 24 Decanted: Y Date Received: 10/22/03

Extraction: Sonc Date Extracted: 10/22/03

Extract Vol.: 2 ml Date Analyzed: 10/29/03

Injection Vol.: 3.0 ul Dilution Factor: 1

GPC Cleanup: N Sulfur Cleanup: Y

Concentration Units: ug/Kg

CAS #	Analyte	MDL	PQL	Result		Q
12674-11-2	PCB-1016	0.50	13.0	13.0		U
11104-28-2	PCB-1221	1.2	13.0	13.0		U
11141-16-5	PCB-1232	0.87	13.0	13.0		U
53469-21-9	PCB-1242	1.1	13.0	13.0		U
12672-29-6	PCB-1248	1.1	13.0	52.6		
11097-69-1	PCB-1254	0.98	13.0	13.0		U
11096-82-5	PCB-1260	1.3	13.0	13.0		U
37324-23-5	PCB-1262	1.3	13.0	13.0		U
11100-14-4	PCB-1268	1.3	13.0	13.0		U

Surrogate	% Rec.	QC Limits	Qualifier
Decachlorobiphenyl	59.6	25-143	

Comments:

AROCLOR 1262 + 1268 MDL'S CALCULATED FROM AROCLOR 1260 MDL

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	SBAC-S-013	Lab Sample ID:	C228705
Project Name:	ALCOA-Vanalco	Date Received:	10/22/2003
Project Manager:	Mike Drewitt	Date Analyzed:	10/24/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/21/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	14:30	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Soil	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	3	3	U
Acenaphthylene	3	3	U
Acenaphthene	3	3	U
Fluorene	3	3	U
Phenanthrene	3	7	
Anthracene	3	3	U
Fluoranthene	3	37	
Pyrene	3	35	
Benzo(a)anthracene	3	11	
Chrysene	3	22	
Benzo(b)fluoranthene	3	23	
Benzo(k)fluoranthene	3	8	
Benzo(a)pyrene	3	8	
Indeno(1,2,3-cd)pyrene	3	6	
Dibenzo(a,h)anthracene	3	3	
Benzo(g,h,i)perylene	3	5	

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	139	33-141%

X1 - SB BB1

J=Estimated value
U=Not detected at specified reporting limits

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1A

ORGANICS ANALYSIS DATA SHEET

Field Sample ID: SBAC-S-013

Lab Name: CH2M HILL/LAB/CVO Contract #: 184717.01.01.08

Lab Code: CVO Case No.: C2287 SAS No.: C2287 SDG No.: C2287

Matrix: SOIL Lab Sample ID: C228705

Sample Amt.: 11.1 g Lab File ID: 004B0401.D

% Moisture: 30 Decanted: Y Date Received: 10/22/03

Extraction: Sonc Date Extracted: 10/22/03

Extract Vol.: 2 ml Date Analyzed: 10/23/03

Injection Vol.: 3.0 ul Dilution Factor: 1

GPC Cleanup: N Sulfur Cleanup: Y

Concentration Units: ug/Kg

CAS #	Analyte	MDL	PQL	Result		Q
12674-11-2	PCB-1016	0.50	12.9	12.9		U
11104-28-2	PCB-1221	1.2	12.9	12.9		U
11141-16-5	PCB-1232	0.87	12.9	12.9		U
53469-21-9	PCB-1242	1.1	12.9	12.9		U
12672-29-6	PCB-1248	1.1	12.9	9.6		J
11097-69-1	PCB-1254	0.97	12.9	12.9		U
11096-82-5	PCB-1260	1.3	12.9	12.9		U
37324-23-5	PCB-1262	1.3	12.9	12.9		U
11100-14-4	PCB-1268	1.3	12.9	12.9		U

Surrogate	% Rec.	QC Limits	Qualifier
Decachlorobiphenyl	#VALUE!	25-143	#VALUE!

Comments:

AROCLOR 1262 + 1268 MDL'S CALCULATED FROM AROCLOR 1260 MDL.

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-014**	**Lab Sample ID:**	**C229801**
Project Name:	ALCOA-Vanalco	Date Received:	10/23/2003
Project Manager:	Mike Drewitt	Date Analyzed:	10/24/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/22/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	10:00	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Soil	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	4	4	U
Acenaphthylene	4	4	U
Acenaphthene	4	7	
Fluorene	4	4	U
Phenanthrene	4	48	
Anthracene	4	10	
Fluoranthene	4	116	
Pyrene	4	132	
Benzo(a)anthracene	4	69	
Chrysene	4	50	
Benzo(b)fluoranthene	4	67	
Benzo(k)fluoranthene	4	43	
Benzo(a)pyrene	4	86	
Indeno(1,2,3-cd)pyrene	4	55	
Dibenzo(a,h)anthracene	4	27	
Benzo(g,h,i)perylene	4	46	

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	131	33-141%

X6-PZ-01

J=Estimated value
U=Not detected at specified reporting limits

This report has been expedited through our laboratory to meet your request of rapid TAT. This data is classed ***Preliminary*** until you receive the hard copy report which has passed the final review process.

1A

ORGANICS ANALYSIS DATA SHEET

Field Sample ID: SBAC-S-014

Lab Name: CH2M HILL/LAB/CVO Contract #: 184717.01.01.08

Lab Code: CVO Case No.: C2298 SAS No.: C2298 SDG No.: C2298

Matrix: SOIL Lab Sample ID: C229801

Sample Amt.: 10.8 g Lab File ID: 012B1201.D

% Moisture: 39 Decanted: Y Date Received: 10/23/03

Extraction: Sonc Date Extracted: 10/23/03

Extract Vol.: 2 ml Date Analyzed: 10/23/03

Injection Vol.: 3.0 ul Dilution Factor: 10

GPC Cleanup: N Sulfur Cleanup: Y

Concentration Units: ug/Kg

CAS #	Analyte	MDL	PQL	Result		Q
12674-11-2	PCB-1016	6.0	153	153		U
11104-28-2	PCB-1221	14.7	153	153		U
11141-16-5	PCB-1232	10.3	153	153		U
53469-21-9	PCB-1242	13.0	153	153		U
12672-29-6	PCB-1248	13.5	153	566		
11097-69-1	PCB-1254	11.5	153	153		U
11096-82-5	PCB-1260	14.9	153	153		U
37324-23-5	PCB-1262	14.9	153	153		U
11100-14-4	PCB-1268	14.9	153	153		U

Surrogate	% Rec.	QC Limits	Qualifier
Decachlorobiphenyl	90.9	25-143	

Comments:
AROCLOR 1262 + 1268 MDL'S CALCULATED FROM AROCLOR 1260 MDL.

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-015**	**Lab Sample ID:**	**C229802**
Project Name:	ALCOA-Vanalco	Date Received:	10/23/2003
Project Manager:	Mike Drewitt	Date Analyzed:	10/24/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/22/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	15:00	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Soil	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	3	3	U
Acenaphthylene	3	3	U
Acenaphthene	3	3	U
Fluorene	3	3	U
Phenanthrene	3	4	
Anthracene	3	3	U
Fluoranthene	3	3	U
Pyrene	3	3	U
Benzo(a)anthracene	3	3	U
Chrysene	3	3	U
Benzo(b)fluoranthene	3	3	U
Benzo(k)fluoranthene	3	3	U
Benzo(a)pyrene	3	3	U
Indeno(1,2,3-cd)pyrene	3	3	U
Dibenzo(a,h)anthracene	3	3	U
Benzo(g,h,i)perylene	3	3	U

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	143	33-141%

X2 - P2-09

J=Estimated value
U=Not detected at specified reporting limits

This report has been expedited through our laboratory to meet your request of rapid TAT. This data is classed ***Preliminary*** until you receive the hard copy report which has passed the final review process.

1A

ORGANICS ANALYSIS DATA SHEET

Field Sample ID: SBAC-S-015

Lab Name: CH2M HILL/LAB/CVO Contract #: 184717.01.01.08

Lab Code: CVO Case No.: C2298 SAS No.: C2298 SDG No.: C2298

Matrix: SOIL Lab Sample ID: C229802

Sample Amt.: 10.8 g Lab File ID: 011B1101.D

% Moisture: 9 Decanted: Y Date Received: 10/23/03

Extraction: Sonc Date Extracted: 10/23/03

Extract Vol.: 2 ml Date Analyzed: 10/23/03

Injection Vol.: 3.0 ul Dilution Factor: 1

GPC Cleanup: N Sulfur Cleanup: Y

Concentration Units: ug/Kg

CAS #	Analyte	MDL	PQL	Result		Q
12674-11-2	PCB-1016	0.40	10.2	10.2		U
11104-28-2	PCB-1221	1.0	10.2	10.2		U
11141-16-5	PCB-1232	0.69	10.2	10.2		U
53469-21-9	PCB-1242	0.87	10.2	10.2		U
12672-29-6	PCB-1248	0.90	10.2	5.18		J
11097-69-1	PCB-1254	0.77	10.2	10.2		U
11096-82-5	PCB-1260	1.0	10.2	10.2		U
37324-23-5	PCB-1262	1.0	10.2	10.2		U
11100-14-4	PCB-1268	1.0	10.2	10.2		U

Surrogate	% Rec.	QC Limits	Qualifier
Decachlorobiphenyl	55.2	25-143	

Comments:
AROCLOR 1262 + 1268 MDL'S CALCULATED FROM AROCLOR 1260 MDL.

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-016**	**Lab Sample ID:**	**C232701**
Project Name:	ALCOA-Vanalco	Date Received:	10/28/2003
Project Manager:	Mike Drewett/PDX	Date Analyzed:	10/29/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/24/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	16:00	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Soil	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	3	3	U
Acenaphthylene	3	3	U
Acenaphthene	3	3	U
Fluorene	3	3	U
Phenanthrene	3	9	
Anthracene	3	7	
Fluoranthene	3	22	
Pyrene	3	26	
Benzo(a)anthracene	3	19	
Chrysene	3	37	
Benzo(b)fluoranthene	3	20	
Benzo(k)fluoranthene	3	19	
Benzo(a)pyrene	3	22	
Indeno(1,2,3-cd)pyrene	3	27	
Dibenzo(a,h)anthracene	3	17	
Benzo(g,h,i)perylene	3	34	

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	81	33-141%

X-1, P2-15

J=Estimated value
U=Not detected at specified reporting limits

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1A

ORGANICS ANALYSIS DATA SHEET

Field Sample ID: **SBAC-S-002**

Lab Name: CH2M HILL/LAB/CVO Contract #: 184717.01.01.08

Lab Code: CVO Case No.: C2236 SAS No.: C2236 SDG No.: C2236

Matrix: SOIL Lab Sample ID: C223602

Sample Amt.: 10.5 g Lab File ID: 005B0501.D

% Moisture: 13 Decanted: Y Date Received: 10/14/03

Extraction: Sonc Date Extracted: 10/14/03

Extract Vol.: 2 ml Date Analyzed: 10/15/03

Injection Vol.: 3.0 ul Dilution Factor: 100

GPC Cleanup: N Sulfur Cleanup: Y

Concentration Units: ug/Kg

CAS #	Analyte	MDL	PQL	Result	Confirm	Q
12674-11-2	PCB-1016	42.7	1100	1100		U
11104-28-2	PCB-1221	105	1100	1100		U
11141-16-5	PCB-1232	73.8	1100	1100		U
53469-21-9	PCB-1242	93.4	1100	1100		U
12672-29-6	PCB-1248	96.9	1100	10300	8010	
11097-69-1	PCB-1254	82.7	1100	1100		U
11096-82-5	PCB-1260	107	1100	1100		U
37324-23-5	PCB-1262	107	1100	1100		U
11100-14-4	PCB-1268	107	1100	1100		U

Surrogate	% Rec.	QC Limits	Qualifier
Decachlorobiphenyl	95	25-143	

Comments:

AROCLOR 1262 + 1268 MDL'S CALCULATED FROM AROCLOR 1260 MDL.

X1, PZ-15

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-019**	**Lab Sample ID:**	**C234202**
Project Name:	ALCOA-Vanalco	Date Received:	10/30/2003
Project Manager:	Mike Drewett	Date Analyzed:	10/31/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/29/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	10:45	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Soil	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	3	3	U
Acenaphthylene	3	3	U
Acenaphthene	3	3	U
Fluorene	3	3	U
Phenanthrene	3	3	U
Anthracene	3	3	U
Fluoranthene	3	3	U
Pyrene	3	3	U
Benzo(a)anthracene	3	3	U
Chrysene	3	3	U
Benzo(b)fluoranthene	3	3	U
Benzo(k)fluoranthene	3	3	U
Benzo(a)pyrene	3	3	U
Indeno(1,2,3-cd)pyrene	3	3	U
Dibenzo(a,h)anthracene	3	3	U
Benzo(g,h,i)perylene	3	3	U

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	60	33-141%

X4 - NE Corner

J=Estimated value
U=Not detected at specified reporting limits

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CH2M HILL Applied Sciences Laboratory

Client Information

Client Sample ID: SBAC-S-017

Project Name: ALCOA-Vanalco
Project Manager: Mike Drewett/PDX
Sampled By: Mark Krekos
Date Collected: 10/24/2003
Time Collected: 16:05
Type: Grab
Matrix: Soil
Basis: Dry Weight

Lab Information

Lab Sample ID: C232702

Date Received: 10/28/2003
Report Revision No.: 0
Analyzed By: MAS
Reviewed By:

Analyte	CAS #	Reporting Limit	Sample Result	Qualifier	Units	Analysis Method	Date Analyzed
PCBs as Aroclors							
Aroclor 1016	12674-11-2	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Aroclor 1221	11104-28-2	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Aroclor 1232	11141-16-5	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Aroclor 1242	53469-21-9	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Aroclor 1248	12672-29-6	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Aroclor 1254	11097-69-1	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Aroclor 1260	11096-82-5	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Aroclor 1262	37324-23-5	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Aroclor 1268	11100-14-4	12.9	12.9	U	µg/kg	SW 8082	10/28/2003
Decachlorobiphenyl	2051-24-3		50%	SS			

U=Not detected at specified reporting limit
SS=Surrogate standard

XH, NE Corner

This report has been expedited through our laboratory to meet your request of rapid TAT. This data is classed ***Preliminary*** until you receive the hard copy report which has passed the final review process.

CH2M HILL Applied Sciences Laboratory

Client Information		Lab Information	
Client Sample ID:	**SBAC-S-018**	**Lab Sample ID:**	**C234201**
Project Name:	ALCOA-Vanalco	Date Received:	10/30/2003
Project Manager:	Mike Drewett	Date Analyzed:	10/31/2003
Sampled By:	Mark Krekos	Dilution Factor:	1
Sampling Date:	10/29/2003	Analysis Method:	PAH-SIM / 8270
Sampling Time:	10:35	Report Revision No.:	0
Type:	Grab	Reported By:	JBH
Matrix:	Soil	Reviewed By:	
Basis:	Dry Weight	Units:	ug/Kg

Analyte	Reporting Limit	Sample Result	Qualifier
Naphthalene	3	3	U
Acenaphthylene	3	3	U
Acenaphthene	3	3	U
Fluorene	3	3	U
Phenanthrene	3	3	U
Anthracene	3	3	U
Fluoranthene	3	3	U
Pyrene	3	3	U
Benzo(a)anthracene	3	3	U
Chrysene	3	3	U
Benzo(b)fluoranthene	3	3	U
Benzo(k)fluoranthene	3	3	U
Benzo(a)pyrene	3	3	U
Indeno(1,2,3-cd)pyrene	3	3	U
Dibenzo(a,h)anthracene	3	3	U
Benzo(g,h,i)perylene	3	3	U

Surrogate Recovery

Compound	% Recovery	Acceptable Range
Terphenyl-d14	65	33-141%

X-4, NW Corner

J=Estimated value
U=Not detected at specified reporting limits

This report has been expedited through our laboratory to meet your request of rapid TAT. This data is classed ***Preliminary*** until you receive the hard copy report which has passed the final review process.

1A

ORGANICS ANALYSIS DATA SHEET

Field Sample ID: SBAC-S-012

Lab Name: CH2M HILL/LAB/CVO
Lab Code: CVO
Matrix: SOIL
Sample Amt.: 10.3 g
% Moisture: 12
Extraction: Sonc
Extract Vol.: 2 ml
Injection Vol.: 3.0 ul
GPC Cleanup: N

Contract #: 184717.01.01.08
Case No.: C2287 SAS No.: C2287

Decanted: Y

SDG No.: C2287
Lab Sample ID: C228704
Lab File ID: 009B0901.D
Date Received: 10/22/03
Date Extracted: 10/22/03
Date Analyzed: 10/23/03
Dilution Factor: 100
Sulfur Cleanup: Y

Concentration Units: ug/Kg

CAS #	Analyte	MDL	PQL	Result		Q
12674-11-2	PCB-1016	42.9	1100	1100		U
11104-28-2	PCB-1221	106	1100	1100		U
11141-16-5	PCB-1232	74.2	1100	1100		U
53469-21-9	PCB-1242	93.8	1100	1100		U
12672-29-6	PCB-1248	97.3	1100	7880		
11097-69-1	PCB-1254	83.1	1100	1100		U
11096-82-5	PCB-1260	107	1100	1100		U
37324-23-5	PCB-1262	107	1100	1100		U
11100-14-4	PCB-1268	107	1100	1100		U

Surrogate	% Rec.	QC Limits	Qualifier
Decachlorobiphenyl	0	25-143	*

Comments:
AROCLOR 1262 + 1268 MDL'S CALCULATED FROM AROCLOR 1260 MDL.
SS DILUTED OUT.

X4, NW Corner

Vancouver Landfill Remediation

North & North 2 Landfill

Clean up Correspondence

Richartz, Bruce K.

From: Sullivan, Patrick [psullivan@BERGMANNPC.com]
Sent: Friday, April 02, 2004 11:16 AM
To: 'Mike.Drewett@CH2M.com'
Cc: Bruce Richartz at Alcoa Troutdale
Subject: RE: Vancouver Landfill Project Restart


880310B3.dwg

880310B1.dwg

880310B3.pdf

880310B1.pdf

You are so lucky! I can't believe I found these....

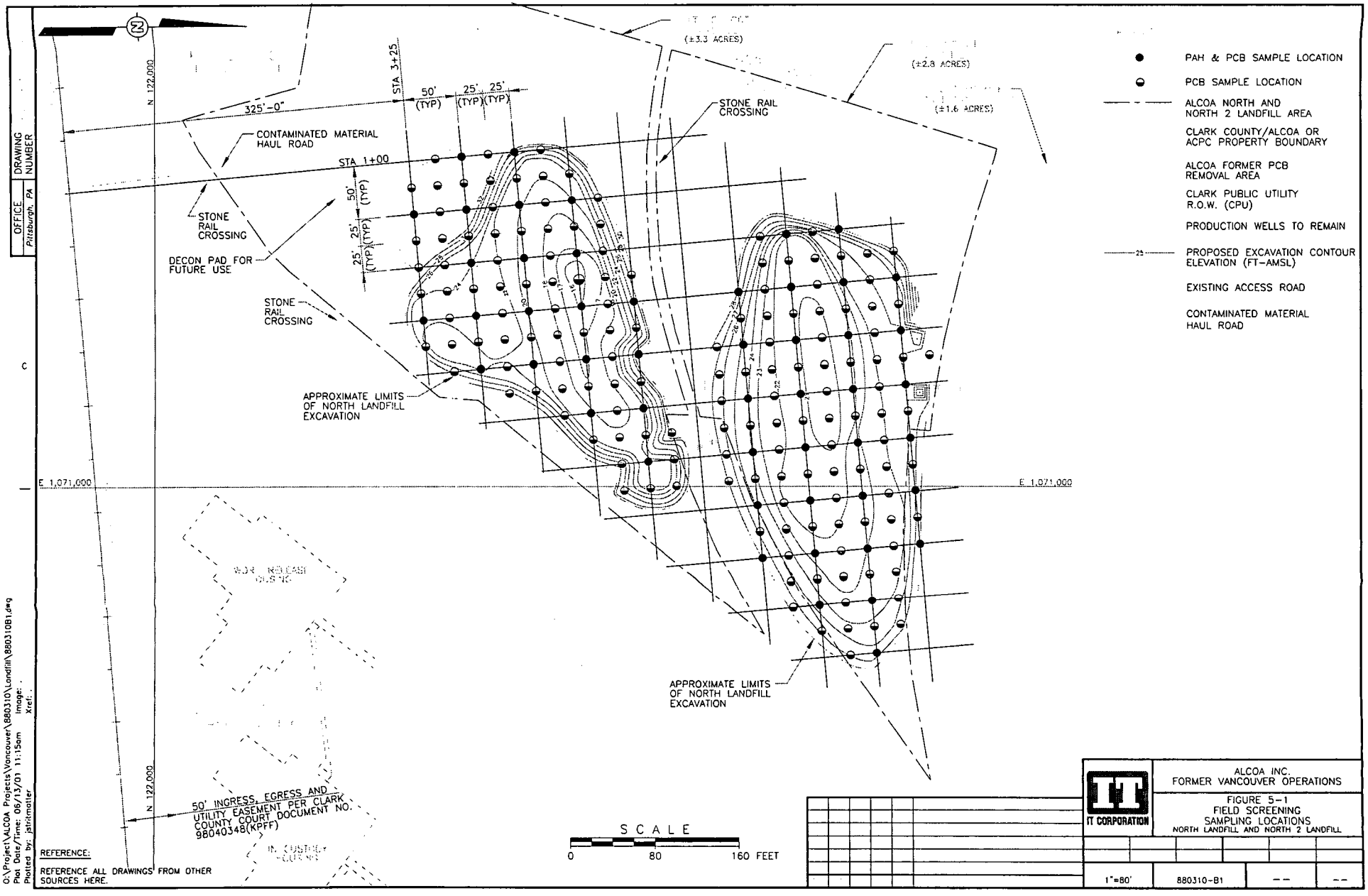
-----Original Message-----
From: Mike.Drewett@CH2M.com [mailto:Mike.Drewett@CH2M.com]
Sent: Wednesday, March 31, 2004 11:02 AM
To: psullivan@BERGMANNPC.com
Subject: FW: Vancouver Landfill Project Restart

Pat,
Could I get hard copies, and if possible electronic copies of these figures?
Thanks
Mike

-----Original Message-----
From: Richartz, Bruce K. [mailto:Bruce.Richartz@alcoa.com]
Sent: Monday, March 29, 2004 4:32 PM
To: Drewett, Mike/PDX
Subject: RE: Vancouver Landfill Project Restart

Mike,
I don't have copies of the figures from the CQAP referenced in the specification. Pat Sullivan at Bergmann can provide those to you so please send him an e-mail requesting them. Regarding the immunoassay screening, we will need to screen a couple of times for material above 50 ppm PCB. After we remove the over 50 ppm material we will excavate the North and North 2 landfills to the extent or dimensions shown in the specifications. When we complete the soil removal, CH2MHill will need to take confirmation samples to insure that the required clean up levels have been achieved for PCB, PAH, and TCE. We want to remove all the material per the specification because we need to clean out the North and North 2 landfills for a future use. We are not interested in minimizing the material removed. If you have any questions while I'm on vacation through 4/12, please contact Gray Keene. Bruce -----Original Message-----
From: Mike.Drewett@CH2M.com [mailto:Mike.Drewett@CH2M.com]
Sent: Friday, March 26, 2004 1:34 PM
To: Bruce.Richartz@alcoa.com
Subject: RE: Vancouver Landfill Project Restart

Bruce,
Do you have copies of the Figures from the CQAP referenced in the specifications? Would like to review for proposed sample locations. We talked briefly about immunoassay screening. Are we still planning to do both PCB and PAH, or just PCB in areas above 50ppm? Carlson is completing the 2nd proctor today. Will send you results when I get them.
Mike



OFFICE Pittsburgh, PA | DRAWING NUMBER

REFERENCE:

REFERENCE ALL DRAWINGS FROM OTHER SOURCES HERE.

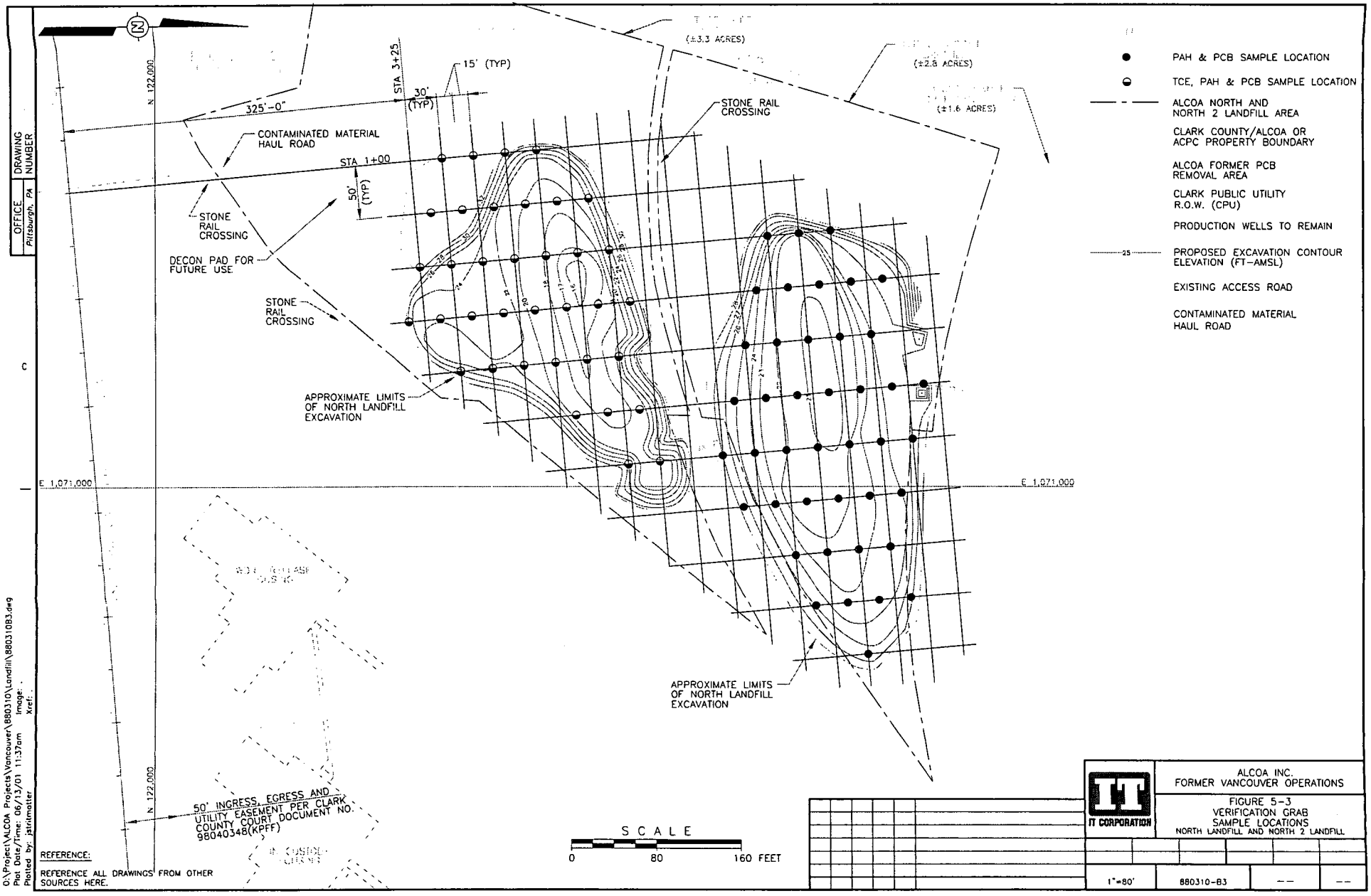
O:\Project\ALCOA Projects\Vancouver\880310\Landfill\880310B1.dwg
Plot Date/Time: 06/13/01 11:15am Image: .
Plotted by: jstratmatter Xref: .

IT CORPORATION

ALCOA INC.
FORMER VANCOUVER OPERATIONS

FIGURE 5-1
FIELD SCREENING
SAMPLING LOCATIONS
NORTH LANDFILL AND NORTH 2 LANDFILL

1"=80'	880310-B1	--	--



OFFICE Pittsburgh, PA | DRAWING NUMBER

O:\Project\ALCOA Projects\Vancouver\880310\Landfill\880310B3.dwg
Plot Date/Time: 06/13/01 11:37am Image: .
Plotted by: jstolmaster Xref: .

REFERENCE:

REFERENCE ALL DRAWINGS FROM OTHER SOURCES HERE.

IT CORPORATION

ALCOA INC.
FORMER VANCOUVER OPERATIONS

FIGURE 5-3
VERIFICATION GRAB SAMPLE LOCATIONS
NORTH LANDFILL AND NORTH 2 LANDFILL

1"=80'	880310-B3	--	--

-----Original Message-----
From: Richartz, Bruce K. [mailto:Bruce.Richartz@alcoa.com]
Sent: Tuesday, March 16, 2004 4:39 PM
To: Drewett, Mike/PDX
Subject: FW: Vancouver Landfill Project Restart

Mike,
As we discussed Envirocon will be starting work at the Vancouver site to run a compaction test the week of April 5 when Al Burba and Pat Sullivan will be on the site. Pat has requested that Envirocon obtain a representative soil sample from each of the North and North 2 landfills and have a standard proctor analysis run on each. A 5 gallon bucket sample is enough to run a standard proctor. Envirocon will collect the samples on 3/17, label each sample, and deliver them to Carlson Testing for analysis. You will need to notify Carlson regarding the required sample analysis. Pat said he did not need a sieve analysis at this time. This will provide us with information needed to do the troxler testing in the field the week of April 5. Carlson will be needed on the site either the afternoon of 4/5 or the morning of 4/6 for the troxler test. We will let you know later.
If everything checks out all right, Envirocon will start moving waste soil from the north and north 2 landfills to the east landfill. CH2MHill will need to collect confirmation samples after the required material is removed to verify clean up levels for each landfill. There is one spot in north 2 landfill that has soil with greater than 50 mg/kg PCB concentration. This material will be excavated and removed to an off site landfill. Confirmation samples will be required to verify complete removal of the over 50 mg/kg soil.
TCE analysis is only required for the North Landfill to verify clean up to .5 mg/kg. PAH & PCB analysis is required in both the north and north 2 landfills.
We will let you know how the excavation is going and when you will need to collect samples for analysis. Let me know if you have any questions.
Thanks. Bruce

> -----Original Message-----
> From: Richartz, Bruce K.
> Sent: Thursday, March 04, 2004 3:37 PM
> To: 'psullivan@bergmannpc.com'; Burba, Albert W. Jr.; Keene, David G.; 'jjohnson@envirocon.com'
> Subject: Vancouver Landfill Project Restart
>
> Envirocon is willing to restart work at the Vancouver landfill remediation project earlier than the scheduled April 14 date if Alcoa will provide a waiver on the specification requirement for waste soil compaction. The specification requires "moisture content during compaction be no more than two percent above or below the optimum moisture content" and "material shall be compacted to not less than 95% of the maximum Standard Proctor Density as determined by ASTM D698".
> In lieu of this compaction requirement, Envirocon proposes to use a method specification using an 84" wide roller with smooth rolls and vibration using multiple passes to compact to non-movement. No vibration would be used if the material has too high of moisture content. This is a practice that is commonly used in consolidating landfill material. It is expected that much of the landfill waste will be too coarse (refractory brick) to enable probe insertion required for the Troxler test. Troxler testing would be used to confirm compaction when the material characteristics would allow. Envirocon would mix excavation debris with finer waste soil to enable good compaction as they are able to and still meet daily production requirements.
> Consolidation of the waste soils and debris would be managed to provide a cushion layer on top of the relocated materials as required by the lining supplier. The sub soil finish grade cannot contain metal and brick that could puncture the lining. This cushion layer may require importing of additional sand as needed depending on what the

waste material characteristics are for the north and north 2 landfills. Let us know your thoughts regarding waiving the original compaction requirement and replacing it with the method specification proposed.
> Al Burba has proposed starting work on the north and north 2 landfills the week of April 5 with a kickoff meeting on Tuesday April 6 to review S requirements and discuss the remaining scope of work. This date should be contingent on waiving the original compaction requirements.>

Richartz, Bruce K.

From: Keene, David G.
nt: Wednesday, April 07, 2004 2:38 PM
: Mike Drewett (E-mail); Jeff Johnson (E-mail)
Cc: Richartz, Bruce K.; Burba, Albert W. Jr.; Pat Sullivan (E-mail)
Subject: Immunoassay Testing and Other Stuff

Mike/Jeff

I spoke with Mike Drewett (CH2) and he is going to order the immunoassay analyzer for delivery early next week. He has the PCB test kits in stock.

Mike Wortz (CH2) will be contacting you (Jeff) regarding schedule for initiating screening and verification testing in the North 2 landfill. He will also want to discuss sample point layout. Alcoa would like to begin verification sampling once an adequate area of the North 2 Landfill is exposed.

WM (Mark Krening) is scheduled to deliver two 20 cy roll-offs to the site by next Monday for the remediation of the remaining area where PCB concentrations are over 50 ppm. Mark will contact Jeff to schedule this. CH2 understands that Envirocon plans on proceeding with the excavation of the this area in lifts and segregating (and stockpiling) this material for sampling and screening. Work can be performed in advance of sampling.

Should either of you have any questions please contact me.

Gray

Bruce will be returning from Germany on April 14th.

Richartz, Bruce K.

From: Burba, Albert W. Jr.

Sent: Tuesday, April 13, 2004 8:47 AM

To: Mike. Drewett (E-mail)

Cc: Sullivan, Patrick J (E-mail); Keene, David G.; Richartz, Bruce K.; Burba, Albert W. Jr.; Jeff Johnson-Envirocon (E-mail)

Subject: North & North 2 Landfill Clean at Vancouver Additional Confirmation sampling Request

Mike/ Bruce/ Gray

Please contact me to discuss the cost to do several additional Soil Vapor Samples in each of North and North 2 as part of the contracted confirmation sampling work in the N & N2 landfill areas.

Mike/ Gray , I can talk to today.

Al

Albert W. Burba
Albert W. Burba

Alcoa Inc.
Alcoa Corporate Center
Remediation Work Group Mr.. 5K04
tel: 1-412-553-2007 fax x 2661 ACT 8-225-x; cell phone 1- 412-496-0876
email: albert.burba@alcoa.com

Richartz, Bruce K.

From: Burba, Albert W. Jr.
Sent: Wednesday, April 14, 2004 8:27 AM
To: Keene, David G.
Cc: Richartz, Bruce K.; 'Mike Drewett (E-mail)'; Burba, Albert W. Jr.
Subject: RE: Little Help Please

Gray

Reply in blue

Al,

Questions for determining approach/cost of soil vapor samples:

What are/were the levels of TCE in the soils and groundwater? Hopefully, we have remove the TCE with the waste.
Cleanup to WDOE Industrial standards as discussed in the East landfill Specifications Section VI pages 1-7
Do you want samples from N and N2 also? Yes; only in N&N2 areas that are currently being clean-up by Envirocon as addition to the immunoassay field screening work.
Sample frequency of 1 per half acre? Total of ten samples from both LFs? good number
What time frame do you need data as part of the other soil confirmation being completed as part of the CQA SOW for the CAP that CH is doing for us . I would do the same format of documentation as the SB AOC reporting completed for Paul and Alcoa.
Who gets the data and what is the objective? confirmation for future documentation that building soil vapor would not be an issue if some industrial building would be built on N&N2 after the sediment fill and additional fill has been placed for construction..

You can call me on Wednesday to discuss or send an e-mail.

ay

PS
Bruce , did you pick-up my initial comments on the DEMO spec for FT Meade in Jeff office in the trailer?

Richartz, Bruce K.

From: Mike.Wirtz@CH2M.com
Sent: Monday, April 19, 2004 3:12 PM
To: Bruce.Richartz@alcoa.com
Cc: SHolmberg@envirocon.com; Mike.Drewett@CH2M.com
Subject: Screening results for Monday April 19

First of all, both stock piles passed the 50 ppm screen. The excavation by the two stock piles passed at one foot below current grade.

Three spots failed at one foot below current grade; A-11, E-11, E-7.

I have results for the samples I collected at "North" landfill today, but I need to make a map showing where they came from. Will send results in the morning.

		Test (PCB)			
Sample Date	Sample ID	10 ppm	50 ppm	Result	Pass/Fail
4/13/2004	**E-1**	X		0.08	Pass
4/13/2004	**E-3**	X		**-0.29**	**Fail**
4/13/2004	**E-5**	X		0.48	Pass
4/13/2004	**E-7**	X		**-0.3**	**Fail**
4/13/2004	**E-9**	X		0.77	Pass
4/13/2004	**E-11**	X		**-0.19**	**Fail**
4/13/2004	**West Pile**	X		**-0.15**	**Fail**
4/13/2004	**East Pile**	X		**-0.41**	**Fail**
4/13/2004	**A-7**	X		**-0.52**	**Fail**
4/15/2004	**A-9**	X		1.87	Pass
4/15/2004	**A-11**	X		**-0.22**	**Fail**
4/15/2004	**A-13**	X		1.7	Pass
4/15/2004	**C-1**	X		0.13	Pass
4/15/2004	**C-3**	X		1.93	Pass
4/15/2004	**C-5**	X		0.79	Pass
4/15/2004	**C-7**	X		1.25	Pass
4/15/2004	**C-9**	X		0.4	Pass
4/15/2004	**C-11**	X		0.07	Pass
4/15/2004	**C-13**	X		0.98	Pass
4/15/2004	**C-15**	X		0.94	Pass
4/15/2004	**C-17**	X		0.31	Pass
4/15/2004	**E-13**	X		**-0.34**	**Fail**
4/15/2004	**E-15**	X		0.16	Pass
4/15/2004	**G-3**	X		2.58	Pass
4/15/2004	**G-5**	X		1.86	Pass
4/15/2004	**G-7**	X		1.84	Pass
4/15/2004	**G-9**	X		1.43	Pass
4/15/2004	**I-3**	X		0.23	Pass
4/15/2004	**I-5**	X		1.58	Pass
4/15/2004	**I-7**	X		**-0.59**	**Fail**
4/15/2004	**I-9**	X		1.72	Pass
4/15/2004	**K-3**	X		2.04	Pass
4/15/2004	**K-5**	X		**-0.04**	**Fail**
4/19/2004	East Pile		X	1.61	Pass
4/19/2004	West Pile		X	1.27	Pass
4/19/2004	A-11	X		**-0.38**	**Fail**
4/19/2004	I-7	X		1.69	Pass
4/19/2004	K-5	X		0.51	Pass
4/19/2004	E-3	X		0.27	Pass
4/19/2004	E-11	X		**-0.27**	**Fail**
4/19/2004	E-7	X		**-0.36**	**Fail**
4/19/2004	A-7-1	X		0.64	Pass
4/19/2004	E-13	X		0.16	Pass
4/19/2004	A-7-2	X		0.00	NA

Comments
North 2 Landfill
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North 2 Landfill
North 2 Landfill, one foot below grade
North 2 Landfill, one foot below grade
North 2 Landfill, one foot below grade
North 2 Landfill, one foot below grade
North 2 Landfill, one foot below grade
North 2 Landfill, one foot below grade
Excavation tested at one foot Below grade
North 2 Landfill, one foot below grade
Excavation tested at two feet below grade

Richartz, Bruce K.

From: Mike.Wirtz@CH2M.com
Sent: Monday, April 19, 2004 3:30 PM
To: Bruce.Richartz@alcoa.com
Cc: SHolmberg@envirocon.com; Mike.Drewett@CH2M.com
Subject: FW: Email from the 14th floor HP 9000L MFP printer

Document.pdf


Alcoa Vancouver Field screenin...

Well, I had time so here are the results from the field screens I collected from North Landfill today (Monday).

You will notice it is the same excel spreadsheet but I added a tab on the bottom for "North Landfill"

BY

SHEET NO. ____ of ____ DATE

PROJECT NO

Richartz, Bruce K.

From: Mike.Wirtz@CH2M.com
Sent: Wednesday, April 21, 2004 1:18 PM
To: Bruce.Richartz@alcoa.com
Cc: SHolmberg@envirocon.com; Mike.Drewett@CH2M.com
Subject: Field screening for 4-21-04

A-11, E-11, and E-7 in North 2 landfill all passed at 2.5 foot depths.

A-1, and A-3 passed in North landfill at 2.5 foot depths.

All sample locations collected to date have passed field screening for 10 ppm. Envirocon will finish excavating North landfill tomorrow (Thursday) to predetermined contours. I will collect remaining field screens Friday from North Landfill.

Mike W.

P.S. I have enough supplies to run 32 more screens

Sample Date	Sample ID	Test (PCB) 10 ppm	50 ppm	Result	Pass/Fail		Comments
4/13/2004	**E-1**	X		0.08	Pass	North 2 Landfill	
4/13/2004	**E-3**	X		**-0.29**	**Fail**	North 2 Landfill	
4/13/2004	**E-5**	X		0.48	Pass	North 2 Landfill	
4/13/2004	**E-7**	X		**-0.3**	**Fail**	North 2 Landfill	
4/13/2004	**E-9**	X		0.77	Pass	North 2 Landfill	
4/13/2004	**E-11**	X		**-0.19**	**Fail**	North 2 Landfill	
4/13/2004	**West Pile**	X		**-0.15**	**Fail**	North 2 Landfill	
4/13/2004	**East Pile**	X		**-0.41**	**Fail**	North 2 Landfill	
4/13/2004	**A-7**	X		**-0.52**	**Fail**	North 2 Landfill	
4/15/2004	**A-9**	X		1.87	Pass	North 2 Landfill	
4/15/2004	**A-11**	X		**-0.22**	**Fail**	North 2 Landfill	
4/15/2004	**A-13**	X		1.7	Pass	North 2 Landfill	
4/15/2004	**C-1**	X		0.13	Pass	North 2 Landfill	
4/15/2004	**C-3**	X		1.93	Pass	North 2 Landfill	
4/15/2004	**C-5**	X		0.79	Pass	North 2 Landfill	
4/15/2004	**C-7**	X		1.25	Pass	North 2 Landfill	
4/15/2004	**C-9**	X		0.4	Pass	North 2 Landfill	
4/15/2004	**C-11**	X		0.07	Pass	North 2 Landfill	
4/15/2004	**C-13**	X		0.98	Pass	North 2 Landfill	
4/15/2004	**C-15**	X		0.94	Pass	North 2 Landfill	
4/15/2004	**C-17**	X		0.31	Pass	North 2 Landfill	
4/15/2004	**E-13**	X		**-0.34**	**Fail**	North 2 Landfill	
4/15/2004	**E-15**	X		0.16	Pass	North 2 Landfill	
4/15/2004	**G-3**	X		2.58	Pass	North 2 Landfill	
4/15/2004	**G-5**	X		1.86	Pass	North 2 Landfill	
4/15/2004	**G-7**	X		1.84	Pass	North 2 Landfill	
4/15/2004	**G-9**	X		1.43	Pass	North 2 Landfill	
4/15/2004	**I-3**	X		0.23	Pass	North 2 Landfill	
4/15/2004	**I-5**	X		1.58	Pass	North 2 Landfill	
4/15/2004	**I-7**	X		**-0.59**	**Fail**	North 2 Landfill	
4/15/2004	**I-9**	X		1.72	Pass	North 2 Landfill	
4/15/2004	**K-3**	X		2.04	Pass	North 2 Landfill	
4/15/2004	**K-5**	X		**-0.04**	**Fail**	North 2 Landfill	
4/19/2004	**East Pile**		X	1.61	Pass	North 2 Landfill	
4/19/2004	**West Pile**		X	1.27	Pass	North 2 Landfill	

4/19/2004 **A-11**	X	**-0.38**	**Fail**	North 2 Landfill, one foot below grade
4/19/2004 **I-7**	X	1.69	Pass	North 2 Landfill, one foot below grade
4/19/2004 **K-5**	X	0.51	Pass	North 2 Landfill, one foot below grade
4/19/2004 **E-3**	X	0.27	Pass	North 2 Landfill, one foot below grade
4/19/2004 **E-11**	X	**-0.27**	**Fail**	North 2 Landfill, one foot below grade
4/19/2004 **E-7**	X	**-0.36**	**Fail**	North 2 Landfill, one foot below grade
4/19/2004 **A-7-1**	X	0.64	Pass	Excavation tested at one foot Below grade
4/19/2004 **E-13**	X	0.16	Pass	North 2 Landfill, one foot below grade
4/19/2004 **A-7-2**	X	0.00	NA	Excavation tested at two feet below grade
4/21/2004 **A-11**	X	1.21	Pass	North 2 Landfill at 2.5 feet below grade
4/21/2004 **E-11**	X	1.37	Pass	North 2 Landfill at 2.5 feet below grade
4/21/2004 **E-7**	X	1.12	Pass	North 2 Landfill at 2.5 feet below grade

Sample Date	Sample ID	Test (PCB) 10 ppm	50 ppm	Result	Pass/Fail	Comments
4/19/2004	**A-5**	X		1.35	Pass	North Landfill
4/19/2004	**C-5**	X		1.70	Pass	North Landfill
4/19/2004	**C-7**	X		1.55	Pass	North Landfill
4/19/2004	**C-3**	X		1.64	Pass	North Landfill
4/19/2004	**E-7**	X		0.08	Pass	North Landfill
4/19/2004	**A-3**	X		**-0.30**	**Fail**	North Landfill
4/19/2004	**A-7**	X		0.15	Pass	North Landfill
4/19/2004	**A-1**	X		**-0.41**	**Fail**	North Landfill
4/21/2004	**A-1**	X		1.37	Pass	North Landfill at 2.5 feet below grade
4/21/2004	**A-3**	X		1.36	Pass	North Landfill at 2.5 feet below grade

Richartz, Bruce K.

From: Mike.Wirtz@CH2M.com
Sent: Sunday, April 25, 2004 11:27 AM
To: Bruce.Richartz@alcoa.com
Cc: SHolmberg@envirocon.com; Mike.Drewett@CH2M.com
Subject: FW: Email from the 14th floor HP 9000L MFP printer

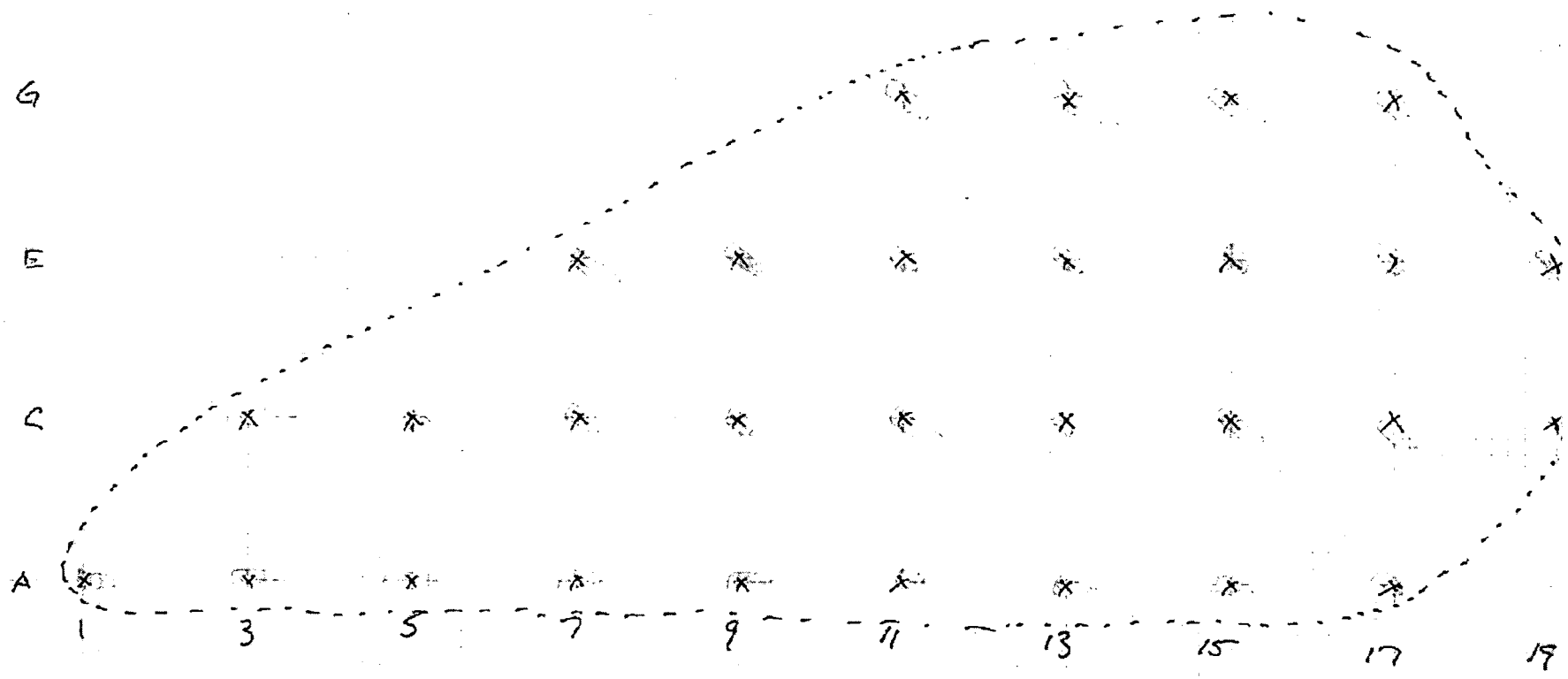
Document.pdf

Attached is the field screening results for both landfills along with a diagram showing where I collected the samples.

-----Original Message-----
From: PDX 14th floor HP 9000L MFP [mailto:umpqua@ch2m.com]
Sent: Sunday, April 25, 2004 11:21 AM
To: Wirtz, Mike/PDX
Subject: Email from the 14th floor HP 9000L MFP printer

Please open the attached document. This document was digitally sent to you using an HP MFP Digital Sending Software.

NORTH LANDFILL
ALCOA- VANCOUVER
X SAMPLE LOCATIONS FOR FIELD SCREENS



GERAGHTY & MILLER SUBJECT _____ BY _____
SHEET NO. ____ of ____ DATE _____
PROJECT NO _____

		Test (PCB)					
Sample Date	Sample ID	10 ppm	50 ppm	Result	Pass/Fail		Comments
4/13/2004	**E-1**	X		0.08	Pass	North 2 Landfill	
4/13/2004	**E-3**	X		**-0.29**	**Fail**	North 2 Landfill	
4/13/2004	**E-5**	X		0.48	Pass	North 2 Landfill	
4/13/2004	**E-7**	X		**-0.3**	**Fail**	North 2 Landfill	
4/13/2004	**E-9**	X		0.77	Pass	North 2 Landfill	
4/13/2004	**E-11**	X		**-0.19**	**Fail**	North 2 Landfill	
4/13/2004	**West Pile**	X		**-0.15**	**Fail**	North 2 Landfill	
4/13/2004	**East Pile**	X		**-0.41**	**Fail**	North 2 Landfill	
4/13/2004	**A-7**	X		**-0.52**	**Fail**	North 2 Landfill	
4/15/2004	**A-9**	X		1.87	Pass	North 2 Landfill	
4/15/2004	**A-11**	X		**-0.22**	**Fail**	North 2 Landfill	
4/15/2004	**A-13**	X		1.7	Pass	North 2 Landfill	
4/15/2004	**C-1**	X		0.13	Pass	North 2 Landfill	
4/15/2004	**C-3**	X		1.93	Pass	North 2 Landfill	
4/15/2004	**C-5**	X		0.79	Pass	North 2 Landfill	
4/15/2004	**C-7**	X		1.25	Pass	North 2 Landfill	
4/15/2004	**C-9**	X		0.4	Pass	North 2 Landfill	
4/15/2004	**C-11**	X		0.07	Pass	North 2 Landfill	
4/15/2004	**C-13**	X		0.98	Pass	North 2 Landfill	
4/15/2004	**C-15**	X		0.94	Pass	North 2 Landfill	
4/15/2004	**C-17**	X		0.31	Pass	North 2 Landfill	
4/15/2004	**E-13**	X		**-0.34**	**Fail**	North 2 Landfill	
4/15/2004	**E-15**	X		0.16	Pass	North 2 Landfill	
4/15/2004	**G-3**	X		2.58	Pass	North 2 Landfill	
4/15/2004	**G-5**	X		1.86	Pass	North 2 Landfill	
4/15/2004	**G-7**	X		1.84	Pass	North 2 Landfill	
4/15/2004	**G-9**	X		1.43	Pass	North 2 Landfill	
4/15/2004	**I-3**	X		0.23	Pass	North 2 Landfill	
4/15/2004	**I-5**	X		1.58	Pass	North 2 Landfill	
4/15/2004	**I-7**	X		**-0.59**	**Fail**	North 2 Landfill	
4/15/2004	**I-9**	X		1.72	Pass	North 2 Landfill	
4/15/2004	**K-3**	X		2.04	Pass	North 2 Landfill	
4/15/2004	**K-5**	X		**-0.04**	**Fail**	North 2 Landfill	
4/19/2004	**East Pile**		X	1.61	Pass	North 2 Landfill	
4/19/2004	**West Pile**		X	1.27	Pass	North 2 Landfill	

4/19/2004 **A-11**	X	**-0.38**	**Fail**	North 2 Landfill, one foot below grade
4/19/2004 **I-7**	X	1.69	Pass	North 2 Landfill, one foot below grade
4/19/2004 **K-5**	X	0.51	Pass	North 2 Landfill, one foot below grade
4/19/2004 **E-3**	X	0.27	Pass	North 2 Landfill, one foot below grade
4/19/2004 **E-11**	X	**-0.27**	**Fail**	North 2 Landfill, one foot below grade
4/19/2004 **E-7**	X	**-0.36**	**Fail**	North 2 Landfill, one foot below grade
4/19/2004 **A-7-1**	X	0.64	Pass	Excavation tested at one foot Below grade
4/19/2004 **E-13**	X	0.16	Pass	North 2 Landfill, one foot below grade
4/19/2004 **A-7-2**	X	0.00	NA	Excavation tested at two feet below grade
4/21/2004 **A-11**	X	1.21	Pass	North 2 Landfill at 2.5 feet below grade
4/21/2004 **E-11**	X	1.37	Pass	North 2 Landfill at 2.5 feet below grade
4/21/2004 **E-7**	X	1.12	Pass	North 2 Landfill at 2.5 feet below grade

Sample Date	Sample ID	Test (PCB) 10 ppm	50 ppm	Result	Pass/Fail	Comments
4/19/2004	**A-5**	X		1.35	Pass	North Landfill
4/19/2004	**C-5**	X		1.70	Pass	North Landfill
4/19/2004	**C-7**	X		1.55	Pass	North Landfill
4/19/2004	**C-3**	X		1.64	Pass	North Landfill
4/19/2004	**E-7**	X		0.08	Pass	North Landfill
4/19/2004	**A-3**	X		**-0.30**	**Fail**	North Landfill
4/19/2004	**A-7**	X		0.15	Pass	North Landfill
4/19/2004	**A-1**	X		**-0.41**	**Fail**	North Landfill
4/21/2004	**A-1**	X		1.37	Pass	North Landfill at 2.5 feet below grade
4/21/2004	**A-3**	X		1.36	Pass	North Landfill at 2.5 feet below grade
4/22/2004	**A-15**	X		**-0.71**	**Fail**	North Landfill
4/22/2004	**A-17**	X		0.45	Pass	North Landfill
4/22/2004	**C-9**	X		0.46	Pass	North Landfill
4/22/2004	**G-11**	X		**-0.49**	**Fail**	North Landfill
4/22/2004	**E-11**	X		1.45	Pass	North Landfill
4/22/2004	**A-9**	X		1.42	Pass	North Landfill
4/22/2004	**A-11**	X		1.54	Pass	North Landfill
4/22/2004	**C-11**	X		1.38	Pass	North Landfill
4/22/2004	**E-9**	X		1.46	Pass	North Landfill
4/22/2004	**A-13**	X		1.39	Pass	North Landfill
4/23/2004	**E-13**	X		1.42	Pass	North Landfill
4/23/2004	**G-17**	X		1.40	Pass	North Landfill
4/23/2004	**C-13**	X		1.45	Pass	North Landfill
4/23/2004	**G-15**	X		1.45	Pass	North Landfill
4/23/2004	**E-17**	X		1.49	Pass	North Landfill
4/23/2004	**C-17**	X		1.50	Pass	North Landfill
4/23/2004	**E-15**	X		1.49	Pass	North Landfill
4/23/2004	**C-19**	X		1.49	Pass	North Landfill
4/23/2004	**E-19**	X		1.39	Pass	North Landfill
4/23/2004	**G-13**	X		1.46	Pass	North Landfill
4/23/2004	**A-15**	X		1.44	Pass	North Landfill, at minus 2 foot
4/23/2004	**C-15**	X		1.44	Pass	North Landfill
4/23/2004	**G-11**	X		1.45	Pass	North Landfill, at minus 2 foot

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Monday, April 26, 2004 7:39 AM
To: Bruce.Richartz@alcoa.com; David.Keene@alcoa.com
Subject: Vancouver Update

Bruce/Gray,

Mike W finished screening North Landfill on Thursday/Friday last week. All areas have passed. Mike W and Pat Heins began collecting confirmation samples on Friday. Since Envirocon didn't finish excavation activities at North Landfill until Friday PM, we were only able to collect samples from North 2 on Friday (~55 each). These have been sent to the labs and we should have preliminary results back on Friday (30th).

My plan is to have Pat Heins come out Monday and complete sampling activities for North Landfill. However, need to juggle some other folks schedule so I'll update you later this morning.

We are also planning on doing the soil-gas study on Thursday this week if that is acceptable to you. Expenses for effort are ~$1,300. Will need two folks for 1 day minimum. Total for effort should be ~$3,000. If we need an extra day, it will only entail labor.

55 confirmation samples were sent to the labs on Friday. Additional 42 to be collected from North Landfill. Labs did not increase prices from last years rates. That said, this still is a costly effort (~$36,000).

Mike

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Tuesday, May 04, 2004 8:27 AM
To: Bruce.Richartz@alcoa.com; SHolmberg@envirocon.com
Subject: North 2 Landfill Confirmation Results

Bruce/Steve,

Here are confirmation results for north half of North 2 Landfill. Cleanup levels exceed goals at the following locations;

N2LF-S-023-0	3+50	760	46.6 mg/kg PCB
N2LF-S-024-0	3+50	790	26.4 mg/kg PCB
N2LF-S-029-0	4+00	715	42.1 mg/kg PCB
N2LF-S-002-0	2+00	685	59.1 mg/kg PAH
N2LF-S-005-0	2+50	610	112 mg/kg PAH

Will update table as I get more lab data.

Mike

Confirmation Sampling on North 2 Landfill, Alcoa/Vancouver

Sample #	Baseline	Offset	PCBs	PAHs	
N2LF-S-001-0	2+00	655	0.144	11.1	
N2LF-S-002-0	2+00	685	0.044	59.1	
N2LF-S-003-0	2+00	715	<0.044	1.83	
N2LF-S-004-0	2+50	580	0.061	0.651	
N2LF-S-005-0	2+50	610		112	
N2LF-S-006-0	2+50	640	0.054	0.55	
N2LF-S-007-0	2+50	670	<0.047	0.128	
N2LF-S-008-0	2+50	700	<0.047	0.487	
N2LF-S-009-0	2+50	730	<0.05	0.01	
N2LF-S-010-0	2+50	760	<0.047	0.306	
N2LF-S-010-1	2+50	760	<0.046	0.226	Duplicate
N2LF-S-011-0	3+00	595	0.105	8.39	
N2LF-S-012-0	3+00	625		1.2	
N2LF-S-013-0	3+00	655	0.055	0.835	
N2LF-S-014-0	3+00	685	<0.062	0.036	
N2LF-S-015-0	3+00	715	<0.053	0.038	
N2LF-S-016-0	3+00	745	<0.053	0.49	
N2LF-S-017-0	3+00	775	<0.053	0.265	
N2LF-S-018-0	3+50	610	<0.053	0.778	
N2LF-S-019-0	3+50	640	<0.061	0.382	
N2LF-S-020-0	3+50	670	<0.061	0.4	
N2LF-S-020-1	3+50	670	<0.06	0.633	Duplicate
N2LF-S-020-2	3+50	670			MSD
N2LF-S-021-0	3+50	700	<0.064	0.009	
N2LF-S-022-0	3+50	730	2.63	4.22	
N2LF-S-023-0	3+50	760	46.6	0.045	
N2LF-S-024-0	3+50	790	26.4	0.056	
N2LF-S-025-0	4+00	595	Not In Excavation Area		
N2LF-S-026-0	4+00	625	0.701	0.628	
N2LF-S-027-0	4+00	655	<0.488		

N2LF-S-028-0	4+00	685	0.15	
N2LF-S-029-0	4+00	715	42.1	
N2LF-S-030-0	4+00	745	3.7	
N2LF-S-030-1	4+00	745	1.57	Duplicate
N2LF-S-031-0	4+00	775	<0.0532	
N2LF-S-032-0	4+50	610	0.774	
N2LF-S-033-0	4+50	640	0.131	
N2LF-S-034-0	4+50	670	0.167	
N2LF-S-035-0	4+50	700		
N2LF-S-036-0	4+50	730		
N2LF-S-037-0	4+50	760		
N2LF-S-038-0	4+50	790		
N2LF-S-039-0	5+00	655	<0.066	
N2LF-S-040-0	5+00	685		
N2LF-S-040-1	5+00	685		Duplicate
N2LF-S-040-2	5+00	685		MSD
N2LF-S-041-0	5+00	715		
N2LF-S-042-0	5+00	745		
N2LF-S-043-0	5+00	775		
N2LF-S-044-0	5+50	670		
N2LF-S-045-0	5+50	700	0.197	
N2LF-S-046-0	5+50	730	<0.054	
N2LF-S-047-0	5+50	760		
N2LF-S-048-0	6+00	715		
N2LF-S-048-1	6+00	715		Duplicate

Collect analytical samples for PCB and PAH analyses.

Analysis	# of Samples	Laboratory
PCB	55	ASL
PAH	55	CAS-Redding

Confirmation Sampling on North Landfill, Alcoa/Vancouver

Sample #	Baseline	Offset		
NOLF-S-001-0	1+00	355		
NOLF-S-002-0	1+00	385		
NOLF-S-003-0	1+00	415		
NOLF-S-004-0	1+00	445		
NOLF-S-005-0	1+50	340		
NOLF-S-006-0	1+50	370		
NOLF-S-007-0	1+50	400		
NOLF-S-008-0	1+50	430		
NOLF-S-009-0	1+50	460		
NOLF-S-010-0	1+50	460	Take Duplicate NOLF-S-010-1	
NOLF-S-011-0	2+00	325		
NOLF-S-012-0	2+00	355		
NOLF-S-013-0	2+00	385		
NOLF-S-014-0	2+00	415		
NOLF-S-015-0	2+00	445		
NOLF-S-016-0	2+00	475		
NOLF-S-017-0	2+00	505		
NOLF-S-018-0	2+50	310		
NOLF-S-019-0	2+50	340		
NOLF-S-020-0	2+50	370	Take Duplicate NOLF-S-020-1	Take MS/MSD Duplicate NOLF-S-020-2
NOLF-S-021-0	2+50	400		
NOLF-S-022-0	2+50	430		
NOLF-S-023-0	2+50	460		
NOLF-S-024-0	2+50	490		
NOLF-S-025-0	2+50	520		
NOLF-S-026-0	3+00	355		
NOLF-S-027-0	3+00	385		
NOLF-S-028-0	3+00	415		
NOLF-S-029-0	3+00	445		
NOLF-S-030-0	3+00	475	Take Duplicate NOLF-S-030-1	

NOLF-S-031-0	3+00	505		
NOLF-S-032-0	3+50	460		
NOLF-S-033-0	3+50	490		
NOLF-S-034-0	3+50	520		
NOLF-S-035-0	4+00	505		
NOLF-S-036-0	4+00	535	Take Duplicate NOLF-S-036-1	Take MS/MSD Duplicate NOLF-S-036-2

Collect analytical samples for PCB, PAH and VOC analyses.

Analysis	# of Samples	Laboratory
PCB	43	ASL
PAH	43	CAS-Redding
VOC	43	CAS-Redding

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Tuesday, May 04, 2004 11:28 AM
To: Bruce.Richartz@alcoa.com; SHolmberg@envirocon.com
Subject: More Test Results for NL2F and NLOF

Bruce/Steve,

Attached is an updated listing of analytical data. Update includes additional PCB data. Laboratory doing PAHs stated they would have NL2F completed and reported to me today. New data has identified additional areas requiring removal;

NL2F-S-035	4+50	700	42.6 PCB
NL2F-S-036	4+50	730	25.0 PCB
NL2F-S-040	5+00	685	42.3 PCB
NL2F-S-041	5+00	715	20.4 PCB

Material is suitable for disposal at East Landfill.

Have received about 2/3 of NOLF PCB data. All is below cleanup requirements. PAH's for North should start coming in tomorrow.

Will send more data when I get it.

Checking with labs on if they can handle rush samples. Minimum TAT is 2 to 3 days if they have the capacity.

Mike

Confirmation Sampling on North 2 Landfill, Alcoa/Vancouver

Sample #	Baseline	Offset	PCBs	PAHs	
N2LF-S-001-0	2+00	655	0.144	11.1	
N2LF-S-002-0	2+00	685	0.044	59.1	
N2LF-S-003-0	2+00	715	<0.044	1.83	
N2LF-S-004-0	2+50	580	0.061	0.651	
N2LF-S-005-0	2+50	610	0.87	112	
N2LF-S-006-0	2+50	640	0.054	0.55	
N2LF-S-007-0	2+50	670	<0.047	0.128	
N2LF-S-008-0	2+50	700	<0.047	0.487	
N2LF-S-009-0	2+50	730	<0.05	0.01	
N2LF-S-010-0	2+50	760	<0.047	0.306	
N2LF-S-010-1	2+50	760	<0.046	0.226	Duplicate
N2LF-S-011-0	3+00	595	0.105	8.39	
N2LF-S-012-0	3+00	625	3.53	1.2	
N2LF-S-013-0	3+00	655	0.055	0.835	
N2LF-S-014-0	3+00	685	<0.062	0.036	
N2LF-S-015-0	3+00	715	<0.053	0.038	
N2LF-S-016-0	3+00	745	<0.053	0.49	
N2LF-S-017-0	3+00	775	<0.053	0.265	
N2LF-S-018-0	3+50	610	<0.053	0.778	
N2LF-S-019-0	3+50	640	<0.061	0.382	
N2LF-S-020-0	3+50	670	<0.061	0.4	
N2LF-S-020-1	3+50	670	<0.06	0.633	Duplicate
N2LF-S-021-0	3+50	700	<0.064	0.009	
N2LF-S-022-0	3+50	730	2.63	4.22	
N2LF-S-023-0	3+50	760	46.6	0.045	
N2LF-S-024-0	3+50	790	26.4	0.056	
N2LF-S-026-0	4+00	625	0.701	0.628	
N2LF-S-027-0	4+00	655	<0.488		
N2LF-S-028-0	4+00	685	0.15		
N2LF-S-029-0	4+00	715	42.1		

N2LF-S-030-0	4+00	745	3.7	
N2LF-S-030-1	4+00	745	1.57	Duplicate
N2LF-S-031-0	4+00	775	<0.0532	
N2LF-S-032-0	4+50	610	0.774	
N2LF-S-033-0	4+50	640	0.131	
N2LF-S-034-0	4+50	670	0.167	
N2LF-S-035-0	4+50	700	42.6	
N2LF-S-036-0	4+50	730	25	
N2LF-S-037-0	4+50	760		
N2LF-S-039-0	5+00	655	<0.066	
N2LF-S-040-0	5+00	685	42.3	
N2LF-S-040-1	5+00	685	47.5	Duplicate
N2LF-S-041-0	5+00	715	20.4	
N2LF-S-042-0	5+00	745	2.28	
N2LF-S-044-0	5+50	670	0.628	
N2LF-S-045-0	5+50	700	0.197	
N2LF-S-046-0	5+50	730	<0.054	

Collect analytical samples for PCB and PAH analyses.

Analysis	# of Samples	Laboratory
PCB	55	ASL
PAH	55	CAS-Redding

Confirmation Sampling on North Landfill, Alcoa/Vancouver

Sample #	Baseline	Offset	PCBs	PAHs
NOLF-S-001-0	1+00	355	<0.05	
NOLF-S-002-0	1+00	385	<0.049	
NOLF-S-003-0	1+00	415	0.176	
NOLF-S-004-0	1+00	445	<0.046	
NOLF-S-005-0	1+50	340		
NOLF-S-006-0	1+50	370		
NOLF-S-007-0	1+50	400	<0.047	
NOLF-S-008-0	1+50	430	0.115	
NOLF-S-009-0	1+50	460	<0.064	
NOLF-S-010-0	1+50	460	<0.056	
NOLF-S-010-1	1+50	460	<0.055	
NOLF-S-011-0	2+00	325	0.159	
NOLF-S-012-0	2+00	355	<0.053	
NOLF-S-013-0	2+00	385	<0.053	
NOLF-S-014-0	2+00	415	<0.067	
NOLF-S-015-0	2+00	445	<0.064	
NOLF-S-016-0	2+00	475	<0.064	
NOLF-S-017-0	2+00	505	<0.067	
NOLF-S-018-0	2+50	310	<0.053	
NOLF-S-019-0	2+50	340	<0.057	
NOLF-S-020-0	2+50	370	<0.06	
NOLF-S-020-1	2+50	370	<0.061	
NOLF-S-020-2	2+50	370	<0.059	
NOLF-S-021-0	2+50	400	<0.055	
NOLF-S-022-0	2+50	430	<0.058	
NOLF-S-023-0	2+50	460		
NOLF-S-024-0	2+50	490		
NOLF-S-025-0	2+50	520		
NOLF-S-026-0	3+00	355		
NOLF-S-027-0	3+00	385		

NOLF-S-028-0	3+00	415
NOLF-S-029-0	3+00	445
NOLF-S-030-0	3+00	475
NOLF-S-030-1	3+00	475
NOLF-S-031-0	3+00	505
NOLF-S-032-0	3+50	460
NOLF-S-033-0	3+50	490
NOLF-S-034-0	3+50	520
NOLF-S-035-0	4+00	505
NOLF-S-036-0	4+00	535
NOLF-S-036-1	4+00	535
NOLF-S-036-2	4+00	535

Collect analytical samples for PCB, PAH and VOC analyses.

Analysis	# of Samples	Laboratory
PCB	43	ASL
PAH	43	CAS-Redding
VOC	43	CAS-Redding

Richartz, Bruce K.

From: Mike.Wirtz@CH2M.com
Sent: Tuesday, May 04, 2004 1:25 PM
To: Bruce.Richartz@alcoa.com
Cc: SHolmberg@envirocon.com; Mike.Drewett@CH2M.com
Subject: Lab results to date

Document.pdf

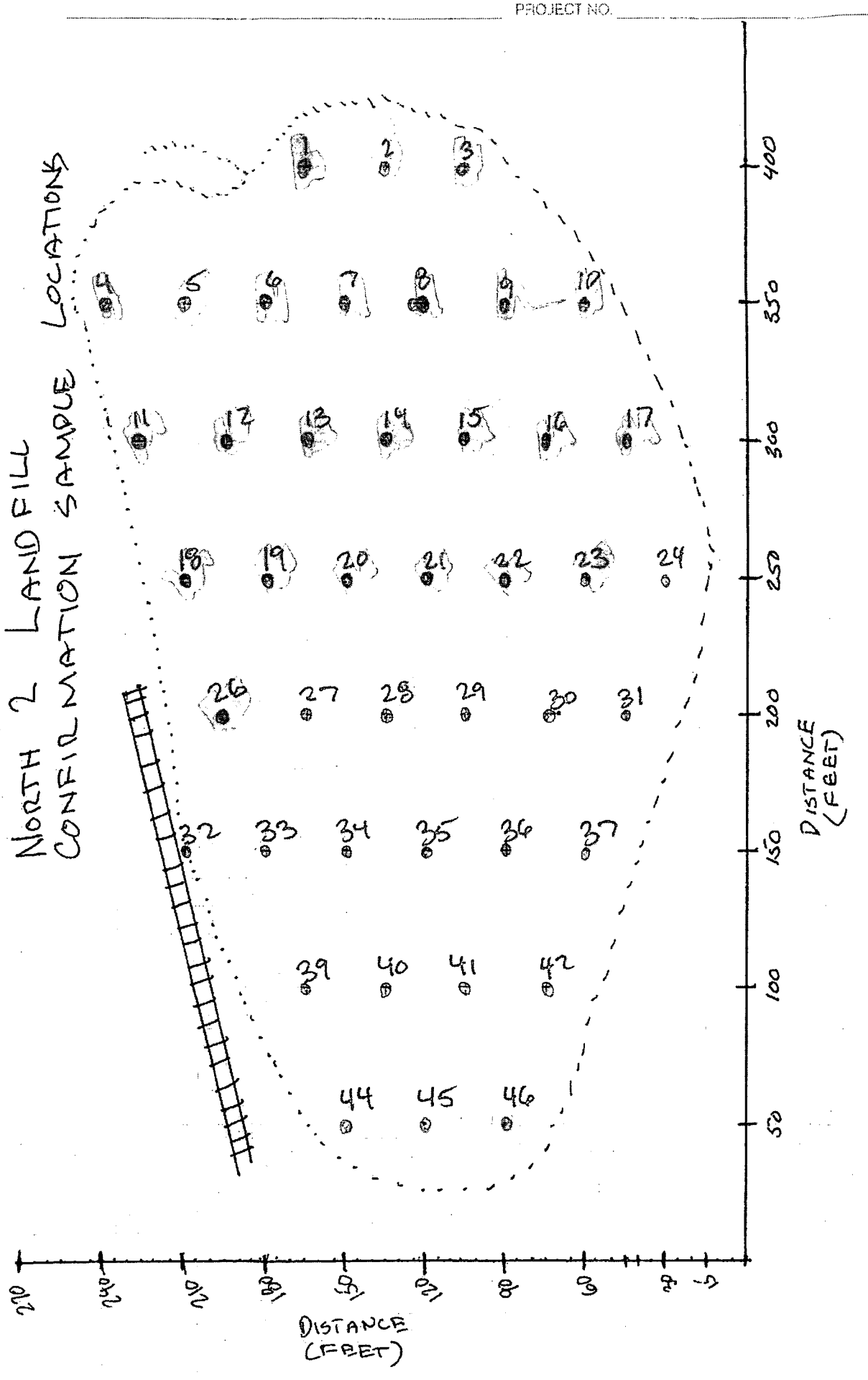
Confirmation sampling location...

Attached is a spreadsheet showing lab results along with a diagram.

SUBJECT _____ BY _____

SHEET NO. ____ of ____ DATE _____

PROJECT NO. _____



"PCB's"

PROJECT NO.

SHEET NO. ___ of ___ DATE

BY

NORTH LANDFILL
CONFIRMATION SAMPLE
LOCATIONS

PCB's

PASS
FAIL

PROJECT NO.

SHEET NO. of DATE

Confirmation Sampling on North Landfill, Alcoa/Vancouver

Sample Name	Sample Date	Survey Point	Sampling Location	Sampling Results (ppm)			Elevation
				PCB	PAH	TCE (North)	
NOLF-S-001-0	4/28/2004	1469	100 + 355	ND < 0.0499			27
NOLF-S-002-0	4/28/2004	1470	100 + 385	ND < 0.0491			28.51
NOLF-S-003-0	4/28/2004	1471	100 + 415	0.24			29.83
NOLF-S-004-0	4/28/2004	1472	100 + 445	ND < 0.0460			28.32
NOLF-S-005-0	4/28/2004	1473	150+ 340				26.11
NOLF-S-006-0	4/28/2004	1474	150+ 370				26.97
NOLF-S-007-0	4/28/2004	1475	150+ 400	ND < 0.0472			23.48
NOLF-S-008-0	4/28/2004	1476	150+ 430	0.115			18.08
NOLF-S-009-0	4/28/2004	1477	150+ 460	ND < 0.0643			16.26
NOLF-S-010-0	4/28/2004	1478	150+ 460	ND < 0.0563			16.26
NOLF-S-010-1	4/28/2004	1478	150+ 460	ND < 0.0552			16.26
NOLF-S-011-0	4/28/2004	1479	200 + 325	0.159			25.5
NOLF-S-012-0	4/28/2004	1480	200 + 355	ND < 0.0531			25.2
NOLF-S-013-0	4/28/2004	1481	200 + 385	ND < 0.0532			24.32
NOLF-S-014-0	4/28/2004	1482	200 + 415	ND < 0.0670			20.35
NOLF-S-015-0	4/28/2004		200 + 445	ND < 0.0638			
NOLF-S-016-0	4/28/2004	1484	200 + 475	ND < 0.0639			12.91
NOLF-S-017-0	4/28/2004	1485	200 + 505	ND < 0.0666			21.67
NOLF-S-018-0	4/28/2004	1486	250+ 310	ND < 0.0531			24.75
NOLF-S-019-0	4/28/2004	1487	250+ 340	ND < 0.0574			23.19
NOLF-S-020-0	4/28/2004	1488	250+ 370	ND < 0.0604			23.11
NOLF-S-020-1	4/28/2004	1488	250+ 370	ND < 0.0606			23.11
NOLF-S-020-2	4/28/2004	1488	250+ 370	ND < 0.0594			23.11
NOLF-S-021-0	4/28/2004	1489	250+ 400	ND < 0.0551			22.05
NOLF-S-022-0	4/28/2004	1490	250+ 430	ND < 0.0579			20.89
NOLF-S-023-0	4/28/2004	1491	250+ 460				18.61
NOLF-S-024-0	4/28/2004	1492	250+ 490				17.08
NOLF-S-025-0	4/28/2004	1493	250+ 520				23.15
NOLF-S-026-0	4/28/2004	1494	300+ 355				23.16
NOLF-S-027-0	4/28/2004	1495	300+ 385				22.06
NOLF-S-028-0	4/28/2004	1496	300+ 415				21.93
NOLF-S-029-0	4/28/2004	1497	300+ 445				20.04
NOLF-S-030-0	4/28/2004	1498	300+ 475				18.27

NOLF-S-030-1	4/28/2004	1498	300+ 475	18.27
NOLF-S-031-0	4/28/2004	1499	300+ 505	17.48
NOLF-S-032-0	4/28/2004	1500	350+ 460	18.34
NOLF-S-033-0	4/28/2004	1501	350+ 490	14.42
NOLF-S-034-0	4/28/2004	1502	350+ 520	21.03
NOLF-S-035-0	4/28/2004		400+ 505	
NOLF-S-036-0	4/28/2004	1504	400+ 535	19.59

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Tuesday, May 04, 2004 2:07 PM
To: Bruce.Richartz@alcoa.com; SHolmberg@envirocon.com
Subject: N2LF Results

Bruce/Steve,

Received PAH results for North 2. One additional location needs excavation/

N2LF-S-032 4+50 610 429 mg/kg PAHs

No more PCB or PAH results today. Should see PAH/TCE results for some of North tomorrow.

Mike

Richartz, Bruce K.

From: Mike.Wirtz@CH2M.com
Sent: Tuesday, May 04, 2004 3:39 PM
To: Bruce.Richartz@alcoa.com
Cc: SHolmberg@envirocon.com; Mike.Drewett@CH2M.com
Subject: North 2 PAH's

Document.pdf


Confirmation sampling location...

Here are the results of all the PAH analysis on North 2 landfill.

-----Original Message-----
From: PDX 13th floor HP 9000L MFP [mailto:salmon@ch2m.com]
Sent: Tuesday, May 04, 2004 3:29 PM
To: Wirtz, Mike/PDX
Subject: Email from the 13th floor HP 9000L MFP

PROJECT NO.

SHEET NO. of DATE

Confirmation Sampling on North 2 Landfill, Alcoa/Vancouver

Sample Name	Sample Date	Survey Point	Sampling Location	Sampling Results (ppm)			Elevation
				PCB	PAH	TCE (North)	
N2LF-S-001-0	4/23/2004	1421	200 + 655	0.144	11.015		28.01
N2LF-S-002-0	4/23/2004	1422	200 + 685	0.044	**59.144**		24.48
N2LF-S-003-0	4/23/2004	1423	200 + 715	ND < 0.0442	1.834		26.34
N2LF-S-004-0	4/23/2004	1424	250 + 580	0.061	0.651		25.41
N2LF-S-005-0	4/23/2004	1425	250 + 610	0.870	**112.180**		23.20
N2LF-S-006-0	4/23/2004	1426	250 + 640	0.054	0.550		25.14
N2LF-S-007-0	4/23/2004	1427	250 + 670	ND < 0.0473	0.128		23.01
N2LF-S-008-0	4/23/2004	1428	250 + 700	ND < 0.0468	0.487		22.65
N2LF-S-009-0	4/23/2004	1429	250 + 730	ND < 0.0501	0.010		21.30
N2LF-S-010-0	4/23/2004	1430	250 + 760	ND < 0.0469	0.306		23.98
N2LF-S-010-1	4/23/2004	1430	250 + 760	ND < 0.0463	0.226		23.98
N2LF-S-011-0	4/23/2004	1431	300 + 595	0.105	8.391		22.41
N2LF-S-012-0	4/23/2004	1432	300 + 625	3.530	1.201		21.87
N2LF-S-013-0	4/23/2004	1433	300 + 655	0.055	0.835		21.92
N2LF-S-014-0	4/23/2004	1434	300 + 685	ND < 0.0624	0.036		21.05
N2LF-S-015-0	4/23/2004	1435	300 + 715	ND < 0.053	0.038		21.18
N2LF-S-016-0	4/23/2004	1436	300 + 745	ND < 0.0525	0.490		23.58
N2LF-S-017-0	4/23/2004	1437	300 + 775	ND < 0.0526	0.265		23.89
N2LF-S-018-0	4/23/2004	1438	350 + 610	ND < 0.0525	0.778		22.92
N2LF-S-019-0	4/23/2004	1439	350 + 640	ND < 0.0607	0.382		21.37
N2LF-S-020-0	4/23/2004	1440	350 + 670	ND < 0.0609	0.400		21.48
N2LF-S-020-1	4/23/2004	1440	350 + 670	ND < 0.060	0.633		21.48
N2LF-S-021-0	4/23/2004	1441	350 + 700	ND < 0.064	0.009		17.34
N2LF-S-022-0	4/23/2004	1442	350 + 730	2.630	4.223		21.70
N2LF-S-023-0	4/23/2004	1443	350 + 760	**46.600**	0.045		20.89
N2LF-S-024-0	4/23/2004	1444	350 + 790	**26.400**	0.056		26.79
N2LF-S-025-0	4/23/2004	1445	400 + 595	No Sample			27.68
N2LF-S-026-0	4/23/2004	1446	400 + 625	0.701	0.628		20.55
N2LF-S-027-0	4/23/2004	1447	400 + 655	ND < 0.488	0.029		19.97
N2LF-S-028-0	4/23/2004	1448	400 + 685	0.150	ND < 0.0063		19.64
N2LF-S-029-0	4/23/2004	1449	400 + 715	**42.100**	0.029		20.16
N2LF-S-030-0	4/23/2004	1450	400 + 745	3.070	0.034		19.90

N2LF-S-030-1	4/23/2004	1450	400 + 745	1.570	0.037	19.90
N2LF-S-031-0	4/23/2004	1451	400 + 775	ND < 0.0523	0.743	23.38
N2LF-S-032-0	4/23/2004	1452	450 + 610	0.774	**352.767**	26.82
N2LF-S-033-0	4/23/2004	1453	450 + 640	0.131	0.058	20.38
N2LF-S-034-0	4/23/2004	1454	450 + 670	0.167	0.044	17.50
N2LF-S-035-0	4/23/2004	1455	450 + 700	**42.600**	0.146	19.02
N2LF-S-036-0	4/23/2004	1456	450 + 730	**25.000**	0.185	19.04
N2LF-S-037-0	4/23/2004	1457	450 + 760		0.118	21.18
N2LF-S-038-0	4/23/2004	1458	450 + 790	No Sample		27.46
N2LF-S-039-0	4/23/2004	1459	500 + 655	ND < 0.0661	0.007	17.21
N2LF-S-040-0	4/23/2004	1460	500 + 685	**42.300**	0.102	18.68
N2LF-S-040-1	4/23/2004	1460	500 + 685	**47.500**	0.125	18.68
N2LF-S-041-0	4/23/2004	1461	500 + 715	**20.400**	0.086	19.91
N2LF-S-042-0	4/23/2004	1462	500 + 745	2.280	0.023	20.84
N2LF-S-043-0	4/23/2004	1463	500 + 775	No Sample		26.34
N2LF-S-044-0	4/23/2004	1464	550 + 670	0.628	0.056	20.65
N2LF-S-045-0	4/23/2004	1465	550 + 700	0.197	0.044	20.14
N2LF-S-046-0	4/23/2004	1466	550 + 730	ND < 0.0535	ND < 0.0053	24.67
N2LF-S-047-0	4/23/2004	1467	550 + 760	No Sample		27.97
N2LF-S-048-0	4/23/2004	1468	600 + 715	No Sample		27.96

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Wednesday, May 05, 2004 1:13 PM
To: Bruce.Richartz@alcoa.com
Cc: David.Keene@alcoa.com
Subject: Soil Gas Survey Results, Former Vancouver Operations Site

Bruce,
Attached is tech memo on soil gas vapor sampling. I'm also attaching a couple of photographs of activity.
Mike

Alcoa Soil Gas Investigation

PREPARED FOR: Mike Drewett/PDX

PREPARED BY: Ben Thompson/CVO

DATE: May 3, 2004

On April 30, 2004, soil gas samples were collected from fourteen locations across the North and North 2 landfills at the former Alcoa Vancouver Operations site. Soil gas samples were analyzed using an on-site portable Photovac Voyager gas chromatograph to assess trichloroethene (TCE) vapor concentrations in shallow subsurface soils. The methodology used and results obtained during this effort are described below.

Methodology

Soil gas probes consisting of 3 to 4 foot long sections of hollow steel tubing fitted with a retractable soil gas probe tip were driven using a 'slam' bar to a depth of approximately 3-feet below ground surface (BGS). A piece of clean flexible FEP tubing was run through the steel tube and attached to a barbed fitting on the probe tip. Once the desired sampling depth was reached, the probes were pulled back several inches to expose the sample collection void and allowed to equilibrate 20 minutes. Modeling clay was used to seal the area around the probe at ground surface prior to sample collection. A sampling manifold equipped with isolation valves, a pressure gauge, and a septum sampling port was attached to the exposed end of the flexible FEP tubing. The probe and sample manifold were purged with 3 dead volumes, then, a sample was collected and analyzed using an on-site portable Photovac Voyager gas chromatograph (GC) equipped with a photoionization detector (PID) and a capillary column. The GC was calibrated using a five point curve with a low point at the project reporting limit of 10 parts per billion vapor (ppbv) and a high point of 1000 ppbv. A method blank was analyzed before each sample analysis to ensure the instrument was free of contamination.

Results

TCE was detected at two sample locations above the method reporting limit of 10 ppbv. NOLF-035 was detected at 160 ppbv and N2LF-028 was detected at 114 ppbv. A field duplicate and split sample were collected sample location NOLF-35. The field duplicate result was 161 ppbv. The split sample was taken in a passivated SUMMA® canister for fixed lab EPA Method TO-15 confirmation analysis. The result from this method was 231 ppbv, which is within acceptable limits for a field versus fixed lab analysis.

In order to obtain a valid sample, the vacuum in the probe sample system should be less than 10" Hg after purging and before sampling. Soil composition and water content can cause a vacuum greater than this which indicates low volumes of available soil gas and a reduced chance for obtaining a representative sample. Both sample location NOLF-035 and N2LF-028 exhibited high water content in the soil. Probes had to be driven twice due to a

high sampling vacuum. No sample was collected from the initial probe driven at NOLF-035 because water was drawn into the sample line. TCE in the initial sample collected at N2LF-028 was detected at 10 ppbv, however, the probe was installed at a depth of 1' BGS allowing for possible ambient air intrusion. A second probe was driven to 2' BGS and re-sampled.

Two extra probes were installed at the request of the client 18' to the north east and 36' to the north west of NOLF-035 in order to assess the extent of TCE in the surrounding area. TCE was not detected in either sample above the method reporting limit of 10 ppbv. A summary of sample results are presented below in Table 1.

Table 1 – Onsite Laboratory Analytical Results

Sample Location	Depth	Comment	Trichloroethene (ppbv)
NOLF-005	3'		ND
NOLF-013	3'		ND
NOLF-016	3'		ND
NOLF-018	3'		ND
NOLF-021	3'		ND
NOLF-030	3'		ND
NOLF-035	3'		**160**
NOLF-035 FD	3'	Field Duplicate	161
NOLF-035 NE	2' 6"	18' NE of NOLF-035	ND
NOLF-035 NW	3'	36' NW of NOLF-035	ND
N2LF-008	3'		ND
N2LF-018	3'		ND
N2LF-023	3'		ND
N2LF-028	1'	Bad Sample-high vacuum	10
N2LF-028 R	2'	Re-Sample	**114**
N2LF-039	3'		ND

ND=Not Detected
above 10 ppbv

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Wednesday, May 05, 2004 1:21 PM
To: Bruce.Richartz@alcoa.com
Cc: SHolmberg@envirocon.com
Subject: North 2 Landfill Re-sampling Effort

Bruce/Steve,

Following excavation by Envirocon, Mike Wirtz re-sampled locations at North 2 Landfill which exceeded site cleanup criteria. Soil samples were collected on May 5, 2004 and will be shipped to laboratories later this afternoon. PAH samples will be analyzed by Columbia Analytical and PCB samples will be analyzed by Applied Science. Preliminary results will not be available until late Wednesday, May 12, 2004.

Mike

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Thursday, May 06, 2004 7:41 AM
To: Bruce.Richartz@alcoa.com; SHolmberg@envirocon.com
Cc: David.Keene@alcoa.com
Subject: Vancouver TCE results for 2 of 3 batches

Bruce/Steve,

Attached file includes 2 of 3 batches for TCE analysis at North Landfill. All data is below method reporting limit (<0.01 ppm).

Expect to begin seeing PAH data for North Landfill today, and possibly the remainder of the TCE and PCB data for North Landfill. We should have all data for North by Friday.

Re-sampling efforts at North 2 were completed and samples sent to lab yesterday. Expect results from these on the 12th.

Mike

Confirmation Sampling on North Landfill, Alcoa/Vancouver

Sample #	Baseline	Offset	PCBs	PAHs	TCE
NOLF-S-001-0	1+00	355	<0.05		
NOLF-S-002-0	1+00	385	<0.049		
NOLF-S-003-0	1+00	415	0.176		
NOLF-S-004-0	1+00	445	<0.046		
NOLF-S-005-0	1+50	340			
NOLF-S-006-0	1+50	370			
NOLF-S-007-0	1+50	400	<0.047		
NOLF-S-008-0	1+50	430	0.115		
NOLF-S-009-0	1+50	460	<0.064		
NOLF-S-010-0	1+50	460	<0.056		
NOLF-S-010-1	1+50	460	<0.055		
NOLF-S-011-0	2+00	325	0.159		
NOLF-S-012-0	2+00	355	<0.053		
NOLF-S-013-0	2+00	385	<0.053		
NOLF-S-014-0	2+00	415	<0.067		<0.01
NOLF-S-015-0	2+00	445	<0.064		<0.01
NOLF-S-016-0	2+00	475	<0.064		<0.01
NOLF-S-017-0	2+00	505	<0.067		<0.01
NOLF-S-018-0	2+50	310	<0.053		<0.01
NOLF-S-019-0	2+50	340	<0.057		<0.01
NOLF-S-020-0	2+50	370	<0.06		<0.01
NOLF-S-020-1	2+50	370	<0.061		<0.01
NOLF-S-020-2	2+50	370	<0.059		<0.01
NOLF-S-021-0	2+50	400	<0.055		<0.01
NOLF-S-022-0	2+50	430	<0.058		<0.01
NOLF-S-023-0	2+50	460			<0.01
NOLF-S-024-0	2+50	490			<0.01
NOLF-S-025-0	2+50	520			<0.01
NOLF-S-026-0	3+00	355			<0.01
NOLF-S-027-0	3+00	385			<0.01

NOLF-S-028-0	3+00	415	<0.01
NOLF-S-029-0	3+00	445	<0.01
NOLF-S-030-0	3+00	475	<0.01
NOLF-S-030-1	3+00	475	<0.01
NOLF-S-031-0	3+00	505	<0.01
NOLF-S-032-0	3+50	460	<0.01
NOLF-S-033-0	3+50	490	<0.01
NOLF-S-034-0	3+50	520	<0.01
NOLF-S-035-0	4+00	505	<0.01
NOLF-S-036-0	4+00	535	<0.01
NOLF-S-036-1	4+00	535	<0.01
NOLF-S-036-2	4+00	535	<0.01

Collect analytical samples for PCB, PAH and VOC analyses.

Analysis	# of Samples	Laboratory
PCB	43	ASL
PAH	43	CAS-Redding
VOC	43	CAS-Redding

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Thursday, May 06, 2004 8:32 AM
To: Bruce.Richartz@alcoa.com; SHolmberg@envirocon.com
Cc: David.Keene@alcoa.com
Subject: Preliminary TCE Data for North Landfill

Bruce/Steve,
Attached is complete data set for TCE analyses at North Landfill. Results are all <0.010 ppm. Will send additional updates when I get PCB and PAH data.
Mike

Confirmation Sampling on North Landfill, Alcoa/Vancouver

Sample #	Baseline	Offset	PCBs	PAHs	TCE
NOLF-S-001-0	1+00	355	<0.05		<0.01
NOLF-S-002-0	1+00	385	<0.049		<0.01
NOLF-S-003-0	1+00	415	0.176		<0.01
NOLF-S-004-0	1+00	445	<0.046		<0.01
NOLF-S-005-0	1+50	340			<0.01
NOLF-S-006-0	1+50	370			<0.01
NOLF-S-007-0	1+50	400	<0.047		<0.01
NOLF-S-008-0	1+50	430	0.115		<0.01
NOLF-S-009-0	1+50	460	<0.064		<0.01
NOLF-S-010-0	1+50	460	<0.056		<0.01
NOLF-S-010-1	1+50	460	<0.055		<0.01
NOLF-S-011-0	2+00	325	0.159		<0.01
NOLF-S-012-0	2+00	355	<0.053		<0.01
NOLF-S-013-0	2+00	385	<0.053		<0.01
NOLF-S-014-0	2+00	415	<0.067		<0.01
NOLF-S-015-0	2+00	445	<0.064		<0.01
NOLF-S-016-0	2+00	475	<0.064		<0.01
NOLF-S-017-0	2+00	505	<0.067		<0.01
NOLF-S-018-0	2+50	310	<0.053		<0.01
NOLF-S-019-0	2+50	340	<0.057		<0.01
NOLF-S-020-0	2+50	370	<0.06		<0.01
NOLF-S-020-1	2+50	370	<0.061		<0.01
NOLF-S-020-2	2+50	370	<0.059		<0.01
NOLF-S-021-0	2+50	400	<0.055		<0.01
NOLF-S-022-0	2+50	430	<0.058		<0.01
NOLF-S-023-0	2+50	460			<0.01
NOLF-S-024-0	2+50	490			<0.01
NOLF-S-025-0	2+50	520			<0.01
NOLF-S-026-0	3+00	355			<0.01
NOLF-S-027-0	3+00	385			<0.01

NOLF-S-028-0	3+00	415	<0.01
NOLF-S-029-0	3+00	445	<0.01
NOLF-S-030-0	3+00	475	<0.01
NOLF-S-030-1	3+00	475	<0.01
NOLF-S-031-0	3+00	505	<0.01
NOLF-S-032-0	3+50	460	<0.01
NOLF-S-033-0	3+50	490	<0.01
NOLF-S-034-0	3+50	520	<0.01
NOLF-S-035-0	4+00	505	<0.01
NOLF-S-036-0	4+00	535	<0.01
NOLF-S-036-1	4+00	535	<0.01
NOLF-S-036-2	4+00	535	<0.01

Collect analytical samples for PCB, PAH and VOC analyses.

Analysis	# of Samples	Laboratory
PCB	43	ASL
PAH	43	CAS-Redding
VOC	43	CAS-Redding

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Thursday, May 06, 2004 4:34 PM
To: Bruce.Richartz@alcoa.com; SHolmberg@envirocon.com
Cc: David.Keene@alcoa.com
Subject: Updated Confirmation Data through 5/6/2004

Bruce,
Attached is revised file with data through 5/6/2004. We now have all the TCE, 25 of 36 PAH and 33 of 36 PCB.
Mike

Two new locations in North Landfill need excavation 003 and 008.

Mike

Confirmation Sampling on North 2 Landfill, Alcoa/Vancouver

Sample Name	Sample Date	Survey Point	Sampling Location		Sampling Results (ppm)			Elevation
			Baseline	Offset	PCB	PAH	TCE	
N2LF-S-001-0	4/23/2004	1421	2+00	655	0.144	11.0	-	28.01
N2LF-S-002-0	4/23/2004	1422	2+00	685	0.044	**59.1**	-	24.48
N2LF-S-003-0	4/23/2004	1423	2+00	715	< 0.044	1.83	-	26.34
N2LF-S-004-0	4/23/2004	1424	2+50	580	0.061	0.651	-	25.41
N2LF-S-005-0	4/23/2004	1425	2+50	610	0.870	**112**	-	23.20
N2LF-S-006-0	4/23/2004	1426	2+50	640	0.054	0.550	-	25.14
N2LF-S-007-0	4/23/2004	1427	2+50	670	< 0.047	0.128	-	23.01
N2LF-S-008-0	4/23/2004	1428	2+50	700	< 0.047	0.487	-	22.65
N2LF-S-009-0	4/23/2004	1429	2+50	730	< 0.050	0.010	-	21.30
N2LF-S-010-0	4/23/2004	1430	2+50	760	< 0.047	0.306	-	23.98
N2LF-S-010-1	4/23/2004	1430	2+50	760	< 0.046	0.226	-	23.98
N2LF-S-011-0	4/23/2004	1431	3+00	595	0.105	8.39	-	22.41
N2LF-S-012-0	4/23/2004	1432	3+00	625	3.53	1.20	-	21.87
N2LF-S-013-0	4/23/2004	1433	3+00	655	0.055	0.835	-	21.92
N2LF-S-014-0	4/23/2004	1434	3+00	685	< 0.062	0.036	-	21.05
N2LF-S-015-0	4/23/2004	1435	3+00	715	< 0.053	0.038	-	21.18
N2LF-S-016-0	4/23/2004	1436	3+00	745	< 0.053	0.490	-	23.58
N2LF-S-017-0	4/23/2004	1437	3+00	775	< 0.053	0.265	-	23.89
N2LF-S-018-0	4/23/2004	1438	3+50	610	< 0.053	0.778	-	22.92
N2LF-S-019-0	4/23/2004	1439	3+50	640	< 0.061	0.382	-	21.37
N2LF-S-020-0	4/23/2004	1440	3+50	670	< 0.061	0.400	-	21.48
N2LF-S-020-1	4/23/2004	1440	3+50	670	< 0.060	0.633	-	21.48
N2LF-S-021-0	4/23/2004	1441	3+50	700	< 0.064	0.009	-	17.34
N2LF-S-022-0	4/23/2004	1442	3+50	730	2.63	4.22	-	21.70
N2LF-S-023-0	4/23/2004	1443	3+50	760	**46.6**	0.045	-	20.89
N2LF-S-024-0	4/23/2004	1444	3+50	790	**26.4**	0.056	-	26.79
N2LF-S-025-0	4/23/2004	1445	4+00	595	No Sample	-	-	27.68
N2LF-S-026-0	4/23/2004	1446	4+00	625	0.701	0.628	-	20.55
N2LF-S-027-0	4/23/2004	1447	4+00	655	< 0.488	0.031	-	19.97
N2LF-S-028-0	4/23/2004	1448	4+00	685	0.150	<0.006	-	19.64
N2LF-S-029-0	4/23/2004	1449	4+00	715	**42.1**	0.029	-	20.16
N2LF-S-030-0	4/23/2004	1450	4+00	745	3.07	0.034	-	19.90

N2LF-S-030-1	4/23/2004	1450	4+00	745	1.57	0.037	-	19.90
N2LF-S-031-0	4/23/2004	1451	4+00	775	< 0.053	0.743	-	23.38
N2LF-S-032-0	4/23/2004	1452	4+50	610	0.774	**351**	-	26.82
N2LF-S-033-0	4/23/2004	1453	4+50	640	0.131	0.058	-	20.38
N2LF-S-034-0	4/23/2004	1454	4+50	670	0.167	0.044	-	17.50
N2LF-S-035-0	4/23/2004	1455	4+50	700	**42.6**	0.222	-	19.02
N2LF-S-036-0	4/23/2004	1456	4+50	730	**25.0**	0.185	-	19.04
N2LF-S-037-0	4/23/2004	1457	4+50	760	1.11	0.118	-	21.18
N2LF-S-038-0	4/23/2004	1458	4+50	790	No Sample	-	-	27.46
N2LF-S-039-0	4/23/2004	1459	5+00	655	< 0.066	0.007	-	17.21
N2LF-S-040-0	4/23/2004	1460	5+00	685	**42.3**	0.102	-	18.68
N2LF-S-040-1	4/23/2004	1460	5+00	685	**47.5**	0.125	-	18.68
N2LF-S-041-0	4/23/2004	1461	5+00	715	**20.4**	0.086	-	19.91
N2LF-S-042-0	4/23/2004	1462	5+00	745	2.28	0.023	-	20.84
N2LF-S-043-0	4/23/2004	1463	5+00	775	No Sample	-	-	26.34
N2LF-S-044-0	4/23/2004	1464	5+50	670	0.628	0.056	-	20.65
N2LF-S-045-0	4/23/2004	1465	5+50	700	0.197	0.044	-	20.14
N2LF-S-046-0	4/23/2004	1466	5+50	730	< 0.054	<0.005	-	24.67
N2LF-S-047-0	4/23/2004	1467	5+50	760	No Sample	-	-	27.97
N2LF-S-048-0	4/23/2004	1468	6+00	715	No Sample	-	-	27.96

Richartz, Bruce K.

From: Mike.Wirtz@CH2M.com
Sent: Monday, May 10, 2004 11:38 AM
To: Bruce.Richartz@alcoa.com; SHolmberg@envirocon.com
Cc: Mike.Drewett@CH2M.com
Subject: Updated confirmation sampling spreadsheet

Updated confirmation sampling spreadsheet attached.

Confirmation Sampling on North Landfill, Alcoa/Vancouver

Sample Name	Sample Date	Survey Point	Sampling Location		Sampling Results (ppm)			Elevation
			Baseline	Offset	PCB	PAH	TCE	
NOLF-S-001-0	4/26/2004	1469	1+00	355	< 0.050	0.005	<0.01	27.00
NOLF-S-002-0	4/26/2004	1470	1+00	385	< 0.049	0.258	<0.01	28.51
NOLF-S-003-0	4/26/2004	1471	1+00	415	0.240	**53.704**	<0.01	29.83
NOLF-S-004-0	4/26/2004	1472	1+00	445	< 0.046	0.067	<0.01	28.32
NOLF-S-005-0	4/26/2004	1473	1+50	340	0.300	2.939	<0.01	26.11
NOLF-S-006-0	4/26/2004	1474	1+50	370	1.94	11.011	<0.01	26.97
NOLF-S-007-0	4/26/2004	1475	1+50	400	< 0.047	0.014	<0.01	23.48
NOLF-S-008-0	4/26/2004	1476	1+50	430	0.115	**684.5**	<0.01	18.08
NOLF-S-009-0	4/26/2004	1477	1+50	460	< 0.064	0.024	<0.01	16.26
NOLF-S-010-0	4/26/2004	1478	1+50	460	< 0.056	0.016	<0.01	16.26
NOLF-S-010-1	4/26/2004	1478	1+50	460	< 0.055	0.023	<0.01	16.26
NOLF-S-011-0	4/26/2004	1479	2+00	325	0.159	3.229	<0.01	25.50
NOLF-S-012-0	4/26/2004	1480	2+00	355	< 0.053	0.112	<0.01	25.20
NOLF-S-013-0	4/26/2004	1481	2+00	385	< 0.053	< 0.005	<0.01	24.32
NOLF-S-014-0	4/26/2004	1482	2+00	415	< 0.067	< 0.007	<0.01	20.35
NOLF-S-015-0	4/26/2004		2+00	445	< 0.064	0.002	<0.01	
NOLF-S-016-0	4/26/2004	1484	2+00	475	< 0.064	< 0.006	<0.01	12.91
NOLF-S-017-0	4/26/2004	1485	2+00	505	< 0.067	< 0.007	<0.01	21.67
NOLF-S-018-0	4/26/2004	1486	2+50	310	< 0.053	0.465	<0.01	24.75
NOLF-S-019-0	4/26/2004	1487	2+50	340	< 0.057	0.108	<0.01	23.19
NOLF-S-020-0	4/26/2004	1488	2+50	370	< 0.060	0.455	<0.01	23.11
NOLF-S-020-1	4/26/2004	1488	2+50	370	< 0.061	0.832	<0.01	23.11
NOLF-S-020-2	4/26/2004	1488	2+50	370	< 0.059	0.905	<0.01	23.11
NOLF-S-021-0	4/26/2004	1489	2+50	400	< 0.055	1.541	<0.01	22.05
NOLF-S-022-0	4/26/2004	1490	2+50	430	< 0.058	2.750	<0.01	20.89
NOLF-S-023-0	4/26/2004	1491	2+50	460	< 0.061	0.001	<0.01	18.61
NOLF-S-024-0	4/26/2004	1492	2+50	490	< 0.063	0.045	<0.01	17.08
NOLF-S-025-0	4/26/2004	1493	2+50	520	< 0.052	0.607	<0.01	23.15
NOLF-S-026-0	4/26/2004	1494	3+00	355	< 0.061	0.081	<0.01	23.16
NOLF-S-027-0	4/26/2004	1495	3+00	385	< 0.065	0.073	<0.01	22.06
NOLF-S-028-0	4/26/2004	1496	3+00	415	< 0.065	0.015	<0.01	21.93
NOLF-S-029-0	4/26/2004	1497	3+00	445	< 0.061	0.008	<0.01	20.04
NOLF-S-030-0	4/26/2004	1498	3+00	475	< 0.068	< 0.007	<0.01	18.27

NOLF-S-030-1	4/26/2004	1498	3+00	475	< 0.067	< 0.007	<0.01	18.27
NOLF-S-031-0	4/26/2004	1499	3+00	505	< 0.065	0.003	<0.01	17.48
NOLF-S-032-0	4/26/2004	1500	3+50	460	< 0.063	0.122	<0.01	18.34
NOLF-S-033-0	4/26/2004	1501	3+50	490	1.08	**117.41**	<0.01	14.42
NOLF-S-034-0	4/26/2004	1502	3+50	520	< 0.054	0.098	<0.01	21.03
NOLF-S-035-0	4/26/2004		4+00	505	< 0.063	0.837	<0.01	
NOLF-S-036-0	4/26/2004	1504	4+00	535	< 0.065	0.878	<0.01	19.59
NOLF-S-036-1	4/26/2004	1504	4+00	535	< 0.066	0.851	<0.01	19.59
NOLF-S-036-2	4/26/2004	1504	4+00	535	< 0.063	1.920	<0.01	19.59

Richartz, Bruce K.

From: Mike.Wirtz@CH2M.com
Sent: Tuesday, May 11, 2004 3:23 PM
To: Bruce.Richartz@alcoa.com
Cc: SHolmberg@envirocon.com; Mike.Drewett@CH2M.com
Subject: PAH results

The three PAHs came back from the resampling at North 2 landfill which all passed (location #'s 002, 005, 0032). We will be receiving the PCB results from North 2 resampling tomorrow.

Mike Wirtz

Resampling Identification:
N2LF-049-0 is from location 002
N2LF-050-0 is from location 005
N2LF-051-0 is from location 032

Confirmation Sampling on North 2 Landfill, Alcoa/Vancouver

Sample Name	Sample Date	Survey Point	Sampling Location		Sampling Results (ppm)			Elevation
			Baseline	Offset	PCB	PAH	TCE	
N2LF-S-001-0	4/23/2004	1421	2+00	655	0.144	11.0	-	28.01
N2LF-S-002-0	4/23/2004	1422	2+00	685	0.044	**59.1**	-	24.48
N2LF-S-003-0	4/23/2004	1423	2+00	715	< 0.044	1.83	-	26.34
N2LF-S-004-0	4/23/2004	1424	2+50	580	0.061	0.651	-	25.41
N2LF-S-005-0	4/23/2004	1425	2+50	610	0.870	**112**	-	23.20
N2LF-S-006-0	4/23/2004	1426	2+50	640	0.054	0.550	-	25.14
N2LF-S-007-0	4/23/2004	1427	2+50	670	< 0.047	0.128	-	23.01
N2LF-S-008-0	4/23/2004	1428	2+50	700	< 0.047	0.487	-	22.65
N2LF-S-009-0	4/23/2004	1429	2+50	730	< 0.050	0.010	-	21.30
N2LF-S-010-0	4/23/2004	1430	2+50	760	< 0.047	0.306	-	23.98
N2LF-S-010-1	4/23/2004	1430	2+50	760	< 0.046	0.226	-	23.98
N2LF-S-011-0	4/23/2004	1431	3+00	595	0.105	8.39	-	22.41
N2LF-S-012-0	4/23/2004	1432	3+00	625	3.53	1.20	-	21.87
N2LF-S-013-0	4/23/2004	1433	3+00	655	0.055	0.835	-	21.92
N2LF-S-014-0	4/23/2004	1434	3+00	685	< 0.062	0.036	-	21.05
N2LF-S-015-0	4/23/2004	1435	3+00	715	< 0.053	0.038	-	21.18
N2LF-S-016-0	4/23/2004	1436	3+00	745	< 0.053	0.490	-	23.58
N2LF-S-017-0	4/23/2004	1437	3+00	775	< 0.053	0.265	-	23.89
N2LF-S-018-0	4/23/2004	1438	3+50	610	< 0.053	0.778	-	22.92
N2LF-S-019-0	4/23/2004	1439	3+50	640	< 0.061	0.382	-	21.37
N2LF-S-020-0	4/23/2004	1440	3+50	670	< 0.061	0.400	-	21.48
N2LF-S-020-1	4/23/2004	1440	3+50	670	< 0.060	0.633	-	21.48
N2LF-S-020-2	4/26/2004	1440	3+50	670	<0.059	0.629	-	21.48
N2LF-S-021-0	4/23/2004	1441	3+50	700	< 0.064	0.009	-	17.34
N2LF-S-022-0	4/23/2004	1442	3+50	730	2.63	4.22	-	21.70
N2LF-S-023-0	4/23/2004	1443	3+50	760	**46.6**	0.045	-	20.89
N2LF-S-024-0	4/23/2004	1444	3+50	790	**26.4**	0.056	-	17.50
N2LF-S-025-0	4/23/2004	1445	4+00	595	No Sample	-	-	27.68
N2LF-S-026-0	4/23/2004	1446	4+00	625	0.701	0.628	-	20.55
N2LF-S-027-0	4/23/2004	1447	4+00	655	< 0.488	0.031	-	19.97
N2LF-S-028-0	4/23/2004	1448	4+00	685	0.150	<0.006	-	19.64
N2LF-S-029-0	4/23/2004	1449	4+00	715	**42.1**	0.029	-	20.16

N2LF-S-030-0	4/23/2004	1450	4+00	745	3.07	0.034	-	19.90
N2LF-S-030-1	4/23/2004	1450	4+00	745	1.57	0.037	-	19.90
N2LF-S-031-0	4/23/2004	1451	4+00	775	< 0.053	0.743	-	23.38
N2LF-S-032-0	4/23/2004	1452	4+50	610	0.774	**351**	-	26.82
N2LF-S-033-0	4/23/2004	1453	4+50	640	0.131	0.058	-	20.38
N2LF-S-034-0	4/23/2004	1454	4+50	670	0.167	0.044	-	17.50
N2LF-S-035-0	4/23/2004	1455	4+50	700	**42.6**	0.222	-	19.02
N2LF-S-036-0	4/23/2004	1456	4+50	730	**25.0**	0.185	-	19.04
N2LF-S-037-0	4/23/2004	1457	4+50	760	1.110	0.118	-	21.18
N2LF-S-038-0	4/23/2004	1458	4+50	790	No Sample	-	-	27.46
N2LF-S-039-0	4/23/2004	1459	5+00	655	< 0.066	0.007	-	17.21
N2LF-S-040-0	4/23/2004	1460	5+00	685	**42.3**	0.102	-	18.68
N2LF-S-040-1	4/23/2004	1460	5+00	685	**47.5**	0.125	-	18.68
N2LF-S-040-2	4/26/2004	1460	5+00	685	**74.5**	0.063	-	18.68
N2LF-S-041-0	4/23/2004	1461	5+00	715	**20.4**	0.086	-	19.91
N2LF-S-042-0	4/23/2004	1462	5+00	745	2.28	0.023	-	20.84
N2LF-S-043-0	4/23/2004	1463	5+00	775	No Sample	-	-	26.34
N2LF-S-044-0	4/23/2004	1464	5+50	670	0.628	0.056	-	20.65
N2LF-S-045-0	4/23/2004	1465	5+50	700	0.197	0.044	-	20.14
N2LF-S-046-0	4/23/2004	1466	5+50	730	< 0.054	<0.005	-	24.67
N2LF-S-046-1	4/26/2004	1466	5+50	730	< 0.050	0.030	-	24.67
N2LF-S-047-0	4/23/2004	1467	5+50	760	No Sample	-	-	27.97
N2LF-S-048-0	4/23/2004	1468	6+00	715	No Sample	-	-	27.96
Z0504SA3	Method Blank	-	-	-	-	< 0.005	-	-
N2LF-S-049-0	5/5/2004	50005	2+00	685	-	3.326	-	21.91
N2LF-S-050-0	5/5/2004	50004	2+50	610	-	0.017	-	19.71
N2LF-S-051-0	5/5/2004	50010	4+50	610	-	0.573	-	24.29
N2LF-S-052-0	5/5/2004	50006	3+50	760		-	-	17.78
N2LF-S-053-0	5/5/2004	50006	3+50	790		-	-	15.28
N2LF-S-054-0	5/5/2004	50007	4+00	715		-	-	15.93
N2LF-S-055-0	5/5/2004	50009	4+50	700		-	-	15.40
N2LF-S-056-0	5/5/2004	50008	4+50	730		-	-	15.40
N2LF-S-057-0	5/5/2004	50011	5+00	685		-	-	15.39
N2LF-S-058-0	5/5/2004	50012	5+00	715		-	-	16.91
Z0507SA1	Method Blank	-	-	-	-	< 0.005	-	-

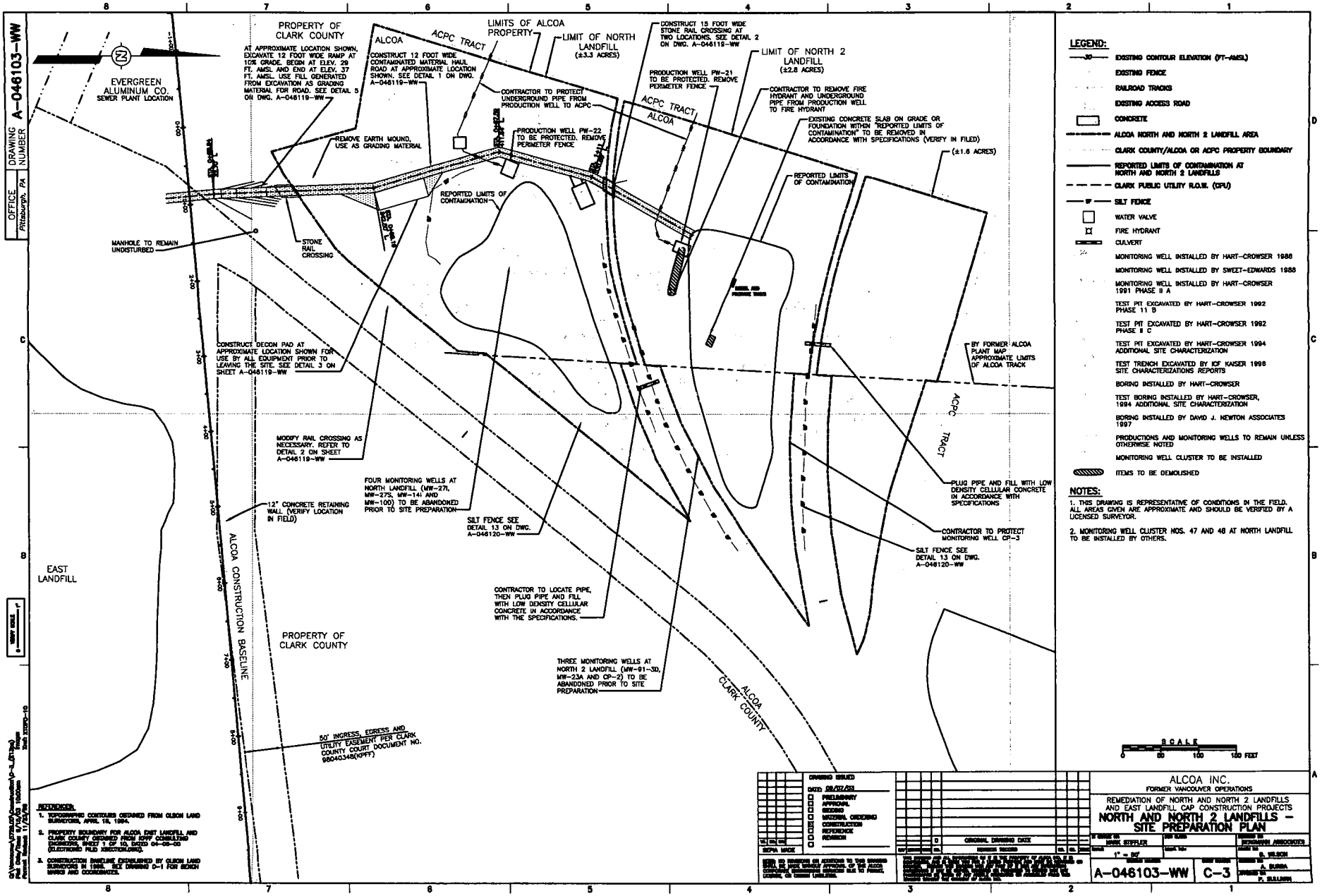
Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Thursday, May 13, 2004 11:50 AM
To: Bruce.Richartz@alcoa.com
Cc: David.Keene@alcoa.com
Subject: Alcoa Drawing C-3

Bruce,

Attached is pdf of drawing Pat Sullivan sent me showing historical sample locations.

Mike


PROPERTY OF CLARK COUNTY
AT APPROXIMATE LOCATION SHOWN, EXCAVATE 12 FOOT WIDE RAMP AT 10% GRADE. BEGIN AT ELEV. 29 FT. AMSL AND END AT ELEV. 37 FT. AMSL. USE FILL GENERATED FROM EXCAVATION AS GRADING MATERIAL FOR ROAD. SEE DETAIL 5 ON DWG. A-046119-WW
EVERGREEN ALUMINUM CO. SEWER PLANT LOCATION
ALCOA
ACPC TRACT
LIMITS OF ALCOA PROPERTY
LIMIT OF NORTH LANDFILL (±3.3 ACRES)
LIMIT OF NORTH 2 LANDFILL (±2.8 ACRES)
CONSTRUCT 12 FOOT WIDE CONTAMINATED MATERIAL HAUL ROAD AT APPROXIMATE LOCATION SHOWN. SEE DETAIL 1 ON DWG. A-046119-WW
CONSTRUCT 15 FOOT WIDE STONE RAIL CROSSING AT TWO LOCATIONS. SEE DETAIL 2 ON DWG. A-046119-WW
CONTRACTOR TO PROTECT UNDERGROUND PIPE FROM PRODUCTION WELL TO ACPC
PRODUCTION WELL PW-21 TO BE PROTECTED. REMOVE PERIMETER FENCE
CONTRACTOR TO REMOVE FIRE HYDRANT AND UNDERGROUND PIPE FROM PRODUCTION WELL TO FIRE HYDRANT
EXISTING CONCRETE SLAB ON GRADE OR FOUNDATION WITHIN "REPORTED LIMITS OF CONTAMINATION" TO BE REMOVED IN ACCORDANCE WITH SPECIFICATIONS (VERIFY IN FILED)
(±1.6 ACRES)
REMOVE EARTH MOUND, USE AS GRADING MATERIAL
PRODUCTION WELL PW-22 TO BE PROTECTED. REMOVE PERIMETER FENCE
REPORTED LIMITS OF CONTAMINATION
MANHOLE TO REMAIN UNDISTURBED
STONE RAIL CROSSING
CONSTRUCT DECON PAD AT APPROXIMATE LOCATION SHOWN FOR USE BY ALL EQUIPMENT PRIOR TO LEAVING THE SITE. SEE DETAIL 3 ON SHEET A-046119-WW
BY FORMER ALCOA PLANT MAP APPROXIMATE LIMITS OF ALCOA TRACK
MODIFY RAIL CROSSING AS NECESSARY. REFER TO DETAIL 2 ON SHEET A-046119-WW
FOUR MONITORING WELLS AT NORTH LANDFILL (MW-27I, MW-27S, MW-14I AND MW-10D) TO BE ABANDONED PRIOR TO SITE PREPARATION
12" CONCRETE RETAINING WALL (VERIFY LOCATION IN FIELD)
SILT FENCE SEE DETAIL 13 ON DWG. A-046120-WW
PLUG PIPE AND FILL WITH LOW DENSITY CELLULAR CONCRETE IN ACCORDANCE WITH SPECIFICATIONS
CONTRACTOR TO PROTECT MONITORING WELL CP-3
SILT FENCE SEE DETAIL 13 ON DWG. A-046120-WW
EAST LANDFILL
ALCOA CONSTRUCTION BASELINE
CONTRACTOR TO LOCATE PIPE, THEN PLUG PIPE AND FILL WITH LOW DENSITY CELLULAR CONCRETE IN ACCORDANCE WITH THE SPECIFICATIONS.
PROPERTY OF CLARK COUNTY
THREE MONITORING WELLS AT NORTH 2 LANDFILL (MW-01-3D, MW-23A AND CP-2) TO BE ABANDONED PRIOR TO SITE PREPARATION
ALCOA CLARK COUNTY
50' INGRESS, EGRESS AND UTILITY EASEMENT PER CLARK COUNTY COURT DOCUMENT NO. 9804034S(KPFF)
REFERENCES:
1. TOPOGRAPHIC CONTOURS OBTAINED FROM OLSON LAND SURVEYORS, APRIL 18, 1994.
2. PROPERTY BOUNDARY FOR ALCOA EAST LANDFILL AND CLARK COUNTY OBTAINED FROM KPFF CONSULTING ENGINEERS, SHEET 1 OF 10, DATED 04-08-00 (ELECTRONIC FILE XREFCTOPO.DWG)
3. CONSTRUCTION BASELINE ESTABLISHED BY OLSON LAND SURVEYORS IN 1998. SEE DRAWING C-1 FOR BEARING MARKS AND COORDINATES.
LEGEND:
EXISTING CONTOUR ELEVATION (FT-AMSL)
EXISTING FENCE
RAILROAD TRACKS
EXISTING ACCESS ROAD
CONCRETE
ALCOA NORTH AND NORTH 2 LANDFILL AREA
CLARK COUNTY/ALCOA OR ACPC PROPERTY BOUNDARY
REPORTED LIMITS OF CONTAMINATION AT NORTH AND NORTH 2 LANDFILLS
CLARK PUBLIC UTILITY R.O.W. (CPU)
SILT FENCE
WATER VALVE
FIRE HYDRANT
CULVERT
MONITORING WELL INSTALLED BY HART-CROWSER 1988
MONITORING WELL INSTALLED BY SWEET-EDWARDS 1988
MONITORING WELL INSTALLED BY HART-CROWSER 1991 PHASE II A
TEST PIT EXCAVATED BY HART-CROWSER 1992 PHASE II B
TEST PIT EXCAVATED BY HART-CROWSER 1992 PHASE II C
TEST PIT EXCAVATED BY HART-CROWSER 1994 ADDITIONAL SITE CHARACTERIZATION
TEST TRENCH EXCAVATED BY ICF KAISER 1998 SITE CHARACTERIZATIONS REPORTS
BORING INSTALLED BY HART-CROWSER
TEST BORING INSTALLED BY HART-CROWSER, 1994 ADDITIONAL SITE CHARACTERIZATION
BORING INSTALLED BY DAVID J. NEWTON ASSOCIATES 1997
PRODUCTIONS AND MONITORING WELLS TO REMAIN UNLESS OTHERWISE NOTED
MONITORING WELL CLUSTER TO BE INSTALLED
ITEMS TO BE DEMOLISHED
NOTES:
1. THIS DRAWING IS REPRESENTATIVE OF CONDITIONS IN THE FIELD. ALL AREAS GIVEN ARE APPROXIMATE AND SHOULD BE VERIFIED BY A LICENSED SURVEYOR.
2. MONITORING WELL CLUSTER NOS. 47 AND 48 AT NORTH LANDFILL TO BE INSTALLED BY OTHERS.
SCALE
0 50 100 150 FEET
DRAWING ISSUED
DATE: 08/07/03
PRELIMINARY
APPROVAL
BIDDING
MATERIAL ORDERING
CONSTRUCTION
REFERENCE
REVISION
SEPIA MADE
ALCOA INC.
FORMER VANCOUVER OPERATIONS
REMEDIATION OF NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP CONSTRUCTION PROJECTS
NORTH AND NORTH 2 LANDFILLS - SITE PREPARATION PLAN
DRAWN BY: MARK SIEFKER
1" = 50'
A-046103-WW
C-3
DESIGNED BY: MCMAHON ASSOCIATES
S. WILSON
A. BURNS
P. SULLIVAN
OFFICE: Pittsburgh, PA
DRAWING NUMBER: A-046103-WW

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Friday, June 11, 2004 1:21 PM
To: Bruce.Richartz@alcoa.com
Subject: Confirmation sampling locations.xls

Bruce,
Attached is summary table of analytical results for North and North 2 landfills.
Mike

Confirmation Sampling Data Summary
North 2 Landfill, Vancouver

June 2004

			Sampling Location		Sampling Results (ppm)				
Sample Name	Sample Date	Survey Point	Baseline	Offset	PCB	PAH	TCE	Elevation	Notes
N2LF-S-001-0	4/23/2004	1421	2+00	655	0.144	11.0	-	28.01	
N2LF-S-002-0	4/23/2004	1422	2+00	685	0.044	**59.1**	-	24.48	
N2LF-S-049-0	5/5/2004	50005	2+00	685	-	2.96	-	21.91	Re-Sample N2LF-S-002
N2LF-S-003-0	4/23/2004	1423	2+00	715	< 0.044	1.83	-	26.34	
N2LF-S-004-0	4/23/2004	1424	2+50	580	0.061	0.651	-	25.41	
N2LF-S-005-0	4/23/2004	1425	2+50	610	0.870	**112**	-	23.20	
N2LF-S-050-0	5/5/2004	50004	2+50	610	-	0.017	-	19.71	Re-Sample N2LF-S-005
N2LF-S-006-0	4/23/2004	1426	2+50	640	0.054	0.550	-	25.14	
N2LF-S-007-0	4/23/2004	1427	2+50	670	< 0.047	0.128	-	23.01	
N2LF-S-008-0	4/23/2004	1428	2+50	700	< 0.047	0.487	-	22.65	
N2LF-S-009-0	4/23/2004	1429	2+50	730	< 0.050	0.010	-	21.30	
N2LF-S-010-0	4/23/2004	1430	2+50	760	< 0.047	0.306	-	23.98	
N2LF-S-010-1	4/23/2004	1430	2+50	760	< 0.046	0.226	-	23.98	
N2LF-S-011-0	4/23/2004	1431	3+00	595	0.105	8.39	-	22.41	
N2LF-S-012-0	4/23/2004	1432	3+00	625	3.53	1.20	-	21.87	
N2LF-S-013-0	4/23/2004	1433	3+00	655	0.055	0.835	-	21.92	
N2LF-S-014-0	4/23/2004	1434	3+00	685	< 0.062	0.068	-	21.05	
N2LF-S-015-0	4/23/2004	1435	3+00	715	< 0.053	0.025	-	21.18	
N2LF-S-016-0	4/23/2004	1436	3+00	745	< 0.053	0.542	-	23.58	
N2LF-S-017-0	4/23/2004	1437	3+00	775	< 0.053	0.888	-	23.89	
N2LF-S-018-0	4/23/2004	1438	3+50	610	< 0.053	0.885	-	22.92	
N2LF-S-019-0	4/23/2004	1439	3+50	640	0.208	0.601	-	21.37	
N2LF-S-020-0	4/23/2004	1440	3+50	670	< 0.061	0.671	-	21.48	
N2LF-S-020-1	4/23/2004	1440	3+50	670	0.169	1.24	-	21.48	
N2LF-S-020-2	4/26/2004	1440	3+50	670	<0.059	0.629	-	21.48	
N2LF-S-021-0	4/23/2004	1441	3+50	700	< 0.064	0.023	-	17.34	
N2LF-S-022-0	4/23/2004	1442	3+50	730	2.63	1.01	-	21.70	
N2LF-S-023-0	4/23/2004	1443	3+50	760	**46.6**	**20.7**	-	20.89	
N2LF-S-052-0	5/5/2004	50006	3+50	760	0.112	-	-	17.78	Re-Sample N2LF-S-023
N2LF-S-063-0	5/13/2004	-	3+50	760	-	0.040	-	17.78	Re-Sample N2LF-S-052
N2LF-S-024-0	4/23/2004	1444	3+50	790	**26.4**	0.075	-	26.79	
N2LF-S-053-0	5/5/2004		3+50	790	0.495	-	-	15.28	Re-Sample N2LF-S-024
N2LF-S-025-0	4/23/2004	1445	4+00	595	No Sample	-	-	27.68	Outside excavation
N2LF-S-026-0	4/23/2004	1446	4+00	625	0.701	0.609	-	20.55	
N2LF-S-027-0	4/23/2004	1447	4+00	655	<0.057	0.031	-	19.97	
N2LF-S-028-0	4/23/2004	1448	4+00	685	0.150	<0.006	-	19.64	

Confirmation Sampling Data Summary
North 2 Landfill, Vancouver

June 2004

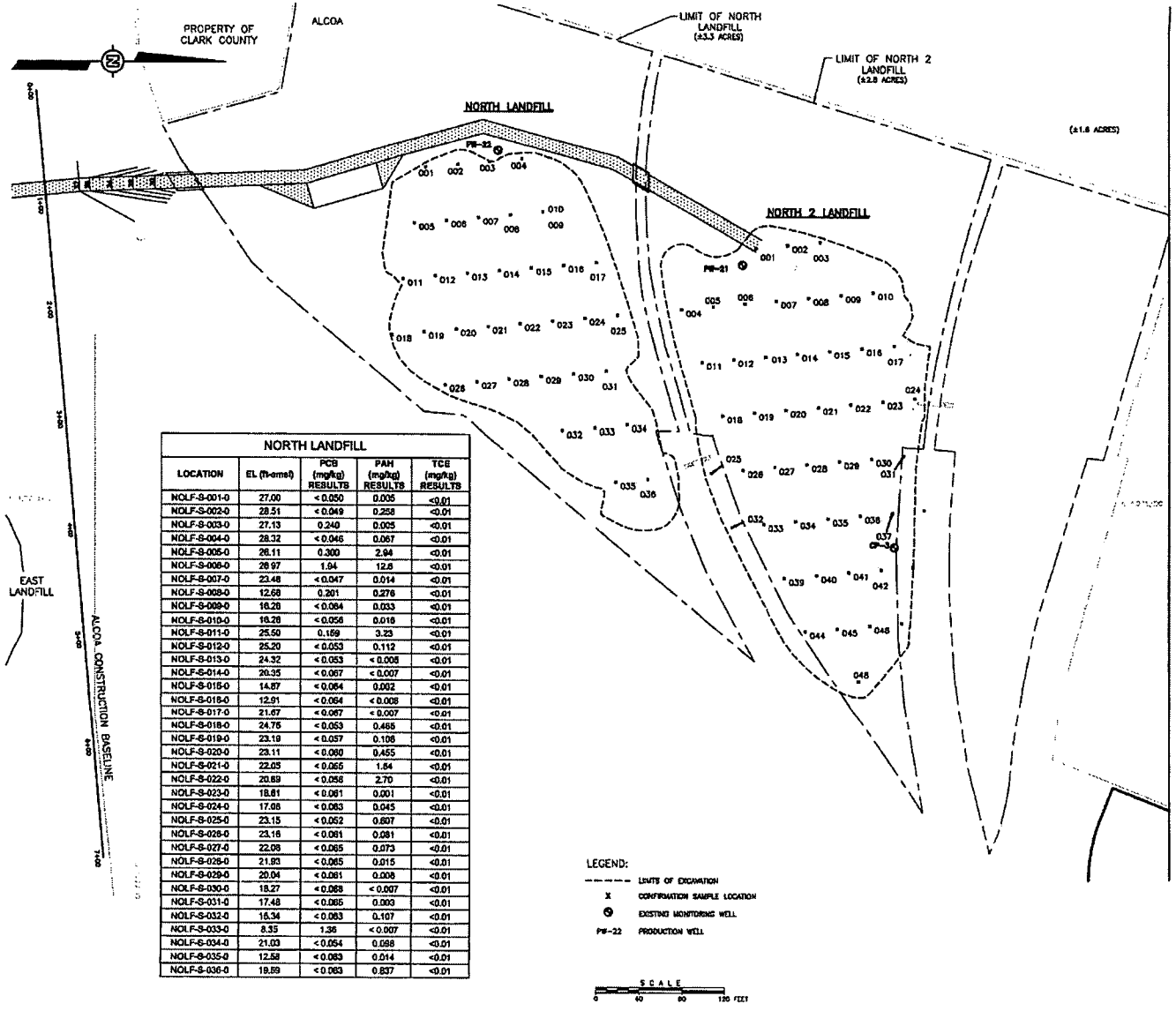
			Sampling Location		Sampling Results (ppm)				
Sample Name	Sample Date	Survey Point	Baseline	Offset	PCB	PAH	TCE	Elevation	Notes
N2LF-S-029-0	4/23/2004	1449	4+00	715	**42.1**	0.029	-	20.16	
N2LF-S-054-0	5/5/2004	50007	4+00	715	<0.060	-	-	15.93	Re-Sample N2LF-S-029
N2LF-S-030-0	4/23/2004	1450	4+00	745	3.07	0.034	-	19.90	
N2LF-S-030-1	4/23/2004	1450	4+00	745	1.57	0.037	-	19.90	
N2LF-S-031-0	4/23/2004	1451	4+00	775	< 0.053	0.743	-	23.38	
N2LF-S-032-0	4/23/2004	1452	4+50	610	0.774	**351**	-	26.82	
N2LF-S-051-0	5/5/2004	50010	4+50	610	-	0.573	-	24.29	Re-Sample N2LF-S-032
N2LF-S-033-0	4/23/2004	1453	4+50	640	0.131	0.058	-	20.38	
N2LF-S-034-0	4/23/2004	1454	4+50	670	0.167	0.044	-	17.50	
N2LF-S-035-0	4/23/2004	1455	4+50	700	**50.5**	0.222	-	19.02	
N2LF-S-055-0	5/5/2004	50009	4+50	700	**82.3**	-	-	15.40	Re-Sample N2LF-S-035
N2LF-S-060-0	5/13/2004	-	4+50	700	1.30	-	-	8.00	Re-Sample N2LF-S-055
N2LF-S-036-0	4/23/2004	1456	4+50	730	**32.4**	0.185	-	19.04	
N2LF-S-056-0	5/5/2004	50008	4+50	730	**93.7**	-	-	15.60	Re-Sample N2LF-S-036
N2LF-S-061-0	5/13/2004	-	4+50	730	0.204	-	-	8.00	Re-Sample N2LF-S-056
N2LF-S-037-0	4/23/2004	1457	4+50	760	1.11	0.118	-	21.18	
N2LF-S-038-0	4/23/2004	1458	4+50	790	No Sample	No Sample	No Sample	27.46	Outside excavation
N2LF-S-039-0	4/23/2004	1459	5+00	655	< 0.066	0.007	-	17.21	
N2LF-S-040-0	4/23/2004	1460	5+00	685	**54.2**	0.102	-	18.68	
N2LF-S-040-1	4/23/2004	1460	5+00	685	**54.7**	0.125	-	18.68	
N2LF-S-040-2	4/26/2004	1460	5+00	685	**147**	0.063	-	18.68	
N2LF-S-057-0	5/5/2004	50011	5+00	685	**24.9**	-	-	15.39	Re-Sample N2LF-S-040
N2LF-S-062-0	5/13/2004	-	5+00	685	<0.063	-	-	13.00	Re-Sample N2LF-S-057
N2LF-S-041-0	4/23/2004	1461	5+00	715	**48.0**	0.086	-	19.91	
N2LF-S-058-0	5/5/2004	50012	5+00	715	<0.056	-	-	16.91	Re-Sample N2LF-S-041
N2LF-S-042-0	4/23/2004	1462	5+00	745	7.99	0.023	-	20.84	
N2LF-S-043-0	4/23/2004	1463	5+00	775	No Sample	No Sample	No Sample	26.34	Outside excavation
N2LF-S-044-0	4/23/2004	1464	5+50	670	0.626	0.056	-	20.65	
N2LF-S-045-0	4/23/2004	1465	5+50	700	0.197	0.044	-	20.14	
N2LF-S-046-0	4/23/2004	1466	5+50	730	< 0.054	<0.005	-	24.67	
N2LF-S-046-1	4/26/2004	1466	5+50	730	<0.051	0.030	-	24.67	
N2LF-S-047-0	4/23/2004	1467	5+50	760	No Sample	No Sample	No Sample	27.97	Outside excavation
N2LF-S-048-0	4/23/2004	1468	6+00	715	No Sample	No Sample	No Sample	27.96	Outside excavation

Richartz, Bruce K.

From: Mike.Drewett@CH2M.com
Sent: Friday, June 25, 2004 12:21 PM
To: Bruce.Richartz@alcoa.com
Subject: Electronic Version of Figure 1 for North/North 2 Landfills

Bruce,
Here is electronic version. Let me know if you can't locate CD we will burn another.
Mike

07-June-2004



NORTH LANDFILL				
LOCATION	EL (ft-amsl)	PCB (mg/kg) RESULTS	PAH (mg/kg) RESULTS	TCE (mg/kg) RESULTS
NOLF-S-001-0	27.00	< 0.050	0.005	<0.01
NOLF-S-002-0	28.51	< 0.049	0.258	<0.01
NOLF-S-003-0	27.13	0.240	0.005	<0.01
NOLF-S-004-0	28.32	< 0.046	0.067	<0.01
NOLF-S-005-0	26.11	0.300	2.94	<0.01
NOLF-S-006-0	26.97	1.94	12.6	<0.01
NOLF-S-007-0	23.48	< 0.047	0.014	<0.01
NOLF-S-008-0	12.68	0.201	0.276	<0.01
NOLF-S-009-0	16.26	< 0.064	0.033	<0.01
NOLF-S-010-0	16.26	< 0.056	0.016	<0.01
NOLF-S-011-0	25.50	0.159	3.23	<0.01
NOLF-S-012-0	25.20	< 0.053	0.112	<0.01
NOLF-S-013-0	24.32	< 0.053	< 0.008	<0.01
NOLF-S-014-0	20.35	< 0.067	< 0.007	<0.01
NOLF-S-015-0	14.87	< 0.064	0.002	<0.01
NOLF-S-016-0	12.91	< 0.064	< 0.008	<0.01
NOLF-S-017-0	21.67	< 0.067	< 0.007	<0.01
NOLF-S-018-0	24.76	< 0.053	0.465	<0.01
NOLF-S-019-0	23.19	< 0.057	0.106	<0.01
NOLF-S-020-0	23.11	< 0.060	0.455	<0.01
NOLF-S-021-0	22.05	< 0.065	1.84	<0.01
NOLF-S-022-0	20.89	< 0.058	2.70	<0.01
NOLF-S-023-0	18.81	< 0.061	0.001	<0.01
NOLF-S-024-0	17.06	< 0.063	0.045	<0.01
NOLF-S-025-0	23.15	< 0.052	0.807	<0.01
NOLF-S-026-0	23.16	< 0.061	0.081	<0.01
NOLF-S-027-0	22.08	< 0.065	0.073	<0.01
NOLF-S-028-0	21.93	< 0.065	0.015	<0.01
NOLF-S-029-0	20.04	< 0.061	0.008	<0.01
NOLF-S-030-0	18.27	< 0.068	< 0.007	<0.01
NOLF-S-031-0	17.48	< 0.065	0.003	<0.01
NOLF-S-032-0	16.34	< 0.063	0.107	<0.01
NOLF-S-033-0	8.35	1.36	< 0.007	<0.01
NOLF-S-034-0	21.03	< 0.054	0.098	<0.01
NOLF-S-035-0	12.58	< 0.063	0.014	<0.01
NOLF-S-036-0	19.69	< 0.063	0.837	<0.01

NORTH 2 LANDFILL			
LOCATION	EL (ft-amsl)	PCB (mg/kg) RESULTS	PAH (mg/kg) RESULTS
N2LF-S-001-0	28.01	0.144	11.0
N2LF-S-002-0	21.91	0.044	2.86
N2LF-S-003-0	26.34	< 0.044	1.83
N2LF-S-004-0	25.41	0.061	0.651
N2LF-S-005-0	19.71	0.870	0.017
N2LF-S-006-0	25.14	0.054	0.550
N2LF-S-007-0	23.01	< 0.047	0.128
N2LF-S-008-0	22.65	< 0.047	0.487
N2LF-S-009-0	21.30	< 0.050	0.010
N2LF-S-010-0	23.98	< 0.047	0.300
N2LF-S-011-0	22.41	0.105	8.39
N2LF-S-012-0	21.87	3.53	1.20
N2LF-S-013-0	21.92	0.055	0.835
N2LF-S-014-0	21.05	< 0.062	0.068
N2LF-S-015-0	21.16	< 0.053	0.025
N2LF-S-016-0	23.58	< 0.053	0.542
N2LF-S-017-0	23.89	< 0.053	0.888
N2LF-S-018-0	22.92	< 0.053	0.885
N2LF-S-019-0	21.37	0.208	0.801
N2LF-S-020-0	21.46	< 0.061	0.671
N2LF-S-021-0	17.34	< 0.064	0.023
N2LF-S-022-0	21.70	2.83	1.01
N2LF-S-023-0	17.76	0.112	0.040
N2LF-S-024-0	16.28	0.495	0.075
N2LF-S-025-0	20.55	0.701	0.609
N2LF-S-027-0	19.97	< 0.057	0.031
N2LF-S-028-0	19.64	0.150	<0.006
N2LF-S-029-0	15.93	< 0.060	0.029
N2LF-S-030-0	18.90	3.07	0.034
N2LF-S-031-0	23.38	< 0.053	0.743
N2LF-S-032-0	24.29	0.774	0.573
N2LF-S-033-0	20.38	0.131	0.058
N2LF-S-034-0	17.50	0.167	0.044
N2LF-S-035-0	8.00	1.30	0.222
N2LF-S-036-0	8.00	0.204	0.186
N2LF-S-037-0	21.18	1.11	0.118
N2LF-S-039-0	17.21	< 0.068	0.007
N2LF-S-040-0	13.00	< 0.063	0.102
N2LF-S-041-0	16.91	< 0.056	0.026
N2LF-S-042-0	20.84	7.99	0.023
N2LF-S-044-0	20.65	0.826	0.056
N2LF-S-045-0	20.14	0.197	0.044
N2LF-S-048-0	24.67	< 0.054	<0.005

Figure 1
ALCOA VANCOUVER OPERATIONS
NORTH AND NORTH 2 LANDFILLS
CONFIRMATION SOIL SAMPLE RESULTS
REYNOLDS METALS COMPANY/ALCOA, INC.
VANCOUVER, WASHINGTON

CH2MHILL

\\ROSA\PROJ\ALCOA\184717\CAD 184717-C-5_(E27pg).dwg

APPENDIX G

WASTE SOIL AND RANDOM FILL PLACEMENT AT EAST LANDFILL

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

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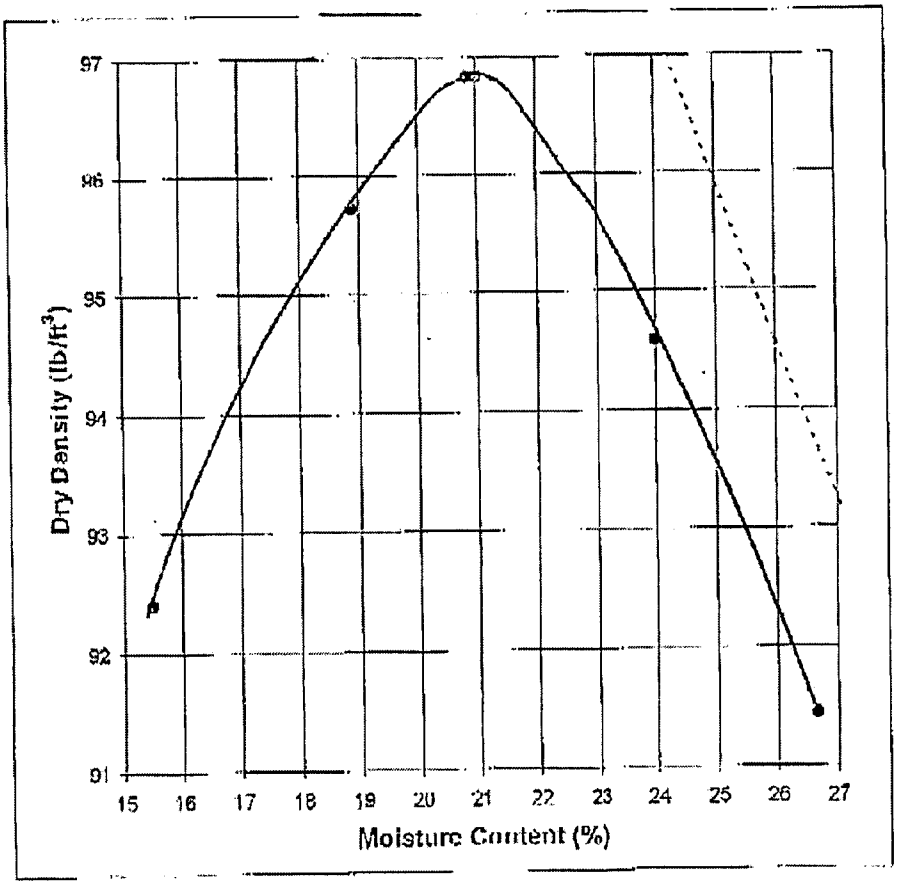
Moisture - Density Relationship

Client: CH2M Hill Engineers (Portland) - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
Material Type: Grey Silt with Recycled Material

03/29/04
Job Number: T0304239
Location: On-Site (North #2)

Test Method:	ASTM D-698 C, C-136, D-2216	**Date Sampled:**	03/17/04
Sample Method:	ASTM D-75	**Date Tested:**	03/18/04
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 21.0% **Max. Dry Density:** 96.8 lbs/ft³
Adjusted Opt Moisture: 20.3% **Adjusted Max Density:** 98.4 lbs/ft³
Percent Passing 3/4" Sieve: 93.9%

dk
cc:

Reviewed By: _____
Ty Toller - Assistant Laboratory Manager

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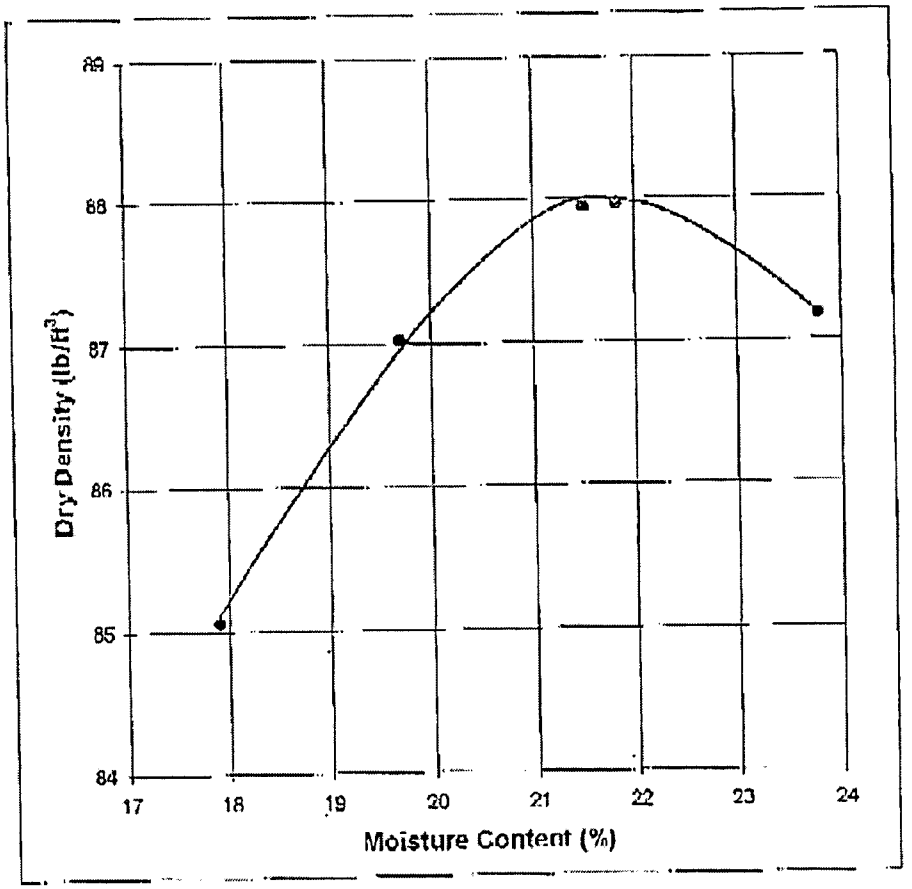
Moisture - Density Relationship

Client: CH2M Hill Engineers (Portland) - Marc Krekos
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03
Material Type: Grey Silt with Recycled Material

03/29/04
Job Number: T0304239
Location: On-Site (North)

Test Method:	ASTM D-698 C, C-136, D-2216	**Date Sampled:**	03/17/04
Sample Method:	ASTM D-75	**Date Tested:**	03/18/04
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.500

Optimum Moisture: 21.8% **Max. Dry Density:** 88.0 lbs/ft³

Percent Passing 3/4" Sieve: 96.6%

dk
cc:

Reviewed By: Ty Toller - Assistant Laboratory Manager

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JOB NO. T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client: CH2M Hill

Project: Alcoa Former Vancouver Operations - Project # 184717-01-01-03

Material Description: Grey silt w/recycled material - From area N2 (North 2)

Max. Dry Density: 98.4 lbs./cu. ft. Optimum Moisture: 20.3 % Serial #: 24463

Method of Test: ASTM D698 Required Compaction: 95% %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
7/6/04	1		Alcoa Baseline: Station 7.0 + 135's of N Silt Fence	1395	142	DT	8"	42.5'	9.2	127.6	116.8	118.7
	2		" : 6.5 + " " "	1911	152	DT	6"	42.5'	9.9	133.4	121.4	123.4
	3		" : 7.5 + " " "	1285	138	DT	6"	42.5'	8.7	130.9	120.5	122.4
	4		Same as test #3	2984	128	DT	6"	42.5'	9.2	113.2	103.7	105.3
	5		" : 7.5 + 125's of N Silt Fence	1650	126	DT	8"	42.5'	8.4	121.0	111.6	113.4
	6		" : 8.0 + 125's of N Silt Fence	1444	141	DT	8"	42.5'	9.2	126.2	115.6	117.4
	7		" : 7.5 + 130' s of N Silt Fence	1846	127	DT	8"	42.5'	8.9	116.6	107.1	108.8
	8		" : 8.0 + 130' s of N Silt Fence	1596	208	DT	8"	42.5'	15.6	122.0	105.5	107.3

Standard Counts - Density: ~~2753~~ 2753 Moisture: 603 Calibration Data: 7/04

Remarks:

- Lots of construction debris, (roots, concrete, brick, metal).
- measurements are approximate
- Alcoa Baseline runs W to E (0.0 to 8.0)

Tested by: M. Odd

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Report Of In-Place Density Tests

Date: 04/08/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 98.4 lbs./cu. ft. **Optimum Moisture:** 20.3 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24463 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/18/2004

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4- 6	40	SF	ALCOA BASELINE STATION 7.0, 135' SOUTH OF WEST SILT FENCE	1395	142	DT	8"	42.5'	9.2	127.6	116.8	100+
4- 6	41	SF	ALCOA BASELINE STATION 6.5, 135' SOUTH OF WEST SILT FENCE	1911	156	DT	6"	42.5'	9.9	133.4	121.4	100+
4- 6	42	SF	ALCOA BASELINE STATION 7.5, 135' SOUTH OF WEST SILT FENCE	1285	138	DT	8"	42.5'	8.7	130.9	120.5	100+
4- 6	43	SF	SAME AS TEST #3	2984	128	DT	6"	42.5'	9.2	113.2	103.7	100+
4- 6	44	SF	ALCOA BASELINE STATION 7.5, 128' SOUTH OF NORTH SILT FENCE	1650	126	DT	6"	42.5'	8.4	121	111.6	100+
4- 6	45	SF	ALCOA BASELINE STATION 8.0, 125' SOUTH OF NORTH SILT FENCE	1444	141	DT	6"	42.5'	9.2	126.2	115.6	100+
4- 6	46	SF	ALCOA BASELINE STATION 7.5, 130' SOUTH OF NORTH SILT FENCE	1846	127	DT	6"	42.5'	8.9	116.6	107.1	100+
4- 6	47	SF	ALCOA BASELINE STATION 8.0, 130' SOUTH OF NORTH SILT FENCE	1596	208	DT	6"	42.5'	15.6	122	105.5	100+

dard Counts - Density: 2753 **Moisture:** 603 **Calibration Data:** 07/04

Please see reverse side for additional information.

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JOB T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA Former Vancouver Operations - Project #184717-01-01-03

Material Description Grey Silt w/recycled material - From area N2 (North 2)

Max. Dry Density 98.4 lbs./cu. ft. Optimum Moisture 20.3 %. Serial # 24463

Method of Test ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/7/04	1		(ALCOA Baseline Stations) 8+0 ↓ 80's of North Silt fence	1534	166	DT	8"	38.0'	11.5	123.4	110.7	112.5
	2		7+5 ↓ 80's	1644	128	DT	8"	38.0'	8.5	120.8	111.4	113.2
	3		7+0 ↓ 80's	1609	168	DT	8"	38.0'	11.9	121.5	108.6	110.4
	4		6+5 ↓ 127's	1497	159	DT	8"	43.0'	10.8	124.4	112.3	114.1
	5		7+0 ↓ 180's	1286	152	DT	8"	43.0'	10.0	130.5	118.6	120.6
	6		7+5 ↓ 127's of N Silt fence	1351	123	DT	8"	43.0'	7.6	128.7	119.6	121.4
	7		7+5 ↓ 180's of N silt fence	1181	157	DT	8"	43.0'	9.3	133.9	122.5	124.5

Standard Counts - Density: _____ Moisture: _____ Calibration Data: 7/04

Remarks:

- Lots of construction debris (bricks, concrete, metal)
- measurements are approximate
- Ex. to ALCOA Baseline runs ~~Northerly~~ W to E (0 to 8+0) w/ 8+0 at East End of landfill.

Tested by M. O-J-J

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Report Of In-Place Density Tests

Date: 04/14/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 98.4 **lbs./cu. ft.** **Optimum Moisture:** 20.3 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24463 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: x **Project Specific, Date:** 03/18/2004

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4- 7	21	NC	ALCO BASELINE STATION 8+0 80' SOUTH OF NORTH SILT FENCE.	1534	166	DT	8"	38.0'	11.5	123.4	110.7	100+
4- 7	22	NC	ALCO BASELINE STATION 7+5 80' SOUTH OF NORTH SILT FENCE.	1644	128	DT	8"	38.0'	8.5	120.8	111.4	100+
4- 7	23	NC	ALCO BASELINE STATION 7+0 80' SOUTH OF NORTH SILT FENCE.	1609	168	DT	8"	38.0'	11.9	121.5	108.6	100+
4- 7	24	NC	ALCO BASELINE STATION 6+5 127' SOUTH OF NORTH SILT FENCE.	1497	159	DT	8"	43.0'	10.8	124.4	112.3	100+
4- 7	25	NC	ALCO BASELINE STATION 7+0 180' SOUTH OF NORTH SILT FENCE.	1286	156	DT	8"	43.0'	10	130.5	118.6	100+
4- 7	26	NC	ALCO BASELINE STATION 7+5 127' SOUTH OF NORTH SILT FENCE.	1351	123	DT	8"	43.0'	7.6	128.7	119.6	100+
4- 7	27	NC	ALCO BASELINE STATION 7+5 180' SOUTH OF NORTH SILT FENCE.	1181	151	DT	8"	43.0'	9.3	133.9	122.5	100+

ndard Counts - Density: 2732 **Moisture:** 608 **Calibration Data:** 07/04

Please see reverse side for additional information.

Remarks:
LOTS OF CONSTRUCTION DEBRIS (BRICKS, CONCRETE, METAL). MEASUREMENTS ARE APPROXIMATE. ALCOA BASELINE RUNS WEST TO EAST (0 TO 8+0) WITH STATION 8+0 AT EAST END OF LANDFILL.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB # T0304259

REPORT OF IN-PLACE DENSITY TESTS

Client CHZM Hill

Project ALCOA Former Vancouver Operations - Project # 184717-01.01-03

Material Description Grey Silt w/recycled material - From area N2 (North 2)

Max. Dry Density 98.4 lbs./cu. ft. Optimum Moisture 20.3 %. Serial # 24467

Method of Test ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. +/- FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/8/04	1		Alcoa Baseline 6 - 134' S of the North Silt Fence	1784	132	DT	8"	43.0	7.2	117.7	107.7	109.5
	2		" 5.5 - 131' S	1552	136	DT	8"	43.0	9.1	123.2	112.9	114.8
	3		" 5.0 - 134' S	1735	206	DT	8"	43.0	16.6	114.1	97.7	99.5
	4		" 5.5 - 185' S	1901	128	DT	8"	42.0	9.0	115.2	105.5	107.3
	5		" 6.0 - 185' S	1569	180	DT	8"	41.0	12.9	122.6	108.5	110.3
	6		" 6.5 - 185' S	1481	136	DT	8"	41.0	8.7	125.0	114.8	116.7
	7		" 6.5 - 262' S	1480	107	DT	8"	41.0	6.6	125.2	117.5	119.4
	8		" 5.5 - 262' S	1980	124	DT	8"	39.0	8.8	113.5	104.4	106.1

Standard Counts - Density: 2738 Moisture: 604 Calibration Data: ~~2/04~~ 7/04

Remarks:
- Lots of construction debris (bricks, concrete, metal)
- Measurements are approximate

Page 1 of 2

ALCOA Baseline runs ~~S to N~~ W to E (0 to 8+) 4/ 80' at East end of Landfill
- Elevation

Tested by MD JJ

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JOB # T03Y235

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M-Hill

Project ALCOA Former Vancouver Operations - Project # 184777 - 01-01-07

Material Description Borey Silt w/recycled material - From area N2 (North 2)

Max. Dry Density 98.4 lbs./cu. ft. Optimum Moisture 20.3 % Serial # 24YC.I

Method of Test ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/28/04	9		ALCOA Baseline	1574	112	DT	8"	39.0	7.1	122.7	114.6	116.4
			5.5 - 262's of the North Silt Fence									
	10		"	1274	115	DT	8"	38.0	6.9	131.3	122.7	124.7
			6.5 - 395's	"	"	"	"	"	"	"	"	
	11		"	1617	129	DT	8"	38.0	8.6	121.6	111.9	113.8
			6.0 - 395's	"	"	"	"	"	"	"	"	

Standard Counts - Density: 7738 Moisture: 604 Calibration Data: 7/04

Remarks:

See page # 1

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Report Of In-Place Density Tests

Date: 04/12/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 98.4 **lbs./cu. ft.** **Optimum Moisture:** 20.3 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/18/2004

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4- 8	1	NC	ALCOA BASELINE 6 - 134' S. OF THE NORTH SILT FENCE	1784	132	DT	8"	43.0	9.2	117.7	107.9	100+
4- 8	2	NC	ALCOA BASELINE 5.5 - 134' S. OF THE NORTH SILT FENCE	1552	136	DT	8"	43.0	9.1	123.2	112.9	100+
4- 8	3	NC	ALCOA BASELINE 5.0 - 134' S. OF THE NORTH SILT FENCE	1935	206	DT	8"	43.0	16.6	114.1	97.9	99
4- 8	4	NC	ALCOA BASELINE 5.5 - 185' S. OF THE NORTH SILT FENCE	1901	128	DT	8"	42.0	9	115.2	105.6	100+
4- 8	5	NC	ALCOA BASELINE 6.0 - 185' S. OF THE NORTH SILT FENCE	1569	180	DT	8"	41.0	12.9	122.6	108.6	100+
4- 8	6	NC	ALCOA BASELINE 6.5 - 185' S. OF THE NORTH SILT FENCE	1481	136	DT	8"	41.0	8.9	125	114.8	100+
4- 8	7	NC	ALCOA BASELINE 6.5 - 262' S. OF THE NORTH SILT FENCE	1480	107	DT	8"	41.0	6.6	125.2	117.5	100+
4- 8	8	NC	ALCOA BASELINE 5.5 - 262' S. OF THE NORTH SILT FENCE	1980	124	DT	8"	39.0	8.8	113.5	104.4	100+

Standard Counts - Density: 2738 **Moisture:** 604 **Calibration Data:** 07/04

Please see reverse side for additional information.

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% C
				1574	112	DT	8"	39.0	7.1	122.7	114.6	
4- 8	9	NC	ALCOA BASELINE 5.5 - 262' S. OF THE NORTH SILT FENCE									100+
				1274	115	DT	8"	38.0	6.9	131.1	112.7	
4- 8	10	NC	ALCOA BASELINE 6.5 - 345' S. OF THE NORTH SILT FENCE									100+
				1617	129	DT	8"	38.0	8.6	121.6	111.9	
4- 8	11	NC	ALCOA BASELINE 6.0 - 345' S. OF THE NORTH SILT FENCE									100+

Remarks:

LOTS OF CONSTRUCTION DEBRIS (BRICKS, CONCRETE, METAL). MEASUREMENTS ARE APPROXIMATE. ALCOA BASE LINE RUNS WEST TO EAST (0 TO 8.0) W/ 8.0 AT EAST END OF LANDFILL.

CC: ELEVATIONS ARE FROM +1,

Project Manager:

Reviewed By:

Typist: MHX

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JOB NO. T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA Former Vancouver Operations - Project # 184717-01.01.03

Material Description Grey Silt w/recycled material - From Area NE (North 2) ~~(East Landfill)~~

Max. Dry Density 98.4 lbs./cu. ft. Optimum Moisture 20.3 % Serial # 24463

Method of Test ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/9/04	1		ALCOA Baseline - 515 : 100' S of the North Silt Fence	1688	165	DT	8"	38'	11.1	119.9	107.3	109.1
	2		" - 515 : 150' S	1866	179	DT	8"	38'	13.5	115.9	102.1	103.8
	3		" - 515 : 200' S	1786	~~159~~ 159	DT	8"	39'	11.4	117.7	105.6	107.4
	4		" - 510 : 200' S	2130	204	DT	8"	37'	16.8	110.6	94.7	96.2
	5		" - 415 : 200' S	1869	155	DT	8"	37'	11.3	115.9	104.2	105.9
	6		" - 410 : 200' S	2805	178	DT	8"	36'	14.3	108.3	95.6	97.2
	7		" - 410 : 150' S	2708	157	DT	8"	37'	12.2	109.4	97.4	99.0
	8		" - 415 : 150' S	2073	169	DT	8"	37'	13.1	111.8	98.9	100.5

Standard Counts - Density: 2752 Moisture: 610 Calibration Data: 7/04

Remarks:

- Lots of construction debris (bricks, metal, concrete)
- Measurements are approximate
- Alcoa Baseline runs W(0) to E(P)
- NW area of East Landfill tested today

Page 1 of 2

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JOB NO. T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA Former Vancouver Operations - Project # 184717-01 01 03

Material Description brey Silt Recycled Material - from Area NZ (North 2)

Max. Dry Density 98.4 lbs./cu. ft. Optimum Moisture 20.3 % Serial # 24463

Method of Test ASTM 698 Required Compaction: 95 % %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT +/-	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
				2500	145	DT	8"	37'	11.6	104.5	93.6	
4/4/04	9		ALCOA Baseline 510' : 150' S of the North Silt Fence									95%

Standard Counts - Density: 2752 Moisture: 610 Calibration Data: 7/04

Remarks:

- See page 1

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Report Of In-Place Density Tests

Date: 04/12/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 98.4 **lbs./cu. ft.** **Optimum Moisture:** 20.3 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24463 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/18/2004

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4- 9	12	NC	ALCOA BASE LINE - STATION 5+5: 100' S. OF THE NORTH SILT FENCE	1688	165	DT	8"	38'	11.1	119.9	107.3	100+
4- 9	13	NC	ALCOA BASE LINE - STATION 5+5: 150' S. OF THE NORTH SILT FENCE	1866	179	DT	8"	38'	13.5	115.9	102.1	100+
4- 9	14	NC	ALCOA BASE LINE - STATION 5+5: 200' S. OF THE NORTH SILT FENCE	1786	159	DT	8"	39'	11.4	117.7	105.6	100+
4- 9	15	NC	ALCOA BASE LINE - STATION 5+0: 200' S. OF THE NORTH SILT FENCE	2130	204	DT	8"	37'	16.8	110.6	94.7	96
4- 9	16	NC	ALCOA BASE LINE - STATION 4+5: 200' S. OF THE NORTH SILT FENCE	1869	155	DT	8"	37'	11.3	115.9	104.2	100+
4- 9	17	NC	ALCOA BASE LINE - STATION 4+0: 200' S. OF THE NORTH SILT FENCE	2205	178	DT	8"	36'	14.3	109.3	95.6	97
4- 9	18	NC	ALCOA BASE LINE - STATION 4+0: 150' S. OF THE NORTH SILT FENCE	2208	157	DT	8"	37'	12.2	109.4	97.4	99
4- 9	19	NC	ALCOA BASE LINE - STATION 4+5: 150' S. OF THE NORTH SILT FENCE	2073	169	DT	8"	37'	13.1	111.8	98.9	100+

ndard Counts - Density: 2752 **Moisture:** 610 **Calibration Data:** 07/04

Please see reverse side for additional information.

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% C
4- 4	20	NC	ALCOA BASE LINE - STATION 5+50: 150' S. OF THE NORTH SILT FENCE	2500	145	DT	8"	37'	11.6	104.5	93.5	95

Remarks:

ALCOA BASELINE RUNS WEST(0) TO EAST(8). N.W. AREA OF EAST LANDFILL TESTED TODAY. MEASUREMENTS ARE APPROXIMATE, LOTS OF CONSTUCITON DEBRIS (BRICKS, METAL, AND CONCRETE).

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB NO. T0304639

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M - Hill

Project ALCOA Former Vancouver Operations - Project # 184717 - 01.01.03

Material Description Gray Silt w/recycled material - from area N2 (North 2)

Max. Dry Density 98.4 lbs./cu. ft. Optimum Moisture 20.3 %. Serial # 24463

Method of Test ASTM 698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/12/04	1			1770	195	DT	8"	39'	14.9	117.5	102.2	
			ALCOA Baseline 6+10 ↓ 120' ↓ South of the North Slit Fence									103.9
	2		"	1956	175	DT	8"	39'	13.5	113.6	100.1	
			5+85 ↓ 120' S			"	"	"				101.7
	3		"	2130	159	DT	8"	39'	12.4	110.3	98.2	
			5+0 ↓ 120' S			"	"	"				99.8
	4		"	~~2659~~ 2313	154	DT	8"	40'	12.3	107.1	95.4	
			4+5 ↓ 120' S			"	"	"				96.9
	5		"	~~3304~~ 2659	108	DT	8"	41'	8.3	101.9	94.1	
			4+0 ↓ 120' S			"	"	"				95.6
	6		"	~~1550~~ 3378	96	DT	8"	41.5'	6.8	106.9	100.2	
			4+5 ↓ 270' S			"	"	"				101.8
	7		"	~~1652~~ 1950	81	DT	8"	41'	5.1	114.1	108.7	
			5+0 ↓ 270' S			"	"	"				110.4
	8		"	1652	94	DT	8"	40	5.8	120.7	114.2	
			5+5 ↓ 270' S			"	"	"				115.9

Standard Counts - Density: 2722 Moisture: 606 Calibration Data: 3/04

Remarks:

- Lots of Construction debris (brick, concrete, metal)
- Today's tests were on the west half of the east landfill
- Discussed today's test results w/ [illegible] Contractor before leaving.

1 of 2

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JOB NO. T0304235

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALLOA Former Vancouver Operations - Project #184717-01-01-03

Material Description Grey silt w/recycled material from cell N2 (North 2)

Max. Dry Density 98.4 lbs./cu. ft. Optimum Moisture 20.3 %. Serial # 741463

Method of Test ASTM 698 Required Compaction: 95% %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/12/04	9		ALLOA Baseline 6+00 @ 350' S of the North Site Fence	1349	183	DT	8"	38'	12.1	128.5	114.3	116.1
	10		"	2143	206	DT	8"	38'	17.3	109.9	93.7	95.2
				5+50	@	"	"	"	"			
	11		"	2101	196	DT	8"	38'	16.1	110.7	95.4	96.9
				5+00	@	"	"	"	"			
	12		"	1396	152	DT	8"	38'	10.0	127.1	115.5	117.4
				4+45	@	"	"	"	"			

Standard Counts - Density: 2722 Moisture: 606 Calibration Data: 7/04

Remarks:

See page 1

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Report Of In-Place Density Tests

Date: 04/15/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 98.4 lbs./cu. ft. **Optimum Moisture:** 20.3 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24463 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/18/2004

__ **Supplied By Client** __ **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4-12	28	NC	ALCOA BASELINE - STATION 6+10 120' SOUTH OF TEHF NORTH SILT FENCE	1770	195	DT	8'	39'	14.9	117.5	102.2	100+
4-12	29	NC	ALCOA BASELINE - STATION 5+5 120' SOUTH OF TEHF NORTH SILT FENCE	1956	175	DT	8'	39'	13.5	113.6	100.1	100+
4-12	30	NC	ALCOA BASELINE - STATION 5+0 120' SOUTH OF TEHF NORTH SILT FENCE	2130	159	DT	8'	39'	12.4	110.3	98.2	100
4-12	31	NC	ALCOA BASELINE - STATION 4+5 120' SOUTH OF TEHF NORTH SILT FENCE	2313	154	DT	8'	40'	12.3	107.1	95.4	97
4-12	32	NC	ALCOA BASELINE - STATION 4+0 270' SOUTH OF TEHF NORTH SILT FENCE	2654	108	DT	8'	41'	8.3	101.9	94.1	96
4-12	33	NC	ALCOA BASELINE - STATION 4+5 270' SOUTH OF TEHF NORTH SILT FENCE	3338	96	DT	8'	41.5'	6.8	106.9	100.2	100+
4-12	34	NC	ALCOA BASELINE - STATION 5+0 270' SOUTH OF TEHF NORTH SILT FENCE	1950	81	DT	8'	41'	5.1	114.1	108.7	100+
4-12	35	NC	ALCOA BASELINE - STATION 5+5 270' SOUTH OF TEHF NORTH SILT FENCE	1652	94	DT	8'	40'	5.8	120.7	114.0	100+

Standard Counts - Density: 2722 **Moisture:** 606 **Calibration Data:** 07/04

Please see reverse side for additional information.

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Co
4-12	36	NC	ALCOA BASELINE - STATION 6+0 350' SOUTH OF TEHF NORTH SILT FENCE	1344	183	DT	8'	38'	12.4	128.5	114.3	100+
4-12	37	NC	ALCOA BASELINE - STATION 5+5 350' SOUTH OF TEHF NORTH SILT FENCE	2143	206	DT	8'	38'	17.3	109.9	93.7	95
4-12	38	NC	ALCOA BASELINE - STATION 5+0 350' SOUTH OF TEHF NORTH SILT FENCE	2101	196	DT	8'	38'	16.1	110.7	95.4	97
4-12	39	NC	ALCOA BASELINE - STATION 4+5 350' SOUTH OF TEHF NORTH SILT FENCE	1396	152	DT	8'	38'	10	127.1	115.5	100+

Remarks:

LOTS OF CONSTRUCITON DEBRIS (BRICK,CONCRETE, AND METAL). TESTS WERE ON TEH WEST HALF OF THE EAST LANDFILL. DISCUSSED TESTS RESULTS W/ RICK OF ENVIORCON BEFORE LEAVING.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB # T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA Former Vancouver Operations / Project # 184717-01 01-03

Material Description brey Silt w/recycled material - from area NE (North)

Max. Dry Density 88@ lbs./cu. ft. Optimum Moisture 20.8 %. Serial # 24467

Method of Test ASTM 698 Required Compaction: 95% %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/13/04	1			1939	140	DT	8"	38'	10.1	114.4	103.9	
			AlCOA Baseline 4+0 + 300' South of the North silt fence									111.1
	2		"	1782	179	DT	8"	38'	13.3	117.5	103.7	
			4+5 + "			"	"	"				117.9
	3		"	1674	175	DT	8'	38'	12.6	120.0	106.6	
			5+0 + "			"	"	"				121.1
	4		"	1833	121	DT	8'	38'	8.2	116.6	107.8	
			5+5 + "			"	"	"				122.5
	5		"	2741	97	DT	8'	37.5'	7.2	100.9	94.1	
			5+5 + 350' South of the North silt fence									106.9
	6		"	1210	158	DT	8"	37.5'	9.9	133.0	121.0	
			5+0 + "			"	"	"				137.5
	7		"	1617	172	DT	8"	37.5'	12.2	121.4	108.2	
			4+5 + "			"	"	"				123
	8		"	1636	189	DT	8"	37.5'	13.8	120.9	106.2	
			4+0 + "			"	"	"				120.7

Standard Counts - Density: 2739 Moisture: 609 Calibration Data: 7/04

Remarks:

- Lots of construction debris (bricks, concrete, metal)
- measurements are approximate
- discussed results with Rick of Environ before leaving
- today, the SW corner area of the East landfill was tested

Tested by MDJJ

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Report Of In-Place Density Tests

Date: 04/19/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 88.0 **lbs./cu. ft.** **Optimum Moisture:** 21.8 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/02/2031

__ **Supplied By Client** __ **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4-13	40	NC	ALCOA BASELINE STATION 4+0, 300' S. OF THE NORTH SILT FENCE.	1939	140	DT	8"	38'	10.1	114.4	103.9	100+
4-13	41	NC	ALCOA BASELINE STATION 4+5, 300' S. OF THE NORTH SILT FENCE.	1782	179	DT	8"	38'	13.3	117.5	103.7	100+
4-13	42	NC	ALCOA BASELINE STATION 5+0, 300' S. OF THE NORTH SILT FENCE.	1674	175	DT	8"	38'	12.6	120	106.6	100+
4-13	43	NC	ALCOA BASELINE STATION 5+5, 300' S. OF THE NORTH SILT FENCE.	1833	121	DT	8"	38'	8.2	116.6	107.8	100+
4-13	44	NC	ALCOA BASELINE STATION 5+5, 350' S. OF THE NORTH SILT FENCE.	2741	97	DT	8"	37.5'	7.2	100.9	94.1	100+
4-13	45	NC	ALCOA BASELINE STATION 5+0, 350' S. OF THE NORTH SILT FENCE.	1210	158	DT	8"	37.5'	9.9	133	121.0	100+
4-13	46	NC	ALCOA BASELINE STATION 4+5, 350' S. OF THE NORTH SILT FENCE.	1617	172	DT	8"	37.5'	12.2	121.4	108.2	100+
4-13	47	NC	ALCOA BASELINE STATION 4+0, 350' S. OF THE NORTH SILT FENCE.	1636	189	DT	8"	37.5'	13.8	120.9	106.2	100+

Standard Counts - Density: 2739 **Moisture:** 609 **Calibration Data:** 07/04

Please see reverse side for additional information.

Remarks:

LOTS OF CONSTRUCITON DEBRIS (BRICKS, CONCRETE, METAL). MEASUREMENTS ARE APPROXIMATE. DISCUSSED RESULTS WITH RICK OF ENVIROSEN BEFORE LEAVING. THE SW CORNER AREA OF THE EAST LANDFILL WAS TESTED.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB # T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA Former Vancouver Operations / Project # 184717-01-01:03

Material Description brey silt w/recycled material - from area N (North) 21-B

Max. Dry Density 88.0 lbs./cu. ft. Optimum Moisture ~~~~ % Serial # 24467

Method of Test ASTM C98 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
				1781	139	DT	8"	33'	9.9	118.0	107.4	
4/14/04	1		ALCOA Baseline : 8+5 / 225' N of the South Burm									122.0
	2		"	2003	239	DT	8"	33'	20.9	111.9	92.1	
			: 8+5 / 125' N	"	"							104.6
	3		"	1903	126	DT	8"	33'	9.0	115.3	105.8	
			: 7+5 / 75' N	"	"							120.3
	4		"	1398	184	DT	8"	31'	12.9	127.4	112.9	
			: 6+5 / 75' N	"	"							128.3
	5		"	1514	128	DT	8"	31'	8.4	124.5	114.8	
			: 5+5 / 20' N	"	"							130.5
	6		"	1967	128	DT	8"	30'	9.3	114.1	104.4	
			: 5+5 / 20' N	"	"							118.7
	7		"	2214	138	DT	8"	30'	10.6	109.4	98.9	
			: 6+5 / 20' N	"	"							112.3

Standard Counts - Density: 2757 Moisture: 598 Calibration Data: 7/04

Remarks:

- Lots of construction debris (brick, metal, concrete)
- East landfill, area tested was S + SE corner
- Discussed results w/Rick of Environcon, before leaving
- measurements are approximate.

Tested by MDJJ

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Report Of In-Place Density Tests

Date: 04/19/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MARC KREKOS

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 88.0 **lbs./cu. ft.** **Optimum Moisture:** 21.8 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/02/2031

__ **Supplied By Client** __ **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4-14	48	NC	ALCOA BASELINE: STATION 8+5 225' NORTH OF THE SOUTH BURN	1781	139	DT	8"	33'	9.9	118	107.4	100+
4-14	49	NC	ALCOA BASELINE: STATION 8+5 125' NORTH OF THE SOUTH BURN	2003	239	DT	8"	33'	20.9	111.4	92.1	100+
4-14	50	NC	ALCOA BASELINE: STATION 7+5 75' NORTH OF THE SOUTH BURN	1908	126	DT	8"	33'	9	115.3	105.8	100+
4-14	51	NC	ALCOA BASELINE: STATION 6+5 75' NORTH OF THE SOUTH BURN	1398	184	DT	8"	31'	12.9	127.4	112.9	100+
4-14	52	NC	ALCOA BASELINE: STATION 5+5 20' NORTH OF THE SOUTH BURN	1514	128	DT	8"	31'	8.4	124.5	114.8	100+
4-14	53	NC	ALCOA BASELINE: STATION 5+5 20' NORTH OF THE SOUTH BURN	1967	128	DT	8"	30'	9.3	114.1	104.4	100+
4-14	54	NC	ALCOA BASELINE: STATION 6+5 20' NORTH OF THE SOUTH BURN	2214	138	DT	8"	30'	10.6	109.4	98.9	100+

ard Counts - Density: 2757 **Moisture:** 598 **Calibration Data:** 07/04

Please see reverse side for additional information.

Remarks:

EAST LANDFILL, AREA TESTED WAS S. & SE. CORNER. DISCUSSED RESULTS WITH RICK OF ENVIROCON, BEFORE LEAVING. MEASUREMENTS ARE APPROXIMATE. LOTS OF CONSTRUCTION DEBRIS (BRICKS, METAL, CONCRETE).

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA Former Vancouver Operations / Project # 184717 01-01 03

Material Description Grey silt w/recycled material - From area 'N' (north)

Max. Dry Density 88.0 lbs./cu. ft. Optimum Moisture 21.8 % Serial # 24467

Method of Test ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☑ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
4/15/04	1		ALCOA STATION - 5+5 / 100's of the N. Silt Fence	2353	238	DT	8"	43'	22.6	103.1	84.0	95.5
	2		" - 4+5 / 100's	2259	188	DT	8"	43'	15.9	107.0	92.7	105.3
	3		" - 5+0 / 150's	2094	76	DT	8"	43.5'	14.1	111.1	97.4	110.7
	4		" - 6+0 / 150's	1342	197	DT	8"	44'	13.7	128.7	113.2	128.6
	5		" - 6+0 / 225's	1893	135	DT	8"	42.5'	9.7	115.3	105.1	119.5
	6		" - 5+5 / 225's	2716	139	DT	8"	42.0'	11.6	101.1	90.6	102.9
	7		" - 5+0 / 275's	2463	141	DT	8"	42.5'	11.3	101.9	91.2	103.1

Standard Counts - Density: 2737 Moisture: 603 Calibration Data: 7/04

Remarks:
- Lots of construction debris (bricks, metals, concrete)
- Measurements are approximate
- NW corner of the East landfill tested today
- Talked to Rick w/Environcon regarding test results

Tested by M. D. J. J.

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Report Of In-Place Density Tests

Date: 04/21/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 88.0 **lbs./cu. ft.** **Optimum Moisture:** 21.8 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/02/2031

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4-15	55	NC	ALCOA STATION 5+5: 100' SOUTH OF THE NORHT SILT FENCE	2353	238	DT	8"	43'	22.6	103.1	84.0	95
4-15	56	NC	ALCOA STATION 4+5: 100' SOUTH OF THE NORHT SILT FENCE	2299	188	DT	8"	43'	15.9	107.4	92.7	100+
4-15	57	NC	ALCOA STATION 5+0: 150' SOUTH OF THE NORHT SILT FENCE	2094	76	DT	8"	43.5'	14.1	111.1	97.4	100+
4-15	58	NC	ALCOA STATION 6+0: 150' SOUTH OF THE NORHT SILT FENCE	1342	197	DT	8"	44'	13.7	128.7	113.2	100+
4-15	59	NC	ALCOA STATION 6+0: 225' SOUTH OF THE NORHT SILT FENCE	1893	135	DT	8"	42.5'	9.7	115.3	105.1	100+
4-15	60	NC	ALCOA STATION 5+5: 225' SOUTH OF THE NORHT SILT FENCE	2716	139	DT	8"	42.0'	11.6	101.1	90.6	100+
4-15	61	NC	ALCOA STATION 5+0: 225' SOUTH OF THE NORHT SILT FENCE	2463	141	DT	8"	42.5'	11.3	104.9	94.2	100+

Standard Counts - Density: 2737 **Moisture:** 603 **Calibration Data:** 07/04

Please see reverse side for additional information.

Remarks:

LOTS OF CONSTRUCITON DEBRIS (BRICKS, METALS, CONCRETE). MEASUREMENTS ARE APPROXIMATE AND NW CORNER OF THE EAST LANDFILL TESTED TODAY. TALKED TO RICK WITH ENVIROCON REGARDING TEST RESULTS.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB NO. T0304259

REPORT OF IN-PLACE DENSITY TESTS

Client: CH2M Hill

Project: ALCOA Former Vancouver Operations | Project # 184717-01-01-03

Material Description: Grey silt w/recycled material - from area "N" (North)

Max. Dry Density: 88.0 lbs./cu. ft. Optimum Moisture: 21.8 %. Serial #: 24467

Method of Test: ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	DRY	% COMP.
4/19/04	1		Alcoa Baseline: 4+0 / 90' S of the north sill fence line	2339	111	DT	8"	40'±	8.1	106.9	98.9	112.4
	2		" : 4+0 / 175' S	2397	201	DT	8"	39'	17.4	105.6	89.9	102.2
	3		" : 4+0 / 250' S	1570	155	DT	8"	38'	10.6	122.5	110.7	125.8
	4		" : 4+75 / 175' S	2706	110	DT	8"	40'	8.5	101.2	93.3	106.0
	5		" : 4+75 / 105' S	1855	109	DT	8"	40'	7.2	116.1	108.2	123.0
	6		" : 5+0 / 75' S	2402	163	DT	8"	41'	13.3	105.7	93.2	105.9
	7		" : 5+0 / 150' S	2897	89	DT	8"	40'	6.6	98.6	92.5	105.1

Standard Counts - Density: 2728 Moisture: 609 Calibration Data: 8/03

Remarks: - Lots of Construction Debris (bricks, concrete, metal)

- measurements are approximate

- NW corner of the Cost landfill was tested today

~~[illegible]~~

Tested by: [signature]

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Report Of In-Place Density Tests

Date: 04/26/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 88.0 **lbs./cu. ft.** **Optimum Moisture:** 21.8 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/02/2031

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	Dry	% Comp.
4-19	62	NC	ALCOA BASELINE: STATION 4+0 90' S. OF THE NORTH SILT FENCE LINE.	2339	111	DT	8"	40'~	8.1	106.9	98.9	100+
4-19	63	NC	ALCOA BASELINE: STATION 4+0 175' S. OF THE NORTH SILT FENCE LINE.	2397	201	DT	8"	39'	17.4	105.6	89.9	100+
4-19	64	NC	ALCOA BASELINE: STATION 4+0 250' S. OF THE NORTH SILT FENCE LINE.	1570	155	DT	8"	38'	10.6	122.5	110.7	100+
4-19	65	NC	ALCOA BASELINE: STATION 4+5 175' S. OF THE NORTH SILT FENCE LINE.	2706	110	DT	8"	40'	8.5	101.2	93.3	100+
4-19	66	NC	ALCOA BASELINE: STATION 4+5 105' S. OF THE NORTH SILT FENCE LINE.	1855	109	DT	8"	40'	7.2	116.1	108.2	100+
4-19	67	NC	ALCOA BASELINE: STATION 5+0 75' S. OF THE NORTH SILT FENCE LINE.	2402	163	DT	8"	41'	13.3	105.7	93.2	100+
4-19	68	NC	ALCOA BASELINE: STATION 5+0 150' S. OF THE NORTH SILT FENCE LINE.	2897	89	DT	8"	40'	6.6	98.6	92.5	100+

Standard Counts - Density: 2728 **Moisture:** 609 **Calibration Data:** 08/03

Please see reverse side for additional information.

Remarks:
LOTS OF CONSTRUCITON DEBRIS: (BRICKS, CONCRETE, METAL). MEASUREMENTS ARE APPROXIMATE. NORTHWEST OF THE LANDFILL WAS TESTED TODAY.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB NO. T0304259

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA Former Vancouver Operations | Project # 184717-01.01-03

Material Description brey Silt w/recycled material - From area "N" (North)

Max. Dry Density 88.0 lbs./cu. ft. Optimum Moisture 21.8 %. Serial # 24467

Method of Test ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/20/04	1			2278	157	DT	8"	43'	12.4	108.2	96.2	
			ALCOA Baseline : 510 / 150' North of the South Burm									109.3
	2		"	2342	216	DT	8"	43'	18.9	106.8	89.9	
			: 515 / 200'						"	"		102.1
	3		"	~~2036~~ 2269	222	DT	8	43'	20.7	101.6	84.2	
			: 610 / 150'						"	"		95.7
	4		"	2036	154	DT	8"	43'	11.6	112.6	100.9	
			: 615 / 200'						"	"		114.7
	5		"	2148	198	DT	8"	42'	16.3	110.3	94.9	
			: 710 / 150'						"	"		107.8
	6		"	2863	179	DT	8"	42'	16.2	99.1	85.3	
			: 710 / 200'									91.9

Standard Counts - Density: 2754 Moisture: 609 Calibration Data: 8/03

Remarks:

- measurements are approximate
- Lots of construction debris (bricks, concrete, metals)
- Area tested today: East landfill
- Discussed test results w/Rick of Environcon before leaving.

Tested by MJJ

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Report Of In-Place Density Tests

Date: 04/26/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 88.0 **lbs./cu. ft.** **Optimum Moisture:** 21.8 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/02/2031

__ **Supplied By Client** __ **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4-20	69	NC	ALCOA BASELINE: STATION 5+0 150' NORTH OF THE SOUTH BARM	2278	157	DT	8"	43'	12.4	108.2	96.2	100+
4-20	70	NC	ALCOA BASELINE: STATION 5+5 200' NORTH OF THE SOUTH BARM	2342	216	DT	8"	43'	18.9	106.8	89.9	100+
4-20	71	NC	ALCOA BASELINE: STATION 6+0 150' NORTH OF THE SOUTH BARM	2669	222	DT	8"	43'	20.7	101.6	84.2	96
4-20	72	NC	ALCOA BASELINE: STATION 6+5 200' NORTH OF THE SOUTH BARM	2036	154	DT	8"	43'	11.6	112.6	100.9	100+
4-20	73	NC	ALCOA BASELINE: STATION 7+0 150' NORTH OF THE SOUTH BARM	2148	198	DT	8"	42'	16.3	110.3	94.9	100+
4-20	74	NC	ALCOA BASELINE: STATION 7+0 200' NORTH OF THE SOUTH BARM	2863	179	DT	8"	42'	16.2	99.1	85.3	97

Standard Counts - Density: 2754 **Moisture:** 609 **Calibration Data:** 08/03

Please see reverse side for additional information.

Remarks:

LOTS OF CONSTRUCITON DEBRIS: (BRICKS, CONCRETE, METAL). MEASUREMENTS ARE APPROXIMATE. AREA TESTED TODAY: EAST LANDFILL. DISCUSSED TEST RESULTS WITH RICK OR ENVIROCON BEFOR LEAVING.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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P.O. T0304739

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA - Former Vancouver Operations / Project # 184717 01 01 03

Material Description Grey Silt "recycled material" From area N (North)

Max. Dry Density 88.0 lbs./cu. ft. Optimum Moisture 21.5 %. Serial # 241467

Method of Test ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
				2114	221	DT	8"	40'	18.6	110.6	93.2	
4/21/04	1		ALCOA Baseline: 540 / 175' N of the South Berm									105.9
	2		" : / 175' N	2400	114	DT	8"	39'	8.5	106.6	97.7	111.1
	3		" : / 175' N	1880	176	DT	8"	39'	13.3	115.4	101.8	115.7
	4		" : / 100' N	2012	161	DT	8"	38'	12.3	112.2	99.9	113.5
	5		" : / 100' N	1780	166	DT	8"	38'	12.1	117.6	104.9	119.2
	6		" : / 100' N	2069	161	DT	8"	39'	12.3	111.7	99.4	112.9
	7		" : / 50' N	2235	120	DT	8"	38'	8.8	108.8	100.0	113.6
	8		" : / 50' N	2137	115	DT	8"	37'	8.2	110.7	102.3	111.3

Standard Counts - Density: 2785 Moisture: _____ Calibration Data: 3/03

Remarks:

- measurements are approximate
- Plu sample for proctor
- Use of conventional tools (bricks, concrete, metals)
- Area Tested Fully Compacted
- Discussed results w/ Rick of Environmental Services Inc.

Tested by M. O'Dell

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Report Of In-Place Density Tests

Date: 04/26/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: GREY SILT WITH RECYCLED MATERIAL

Max. Dry Density: 88.0 **lbs./cu. ft.** **Optimum Moisture:** 21.8 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 03/02/2031

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4-21	75	NC	ALCOA BASELINE: STATION 5+0 175' N. OF THE SOUTH BURNS.	2114	221	DT	8"	40'	18.6	110.6	93.2	100+
4-21	76	NC	ALCOA BASELINE: 175' N. OF THE SOUTH BURNS.	2400	114	DT	8"	39'	8.5	106	97.7	100+
4-21	77	NC	ALCOA BASELINE: 175' N. OF THE SOUTH BURNS.	1880	176	DT	8"	39'	13.3	115.4	101.8	100+
4-21	78	NC	ALCOA BASELINE: 100' N. OF THE SOUTH BURNS.	2042	161	DT	8"	38'	12.3	112.2	99.9	100+
4-21	79	NC	ALCOA BASELINE: 100' N. OF THE SOUTH BURNS.	1780	166	DT	8"	38'	12.1	117.6	104.9	100+
4-21	80	NC	ALCOA BASELINE: 100' N. OF THE SOUTH BURNS.	2069	161	DT	8"	39'	12.3	111.7	99.4	100+
4-21	81	NC	ALCOA BASELINE: 50' N. OF THE SOUTH BURNS.	2235	120	DT	8"	38'	8.8	108.8	100.6	100+
4-21	82	NC	ALCOA BASELINE: 50' N. OF THE SOUTH BURNS.	2132	115	DT	8"	37'	8.2	110.7	102.3	100+

dard Counts - Density: 2735 **Moisture:** **Calibration Data:** 08/03

Please see reverse side for additional information.

Remarks:

MEASUREMENTS ARE APPROXIMATE. LOTS OF CONSTRUCTION DEBRIS (BRICKS, CONCRETE, METALS). AREA TESTED TODAY: EAST LANDFILL. DISCUSSSED RESULTS WITH RICK OF ENVIORCON BEFORE LEAVING.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB NO. T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client: CH2M Hill

Project: ALCOA Former Vancouver Operations \ Project # 184717.01.01.03

Material Description: Gray Silt w/recycled material - From area N (North)

Max. Dry Density: 88 lbs./cu. ft. Optimum Moisture: 21.5 %. Serial # 24467

Method of Test: D 698 Required Compaction: 95 % %

Source of Proctor Value: ☒ Project Specific, Date: 3/04 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	DRY	% COMP.
4/23/04	1		ALCOA Baseline 4+5 / 215' S of the N Site fence	1951	184	DT	5	45'	14.1	113.5	99.3	11[illegible]
	2		" " 5+15 / " " " "	1986	231	DT	8	45'	19.3	112.9	94.6	10[illegible]
	3		" " 6+15 / " " " "	1994	180	DT	5'	45'	14.0	112.9	99.0	112.[illegible]
	4		" " 6+10 / 220' S of the N Site fence	1701	246	DT	8	44	22.0	116.9	97.4	11[illegible]
	5		" " 7+00 / " " "	1879	200	DT	8	44	15.7	115.2	99.6	113.2
	6		" " 4+45 / 325' S of the N Site Fence	1732	199	DT	5	43'	15.1	118.4	102.9	116.9
	7		" " 5+5 / " " "	1851	111	DT	8	42.5'	7.4	116.2	108.1	122.[illegible]
	8		" " 6+5 / " " "	2230	136	DT	5'	44	12.3	110.7	98.6	112.[illegible]

Standard Counts - Density: 2777 Moisture: 609 Calibration Data: 8/03

Remarks:

- [illegible] [illegible] [illegible] are approximate
- [illegible] [illegible] [illegible] [illegible] ([illegible] [illegible] [illegible] material)
- Tests taken today at [illegible] [illegible] [illegible]
- [illegible] [illegible] results w/ George of [illegible] before leaving

Tested by [illegible signature]

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Report Of In-Place Density Tests

Date: 05/03/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: LIGHT BROWN SILTY CLAY

Max. Dry Density: 104.6 **lbs./cu. ft.** **Optimum Moisture:** 20.2 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: x **Project Specific, Date:** 04/26/2004

___ **Supplied By Client** ___ **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4-23	83	NC	ALCOA BASELINE: STATION 4+5 175' S. OF THE N. SILT FENCE	1951	184	DT	8"	45'	14.7	113.8	99.5	95
4-23	84	NC	ALCOA BASELINE: STATION 5+5 175' S. OF THE N. SILT FENCE	1986	231	DT	8"	45'	19.3	112.9	94.6	90
4-23	85	NC	ALCOA BASELINE: STATION 6+5 175' S. OF THE N. SILT FENCE	1994	180	DT	8"	45'	14	112.9	99.0	95
4-23	86	NC	ALCOA BASELINE: STATION 6+0 250' S. OF THE N. SILT FENCE	1701	246	DT	8"	44'	20	116.9	97.4	93
4-23	87	NC	ALCOA BASELINE: STATION 5+0 250' S. OF THE N. SILT FENCE	1879	200	DT	8"	45'	15.7	115.2	99.6	95
4-23	88	NC	ALCOA BASELINE: STATION 4+5 325' S. OF THE N. SILT FENCE	1732	199	DT	8"	43'	15.1	118.4	102.9	98
4-23	89	NC	ALCOA BASELINE: STATION 5+5 325' S. OF THE N. SILT FENCE	1851	111	DT	8"	42.5'	7.4	116.2	108.1	100+
4-23	90	NC	ALCOA BASELINE: STATION 6+5 325' S. OF THE N. SILT FENCE	2230	136	DT	8"	44'	10.3	108.7	98.6	94

Standard Counts - Density: 2727 **Moisture:** 609 **Calibration Data:** 08/03

Please see reverse side for additional information.

Remarks:

MEASUREMENTS ARE APROXIMATE. LOTS OF CONSTRUCTION DEBRIS(CONCRETE, BRICKS, METALS). TESTS TAKEN TODAY AT: EAST LANDFILL. DISCUSSED RESULTS WITH GEORGE OF ENVIORCON BEFOR LEAVING SITE.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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Moisture - Density Relationship

Client: CH2M Hill Engineers (Portland) - Mike Wirtz

Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03

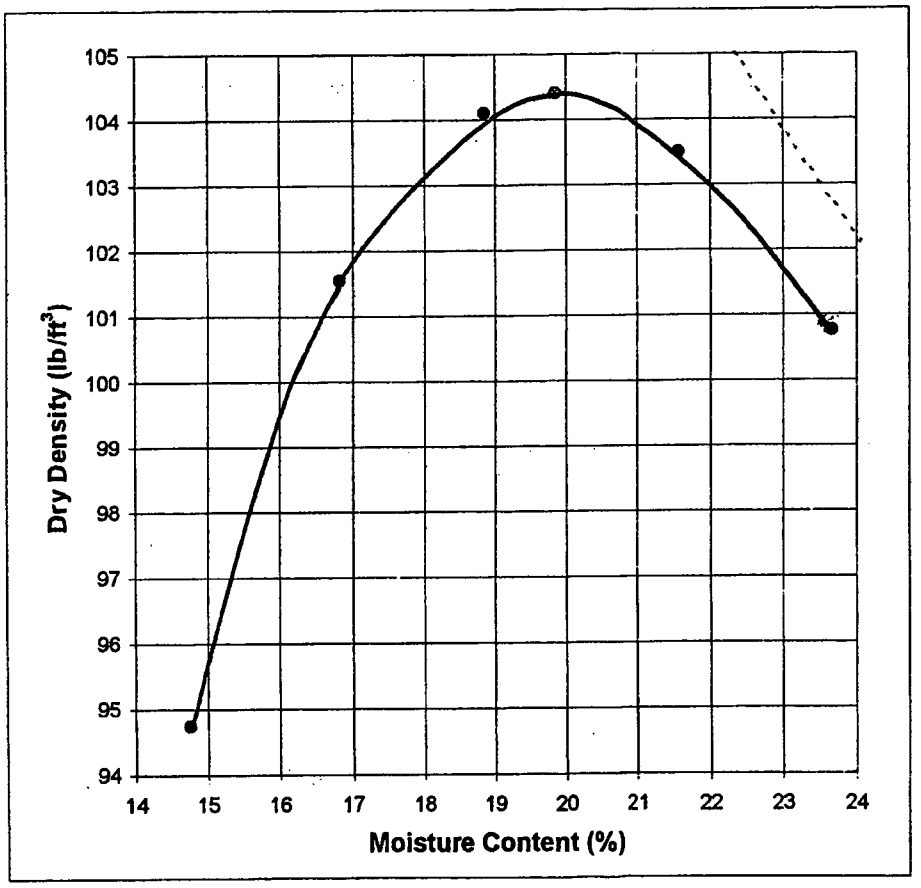
04/27/04

Job Number: T0304239

Material Type: Brown Silty Clay

Location: 114th and Lakeshore Drive

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	04/21/04
Sample Method:	ASTM D-75	**Date Tested:**	04/23/04
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.700

Optimum Moisture: 19.9%

Max. Dry Density: 104.4 lbs/ft³

Percent Passing #4 Sieve: 98.8%

dk

CC:

Reviewed By: _____

Ty Toller - Assistant Laboratory Manager

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Moisture - Density Relationship

Client: CH2M Hill Engineers (Portland) - Mike Wirtz

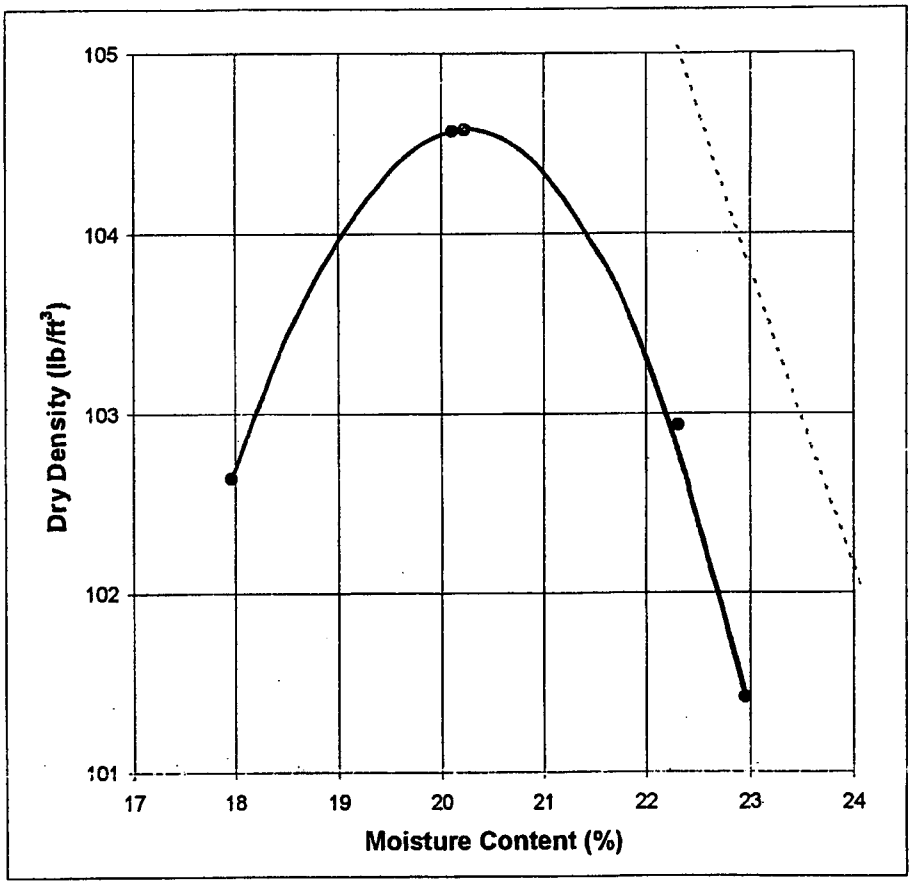
Project: Alcoa Former Vancouver Operations - Project #184717-01-01-03 — 04/27/04

Job Number: T0304239

Material Type: Light Brown Silty Clay

Location: 4th Plain and Fruit Valley Rd.

Test Method:	ASTM D-698 A, C-136, D-2216	**Date Sampled:**	04/23/04
Sample Method:	ASTM D-75	**Date Tested:**	04/26/04
Preparation Method:	Moist	**Oversized Material:**	Removed
Compacting Method:	Manual	**Hammer Type:**	Circular



Zero Air Voids Line = 2.700

Optimum Moisture: 20.2% **Max. Dry Density:** 104.6 lbs/ft³

Percent Passing #4 Sieve: 97.2%

dk
CC:

Reviewed By: _____
Ty Toller - Assistant Laboratory Manager

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NO. T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA Former Vancouver Operations / Project # 184717-01-01-03

Material Description Brn Silty Clay - From site on Lakeside Dr

Max. Dry Density 104.6 lbs./cu. ft. Optimum Moisture 20.2 % Serial # 24467

Method of Test D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 4/2004 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. FT.) WET	IN-PLACE DENSITY (LBS/C U. FT.) DRY	% COMP.
4/27/04	1		Anchor Platform - NE corner \ 100' from S & W silt fence	1393	221	DT	8"	345' +/-	15.8	127.4	110.0	105.2
	2		Anchor Platform - ~~E side~~ center NE corner \ 200' S & W silt fence	1372	225	DT	8"	340'	16.0	128.0	110.3	105.4
	3		Anchor Platform - E side \ center	1607	232	DT	8"	330	17.2	121.7	103.4	98.8
	4		Anchor Platform - SE corner \ 200' N & S barm	1504	230	DT	8"	340'	17.1	124.2	106.1	101.4
	5		Anchor Platform - SE corner	1526	226	DT	8"	340'	16.9	123.7	106.0	101.3
	6		Anchor Platform - South side \ center	1668	248	DT	8	340'	18.5	120.1	100.5	96.1
	7		Anchor Platform - SW corner	1632	226	DT	8"	340'	17.2	121.0	103.2	98.7
	8		Anchor Platform - West side \ center	1640	251	DT	8"	340'	19.7	120.3	100.7	96.4

Standard Counts - Density: 2752 Moisture: 610 Calibration Data: 8/03

Remarks:

- Measurements are approximate
- soil, though passing density requirement, pumps under foot traffic
- Received results of tests w/Rick & Environ before leaving

Tested by M. Dodd

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Report Of In-Place Density Tests

Date: 05/06/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: LIGHT BROWN SILTY CLAY

Max. Dry Density: 104.6 **lbs./cu. ft.** **Optimum Moisture:** 20.2 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 04/26/2004

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
4-27	91	NC	ANCHOR PLATFORM - NE CORNER 100' FROM SOUTH OF NORH SILT FENCE.	1393	221	DT	8"	34.5'	15.8	127.4	110.0	100+
4-27	92	NC	ANCHOR PLATFORM - NE CORNER 200' SOUTH OF NORH SILT FENCE.	1372	225	DT	8"	34.0'	16	128	110.3	100+
4-27	93	NC	ANCHOR PLATFORM - EAST SIDE CENTER	1607	732	DT	8"	33.0'	17.7	121.7	103.4	99
4-27	94	NC	ANCHOR PLATFORM - SE CORNER 200' NORTH OF SOUTH BURM	1509	230	DT	8"	34.0'	17.1	124.2	106.1	100+
4-27	95	NC	ANCHOR PLATFORM - SE CORNER	1522	622	6T	8"	34.0'	16.8	123.7	106.0	100+
4-27	96	NC	ANCHOR PLATFORM - SOUTH SIDE CENTER	1668	226	DT	8"	34.0'	19.5	120.1	100.5	96
4-27	97	NC	ANCHOR PLATFORM - SW CORNER	1632	726	DT	8"	34.0'	17.2	121	103.2	99
4-27	98	NC	ANCHOR PLATFORM - WEST SIDE CENTER	1640	251	DT	8"	34.0'	19.7	120.8	100.7	96

Standard Counts - Density: 2756 **Moisture:** 610 **Calibration Data:** 08/03

Please see reverse side for additional information.

Remarks: MEASUREMENTS ARE APPROXIMATE. SOIL, THOUGH PASSING DENSITY REQUIREMENTS, PUMPS UNDER FOOT TRAFFIC. DISCUSSED RESULTS WITH RICK OF ENVIORCON BEFORE LEAVING.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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Carlson Testing, Inc.

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JOB NO. T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA - Former Vancouver Operations / Project # 184717-01-01-03

Material Description Grey Sand from Glacier NW

Max. Dry Density 91.7 lbs./cu. ft. Optimum Moisture 20.5 % Serial # 24467

Method of Test ASTM D698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/03 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
6/4/04	1			3923	78	DT	6"	0'	5.5	100.9	95.7	
			South Trench - 100' E of the SW corner									104.3
	2			4567	48	DT	6"	0'	2.7	~~91.6~~ 94.2	~~94.2~~ 91.6	
			SW corner of perimeter trenches									89.9
	3			4073	51	DT	6"	0'	3.0	99.3	96.4	
			West Trench 100' N of the SW corner									105.1
	4		" "	4139	50	DT	6"	0'	3.0	98.6	95.8	
			200' N " " "									104.5
	5		" "	4113	63	DT	6"	0'	4.1	98.8	94.9	
			300' N " " "									103.5
	6		" "	4152	55	DT	6"	0'	3.4	98.4	95.2	
			400' N " " "									103.8

Standard Counts - Density: 2734 Moisture: 608 Calibration Data: 8/03

Remarks:

- 0' = top of sand layer
- area tested today: Cap perimeter trench (only West trench and ½ of south trench backfilled at this time)
- 1 ea copy of results to George of Environcon

Tested by M. O. J.

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Report Of In-Place Density Tests

Date: 06/07/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: SAND FROM GLACIER NORTHWEST

Max. Dry Density: 91.7 lbs./cu. ft. **Optimum Moisture:** 20.5 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 10/16/2003

Supplied By Client **Current Fill Source Proctor**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
6- 4	99	NC	SOUTH TRENCH - 100' EAST OTH TEH SW CORNER	3923	78	DT	6"	0'	5.5	100.9	95.7	100+
6- 4	100	NC	SW CORNER OF PERIMETER TRENCHES	4567	48	DT	6"	0'	2.9	94.2	91.6	100
6- 4	101	NC	WEST TRENCH - 100' NORTH OF THE SW CORNER	4073	51	DT	6"	0'	3	99.3	96.4	100+
6- 4	102	NC	WEST TRENCH - 200' NORTH OF THE SW CORNER	4139	50	DT	6"	0'	3	98.6	95.8	100+
6- 4	103	NC	WEST TRENCH - 300' NORTH OF THE SW CORNER	4113	63	DT	6"	0'	4.1	98.8	94.9	100+
6- 4	104	NC	WEST TRENCH - 400' NORTH OF THE SW CORNER	4152	55	DT	6"	0'	3.4	98.4	95.2	100+

Standard Counts - Density: 2734 **Moisture:** 608 **Calibration Data:** 08/03

Please see reverse side for additional information.

Remarks:
0' = TOP OF SAND LAYER. AREA TESTED TODAY: CAP PERIMETER TRENCH. LEFT COPY OF RESULTS WITH GEORGE OF ENVIROCON. (ONLY WEST TRENCH AND 1/2 OF SOUTH TRENCH BACKFILL AT THIS TIME.)

CC:

Project Manager: A. EWING

Reviewed By:

Typist: MHX

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Job No. T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA - Former Vancouver Operations / Project # 184717-01-01-03

Material Description Grey sand from Glacier NW

Max. Dry Density 91.7 lbs./cu. ft. Optimum Moisture 20.5 % Serial # 24467

Method of Test ASTM D-698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/03 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
6/8/04	1		55' N of the south trench - ALCOA baseline 3+98	2410	74	DT	8"	0'	4.8	103.8	101.0	110.1
	2		105' N " " " " - " " 3+99	2680	71	DT	8"	0'	4.7	101.7	97.0	
	3		210' N " " " " - " " 3+98	3419	64	DT	8"	0'	4.6	92.1	88.1	96.1
	4		62' N " " " " - " " 5+09	2639	83	DT	8"	0'	5.8	102.2	96.6	105.3
	5		52' N " " " " - " " 6+11	2648	65	DT	8"	0'	4.2	102.2	98.1	106.9
	6		45' N " " " " - " " 7+27	2705	73	DT	8"	0'	5.0	101.3	96.5	105.2
	7		60' N " " " " - " " 8+30	2668	73	DT	8"	0'	4.9	101.0	97.0	105.8

Standard Counts - Density: 2721 Moisture: 609 Calibration Data: 8/03

Remarks:
- 0' = top of sand cap layer
- Area tested: Initial Sand Backfill over liner
- Left copy of results in office

Tested by M. JONES

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Report Of In-Place Density Tests

Date: 06/09/2004 **Job Number:** T0304239.

Permit Number:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: SAND FROM GLACIER NORTHWEST

Max. Dry Density: 91.7 lbs./cu. ft. **Optimum Moisture:** 20.5 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 10/16/2003

__ **Supplied By Client** __ **Current Fill Source Proctor**

Test Of	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
6- 8	105	NC	55' NORTH OF SOUTH TRENCH: ALCOA BASELINE STATION 3+98	2410	74	DT	8"	0'	4.8	105.8	101.0	100+
6- 8	106	NC	105' NORTH OF SOUTH TRENCH: ALCOA BASELINE STATION 3+99	2680	71	DT	8"	0'	4.7	101.7	97.0	100+
6- 8	107	NC	210' NORTH OF SOUTH TRENCH: ALCOA BASELINE STATION 3+98	3419	64	DT	8"	0'	4.6	92.1	88.1	96
6- 8	108	NC	62' NORTH OF SOUTH TRENCH: ALCOA BASELINE STATION 5+09	2639	83	DT	8"	0'	5.8	102.2	96.6	100+
6- 8	109	NC	52' NORTH OF SOUTH TRENCH: ALCOA BASELINE STATION 6+11	2648	65	DT	8"	0'	4.2	102.2	98.1	100+
6- 8	110	NC	45' NORTH OF SOUTH TRENCH: ALCOA BASELINE STATION 7+27	2705	73	DT	8"	0'	5	101.3	96.5	100+
6- 8	111	NC	60' NORTH OF SOUTH TRENCH: ALCOA BASELINE STATION 8+30	2668	73	DT	8"	0'	4.9	101	97.0	100+

Standard Counts - Density: 2721 **Moisture:** 609 **Calibration Data:** 08/03

Please see reverse side for additional information.

Remarks:
0" = TOP OF SAND CAP LAYER. AREA TESTED: INITIAL SAND BACKFILL OVER LINE. LEFT COPY OF RESULTS IN OFFICE.

CC:

Project Manager:

Reviewed By:

Typist: MHX

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JOB [redacted] T0304239

REPORT OF IN-PLACE DENSITY TESTS

Client CH2M Hill

Project ALCOA - Former Vancouver Operations / Project # 184717-01-01-03

Material Description Grey sand - Glacier NW - Vancouver

Max. Dry Density 91.7 lbs./cu. ft. Optimum Moisture 20.5 % Serial # Z4467

Method of Test ASTM D-698 Required Compaction: 95 %

Source of Proctor Value: ☒ Project Specific, Date: 10/03 ☐ Supplied By Client ☐ Current Fill Source Proctor

DATE OF TEST	TEST NO.	CODE	TEST LOCATION	DENSITY COUNT	MOIST. COUNT	MODE	DEPTH	ELEV. FT.	% FIELD MOIST.	IN-PLACE DENSITY (LBS/C U. Ft.) WET	IN-PLACE DENSITY (LBS/C U. Ft.) DRY	% COMP.
6/16/04	1		60' S of N Trench - ALCOA Baseline 8.0	2558	69	DT	8"	0'	4.7 (1ST lift)	103.7	99.3	108.3
	2		160' S of N Trench - " " "	2515	64	DT	8"	0'	3.9 (1ST lift)	104.3	100.4	109.5
	3		250' S of N Trench - " " "	2748	57	DT	8"	0'	3.5 (1ST lift)	100.9	97.5	106.4
	4		55' N of S Trench - ALCOA Baseline 8.0	2819	55	DT	8"	0'	3.3 (2nd lift)	99.9	96.7	105.5
	5		150' N of S Trench - ALCOA Baseline 4.0	2796	48	DT	8"	0'	2.7 (2nd lift)	100.3	97.6	106.5
	6		200' N of S Trench - " " "	2825	80	DT	8"	0'	5.6 (2nd lift)	99.7	94.4	102.7

Standard Counts - Density: 2732 Moisture: 615 Calibration Data: 8/2003

Remarks: 0' = Top of sand cap 1-ft - Tests 1-3 1ST 1 ft, 4-6 [redacted] 2nd = Final 1 ft

- Area Tested = Initial Sand Backfill over liner
- 1 ft copy of test results in office
- Measurements are approximate

Tested by M. Ojala

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Fax (503) 684-0954	Fax (503) 589-1309	Fax (541) 330-9163

Report Of In-Place Density Tests

Date: 06/22/2004 **Job Number:** T0304239.

Permit #:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: SAND FROM GLACIER NORTHWEST

Max. Dry Density: 91.7 **Optimum Moisture:** 20.5 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 10/16/2003 ___ **Current Fill Source Proctor**

___ **Supplied By Client**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
06-16	112	NC	60' S. OF NORTH TRENCH - ALCOA BASELINE 8.0 1ST LIFT	2558	69	DT	8"	0'	4.4	103.7	99.3	100+
06-16	113	NC	160' S. OF NORTH TRENCH - ALCOA BASELINE 8.0 1ST LIFT	2515	64	DT	8"	0'	3.9	104.3	100.4	100+
06-16	114	NC	250' S. OF NORTH TRENCH - ALCOA BASELINE 8.0 1ST LIFT	2748	57	DT	8"	0'	3.5	100.9	97.5	100+
06-16	115	NC	55' N. OF SOUTH TRENCH - ALCOA BASELINE 8.0 2ND LIFT	2819	55	DT	8"	0'	3.3	99.9	96.7	100+
06-16	116	NC	150' N. OF SOUTH TRENCH - ALCOA BASELINE 4.0 2ND LIFT	2796	48	DT	8"	0'	2.7	100.3	97.6	100+
06-16	117	NC	200' N. OF SOUTH TRENCH - ALCOA BASELINE 4.0 2ND LIFT	2825	80	DT	8"	0'	5.6	99.7	94.4	100+

Standard Counts - Density: 2732 **Moisture:** 615 **Calibration Data:** 08/03

Please see reverse side for additional information.

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.)		% Comp.
										Wet	Dry	

Remarks:

0'= TOP OF SAND CAP LIFT - TESTS 1-3 FIRST LIFT, TESTS 4-6 SECOND & FINAL LIFT.
LIFT COPY OF TEST RESULTS IN OFFICE. MEASUREMENTS ARE APPROXIMATE.
AREA TESTED = INITIAL SAND BACKFILL OVER LINER.

CC:

Typist: MHX

Project Manager:

Reviewed By:

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Report Of In-Place Density Tests

Date: 07/15/2004 **Job Number:** T0304239.

Permit #:

Client: CH2M HILL ENGINEERS (PORTLAND) - MIKE WIRTZ

Project: ALCOA FORMER VANCOUVER OPERATIONS - PROJECT #184717-01-01-03

Address: 5509 NW LOWER RIVER ROAD VANCOUVER WA

Material Description: SAND FROM GLACIER NORTHWEST NONE

Max. Dry Density: 91.7 **Optimum Moisture:** 20.5 %

Method of Test: ASTM D2922,D3017/ ASTM D698 **Serial #:** Troxler 24467 NUC 3440

Test By: D. IRISH **Required Compaction:** 95 %

Source of Proctor Value: X **Project Specific, Date:** 10/16/2003 ___ **Current Fill Source Proctor**

___ **Supplied By Client**

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.) Wet	In-Place Density (lbs/cu. ft.) Dry	% Comp.
07-12	118	NC	ALCOA BASELINE: 8.5 - 50' S. FROM THE N. END OF FILL TOP LIFT	2791	44	DT	8"	-4"	2.4	100.2	97.9	100+
07-12	119	NC	ALCOA BASELINE: 8.5 - 150' S. FROM THE N. END OF FILL TOP LIFT	2845	51	DT	8"	-4"	3	99.4	96.4	100+
07-12	120	NC	ALCOA BASELINE: 8.5 - 250' S. FROM THE N. END OF FILL TOP LIFT	2760	58	DT	8"	-4"	3.6	100.6	97.1	100+
07-12	121	NC	ALCOA BASELINE: 8.5 - 350' S. FROM THE N. END OF FILL TOP LIFT	2494	65	DT	8"	-2"	4.1	104.5	100.4	100+
07-12	122	NC	ALCOA BASELINE: 8.0 - 350' S. FROM THE N. END OF FILL TOP LIFT	2688	63	DT	8"	-2"	4.1	101.6	97.6	100+
07-12	123	NC	ALCOA BASELINE: 7.5 - 350' S. FROM THE N. END OF FILL TOP LIFT	2710	65	DT	8"	-2"	4.3	101.3	97.1	100+
07-12	124	NC	ALCOA BASELINE: 7.0 - 350' S. FROM THE N. END OF FILL TOP LIFT	2695	74	DT	8"	-2"	5.1	101.5	96.6	100+
07-12	125	NC	ALCOA BASELINE: 6.5 - 350' S. FROM THE N. END OF FILL TOP LIFT	2831	102	DT	8"	-2"	7.9	99.4	92.1	100

Standard Counts - Density: 2724 **Moisture:** 604 **Calibration Data:** 08/03

Please see reverse side for additional information.

Date Of Test	Test No.	Code	Test Location	Density Count	Moist. Count	Mode	Depth	Elev. Ft.	% Field Moist.	In-Place Density (lbs/cu. ft.)		% Comp.
										Wet	Dry	

Remarks:

0'=TOP OF SAND CAP LIFT. AREA TESTED: SAND BACKFILL PLACED OVER LINER. LEFT COPIES OF TEST RESULTS IN OFFICE. MEASUREMENTS ARE APPROXIMATE.

CC:

Typist: MHX

Project Manager:

Reviewed By:

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APPENDIX H

QUALITY CONTROL INFORMATION FOR GEOSYNTHETICS OF ENGINEERED BARRIERS

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

APPENDIX H1
HIGH DENSITY POLYETHYLENE GEOMEMBRANE

ENVIROCON

Submittal

Submittal Number 003

1.0 Name of Submitter	Envirocon, Inc. 10400 North Burgard Way Portland, Oregon 97203
1.1 Contact Name	Steve Holmberg
1.2 Contact Phone	(503) 285-6164
1.3 Contact Fax	(503) 285-6205
2.0 Name of Project	Remediation of North and North 2 Landfills
3.0 Service Order No.	
4.0 Submittal Description	**HDPE certifications**
5.0 Drawing Number	**NA**
6.0 Specification Section Number	**Section VII,D.5.d.(2)**
7.0 Original Submittal	YES
8.0 Manufacture's Information	**GSE Lining Technology**
9.0 Date of Submittal	**06 MAY 04**
10.0 Person Submitting	**S. F. Holmberg**

Printed Name Signature

GSE Roll Allocation

Order 34003
Customer TEP
Site Alcoa Vancouver Works-LF Remediatio

Roll#	*Resin Lot*	*Product Code*	*Description*	*Mfg. Date*	*Length*
102108482	8231362	HDT060A000	HDT060A000	1/5/2004	520
102108487	8231362	HDT060A000	HDT060A000	1/5/2004	520
102108494	8231362	HDT060A000	HDT060A000	1/6/2004	520
102108499	8231362	HDT060A000	HDT060A000	1/6/2004	520
102108501	8231362	HDT060A000	HDT060A000	1/6/2004	520
102108504	8231362	HDT060A000	HDT060A000	1/6/2004	520
102108505	8231362	HDT060A000	HDT060A000	1/6/2004	520
102108506	8231362	HDT060A000	HDT060A000	1/6/2004	520
102108507	8231362	HDT060A000	HDT060A000	1/7/2004	520
102108511	8231362	HDT060A000	HDT060A000	1/7/2004	520
102108512	8231362	HDT060A000	HDT060A000	1/7/2004	520
102108514	8231362	HDT060A000	HDT060A000	1/7/2004	520
102108515	8231360	HDT060A000	HDT060A000	1/7/2004	520
102108516	8231360	HDT060A000	HDT060A000	1/7/2004	520
102108517	8231360	HDT060A000	HDT060A000	1/7/2004	520
102108518	8231360	HDT060A000	HDT060A000	1/7/2004	520
102108519	8231360	HDT060A000	HDT060A000	1/7/2004	520
102108525	8231360	HDT060A000	HDT060A000	1/8/2004	520
102108526	8231360	HDT060A000	HDT060A000	1/8/2004	520
102108530	8231360	HDT060A000	HDT060A000	1/8/2004	520
102108531	8231360	HDT060A000	HDT060A000	1/8/2004	520
102108532	8231360	HDT060A000	HDT060A000	1/8/2004	520
102108557	8231364	HDT060A000	HDT060A000	1/9/2004	520
102108558	8231364	HDT060A000	HDT060A000	1/9/2004	520
102108559	8231364	HDT060A000	HDT060A000	1/9/2004	520
102108560	8231364	HDT060A000	HDT060A000	1/9/2004	520
102108564	8231364	HDT060A000	HDT060A000	1/10/2004	520
102108566	8231364	HDT060A000	HDT060A000	1/10/2004	520
102108567	8231364	HDT060A000	HDT060A000	1/10/2004	520

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CoA Date: 12/29/2003

Certificate of Analysis

Shipped To: GSE LINING TECHNOLOGY INC HC
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86529345
PO #: 25716
Weight: 182600 LB
Ship Date: 12/29/2003
Package: BULK
Mode: Hopper Car
Car #: PSPX005824

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8231364

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.100	g/10mi
HLMI Flow Rate	ASTM D1238	11.80	g/10mi
Density	ASTM D1505	0.9380	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Jackie Edwards
Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-289-4799

CoA Date: 12/18/2003

Certificate of Analysis

Shipped To: GSE LINING TECHNOLOGY INC HC
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86523736
PO #: 25716
Weight: 173100 LB
Ship Date: 12/18/2003
Package: BULK
Mode: Hopper Car
Car #: PSPX006332

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8231360

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.080	g/10mi
HLMI Flow Rate	ASTM D1238	11.50	g/10mi
Density	ASTM D1505	0.9360	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. **However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Jackie Edwards
Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-289-4799

CoA Date: 12/18/2003

Certificate of Analysis

Shipped To: GSE LINING TECHNOLOGY INC HC
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86523738
PO #: 25716
Weight: 182500 LB
Ship Date: 12/18/2003
Package: BULK
Mode: Hopper Car
Car #: ACFX097767

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8231362

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.100	g/10mi
HLMI Flow Rate	ASTM D1238	12.20	g/10mi
Density	ASTM D1505	0.9360	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. **However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Jackie Edwards
Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-289-4799

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108482

ROLL IDENTIFICATION

Roll Number	102108482	
Product Name	HDT060A000	
Production Date	1/5/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,005 1,817	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppl (N/cm) - TD		every 4th	130	(228)	160	(280)
- M D		every 4th	130	(228)	157	(274)
Break Strength, ppl (N/cm) - TD		every 4th	90	(158)	159	(279)
- M D		every 4th	90	(158)	190	(333)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		13	
- M D	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		400	
- M D	(51 mm)	every 4th	150		560	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- M D		every 4th	42	(187)	60	(265)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	157	(699)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		19	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108487

ROLL IDENTIFICATION

Roll Number	102108487
Product Name	HDT060A000
Production Date	1/5/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,010 1,819	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(294)
- M D		every 4th	130	(228)	162	(284)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	147	(257)
- M D		every 4th	90	(158)	195	(341)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- M D	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		294	
- M D	(51 mm)	every 4th	150		592	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	59	(263)
- M D		every 4th	42	(187)	61	(271)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	154	(684)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 4th	9		10	
Asperity Height Average (mils) - Side A	GRI GM 12	every 2nd	10		13	

Order No. 34003
Customer Name TEP
Project Name Alcoa Vancouver Works-LF Remediation
Location Vancouver, WA

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108494

ROLL IDENTIFICATION

Roll Number	102108494
Product Name	HDT060A000
Production Date	1/6/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,012 1,820	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	173	(303)
- MD		every 4th	130	(228)	168	(294)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	193	(337)
- MD		every 4th	90	(158)	199	(348)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		521	
- MD	(51 mm)	every 4th	150		538	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(251)
- MD		every 4th	42	(187)	60	(265)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	163	(724)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		20	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108499

ROLL IDENTIFICATION

Roll Number	102108499	
Product Name	HDT060A000	
Production Date	1/6/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,002 1,815	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	62	(1.6)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(295)
- MD		every 4th	130	(228)	170	(298)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	168	(294)
- MD		every 4th	90	(158)	225	(393)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		392	
- MD	(51 mm)	every 4th	150		603	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(254)
- MD		every 4th	42	(187)	63	(279)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	162	(722)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596	every 4th	9		10	
Views in Cat1 - Cat2						
Asperity Height	GRI GM 12	every 2nd	10		22	
Average (mils) - Side A						

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108501

ROLL IDENTIFICATION

Roll Number	102108501	
Product Name	HDT060A000	
Production Date	1/6/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,007 1,818	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	*Test Method*	*Results*
Density, g/cc	*ASTM D 1505*	0.936
Melt Index, g/10 min.	*ASTM D 1238 (190/2.16)*	0.10

Physical Property	*Test Method*	*Test Frequency*	*Customer Minimum* English	Metric	*Test Results* English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	173	(304)
- M D		every 4th	130	(228)	169	(296)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	165	(289)
- M D		every 4th	90	(158)	209	(366)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- M D	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		350	
- M D	(51 mm)	every 4th	150		535	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(251)
- M D		every 4th	42	(187)	63	(278)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	160	(710)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 4th	9		10	
Asperity Height Average (mils) - Side A	GRI GM 12	every 2nd	10		20	

Order No. 34003
Customer Name TEP
Project Name Alcoa Vancouver Works-LF Remediation
Location Vancouver, WA

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108504

ROLL IDENTIFICATION

Roll Number	102108504
Product Name	HDT060A000
Production Date	1/6/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,996 1,813	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	169	(296)
- MD		every 4th	130	(228)	165	(289)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	191	(334)
- MD		every 4th	90	(158)	208	(364)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		561	
- MD	(51 mm)	every 4th	150		510	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- MD		every 4th	42	(187)	62	(275)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	158	(701)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.948	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion Views In Cat1 - Cat2	ASTM D 5596	every 4th	9		10	
Asperity Height Average (mils) - Side A	GRI GM 12	every 2nd	10		11	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108505

ROLL IDENTIFICATION

Roll Number	102108505
Product Name	HDT060A000
Production Date	1/6/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,013 1,820	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	169	(296)
- M D		every 4th	130	(228)	165	(289)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	191	(334)
- M D		every 4th	90	(158)	208	(364)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- M D	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		561	
- M D	(51 mm)	every 4th	150		510	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- M D		every 4th	42	(187)	62	(275)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	158	(701)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.948	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596	every 4th	9		10	
Views in Cat1 - Cat2						
Asperity Height	GRI GM 12	every 2nd	10		11	
Average (mils) - Side A						

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108506

ROLL IDENTIFICATION

Roll Number	102108506
Product Name	HDT060A000
Production Date	1/6/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,005 1,817	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K308
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	169	(296)
- MD		every 4th	130	(228)	165	(289)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	191	(334)
- MD		every 4th	90	(158)	208	(364)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		561	
- MD	(51 mm)	every 4th	150		510	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- MD		every 4th	42	(187)	62	(275)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	158	(701)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.948	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		17	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108507

ROLL IDENTIFICATION

Roll Number	102108507
Product Name	HDT060A000
Production Date	1/7/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,008 1,818	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	169	(296)
- MD		every 4th	130	(228)	165	(289)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	191	(334)
- MD		every 4th	90	(158)	208	(364)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		561	
- MD	(51 mm)	every 4th	150		510	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- MD		every 4th	42	(187)	62	(275)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	158	(701)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.948	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596	every 4th	9		10	
Views In Cat1 - Cat2						
Asperity Height	GRI GM 12	every 2nd	10		17	
Average (mils) - Side A						

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108511

ROLL IDENTIFICATION

Roll Number	102108511	
Product Name	HDT060A000	
Production Date	1/7/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,005 1,817	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994	every roll	60	(1.5)	60	(1.5)
Average		every roll	54	(1.4)	55	(1.4)
Minimum						
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	176	(308)
- MD		every 4th	130	(228)	166	(290)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	179	(313)
- MD		every 4th	90	(158)	222	(389)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		427	
- MD	(51 mm)	every 4th	150		591	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	61	(271)
- MD		every 4th	42	(187)	62	(277)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	159	(708)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.947	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596	every 4th	9		10	
Views in Cat1 - Cat2						
Asperity Height	GRI GM 12	every 2nd	10		13	
Average (mils) - Side A						

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108512

ROLL IDENTIFICATION

Roll Number	102108512	
Product Name	HDT060A000	
Production Date	1/7/2004	
Length ≃(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,002 1,815	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	164	(286)
- MD		every 4th	130	(228)	163	(284)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	149	(261)
- MD		every 4th	90	(158)	211	(369)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		375	
- MD	(51 mm)	every 4th	150		533	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- MD		every 4th	42	(187)	59	(263)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	158	(701)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		16	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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GSE *Lining Technology, Inc.*

Roll Test Data Report

Roll No. 102108514

ROLL IDENTIFICATION

Roll Number	102108514	
Product Name	HDT060A000	
Production Date	1/7/2004	
Length *≃(+/- 1%)*	520 158	feet meters
Width *(Nominal)*	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,003 1,816	pounds kilograms

RESIN INFORMATION

Lot Number	8231362
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	*Test Method*	*Results*
Density, g/cc	***ASTM D 1505***	0.936
Melt index, g/10 min.	***ASTM D 1238 (190/2.16)***	0.10

Physical Property	*Test Method*	*Test Frequency*	*Customer Minimum* English	Metric	*Test Results* English	Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	164	(286)
- M D		every 4th	130	(228)	163	(284)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	149	(261)
- M D		every 4th	90	(158)	211	(369)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- M D	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		375	
- M D	(51 mm)	every 4th	150		533	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- M D		every 4th	42	(187)	59	(263)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	158	(701)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		17	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108515

ROLL IDENTIFICATION

Roll Number	102108515	
Product Name	HDT060A000	
Production Date	1/7/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,007 1,818	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	164	(286)
- MD		every 4th	130	(228)	163	(284)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	149	(261)
- MD		every 4th	90	(158)	211	(369)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		375	
- MD	(51 mm)	every 4th	150		533	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- MD		every 4th	42	(187)	59	(263)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	158	(701)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		17	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108516

ROLL IDENTIFICATION

Roll Number	102108516
Product Name	HDT060A000
Production Date	1/7/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,004 1,816	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(293)
- MD		every 4th	130	(228)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	176	(309)
- MD		every 4th	90	(158)	149	(260)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		445	
- MD	(51 mm)	every 4th	150		445	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(252)
- MD		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	156	(695)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		19	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108517

ROLL IDENTIFICATION

Roll Number	102108517
Product Name	HDT060A000
Production Date	1/7/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,006 1,817	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(293)
- MD		every 4th	130	(228)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	176	(309)
- MD		every 4th	90	(158)	149	(260)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		445	
- MD	(51 mm)	every 4th	150		445	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(252)
- MD		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	156	(695)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		19	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108518

ROLL IDENTIFICATION

Roll Number	102108518
Product Name	HDT060A000
Production Date	1/7/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,000 1,814	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	**ASTM D 1505**	0.936
Melt index, g/10 min.	**ASTM D 1238 (190/2.16)**	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(293)
- MD		every 4th	130	(228)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	176	(309)
- MD		every 4th	90	(158)	149	(260)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		445	
- MD	(51 mm)	every 4th	150		445	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(252)
- MD		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	156	(695)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		15	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108519

ROLL IDENTIFICATION

Roll Number	102108519	
Product Name	HDT060A000	
Production Date	1/7/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,007 1,818	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(293)
- MD		every 4th	130	(228)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	176	(309)
- MD		every 4th	90	(158)	149	(260)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		445	
- MD	(51 mm)	every 4th	150		445	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(252)
- MD		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	156	(695)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596	every 4th	9		10	
Views In Cat1 - Cat2						
Asperity Height	GRI GM 12	every 2nd	10		15	
Average (mils) - Side A						

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108525

ROLL IDENTIFICATION

Roll Number	102108525	
Product Name	HDT060A000	
Production Date	1/8/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,015 1,821	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	158	(276)
- M D		every 4th	130	(228)	159	(279)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	177	(309)
- M D		every 4th	90	(158)	208	(364)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- M D	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		511	
- M D	(51 mm)	every 4th	150		556	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(243)
- M D		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	156	(695)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		16	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108526

ROLL IDENTIFICATION

Roll Number	102108526
Product Name	HDT060A000
Production Date	1/8/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,012 1,820	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	158	(276)
- MD		every 4th	130	(228)	159	(279)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	177	(309)
- MD		every 4th	90	(158)	208	(364)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		511	
- MD	(51 mm)	every 4th	150		556	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(243)
- MD		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	156	(695)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		14	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108530

ROLL IDENTIFICATION

Roll Number	102108530	
Product Name	HDT060A000	
Production Date	1/8/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,005 1,817	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	159	(279)
- MD		every 4th	130	(228)	155	(271)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	153	(268)
- MD		every 4th	90	(158)	202	(354)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		421	
- MD	(51 mm)	every 4th	150		481	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	54	(242)
- MD		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	156	(694)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.6	
Carbon Black Dispersion Views In Cat1 - Cat2	ASTM D 5596	every 4th	9		10	
Asperity Height Average (mils) - Side A	GRI GM 12	every 2nd	10		14	

Order No. 34003
Customer Name TEP
Project Name Alcoa Vancouver Works-LF Remediation
Location Vancouver, WA
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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108531

ROLL IDENTIFICATION

Roll Number	102108531
Product Name	HDT060A000
Production Date	1/8/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,992 1,811	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	159	(279)
- MD		every 4th	130	(228)	155	(271)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	153	(268)
- MD		every 4th	90	(158)	202	(354)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		421	
- MD	(51 mm)	every 4th	150		481	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	54	(242)
- MD		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	156	(694)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.6	
Carbon Black Dispersion	ASTM D 5596					
Views In Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		18	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108532

ROLL IDENTIFICATION

Roll Number	102108532
Product Name	HDT060A000
Production Date	1/8/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,004 1,816	pounds kilograms

RESIN INFORMATION

Lot Number	8231360
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.936
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.08

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(293)
- MD		every 4th	130	(228)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	163	(285)
- MD		every 4th	90	(158)	189	(331)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		15	
- MD	(33 mm)	every 4th	13		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		356	
- MD	(51 mm)	every 4th	150		503	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- MD		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	157	(700)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views In Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		18	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108557

ROLL IDENTIFICATION

Roll Number	102108557	
Product Name	HDT060A000	
Production Date	1/9/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,992 1,811	pounds kilograms

RESIN INFORMATION

Lot Number	8231364
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	160	(280)
- MD		every 4th	130	(228)	163	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	166	(290)
- MD		every 4th	90	(158)	171	(299)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		461	
- MD	(51 mm)	every 4th	150		387	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	53	(237)
- MD		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	157	(698)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 4th	9		10	
Asperity Height Average (mils) - Side A	GRI GM 12	every 2nd	10		15	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108558

ROLL IDENTIFICATION

Roll Number	102108558
Product Name	HDT060A000
Production Date	1/9/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,995 1,812	pounds kilograms

RESIN INFORMATION

Lot Number	8231364
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt Index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	160	(280)
- M D		every 4th	130	(228)	163	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	166	(290)
- M D		every 4th	90	(158)	171	(299)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- M D	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		461	
- M D	(51 mm)	every 4th	150		387	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	53	(237)
- M D		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	157	(698)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596	every 4th	9		10	
Views In Cat1 - Cat2						
Asperity Height	GRI GM 12	every 2nd	10		15	
Average (mils) - Side A						

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108559

ROLL IDENTIFICATION

Roll Number	102108559
Product Name	HDT060A000
Production Date	1/9/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,000 1,814	pounds kilograms

RESIN INFORMATION

Lot Number	8231364
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	160	(280)
- M D		every 4th	130	(228)	163	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	166	(290)
- M D		every 4th	90	(158)	171	(299)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- M D	(33 mm)	every 4th	13		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		461	
- M D	(51 mm)	every 4th	150		387	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	53	(237)
- M D		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	157	(698)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		16	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108560

ROLL IDENTIFICATION

Roll Number	102108560
Product Name	HDT060A000
Production Date	1/9/2004

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,998 1,813	pounds kilograms

RESIN INFORMATION

Lot Number	8231364
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	161	(283)
- M D		every 4th	130	(228)	166	(290)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	149	(261)
- M D		every 4th	90	(158)	173	(302)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- M D	(33 mm)	every 4th	13		15	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		305	
- M D	(51 mm)	every 4th	150		451	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	58	(258)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	160	(713)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596	every 4th	9		10	
Views In Cat1 - Cat2						
Asperity Height	GRI GM 12	every 2nd	10		16	
Average (mils) - Side A						

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108564

ROLL IDENTIFICATION

Roll Number	102108564	
Product Name	HDT060A000	
Production Date	1/10/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,005 1,817	pounds kilograms

RESIN INFORMATION

Lot Number	8231364
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(294)
- MD		every 4th	130	(228)	164	(288)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	185	(325)
- MD		every 4th	90	(158)	206	(361)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		483	
- MD	(51 mm)	every 4th	150		506	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(254)
- MD		every 4th	42	(187)	60	(269)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	150	(668)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.943	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 4th	9		10	
Asperity Height Average (mils) - Side A	GRI GM 12	every 2nd	10		19	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108566

ROLL IDENTIFICATION

Roll Number	102108566
Product Name	HDT060A000
Production Date	1/10/2004

Length ≃(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,016 1,822	pounds kilograms

RESIN INFORMATION

Lot Number	8231364
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(294)
- MD		every 4th	130	(228)	164	(288)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	185	(325)
- MD		every 4th	90	(158)	206	(361)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		483	
- MD	(51 mm)	every 4th	150		506	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(254)
- MD		every 4th	42	(187)	60	(269)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	150	(668)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.943	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion Views in Cat1 - Cat2	ASTM D 5596	every 4th	9		10	
Asperity Height Average (mils) - Side A	GRI GM 12	every 2nd	10		20	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108567

ROLL IDENTIFICATION

Roll Number	102108567	
Product Name	HDT060A000	
Production Date	1/10/2004	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,000 1,814	pounds kilograms

RESIN INFORMATION

Lot Number	8231364
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.938
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.10

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	130	(228)	168	(294)
- MD		every 4th	130	(228)	164	(288)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	185	(325)
- MD		every 4th	90	(158)	206	(361)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	13		14	
- MD	(33 mm)	every 4th	13		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	150		483	
- MD	(51 mm)	every 4th	150		506	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(254)
- MD		every 4th	42	(187)	60	(269)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	108	(478)	150	(668)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.943	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		20	

Order No.	34003
Customer Name	TEP
Project Name	Alcoa Vancouver Works-LF Remediation
Location	Vancouver, WA

*Modified

APPROVED
K.A.
1/10/2004
QA

MAY-04-2004 13:43
P.33

TOTAL P.34

********** -COMM. JOURNAL- ********** DATE MAY-04-2004 ***** TIME 09:36 *********

MODE = MEMORY TRANSMISSION START=MAY-04 09:33 END=MAY-04 09:36

FILE NO.=207

STN NO.	COMM.	ONE-TOUCH/ ABBR NO.	STATION NAME/TEL NO.	PAGES	DURATION
001	OK	#	2818217138	033/033	00:02:32

********** - ***** - **********

APPENDIX H2
GEOSYNTHETIC CLAY LINER

ENVIROCON

Submittal

Submittal Number 004

1.0 Name of Submitter	Envirocon, Inc. 10400 North Burgard Way Portland, Oregon 97203
1.1 Contact Name	Steve Holmberg
1.2 Contact Phone	(503) 285-6164
1.3 Contact Fax	(503) 285-6205
2.0 Name of Project	Remediation of North and North 2 Landfills
3.0 Service Order No.	
4.0 Submittal Description	**GCL certifications**
5.0 Drawing Number	**NA**
6.0 Specification Section Number	**Section VII,D.5.d.(1)**
7.0 Original Submittal	YES
8.0 Manufacture's Information	**CETCO**
9.0 Date of Submittal	**06 MAY 04**
10.0 Person Submitting	**S. F. Holmberg**

Printed Name Signature

CETCO
COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY
P.O. Box 428 • Lovell, Wyoming 82431
(307) 548-6521 • Fax (307) 548-6413

Date: May 4, 2004
PO: 200415
Order #: 184618, 184619

Sam Mangrum
TEP-Texas Enviromental Plastics
2500 Farrell Road
Houston TX 77073
281-821-7320
smangrum@tepinc.net

Dear Sam Mangrum

Please find enclosed the MQA/MQC Data Package for GCL shipments to TEP-Texas Enviromental Plastics. These shipments left our CETCO - Lovell, Wy. plant on May 3, 2004.

If you have any questions regarding the enclosed QA/QC information, please contact me at (800)322-1149 ext:423.

Sincerely,

Roger B. Wilkerson
Quality Assurance

GEOSYNTHETIC CLAY LINER

MANUFACTURING
QA / QC DATA PACKAGE

PROJECT NAME: ALCOA
Vancouver WA 98660

CUSTOMER P.O.: 200415

PREPARED FOR: TEP-Texas Enviromental Plastics
2500 Farrell Road
Houston TX 77073
Telephone # : 281-821-7320
Email Address: smangrum@tepinc.net

PREPARED BY: Roger B. Wilkerson
Quality Assurance
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, Wy. 82431
Telephone #: 800-322-1149 (Ext. 423)
Fax #: (307)548-6927, (307)548-6413
E-Mail: rwilke@cetco.com

GEOSYNTHETIC CLAY LINER

MANUFACTURING
QA / QC DATA

FOR ALL GCL MANUFACTURED ON:

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184618, 184619
Ship Date:	3-May

CONTENTS:

P A C K I N G L I S T

[redacted]TCO
[redacted]00 WEST SHURE DRIVE
ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184618
ORDER DATE: 3/03/2004
SHIP DATE:. 5/03/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200405LO	00000516	150.0	15.0	2250.0	2703.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000518	150.0	15.0	2250.0	2716.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000519	150.0	15.0	2250.0	2702.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000520	150.0	15.0	2250.0	2711.0
[redacted]BENTOMAT ST		SFT	SF 200405LO	00000521	150.0	15.0	2250.0	2709.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000522	150.0	15.0	2250.0	2705.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000548	150.0	15.0	2250.0	2659.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000549	150.0	15.0	2250.0	2673.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000550	150.0	15.0	2250.0	2676.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000574	150.0	15.0	2250.0	2634.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000575	150.0	15.0	2250.0	2637.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001086	150.0	15.0	2250.0	2657.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001194	150.0	15.0	2250.0	2686.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001323	150.0	15.0	2250.0	2638.0
ORDER TOTALS.....							31500.0	37506.0

TOTAL ITEMS..... 14

[redacted]

P A C K I N G L I S T

[redacted]ETCO
[redacted]00 WEST SHURE DRIVE
ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184619
ORDER DATE: 3/03/2004
SHIP DATE:. 5/03/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200405LO	00000523	150.0	15.0	2250.0	2708.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000524	150.0	15.0	2250.0	2704.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000551	150.0	15.0	2250.0	2621.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000552	150.0	15.0	2250.0	2715.0
[redacted]BENTOMAT ST		SFT	SF 200405LO	00000553	150.0	15.0	2250.0	2685.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000554	150.0	15.0	2250.0	2690.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000555	150.0	15.0	2250.0	2691.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000576	150.0	15.0	2250.0	2645.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000577	150.0	15.0	2250.0	2639.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000578	150.0	15.0	2250.0	2628.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000579	150.0	15.0	2250.0	2626.0
LO-BENTOMAT ST		SFT	SF 200405LO	00000580	150.0	15.0	2250.0	2619.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001072	150.0	15.0	2250.0	2670.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001082	150.0	15.0	2250.0	2650.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001083	150.0	15.0	2250.0	2671.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001084	150.0	15.0	2250.0	2670.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001085	150.0	15.0	2250.0	2533.0
ORDER TOTALS.....							38250.0	45165.0

TOTAL ITEMS..... 17

GEOSYNTHETIC CLAY LINER MANUFACTURING CERTIFICATION

GEOSYNTHETIC CLAY LINER

MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184618, 184619
Ship Date:	3-May

Colloid Environmental Technologies Company (CETCO) hereby affirms and certifies that all of the **BENTOMAT ST** manufactured in this lot achieves the physical and chemical criteria listed on the attached analysis sheet.

~~Sheri McArthur~~ Shainewagner
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

NEEDLE DETECTION CERTIFICATION

CERTIFICATION STATEMENT

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184618, 184619
Ship Date:	3-May

This statement is to certify that all components of the **BENTOMAT ST** manufactured for the above project have been inspected continually for the presence of broken needles through the use of a magnetic removal system.

~~Sheri McArthur~~ Shaine Wagner
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

BENTONITE CLAY CERTIFICATIONS

TECHNICAL DATA SHEET

ORIGIN INFORMATION

BENTONITE

Manufacturer: **AMERICAN COLLOID COMPANY**

PRODUCTION

Facility: **AMERICAN COLLOID COMPANY**
92 HWY. 37
Lovell, WY 82431

Contact: **Moses Briseno**
Quality Assurance Coordinator
(800)-322-1160

Brand Name: **CG 50**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **15-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **011504B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**27.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **15-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **011504C**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**27.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **16-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **011604A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.8**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.6**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **27-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012704D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.6**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **28-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012804A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **04-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020404B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

WOVEN GEOTEXTILE
MANUFACTURER'S CERTIFICATION

TECHNICAL DATA SHEET

ORIGIN INFORMATION

WOVEN GEOTEXTILE

Manufacturer: **Synthetic Industries Inc.**

PRODUCTION

Facility: **Synthetic Industries**
4019 Industry Drive
Chattanooga, TN. 37416

Contact: Randy Johnson

Brand Name: 82 Tex.

SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	DOFFED	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST
2001604167	2026761	1002581	82TEX	8/27/2003	3.6	152	146	21	16	98	155	293
2001604168	2026761	1002581	82TEX	8/24/2003	3.6	169	136	26	16	97	130	313
2001604169	2027100	1002581	82TEX	8/26/2003	3.6	149	147	23	17	88	98	323
2001604170	2027100	1002581	82TEX	8/28/2003	3.6	152	140	23	17	95	133	283
2001604177	2027100	1002581	82TEX	8/24/2003	3.5	152	142	23	18	80	141	290
2001608103	2027364	1002581	82TEX	8/24/2003	3.5	164	146	24	18	80	151	288
2001608104	2027364	1002581	82TEX	8/27/2003	3.8	163	166	22	19	85	186	305
2001608105	2027364	1002581	82TEX	8/29/2003	3.5	150	137	21	18	66	82	333
2001608350	2026762	1002581	82TEX	8/24/2003	3.6	148	141	21	15	69	129	287
2001608351	2026762	1002581	82TEX	8/27/2003	3.5	151	146	21	17	71	86	333
2001608352	2026762	1002581	82TEX	8/29/2003	3.5	157	140	21	17	79	68	380
2001610306	2027095	1002581	82TEX	9/2/2003	3.5	149	143	21	16	70	81	310
2001610307	2027095	1002581	82TEX	8/31/2003	3.6	144	146	23	18	69	84	297
2001610308	2027095	1002581	82TEX	8/28/2003	3.6	151	136	20	16	73	139	323
2001620734	2027099	1002581	82TEX	9/4/2003	3.6	150	149	19	16	74	78	303
2001620735	2027099	1002581	82TEX	9/1/2003	3.6	160	143	25	19	74	78	323
2001620736	2027099	1002581	82TEX	8/29/2003	3.4	148	140	20	16	65	75	310
2001621341	2027362	1002581	82TEX	9/3/2003	3.3	145	152	22	18	75	97	322
2001621342	2027362	1002581	82TEX	9/1/2003	3.7	145	152	24	19	67	90	292
2001621343	2027362	1002581	82TEX	8/29/2003	3.6	135	149	20	15	66	91	340
2001621520	2027098	1002581	82TEX	9/1/2003	3.6	155	161	23	19	61	88	303
2001621521	2027098	1002581	82TEX	8/30/2003	3.8	143	153	24	16	59	88	302
2001621522	2027098	1002581	82TEX	8/27/2003	3.6	145	149	21	17	109	159	283
2001635705	2027102	1002581	82TEX	9/1/2003	3.6	167	139	23	19	79	76	298
2001635706	2027102	1002581	82TEX	8/30/2003	3.8	161	149	24	17	89	82	285
2001635713	2027102	1002581	82TEX	9/3/2003	3.5	162	141	25	17	80	82	315
2001635714	2028193	1002581	82TEX	9/3/2003	3.6	151	159	21	16	72	82	270
2001636721	2028193	1002581	82TEX	9/1/2003	3.6	155	162	25	18	80	89	313
2001644384	2028192	1002581	82TEX	9/2/2003	3.6	169	151	25	19	86	148	293
2001644385	2028192	1002581	82TEX	9/4/2003	3.7	152	168	20	17	83	128	280
2001644393	2028192	1002581	82TEX	8/31/2003	3.7	167	160	25	20	95	108	318
2001647170	2027101	1002581	82TEX	9/1/2003	3.6	175	167	26	22	88	99	323
2001647171	2027101	1002581	82TEX	9/3/2003	3.5	169	144	26	18	89	178	325
2001647172	2027101	1002581	82TEX	9/5/2003	3.5	152	137	23	18	80	83	327
2001647819	2028194	1002581	82TEX	9/6/2003	3.2	158	137	23	17	70	70	267
2001647820	2028194	1002581	82TEX	9/4/2003	3.6	145	142	19	16	65	82	315

SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	DOFFED	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST
2001836329	2030465	1002581	82TEX	10/09/03	3.6	170	155	25	18	64	70	357
2001836330	2030465	1002581	82TEX	10/11/03	3.7	166	189	23	20	76	112	347
2001858815	2030482	1002581	82TEX	10/09/03	3.3	164	142	26	19	79	89	333
2001881363	2030474	1002581	82TEX	10/09/03	3.6	152	159	20	16	68	102	330
2001881364	2030474	1002581	82TEX	10/12/03	3.5	161	149	23	18	72	82	357
2001881365	2030474	1002581	82TEX	10/14/03	3.5	160	153	24	18	74	83	300
2001900949	2031846	1002581	82TEX	10/14/03	3.4	150	145	22	18	69	76	340
2001900950	2031846	1002581	82TEX	10/13/03	3.5	149	152	21	19	63	80	360
2001900951	2031846	1002581	82TEX	10/10/03	4.5	166	164	23	18	74	95	320
2001914847	2032601	1002581	82TEX	10/14/03	3.7	137	140	19	17	63	79	333
2001914849	2032601	1002581	82TEX	10/18/03	3.5	159	151	25	19	71	77	327
2001914850	2032601	1002581	82TEX	10/21/03	3.6	143	145	17	16	72	64	270
2001920360	2032600	1002581	82TEX	10/18/03	3.6	163	174	23	20	74	99	358
2001920361	2032600	1002581	82TEX	10/20/03	3.5	168	158	25	19	74	98	333
2001920469	2032600	1002581	82TEX	10/15/03	3.5	167	159	22	18	78	89	320
2001938397	2032602	1002581	82TEX	10/17/03	3.4	148	140	21	18	80	93	307
2001938398	2032602	1002581	82TEX	10/20/03	3.5	156	154	23	20	65	96	307
2001938399	2032602	1002581	82TEX	10/22/03	3.6	168	168	25	20	68	104	340
2001938401	2032602	1002581	82TEX	10/24/03	3.5	160	158	25	19	80	95	328
2001938407	2032603	1002581	82TEX	10/20/03	3.4	162	151	24	19	73	79	297
2001938408	2032603	1002581	82TEX	10/22/03	3.4	161	153	23	19	70	85	333
2001938409	2032603	1002581	82TEX	10/24/03	3.7	165	166	23	18	74	93	303
2001938410	2032603	1002581	82TEX	10/26/03	3.7	164	168	20	17	78	103	323
2001950437	2033345	1002581	82TEX	10/24/03	3.3	166	148	25	19	77	92	305
2001950438	2033345	1002581	82TEX	10/26/03	3.5	162	161	26	20	74	105	355
2001950439	2033345	1002581	82TEX	10/28/03	3.5	170	161	26	20	75	101	335

SI® Geosolutions

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1597	**HandUnit**	**ProdOrd**	**Product**	**STYLE**	**DOFFED**	**WEIGHT**	**TENSMA**	**TENSCR**	**ELONGM**	**ELONGC**	**TTEARM**	**TTEARC**	**BURST**	
1598	2002246422	2038787	1002581	82TEX	12/9/2003	3.6	154	159	24	21	76	111	318	
1599	2002274599	2037953	1002581	82TEX	12/8/2003	3.7	144	157	23	17	81	135	288	
1600	2002274600	2037953	1002581	82TEX	12/11/2003	3.7	148	158	24	19	86	93	335	
1601	2002275171	2037951	1002581	82TEX	12/8/2003	3.6	156	154	26	20	81	111	295	
1602	2002275172	2037951	1002581	82TEX	12/11/2003	3.7	157	162	24	19	88	136	303	
1603	2002275173	2037951	1002581	82TEX	12/14/2003	3.4	163	153	26	20	94	106	303	
1604	2002276016	2037952	1002581	82TEX	12/12/2003	3.5	154	147	26	19	86	96	338	
1605	2002276017	2037952	1002581	82TEX	12/14/2003	3.6	149	158	24	18	79	108	282	
1606	2002276025	2037952	1002581	82TEX	12/9/2003	3.2	150	138	24	19	84	85	298	
1607	2002317467	2038786	1002581	82TEX	12/14/2003	3.6	151	153	25	20	87	146	283	
1608	2002317468	2038786	1002581	82TEX	12/16/2003	3.4	155	148	26	21	82	121	273	
1609	2002317469	2038786	1002581	82TEX	12/19/2003	3.6	152	146	25	19	81	149	292	
1610	2002364345	2039467	1002581	82TEX	12/19/2003	3.6	152	147	25	18	69	61	297	
1611	2002364347	2039467	1002581	82TEX	12/22/2003	3.7	156	150	25	21	82	96	310	
1612	2002364348	2039467	1002581	82TEX	12/24/2003	3.6	154	150	24	19	78	128	288	
1613	2002378684	2040228	1002581	82TEX	12/23/2003	3.8	154	148	25	20	79	81	310	

COLLOID ENVIRONMENTAL TECH. CO.
GEOTEXTILE QC DATA

LOVELL AMERICAN COLLOID

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER: 000184619

Material	Lot #	Roll #	Geotextile Mass/Area ASTM D 5261	Grab Strength ASTM D 4632
LO-WOVEN-ST	2002423519		3.4	174.3
LO-WOVEN-ST	2002276020		3.3	168.2
LO-WOVEN-ST	2002408620		3.3	169.8

NON-WOVEN GEOTEXTILE MANUFACTURER'S CERTIFICATION

TECHNICAL DATA SHEET

ORIGIN INFORMATION

NON-WOVEN GEOTEXTILE

Manufacturer:	**Colloid Environmental Technologies Co.**
PRODUCTION FACILITY:	**CETCO** **102 Conners Road** **Villa Rica, GA 30180**
CONTACT:	Debbie Bivins 404-459-4995
BRAND NAME:	Standard

NON-WOVEN GEOTEXTILE

MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184618, 184619
Ship Date:	3-May

CETCO hereby affirms and certifies that the Non-Woven geotextile in the **BENTOMAT ST** product for the above project has been manufactured to meet the following physical properties.

PROPERTY	TEST METHOD	MINIMUM VALUE
Mass / Area	ASTM D-5261	6.0 oz/sqyd (Min.)
Grab Strength	ASTM D-4632	6.0 Lbs MARV (MD)

~~Shem McArthur~~ Shaine Wagner
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

CETCO
GEOTEXTILE QC DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184619

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200341VR	00003214	6.6	60.4
LO-N/W-WHITE-ST	200341VR	00003228	6.5	60.4
LO-N/W-WHITE-ST	200346VR	00003511	7.2	76.2
LO-N/W-WHITE-ST	200403VR	00000149	6.7	58.1
LO-N/W-WHITE-ST	200403VR	00000175	6.7	131.5
LO-N/W-WHITE-ST	200404VR	00000189	6.6	61.4

TOTAL PAGES 1

CETCO
GEOTEXTILE QC DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184618

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200341VR	00003214	6.6	60.4
LO-N/W-WHITE-ST	200341VR	00003228	6.5	60.4
LO-N/W-WHITE-ST	200341VR	00003235	7.0	28.8
LO-N/W-WHITE-ST	200352VR	00003957	6.6	44.5
LO-N/W-WHITE-ST	200403VR	00000149	6.7	58.1
LO-N/W-WHITE-ST	200403VR	00000175	6.7	131.5
LO-N/W-WHITE-ST	200404VR	00000218	6.6	76.7

TOTAL PAGES 1

GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS

GEOSYNTHETIC CLAY LINER

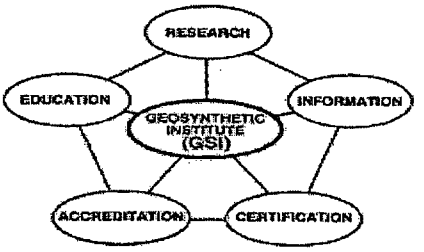
MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184618, 184619
Ship Date:	3-May

CETCO hereby affirms and certifies that the **BENTOMAT ST** material supplied to this project will meet the physical and chemical criteria listed below.

PROPERTY	TEST METHOD	MINIMUM VALUE
Peel Strength	ASTM D 4632 (Modified)	**15 lbs**
Bentonite Free Swell	ASTM D 5890	**24 mL / 2g MIN.**
Bentonite Fluid Loss	ASTM D 5891	**18.0 mL (MAX)**
Bentonite Mass / Area	ASTM D 5993	*** .75 lb/sq.ft. (Min.)**
Grab Strength	ASTM D 4632	**90 lbs.**
Permeability	ASTM D 5887	**5 x 10 (-9) cm/sec. (Max)**
Index Flux	ASTM D 5887	**1.0 x 10 (-8) m(3)/m(2)/sec.**

*** Reported at 0 % moisture content.**
GAI Lab Accredited Test Methods were followed during conformance testing for:
ASTM D 4632 - Grab Strength and Grab Elongation.
ASTM D 5993 - Bentonite Mass/Area.



~~Shem McArthur~~ Shaine Wagner
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

QCG#FT2 QCT#FT2
5/04/04 13:29:56

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184619

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200407LO	00001085	.88	273.40	40.80
LO-BENTOMAT ST	200407LO	00001084	.88	273.40	40.80
LO-BENTOMAT ST	200407LO	00001083	.88	273.40	40.80
LO-BENTOMAT ST	200407LO	00001082	.88	273.40	40.80
LO-BENTOMAT ST	200407LO	00001072	.88	273.40	40.80
LO-BENTOMAT ST	200405LO	00000580	.91	282.20	30.40
LO-BENTOMAT ST	200405LO	00000579	.91	282.20	30.40
LO-BENTOMAT ST	200405LO	00000578	.91	282.20	30.40
LO-BENTOMAT ST	200405LO	00000577	.91	282.20	30.40
LO-BENTOMAT ST	200405LO	00000576	.91	282.20	30.40
LO-BENTOMAT ST	200405LO	00000555	.97	282.20	35.00
LO-BENTOMAT ST	200405LO	00000554	.97	282.20	35.00
LO-BENTOMAT ST	200405LO	00000553	.97	282.20	35.00
LO-BENTOMAT ST	200405LO	00000552	.97*	282.20*	35.00*
LO-BENTOMAT ST	200405LO	00000551	.92	213.40	37.90
LO-BENTOMAT ST	200405LO	00000524	.88	213.40	40.30
LO-BENTOMAT ST	200405LO	00000523	.88	213.40	40.30

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present. test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200,000sf.
Peel Strength is tested a minimum of every 40,000sf.
All tensile testing is in the machine direction

*** End of Report ***

QCG#FT2 QCT#FT2
5/04/04 13:30:37

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184618

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200407LO	00001323	.80	308.30	41.80
LO-BENTOMAT ST	200407LO	00001194	.93	249.70	28.90
LO-BENTOMAT ST	200407LO	00001086	.88	273.40	40.80
LO-BENTOMAT ST	200405LO	00000575	.91	282.20	30.40
LO-BENTOMAT ST	200405LO	00000574	.91	282.20	30.40
LO-BENTOMAT ST	200405LO	00000550	.92	213.40	37.90
LO-BENTOMAT ST	200405LO	00000549	.92	213.40	37.90
LO-BENTOMAT ST	200405LO	00000548	.92	213.40	37.90
LO-BENTOMAT ST	200405LO	00000522	.88	213.40	40.30
LO-BENTOMAT ST	200405LO	00000521	.88	213.40	40.30
LO-BENTOMAT ST	200405LO	00000520	.88	213.40	40.30
LO-BENTOMAT ST	200405LO	00000519	.88	213.40	40.30
LO-BENTOMAT ST	200405LO	00000518	.88*	213.40	40.30*
LO-BENTOMAT ST	200405LO	00000516	.94	213.40	30.10

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present, test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200,000sf.
Peel Strength is tested a minimum of every 40,000sf.
All tensile testing is in the machine direction

*** End of Report ***

GEOSYNTHETIC CLAY LINER
MQA TRACKING FORMS

CETCO
GCL MQA/MQC TRACKING FORM

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184619

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200405LO									
00000523	LO-BENTOMAT ST	150	2250	2708	200341VR	00003214	2002276020		011504B
00000524	LO-BENTOMAT ST	150	2250	2704	200341VR	00003214	2002276020		011504B
00000551	LO-BENTOMAT ST	150	2250	2621	200341VR	00003228	2002193990		011504C
00000552	LO-BENTOMAT ST	150	2250	2715	200404VR	00000189	2002188845		011504C
00000553	LO-BENTOMAT ST	150	2250	2685	200404VR	00000189	2002188845		011504C
00000554	LO-BENTOMAT ST	150	2250	2690	200404VR	00000189	2002188845		011604A
00000555	LO-BENTOMAT ST	150	2250	2691	200404VR	00000189	2002188845		011604A
00000576	LO-BENTOMAT ST	150	2250	2645	200403VR	00000149	2002151860		011604A
00000577	LO-BENTOMAT ST	150	2250	2639	200403VR	00000149	2002151860		011604A
00000578	LO-BENTOMAT ST	150	2250	2628	200403VR	00000149	2002151860		011604A
00000579	LO-BENTOMAT ST	150	2250	2626	200403VR	00000149	2002151860		011604A
00000580	LO-BENTOMAT ST	150	2250	2619	200403VR	00000149	2002151860		011604A
LOT# 200407LO									
00001072	LO-BENTOMAT ST	150	2250	2670	200346VR	00003511	2002151865		012704D
00001082	LO-BENTOMAT ST	150	2250	2650	200403VR	00000175	2002423519		012704D
00001083	LO-BENTOMAT ST	150	2250	2671	200403VR	00000175	2002423519		012704D
00001084	LO-BENTOMAT ST	150	2250	2670	200403VR	00000175	2002423519		012704D
00001085	LO-BENTOMAT ST	150	2250	2533	200403VR	00000175	2002423519		012804A

TOTAL SQUARE FEET..... 38,250

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184618

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200405LO									
00000516	LO-BENTOMAT ST	150	2250	2703	200341VR	00003235	2002276020		011504B
00000518	LO-BENTOMAT ST	150	2250	2716	200341VR	00003214	2002276020		011504B
00000519	LO-BENTOMAT ST	150	2250	2702	200341VR	00003214	2002276020		011504B
00000520	LO-BENTOMAT ST	150	2250	2711	200341VR	00003214	2002276020		011504B
00000521	LO-BENTOMAT ST	150	2250	2709	200341VR	00003214	2002276020		011504B
00000522	LO-BENTOMAT ST	150	2250	2705	200341VR	00003214	2002276020		011504B
00000548	LO-BENTOMAT ST	150	2250	2659	200341VR	00003228	2002193990		011504C
00000549	LO-BENTOMAT ST	150	2250	2673	200341VR	00003228	2002193990		011504C
00000550	LO-BENTOMAT ST	150	2250	2676	200341VR	00003228	2002193990		011504C
00000574	LO-BENTOMAT ST	150	2250	2634	200403VR	00000149	2002151860		011604A
00000575	LO-BENTOMAT ST	150	2250	2637	200403VR	00000149	2002151860		011604A
LOT# 200407LO									
00001086	LO-BENTOMAT ST	150	2250	2657	200403VR	00000175	2002423519		012804A
00001194	LO-BENTOMAT ST	150	2250	2686	200352VR	00003957	2001635707		020204A
00001323	LO-BENTOMAT ST	150	2250	2638	200404VR	00000218	2002408620		020404B

TOTAL SQUARE FEET..... 31,500

TOTAL PAGES 1

ENVIROCON

Submittal

Submittal Number 004A

1.0 Name of Submitter	Envirocon, Inc. 10400 North Burgard Way Portland, Oregon 97203
1.1 Contact Name	Steve Holmberg
1.2 Contact Phone	(503) 285-6164
1.3 Contact Fax	(503) 285-6205
2.0 Name of Project	Remediation of North and North 2 Landfills
3.0 Service Order No.	
4.0 Submittal Description	**GCL certifications**
5.0 Drawing Number	**NA**
6.0 Specification Section Number	**Section VII,D.5.d.(1)**
7.0 Original Submittal	YES
8.0 Manufacture's Information	**CETCO**
9.0 Date of Submittal	**11 MAY 04**
10.0 Person Submitting	**S. F. Holmberg**

Printed Name Signature

CETCO
COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY
P.O. Box 428 • Lovell, Wyoming 82431
(307) 548-6521 • Fax (307) 548-6413

Date: May 6, 2004
PO: 200415
Order #: 184621

Sam Mangrum
TEP-Texas Enviromental Plastics
2500 Farrell Road
Houston TX 77073
281-821-7320
smangrum@tepinc.net

Dear Sam Mangrum

Please find enclosed the MQA/MQC Data Package for GCL shipments to TEP-Texas Enviromental Plastics. These shipments left our CETCO - Lovell, Wy. plant on May 5, 2004.

If you have any questions regarding the enclosed QA/QC information, please contact me at (800)322-1149 ext:423.

Sincerely,

Roger B. Wilkerson
Quality Assurance

Printed on recycled paper.

CETCO
COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY
P.O. Box 428 • Lovell, Wyoming 82431
(307) 548-6521 • Fax (307) 548-6413

Date: May 7, 2004
PO: 200415
Order #: 184625

Sam Mangrum
TEP-Texas Enviromental Plastics
2500 Farrell Road
Houston TX 77073
281-821-7320
smangrum@tepinc.net

Dear Sam Mangrum

Please find enclosed the MQA/MQC Data Package for GCL shipments to TEP-Texas Enviromental Plastics. These shipments left our CETCO - Lovell, Wy. plant on May 6, 2004.

If you have any questions regarding the enclosed QA/QC information, please contact me at (800)322-1149 ext:423.

Sincerely,

Roger B. Wilkerson
Quality Assurance

GEOSYNTHETIC CLAY LINER

MANUFACTURING
QA / QC DATA PACKAGE

PROJECT NAME: ALCOA
Vancouver WA 98660

CUSTOMER P.O.: 200415

PREPARED FOR: TEP-Texas Enviromental Plastics
2500 Farrell Road
Houston TX 77073
Telephone # : 281-821-7320
Email Address: smangrum@tepinc.net

PREPARED BY: Roger B. Wilkerson
Quality Assurance
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, Wy. 82431
Telephone #: 800-322-1149 (Ext. 423)
Fax #: (307)548-6927, (307)548-6413
E-Mail: rwilke@cetco.com

GEOSYNTHETIC CLAY LINER

MANUFACTURING
QA / QC DATA

FOR ALL GCL MANUFACTURED ON:

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184621
Ship Date:	5-May

CONTENTS:

P A C K I N G L I S T

[redacted]TCO
[redacted]00 WEST SHURE DRIVE
ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184621
ORDER DATE: 3/03/2004
SHIP DATE:. 5/05/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200407LO	00001088	150.0	15.0	2250.0	2624.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001091	150.0	15.0	2250.0	2685.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001124	150.0	15.0	2250.0	2636.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001125	150.0	15.0	2250.0	2622.0
[redacted]BENTOMAT ST		SFT	SF 200407LO	00001159	150.0	15.0	2250.0	2769.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001169	150.0	15.0	2250.0	2742.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001190	150.0	15.0	2250.0	2703.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001218	150.0	15.0	2250.0	2705.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001245	150.0	15.0	2250.0	2662.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001273	150.0	15.0	2250.0	2730.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001274	150.0	15.0	2250.0	2758.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001298	150.0	15.0	2250.0	2653.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001299	150.0	15.0	2250.0	2650.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001320	150.0	15.0	2250.0	2633.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001321	150.0	15.0	2250.0	2627.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001322	150.0	15.0	2250.0	2623.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001345	150.0	15.0	2250.0	2654.0
[redacted]							========	========
ORDER TOTALS.....							38250.0	45476.0

TOTAL ITEMS..... 17

GEOSYNTHETIC CLAY LINER MANUFACTURING CERTIFICATION

GEOSYNTHETIC CLAY LINER

MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184621
Ship Date:	5-May

Colloid Environmental Technologies Company (CETCO) hereby affirms and certifies that all of the **BENTOMAT ST** manufactured in this lot achieves the physical and chemical criteria listed on the attached analysis sheet.

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

NEEDLE DETECTION CERTIFICATION

CERTIFICATION STATEMENT

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184621
Ship Date:	5-May

This statement is to certify that all components of the **BENTOMAT ST** manufactured for the above project have been inspected continually for the presence of broken needles through the use of a magnetic removal system.

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

BENTONITE CLAY CERTIFICATIONS

TECHNICAL DATA SHEET

ORIGIN INFORMATION

BENTONITE

Manufacturer: **AMERICAN COLLOID COMPANY**

PRODUCTION

Facility: **AMERICAN COLLOID COMPANY**
92 HWY. 37
Lovell, WY 82431

Contact: **Moses Briseno**
Quality Assurance Coordinator
(800)-322-1160

Brand Name: **CG 50**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **28-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012804A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **29-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012904A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.3**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **29-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012904C**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**27.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **03-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020304A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **03-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020304B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **04-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020404A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **04-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020404B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **04-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020404D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

WOVEN GEOTEXTILE
MANUFACTURER'S CERTIFICATION

TECHNICAL DATA SHEET

ORIGIN INFORMATION

WOVEN GEOTEXTILE

Manufacturer:	**Synthetic Industries Inc.**
PRODUCTION	
Facility:	**Synthetic Industries** **4019 Industry Drive** **Chattanooga, TN. 37416**
Contact:	Randy Johnson
Brand Name:	82 Tex.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4														
5														
1190	**HandUnit**	**ProdOrd**	**Product**	**STYLE**	**DOFFED**	**WEIGHT**	**TENSMA**	**TENSCR**	**ELONGM**	**ELONGC**	**TTEARM**	**TTEARC**	**BURST**	
1191	2001604167	2026761	1002581	82TEX	8/27/2003	3.6	152	146	21	16	98	155	293	
1192	2001604168	2026761	1002581	82TEX	8/24/2003	3.6	169	136	26	16	97	130	313	
1193	2001604169	2027100	1002581	82TEX	8/26/2003	3.6	149	147	23	17	88	98	323	
1194	2001604170	2027100	1002581	82TEX	8/28/2003	3.6	152	140	23	17	95	133	283	
1195	2001604177	2027100	1002581	82TEX	8/24/2003	3.5	152	142	23	18	80	141	290	
1196	2001608103	2027364	1002581	82TEX	8/24/2003	3.5	164	146	24	18	80	151	288	
1197	2001608104	2027364	1002581	82TEX	8/27/2003	3.8	163	166	22	19	85	186	305	
1198	2001608105	2027364	1002581	82TEX	8/29/2003	3.5	150	137	21	18	66	82	333	
1199	2001608350	2026762	1002581	82TEX	8/24/2003	3.6	148	141	21	15	69	129	287	
1200	2001608351	2026762	1002581	82TEX	8/27/2003	3.5	151	146	21	17	71	86	333	
1201	2001608352	2026762	1002581	82TEX	8/29/2003	3.5	157	140	21	17	79	68	380	
1202	2001610306	2027095	1002581	82TEX	9/2/2003	3.5	149	143	21	16	70	81	310	
1203	2001610307	2027095	1002581	82TEX	8/31/2003	3.6	144	146	23	18	69	84	297	
1204	2001610308	2027095	1002581	82TEX	8/28/2003	3.6	151	136	20	16	73	139	323	
1205	2001620734	2027099	1002581	82TEX	9/4/2003	3.6	150	149	19	16	74	78	303	
1206	2001620735	2027099	1002581	82TEX	9/1/2003	3.6	160	143	25	19	74	78	323	
1207	2001620736	2027099	1002581	82TEX	8/29/2003	3.4	148	140	20	16	65	75	310	
1208	2001621341	2027362	1002581	82TEX	9/3/2003	3.3	145	152	22	18	75	97	322	
1209	2001621342	2027362	1002581	82TEX	9/1/2003	3.7	145	152	24	19	67	90	292	
1210	2001621343	2027362	1002581	82TEX	8/29/2003	3.6	135	149	20	15	66	91	340	
1211	2001621520	2027098	1002581	82TEX	9/1/2003	3.6	155	161	23	19	61	88	303	
1212	2001621521	2027098	1002581	82TEX	8/30/2003	3.8	143	153	24	16	59	88	302	
1213	2001621522	2027098	1002581	82TEX	8/27/2003	3.6	145	149	21	17	109	159	283	
1214	2001635705	2027102	1002581	82TEX	9/1/2003	3.6	167	139	23	19	79	76	298	
1215	2001635706	2027102	1002581	82TEX	8/30/2003	3.8	161	149	24	17	89	82	285	
1216	2001635713	2027102	1002581	82TEX	9/3/2003	3.5	162	141	25	17	80	82	315	
1217	2001635714	2028193	1002581	82TEX	9/3/2003	3.6	151	159	21	16	72	82	270	
1218	2001636721	2028193	1002581	82TEX	9/1/2003	3.6	155	162	25	18	80	89	313	
1219	2001644384	2028192	1002581	82TEX	9/2/2003	3.6	169	151	25	19	86	148	293	
1220	2001644385	2028192	1002581	82TEX	9/4/2003	3.7	152	168	20	17	83	128	280	
1221	2001644393	2028192	1002581	82TEX	8/31/2003	3.7	167	160	25	20	95	108	318	
1222	2001647170	2027101	1002581	82TEX	9/1/2003	3.6	175	167	26	22	88	99	323	
1223	2001647171	2027101	1002581	82TEX	9/3/2003	3.5	169	144	26	18	89	178	325	
1224	2001647172	2027101	1002581	82TEX	9/5/2003	3.5	152	137	23	18	80	83	327	
1225	2001647819	2028194	1002581	82TEX	9/6/2003	3.2	158	137	23	17	70	70	267	
1226	2001647820	2028194	1002581	82TEX	9/4/2003	3.6	145	142	19	16	65	82	315	

SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	DOFFED	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST
2001730613	2028839	1002581	82TEX	9/19/2003	3.5	175	167	25	19	73	103	340
2001730638	2028836	1002581	82TEX	9/19/2003	3.5	169	157	22	18	61	81	347
2001730650	2028837	1002581	82TEX	9/19/2003	3.5	156	143	20	17	68	92	330
2001741069	2028842	1002581	82TEX	9/19/2003	3.6	165	158	26	18	78	88	333
2001741070	2028842	1002581	82TEX	9/21/2003	3.5	167	149	21	18	69	92	317
2001741799	2029690	1002581	82TEX	9/19/2003	3.4	173	155	27	20	76	88	268
2001741800	2029690	1002581	82TEX	9/21/2003	3.4	175	154	26	20	77	94	348
2001756542	2028831	1002581	82TEX	9/19/2003	3.4	139	141	21	17	58	59	267
2001756543	2028831	1002581	82TEX	9/22/2003	3.5	151	141	22	17	68	80	303
2001756543	2028831	1002581	82TEX	9/22/2003	3.5	151	141	22	17	68	80	303
2001757153	2029691	1002581	82TEX	9/20/2003	3.3	155	139	21	17	83	99	360
2001757154	2029691	1002581	82TEX	9/23/2003	3.6	156	153	26	19	67	97	323
2001758202	2029689	1002581	82TEX	9/24/2003	3.4	149	140	22	18	57	70	328
2001758203	2029689	1002581	82TEX	9/21/2003	3.3	146	136	20	16	72	92	297

SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	DOFFED	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST
2002083025	2033346	1002581	82TEX	11/13/2003	3.6	163	159	24	21	79	101	342
2002083026	2033346	1002581	82TEX	11/15/2003	3.2	161	148	25	20	96	99	307
2002134885	2034251	1002581	82TEX	11/21/2003	3.5	148	144	26	21	84	81	293
2002134887	2034251	1002581	82TEX	11/26/2003	3.6	159	147	25	18	94	131	300
2002134891	2034251	1002581	82 TEX	12/4/2003	3.6	158	150	22	18	85	72	293
2002151844	2036317	1002581	82TEX	11/20/2003	3.7	153	149	24	19	81	125	280
2002151845	2036317	1002581	82TEX	11/22/2003	3.6	166	146	23	19	83	89	330
2002151846	2036317	1002581	82TEX	11/24/2003	3.3	165	137	25	20	84	95	297
2002151857	2036318	1002581	82TEX	11/20/2003	3.4	156	143	25	18	74	106	310
2002151858	2036318	1002581	82TEX	11/25/2003	3.6	150	143	24	16	85	118	320
2002151865	2036318	1002581	82TEX	11/23/2003	3.6	157	142	24	20	78	87	335
2002188845	2036316	1002581	82TEX	11/28/2003	3.6	157	158	21	18	63	103	318
2002188846	2036316	1002581	82TEX	11/25/2003	3.6	164	152	25	19	87	116	300
2002188847	2036316	1002581	82 TEX	11/30/2003	3.5	163	154	24	19	78	133	300
2002193991	2037887	1002581	82 TEX	11/30/2003	3.5	165	148	26	19	84	189	297
2002193992	2037887	1002581	82TEX	12/3/2003	3.7	152	171	22	21	86	143	318
2002193998	2037887	1002581	82TEX	11/25/2003	3.5	158	152	24	19	85	178	300
2002246420	2038787	1002581	82 TEX	12/5/2003	3.4	135	138	29	25	91	119	297
2002246421	2038787	1002581	82TEX	12/7/2003	3.6	149	155	25	20	85	101	340
2002274598	2037953	1002581	82TEX	12/7/2003	3.5	146	139	25	19	74	75	313

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4														
5														
1597	**HandUnit**	**ProdOrd**	**Product**	**STYLE**	**DOFFED**	**WEIGHT**	**TENSMA**	**TENSCR**	**ELONGM**	**ELONGC**	**TTEARM**	**TTEARC**	**BURST**	
1598	2002246422	2038787	1002581	82TEX	12/9/2003	3.6	154	159	24	21	76	111	318	
1599	2002274599	2037953	1002581	82TEX	12/8/2003	3.7	144	157	23	17	81	135	288	
1600	2002274600	2037953	1002581	82TEX	12/11/2003	3.7	148	158	24	19	86	93	335	
1601	2002275171	2037951	1002581	82TEX	12/8/2003	3.6	156	154	26	20	81	111	295	
1602	2002275172	2037951	1002581	82TEX	12/11/2003	3.7	157	162	24	19	88	136	303	
1603	2002275173	2037951	1002581	82TEX	12/14/2003	3.4	163	153	26	20	94	106	303	
1604	2002276016	2037952	1002581	82TEX	12/12/2003	3.5	154	147	26	19	86	96	338	
1605	2002276017	2037952	1002581	82TEX	12/14/2003	3.6	149	158	24	18	79	108	282	
1606	2002276025	2037952	1002581	82TEX	12/9/2003	3.2	150	138	24	19	84	85	298	
1607	2002317467	2038786	1002581	82TEX	12/14/2003	3.6	151	153	25	20	87	146	283	
1608	2002317468	2038786	1002581	82TEX	12/16/2003	3.4	155	148	26	21	82	121	273	
1609	2002317469	2038786	1002581	82TEX	12/19/2003	3.6	152	146	25	19	81	149	292	
1610	2002364345	2039467	1002581	82TEX	12/19/2003	3.6	152	147	25	18	69	61	297	
1611	2002364347	2039467	1002581	82TEX	12/22/2003	3.7	156	150	25	21	82	96	310	
1612	2002364348	2039467	1002581	82TEX	12/24/2003	3.6	154	150	24	19	78	128	288	
1613	2002378684	2040228	1002581	82TEX	12/23/2003	3.8	154	148	25	20	79	81	310	

COLLOID ENVIRONMENTAL TECH. CO.
GEOTEXTILE QC DATA

LOVELL AMERICAN COLLOID

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER: 000184621

Material	Lot #	Roll #	Geotextile Mass/Area ASTM D 5261	Grab Strength ASTM D 4632
LO-WOVEN-ST	2002445716		3.4	168.4
LO-WOVEN-ST	2002423519		3.4	174.3
LO-WOVEN-ST	2002408620		3.4	169.6

TOTAL PAGES 1

NON-WOVEN GEOTEXTILE MANUFACTURER'S CERTIFICATION

TECHNICAL DATA SHEET

ORIGIN INFORMATION

NON-WOVEN GEOTEXTILE

Manufacturer: **Colloid Environmental Technologies Co.**

PRODUCTION
FACILITY: **CETCO**
102 Conners Road
Villa Rica, GA 30180

CONTACT: Debbie Bivins 404-459-4995

BRAND NAME: Standard

NON-WOVEN GEOTEXTILE

MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184621
Ship Date:	5-May

CETCO hereby affirms and certifies that the Non-Woven geotextile in the **BENTOMAT ST** product for the above project has been manufactured to meet the following physical properties.

PROPERTY	TEST METHOD	MINIMUM VALUE
Mass / Area	ASTM D-5261	6.0 oz/sqyd (Min.)
Grab Strength	ASTM D-4632	6.0 Lbs MARV (MD)

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

QCG#TF3 QCT#TF3
5/06/04 7:51:50

CETCO
GEOTEXTILE QC DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184621

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200347VR	00003566	6.6	82.2
LO-N/W-WHITE-ST	200348VR	00003636	6.6	57.0
LO-N/W-WHITE-ST	200351VR	00003901	6.6	57.1
LO-N/W-WHITE-ST	200402VR	00000048	6.6	84.7
LO-N/W-WHITE-ST	200403VR	00000146	6.6	49.7
LO-N/W-WHITE-ST	200403VR	00000148	6.6	49.7
LO-N/W-WHITE-ST	200403VR	00000171	6.7	131.5
LO-N/W-WHITE-ST	200403VR	00000175	6.7	131.5
LO-N/W-WHITE-ST	200403VR	00000177	6.7	131.5
LO-N/W-WHITE-ST	200403VR	00000179	6.8	71.1
LO-N/W-WHITE-ST	200404VR	00000218	6.6	76.7
LO-N/W-WHITE-ST	200407VR	00000458	6.8	65.9

GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS

GEOSYNTHETIC CLAY LINER

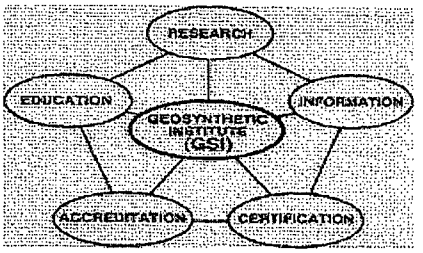
MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184621
Ship Date:	5-May

CETCO hereby affirms and certifies that the **BENTOMAT ST** material supplied to this project will meet the physical and chemical criteria listed below.

PROPERTY	TEST METHOD	MINIMUM VALUE
Peel Strength	ASTM D 4632 (Modified)	**15 lbs**
Bentonite Free Swell	ASTM D 5890	**24 mL / 2g MIN.**
Bentonite Fluid Loss	ASTM D 5891	**18.0 mL (MAX)**
Bentonite Mass / Area	ASTM D 5993	*** .75 lb/sq.ft. (Min.)**
Grab Strength	ASTM D 4632	**90 lbs.**
Permeability	ASTM D 5887	**5 x 10 (-9) cm/sec. (Max)**
Index Flux	ASTM D 5887	**1.0 x 10 (-8) m(3)/m(2)/sec.**

*** Reported at 0 % moisture content.**
GAI Lab Accredited Test Methods were followed during conformance testing for:
ASTM D 4632 - Grab Strength and Grab Elongation.
ASTM D 5993 - Bentonite Mass/Area.



Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

QCG#FT2 QCT#FT2
5/06/04 7:51:50

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184621

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200407LO	00001345	.86	308.30	28.70
LO-BENTOMAT ST	200407LO	00001322	.80	308.30	41.80
LO-BENTOMAT ST	200407LO	00001321	.80	308.30	41.80
LO-BENTOMAT ST	200407LO	00001320	.80	308.30	41.80
LO-BENTOMAT ST	200407LO	00001299	.85	195.70	38.70
LO-BENTOMAT ST	200407LO	00001298	.85	195.70	38.70
LO-BENTOMAT ST	200407LO	00001274	.91*	195.70	37.90*
LO-BENTOMAT ST	200407LO	00001273	.91	195.70	29.40
LO-BENTOMAT ST	200407LO	00001245	.92	195.70	43.10
LO-BENTOMAT ST	200407LO	00001218	.89	195.70	42.90
LO-BENTOMAT ST	200407LO	00001190	.93	249.70	28.90
LO-BENTOMAT ST	200407LO	00001169	.88	249.70	32.00
LO-BENTOMAT ST	200407LO	00001159	.88	249.70	32.00
LO-BENTOMAT ST	200407LO	00001125	.85	249.70	34.80
LO-BENTOMAT ST	200407LO	00001124	.85	249.70	34.80
LO-BENTOMAT ST	200407LO	00001091	.89	273.40	31.70
LO-BENTOMAT ST	200407LO	00001088	.89	273.40	31.70

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present, test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200,000sf.
Peel Strength is tested a minimum of every 40,000sf.
All tensile testing is in the machine direction

*** End of Report ***

GEOSYNTHETIC CLAY LINER
MQA TRACKING FORMS

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184621

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200407LO									
00001088	LO-BENTOMAT ST	150	2250	2624	200403VR	00000175	2002423519		012804A
00001091	LO-BENTOMAT ST	150	2250	2685	200351VR	00003901	2002423519		012804A
00001124	LO-BENTOMAT ST	150	2250	2636	200348VR	00003636	2002445715		012904A
00001125	LO-BENTOMAT ST	150	2250	2622	200348VR	00003636	2002445715		012904A
00001159	LO-BENTOMAT ST	150	2250	2769	200347VR	00003566	2001730655		012904C
00001169	LO-BENTOMAT ST	150	2250	2742	200403VR	00000146	2001730655		012904C
00001190	LO-BENTOMAT ST	150	2250	2703	200403VR	00000148	2001635707		020204A
00001218	LO-BENTOMAT ST	150	2250	2705	200403VR	00000177	2002445716		020204B
00001245	LO-BENTOMAT ST	150	2250	2662	200403VR	00000171	2002151859		020204D
00001273	LO-BENTOMAT ST	150	2250	2730	200403VR	00000179	2002408623		020304A
00001274	LO-BENTOMAT ST	150	2250	2758	200403VR	00000179	2002408623		020304B
00001298	LO-BENTOMAT ST	150	2250	2653	200402VR	00000048	2002423522		020404A
00001299	LO-BENTOMAT ST	150	2250	2650	200402VR	00000048	2002423522		020404A
00001320	LO-BENTOMAT ST	150	2250	2633	200404VR	00000218	2002408620		020404B
00001321	LO-BENTOMAT ST	150	2250	2627	200404VR	00000218	2002408620		020404B
00001322	LO-BENTOMAT ST	150	2250	2623	200404VR	00000218	2002408620		020404B
00001345	LO-BENTOMAT ST	150	2250	2654	200407VR	00000458	2002276017		020404D

TOTAL SQUARE FEET..... 38,250

TOTAL PAGES 1

GEOSYNTHETIC CLAY LINER

MANUFACTURING
QA / QC DATA PACKAGE

PROJECT NAME: ALCOA
Vancouver WA 98660

CUSTOMER P.O.: 200415

PREPARED FOR: TEP-Texas Enviromental Plastics
2500 Farrell Road
Houston TX 77073
Telephone # : 281-821-7320
Email Address: smangrum@tepinc.net

PREPARED BY: Roger B. Wilkerson
Quality Assurance
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, Wy. 82431
Telephone #: 800-322-1149 (Ext. 423)
Fax #: (307)548-6927, (307)548-6413
E-Mail: rwilke@cetco.com

GEOSYNTHETIC CLAY LINER

MANUFACTURING
QA / QC DATA

FOR ALL GCL MANUFACTURED ON:

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184625
Ship Date:	6-May

CONTENTS:

P A C K I N G L I S T

[redacted]ETCO
[redacted]00 WEST SHURE DRIVE
ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184625
ORDER DATE: 3/03/2004
SHIP DATE:. 5/06/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200407LO	00001087	150.0	15.0	2250.0	2650.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001090	150.0	15.0	2250.0	2665.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001122	150.0	15.0	2250.0	2636.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001156	150.0	15.0	2250.0	2754.0
[redacted]-BENTOMAT ST		SFT	SF 200407LO	00001157	150.0	15.0	2250.0	2772.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001158	150.0	15.0	2250.0	2757.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001217	150.0	15.0	2250.0	2718.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001244	150.0	15.0	2250.0	2659.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001343	150.0	15.0	2250.0	2645.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001344	150.0	15.0	2250.0	2650.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002152	150.0	15.0	2250.0	2761.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002161	150.0	15.0	2250.0	2754.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002167	150.0	15.0	2250.0	2744.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002168	150.0	15.0	2250.0	2749.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002169	150.0	15.0	2250.0	2743.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002171	150.0	15.0	2250.0	2751.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002175	150.0	15.0	2250.0	2721.0

[redacted]

ORDER TOTALS.....	38250.0	46129.0

TOTAL ITEMS..... 17

GEOSYNTHETIC CLAY LINER MANUFACTURING CERTIFICATION

GEOSYNTHETIC CLAY LINER

MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184625
Ship Date:	6-May

Colloid Environmental Technologies Company (CETCO) hereby affirms and certifies that all of the **BENTOMAT ST** manufactured in this lot achieves the physical and chemical criteria listed on the attached analysis sheet.

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

NEEDLE DETECTION CERTIFICATION

CERTIFICATION STATEMENT

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184625
Ship Date:	6-May

This statement is to certify that all components of the **BENTOMAT ST** manufactured for the above project have been inspected continually for the presence of broken needles through the use of a magnetic removal system.

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

BENTONITE CLAY CERTIFICATIONS

TECHNICAL DATA SHEET

ORIGIN INFORMATION

BENTONITE

Manufacturer: **AMERICAN COLLOID COMPANY**

PRODUCTION

Facility: **AMERICAN COLLOID COMPANY**
92 HWY. 37
Lovell, WY 82431

Contact: **Moses Briseno**
Quality Assurance Coordinator
(800)-322-1160

Brand Name: **CG 50**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **28-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012804A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **29-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012904A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.3**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **29-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012904C**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**27.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **04-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020404D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.8**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **26-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **022604A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.0**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

WOVEN GEOTEXTILE
MANUFACTURER'S CERTIFICATION

TECHNICAL DATA SHEET

ORIGIN INFORMATION

WOVEN GEOTEXTILE

Manufacturer: **Synthetic Industries Inc.**

PRODUCTION

Facility: **Synthetic Industries**
4019 Industry Drive
Chattanooga, TN. 37416

Contact: Randy Johnson

Brand Name: 82 Tex.

SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	TESTDATE	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST	PUNCT
2001684527	2028840	1002581	82TEX	09/15/03	3.47	164.7	162.55	21.55	17.78333	73.65	91.8	343.33	84.7
2001700944	2028832	1002581	82TEX	09/18/03	3.55	154.25	141.8	24.725	16.23333	65.25	71.6	308.33	78.75
2001700945	2028832	1002581	82TEX	09/15/03	3.64	154.55	155.4667	20.9	16.7	65.8	96.15	310	72
2001700947	2028832	1002581	82TEX	09/13/03	3.64	147.925	150.2667	21.65	15.6	74.45	94.85	326.67	82.15
2001730637	2028836	1002581	82TEX	09/17/03	3.43	162.125	173.05	24.075	21.15	67.2	78.55	353.33	97.1
2001730638	2028836	1002581	82TEX	09/19/03	3.5	169.25	156.8667	21.9	18.15	61	80.75	346.67	100.4
2001730646	2028836	1002581	82TEX	09/15/03	3.68	156.125	164.8167	20.725	17.85	61.2	73.3	330	85.85
2001730647	2028837	1002581	82TEX	09/15/03	3.61	148.725	150.1833	20.85	16.08333	65.05	102	320	72.65
2001730649	2028837	1002581	82TEX	09/17/03	3.57	161.825	166.4167	24.975	16.66667	66	94.8	346.67	87.95
2001730650	2028837	1002581	82TEX	09/19/03	3.46	156.075	143.1	19.75	16.71667	68.25	91.6	330	70.7
2001741069	2028842	1002581	82TEX	09/19/03	3.57	165.225	157.8	26.075	17.63333	78.2	87.55	333.33	82.3
2001741070	2028842	1002581	82TEX	09/21/03	3.51	166.55	149.05	21.15	18.28333	69.3	92.25	316.67	82.15
2001741078	2028842	1002581	82TEX	09/17/03	3.32	146.4	139.4333	22.275	19.25	75.65	87.5	296.67	71.95
2001741798	2029690	1002581	82TEX	09/17/03	3.42	173.9	164.7	25.35	19.48333	89.5	98.6	316.67	77.9
2001741799	2029690	1002581	82TEX	09/19/03	3.4	172.625	154.9333	26.675	19.68333	75.5	87.9	268.33	90.7
2001741800	2029690	1002581	82TEX	09/21/03	3.36	175.275	153.95	25.8	19.76667	76.8	93.9	348.33	87.4
2001741804	2029690	1002581	82TEX	10/01/03	3.46	158.575	149.45	21.825	18.03333	69.95	101.6	333.33	95.05
2001786178	2029692	1002581	82TEX	10/04/03	3.44	161.05	147.1	23.425	18.98333	61.85	69.55	320	95.35
2001786182	2029692	1002581	82TEX	09/27/03	3.52	162.85	148.9333	24.75	17.13333	57.75	74.45	356.67	107.7
2001814524	2030481	1002581	82TEX	09/29/03	3.52	156.55	155.85	22.825	16.95	69.65	84.2	303.33	88.6
2001826164	2030475	1002581	82TEX	09/30/03	3.68	163.925	157.36	25.575	20.28	84	116	320	73.55
2001839554	2030483	1002581	82TEX	10/04/03	3.45	166.475	159.6167	22.25	19.38333	74.45	90.75	363.33	95.35
2001858813	2030482	1002581	82TEX	10/04/03	3.44	155.025	145.5	21.25	17.51667	74.3	94.75	330	80.15
2001858814	2030482	1002581	82TEX	10/07/03	3.46	168.8	144.6333	24.6	18.31667	69.35	83.9	338.33	96
2001858815	2030482	1002581	82TEX	10/09/03	3.31	164.375	141.8833	26.05	18.5	79.25	89.25	333.33	90.3
2001881363	2030474	1002581	82TEX	10/09/03	3.61	152.325	159.3667	20.175	16.28333	67.95	101.95	330	98
2001881364	2030474	1002581	82TEX	10/12/03	3.53	160.75	148.8167	23.05	18.15	72.3	81.8	356.67	105.9
2001881365	2030474	1002581	82TEX	10/14/03	3.54	159.7	153.1333	24.4	18.26667	74.1	82.7	300	99.8
2001914849	2032601	1002581	82TEX	10/18/03	3.51	158.95	150.8333	24.675	18.51667	70.9	77.45	326.67	93.75
2001920361	2032600	1002581	82TEX	10/20/03	3.54	167.9	158.0833	25.225	18.61667	74.45	98.15	333.33	86.55
2001938399	2032602	1002581	82TEX	10/22/03	3.57	168	167.75	25.25	19.76667	67.9	103.85	340	92.85

SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	DOFFED	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST
2002083025	2033346	1002581	82TEX	11/13/2003	3.6	163	159	24	21	79	101	342
2002083026	2033346	1002581	82TEX	11/15/2003	3.2	161	148	25	20	96	99	307
2002134885	2034251	1002581	82TEX	11/21/2003	3.5	148	144	26	21	84	81	293
2002134887	2034251	1002581	82TEX	11/26/2003	3.6	159	147	25	18	94	131	300
2002134891	2034251	1002581	82 TEX	12/4/2003	3.6	158	150	22	18	85	72	293
2002151844	2036317	1002581	82TEX	11/20/2003	3.7	153	149	24	19	81	125	280
2002151845	2036317	1002581	82TEX	11/22/2003	3.6	166	146	23	19	83	89	330
2002151846	2036317	1002581	82TEX	11/24/2003	3.3	165	137	25	20	84	95	297
2002151857	2036318	1002581	82TEX	11/20/2003	3.4	156	143	25	18	74	106	310
2002151858	2036318	1002581	82TEX	11/25/2003	3.6	150	143	24	16	85	118	320
2002151865	2036318	1002581	82TEX	11/23/2003	3.6	157	142	24	20	78	87	335
2002188845	2036316	1002581	82TEX	11/28/2003	3.6	157	158	21	18	63	103	318
2002188846	2036316	1002581	82TEX	11/25/2003	3.6	164	152	25	19	87	116	300
2002188847	2036316	1002581	82 TEX	11/30/2003	3.5	163	154	24	19	78	133	300
2002193991	2037887	1002581	82 TEX	11/30/2003	3.5	165	148	26	19	84	189	297
2002193992	2037887	1002581	82TEX	12/3/2003	3.7	152	171	22	21	86	143	318
2002193998	2037887	1002581	82TEX	11/25/2003	3.5	158	152	24	19	85	178	300
2002246420	2038787	1002581	82 TEX	12/5/2003	3.4	135	138	29	25	91	119	297
2002246421	2038787	1002581	82TEX	12/7/2003	3.6	149	155	25	20	85	101	340
2002274598	2037953	1002581	82TEX	12/7/2003	3.5	146	139	25	19	74	75	313

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4														
5														
1597	**HandUnit**	**ProdOrd**	**Product**	**STYLE**	**DOFFED**	**WEIGHT**	**TENSMA**	**TENSCR**	**ELONGM**	**ELONGC**	**TTEARM**	**TTEARC**	**BURST**	
1598	2002246422	2038787	1002581	82TEX	12/9/2003	3.6	154	159	24	21	76	111	318	
1599	2002274599	2037953	1002581	82TEX	12/8/2003	3.7	144	157	23	17	81	135	288	
1600	2002274600	2037953	1002581	82TEX	12/11/2003	3.7	148	158	24	19	86	93	335	
1601	2002275171	2037951	1002581	82TEX	12/8/2003	3.6	156	154	26	20	81	111	295	
1602	2002275172	2037951	1002581	82TEX	12/11/2003	3.7	157	162	24	19	88	136	303	
1603	2002275173	2037951	1002581	82TEX	12/14/2003	3.4	163	153	26	20	94	106	303	
1604	2002276016	2037952	1002581	82TEX	12/12/2003	3.5	154	147	26	19	86	96	338	
1605	2002276017	2037952	1002581	82TEX	12/14/2003	3.6	149	158	24	18	79	108	282	
1606	2002276025	2037952	1002581	82TEX	12/9/2003	3.2	150	138	24	19	84	85	298	
1607	2002317467	2038786	1002581	82TEX	12/14/2003	3.6	151	153	25	20	87	146	283	
1608	2002317468	2038786	1002581	82TEX	12/16/2003	3.4	155	148	26	21	82	121	273	
1609	2002317469	2038786	1002581	82TEX	12/19/2003	3.6	152	146	25	19	81	149	292	
1610	2002364345	2039467	1002581	82TEX	12/19/2003	3.6	152	147	25	18	69	61	297	
1611	2002364347	2039467	1002581	82TEX	12/22/2003	3.7	156	150	25	21	82	96	310	
1612	2002364348	2039467	1002581	82TEX	12/24/2003	3.6	154	150	24	19	78	128	288	
1613	2002378684	2040228	1002581	82TEX	12/23/2003	3.8	154	148	25	20	79	81	310	

	A	B	C
1			
2	**SI® Geosolutions**		
3			
4	**Roll Number**	**WEIGHT**	**TENSMA**
5	2002408616	3.7	149
6	2002408617	3.4	154
7	2002408618	3.5	156
8	2002423525	3.5	141
9	2002441787	3.8	155
10	2002441788	3.7	169
11	2002445769	3.6	157
12	2002493149	3.6	162
13	2002493150	3.6	174
14	2002493151	3.4	151
15	2002498504	3.6	157
16	2002498510	3.5	164
17	2002498511	3.5	168
18	2002537672	3.6	155
19	2002537673	3.5	148
20	2002537674	3.7	154
21	2002539799	3.4	189
22	2002539800	3.7	163
23	2002539801	3.7	156
24	2002611435	3.5	159
25	2002611437	3.6	155
26	2002611438	4.3	155
27	2002636654	3.6	156
28	2002636655	3.6	146
29	2002636657	3.6	144
30	2002636658	3.6	139
31	2002729022	3.5	140
32	2002744745	3.6	142
33	2002744747	3.5	149
34	2002847681	3.6	154
35	2002729024	3.6	157
36	2002744749	3.4	157
37	2002847688	3.5	147
38	2002729023	3.6	160

COLLOID ENVIRONMENTAL TECH. CO.
GEOTEXTILE QC DATA

LOVELL AMERICAN COLLOID

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER: 000184625

Material	Lot #	Roll #	Geotextile Mass/Area ASTM D 5261	Grab Strength ASTM D 4632
LO-WOVEN-ST	2002423519		3.4	174.3
LO-WOVEN-ST	2002445716		3.4	168.4

TOTAL PAGES 1

NON-WOVEN GEOTEXTILE MANUFACTURER'S CERTIFICATION

TECHNICAL DATA SHEET

ORIGIN INFORMATION

NON-WOVEN GEOTEXTILE

Manufacturer:	**Colloid Environmental Technologies Co.**
PRODUCTION FACILITY:	**CETCO** **102 Conners Road** **Villa Rica, GA 30180**
CONTACT:	Debbie Bivins 404-459-4995
BRAND NAME:	Standard

NON-WOVEN GEOTEXTILE

MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184625
Ship Date:	6-May

CETCO hereby affirms and certifies that the Non-Woven geotextile in the **BENTOMAT ST** product for the above project has been manufactured to meet the following physical properties.

PROPERTY	TEST METHOD	MINIMUM VALUE
Mass / Area	ASTM D-5261	6.0 oz/sqyd (Min.)
Grab Strength	ASTM D-4632	6.0 Lbs MARV (MD)

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

CETCO
GEOTEXTILE QC DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184625

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200347VR	00003566	6.6	82.2
LO-N/W-WHITE-ST	200351VR	00003901	6.6	57.1
LO-N/W-WHITE-ST	200403VR	00000114	6.5	70.3
LO-N/W-WHITE-ST	200403VR	00000169	6.9	76.9
LO-N/W-WHITE-ST	200403VR	00000175	6.7	131.5
LO-N/W-WHITE-ST	200403VR	00000177	6.7	131.5
LO-N/W-WHITE-ST	200407VR	00000458	6.8	65.9
LO-N/W-WHITE-ST	200409VR	00000661	6.9	58.3
LO-N/W-WHITE-ST	200409VR	00000680	6.7	55.3
LO-N/W-WHITE-ST	200409VR	00000683	6.8	40.8

TOTAL PAGES 1

GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS

GEOSYNTHETIC CLAY LINER

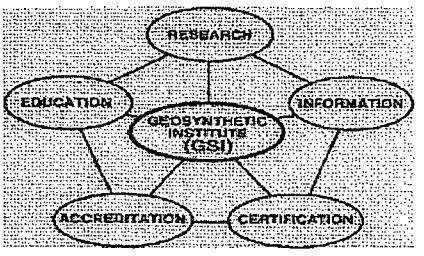
MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184625
Ship Date:	6-May

CETCO hereby affirms and certifies that the **BENTOMAT ST** material supplied to this project will meet the physical and chemical criteria listed below.

PROPERTY	TEST METHOD	MINIMUM VALUE
Peel Strength	ASTM D 4632 (Modified)	**15 lbs**
Bentonite Free Swell	ASTM D 5890	**24 mL / 2g MIN.**
Bentonite Fluid Loss	ASTM D 5891	**18.0 mL (MAX)**
Bentonite Mass / Area	ASTM D 5993	*** .75 lb/sq.ft. (Min.)**
Grab Strength	ASTM D 4632	**90 lbs.**
Permeability	ASTM D 5887	**5 x 10 (-9) cm/sec. (Max)**
Index Flux	ASTM D 5887	**1.0 x 10 (-8) m(3)/m(2)/sec.**

*** Reported at 0 % moisture content.**
GAI Lab Accredited Test Methods were followed during conformance testing for:
ASTM D 4632 - Grab Strength and Grab Elongation.
ASTM D 5993 - Bentonite Mass/Area.



Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

QCG#FT2 QCT#FT2
5/07/04 12:21:35

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184625

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200411LO	00002175	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002171	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002169	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002168	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002167	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002161	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002152	.87	260.70	46.10
LO-BENTOMAT ST	200407LO	00001344	.86	308.30	28.70
LO-BENTOMAT ST	200407LO	00001343	.86	308.30	28.70
LO-BENTOMAT ST	200407LO	00001244	.92	195.70	43.10
LO-BENTOMAT ST	200407LO	00001217	.89	195.70	42.90
LO-BENTOMAT ST	200407LO	00001158	.88	249.70	32.00
LO-BENTOMAT ST	200407LO	00001157	.88	249.70	32.00
LO-BENTOMAT ST	200407LO	00001156	.88	249.70	32.00
LO-BENTOMAT ST	200407LO	00001122	.85	249.70	34.80
LO-BENTOMAT ST	200407LO	00001090	.89	273.40	31.70
LO-BENTOMAT ST	200407LO	00001087	.89*	273.40	31.70*

NOTE:
An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present, test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200,000sf.
Peel Strength is tested a minimum of every 40,000sf.
All tensile testing is in the machine direction

*** End of Report ***

GEOSYNTHETIC CLAY LINER
MQA TRACKING FORMS

CETCO
GCL MQA/MQC TRACKING FORM

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184625

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200407LO									
00001087	LO-BENTOMAT ST	150	2250	2650	200403VR	00000175	2002423519		012804A
00001090	LO-BENTOMAT ST	150	2250	2665	200351VR	00003901	2002423519		012804A
00001122	LO-BENTOMAT ST	150	2250	2636	200403VR	00000114	2002445715		012904A
00001156	LO-BENTOMAT ST	150	2250	2754	200347VR	00003566	2001730655		012904C
00001157	LO-BENTOMAT ST	150	2250	2772	200347VR	00003566	2001730655		012904C
00001158	LO-BENTOMAT ST	150	2250	2757	200347VR	00003566	2001730655		012904C
00001217	LO-BENTOMAT ST	150	2250	2718	200403VR	00000177	2002445716		020204B
00001244	LO-BENTOMAT ST	150	2250	2659	200403VR	00000169	2002151859		020204D
00001343	LO-BENTOMAT ST	150	2250	2645	200407VR	00000458	2002276017		020404D
00001344	LO-BENTOMAT ST	150	2250	2650	200407VR	00000458	2002276017		020404D
LOT# 200411LO									
00002152	LO-BENTOMAT ST	150	2250	2761	200409VR	00000661	2002493153		022604A
00002161	LO-BENTOMAT ST	150	2250	2754	200409VR	00000683	2002537677		022604A
00002167	LO-BENTOMAT ST	150	2250	2744	200409VR	00000683	2002537677		022604A
00002168	LO-BENTOMAT ST	150	2250	2749	200409VR	00000683	2002537677		022604A
00002169	LO-BENTOMAT ST	150	2250	2743	200409VR	00000683	2002537677		022604A
00002171	LO-BENTOMAT ST	150	2250	2751	200409VR	00000680	2002457747		022604A
00002175	LO-BENTOMAT ST	150	2250	2721	200409VR	00000680	2002457747		022604A

TOTAL SQUARE FEET..... 38,250

CETCO
COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY
P.O. Box 428 • Lovell, Wyoming 82431
(307) 548-6521 • Fax (307) 548-6413

Date: May 10, 2004
PO: 200415
Order #: 184626, 184624, 184623,
184622, 184620

Sam Mangrum,
TEP-Texas Enviromental Plastics
2500 Farrell Road
Houston TX 77073
281-821-7320
smangrum@tepinc.net

Dear Sam Mangrum,

Please find enclosed the MQA/MQC Data Package for GCL shipments to TEP-Texas Enviromental Plastics. These shipments left our CETCO - Lovell, Wy. plant on May 7, 2004.

If you have any questions regarding the enclosed QA/QC information, please contact me at (800)322-1149 ext:423.

Sincerely,

Roger B. Wilkerson
Quality Assurance

GEOSYNTHETIC CLAY LINER

MANUFACTURING
QA / QC DATA PACKAGE

PROJECT NAME: ALCOA
Vancouver WA 98660

CUSTOMER P.O.: 200415

PREPARED FOR: TEP-Texas Enviromental Plastics
2500 Farrell Road
Houston TX 77073
Telephone # : 281-821-7320
Email Address: smangrum@tepinc.net

PREPARED BY: Roger B. Wilkerson
Quality Assurance
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, Wy. 82431
Telephone #: 800-322-1149 (Ext. 423)
Fax #: (307)548-6927, (307)548-6413
E-Mail: rwilke@cetco.com

GEOSYNTHETIC CLAY LINER

MANUFACTURING
QA / QC DATA

FOR ALL GCL MANUFACTURED ON:

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184626, 184624, 184623, 184622, 184620
Ship Date:	7-May

CONTENTS:

P A C K I N G L I S T

[redacted]ETCO
[redacted]00 WEST SHURE DRIVE
ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184620
ORDER DATE: 3/03/2004
SHIP DATE:. 5/07/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200405LO	00000570	150.0	15.0	2250.0	2652.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001128	150.0	15.0	2250.0	2626.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001144	150.0	15.0	2250.0	2627.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001161	150.0	15.0	2250.0	2766.0
[redacted]BENTOMAT ST		SFT	SF 200407LO	00001192	150.0	15.0	2250.0	2688.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001288	150.0	15.0	2250.0	2673.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001300	150.0	15.0	2250.0	2654.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001318	150.0	15.0	2250.0	2636.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001319	150.0	15.0	2250.0	2644.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001346	150.0	15.0	2250.0	2655.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002129	150.0	15.0	2250.0	2716.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002159	150.0	15.0	2250.0	2750.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002186	150.0	15.0	2250.0	2713.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002187	150.0	15.0	2250.0	2706.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002193	150.0	15.0	2250.0	2704.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002202	150.0	15.0	2250.0	2694.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002208	150.0	15.0	2250.0	2722.0
[redacted]ORDER TOTALS.....							38250.0	45626.0

TOTAL ITEMS..... 17

P A C K I N G L I S T

[redacted]ETCO
[redacted]00 WEST SHURE DRIVE
[redacted]ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184622
ORDER DATE: 3/03/2004
SHIP DATE:. 5/07/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200407LO	00001094	150.0	15.0	2250.0	2712.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001152	150.0	15.0	2250.0	2658.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001230	150.0	15.0	2250.0	2683.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001271	150.0	15.0	2250.0	2733.0
[redacted]BENTOMAT ST		SFT	SF 200407LO	00001272	150.0	15.0	2250.0	2726.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001342	150.0	15.0	2250.0	2662.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002122	150.0	15.0	2250.0	2718.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002127	150.0	15.0	2250.0	2723.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002130	150.0	15.0	2250.0	2700.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002131	150.0	15.0	2250.0	2706.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002143	150.0	15.0	2250.0	2757.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002158	150.0	15.0	2250.0	2755.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002162	150.0	15.0	2250.0	2756.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002177	150.0	15.0	2250.0	2703.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002182	150.0	15.0	2250.0	2720.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002183	150.0	15.0	2250.0	2743.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002188	150.0	15.0	2250.0	2744.0
[redacted]ORDER TOTALS.....							38250.0	46199.0

TOTAL ITEMS..... 17

P A C K I N G L I S T

[redacted]ETCO
[redacted]00 WEST SHURE DRIVE
ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184623
ORDER DATE: 3/03/2004
SHIP DATE:. 5/07/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200407LO	00001164	150.0	15.0	2250.0	2740.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001185	150.0	15.0	2250.0	2731.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001242	150.0	15.0	2250.0	2654.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001248	150.0	15.0	2250.0	2680.0
[redacted]BENTOMAT ST		SFT	SF 200407LO	00001275	150.0	15.0	2250.0	2730.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001296	150.0	15.0	2250.0	2663.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001297	150.0	15.0	2250.0	2655.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002121	150.0	15.0	2250.0	2726.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002124	150.0	15.0	2250.0	2727.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002155	150.0	15.0	2250.0	2747.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002156	150.0	15.0	2250.0	2752.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002157	150.0	15.0	2250.0	2776.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002163	150.0	15.0	2250.0	2750.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002164	150.0	15.0	2250.0	2763.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002184	150.0	15.0	2250.0	2718.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002185	150.0	15.0	2250.0	2725.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002189	150.0	15.0	2250.0	2726.0
[redacted] ORDER TOTALS.....							38250.0	46263.0

TOTAL ITEMS..... 17

P A C K I N G L I S T

[redacted]ETCO
[redacted]00 WEST SHURE DRIVE
ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184624
ORDER DATE: 3/03/2004
SHIP DATE:. 5/07/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200407LO	00001080	150.0	15.0	2250.0	2702.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001121	150.0	15.0	2250.0	2668.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001155	150.0	15.0	2250.0	2669.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001187	150.0	15.0	2250.0	2733.0
[redacted]BENTOMAT ST		SFT	SF 200407LO	00001189	150.0	15.0	2250.0	2726.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001210	150.0	15.0	2250.0	2736.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001216	150.0	15.0	2250.0	2743.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001243	150.0	15.0	2250.0	2651.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001348	150.0	15.0	2250.0	2632.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002119	150.0	15.0	2250.0	2707.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002120	150.0	15.0	2250.0	2720.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002123	150.0	15.0	2250.0	2723.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002126	150.0	15.0	2250.0	2721.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002165	150.0	15.0	2250.0	2759.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002172	150.0	15.0	2250.0	2743.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002173	150.0	15.0	2250.0	2738.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002174	150.0	15.0	2250.0	2716.0
[redacted] ORDER TOTALS.....							38250.0	46087.0

TOTAL ITEMS..... 17

P A C K I N G L I S T

[redacted]TCO
[redacted]00 WEST SHURE DRIVE
ARLINGTON HEIGHTS IL 60004

ORDER NO:.. 000184626
ORDER DATE: 3/03/2004
SHIP DATE:. 5/07/2004

SOLD TO: 1733
TEXAS ENV. PLASTICS, INC.
2500 FARRELL ROAD

HOUSTON TX 77073

SHIP FROM:. CETCO LOVELL PLANT
FRT TERMS:. PREPAID & ABSORBED
SHIP VIA:.. AMERI-CO

SHIP TO: 17
ALCOA
5701 N.W. LOWER RIVER RD.

VANCOUVER WA 98660

PO: 200415

PRODUCT	SIZE	U/M	LOT #	ROLL#	LNGTH	WIDTH	SHIP QTY	WEIGHT
LO-BENTOMAT ST		SFT	SF 200407LO	00001095	150.0	15.0	2250.0	2715.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001120	150.0	15.0	2250.0	2610.0
LO-BENTOMAT ST		SFT	SF 200407LO	00001276	150.0	15.0	2250.0	2727.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002115	150.0	15.0	2250.0	2607.0
[redacted]BENTOMAT ST		SFT	SF 200411LO	00002166	150.0	15.0	2250.0	2766.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002170	150.0	15.0	2250.0	2750.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002176	150.0	15.0	2250.0	2715.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002178	150.0	15.0	2250.0	2701.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002181	150.0	15.0	2250.0	2707.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002190	150.0	15.0	2250.0	2718.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002194	150.0	15.0	2250.0	2785.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002196	150.0	15.0	2250.0	2686.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002197	150.0	15.0	2250.0	2711.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002199	150.0	15.0	2250.0	2683.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002205	150.0	15.0	2250.0	2706.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002206	150.0	15.0	2250.0	2709.0
LO-BENTOMAT ST		SFT	SF 200411LO	00002207	150.0	15.0	2250.0	2706.0
ORDER TOTALS.....							38250.0	46002.0

TOTAL ITEMS..... 17

GEOSYNTHETIC CLAY LINER MANUFACTURING CERTIFICATION

GEOSYNTHETIC CLAY LINER

MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184626, 184624, 184623, 184622, 184620
Ship Date:	7-May

Colloid Environmental Technologies Company (CETCO) hereby affirms and certifies that all of the **BENTOMAT ST** manufactured in this lot achieves the physical and chemical criteria listed on the attached analysis sheet.

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

NEEDLE DETECTION CERTIFICATION

CERTIFICATION STATEMENT

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184626, 184624, 184623, 184622, 184620
Ship Date:	7-May

This statement is to certify that all components of the **BENTOMAT ST** manufactured for the above project have been inspected continually for the presence of broken needles through the use of a magnetic removal system.

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

BENTONITE CLAY CERTIFICATIONS

TECHNICAL DATA SHEET

ORIGIN INFORMATION

BENTONITE

Manufacturer: **AMERICAN COLLOID COMPANY**

PRODUCTION

Facility: **AMERICAN COLLOID COMPANY**
92 HWY. 37
Lovell, WY 82431

Contact: **Moses Briseno**
Quality Assurance Coordinator
(800)-322-1160

Brand Name: **CG 50**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **16-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **011604A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.8**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.6**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **27-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012704D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.2**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **28-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012804A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **28-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012804B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **29-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012904A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.3**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **29-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012904B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.3**
Moisture	ASTM D 2216	12.0 % (MAX)	**10.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **29-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012904C**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **29-Jan-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **012904D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.1**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**15.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204C**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**27.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **02-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020204D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**27.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.4**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **03-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020304A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **03-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020304B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **04-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020404A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **04-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020404B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.0**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **04-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **020404D**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**8.8**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **23-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **022304B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**11.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**13.8**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **24-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **022404B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.0**
Moisture	ASTM D 2216	12.0 % (MAX)	**11.2**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**13.6**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our
Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **26-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **022604A**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.0**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

BENTONITE
CERTIFICATE OF ANALYSIS

AMERICAN COLLOID COMPANY
92 HWY. 37
LOVELL, WY 82431

TO: **CETCO - LOVELL PLANT**
P.O. BOX 428
92 HWY 37
LOVELL, WY. 82431

DATE: **26-Feb-04**

ATTN: **Roger B. Wilkerson**

Dear Sirs:

A shipment of **CG 50**
left our Lovell, WY plant on **022604B**
in **TANK A**
as requested on your order no. **VERBAL**

A sample from this shipment was tested, and gave the following results:

TEST	METHOD	REQ. SPECIFICATION	ACTUAL RESULTS
RET. 8 MESH	ASTM C 136	0 PERCENT	**0**
Passing 200 Mesh	ASTM C 136	1 % (Max)	**0.4**
Moisture	ASTM D 2216	12.0 % (MAX)	**9.6**
Bentonite Free Swell	ASTM D 5890	24 mL / 2g MIN.	**26.0**
Bentonite Fluid Loss	ASTM D 5891	18.0 mL (MAX)	**14.0**

We hereby certify that the results shown above represent this shipment.
Tests were conducted using American Standard Test Methods and/or customer approved laboratory procedures.
Product made in the U.S.A.

Tests Conducted By: **DM., BM., JS., SK., JB.**

Approved By: **MOSES BRISENO**
ACC

In any correspondence regarding this shipment, please refer to our Order Number **NA**

WOVEN GEOTEXTILE
MANUFACTURER'S CERTIFICATION

TECHNICAL DATA SHEET

ORIGIN INFORMATION

WOVEN GEOTEXTILE

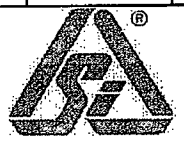
Manufacturer:	**Synthetic Industries Inc.**
PRODUCTION	
Facility:	**Synthetic Industries** **4019 Industry Drive** **Chattanooga, TN. 37416**
Contact:	Randy Johnson
Brand Name:	82 Tex.

SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	DOFFED	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST
2001604167	2026761	1002581	82TEX	8/27/2003	3.6	152	146	21	16	98	155	293
2001604168	2026761	1002581	82TEX	8/24/2003	3.6	169	136	26	16	97	130	313
2001604169	2027100	1002581	82TEX	8/26/2003	3.6	149	147	23	17	88	98	323
2001604170	2027100	1002581	82TEX	8/28/2003	3.6	152	140	23	17	95	133	283
2001604177	2027100	1002581	82TEX	8/24/2003	3.5	152	142	23	18	80	141	290
2001608103	2027364	1002581	82TEX	8/24/2003	3.5	164	146	24	18	80	151	288
2001608104	2027364	1002581	82TEX	8/27/2003	3.8	163	166	22	19	85	186	305
2001608105	2027364	1002581	82TEX	8/29/2003	3.5	150	137	21	18	66	82	333
2001608350	2026762	1002581	82TEX	8/24/2003	3.6	148	141	21	15	69	129	287
2001608351	2026762	1002581	82TEX	8/27/2003	3.5	151	146	21	17	71	86	333
2001608352	2026762	1002581	82TEX	8/29/2003	3.5	157	140	21	17	79	68	380
2001610306	2027095	1002581	82TEX	9/2/2003	3.5	149	143	21	16	70	81	310
2001610307	2027095	1002581	82TEX	8/31/2003	3.6	144	146	23	18	69	84	297
2001610308	2027095	1002581	82TEX	8/28/2003	3.6	151	136	20	16	73	139	323
2001620734	2027099	1002581	82TEX	9/4/2003	3.6	150	149	19	16	74	78	303
2001620735	2027099	1002581	82TEX	9/1/2003	3.6	160	143	25	19	74	78	323
2001620736	2027099	1002581	82TEX	8/29/2003	3.4	148	140	20	16	65	75	310
2001621341	2027362	1002581	82TEX	9/3/2003	3.3	145	152	22	18	75	97	322
2001621342	2027362	1002581	82TEX	9/1/2003	3.7	145	152	24	19	67	90	292
2001621343	2027362	1002581	82TEX	8/29/2003	3.6	135	149	20	15	66	91	340
2001621520	2027098	1002581	82TEX	9/1/2003	3.6	155	161	23	19	61	88	303
2001621521	2027098	1002581	82TEX	8/30/2003	3.8	143	153	24	16	59	88	302
2001621522	2027098	1002581	82TEX	8/27/2003	3.6	145	149	21	17	109	159	283
2001635705	2027102	1002581	82TEX	9/1/2003	3.6	167	139	23	19	79	76	298
2001635706	2027102	1002581	82TEX	8/30/2003	3.8	161	149	24	17	89	82	285
2001635713	2027102	1002581	82TEX	9/3/2003	3.5	162	141	25	17	80	82	315
2001635714	2028193	1002581	82TEX	9/3/2003	3.6	151	159	21	16	72	82	270
2001636721	2028193	1002581	82TEX	9/1/2003	3.6	155	162	25	18	80	89	313
2001644384	2028192	1002581	82TEX	9/2/2003	3.6	169	151	25	19	86	148	293
2001644385	2028192	1002581	82TEX	9/4/2003	3.7	152	168	20	17	83	128	280
2001644393	2028192	1002581	82TEX	8/31/2003	3.7	167	160	25	20	95	108	318
2001647170	2027101	1002581	82TEX	9/1/2003	3.6	175	167	26	22	88	99	323
2001647171	2027101	1002581	82TEX	9/3/2003	3.5	169	144	26	18	89	178	325
2001647172	2027101	1002581	82TEX	9/5/2003	3.5	152	137	23	18	80	83	327
2001647819	2028194	1002581	82TEX	9/6/2003	3.2	158	137	23	17	70	70	267
2001647820	2028194	1002581	82TEX	9/4/2003	3.6	145	142	19	16	65	82	315

SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	DOFFED	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST
2001730613	2028839	1002581	82TEX	9/19/2003	3.5	175	167	25	19	73	103	340
2001730638	2028836	1002581	82TEX	9/19/2003	3.5	169	157	22	18	61	81	347
2001730650	2028837	1002581	82TEX	9/19/2003	3.5	156	143	20	17	68	92	330
2001741069	2028842	1002581	82TEX	9/19/2003	3.6	165	158	26	18	78	88	333
2001741070	2028842	1002581	82TEX	9/21/2003	3.5	167	149	21	18	69	92	317
2001741799	2029690	1002581	82TEX	9/19/2003	3.4	173	155	27	20	76	88	268
2001741800	2029690	1002581	82TEX	9/21/2003	3.4	175	154	26	20	77	94	348
2001756542	2028831	1002581	82TEX	9/19/2003	3.4	139	141	21	17	58	59	267
2001756543	2028831	1002581	82TEX	9/22/2003	3.5	151	141	22	17	68	80	303
2001756543	2028831	1002581	82TEX	9/22/2003	3.5	151	141	22	17	68	80	303
2001757153	2029691	1002581	82TEX	9/20/2003	3.3	155	139	21	17	83	99	360
2001757154	2029691	1002581	82TEX	9/23/2003	3.6	156	153	26	19	67	97	323
2001758202	2029689	1002581	82TEX	9/24/2003	3.4	149	140	22	18	57	70	328
2001758203	2029689	1002581	82TEX	9/21/2003	3.3	146	136	20	16	72	92	297



SI® Geosolutions

HandUnit	ProdOrd	Product	STYLE	DOFFED	WEIGHT	TENSMA	TENSCR	ELONGM	ELONGC	TTEARM	TTEARC	BURST
2002083025	2033346	1002581	82TEX	11/13/2003	3.6	163	159	24	21	79	101	342
2002083026	2033346	1002581	82TEX	11/15/2003	3.2	161	148	25	20	96	99	307
2002134885	2034251	1002581	82TEX	11/21/2003	3.5	148	144	26	21	84	81	293
2002134887	2034251	1002581	82TEX	11/26/2003	3.6	159	147	25	18	94	131	300
2002134891	2034251	1002581	82 TEX	12/4/2003	3.6	158	150	22	18	85	72	293
2002151844	2036317	1002581	82TEX	11/20/2003	3.7	153	149	24	19	81	125	280
2002151845	2036317	1002581	82TEX	11/22/2003	3.6	166	146	23	19	83	89	330
2002151846	2036317	1002581	82TEX	11/24/2003	3.3	165	137	25	20	84	95	297
2002151857	2036318	1002581	82TEX	11/20/2003	3.4	156	143	25	18	74	106	310
2002151858	2036318	1002581	82TEX	11/25/2003	3.6	150	143	24	16	85	118	320
2002151865	2036318	1002581	82TEX	11/23/2003	3.6	157	142	24	20	78	87	335
2002188845	2036316	1002581	82TEX	11/28/2003	3.6	157	158	21	18	63	103	318
2002188846	2036316	1002581	82TEX	11/25/2003	3.6	164	152	25	19	87	116	300
2002188847	2036316	1002581	82 TEX	11/30/2003	3.5	163	154	24	19	78	133	300
2002193991	2037887	1002581	82 TEX	11/30/2003	3.5	165	148	26	19	84	189	297
2002193992	2037887	1002581	82TEX	12/3/2003	3.7	152	171	22	21	86	143	318
2002193998	2037887	1002581	82TEX	11/25/2003	3.5	158	152	24	19	85	178	300
2002246420	2038787	1002581	82 TEX	12/5/2003	3.4	135	138	29	25	91	119	297
2002246421	2038787	1002581	82TEX	12/7/2003	3.6	149	155	25	20	85	101	340
2002274598	2037953	1002581	82TEX	12/7/2003	3.5	146	139	25	19	74	75	313

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4														
5														
1597	**HandUnit**	**ProdOrd**	**Product**	**STYLE**	**DOFFED**	**WEIGHT**	**TENSMA**	**TENSCR**	**ELONGM**	**ELONGC**	**TTEARM**	**TTEARC**	**BURST**	
1598	2002246422	2038787	1002581	82TEX	12/9/2003	3.6	154	159	24	21	76	111	318	
1599	2002274599	2037953	1002581	82TEX	12/8/2003	3.7	144	157	23	17	81	135	288	
1600	2002274600	2037953	1002581	82TEX	12/11/2003	3.7	148	158	24	19	86	93	335	
1601	2002275171	2037951	1002581	82TEX	12/8/2003	3.6	156	154	26	20	81	111	295	
1602	2002275172	2037951	1002581	82TEX	12/11/2003	3.7	157	162	24	19	88	136	303	
1603	2002275173	2037951	1002581	82TEX	12/14/2003	3.4	163	153	26	20	94	106	303	
1604	2002276016	2037952	1002581	82TEX	12/12/2003	3.5	154	147	26	19	86	96	338	
1605	2002276017	2037952	1002581	82TEX	12/14/2003	3.6	149	158	24	18	79	108	282	
1606	2002276025	2037952	1002581	82TEX	12/9/2003	3.2	150	138	24	19	84	85	298	
1607	2002317467	2038786	1002581	82TEX	12/14/2003	3.6	151	153	25	20	87	146	283	
1608	2002317468	2038786	1002581	82TEX	12/16/2003	3.4	155	148	26	21	82	121	273	
1609	2002317469	2038786	1002581	82TEX	12/19/2003	3.6	152	146	25	19	81	149	292	
1610	2002364345	2039467	1002581	82TEX	12/19/2003	3.6	152	147	25	18	69	61	297	
1611	2002364347	2039467	1002581	82TEX	12/22/2003	3.7	156	150	25	21	82	96	310	
1612	2002364348	2039467	1002581	82TEX	12/24/2003	3.6	154	150	24	19	78	128	288	
1613	2002378684	2040228	1002581	82TEX	12/23/2003	3.8	154	148	25	20	79	81	310	

COLLOID ENVIRONMENTAL TECH. CO.
GEOTEXTILE QC DATA

LOVELL AMERICAN COLLOID

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER: 000184620

Material	Lot #	Roll #	Geotextile Mass/Area ASTM D 5261	Grab Strength ASTM D 4632
LO-WOVEN-ST	2002408620		3.3	169.8
LO-WOVEN-ST	2002423519		3.4	174.3
LO-WOVEN-ST	2002441786		3.6	172.8
LO-WOVEN-ST	2002445716		3.4	168.4
LO-WOVEN-ST	2002408620		3.4	169.6
LO-WOVEN-ST	2002457747		3.3	172.1
LO-WOVEN-ST	2002493153		3.3	169.5
LO-WOVEN-ST	2002537674		3.6	158.7
LO-WOVEN-ST	2002611436		3.4	168.2
LO-WOVEN-ST	2002406948		3.4	170.6
LO-WOVEN-ST	041104W1		3.5	163.2
LO-WOVEN-ST	041104W2		3.3	169.1

NON-WOVEN GEOTEXTILE MANUFACTURER'S CERTIFICATION

TECHNICAL DATA SHEET

ORIGIN INFORMATION

NON-WOVEN GEOTEXTILE

Manufacturer:	**Colloid Environmental Technologies Co.**
PRODUCTION FACILITY:	**CETCO** **102 Conners Road** **Villa Rica, GA 30180**
CONTACT:	Debbie Bivins 404-459-4995
BRAND NAME:	Standard

NON-WOVEN GEOTEXTILE

MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184626, 184624, 184623, 184622, 184620
Ship Date:	7-May

CETCO hereby affirms and certifies that the Non-Woven geotextile in the **BENTOMAT ST** product for the above project has been manufactured to meet the following physical properties.

PROPERTY	TEST METHOD	MINIMUM VALUE
Mass / Area	ASTM D-5261	6.0 oz/sqyd (Min.)
Grab Strength	ASTM D-4632	6.0 Lbs MARV (MD)

Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184620

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200334VR	00002638	6.5	52.1
LO-N/W-WHITE-ST	200342VR	00003286	6.6	53.4
LO-N/W-WHITE-ST	200348VR	00003636	6.6	57.0
LO-N/W-WHITE-ST	200351VR	00003873	6.8	60.2
LO-N/W-WHITE-ST	200402VR	00000008	6.7	58.1
LO-N/W-WHITE-ST	200402VR	00000048	6.6	84.7
LO-N/W-WHITE-ST	200403VR	00000136	6.5	59.6
LO-N/W-WHITE-ST	200403VR	00000148	6.6	49.7
LO-N/W-WHITE-ST	200404VR	00000218	6.6	76.7
LO-N/W-WHITE-ST	200407VR	00000458	6.8	65.9
LO-N/W-WHITE-ST	200407VR	00000522	6.8	81.5
LO-N/W-WHITE-ST	200409VR	00000623	6.7	50.3
LO-N/W-WHITE-ST	200409VR	00000661	6.9	58.3
LO-N/W-WHITE-ST	200409VR	00000682	6.8	40.8

TOTAL PAGES 1

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184622

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200347VR	00003566	6.6	82.2
LO-N/W-WHITE-ST	200351VR	00003901	6.6	57.1
LO-N/W-WHITE-ST	200403VR	00000179	6.8	71.1
LO-N/W-WHITE-ST	200403VR	00000187	6.6	61.4
LO-N/W-WHITE-ST	200407VR	00000458	6.8	65.9
LO-N/W-WHITE-ST	200407VR	00000465	6.7	58.9
LO-N/W-WHITE-ST	200409VR	00000623	6.7	50.3
LO-N/W-WHITE-ST	200409VR	00000631	6.4	70.1
LO-N/W-WHITE-ST	200409VR	00000652	7.1	65.6
LO-N/W-WHITE-ST	200409VR	00000661	6.9	58.3
LO-N/W-WHITE-ST	200409VR	00000680	6.7	55.3
LO-N/W-WHITE-ST	200409VR	00000682	6.8	40.8
LO-N/W-WHITE-ST	200409VR	00000683	6.8	40.8

TOTAL PAGES 1

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184623

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200351VR	00003873	6.8	60.2
LO-N/W-WHITE-ST	200402VR	00000048	6.6	84.7
LO-N/W-WHITE-ST	200403VR	00000148	6.6	49.7
LO-N/W-WHITE-ST	200403VR	00000169	6.9	76.9
LO-N/W-WHITE-ST	200403VR	00000171	6.7	131.5
LO-N/W-WHITE-ST	200403VR	00000179	6.8	71.1
LO-N/W-WHITE-ST	200407VR	00000465	6.7	58.9
LO-N/W-WHITE-ST	200409VR	00000623	6.7	50.3
LO-N/W-WHITE-ST	200409VR	00000631	6.4	70.1
LO-N/W-WHITE-ST	200409VR	00000661	6.9	58.3
LO-N/W-WHITE-ST	200409VR	00000683	6.8	40.8

TOTAL PAGES 1

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CETCO
GEOTEXTILE QC DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184624

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200347VR	00003566	6.6	82.2
LO-N/W-WHITE-ST	200403VR	00000114	6.5	70.3
LO-N/W-WHITE-ST	200403VR	00000148	6.6	49.7
LO-N/W-WHITE-ST	200403VR	00000155	6.7	58.1
LO-N/W-WHITE-ST	200403VR	00000169	6.9	76.9
LO-N/W-WHITE-ST	200403VR	00000175	6.7	131.5
LO-N/W-WHITE-ST	200403VR	00000177	6.7	131.5
LO-N/W-WHITE-ST	200404VR	00000217	6.8	66.3
LO-N/W-WHITE-ST	200409VR	00000631	6.4	70.1
LO-N/W-WHITE-ST	200409VR	00000680	6.7	55.3
LO-N/W-WHITE-ST	200409VR	00000682	6.8	40.8
LO-N/W-WHITE-ST	200409VR	00000683	6.8	40.8

TOTAL PAGES 1

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5/10/04 11:30:36

CETCO
GEOTEXTILE QC DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

O R D E R # 000184626

MATERIAL	LOT#	ROLL#	GEOTEXTILE 6.0oz/sy mv ASTM D 5261	GRAB STRENGTH 6.0 lbs marv ASTM D 4632
LO-N/W-WHITE-ST	200334VR	00002638	6.5	52.1
LO-N/W-WHITE-ST	200351VR	00003901	6.6	57.1
LO-N/W-WHITE-ST	200403VR	00000137	6.5	59.6
LO-N/W-WHITE-ST	200403VR	00000168	6.9	76.9
LO-N/W-WHITE-ST	200407VR	00000465	6.7	58.9
LO-N/W-WHITE-ST	200407VR	00000522	6.8	81.5
LO-N/W-WHITE-ST	200408VR	00000619	6.6	58.3
LO-N/W-WHITE-ST	200409VR	00000623	6.7	50.3
LO-N/W-WHITE-ST	200409VR	00000680	6.7	55.3
LO-N/W-WHITE-ST	200409VR	00000683	6.8	40.8

TOTAL PAGES 1

GEOSYNTHETIC CLAY LINER QUALITY TEST RESULTS

GEOSYNTHETIC CLAY LINER

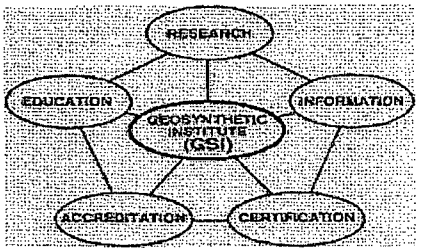
MANUFACTURING CERTIFICATION

Project Name:	ALCOA
Prepared For:	TEP-Texas Enviromental Plastics
Customer PO:	200415
Order Number:	184626, 184624, 184623, 184622, 184620
Ship Date:	7-May

CETCO hereby affirms and certifies that the **BENTOMAT ST** material supplied to this project will meet the physical and chemical criteria listed below.

PROPERTY	TEST METHOD	MINIMUM VALUE
Peel Strength	ASTM D 4632 (Modified)	**15 lbs**
Bentonite Free Swell	ASTM D 5890	**24 mL / 2g MIN.**
Bentonite Fluid Loss	ASTM D 5891	**18.0 mL (MAX)**
Bentonite Mass / Area	ASTM D 5993	*** .75 lb/sq.ft. (Min.)**
Grab Strength	ASTM D 4632	**90 lbs.**
Permeability	ASTM D 5887	**5 x 10 (-9) cm/sec. (Max)**
Index Flux	ASTM D 5887	**1.0 x 10 (-8) m(3)/m(2)/sec.**

*** Reported at 0 % moisture content.**
GAI Lab Accredited Test Methods were followed during conformance testing for:
ASTM D 4632 - Grab Strength and Grab Elongation.
ASTM D 5993 - Bentonite Mass/Area.



Shem McArthur
Production Coordinator
COLLOID ENVIRONMENTAL TECHNOLOGIES CO. (**CETCO**)

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5/10/04 11:33:20

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184620

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200411LO	00002208	.88	274.00	30.90
LO-BENTOMAT ST	200411LO	00002202	.88	274.00	30.90
LO-BENTOMAT ST	200411LO	00002193	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002187	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002186	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002159	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002129	.92	260.70	38.60
LO-BENTOMAT ST	200407LO	00001346	.86	308.30	28.70
LO-BENTOMAT ST	200407LO	00001319	.80	308.30	41.80
LO-BENTOMAT ST	200407LO	00001318	.80	308.30	41.80
LO-BENTOMAT ST	200407LO	00001300	.85	195.70	38.70
LO-BENTOMAT ST	200407LO	00001288	.91	195.70	37.90
LO-BENTOMAT ST	200407LO	00001192	.93	249.70	28.90
LO-BENTOMAT ST	200407LO	00001161	.88	249.70	32.00
LO-BENTOMAT ST	200407LO	00001144	.88	249.70	40.00
LO-BENTOMAT ST	200407LO	00001128	.85	249.70	34.80
LO-BENTOMAT ST	200405LO	00000570	.91	282.20	30.40

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present, test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200,000sf.
Peel Strength is tested a minimum of every 40,000sf.
All tensile testing is in the machine direction

*** End of Report ***

QCG#FT2 QCT#FT2
5/10/04 11:32:45

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184622

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200411LO	00002188	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002183	.93*	274.00	32.50*
LO-BENTOMAT ST	200411LO	00002182	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002177	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002162	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002158	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002143	.86	260.70	42.80
LO-BENTOMAT ST	200411LO	00002131	.92	260.70	38.60
LO-BENTOMAT ST	200411LO	00002130	.92	260.70	38.60
LO-BENTOMAT ST	200411LO	00002127	.92	260.70	38.60
LO-BENTOMAT ST	200411LO	00002122	.92	260.70	38.60
LO-BENTOMAT ST	200407LO	00001342	.86*	308.30	28.70*
LO-BENTOMAT ST	200407LO	00001272	.91	195.70	29.40
LO-BENTOMAT ST	200407LO	00001271	.91	195.70	29.40
LO-BENTOMAT ST	200407LO	00001230	.88	195.70	45.70
LO-BENTOMAT ST	200407LO	00001152	.88	249.70	40.00
LO-BENTOMAT ST	200407LO	00001094	.89	273.40	31.70

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present, test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40.000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200.000sf.
Peel Strength is tested a minimum of every 40.000sf.
All tensile testing is in the machine direction

*** End of Report ***

QCG#FT2 QCT#FT2
5/10/04 11:31:56

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184623

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200411LO	00002189	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002185	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002184	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002164	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002163	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002157	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002156	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002155	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002124	.92	260.70	38.60
LO-BENTOMAT ST	200411LO	00002121	.92	260.70	38.60
LO-BENTOMAT ST	200407LO	00001297	.85	195.70	38.70
LO-BENTOMAT ST	200407LO	00001296	.85	195.70	38.70
LO-BENTOMAT ST	200407LO	00001275	.91	195.70	37.90
LO-BENTOMAT ST	200407LO	00001248	.92	195.70	43.10
LO-BENTOMAT ST	200407LO	00001242	.92	195.70	43.10
LO-BENTOMAT ST	200407LO	00001185	.85	249.70	36.20
LO-BENTOMAT ST	200407LO	00001164	.88	249.70	32.00

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present, test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200,000sf.
Peel Strength is tested a minimum of every 40,000sf.
All tensile testing is in the machine direction

*** End of Report ***

QCG#FT2 QCT#FT2
5/10/04 11:31:16

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184624

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200411LO	00002174	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002173	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002172	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002165	.87	260.70	46.10
LO-BENTOMAT ST	200411LO	00002126	.92	260.70	38.60
LO-BENTOMAT ST	200411LO	00002123	.92	260.70	38.60
LO-BENTOMAT ST	200411LO	00002120	.92	260.70	38.60
LO-BENTOMAT ST	200411LO	00002119	.92	260.70	38.60
LO-BENTOMAT ST	200407LO	00001348	.86	308.30	28.70
LO-BENTOMAT ST	200407LO	00001243	.92	195.70	43.10
LO-BENTOMAT ST	200407LO	00001216	.89	195.70	42.90
LO-BENTOMAT ST	200407LO	00001210	.89	195.70	42.90
LO-BENTOMAT ST	200407LO	00001189	.93*	249.70	28.90*
LO-BENTOMAT ST	200407LO	00001187	.85	249.70	36.20
LO-BENTOMAT ST	200407LO	00001155	.88*	249.70	32.00*
LO-BENTOMAT ST	200407LO	00001121	.85*	249.70*	34.80*
LO-BENTOMAT ST	200407LO	00001080	.88	273.40	40.80

NOTE:

An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present, test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200,000sf.
Peel Strength is tested a minimum of every 40,000sf.
All tensile testing is in the machine direction

*** End of Report ***

QCG#FT2 QCT#FT2
5/10/04 11:30:35

CETCO

GCL QUALITY DATA

CETCO LOVELL PLANT
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W.
VANCOUVER

O R D E R # 000184626

MATERIAL	LOT No.	ROLL No	BENTONITE MASS/AREA .75lbs ASTM D 5993	GRAB STRENGTH 90 lbs MOD ASTM D 4632	PEEL STRENGTH 15 lbs MOD ASTM D 4632
LO-BENTOMAT ST	200411LO	00002207	.88	274.00	30.90
LO-BENTOMAT ST	200411LO	00002206	.88	274.00	30.90
LO-BENTOMAT ST	200411LO	00002205	.88	274.00	30.90
LO-BENTOMAT ST	200411LO	00002199	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002197	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002196	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002194	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002190	.93	274.00	32.50
LO-BENTOMAT ST	200411LO	00002181	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002178	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002176	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002170	.91	274.00	45.10
LO-BENTOMAT ST	200411LO	00002166	.91*	274.00*	45.10*
LO-BENTOMAT ST	200411LO	00002115	.92*	260.70*	38.60*
LO-BENTOMAT ST	200407LO	00001276	.91	195.70	37.90
LO-BENTOMAT ST	200407LO	00001120	.82	273.40	36.50
LO-BENTOMAT ST	200407LO	00001095	.89	273.40	31.70

NOTE:
An asterisk indicates the actual test done on the roll and the roll tested.
If an asterisk is not present, test results are based on the previous roll tested.
Bentonite Mass/Area and Moisture content are tested a minimum of every 40,000sf.
Bentonite Mass/Area is reported at 0% moisture content.
Grab Strength is tested a minimum of every 200,000sf.
Peel Strength is tested a minimum of every 40,000sf.
All tensile testing is in the machine direction

*** End of Report ***

GEOSYNTHETIC CLAY LINER
MQA TRACKING FORMS

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184620

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200405LO									
00000570	LO-BENTOMAT ST	150	2250	2652	200342VR	00003286	2002151860		011604A
LOT# 200407LO									
00001128	LO-BENTOMAT ST	150	2250	2626	200348VR	00003636	2002408622		012904A
00001144	LO-BENTOMAT ST	150	2250	2627	200403VR	00000136	2002408622		012904B
00001161	LO-BENTOMAT ST	150	2250	2766	200351VR	00003873	2001730655		012904C
00001192	LO-BENTOMAT ST	150	2250	2688	200403VR	00000148	2001635707		020204A
00001288	LO-BENTOMAT ST	150	2250	2673	200402VR	00000008	2002423522		020304B
00001300	LO-BENTOMAT ST	150	2250	2654	200402VR	00000048	2002423522		020404A
00001318	LO-BENTOMAT ST	150	2250	2636	200404VR	00000218	2002408620		020404B
00001319	LO-BENTOMAT ST	150	2250	2644	200404VR	00000218	2002408620		020404B
00001346	LO-BENTOMAT ST	150	2250	2655	200407VR	00000458	2002276017		020404D
LOT# 200411LO									
00002129	LO-BENTOMAT ST	150	2250	2716	200409VR	00000682	2002611436		022404B
00002159	LO-BENTOMAT ST	150	2250	2750	200409VR	00000661	2002537677		022604A
00002186	LO-BENTOMAT ST	150	2250	2713	200409VR	00000623	2002457747		022604A
00002187	LO-BENTOMAT ST	150	2250	2706	200409VR	00000623	2002457747		022604A
00002193	LO-BENTOMAT ST	150	2250	2704	200409VR	00000623	041104W1		022604A
00002202	LO-BENTOMAT ST	150	2250	2694	200334VR	00002638	041104W1		022604B
00002208	LO-BENTOMAT ST	150	2250	2722	200407VR	00000522	041104W2		022604B

TOTAL SQUARE FEET..... 38,250

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184622

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200407LO									
00001094	LO-BENTOMAT ST	150	2250	2712	200351VR	00003901	2002423519		012804A
00001152	LO-BENTOMAT ST	150	2250	2658	200347VR	00003566	2002408622		012904C
00001230	LO-BENTOMAT ST	150	2250	2683	200403VR	00000187	2002445716		020204C
00001271	LO-BENTOMAT ST	150	2250	2733	200403VR	00000179	2002408623		020304A
00001272	LO-BENTOMAT ST	150	2250	2726	200403VR	00000179	2002408623		020304A
00001342	LO-BENTOMAT ST	150	2250	2662	200407VR	00000458	2002276017		020404D
LOT# 200411LO									
00002122	LO-BENTOMAT ST	150	2250	2718	200409VR	00000631	2002611436		022404B
00002127	LO-BENTOMAT ST	150	2250	2723	200409VR	00000682	2002611436		022404B
00002130	LO-BENTOMAT ST	150	2250	2700	200409VR	00000682	2002493153		022404B
00002131	LO-BENTOMAT ST	150	2250	2706	200409VR	00000682	2002493153		022404B
00002143	LO-BENTOMAT ST	150	2250	2757	200409VR	00000652	2002493153		022404B
00002158	LO-BENTOMAT ST	150	2250	2755	200409VR	00000661	2002537677		022604A
00002162	LO-BENTOMAT ST	150	2250	2756	200409VR	00000683	2002537677		022604A
00002177	LO-BENTOMAT ST	150	2250	2703	200409VR	00000680	2002457747		022604A
00002182	LO-BENTOMAT ST	150	2250	2720	200407VR	00000465	2002457747		022604A
00002183	LO-BENTOMAT ST	150	2250	2743	200407VR	00000465	2002457747		022604A
00002188	LO-BENTOMAT ST	150	2250	2744	200409VR	00000623	2002457747		022604A

TOTAL SQUARE FEET..... 38,250

CETCO
GCL MQA/MQC TRACKING FORM

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184623

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200407LO									
00001164	LO-BENTOMAT ST	150	2250	2740	200351VR	00003873	2001730655		012904C
00001185	LO-BENTOMAT ST	150	2250	2731	200403VR	00000148	2001730655		012904D
00001242	LO-BENTOMAT ST	150	2250	2654	200403VR	00000169	2002151859		020204D
00001248	LO-BENTOMAT ST	150	2250	2680	200403VR	00000171	2002441786		020204D
00001275	LO-BENTOMAT ST	150	2250	2730	200403VR	00000179	2002408623		020304B
00001296	LO-BENTOMAT ST	150	2250	2663	200402VR	00000048	2002423522		020404A
00001297	LO-BENTOMAT ST	150	2250	2655	200402VR	00000048	2002423522		020404A
LOT# 200411LO									
00002121	LO-BENTOMAT ST	150	2250	2726	200409VR	00000631	2002611436		022404B
00002124	LO-BENTOMAT ST	150	2250	2727	200409VR	00000631	2002611436		022404B
00002155	LO-BENTOMAT ST	150	2250	2747	200409VR	00000661	2002493153		022604A
00002156	LO-BENTOMAT ST	150	2250	2752	200409VR	00000661	2002537677		022604A
00002157	LO-BENTOMAT ST	150	2250	2776	200409VR	00000661	2002537677		022604A
00002163	LO-BENTOMAT ST	150	2250	2750	200409VR	00000683	2002537677		022604A
00002164	LO-BENTOMAT ST	150	2250	2763	200409VR	00000683	2002537677		022604A
00002184	LO-BENTOMAT ST	150	2250	2718	200407VR	00000465	2002457747		022604A
00002185	LO-BENTOMAT ST	150	2250	2725	200409VR	00000623	2002457747		022604A
00002189	LO-BENTOMAT ST	150	2250	2726	200409VR	00000623	041104W1		022604A

TOTAL SQUARE FEET..... 38,250

TOTAL PAGES 1

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184624

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200407LO									
00001080	LO-BENTOMAT ST	150	2250	2702	200403VR	00000175	2002423519		012704D
00001121	LO-BENTOMAT ST	150	2250	2668	200403VR	00000114	2002445715		012904A
00001155	LO-BENTOMAT ST	150	2250	2669	200347VR	00003566	2001730655		012904C
00001187	LO-BENTOMAT ST	150	2250	2733	200403VR	00000148	2001730655		012904D
00001189	LO-BENTOMAT ST	150	2250	2726	200403VR	00000148	2001635707		020204A
00001210	LO-BENTOMAT ST	150	2250	2736	200403VR	00000155	2002445716		020204B
00001216	LO-BENTOMAT ST	150	2250	2743	200403VR	00000177	2002445716		020204B
00001243	LO-BENTOMAT ST	150	2250	2651	200403VR	00000169	2002151859		020204D
00001348	LO-BENTOMAT ST	150	2250	2632	200404VR	00000217	2002276017		020404D
LOT# 200411LO									
00002119	LO-BENTOMAT ST	150	2250	2707	200409VR	00000631	2002611436		022404B
00002120	LO-BENTOMAT ST	150	2250	2720	200409VR	00000631	2002611436		022404B
00002123	LO-BENTOMAT ST	150	2250	2723	200409VR	00000631	2002611436		022404B
00002126	LO-BENTOMAT ST	150	2250	2721	200409VR	00000682	2002611436		022404B
00002165	LO-BENTOMAT ST	150	2250	2759	200409VR	00000683	2002537677		022604A
00002172	LO-BENTOMAT ST	150	2250	2743	200409VR	00000680	2002457747		022604A
00002173	LO-BENTOMAT ST	150	2250	2738	200409VR	00000680	2002457747		022604A
00002174	LO-BENTOMAT ST	150	2250	2716	200409VR	00000680	2002457747		022604A

TOTAL SQUARE FEET..... 38,250

CETCO
P.O. BOX 428
LOVELL WY 82431

SHIP TO: ALCOA
5701 N.W. LOWER RIVER RD.
VANCOUVER WA

ORDER NUMBER 000184626

ROLL#	MATERIAL	ROLL LENGTH	SQUARE FEET	ROLL WEIGHT	GEOTEXTILE TOP LOT#	GEOTEXTILE TOP ROLL#	GEOTEXTILE BOTTOM LOT#	GEOTEXTILE BOTTOM ROLL#	CLAY LOT#
LOT# 200407LO									
00001095	LO-BENTOMAT ST	150	2250	2715	200351VR	00003901	2002423519		012804A
00001120	LO-BENTOMAT ST	150	2250	2610	200403VR	00000137	2002406945		012804B
00001276	LO-BENTOMAT ST	150	2250	2727	200403VR	00000168	2002408623		020304B
LOT# 200411LO									
00002115	LO-BENTOMAT ST	150	2250	2607	200408VR	00000619	2002537674		022304B
00002166	LO-BENTOMAT ST	150	2250	2766	200409VR	00000683	2002537677		022604A
00002170	LO-BENTOMAT ST	150	2250	2750	200409VR	00000680	2002457747		022604A
00002176	LO-BENTOMAT ST	150	2250	2715	200409VR	00000680	2002457747		022604A
00002178	LO-BENTOMAT ST	150	2250	2701	200407VR	00000465	2002457747		022604A
00002181	LO-BENTOMAT ST	150	2250	2707	200407VR	00000465	2002457747		022604A
00002190	LO-BENTOMAT ST	150	2250	2718	200409VR	00000623	041104W1		022604A
00002194	LO-BENTOMAT ST	150	2250	2785	200409VR	00000623	041104W1		022604A
00002196	LO-BENTOMAT ST	150	2250	2686	200334VR	00002638	041104W1		022604B
00002197	LO-BENTOMAT ST	150	2250	2711	200334VR	00002638	041104W1		022604B
00002199	LO-BENTOMAT ST	150	2250	2683	200334VR	00002638	041104W1		022604B
00002205	LO-BENTOMAT ST	150	2250	2706	200407VR	00000522	041104W1		022604B
00002206	LO-BENTOMAT ST	150	2250	2709	200407VR	00000522	041104W1		022604B
00002207	LO-BENTOMAT ST	150	2250	2706	200407VR	00000522	041104W1		022604B

TOTAL SQUARE FEET..... 38,250

APPENDIX H3
DRAINAGE NET GEOCOMPOSITE

ENVIROCON

Submittal

Submittal Number 005

1.0 Name of Submitter	Envirocon, Inc. 10400 North Burgard Way Portland, Oregon 97203
1.1 Contact Name	Steve Holmberg
1.2 Contact Phone	(503) 285-6164
1.3 Contact Fax	(503) 285-6205
2.0 Name of Project	Remediation of North and North 2 Landfills
3.0 Service Order No.	
4.0 Submittal Description	**Drainage Net certifications**
5.0 Drawing Number	**NA**
6.0 Specification Section Number	**Section VII,D.5.d.(3)**
7.0 Original Submittal	YES
8.0 Manufacture's Information	**Skaps Industries**
9.0 Date of Submittal	**12 MAY 04**
10.0 Person Submitting	**S. F. Holmberg**

Printed Name

Signature

SKAPS Industries

Engineered Synthetic Products, Inc.

May 6, 2004
Texas Environmental Plastics
2500 Farrell Road,
Houston , TX 77073

Ref. : ALCOA, Vancouver, WA
Customer P.O. # 200143
Transnet 220-2-H080

We certify that the Transnet 220-2-H080 drainage composite, meets the project requirements as stated in the specifications. The properties listed in this section are:

Property	Test Method	Unit	Required Value	Qualifier
Geonet[3]				
Mass per Unit Area	ASTM D 3776	lb/ft^2	0.162	Minimum
Thickness	ASTM D 5199	mil	220 ± 20	Range
Carbon Black	ASTM D 4218	%	2.0	Minimum
Tensile Strength	ASTM D 5035	lb/in	45	Minimum
Melt Flow	ASTM D 1238[2]	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cc	0.94	Minimum
Composite				
Ply Adhesion	GRI GC7	lb/in	1.0	Minimum
Transmissivity[1]	ASTM D 4716	m^2/sec	1.0×10^{-4}	Minimum
Geotextile[3 & 4]				
Fabric Weight	ASTM D 3776	oz/yd^2	8.0	MARV[5]
Grab Strength	ASTM D 4632	lb	220	MARV
Thickness	ASTM D 5199	mils	100	MARV
Grab Elongation	ASTM D 4632	%	50	MARV
Tear Strength	ASTM D 4533	lb	90	MARV
Puncture Resistance	ASTM D 4833	lb	135	MARV
Mullen Burst	ASTM D 3786[6]	psi	90	MARV
Water Flow Rate	ASTM D 4491	gpm/ft^2	100	MARV
Permittivity	ASTM D 4491	sec^{-1}	1.26	MARV
Permeability	ASTM D 4491	cm/sec	0.30	MARV
AOS	ASTM D 4751	US Sieve	80	MARV

Notes:

1 Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 10000 psf between steel plates after 15 minutes.

2 Condition 190/2.16

3 Geotextile and Geonet properties are prior to lamination.

4 Geotextile data is provided by the supplier.

5 MARV is statistically defined as mean minus two standard deviations and it is the value which is exceeded by 97.5% of all the test data.

6 Modified.

Sincerely,

Nilay Patel

Nilay Patel
QA Manager

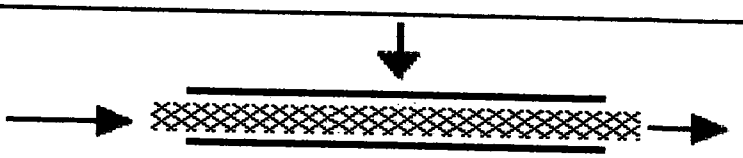
571 Industrial Parkway, Commerce, GA 30529 **Phone**: 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Texas Environmental Plastics	**Job #**	1197
Project:	ALCOA, Vancouver, WA		
Product:	TN220-2-H080		
Roll #	1197060		

Test Configuration:



12 X 12 Test Surface

Test Information:

Boundary Conditions:	Steel Plate Geocomposite Steel Plate	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	10000 psf 0.1 ft 15 minutes MD

Test Results:

Pressure, psf	Gradient, ft	Transmissivity, m^2/sec	Flow rate, gpm/ft
		15 minutes	15 minutes
10000	0.1	1.31×10^{-4}	0.063

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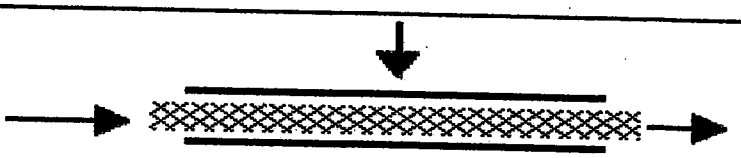
SKAPS Industries

ASTM D 4716

Client:	Texas Environmental Plastics	**Job #**	1197
Project:	ALCOA, Vancouver, WA		
Product:	TN220-2-H080		
Roll #	1197030		

Test Configuration:



12 X 12 Test Surface

Test Information:

Boundary Conditions:	Steel Plate Geocomposite Steel Plate	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	10000 psf 0.1 ft 15 minutes MD

Test Results:

Pressure, psf	Gradient, ft	Transmissivity, m^2/sec	Flow rate, gpm/ft
		15 minutes	15 minutes
10000	0.1	1.38×10^{-4}	0.066

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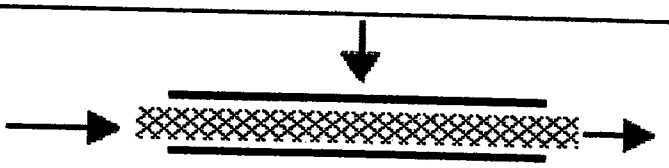
SKAPS Industries

ASTM D 4716

Client:	Texas Environmental Plastics	**Job #**	1197
Project:	ALCOA, Vancouver, WA		
Product:	TN220-2-H080		
Roll #	1197001		

Test Configuration:



12 X 12 Test Surface

Test Information:

Boundary Conditions:	Steel Plate Geocomposite Steel Plate	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	10000 psf 0.1 ft 15 minutes MD

Test Results:

Pressure, psf	Gradient, ft	Transmissivity, m^2/sec	Flow rate, gpm/ft
		15 minutes	15 minutes
10000	0.1	1.29×10^{-4}	0.062

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geonet Manufacturer, hereby ceritify the following for the material delivered to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
1197109 - N	C031021A01	0.9588					
1197110 - N	C031021A01	0.9588	0.194	229	2.24	74	
1197111 - N	C031021A01	0.9588					
1197112 - N	C031021A01	0.9588					
1197113 - N	C031021A01	0.9588					
1197114 - N	C031021A01	0.9588					
1197115 - N	C031021A01	0.9588					
1197116 - N	C031021A01	0.9588					
1197117 - N	C031021A01	0.9588					
1197118 - N	C031021A01	0.9588					
1197119 - N	C031021A01	0.9588					
1197120 - N	C031021A01	0.9588	0.193	219	2.30	70	

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geocomposite manufacturer, hereby certify the following for the material delivered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity* (m^2/sec)
			Top	Bottom	Minimum	Average	
1	1197109	1197109 - N	300126645	300126628			
2	1197110	1197110 - N	300126645	300126628	1.36	1.88	
3	1197111	1197111 - N	300126645	300126628			
4	1197112	1197112 - N	300126629	300126621			
5	1197113	1197113 - N	300126629	300126621			
6	1197114	1197114 - N	300126629	300126621			
7	1197115	1197115 - N	300126636	300126632			
8	1197116	1197116 - N	300126636	300126632			
9	1197117	1197117 - N	300126636	300126632			
10	1197118	1197118 - N	300126639	300126635			
11	1197119	1197119 - N	300126639	300126635			
12	1197120	1197120 - N	300126639	300126635	1.25	1.48	1.41×10^{-4}

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 10000 psf between steel plates after 15 minutes.

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geonet Manufacturer, hereby ceritify the following for the material delivered to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
1197082 - N	C031021A01	0.9588					
1197083 - N	C031021A01	0.9588					
1197084 - N	C031021A01	0.9588					
1197085 - N	C031021A01	0.9588					
1197086 - N	C031021A01	0.9588					
1197087 - N	C031021A01	0.9588					
1197088 - N	C031021A01	0.9588					
1197089 - N	C031021A01	0.9588					
1197090 - N	C031021A01	0.9588	0.180	222	2.42	68	
1197091 - N	C031021A01	0.9588					
1197092 - N	C031021A01	0.9588					
1197093 - N	C031021A01	0.9588					
1197094 - N	C031021A01	0.9588					
1197095 - N	C031021A01	0.9588					
1197096 - N	C031021A01	0.9588					
1197097 - N	C031021A01	0.9588					
1197098 - N	C031021A01	0.9588					
1197099 - N	C031021A01	0.9588					
1197100 - N	C031021A01	0.9588	0.189	228	2.51	73	
1197101 - N	C031021A01	0.9588					
1197102 - N	C031021A01	0.9588					
1197103 - N	C031021A01	0.9588					
1197104 - N	C031021A01	0.9588					
1197105 - N	C031021A01	0.9588					
1197106 - N	C031021A01	0.9588					
1197107 - N	C031021A01	0.9588					
1197108 - N	C031021A01	0.9588					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geocomposite manufacturer, hereby certify the following for the material delivered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity* (m^2/sec)
			Top	Bottom	Minimum	Average	
1	1197082	1197082 - N	300126647	300126634			
2	1197083	1197083 - N	300126647	300126634			
3	1197084	1197084 - N	300126647	300126634			
4	1197085	1197085 - N	300126615	300126618			
5	1197086	1197086 - N	300126615	300126618			
6	1197087	1197087 - N	300126615	300126618			
7	1197088	1197088 - N	300126638	300126641			
8	1197089	1197089 - N	300126638	300126641			
9	1197090	1197090 - N	300126638	300126641	1.67	1.85	1.36×10^{-4}
10	1197091	1197091 - N	300126644	300126622			
11	1197092	1197092 - N	300126644	300126622			
12	1197093	1197093 - N	300126644	300126622			
13	1197094	1197094 - N	300126623	300126642			
14	1197095	1197095 - N	300126623	300126642			
15	1197096	1197096 - N	300126623	300126642			
16	1197097	1197097 - N	300126631	300126616			
17	1197098	1197098 - N	300126631	300126616			
18	1197099	1197099 - N	300126631	300126616			
19	1197100	1197100 - N	300126620	300126630	1.32	1.81	
20	1197101	1197101 - N	300126620	300126630			
21	1197102	1197102 - N	300126620	300126630			
22	1197103	1197103 - N	300126643	300126640			
23	1197104	1197104 - N	300126643	300126640			
24	1197105	1197105 - N	300126643	300126640			
25	1197106	1197106 - N	300126617	300126637			
26	1197107	1197107 - N	300126617	300126637			
27	1197108	1197108 - N	300126617	300126637			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 10000 psf between steel plates after 15 minutes.

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geonet Manufacturer, hereby ceritify the following for the material delivered to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
1197055 - N	C031021A01	0.9588					
1197056 - N	C031021A01	0.9588					
1197057 - N	C031021A01	0.9588					
1197058 - N	C031021A01	0.9588					
1197059 - N	C031021A01	0.9588					
1197060 - N	C031021A01	0.9588	0.192	225	2.48	69	
1197061 - N	C031021A01	0.9588					
1197062 - N	C031021A01	0.9588					
1197063 - N	C031021A01	0.9588					
1197064 - N	C031021A01	0.9588					
1197065 - N	C031021A01	0.9588					
1197066 - N	C031021A01	0.9588					
1197067 - N	C031021A01	0.9588					
1197068 - N	C031021A01	0.9588					
1197069 - N	C031021A01	0.9588					
1197070 - N	C031021A01	0.9588	0.198	223	2.45	75	
1197071 - N	C031021A01	0.9588					
1197072 - N	C031021A01	0.9588					
1197073 - N	C031021A01	0.9588					
1197074 - N	C031021A01	0.9588					
1197075 - N	C031021A01	0.9588					
1197076 - N	C031021A01	0.9588					
1197077 - N	C031021A01	0.9588					
1197078 - N	C031021A01	0.9588					
1197079 - N	C031021A01	0.9588					
1197080 - N	C031021A01	0.9588	0.187	227	2.39	70	
1197081 - N	C031021A01	0.9588					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geocomposite manufacturer, hereby certify the following for the material delivered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity* (m^2/sec)
			Top	Bottom	Minimum	Average	
1	1197055	1197055 - N	300126683	300125937			
2	1197056	1197056 - N	300126683	300125937			
3	1197057	1197057 - N	300126683	300125937			
4	1197058	1197058 - N	300126678	300125927			
5	1197059	1197059 - N	300126678	300125927			
6	1197060	1197060 - N	300126678	300125927	1.35	1.50	1.31×10^{-4}
7	1197061	1197061 - N	300126668	300125931			
8	1197062	1197062 - N	300126668	300125931			
9	1197063	1197063 - N	300126668	300125931			
10	1197064	1197064 - N	300126680	300125942			
11	1197065	1197065 - N	300126680	300125942			
12	1197066	1197066 - N	300126680	300125942			
13	1197067	1197067 - N	300126675	300125935			
14	1197068	1197068 - N	300126675	300125935			
15	1197069	1197069 - N	300126675	300125935			
16	1197070	1197070 - N	300126672	300125930	1.31	1.58	
17	1197071	1197071 - N	300126672	300125930			
18	1197072	1197072 - N	300126672	300125930			
19	1197073	1197073 - N	300126677	300125936			
20	1197074	1197074 - N	300126677	300125936			
21	1197075	1197075 - N	300126677	300125936			
22	1197076	1197076 - N	300126661	300125925			
23	1197077	1197077 - N	300126661	300125925			
24	1197078	1197078 - N	300126661	300125925			
25	1197079	1197079 - N	300126674	300125929			
26	1197080	1197080 - N	300126674	300125929	1.23	1.65	
27	1197081	1197081 - N	300126674	300125929			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 10000 psf between steel plates after 15 minutes.

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geonet Manufacturer, hereby ceritify the following for the material delivered to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
1197028 - N	C031021A01	0.9588					
1197029 - N	C031021A01	0.9588					
1197030 - N	C031021A01	0.9588	0.184	226	2.36	71	
1197031 - N	C031021A01	0.9588					
1197032 - N	C031021A01	0.9588					
1197033 - N	C031021A01	0.9588					
1197034 - N	C031021A01	0.9588					
1197035 - N	C031021A01	0.9588					
1197036 - N	C031021A01	0.9588					
1197037 - N	C031021A01	0.9588					
1197038 - N	C031021A01	0.9588					
1197039 - N	C031021A01	0.9588					
1197040 - N	C031021A01	0.9588	0.173	214	2.41	76	
1197041 - N	C031021A01	0.9588					
1197042 - N	C031021A01	0.9588					
1197043 - N	C031021A01	0.9588					
1197044 - N	C031021A01	0.9588					
1197045 - N	C031021A01	0.9588					
1197046 - N	C031021A01	0.9588					
1197047 - N	C031021A01	0.9588					
1197048 - N	C031021A01	0.9588					
1197049 - N	C031021A01	0.9588					
1197050 - N	C031021A01	0.9588	0.199	215	2.30	72	
1197051 - N	C031021A01	0.9588					
1197052 - N	C031021A01	0.9588					
1197053 - N	C031021A01	0.9588					
1197054 - N	C031021A01	0.9588					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geocomposite manufacturer, hereby certify the following for the material delivered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity* (m^2/sec)
			Top	Bottom	Minimum	Average	
1	1197028	1197028 - N	300125952	300125949			
2	1197029	1197029 - N	300125952	300125949			
3	1197030	1197030 - N	300125952	300125949	1.65	1.95	1.38×10^{-4}
4	1197031	1197031 - N	300125924	300125926			
5	1197032	1197032 - N	300125924	300125926			
6	1197033	1197033 - N	300125924	300125926			
7	1197034	1197034 - N	300125939	300125945			
8	1197035	1197035 - N	300125939	300125945			
9	1197036	1197036 - N	300125939	300125945			
10	1197037	1197037 - N	300125947	300125948			
11	1197038	1197038 - N	300125947	300125948			
12	1197039	1197039 - N	300125947	300125948			
13	1197040	1197040 - N	300125933	300125944	1.72	1.91	
14	1197041	1197041 - N	300125933	300125944			
15	1197042	1197042 - N	300125933	300125944			
16	1197043	1197043 - N	300125951	300125932			
17	1197044	1197044 - N	300125951	300125932			
18	1197045	1197045 - N	300125951	300125932			
19	1197046	1197046 - N	300125946	300125940			
20	1197047	1197047 - N	300125946	300125940			
21	1197048	1197048 - N	300125946	300125940			
22	1197049	1197049 - N	300125950	300125928			
23	1197050	1197050 - N	300125950	300125928	1.29	1.98	
24	1197051	1197051 - N	300125950	300125928			
25	1197052	1197052 - N	300125934	300125943			
26	1197053	1197053 - N	300125934	300125943			
27	1197054	1197054 - N	300125934	300125943			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 10000 psf between steel plates after 15 minutes.

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geonet Manufacturer, hereby ceritify the following for the material delivered to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft²)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m²/sec)
1197001 - N	C031021A01	0.9588	0.183	221	2.32	69	
1197002 - N	C031021A01	0.9588					
1197003 - N	C031021A01	0.9588					
1197004 - N	C031021A01	0.9588					
1197005 - N	C031021A01	0.9588					
1197006 - N	C031021A01	0.9588					
1197007 - N	C031021A01	0.9588					
1197008 - N	C031021A01	0.9588					
1197009 - N	C031021A01	0.9588					
1197010 - N	C031021A01	0.9588	0.186	229	2.58	73	
1197011 - N	C031021A01	0.9588					
1197012 - N	C031021A01	0.9588					
1197013 - N	C031021A01	0.9588					
1197014 - N	C031021A01	0.9588					
1197015 - N	C031021A01	0.9588					
1197016 - N	C031021A01	0.9588					
1197017 - N	C031021A01	0.9588					
1197018 - N	C031021A01	0.9588					
1197019 - N	C031021A01	0.9588					
1197020 - N	C031021A01	0.9588	0.197	224	2.80	75	
1197021 - N	C031021A01	0.9588					
1197022 - N	C031021A01	0.9588					
1197023 - N	C031021A01	0.9588					
1197024 - N	C031021A01	0.9588					
1197025 - N	C031021A01	0.9588					
1197026 - N	C031021A01	0.9588					
1197027 - N	C031021A01	0.9588					

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571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geocomposite manufacturer, hereby certify the following for the material delivered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity* (m^2/sec)
			Top	Bottom	Minimum	Average	
1	1197001	1197001 - N	300126648	300126686	1.24	2.01	1.29×10^{-4}
2	1197002	1197002 - N	300126648	300126686			
3	1197003	1197003 - N	300126648	300126686			
4	1197004	1197004 - N	300126690	300126681			
5	1197005	1197005 - N	300126690	300126681			
6	1197006	1197006 - N	300126690	300126681			
7	1197007	1197007 - N	300126679	300126666			
8	1197008	1197008 - N	300126679	300126666			
9	1197009	1197009 - N	300126679	300126666			
10	1197010	1197010 - N	300126671	300126689	1.80	2.09	
11	1197011	1197011 - N	300126671	300126689			
12	1197012	1197012 - N	300126671	300126689			
13	1197013	1197013 - N	300126662	300126670			
14	1197014	1197014 - N	300126662	300126670			
15	1197015	1197015 - N	300126662	300126670			
16	1197016	1197016 - N	300126684	300126688			
17	1197017	1197017 - N	300126684	300126688			
18	1197018	1197018 - N	300126684	300126688			
19	1197019	1197019 - N	300126673	300126682			
20	1197020	1197020 - N	300126673	300126682	1.79	2.03	
21	1197021	1197021 - N	300126673	300126682			
22	1197022	1197022 - N	300126687	300126665			
23	1197023	1197023 - N	300126687	300126665			
24	1197024	1197024 - N	300126687	300126665			
25	1197025	1197025 - N	300126685	300126649			
26	1197026	1197026 - N	300126685	300126649			
27	1197027	1197027 - N	300126685	300126649			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 10000 psf between steel plates after 15 minutes.

APPROVED 5 QA

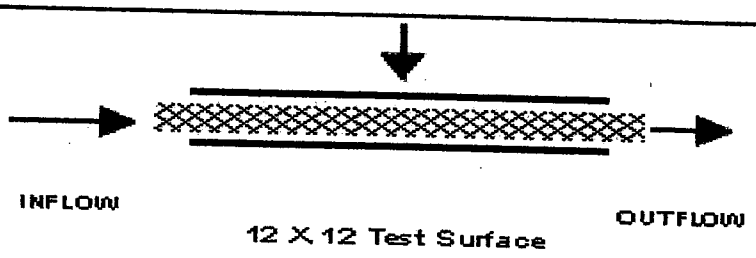
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Texas Environmental Plastics	**Job #**	1197
Project:	ALCOA, Vancouver, WA		
Product:	TN220-2-H080		
Roll #	1197090		

Test Configuration:



Test Information:

Boundary Conditions:	Steel Plate Geocomposite Steel Plate	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	10000 psf 0.1 ft 15 minutes MD

Test Results:

Pressure, psf	Gradient, ft	Transmissivity, m^2/sec	Flow rate, gpm/ft
		15 minutes	15 minutes
10000	0.1	1.36×10^{-4}	0.065

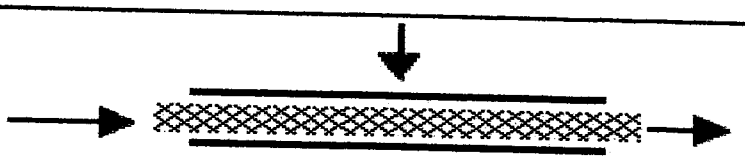
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Texas Environmental Plastics	**Job #**	1197
Project:	ALCOA, Vancouver, WA		
Product:	TN220-2-H080		
Roll #	1197120		

Test Configuration:



12 X 12 Test Surface

Test Information:

Boundary Conditions:	Steel Plate Geocomposite Steel Plate	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	10000 psf 0.1 ft 15 minutes MD

Test Results:

Pressure, psf	Gradient, ft	Transmissivity, m^2/sec	Flow rate, gpm/ft
		15 minutes	15 minutes
10000	0.1	1.41×10^{-4}	0.068

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN220-2-H080
Project : ALCOA, Vancouver, WA

We, the Geocomposite Manufacturer, hereby certify the following for the material delivered to the above referenced project :

GEOCOMP ROLL#	ROLL#	STYLE	WIDTH (in)	LNG (ft)	FABRIC (oz/yd^2)	THICK (mils)	GRAB MD (lb)	GRAB XMD (lb)	ELNG MD (%)	ELNG XMD (%)	TRAP MD (lb)	TRAP XMD (lb)	PUNG REST (lb)	BRST STRG (psi)	FLOW RATE (gpm/ft2)	PERM - ABL (cm/sec)	PERM ITY (sec^{-1})	AOS (US Sieve)
1197001	300126648	H080	180	690	8.0	119	227	248	78	93	124	135	136	460	156	0.750	2.45	80
	300126686	H080	180	690	8.6	104	247	261	68	78	127	140	156	473	190	0.980	2.98	80
1197030	300125952	H080	180	690	8.5	120	244	252	65	85	117	139	141	455	117	0.590	1.84	80
	300125949	H080	180	690	8.5	120	244	252	65	85	117	139	141	455	117	0.590	1.84	80
1197060	300126678	H080	180	690	8.4	122	234	246	75	85	124	135	140	453	156	0.750	2.45	80
	300125927	H080	180	690	8.5	127	240	257	68	85	117	139	139	436	117	0.590	1.84	80
1197090	300126638	H080	180	690	8.3	126	235	242	65	81	113	168	152	453	117	0.590	1.84	80
	300126641	H080	180	690	8.3	126	235	242	65	81	113	168	152	453	117	0.590	1.84	80
1197120	300126639	H080	180	690	8.3	126	235	242	65	81	113	168	152	453	117	0.590	1.84	80
	300126635	H080	180	690	8.3	126	235	242	65	81	113	168	152	453	117	0.590	1.84	80

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

POLYETHYLENE RESIN CERTIFICATION

Customer Name : Texas Environmental Plastics
Project Name : ALCOA, Vancouver, WA
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN220-2-H080

We, the Geonet Manufacturer, hereby certify the following for the material delivered to the above referenced project:

Resin Supplier	Resin Production Plant	Resin Brand Name	Resin Lot Number	Property	Test Method	Units	Resin Supplier Value	Tested Value*
BP Solvay Polyethylene	BP Solvay Houston, TX	HDPE	C031021A01	Density	ASTM D 1505	gm/cc	0.9541	0.9537
				Melt Flow Index	ASTM D 1238[a]	gm/10 min	0.34	0.33

(a) Condition 190/2.16
* Data from SKAPS Quality Control

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

APPENDIX H4
EXTRUSION JOINT RESIN

ENVIROCON

Submittal

Submittal Number 006

1.0 Name of Submitter	Envirocon, Inc. 10400 North Burgard Way Portland, Oregon 97203
1.1 Contact Name	Steve Holmberg
1.2 Contact Phone	(503) 285-6164
1.3 Contact Fax	(503) 285-6205
2.0 Name of Project	Remediation of North and North 2 Landfills
3.0 Service Order No.	
4.0 Submittal Description	**Extrusion Joint Resin certification**
5.0 Drawing Number	**NA**
6.0 Specification Section Number	**Section VII,D.5.d.(2)**
7.0 Original Submittal	YES
8.0 Manufacture's Information	**GSE Lining Tech. Inc.**
9.0 Date of Submittal	**21 MAY 04**
10.0 Person Submitting	**S. F. Holmberg**

Printed Name

Signature

Weld Lot Data Report

GSE Lining Technology, Inc.

LOT IDENTIFICATION		RESIN INFORMATION	
Rod Lot Number	121000318	Resin Lot	8231107
Product Name	HDROD5MM	Resin Type	K306
Production Date	1/5/2004	Resin Vendor	Phillips

Physical Property	Test Method	Test Results
Carbon Content, %	ASTM 1603*	2.45
Thickness, mil	Measurement by Caliper	195

APPROVED
RR
1/5/2004
QA

GSE 8.2.4-021 Rev - - 02/03

CoA Date: 10/23/2003

Chevron Phillips

Certificate of Analysis

Shipped To: GSE LINING TECHNO
WESTFIELD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86483608
PO #:
Weight: 181100 LB
Ship Date: 10/23/2003
Package: BULK
Mode: Hopper Car
Car #: PSPX006614

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8231107

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.070	g/10mi
HLMI Flow Rate	ASTM D1238	10.00	g/10mi
Density	ASTM D1505	0.9360	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Jackie Edwards
Certification Systems Specialist

For CoA questions contact Peter cheirman at 713-289-4799

May 20 04 02:04p Sheri Sim-Connell (281) 230-8663 p.2
05/20/2004 14:20 2818217138 TEXAS ENVIRONMENTAL P PAGE 03

CoA Date: 12/18/2003

Chevron Phillips

Certificate of Analysis

Shipped To: GSE LINING TECHNOLOGY INC HC
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86523738
PO #: 25715
Weight: 102500 LB
Ship Date: 12/18/2003
Package: BULK
Mode: Hopper Car
Car #: ACFX097767

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8231362

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.100	g/10mi
HLMI Flow Rate	ASTM D1238	12.20	g/10mi
Density	ASTM D1505	0.9360	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Jackie Edwards
Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-286-4799

05/20/2004 14:20 2818217138 TEXAS ENVIRONMENTALP PAGE 05
May 20 04 02:04p Sheri Sim-Connell (281) 230-8653 p.4

APPENDIX H5
FIELD TEST DATA

GEOSYNTHETIC CLAY LINER (GCL) INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:** 5-25

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232

POC: (503) 235-5000

Morning Weather Conditions: SUNNY 60s

Afternoon Weather Conditions: SUNNY 70s

Specification/Drawing Reference:

Date	Time	GCL Roll Ident #	Roll Damage	Pre-placement Inspection	GCL Roll Location	GCL Roll Installation	Damaged Section	Bentonite Paste	Post-placement Inspection	Comments
5-25		1274	✓	✓	✓	✓	✓	✓		
"		2166	✓	✓	✓	✓	✓	✓		
"		2167	✓	✓	✓	✓	✓	✓		
		2187	✓	✓	✓	✓	✓	✓		
		2190	✓	✓	✓	✓	✓	✓		
		2142	✓	✓	✓	✓	✓	✓		
		1248	✓	✓	✓	✓	✓	✓		
		2189	✓	✓	✓	✓	✓	✓		
		2194	✓	✓	✓	✓	✓	✓		
		2185	✓	✓	✓	✓	✓	✓		
		2199	✓	✓	✓	✓	✓	✓		
		1164	✓	✓	✓	✓	✓	✓		
		2206	✓	✓	✓	✓	✓	✓		
		2196	✓	✓	✓	✓	✓	✓		
		2178	✓	✓	✓	✓	✓	✓		15" ROLLS

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: [signature] **Title:** QC

Roll Damage: Visual inspection of geosynthetic clay liner to make sure roll is not damaged.

Soil Inspection: Visible inspection to make sure suface is free of any materials that may inhibit the effectiveness of the liner.

Damaged Section: Visible inspection to find tears, holes, or surface blemishes.

Bentonite Paste: Make sure sufficient moistened bentonite paste is applied to seem, 6 to 8 inch overlap required.

GEOSYNTHETIC CLAY LINER (GCL) INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:** 5-26

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232

POC: (503) 235-5000

Morning Weather Conditions: SUNNY 60s

Afternoon Weather Conditions: PARTLY CLOUDY 60s

Specification/Drawing Reference:

Date	Time	GCL Roll Ident #	Roll Damage	Pre-placement Inspection	GCL Roll Location	GCL Roll Installation	Damaged Section	Bentonite Paste	Post-placement Inspection	Comments
5-26		1278	✓	✓		✓	✓	✓	✓	
		2115	✓	✓		✓	✓	✓	✓	
		2206	✓	✓		✓	✓	✓	✓	
		2176	✓	✓		✓	✓	✓	✓	
		2207	✓	✓		✓	✓	✓	✓	
		1120	✓	✓		✓	✓	✓	✓	
		2093	✓	✓		✓	✓	✓	✓	
		2159	✓	✓		✓	✓	✓	✓	
		1095	✓	✓		✓	✓	✓	✓	
		2137	✓	✓		✓	✓	✓	✓	
		1271	✓	✓		✓	✓	✓	✓	
		1272	✓	✓		✓	✓	✓	✓	
		2144	✓	✓		✓	✓	✓	✓	
		2192	✓	✓		✓	✓	✓	✓	
↓		1087	✓	✓		✓	✓	✓	✓	
		~~2192~~								
		2181	✓	✓		✓	✓	✓	✓	16 Rolls

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: Michael West **Title:** QC

Roll Damage: Visual inspection of geosynthetic clay liner to make sure roll is not damaged.

Soil Inspection: Visible inspection to make sure suface is free of any materials that may inhibit the effectiveness of the liner.

Damaged Section: Visible inspection to find tears, holes, or surface blemishes.

Bentonite Paste: Make sure sufficient moistened bentonite paste is applied to seem, 6 to 8 inch overlap required.

GEOSYNTHETIC CLAY LINER (GCL) INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:** ~~5-28~~ 6-1-04

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232

POC: (503) 235-5000

Morning Weather Conditions: ~~CLOUDY 60S SUN~~ P. CLOUDY

Afternoon Weather Conditions: ~~CLOUDY 60S~~ SUNNY UPPER 70S

Specification/Drawing Reference:

Date	Time	GCL Roll Ident #	Roll Damage	Pre-placement Inspection	GCL Roll Location	GCL Roll Installation	Damaged Section	Bentonite Paste	Post-placement Inspection	Comments
6-1		2163	✓	✓	✓	✓	✓	✓		
		1183	✓	✓	✓	✓	✓	✓		
		1256	✓	✓	✓	✓	✓	✓		
		1348	✓	✓	✓	✓	✓	✓		
		1296	✓	✓	✓	✓	✓	✓		
		2164	✓	✓	✓	✓	✓	✓		
		2124	✓	✓	✓	✓	✓	✓		
		2155	✓	✓	✓	✓	✓	✓		
		2165	✓	✓	✓	✓	✓	✓		
		1158	✓	✓	✓	✓	✓	✓		
		0148	✓	✓	✓	✓	✓	✓		
		0157	✓	✓	✓	✓	✓	✓		
		2158	✓	✓	✓	✓	✓	✓		
		2131	✓	✓	✓	✓	✓	✓		
		1144	✓	✓	✓	✓	✓	✓		
		1342	✓	✓	✓	✓	✓	✓		
		2186	✓	✓	✓	✓	✓	✓		
		1192	✓	✓	✓	✓	✓	✓		
		2148	✓	✓	✓	✓	✓	✓		
		2127	✓	✓	✓	✓	✓	✓		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: [signature] **Title:** QC

Roll Damage: Visual inspection of geosynthetic clay liner to make sure roll is not damaged.

Soil Inspection: Visible inspection to make sure suface is free of any materials that may inhibit the effectiveness of the liner.

Damaged Section: Visible inspection to find tears, holes, or surface blemishes.

Bentonite Paste: Make sure sufficient moistened bentonite paste is applied to seem, 6 to 8 inch overlap required.

GEOSYNTHETIC CLAY LINER (GCL) INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:** 6-1-04

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232

POC: (503) 235-5000

Morning Weather Conditions:

Afternoon Weather Conditions:

Specification/Drawing Reference:

Date	Time	GCL Roll Ident #	Roll Damage	Pre-placement Inspection	GCL Roll Location	GCL Roll Installation	Damaged Section	Bentonite Paste	Post-placement Inspection	Comments
6-1-04		1346	✓	✓	✓	✓	✓	✓		
		1217	✓	✓	✓	✓	✓	✓		
		1271	✓	✓	✓	✓	✓	✓		
		1156	✓	✓	✓	✓	✓	✓		
		1343	✓	✓	✓	✓	✓	✓		
		2168	✓	✓	✓	✓	✓	✓		
		1690	✓	✓	✓	✓	✓	✓		
		1344	✓	✓	✓	✓	✓	✓		
		1122	✓	✓	✓	✓	✓	✓		
		1157	✓	✓	✓	✓	✓	✓		
		1252	✓	✓	✓	✓	✓	✓		
		1269	✓	✓	✓	✓	✓	✓		
		2161	✓	✓	✓	✓	✓	✓		
		2184	✓	✓	✓	✓	✓	✓		
		2167	✓	✓	✓	✓	✓	✓		
		2175	✓	✓	✓	✓	✓	✓		36 ROLLS
		″	″	″	″	″	″	″	″	″

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: [signature] **Title:** QC

Roll Damage: Visual inspection of geosynthetic clay liner to make sure roll is not damaged.

Soil Inspection: Visible inspection to make sure suface is free of any materials that may inhibit the effectiveness of the liner.

Damaged Section: Visible inspection to find tears, holes, or surface blemishes.

Bentonite Paste: Make sure sufficient moistened bentonite paste is applied to seem, 6 to 8 inch overlap required.

EOSYNTHETIC CLAY LINER (GCL) INSTALLATION CHECKLIST

oject Name/No.: East Landfill Cap Construction/184717 **Date:** 6-2-04

C Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232

OC: (503) 235-5000

orning Weather Conditions: SUNNY - WINDY 60S

Afternoon Weather Conditions: SUNNY, WINDY 70S

ecification/Drawing Reference:

Date	Time	GCL Roll Ident #	Roll Damage	Pre-placement Inspection	GCL Roll Location	GCL Roll Installation	Damaged Section	Bentonite Paste	Post-placement Inspection	Comments
6-2-04		1121	✓	✓	✓	✓	✓	✓		
		2126	✓	✓	✓	✓	✓	✓		
		2174	✓	✓	✓	✓	✓	✓		
		1187	✓	✓	✓	✓	✓	✓		
		1189	✓	✓	✓	✓	✓	✓		
		1155	✓	✓	✓	✓	✓	✓		
		2123	✓	✓	✓	✓	✓	✓		
		1297	✓	✓	✓	✓	✓	✓		
		1210	✓	✓	✓	✓	✓	✓		
		2128	✓	✓	✓	✓	✓	✓		
		1243	✓	✓	✓	✓	✓	✓		
		2119	✓	✓	✓	✓	✓	✓		
		1246	✓	✓	✓	✓	✓	✓		
		2172	✓	✓	✓	✓	✓	✓		
		2127	✓	✓	✓	✓	✓	✓		
		2173	✓	✓	✓	✓	✓	✓		
		1216	✓	✓	✓	✓	✓	✓		
		1220	✓	✓	✓	✓	✓	✓		
		1080	✓	✓	✓	✓	✓	✓		
		1173	✓	✓	✓	✓	✓	✓		

e item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

gned: [signature] **Title:** QC

e Damage: Visual inspection of geosynthetic clay liner to make sure roll is not damaged.

l Inspection: Visible inspection to make sure suface is free of any materials that may inhibit the effectiveness of the liner.

naged Section: Visible inspection to find tears, holes, or surface blemishes.

ntonite Paste: Make sure sufficient moistened bentonite paste is applied to seem, 6 to 8 inch overlap required.

EOSYNTHETIC CLAY LINER (GCL) INSTALLATION CHECKLIST

oject Name/No.: East Landfill Cap Construction/184717 Date: 6-2-04

C Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232

)C: (503) 235-5000

orning Weather Conditions: | Afternoon Weather Conditions:

ecification/Drawing Reference:

Date	Time	GCL Roll Ident #	Roll Damage	Pre-placement Inspection	GCL Roll Location	GCL Roll Installation	Damaged Section	Bentonite Paste	Post-placement Inspection	Comments
6-2-04		2157	✓	✓	✓	✓	✓	✓	✓	
		2162	✓	✓	✓	✓	✓	✓	✓	
		2130	✓	✓	✓	✓	✓	✓	✓	
		1152	✓	✓	✓	✓	✓	✓	✓	
		1288	✓	✓	✓	✓	✓	✓	✓	25 ROLLS

e item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
gned: Title: QC

e Damage: Visual inspection of geosynthetic clay liner to make sure roll is not damaged.

l Inspection: Visible inspection to make sure suface is free of any materials that may inhibit the effectiveness of the liner.

naged Section: Visible inspection to find tears, holes, or surface blemishes.

ntonite Paste: Make sure sufficient moistened bentonite paste is applied to seem, 6 to 8 inch overlap required.

EOSYNTHETIC CLAY LINER (GCL) INSTALLATION CHECKLIST

oject Name/No.: East Landfill Cap Construction/184717 **Date:** 6-3-04

C Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232

)C: (503) 235-5000

orning Weather Conditions: SUNNY 70

Afternoon Weather Conditions: SUNNY 80s

ecification/Drawing Reference:

Date	Time	GCL Roll Ident #	Roll Damage	Pre-placement Inspection	GCL Roll Location	GCL Roll Installation	Damaged Section	Bentonite Paste	Post-placement Inspection	Comments
6-3-04			1218	✓	✓	✓	✓	✓		
			1159	✓	✓	✓	✓	✓		
			1088	✓	✓	✓	✓	✓		
			1190	✓	✓	✓	✓	✓		
			1084	✓	✓	✓	✓	✓		
			1124	✓	✓	✓	✓	✓		
			0552	✓	✓	✓	✓	✓		
			1322	✓	✓	✓	✓	✓		
			0553	✓	✓	✓	✓	✓		
			1245	✓	✓	✓	✓	✓		
			1299	✓	✓	✓	✓	✓		
			0518	✓	✓	✓	✓	✓		
			1019	✓	✓	✓	✓	✓		
			1123	✓	✓	✓	✓	✓		
			1327	✓	✓	✓	✓	✓		
			1300	✓	✓	✓	✓	✓		
			2122	✓	✓	✓	✓	✓		
			1247	✓	✓	✓	✓	✓		
			1300	✓	✓	✓	✓	✓		
			0549	✓	✓	✓	✓	✓		

e item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

gned: Michael Wurtz **Title:** QC

e Damage: Visual inspection of geosynthetic clay liner to make sure roll is not damaged.

l Inspection: Visible inspection to make sure suface is free of any materials that may inhibit the effectiveness of the liner.

naged Section: Visible inspection to find tears, holes, or surface blemishes.

ntonite Paste: Make sure sufficient moistened bentonite paste is applied to seem, 6 to 8 inch overlap required.

EOSYNTHETIC CLAY LINER (GCL) INSTALLATION CHECKLIST

oject Name/No.: East Landfill Cap Construction/184717 **Date:** 6·3·04

C Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232

OC: (503) 235-5000

orning Weather Conditions: | **Afternoon Weather Conditions:**

ecification/Drawing Reference:

Date	Time	GCL Roll Ident #	Roll Damage	Pre-placement Inspection	GCL Roll Location	GCL Roll Installation	Damaged Section	Bentonite Paste	Post-placement Inspection	Comments
6-3-04		1093	✓	✓	✓	✓	✓	✓	✓	
		0578	✓	✓	✓	✓	✓	✓	✓	
		1082	✓	✓	✓	✓	✓	✓	✓	
		1085	✓	✓	✓	✓	✓	✓	✓	
		1194	✓	✓	✓	✓	✓	✓	✓	
		0580	✓	✓	✓	✓	✓	✓	✓	
		1191							✓	
		1072	✓	✓	✓	✓	✓	✓	✓	
		0550	✓	✓	✓	✓	✓	✓	✓	
		0549	✓	✓	✓	✓	✓	✓	✓	29 Rolls

e item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

gned: Title: QC

e Damage: Visual inspection of geosynthetic clay liner to make sure roll is not damaged.

l Inspection: Visible inspection to make sure suface is free of any materials that may inhibit the effectiveness of the liner.

naged Section: Visible inspection to find tears, holes, or surface blemishes.

ntonite Paste: Make sure sufficient moistened bentonite paste is applied to seem, 6 to 8 inch overlap required.

POLYWELD U.S.A., INC.

1620 EAST RICHEY ROAD
HOUSTON, TEXAS 77073

(281) 821-4156
FAX (281) 821-8901
1-888-325-3168
Email: info@polyweldusa.com
www.polyweldusa.com

CALIBRATION CERTIFICATE

Customer:	TEXAS ENVIRONMENTAL
Device Calibrated:	MEEZAN 500 TENSIOMETER
S/N:	4301997
Model #:	
Load Cell Type:	BUTTON TYPE
Voltage:	120 /V/
Date:	13-FEB-04
Calibration #	CAL1034

Calibration of the PolyWeld USA Meezan 500 Tensiometer was verified using a calibration load cell indicator on dead weights. **2/13/2004** The readings of the calibration set are recorded as "True Load." The readings of the instrument in question are recorded below as "Display Load."

True Load	Display Load Trial #1	Display Load Trial #2	Display Load Trial #3
0	0	0	0
50	49.9	49.8	50
100	99.7	100	100
150	149.8	149.9	150
200	199.8	199.9	200
250	249.8	249.9	250
300	300	299.9	300.1
350	350.1	349.8	349.9
400	399.5	399.8	400
450	449.8	450.1	449.8
500	499.9	499.7	500
Error % for each Trial	0.0618	0.0436	0.0073

Average % Error 0.0376

Wakeel Ahmad

2-13-04
Date

18 Years in the Plastic Welding Industry

• Extrusion Welding Machines • Wedge Welders • Spark Tester • Sample Cutter • Tensiometer Meezan 500

ALCOA

Alcoa Contractor Safety Checklist

Contractor TEP Location VANCOUVER, WA

Evaluator MIKE WIRTZ Date 6-7-01 Time 13:45

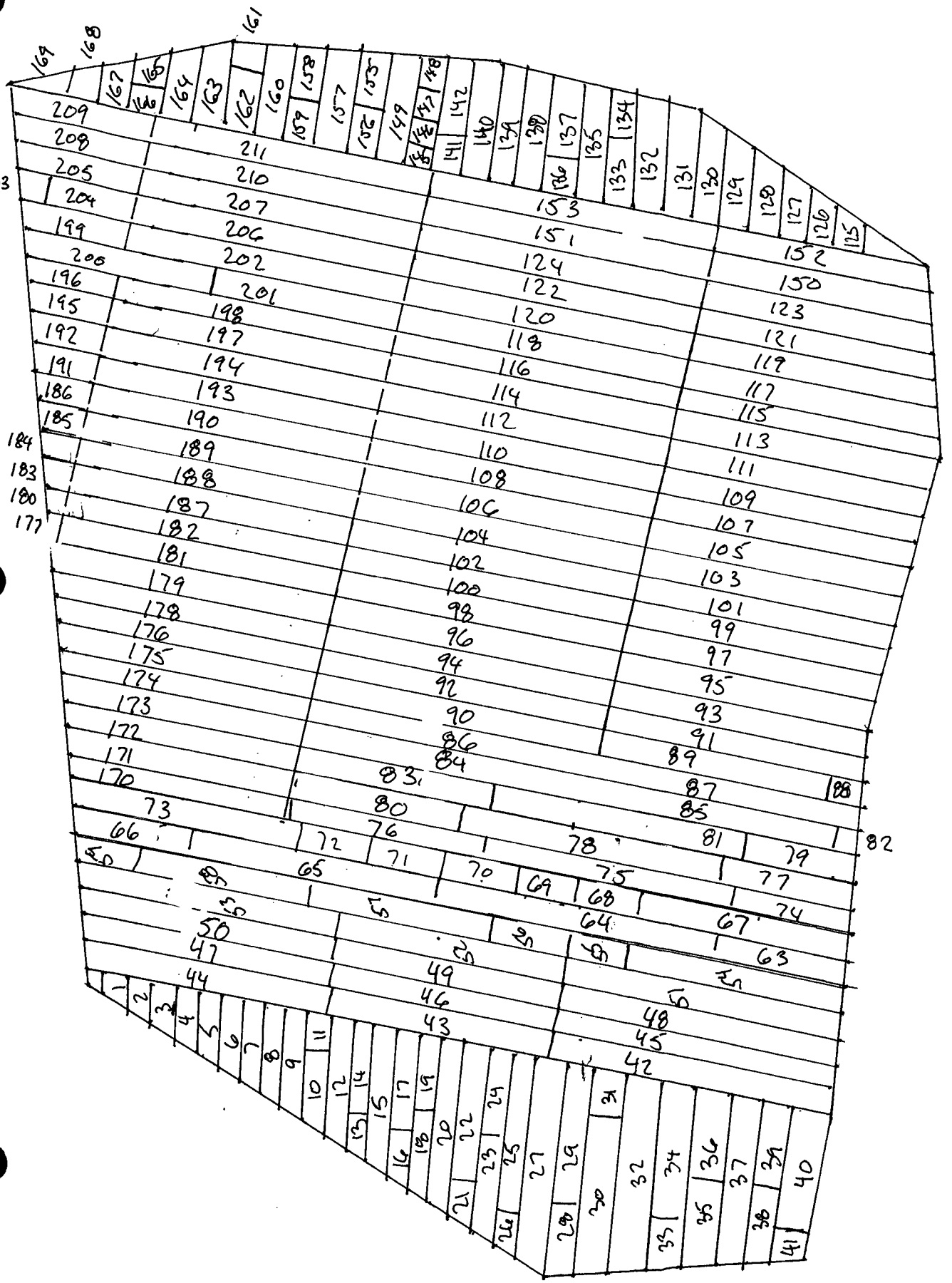
	Yes	No	Comments
Contractor OSHA competent person on site	X		ENVIROCON
All employees wearing proper eye protection/hard hat	X		NO HARD HAT WHEN TIEING DRAINAGE NET
All wearing adequate work or safety shoes, gloves	X		
All wearing hearing protection where necessary	X		
All wearing protective clothing where necessary	X		
Respirator protection used properly as necessary			Contaminant/Hazard: NA
All using fall protection as required			Potential Fall Distance: NA
All Hot Work/Confined Space Entry/Digging permits posted and conditions followed	X		BUTANE TORCH
Aerial Device/crane communication procedures followed, operators/crews trained			NA
Vehicle Pre-Ops Completed	X		
Is firewatch/attendant/flagman on duty, alert, and knowledgeable of responsibilities	X		
Electrical equipment used properly, GFCI	X		
Lockout/Tagout procedures followed, training completed			NA
Excavations/Trenches shored, sloped, set-up properly (OSHA 1926.650-652)			NA
Cranes/Heavy Equipment Inspected	X		
Rigging correct, in good condition	X		
Roads/walkways, properly barricaded, flagged	X		
Scaffolding properly installed/inspected/tagged			NA
Ladders/Tools used properly, good repair	X		
Correct lifting/material handling	X		
Retainer pins on air hose/tool connections			NA
Welding/Cutting equipment good repair, used properly	X		
Compressed gas cylinders secured upright			NA
Good housekeeping, environmental conditions	X		
Correct labels affixed to barrels/containers		X	GAS CANS NOT LABELED "GAS"
Special warnings, signage posted as necessary	X		
High Voltage 32.60 followed as required	X		
Safety awarness/behavior meets Alcoa expectations			
JSP at jobsite & followed			

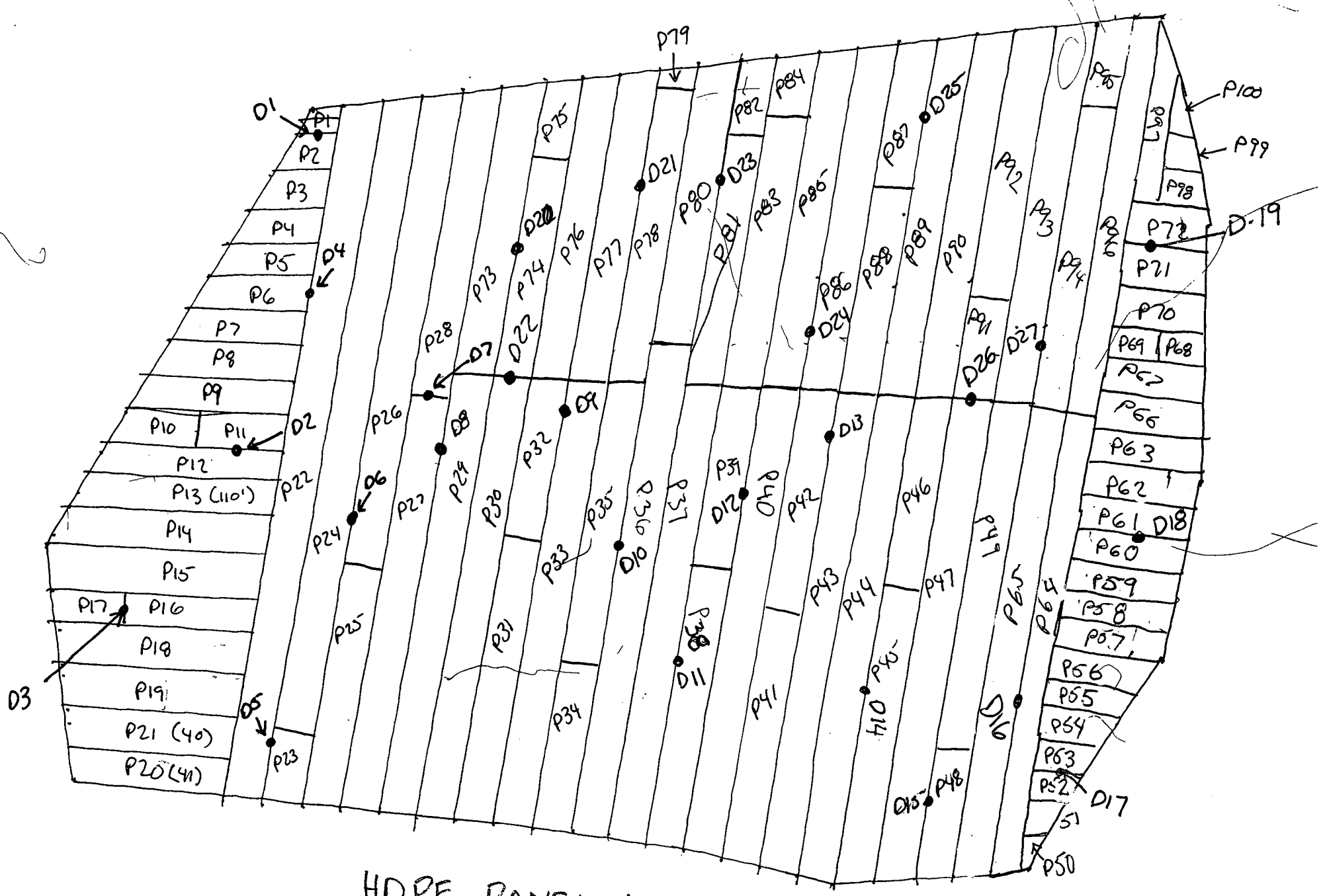
Alcoa Contractor Safety Checklist

Contractor TEXAS PLASTICS Location ALCOA - VANCOUVER

Evaluator MIKE CURTIS Date 6-1-04 Time 1310

	Yes	No	Comments
Contractor OSHA competent person on site	X		ENVIROCON
All employees wearing proper eye protection/hard hat	X		
All wearing adequate work or safety shoes, gloves	X		
All wearing hearing protection where necessary	X		
All wearing protective clothing where necessary	X		
Respirator protection used properly as necessary			Contaminant/Hazard: DOES NOT APPLY
All using fall protection as required			Potential Fall Distance: 11
All Hot Work/Confined Space Entry/Digging permits posted and conditions followed	X		HOT WORK PERMIT
Aerial Device/crane communication procedures followed, operators/crews trained	X		
Vehicle Pre-Ops Completed		X	NOT AT FIRST
Is firewatch/attendant/flagman on duty, alert, and knowledgeable of responsibilities	X		
Electrical equipment used properly, GFCI	X		
Lockout/Tagout procedures followed, training completed	X		
Excavations/Trenches shored, sloped, set-up properly (OSHA 1926.650-652)		1	DOES NOT APPLY
Cranes/Heavy Equipment Inspected	X		
Rigging correct, in good condition	X		
Roads/walkways, properly barricaded, flagged	X		
Scaffolding properly installed/inspected/tagged			DOES NOT APPLY
Ladders/Tools used properly, good repair	X		
Correct lifting/material handling	X		
Retainer pins on air hose/tool connections	X		
Welding/Cutting equipment good repair, used properly	X		
Compressed gas cylinders secured upright			DOES NOT APPLY
Good housekeeping, environmental conditions	X		
Correct labels affixed to barrels/containers	X		
Special warnings, signage posted as necessary	X		
High Voltage 32.60 followed as required	X		
Safety awarness/behavior meets Alcoa expectations	X		
JSP at jobsite & followed	X		


GCL PANEL LAYOUT



HDPE PANEL LAYOUT

DAILY STARTUP SEAM TESTING

Project Name/I East Landfill Cap Construction/184717 **Date:** 5·25·04

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: MICHAEL WIRTZ (503) 235-5000

Morning Weather Conditions: 60S / CLEAR

Afternoon Weather Conditions: CLEAR 70S

Specification/Drawing Reference:

Date	Time	Equipmnet ID	Temperature	Operator	Pass/Fail	Comments
5·25	~~10:31~~ 1305	FWC 009	740	B.K.	FAIL	
5·25	1305	FWC 008	400°C	K.P.	FAIL	5.5 SPEED
~~5·25~~	~~1305~~	FWC 007	400°C	~~K.P~~ KO	FAIL	5.0 SPEED
5·25	1351	FWC 008	400°C	K.P.	PASS	1/4 LEAD PRESSURE
5·25	1406	FWC 007	400	~~K.P~~ KO	PASS	
5·25	1417	FWC 009	740°C	B.K	FAIL	
5·25	1516	FWC 009	740°C	B.K.	PASS	
5·25	1521	X2 SUNGUN	NA	P.S.	PASS	
5·26	0711	008	400°C	~~K.P~~ BK KP	PASS	
5·26	0726	009	740	BK	PASS	
5·26	0734	X2 SUNGUN	NA	P.S.	PASS	
5·26	0742	007	~~400~~ 460	KO	PASS	
5·26	1320	X2 SUNGUN	NA	P.S.	PASS	
5·26	1330	009	400	KP	PASS	
5·26	1342	009	740	BK	PASS	
5·26	1349	007	400	KO	PASS	
5·28	0710	X2 SUNGUN	NA	KP	PASS	

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: Michael Wirtz **Title:** FIELD TECH QA/QC

DAILY STARTUP SEAM TESTING

Project Name/I East Landfill Cap Construction/184717	Date:

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: (503) 235-5000

Morning Weather Conditions:	Afternoon Weather Conditions:

Specification/Drawing Reference:

Date	Time	Equipmnet ID	Temperature	Operator	Pass/Fail	Comments
6-1-04	0656	008	400	K.P.	PASS	
6-1-04	0705	X2 SUNGUN	NA	P.S.	PASS	
6-1-04	0715	007	~~740~~ 400	KO	PASS	
6-1-04	0725	009	740	~~KB~~ B.K.	PASS	
6-1-04	1300	008	400	K.P.	PASS	
6-1-04	1310	009	740	B.K.	PASS	
6-1-04	1334	007	400	KO	PASS	
6-1-04	1345	X2 SUNGUN	NA	P.S.	PASS	
6-2-04	0643	008	400	K.P.	FAIL	DIRT SPOTS CAUSED TWO TO FAIL
"	0650	007	400	KO	PASS	
"	0713	009	740	BK	PASS	
"	0727	X2SUNGUN	NA	P.S.	PASS	
"	0735	008	400	KP	PASS	RECHECK WELDER
"	1309	008	400	KP	PASS	
"	1300	X2SUNGUN	NA	PS	PASS	
"	1320	007	400	KO	PASS	
"	1330	009	740	BK	PASS	

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: [signature] **Title:** QC

DAILY STARTUP SEAM TESTING

Project Name/I East Landfill Cap Construction/184717 **Date:** 6.3.04

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: (503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Date	Time	Equipmnet ID	Temperature	Operator	Pass/Fail	Comments
6.3.04	6:54	008	400	K.P.	PASS	
	7:07	009	740	B.K.	PASS	
	7:20	007	400	K.O.	PASS	
	7:35	X2 SUNGUN	NA	P.S.	PASS	
	1302	008	400	K.P.	PASS	
	13:15	007	400	KO	PASS	CHANGED SPEED TO 5.5
	13:30	009	740	BK	PASS	
	13:40	X2 SUNGUN	NA	P.S.	PASS	
6.4.04	7:15	008	400	KP	PASS	
	7:25	007	400	KO	PASS	
	7:35	X2SUNGUN	NA	P.S.	PASS	
	13:15	X2 SUNGUN	NA	P.S.	PASS	

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: [signature] **Title:** QC

GEOMEMBRANE INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:** 5-25-04

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: M. WIRTZ (503) 235-5000

Morning Weather Conditions:	Afternoon Weather Conditions:
SUNNY 60S	PARTLY CLOUDY UPPER 60S LOW 70S

Specification/Drawing Reference:

Date	Role ID	Damaged Role	Check Base	Location	Damaged Section	Field Seam	Name of Seamer	Destructive Test	Damage After	Comments (Panels)
5-25	8530	✓	✓	P1, P2, ✓	✓	✓	K.P.		✓	P1, P2, P3 P4 (P5, P6) (P7, P8)
	8530	✓	✓	✓	✓	✓	KO			(P5, P4) (P6, P7)
	8531	✓	✓	✓	✓	✓	B.K.			(P10, P11, P9)
	8531	✓	✓	✓	✓	✓	K.P			(P10, P11, P12) (P12, P13) (P13, P14)
	8531	✓	✓	✓	✓	✓	B.K.		✓	(P10, P11) (P15, P16) (P16, P17, P15)
	8531	✓	✓	✓	✓	✓	KO			(P12, P13) (P14, P15)
	8512	✓	✓	✓	✓	✓	KP			(16, 17, 18) (19, 21)
	8512	✓	✓	✓	✓	✓	KO			(18, 19)
	8512	✓	✓	✓	✓	✓	BK			(21, 20)

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: Marshall Wirtz **Title:** FIELD TECH

Damaged Roll: Check geomembrane roll for ~~signs~~ of damage
Check base: Check GC liner for anything that may damage geomembrane
Damaged Section: Check geomembrane after installation for tears, holes, and surface blemishes
Field Seam: 6 to 8 inch overlap
Destructive Test: Every 500 feet of seam, 36 inches long and 18 inches wide section tested for shear and tear

(~~PANELS~~ TO PANELS WELDED TOGETHER (P5, P6)

GEOMEMBRANE INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:** 5-26-04

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: MIN (503) 235-5000

Morning Weather Conditions: CLOUDY CHANCE OF RAIN 50s

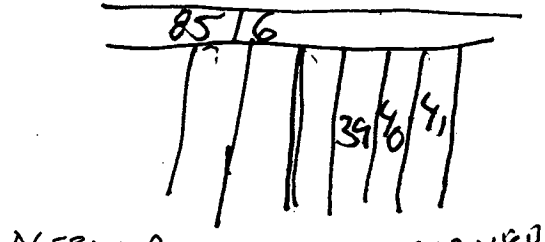
Afternoon Weather Conditions:

Specification/Drawing Reference:

Date	Role ID	Damaged Role	Check Base	Location	Damaged Section	Field Seam	Name of Seamer	Destructive Test	Damage After	Comments (Panels)
5-26	8516	✓	✓	✓	✓	✓	KP	✓	✓	(41,40,19,18,[illegible],16,15
	8516	✓	✓	✓	✓	✓	KO		✓	(14,13,12,10,9,8,7,6)
	8516	✓	✓	✓	✓	✓	BK		✓	(5,4,3,2,1)
	8506	✓	✓	✓	✓	✓	KP (1/3 RIVER)			PANEL # 24
	8506	✓	✓	✓	✓	✓	KO (MIDDLE)			"
	8506	✓	✓	✓	✓	✓	BK (1/3 COAST)			"
	8506	✓	✓	✓	✓	✓	KP (1/3 RIVER)			PANEL # 25
	8514	✓	✓	✓	✓	✓	BK (MIDDLE)			PANEL # 26 (OVER)
	~~8514~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~✓~~	~~KO (MIDDLE 1/3)~~			~~PANEL # 26~~
	8514	✓	✓	✓	✓	✓	KO			(25,26)
	8514	✓	✓	✓	✓	✓	KP			(27)
	8514	✓	✓	✓	✓	✓	KO			(27,28)
	8517	✓	✓	✓	✓	✓	BK			(28,26)

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: **Title:**

Damaged Roll: Check geomembrane roll for signs of damage
Check base: Check GC liner for anything that may damage geomembrane
Damaged Section: Check geomembrane after installation for tears, holes, and surface blemishes
Field Seam: 6 to 8 inch overlap
Destructive Test: Every 500 feet of seam, 36 inches long and 18 inches wide section tested for shear and tear



NOTE: 8 PATCHED ALL CORNERS

GEOMEMBRANE INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:** ~~5-28-04~~ 6-1-04

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: (503) 235-5000

Morning Weather Conditions:	Afternoon Weather Conditions:
SUNNY 60s	MOSTLY SUNNY 70s

Specification/Drawing Reference:

Date	Role ID	Damaged Role	Check Base	Location	Damaged Section	Field Seam	Name of Seamer	Destructive Test	Damage After	Comments (Panels)
~~5-28~~	~~8517~~	✓	✓	✓	✓	✓	KP			(P28, P29)(P27, P28)KP
6-1	~~8499~~	✓	✓	✓	✓	✓	KO			(P29, P30)
6-1	~~8517~~	✓	✓	✓	✓	✓	BK			(P30, P31)
6-1-04	8515	✓	✓	✓	✓	✓	~~BK~~ KP			(P31, P32)(P33, P34)
"	8515	✓	✓	✓	✓	✓	KO			(P32, P33)
"	8515	✓	✓	✓	✓	✓	KP			(P34, P35)(P35, P36)(P34, P36)
"	8515	✓	✓	✓	✓	✓	BK			(P33, P35)
	~~8515~~	✓	✓	✓						
	8507	✓	✓	✓	✓	✓	KO			(P37, P36)
	8505	✓	✓	✓	✓	✓	KP			(P37, P39)
	~~8507~~	✓	✓	✓	✓	✓	BK			(P37, P38)
	8507	✓	✓	✓	✓	✓	KO			(P39, P38)
	8505	✓	✓	✓	✓	✓	BK			(P39, P45)

ELECTRONIC COPY

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: **Title:**

Damaged Roll: Check geomembrane roll for signs of damage
Check base: Check GC liner for anything that may damage geomembrane
Damaged Section: Check geomembrane after installation for tears, holes, and surface blemishes
Field Seam: 6 to 8 inch overlap
Destructive Test: Every 500 feet of seam, 36 inches long and 18 inches wide section tested for shear and tear

GEOMEMBRANE INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:** 6·1·04 TO 6·2·04

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: (503) 235-5000

Morning Weather Conditions:	Afternoon Weather Conditions:

Specification/Drawing Reference:

Date	Role ID	Damaged Role	Check Base	Location	Damaged Section	Field Seam	Name of Seamer	Destructive Test	Damage After	Comments (Panels)
6-1-04	8511	✓	✓	✓	✓	✓	KO			(P40, P42)(P41, P42)
"	8511	✓	✓	✓	✓	✓	KP			(42, P43)(P41, P43)
6-2-04	8559	✓	✓	✓	✓	✓	KP			(46, P47), (P45, P47)
	8560	✓	✓	✓	✓	✓	KP			(P44, P46)
	8560	✓	✓	✓	✓	✓	BK			(P44, P45)
	8559	✓	✓	✓	✓	✓	BK			(P47, P48)(P47, P49)
	8532	✓	✓	✓	✓	✓	KP			(P50, P51)(P52, P53)(P54, P55)
	8532	✓	✓	✓	✓	✓	KO			(P54, P53), (P55, P56)
	8487	✓	✓	✓	✓	✓	KO			(P56, P57) (P61, P62)
	8487	✓	✓	✓	✓	✓	KP			(P57, P58)(P59, P60)(P60, P61)
	8487	✓	✓	✓	✓	✓	BK			(58, P59)
	8501	✓	✓	✓	✓	✓	BK			(P64, P63 TO P54)(P68, P67)
	8501	✓	✓	✓	✓	✓	KO			(P68, P65)(P66, P67)

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: **Title:**

Damaged Roll: Check geomembrane roll for signs of damage
Check base: Check GC liner for anything that may damage geomembrane
Damaged Section: Check geomembrane after installation for tears, holes, and surface blemishes
Field Seam: 6 to 8 inch overlap
Destructive Test: Every 500 feet of seam, 36 inches long and 18 inches wide section tested for shear and tear

GEOMEMBRANE INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717	**Date:**

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Date	Role ID	Damaged Role	Check Base	Location	Damaged Section	Field Seam	Name of Seamer	Destructive Test	Damage After	Comments (Panels)
6-2-04	8500	✓	✓	✓	✓	✓	KP			(P64, P53 TO 50) (P65, P48) (P65, P49)
11	11	✓	✓	✓	✓	✓	KP			(P63, P66) (P68, P69)
	8500	✓	✓	✓	✓	✓	KO			(P66, P67)
	8500	✓	✓	✓	✓	✓	BK			(P68, P67) (P69, P67)
	8494	✓	✓	✓	✓	✓	KP			(P68, 76) (P69, P70)
6-3-04	8494	✓	✓	✓	✓	✓	KP			(P29, P73) (P28, P73)
	8494	✓	✓	✓	✓	✓	BK			(P74, P73) (P71, P72)
	8567	✓	✓	✓	✓	✓	KO			(P74, P75)
	8567	✓	✓	✓	✓	✓	KP KO			(P75, P76)
	8567	✓	✓	✓	✓	✓	KP			(P76, P77) (P78, P79)
	8567	✓	✓	✓	✓	✓	BK			(P77, 78)
	8482	✓	✓	✓	✓	✓	KP			(P72, P79) (P78, P79) (P80, P81)
	8482	✓	✓	✓	✓	✓	KO			(P78, P80)

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted. **Signed:**	**Title:**

Damaged Roll: Check geomembrane roll for signs of damage

Check base: Check GC liner for anything that may damage geomembrane

Damaged Section: Check geomembrane after installation for tears, holes, and surface blemishes

Field Seam: 6 to 8 inch overlap

Destructive Test: Every 500 feet of seam, 36 inches long and 18 inches wide section tested for shear and tear

GEOMEMBRANE INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:**

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: (503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Date	Role ID	Damaged Role	Check Base	Location	Damaged Section	Field Seam	Name of Seamer	Destructive Test	Damage After	Comments (Panels)
6-3-04	8482	✓	✓	✓	✓	✓	KO	✓	✓	(P81, P83)(P81, P82)
	8482	✓	✓	✓	✓	✓	KP	✓	✓	(P80, P82)
	8564	✓	✓	✓	✓	✓	KP			(P84, P85)(P83, P85)
	8564	✓	✓	✓	✓	✓	BK			(P85, P86)
	8564	✓	✓	✓	✓	✓	KO			(P96, P88)(P86, P87)
	8557	✓	✓	✓	✓	✓	KP			(P88, 89)(P87, 89)(P91, P85)
	8557	✓	✓	✓	✓	✓	KO			(P98, P87)
	8557	✓	✓	✓	✓	✓	BK			(P89, P90)
6-2-04	8494	✓	✓	✓	✓	✓	KO			(P70, P71)
6-4-04	8566	✓	✓	✓	✓	✓	KP			(P91, P92)(P92, P3)(P93, 94)
	8566	✓	✓	✓	✓	✓	KO			(P92, P93)

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: **Title:**

Damaged Roll: Check geomembrane roll for signs of damage
Check base: Check GC liner for anything that may damage geomembrane
Damaged Section: Check geomembrane after installation for tears, holes, and surface blemishes
Field Seam: 6 to 8 inch overlap
Destructive Test: Every 500 feet of seam, 36 inches long and 18 inches wide section tested for shear and tear

GEOMEMBRANE INSTALLATION CHECKLIST

Project Name/No.: East Landfill Cap Construction/184717 **Date:**

QC Inspector: CH2M Hill, Inc.
825 NE Multnomah, Suite 1300
Portland, OR 97232
POC: (503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Date	Role ID	Damaged Role	Check Base	Location	Damaged Section	Field Seam	Name of Seamer	Destructive Test	Damage After	Comments (Panels)
6-4-04	8566	✓	✓	✓	✓	✓	KP	✓	✓	(P94, P95) (94, 96) (95, 96)
	~~8566~~	✓	✓	✓	✓	✓	KP			(P97, P72)
	8559	✓	✓	✓	✓	✓	KP			(P97, P72), P(97, P96)
	~~8558~~	✓	✓	✓	✓	✓	KP			(P100) (P98)
	8558	✓	✓	✓	✓	✓	KP			(P99)

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: [signature] **Title:** SSC

Damaged Roll: Check geomembrane roll for signs of damage
Check base: Check GC liner for anything that may damage geomembrane
Damaged Section: Check geomembrane after installation for tears, holes, and surface blemishes
Field Seam: 6 to 8 inch overlap
Destructive Test: Every 500 feet of seam, 36 inches long and 18 inches wide section tested for shear and tear

GEOMEMBRANE REPAIR CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	Date:

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	Afternoon Weather Conditions:

Specification/Drawing Reference:

Date	Roll ID	Type of Damage	Type of Repair
6-25	8530	FAILED SEAM AIR TEST	RETEST - PASSED
6-1		FAILED LAB DESTRUCTIVE SAMPLE	PATCHED ENTIRE SEAM, RESAMPLED
		DS-27 FAILED PEEL TEST	ON EITHER SIDE (10') OF ORIGINAL
			AND SEND TO LAB (DS-7-A, DS-7-B)
6-2	8494	FIELD TEST DS-19 FAILED	RESAMPLED 10' ON EITHER SIDE
			AND SENT SAMPLES (DS-19FA, DS-19-B
			TO LAB. PASSED.
			PATCHED SEAM
6-4-04	8566	FAILED LAB TEST DS-26	PATCHED SEAM
6-4-04		MONITORING WELLS PATCHES	REPATCH IN MORNING. WHEN
		FAILED AT BASE DUE	HDPE IS STRETCHED OUT
		TO CONTRACION/EXPANSION OF	
		HDPE MATERIAL	
6-3-04	PAEL PANELS	HOLES WERE CUT IN HDPE	PATCHED HOLES, VACUUME TESTED
	30, 31, 34, 33, 36	TO BE USED TO PULL HDPE	
	37, 38, 40, 41, 43		
	44, 45, 47, 48, 64		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: Michael West Title: QC

GEOMEMBRANE REPAIR CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Date	Roll ID	Type of Damage	Type of Repair
6-4-04	PANELS #83	HOLES CUT IN HDPE TO BE USED TO PVLC	PATCH, VACUUM TESTED
6-4-04	PANELS #82, 84	HOLES CUT IN HDPE TO BE USED TO PVLC	PATCH, VACUUM TEST

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: Marshall West **Title:**

GEOMEMBRANE TESTING CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717 **Date:** 5-26-04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Date	Time	Temperature (OUTSIDE)	Name of Seamer	Welding Apparatus		Role ID	Sample ID	Field Test Pass/Fail
				Temp	Pressure			
5-26-04		400 MID 60s	K.P.	400		8530	D-1 P01P02	PASS
"		MID 60S	K.P.	740 400		8531	D-2 P10P12	PASS
"		MID 60S	B.K.	740		8517	D-3 P16A7	PASS
"		MID 60S	~~B.K~~ KO	~~740~~ 400		8516	D-4 P6 P22	PASS
5-27-04		LOW 60S	KP	400		8516	D-5 P22P23	PASS
"		LOW 60S	KO BK	400 740		8514	D-6 P24P26	PASS
"		LOW 60S	KO	400		8517	D-7 P28P27	PASS
6-2-04		UPPER 70S	K.P.	400		8517	D-8 P27P29	PASS
"		UPPER 70S	K.O.	400		8515	D-9-P32P33	PASS
"		UPPER 70S	KO	400		8525	D-10 P35P36	PASS
"		UPPER 70S	BK	740		8507	D-11 P37P39	PASS
"		UPPER 70S	BK	740		8505	D-12 P39P40	PASS
"		UPPER 70S	KP	400		8511	D-13 P42P43	PASS

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: [signature] **Title:**

GEOMEMBRANE TESTING CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717 **Date:** 6·3·04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Date	Time	Temperature	Name of Seamer	Welding Apparatus		Role ID	Sample ID	Field Test Pass/Fail
				Temp	Pressure			
6·3·04		Low 80s	BK	740		8559	D-15 P47P48	Pass
"		Low 80s	KD	400		8501	D-16 P64P65	Pass
"		"	KP	400		8537	D-17 P52P53	Pass
"		"	KP	400		~~8484~~ 8487	D-18 P60P61	Pass
"		"	BK	740		8494	D-19A P71P72	Pass
"		"	BK	740		8494	D-19B P71P72	Pass
"		"	BK	740		8494	D-20 P73P74	Pass
"		"	BK	740		8567	D-21 P77P78	Pass
"		"	BK	740		8494	D-22 P75P76	Pass
"		"	BK	740		8494	D-19 P71P72	FAIL

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: Michael Wentz **Title:**

GEOMEMBRANE TESTING CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717 **Date:**

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Date	Time	Temperature	Name of Seamer	Welding Apparatus		Role ID	Sample ID	Field Test Pass/Fail
				Temp	Pressure			
6.2.04		~~MID 50s~~ MID 70s	BK	740		8560	D-14 P44 P45	PASS
6.2.04		~~AM~~ MID 70s	KO	400		8517	D-73 P27 P28	PASS

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: [signature] **Title:** QC

(1)

SHIPPING ADDRESS:
TRI/Environmental, Inc.
A Texas Research International Company
9063 Bee Caves Road, Austin, Texas 78733-6201

GEOSYNTHETIC TESTING LABORATORIES
1-800-880-8378
FAX: 512 263 2558

[redacted]IN OF CUSTODY/TEST REQUEST FORM - DESTRUCTIVE SEAMS

REPORT RESULTS TO:		
	Client Contact: MICHAEL WIRTZ	Client Phone/Fax: 503-998-2517
	Client Company: CH2M HILL	Client Field Phone:/Fax:
	Project Name: ALCOA - VANCOUVER	Project Number: 184717.01.01.01
	Client Mailing Address: 825 NE MULTNOMAH, SUITE1300	E-mail: MWIRTZ @CH2M.COM
	Client City, State, Zip: PORTLAND, OR 97232-2146	Shipped by: FEDEX Date:

SEND INVOICE TO:		
	COMPLETE ONLY IF DIFFERENT FROM ABOVE	Phone:
	Client Contact:	Fax:
	Client Company:	Client P.O. #:
	Client Mailing Address:	E-mail:
	Client City, State, Zip:	Shipped by: Date:

	Geomembrane Seams Sample Identification	Top Panel No.	Bottom Panel No.	Machine Number	Resin Type (ex: HDPE)	Weld Type	Welder (personnel)	Date / Time Sampled
1	D1 - P1 P2 @ 42.5	P2	P1	008	HDPE		KP	5·26·04 08:11
	D2 - P10 P12 @ 42.5	P10	P12	008	"		KP	5·26·04 08:09
	D3 - P16 P17 @ 42.5	P16	P17	009	"		BK	5·26·04 08:05
[redacted]	4 - P22 P6	P22	P6	007	"		KO	5·26·04 11:16
5								
6								
7								
8								
9								
10								

Remarks:

Standard Test Methods: ASTM D 6392 , D 4437 , D413 , D751) Please circle requested test procedure

PLEASE CONTACT TRI WITH QUESTIONS REGARDING APPROPRIATE TEST PROCEDURES

"As-Received" Notes:

TRI Log. Number:
Due Date:

[redacted]E AUTHORIZE BY SIGNING AND DATING BELOW.

[redacted] Michael Wirtz SIGNATURE/DATE:

(2)

SHIPPING ADDRESS:
TRI/Environmental, Inc.
A Texas Research International Company
9063 Bee Caves Road, Austin, Texas 78733-6201

GEOSYNTHETIC TESTING LABORATORIES
1-800-880-8378
FAX: 512 263 2558

CHAIN OF CUSTODY/TEST REQUEST FORM - DESTRUCTIVE SEAMS

Page 1 of 1

REPORT RESULTS TO:		
Client Contact: MICHAEL WIRTZ		Client Phone/Fax: 503-998-2517
Client Company: CH2M HILL		Client Field Phone:/Fax: 503-736-2000
Project Name: ALCOA - VANCOUVER		Project Number: 184717.01.01.01
Client Mailing Address: 825 NE MULTNOMAH, SUITE1300		E-mail: MWIRTZ@CH2M.COM
Client City, State, Zip: PORTLAND, OR 97232-2146		Shipped by: FEDEX Date:

SEND INVOICE TO:	
COMPLETE ONLY IF DIFFERENT FROM ABOVE	Phone:
Client Contact:	Fax:
Client Company:	Client P.O. #:
Client Mailing Address:	E-mail:
Client City, State, Zip:	Shipped by: Date:

	Geomembrane Seams Sample Identification	Top Panel No.	Bottom Panel No.	Machine Number	Resin Type (ex: HDPE)	Weld Type	Welder (personnel)	Date / Time Sampled
1	D5-P23P24	P23	P22	008	HDPE		KP	5-26-04 17:39
	D6-P26P24	P26	P24	009	"		BK	5-26-04 17:42
	D7-P27P28	P28	P27	007	"		KO	5-26-04 17:44
5								
6								
7								
8								
9								
10								

Remarks:

Standard Test Methods: ASTM D 6392 (D 4437, D413, D751) Please circle requested test procedure

PLEASE CONTACT TRI WITH QUESTIONS REGARDING APPROPRIATE TEST PROCEDURES

"As-Received" Notes:

TRI Log. Number:
Due Date:

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SIGNATURE/DATE: MICHAEL WIRTZ

ON BACK!

SHIPPING ADDRESS:
TRI/Environmental, Inc.
A Texas Research International Company
9063 Bee Caves Road, Austin, Texas 78733-6201

GEOSYNTHETIC TESTING LABORATORIES
1-800-880-8378
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CHAIN OF CUSTODY/TEST REQUEST FORM - DESTRUCTIVE SEAMS

REPORT RESULTS TO:

Client Contact: MICHAEL WIRTZ	Client Phone/Fax: 503-998-2517
Client Company: CH2M HILL	Client Field Phone:/Fax: 503-736-2000
Project Name: ALCOA - VANCOUVER	Project Number: 184717.01.01.01
Client Mailing Address: 825 NE MULTNOMAH, SUITE1300	E-mail: MWIRTZ@CH2M.COM
Client City, State, Zip: PORTLAND, OR 97232-2146	Shipped by: FEDEX Date: 6-2-04

SEND INVOICE TO:

COMPLETE ONLY IF DIFFERENT FROM ABOVE	Phone:
Client Contact:	Fax:
Client Company:	Client P.O. #:
Client Mailing Address:	E-mail:
Client City, State, Zip:	Shipped by: Date:

	Geomembrane Seams Sample Identification	Top Panel No.	Bottom Panel No.	Machine Number	Resin Type (ex: HDPE)	Weld Type	Welder (personnel)	Date / Time Sampled
1	D-8 P27 P29	P27	P29	008	HDPE		KP	6-1-04 1410
2	D-9 P32 P33	P32	P33	007	"		KO	6-1-04 1420
3	D-10 P35 P36	P35	P36	008	"		KP	6-1-04 1750
4	D-11 P37 P38	P37	P38	009	"		BK	6-1-04 1800
5	D-12 P39 P40	P39	P40	009	"		BK	6-1-04 1805
6	D-13 P42 P43	P42	P43	008	"		~~KB~~ KP	6-2-04 07:59
7	D-14 P44 P45	P44	P45	009	"		BK	6-2-04 09:02
8	D-7 "A" EAST	P28	P27	007	"		KO	6-1-04 09:23
9	D-7 "B" WEST	P26	P25	007	"		KO	6-2-04 09:56
10								

Remarks:

Standard Test Methods: ASTM D 6392 , (D 4437), D413 , D751) Please circle requested test procedure

PLEASE CONTACT TRI WITH QUESTIONS REGARDING APPROPRIATE TEST PROCEDURES

"As-Received" Notes:

TRI Log. Number:
Due Date:

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MICHAEL WIRTZ SIGNATURE/DATE: Michael Wirtz

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TRI/Environmental, Inc.
A Texas Research International Company
9063 Bee Caves Road, Austin, Texas 78733-6201

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CHAIN OF CUSTODY/TEST REQUEST FORM - DESTRUCTIVE SEAMS

Page 1 of 1

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Client Contact: MICHAEL WIRTZ		Client Phone/Fax: 503-998-2517
Client Company: CH2M HILL		Client Field Phone:/Fax: 503-736-2000
Project Name: ALCOA - VANCOUVER		Project Number: 184717.01.01.01
Client Mailing Address: 825 NE MULTNOMAH, SUITE1300		E-mail: MWIRTZ@CH2M.COM
Client City, State, Zip: PORTLAND, OR 97232-2146		Shipped by: FEDEX Date: 6-3-04

SEND INVOICE TO:	
COMPLETE ONLY IF DIFFERENT FROM ABOVE	Phone:
Client Contact:	Fax:
Client Company:	Client P.O. #:
Client Mailing Address:	E-mail:
Client City, State, Zip:	Shipped by: Date:

	Geomembrane Seams Sample Identification	Top Panel No.	Bottom Panel No.	Machine Number	Resin Type (ex: HDPE)	Weld Type	Welder (personnel)	Date / Time Sampled
1	D-15 P48 P47	P48	P47	009	HDPE		BK	6-2-04 14:24
2	D-16 P65 P64	P65	P64	008	HDPE		KP	6-2-04 16:24
3	D-17 P52 P53	P53	P52	007	HDPE		KO	6-2-04 14:21
4	D-18 P60 P61	P61	P60	007	HDPE		KO	6-2-04 14:16
5	~~D-19 P71 P72~~	~~P72~~	~~P71~~	~~009~~	~~HDPE~~		~~B.K.~~	~~6-3-04 7:33~~
6	D-19 "A" WEST	P72	P71	009	HDPE		B.K.	6-3-04 9:15
7	D-19 "B" EAST	P72	P71	009	HDPE		B.K.	6-3-04 9:15
8								
9								
10								

Remarks:

Standard Test Methods: ASTM D 6392, D 4437, D413, D751) Please circle requested test procedure

PLEASE CONTACT TRI WITH QUESTIONS REGARDING APPROPRIATE TEST PROCEDURES

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TRI Log. Number:
Due Date:

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Michael Wirtz

SIGNATURE/DATE: MICHAEL WIRTZ

SHIPPING ADDRESS:
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9063 Bee Caves Road, Austin, Texas 78733-6201

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1-800-880-8378
FAX: 512 263 2558

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REPORT RESULTS TO:

Client Contact: MICHAEL WIRTZ	Client Phone/Fax: 503-998-2517
Client Company: CH2M HILL	Client Field Phone:/Fax: 503-736-2000
Project Name: ALCOA - VANCOUVER	Project Number: 184717.01.01.01
Client Mailing Address: 825 NE MULTNOMAH, SUITE 1300	E-mail: MWIRTZ@CH2M.COM
Client City, State, Zip: PORTLAND, OR 97232-2146	Shipped by: FEDEX Date:

SEND INVOICE TO:

COMPLETE ONLY IF DIFFERENT FROM ABOVE	Phone:
Client Contact:	Fax:
Client Company:	Client P.O. #:
Client Mailing Address:	E-mail:
Client City, State, Zip:	Shipped by: Date:

	Geomembrane Seams Sample Identification	Top Panel No.	Bottom Panel No.	Machine Number	Resin Type (ex: HDPE)	Weld Type	Welder (personnel)	Date / Time Sampled
1	D-20 ~~P77~~ P73P74	P73	P74	009	HDPE		BK	6-3-04 13:15
2	D-21 P77P78	P77	P78	009	HDPE		BK	6-3-04 13:21
3	D-22 P32P76	P32	P76	008	HDPE		KP	6-3-04 15:09
4								
5								
6								
7								
8								
9								
10								

Remarks:

Standard Test Methods: ASTM D 6392 , D 4437 , D413 , D751) Please circle requested test procedure

PLEASE CONTACT TRI WITH QUESTIONS REGARDING APPROPRIATE TEST PROCEDURES

"As-Received" Notes:

TRI Log. Number:
Due Date:

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MICHAEL WIRTZ SIGNATURE/DATE: Michael Wirtz

SHIPPING ADDRESS:
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9063 Bee Caves Road, Austin, Texas 78733-6201

GEOSYNTHETIC TESTING LABORATORIES
1-800-880-8378
FAX: 512 263 2558

CHAIN OF CUSTODY/TEST REQUEST FORM - DESTRUCTIVE SEAMS

REPORT RESULTS TO:

Client Contact: MICHAEL WIRTZ	Client Phone/Fax: 503-998-2517
Client Company: CH2M HILL	Client Field Phone:/Fax:
Project Name: ALCOA - VANCOUVER	Project Number: 184717.01.01.01
Client Mailing Address: 825 NE MULTNOMAH, SUITE 1300	E-mail: MJWIRTZ @CH2M.COM
Client City, State, Zip: PORTLAND, OR 97232-2146	Shipped by: FEDEX Date: 6-4-04

SEND INVOICE TO:

COMPLETE ONLY IF DIFFERENT FROM ABOVE	Phone:
Client Contact:	Fax:
Client Company:	Client P.O. #:
Client Mailing Address:	E-mail:
Client City, State, Zip:	Shipped by: Date:

	Geomembrane Seams Sample Identification	Top Panel No.	Bottom Panel No.	Machine Number	Resin Type (ex: HDPE)	Weld Type	Welder (personnel)	Date / Time Sampled
1	D-23 P81 P80	P81	P80	008	HDPE		KP	6-4-04 6:36
	~~D-24 P47 P91~~	~~P47~~	~~P91~~					6:50
	D-25 P89 P87	P89	P87	008	HDPE		KP	6-4-04 6:43
	D-26 P47 P91	P47	P91	007	HDPE		KO	6-4-04 650
5	D-24 P86 P85	P86	P85	009	HDPE		BK	6-4-04 6:40
6	D-27 P93 P94	P93	P94	008	HDPE		KP	6-4-04 9:00
7								
8								
9								
10								

Remarks:

Standard Test Methods: ASTM D 6392, D 4437, D413 , D751) Please circle requested test procedure

PLEASE CONTACT TRI WITH QUESTIONS REGARDING APPROPRIATE TEST PROCEDURES

"As-Received" Notes:

TRI Log. Number:
Due Date:

SE AUTHORIZE BY SIGNING AND DATING BELOW.

MICHAEL WIRTZ SIGNATURE/DATE: Michael Wirtz

TRI / Environmental, Inc.
A Texas Research International Company

May 27, 2004

Mail To:

Mr. Michael Wirtz
CH2M Hill
825 NE Multnomah, Suite 1300
Portland, OR 97232-2146

e-mail: mwirtz@ch2m.com
e-mail: mdrewett@ch2m.com - Mike Drewett

Bill To:

Attn: Accounts Payable/PDX
CH2M Hill
2300 NW Walnut Blvd.
Corvallis, OR 97330

Ref. Proj# 184717.01.01.04

Dear Mr. Wirtz:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Alcoa - Vancouver**
TRI Job Reference Number:	E2199-62-05
Material(s) Tested:	4 Heat Fusion Weld(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
non-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-62-05

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D3-P16P17**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	140	146	147	138	137	142
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	138	164	155	120	133	142
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	184	169	172	165	178	174
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D4-P22P6**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	145	151	150	149	146	148
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	141	141	136	138	138	139
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	172	171	179	176	176	175
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

May 28, 2004

Mail To:

Mr. Michael Wirtz
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e-mail: mike.drewett@ch2m.com - Mike Drewett
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Bill To:

Attn: Accounts Payable/PDX
CH2M Hill
2300 NW Walnut Blvd.
Corvallis, OR 97330

Ref. Proj# 184717.01.01.04

Dear Mr. Wirtz:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Alcoa - Vancouver**
TRI Job Reference Number:	E2199-64-04
Material(s) Tested:	3 Heat Fusion Weld(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
non-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-62-05

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **D1-P1P2@42.5**						
	Weld: **Heat Fusion Weld**						
Side A	Peel Strength (ppi)	126	123	128	119	129	Peel A 125
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	137	133	129	138	141	Peel B 136
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	179	177	182	175	179	Shear 178
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: **D2-P11P12@42.5**						
	Weld: **Heat Fusion Weld**						
Side A	Peel Strength (ppi)	138	139	141	149	131	Peel A 140
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	133	136	133	138	137	Peel B 135
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	180	180	179	176	180	Shear 179
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-64-04

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **D7-P27P28**						
	Weld: **Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	139	83	108	124	130	117
Side A	Peel Incursion (%)	<10	100	100	75	90	
Side A	Peel Locus of Failure Code	SE	AD	AD	AD-BRK	AD-BRK	
Side A	Peel NSF Failure Code	FTB	NON-FTB	NON-FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	141	138	144	138	153	143
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	174	178	176	174	161	173
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-64-04

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D5-P23P24**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	141	137	141	136	138	139
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	118	132	134	125	114	125
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	182	182	184	178	182	182
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D6-P26P24**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	138	135	148	129	129	136
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	116	133	109	100	145	121
Side B	Peel Incursion (%)	25	<10	25	25	<10	
Side B	Peel Locus of Failure Code	AD-BRK	SE	AD-BRK	AD-BRK	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	181	181	184	179	182	181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

June 3, 2004

Mail To:

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Bill To:

Attn: Accounts Payable/PDX
CH2M Hill
2300 NW Walnut Blvd.
Corvallis, OR 97330

Ref. Proj# 184717.01.01.04

Dear Mr. Wirtz:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Alcoa - Vancouver**
TRI Job Reference Number:	E2199-69-07
Material(s) Tested:	9 Heat Fusion Weld(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
non-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

GeosyntheticTesting.com
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-69-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D8-P27P29**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	138	149	128	134	159	Peel A: 142
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	133	114	101	125	124	Peel B: 119
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SIP	SE	SIP	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	181	181	180	180	182	Shear: 181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D9-P32P33**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	133	132	153	152	151	Peel A: 144
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	140	142	154	136	148	Peel B: 144
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	178	178	177	177	177	Shear: 177
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-69-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **D10-P35P36**						
	Weld: **Heat Fusion Weld**						
Side A	Peel Strength (ppi)	138	138	134	124	141	Peel A: 135
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	139	132	133	127	139	Peel B: 134
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	180	178	183	179	180	Shear: 180
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: **D11-P37P38**						
	Weld: **Heat Fusion Weld**						
Side A	Peel Strength (ppi)	148	133	157	149	147	Peel A: 147
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	138	147	156	148	135	Peel B: 145
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	176	177	180	179	178	Shear: 178
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-69-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **D12-P39P40**						
	Weld: **Heat Fusion Weld**						
Side A	Peel Strength (ppi)	141	146	139	144	131	Peel A: 140
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	136	131	130	125	123	Peel B: 129
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	179	176	177	176	176	Shear: 177
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: **D13-P42P43**						
	Weld: **Heat Fusion Weld**						
Side A	Peel Strength (ppi)	148	149	137	147	151	Peel A: 146
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	141	156	162	147	148	Peel B: 151
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	182	180	179	176	178	Shear: 179
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-69-07

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D14-P44P45**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	128	130	139	130	146	135
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	132	137	138	148	139	139
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	186	187	188	184	182	185
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D7-A-EAST**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	137	151	119	150	111	134
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SIP	SE	SIP	SE	SIP	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	136	154	147	157	142	147
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	179	183	176	175	174	177
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-69-07

		TEST REPLICATE NUMBER					
PARAMETER		**1**	**2**	**3**	**4**	**5**	**MEAN**
Sample ID:	**D7-B-WEST**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	162	146	125	145	147	145
	Peel Incursion (%)	<10	<10	10	<10	<10	
	Peel Locus of Failure Code	SE	SE	AD-BRK	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	144	148	143	126	145	141
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SIP	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	172	175	169	179	169	173
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

June 4, 2004

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Corvallis, OR 97330

Ref. Proj# 184717.01.01.04

Dear Mr. Wirtz:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Alcoa - Vancouver**
TRI Job Reference Number:	E2199-70-07
Material(s) Tested:	9 Heat Fusion Weld(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
non-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Sam R. Allen

Sam Allen
Vice President and Division Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-70-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D15-P48P47**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	128	130	124	126	143	130
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	137	156	137	140	140	142
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	181	182	185	182	184	183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D16-P65P64**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	132	138	132	140	130	134
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	135	139	130	139	139	136
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	176	179	177	175	175	176
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-70-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D17-P52P53**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	135	146	154	131	133	140
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	114	144	141	128	131	132
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	179	177	177	174	179	177
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D18-P60P61**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	140	138	139	142	141	140
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	145	152	143	144	140	145
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	181	182	183	179	183	182
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-70-07

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D19-A-WEST**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	134	147	138	140	135	Peel A: 139
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	152	136	140	140	144	Peel B: 142
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	179	180	178	177	178	Shear: 178
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D19-B-EAST**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	139	138	144	145	140	Peel A: 141
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	141	147	134	140	149	Peel B: 142
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	175	176	176	174	175	Shear: 175
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-70-07

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D20-P73P74**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	145	138	150	139	137	142
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	150	150	141	153	134	146
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	175	171	174	173	175	174
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D21-P77P78**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	142	129	132	134	138	135
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	122	126	137	137	123	129
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	181	182	183	177	184	181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill

Project: Alcoa - Vancouver

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2199-70-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D22-P32P76**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	147	131	135	126	137	135
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	140	144	134	141	151	142
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	171	173	178	179	176	175
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

June 5, 2004

Mail To:

Mr. Michael Wirtz
CH2M Hill
825 NE Multnomah, Suite 1300
Portland, OR 97232-2146

e-mail: mwirtz@ch2m.com
e-mail: mike.drewett@ch2m.com - Mike Drewett
Site fax: 360-737-1995

Bill To:

Attn: Accounts Payable/PDX
CH2M Hill
2300 NW Walnut Blvd.
Corvallis, OR 97330

Ref. Proj# 184717.01.01.04

Dear Mr. Wirtz:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Alcoa - Vancouver**
TRI Job Reference Number:	E2199-73-03
Material(s) Tested:	5 Heat Fusion Weld(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
non-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Mark E Labedz for

Sam Allen
Vice President and Division Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-73-03

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D23**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	127	131	123	123	122	125
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	127	136	124	130	133	130
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	172	171	171	165	169	170
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D24**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	143	133	148	151	130	141
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	120	122	139	143	132	131
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	181	180	181	176	183	180
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill

Project: Alcoa - Vancouver

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2199-73-03

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D25**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	130	133	128	133	124	130
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	145	144	146	140	140	143
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	175	179	176	172	178	176
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**D26**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	159	137	124	101	147	134
Side A	Peel Incursion (%)	<10	25	100	100	10	
Side A	Peel Locus of Failure Code	SE	AD-BRK	AD	AD	AD-BRK	
Side A	Peel NSF Failure Code	FTB	FTB	NON-FTB	NON-FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	125	85	127	111	133	116
Side B	Peel Incursion (%)	100	100	65	100	80	
Side B	Peel Locus of Failure Code	AD	AD	AD-BRK	AD	AD-BRK	
Side B	Peel NSF Failure Code	NON-FTB	NON-FTB	FTB	NON-FTB	FTB	
							Shear
	Shear Strength (ppi)	172	178	173	168	163	171
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: CH2M Hill
Project: Alcoa - Vancouver

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2199-73-03

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**D27**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A	Peel Strength (ppi)	152	155	152	157	147	153
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	131	130	138	138	133	134
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	172	171	171	168	170	170
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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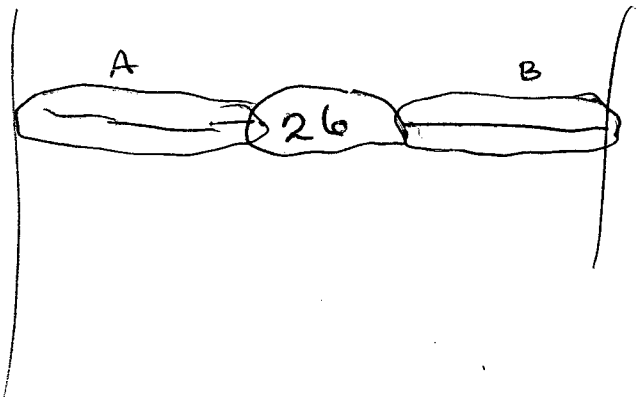


26 FIELD DES TEST

A	B
132	142
137	156
140	131
131	146
161	147
149	175
~~169~~	159
119	112

26 SHEAR
195

DESTRUCTIVE FIELD TEST RESULTS FOR SAMPLE LOCATION D-26.
JUNE 5, 2004

SYNTHETIC DRAINAGE MEDIA CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	6-1-04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**
SUNNY 60S	PARTLY SUNNY 70s

Specification/Drawing Reference:

Date	Slippage	Damaged	Function	Repairs	Comments
6-1-04	NONE	NONE	✓	NO REPAIRS	ZIP TIES AND STITCHING USED TO HOLD SEAMS TOGETHER
6-4-04	NONE	~~NONE~~	✓	HAD TO PATCH AREA WHERE DS-7 WAS CUT OUT FROM FAILED SEAM TESTING	
6-5-04	NONE	NONE	✓	NONE	
6-6-04	NONE	NONE	✓	NO DAMAGE	

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.
Signed: Michael Wilt **Title:** QC

Slippage: Has the synthetic drainage media layer slipped from improper placement or seaming.
Damage: Has the material been damaged in stallation
Function: Does the material function properly, no wrinkles, proper overlap, improper seams.

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	Date:

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	Afternoon Weather Conditions:

Specification/Drawing Reference:

	Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
	CETCO	ST	20040760	0001275	150'×15'	
	"	"	20041160	0002166		
	"	"	20041160	0002176		
	"	"	20041160	0002197		
	"	"	20041160	0002190		
5-26-04	1 SKAPS INDUSTRIES	GA NA	TN220-2-8	1197040	14'×225'	
	2 "	"	TN220-2-8	1197046		
	3 "	"	TN220-2-8	1197035		
	4 "	"	TN220-2-8	1197048		
	5 "	"	TN220-2-8	1197045		
	6 "	"	TN220-2-8	1197028		
	7 "	"	TN220-2-8	1197047		
5-26-04	1 CETCO	ST	20041160	2205	150×15	
	2 "	"	20041160	~~for~~ 2207		
	3 "	"	UNKNOWN	UNKNOWN		
	4 "	"	20040760	1087		
	5 "	"	20041160	2137		
	6 "	"	20040760	1271		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: **Title:**

~~GEOTEXTILE~~ INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

	Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
5-26-04	1 CETCO	ST	20041LO	2150	15' x 150'	
	2 "	"	20040760	1272		
	3 "	"	20041LO	2129		
	4 "	"	20040760	2250		
	5 "	"	20041LO	2202		
	6 "	"	20041LO	2170		
	7 "	"	20041LO	2115		
	8 "	"	20040760	12760		
	9 "	"	20040760	1095		
	10 "	"	20040760	1120		
	11 "	"	20041LO	2193		
5-28-04	SKAPS	TN220-2.8	~~H9 7041~~	197041	14 x 225	
	"	"	N/A	197036	"	
	"	"	"	197050	"	
	"	"	"	197029	"	
	"	"	"	197038	"	
	"	"	"	197053	"	
	"	"	"	197030	"	

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: [signature] **Title:** FIELD TECH SR

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717 **Date:**
QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000
Morning Weather Conditions:	**Afternoon Weather Conditions:**
Specification/Drawing Reference:	

	Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
3-28-04	SKAPS	TN220-2.8	NA	1197033	14 x 225	
	"	"	"	1197049	"	
	"	"	"	1197042	"	
	"	"	"	1197052	"	
	"	"	"	1197032	"	
	"	"	"	1197031	"	
6-1-04	CETCO	~~2004110 ST~~	2163 2004110	~~22 50~~ 2163	15 x 150	
2	"	~~2004760 ST~~	~~185~~ 2004760	22 1185		
3	"	ST	2004760	1122		
4	"	"	2004760	1157		
5	"	"	2004110	2152		
6	"	"	2004760	1158		
7	"	"	2004110	2161		
8	"	"	2004110	2184		
9	"	"	2004760	1192		
10	"	"	2004110	2158		
11	"	"	2004110	2131		
12	"	"	2004110	2143		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: **Title:**

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

6.1.04

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
13 CETCO	ST	20041LO	2186	15 x 150	
14 "	"	20040LO	1343		
15 "	"	20040LO	1319		
16 "		20040LO	1144		
17 "		20040LO	1192		
18 "		20040LO	570		
19 "		20041LO	2158		
20 "		20040LO	1342		
21 "		20041LO	2186		
22 "		20041LO	2192		
23 "		20041LO	2131		
24 "		20040LO	1348		
25 "		20041LO	2167		
1 CETCO	"	20041LO	2157	15 x 150	
2 "		20040LO	1297		
3 "		20040LO	1280		
4 "		20040LO	1189		
5 "		20040LO	1243		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: **Title:**

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

	Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
6	CETCO	SI	20041LO	2172	15 x 150	
7			20040760	1346		
8			20041LO	2123		
9			20041LO	2173		
10			20040760	1155		
11			20040760	1187		
12			20041LO	212-		
13			20040760	1080		
14			20041LO	2177		
15			20041LO	2188		
16			20041LO	2208		
17			20040760	1094		
18			20040760	1128		
19			20041LO	2183		
20			20040760	1101		
21			20040760	1121		
22			200 40760	1216		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: **Title:**

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	~~6-4-04~~ 6.8.04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232	
POC:		(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
CETCO	ST	20040710	1190	15'x150'	
		20040716	1217		
		20040510	578		
		20040710	1084		
		20040710	1082		
		20040710	1085		
		20040710	1088		
		20040710	1322		
		20041110	2181		
		20040510	552		
		20040710	1218		
		20040510	553		
		20040510	518		
		20041110	2122		
		20040710	1159		
		20040710	1245		
		20040710	1299		
		20040710	1274		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: Michael Wing **Title:** QC INSPECTOR

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	6-4-04 6-5-04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
CETCO	ST	20040720	1091	15'x150'	
		20040720	1124		
		20040720	1300		
		20040720	1321		
		UNKNOWN	UNKNOWN		
		20040720	1194		
		20040520	550		
		20040520	549		
		20040720	1085		
		20040720	1194		
		20040720	1083		
		20040520	574		
		20040520	522		
		20040720	1323		
		20040720	1320		
		20040720	1156		
35		20041120	2171		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: Michael Wing **Title:** QC INSPECTOR

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	6-4-04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
SKAPS INDUSTRIES	TN220-2.8	NA	1197063	14' x 225'	
	TN22-2.8		1197096		
	11		1197061		
			1197068		
			1197081		
			1197083		
			1197037		
			1197077		
			1197070		
			1197056		
			1197074		
			1197098		
			1197100		
			1197044		
			1197076		
			1197079		
			1197053		
			1197105		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: [signature] **Title:** QC INSPECTOR

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	6-4-04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
SKAPS INDUSTRIES	TN220-2-8	~~TN220-2-8~~	1197095	14' x 225'	
"	"	NA	1197080	"	
"	"	"	1197078	"	
"	"	"	1197062	"	
"	"	"	1197043	"	
"	"	"	1197060	"	
"	"	"	1197090	"	
"	"	"	1197073	"	

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: R Michael White **Title:** QC INSPECTOR

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	6-5-04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
SKAPS INDUSTRIES	TN220-2-8	NA	1197094	14' x 225'	
			1197023		
			1197092		
			1197101		
			1197065		
			1197026		
			1197058		
			1197072		
			1197106		
			1197097		
			1197089		
			1197086		
			1197064		
			1197082		
			1197055		
			1197011		
			1197068		
			1197073		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: [signature] **Title:** QC. INSPECTOR

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	6-5-04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
SKAPS INDUSTRIES	TN220-2-8	NA	1197019	14 x 225	
			1197027		
			1197022		
			1197014		
			1197022		
			1197027		
			1197015		
			1197013		
			1197007		
			1197085		
			1197020		
			1197021		
			1197057		
			1197087		
			1197019		
			1197066		
			1197071		
			1197084		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: Michael Watts **Title:** QC INSPECTOR

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	6-5-04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
SKAPS INDUSTRIES	TN220-2-8	NA	1197071	14 x 225	
"	"	"	1197093	"	
"	"	"	1197102	"	
"	"	"	1197109	"	

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: Marlene Wright **Title:** QC INSPECTOR

GEOTEXTILE INSTALLATION CHECKLIST

Project Name/No.:	East Landfill Cap Construction/184717	**Date:**	6.6.04

QC Inspector:	CH2M Hill, Inc. 825 NE Multnomah, Suite 1300 Portland, OR 97232
POC:	(503) 235-5000

Morning Weather Conditions:	**Afternoon Weather Conditions:**

Specification/Drawing Reference:

Manufacturer's Name	Product ID	Lot Number	Roll Number	Roll Dimensions	Placement
SKAPS INDUSTRIES	TNZ20-2.8	NA	1197009	14'X225'	
			1197017		
			1197024		
			1197002		
			1197012		
			1197003		
			1197005		
			1197099		
			1197025		
			1197017		
			1197003		
			1197008		
			1197069		
			1197067		
			1197075		
			1197088		

The item(s) and material(s) listed above were inspected and found to conform with the plans and specifications except as noted.

Signed: Michael Craig **Title:** QC INSPECTOR

DAILY INSPECTION PROGRESS REPORT

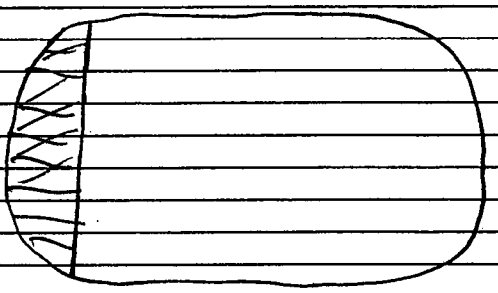
Project Name/No. ALCOA - VANCOUVER		Date: 5-25-04
No. of workers:	Equipment:	
10 - LINER	OFF ROAD FORK LIFT	
2 - CH2		
5 - ENVIROCON		

Morning Weather Conditions:	Afternoon Weather Conditions
SUNNY / CLEAR 60S	

Comments and/or supporting calculations:

- 700 - SAFETY MEETING
- 1104 START LAYING GCL ON NORTH WEST SIDE
- 1230 LUNCH
- 1300 TURN ON SEAM WELDERS AND DO FIELD TEST
- 1358 BEGIN LAYING GEOMEMBRANE
- 1600 CLOUD COVER
- 1800 WIND BEGINS TO PICK UP

PLAN TO FINISH WEST SIDE
- 1930 OFF SITE



30,000 Sq Ft²

Items	Description and Location of Item	Quantity	Unit
GCL	GEOSYNTHETIC CLAY LINER	15	
GEOMEM	GEOMEMBRANE ROLLS	2.5	

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed	MICHAEL WHITE	Title FIELD TECH	No.

Alcoa Vancouver

East Landfill Liner Installation

Additional Notes

- Geomembrane roll number 8507, installed on June 1st, was mislabeled and is either 8518, 8519, 8526, or 8566. Three roles were unused.
- The crew consisted of one supervisor (Joe), one QC (Yan), and nine laborers (4 welders, 4 laying panels, and one operator).
- The machinery used was:
  - one telehandler to haul materials equipped with a spreader bar
  - one gator to unroll and pull liner materials
  - and one rubber-tracked bobcat to unroll and pull liner materials
- The equipment used was:
  - three (3) fusion "wedge" welders (equipment id #s 007, 008, 009) for long seams
  - one extrusion welder for patches, and repair work
- Air testing was done two ways:
  - Long seams were "Air tested" by pressurizing the heat fusion weld to 30 psi which the seam had to maintain for 5 minutes without dropping below 28 psi. Vacuum tests were used for extrusion welds.
  - Soapy water was spread over an extrusion weld, then a round air tight drum with a clear top was placed on top of an extrusion weld and the air was removed to a negative pressure of about 10 psi. Bubbles would form if the extrusion weld did not fully adhere.
- Patches were made by cutting a piece of geomembrane to at least 6 inches of overlap all around. The corners were rounded. A hot air blower was used to temporary adhere the patch to the liner. The edges of the patch were then welded down with a grinder, along with grinding the liner where the patch edge meets the liner. Finally, the extrusion welder would extrude heated plastic that would adhere to the patch and the liner.
- Since the distance (north-south) across the liner was about 450 feet, one seam sample was collected every panel for destructive testing. The approximately 36 inch sample was divided into thirds; one third was given to Bruce Richartz, one third was destructive tested on site by Texas Environmental Plastics (liner installers, TEP), and one third was sent to TRI, Environmenal for third party destructive testing (ASTM D4437, peel and sheer).

- ALL ACTIVITIES WERE DONE IN A MODIFIED LEVEL D - HARD HAT, SAFETY GLASSES, PROTECTIVE BOOTS, SAFETY VEST
- WELDERS WORE LONG SLEEVES

DAILY INSPECTION PROGRESS REPORT

Project Name/No. 184717 ALCOA - VANCOUVER		Date: 5-26-04
No. of workers:	Equipment:	
LINER = 13	TRACKED (RUBBER) BOBCAT	
C&M = 1	3 SEAM WELDERS	
ENVIROCON = 5	1 WELDING GUN	

Morning Weather Conditions:	Afternoon Weather Conditions
CLOWDY 50s	CLOWDY 50s

Comments and/or supporting calculations:

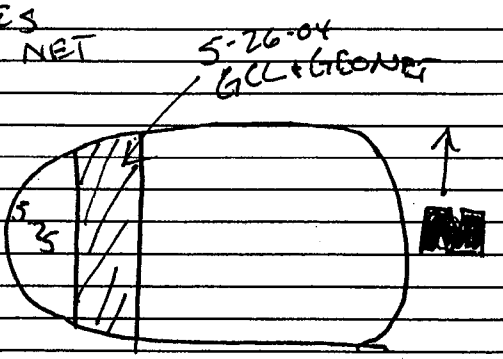
0600 ON SITE - SAFETY MEETING
0700 BEGIN LAYING ~~EE~~ GCL
0810 COLLECT SAMPLES TO BE SENT TO LAB FOR DESTRUCTIVE SAMPLING
~~0100~~ 1130 LUNCH FOR CREW
1700 LUNCH FOR SEAMERS
1215 RAIN BEGINS
· HALTS SEAMERS ACTIVITIES
1700 · START LAYING DRAINAGE NET

COLLECTED SEVEN SEAM TEST

#1 - P1 P2
#2 - P10 P12
#3 - P16 P17
#4 - P22 P16
#5 - P23 P24
#6 - P26 P24
#7 - P27 P28

} SENT TO LAB 5-26-04

7:30 OFF SITE



Items	Description and Location of Item	Quantity	Unit
GCL	GEOTEXTILE CLAY LINER	17	ROLL
GEOMEM	GEOMEMBRANE	4	ROLL
	DRAINAGE NET	7	ROLL

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		Title TECH	No.

DAILY INSPECTION PROGRESS REPORT

Project Name/No. ALCOA VANCOUVER - # 184717.01.01.01		Date: 5-27-04
No. of workers:	Equipment:	
13 - LINER	TRACKED BOBCAT	
1 - CH2M HILL	GATOR	
	FORKLIFT	

Morning Weather Conditions:	Afternoon Weather Conditions
CLOUDY - RAIN UPPER 50S	

Comments and/or supporting calculations:

COOL
0600 - MORNING SAFETY MEETING
0620 - OUT TO SITE
0640 - STOP WORK DUE TO RAIN
0930 - STOP WORK FOR THE DAY
RAIN HAS STOPPED PRODUCTION, FORCAST FOR MORE RAIN THROUGH WEEKEND

Items	Description and Location of Item	Quantity	Unit
	DRAINAGE JUTE	9	ROLLS

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed [signature] Title FIELD TECH No.

DAILY INSPECTION PROGRESS REPORT

Project Name/No. ALCOA- VANCOUVER	Date: 6-5-28-04
No. of workers:	**Equipment:**
11 LINER	FORKLIFT
2 ENVIROCON	GATOR
1 CH+2M	TRACKED BOB CAT

Morning Weather Conditions:	Afternoon Weather Conditions
RAIN - 50%	

Comments and/or supporting calculations:

0600 - START DAY
MORNING HEALTH AND SAFETY
TECHS ARE ON STAND BY
0645 - SET UP
0730 - CLEARING IN WEATHER - START PATCHING SEAMS
0915 - SEAMS DONE
- CALL IN CREW TO LAY DRAINAGE NET
1010 - CREW ON SITE
1030 - START LAYING DRAINAGE NET
1200 - LUNCH
1245 - BACK ON SITE - CONTINUE LAYING DRAINAGE NET
1300 - RECEIVED RESULTS FROM DESTRUCTIVE SAMPLING
D-7 FAILED - WILL RESAMPLE TUESDAY

Items	Description and Location of Item	Quantity	Unit
~~13~~	DRAINAGE NET	13	ROLL

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed [signature]		Title FIELD TECH	No.

DAILY INSPECTION PROGRESS REPORT

Project Name/No. ALCOA- VANCOUVER	Date: 6-1-04
No. of workers:	Equipment:
11 - LINER	
1 CH2M HILL	

Morning Weather Conditions:	Afternoon Weather Conditions
SUNNY 60s	SUNNY 70s

Comments and/or supporting calculations:

0600 MORNING SAFETY MEETING
0610 - OUT TO SITE
BEGIN BY SMOOTHING OUT SUBGRADE WHICH ~~IN~~ HAS BEEN RUTTED
NOTE: ENVIROCON DUG SOUTH TRENCH ON SATURDAY (5-29-04)
1100 LUNCH
-5 PANELS OF HDPE LAYED (3 ROLLS)
NOTE: ENVIROCON BACKFILLED TRENCH ON WEST SIDE
950: COLLECT SAMPLES 10' ON EITHER SIDE OF D-7 TO RETEST WELDS
1420: COLLECTE SAMPLES D-8 AND D-9
D-8 WAS FROM THE LAST SEAM PRIOR TO THE WEEKEND AND WAS DIRTY PRIOR TO WELDING
1700 COLLECT DESTRUCTIVE SAMPLES 10, 11, 12
ENVIROCON STARTS ADDING 18" SAND CAP ON TOP OF LINER
1945 12 PANELS ABOUT 300' LONG INSTALLED TODAY
CREW OFF SITE
ABOUT 80,000 Sq. FEET OF GCL AND GEOMEMBRANE

Items	Description and Location of Item	Quantity	Unit
	GCL ROLLS	36	ROLLS
	~~+~~HDPE	#7	ROLLS

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed Michael Yost	Title SGC	No.

CALL CARLSON

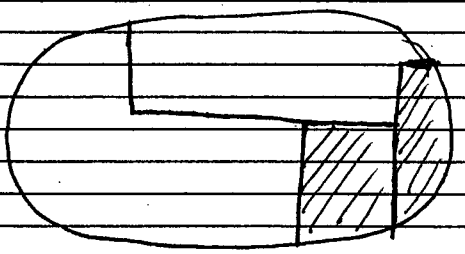
DAILY INSPECTION PROGRESS REPORT

Project Name/No.	Date: 6.2.04
No. of workers:	Equipment:
11 - LINER	FORKLIFT
1 - CH2M HILL	BOBCAT (TRACKED
	GATOR

Morning Weather Conditions:	Afternoon Weather Conditions
PARTLY SUNNY - BREEZY - UPPER 50S	SUNNY UPPER 70S

Comments and/or supporting calculations:

0600 - SAFETY MEETING - HYDRATE YOURSELF
0610 - OUT TO SITE
0759 - COLLECT DS # 13
0910 - COLLECT DS #14
0920 - DS #7 B FAILED ONSITE DESTRUCTIVE TEST, COLLECT SAMPLE FROM NEARES CROSS SEAM WHERE OPERATOR AND MACHINE ALSO WELDED - MAP ON BACK -
1100 LUNCH
1230 CONTINUE LAYING HDPE AND GCL
1400 COLLECT SAMPLES DS 15, 16, 17, 18
1900 FINISH SEAMS



Items	Description and Location of Item	Quantity	Unit
	GCL	25	ROLLS
	GEOMEMBRANE	6	ROLL

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed [signature] Title SGL No.

DAILY INSPECTION PROGRESS REPORT

Project Name/No. ALCOA- VANCOUVER		Date: 6-3-04
No. of workers:	Equipment:	
11- LINER	1 OFF ROAD FORKLIFT	
1 CHEMICAL	1 BOBCAT	
	1 GATOR	

Morning Weather Conditions:	Afternoon Weather Conditions
SUNNY 60S	SUNNY 80s

Comments and/or supporting calculations:

0600 MORNING HEALTH AND SAFETY
0610 OUT TO SITE
0650 TRIAL SEAMS
0730 COLLECT DS #19
0930 DS#7 FAILED ON-SITE DESTRUCTIVE TESTING COLLECT 2 SAMPLES 10' ON EACH SIDE OF DS#7
1130 GEOMEMBRANE HAS PULLED AWAY FROM THE MONITORING WELLS ON THE SOUTH SIDE RESULTING FROM EXPANSION AND CONTRACTION OF GEOMEMBRANE AND TEMP. CHANGES. WILL BE REPAIRE FRIDAY A.M.
1200 LUNCH - DROP 6 SAMPLES OFF AT FED EX
1330 DROP 3 MORE SAMPLES OFF AT FED EX
2000 ALMOST FINISH ALL GCL AND HDPE INSTALLATION

-ON BACK-

Items	Description and Location of Item	Quantity	Unit
	~~29 Rolls~~ GCL	29	Rolls

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted. —

Signed [signature] Title SE No.

DAILY INSPECTION PROGRESS REPORT

Project Name/No. ALCOA VANCOUVER		Date: 6-4-04
No. of workers:	Equipment:	
11- LINER	FORKLIFT	
1-CH2M	BOBCAT	
	GATOR	

Morning Weather Conditions:	Afternoon Weather Conditions
SUNNY 60s	SUNNY MID 80s

Comments and/or supporting calculations:

0600 MORNING MEETING
- FINISH GCL & HDPE INSTALL; START DRAINAGE NET
0738 - ALL GCL AND HDPE LAYED DOWN
- BEGIN DRAINAGE NET
1200 - ALL SEAMS WELDED ALONG WITH MOST OF THE PATCHES
16 PANELS OF DRAINAGE NET LAYED
1300 - BACK FROM LUNCH
5 SAMPLES SHIPPED OUT FOR SATURDAY DELIVERY
1600 - PREPING NORTH MWS FOR HDPE & MORE PANELS LAYED
TOTAL OF 24 PANELS
75,600 Sq ft TOTAL LAYED TODAY
1700 - CREW IS CALLING IT QUITS ON AN EARLY DAY.

WORKERS DAILY TASKS

~~Items~~	~~Description and Location of Item~~	Quantity	Unit
3	WELD (SEAMS)		
1	EXTRUSION WELD (PATCHES		
4	LAY FABRIC		
1	OPERATOR		
1	SUPERVISER (JOE)		
1	QC (YAN)		
26	DRAINAGE NET	26	ROLLS

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed _____ Title QC No.

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

Job Number:	Client:
Job Name: Alcoa.	Bill To:

Job Description: Install	% Complete 100% Total for Job

Certificate of Acceptance

Material	Estimated SF	Final Quantity/Description
60mil Textured liner		285-218 SF
welding Seame		13,601 LF
G.C.L		280,172 SF
7 Boots.	6" boots	7 Boots
Composite		318.452 SF
T.E.P Crew line - G.C.L. and	Complete installed 60mil Textured Composite. 100% and clean up	

I, the undersigned, duly authorized representative of:
do hereby take over and accept the work described above from the date hereof and confirm that to the best of my knowledge the work has been completed in accordance with specifications and the terms and conditions of the contract.

NAME:	SIGNATURE:	TITLE:	DATE:
William G. Griffin		QC observer	6/6/04

Certificate accepted by Texas Environmental Plastics, Inc.'s Representative

NAME:	SIGNATURE:	TITLE:	DATE:
Joe. Khamtaq Keophouay Savanh	Khamtaq Keophouay	Superintendent	6-6-04

2500 Farrell Road • Houston, Texas 77073 U.S.A. • Tel: 281-821-7320 • Fax: 281-821-7138

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa, WA Location: Vancouver_WA Job #: Date: 5.25.04

Texas Environmental Plastics Representative: Joe. Khamta

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		11
	Foreman		
12	Technician		132
	Labor		
	Operator		
	TOTAL HRS		143

DAILY PRODUCTION

Material	Deployed	Welded	QCed
60mil	32,681	1,470	
GCL	30,772		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail
KP	W#8	400/s	1:50	Pass
KO	W#7	400/s	2:00	Pass
BK	W#9	740/s	3:15	Pass
PS	G#6	270/230	3:20	Pass

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil Liner	32,681	1.470	
GCL	30,772		

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today crew on site have to set up Equipment & after noon crew deploy G-C-L. and 60mil liner

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DEPLOYMENT

anel #	Roll #	Length
1	8530	13
2	8530	27
3	8530	33
4	8530	41
5	8530	51
6	8530	59
7	8530	70
8	8530	77
9	8530	87
10	8530	49
11	8531	40
12	8531	96
12	8531	96
13	8531	113
10/11	8530 8531	22-CR
14	8531	112
14	8531	112
15	8531	119
15	8531	119
16	8531	31
16/17	8531 8512	22-CR
17	8512	106
18	8512	104
19	8512	104
20	8512	99x13
1	8512	95

SEAMING

Seam	Machine Tech	Length
1-2	W#8 KP	13
2-3	W#7 KO	27
3-4	W#8 KO	33
4-5	W#7 KO	41
5-6	W#8 KP	51
6-7	W#7 KO	59
7-8	W#8 KP	70
8-9	W#7 KO	77
9-10	W#9 BK	87
10-12	W#8 KP	49
11-12	W#8 KP	40
12-13	W#7 KP	96
12-13	W#7 KP	96
13-14	W#8 KP	113
10-11	W#9 BK	22-CR
14-15	W#7 KO	112
14-15	W#7 KO	112
15-17	W#9 BK	119
15-16	W#9 BK	119
16-18	W#8 KP	31
16-18	W#9 BK	22-CR
17-18	W#9 BK	106
18-19	W#7 KO	104
19-20	W#8 KP	104
20-21	W#9 BK	99x13
21-END		

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
1-2	12		2 40			P
			2 45			
2-3	27		2 52			P
			2 57			
3-4	33		3 02			P
			3 07			
4-5	40		3 07			P
			3 12			
5-6	51		3 21			P
			3 26			
6-7	59		3 29			P
			3 34			
7-8	70		3 44			P
			3 49			
8-9	77		4 05			P
			4 10			
9-10	87		3 50			P
			3 55			
10-12	49		4 09			P
			4 14			
11-12	40		4 16			P
			4 21			
12-13	40		4 23			P
			4 28			
12-13	62		4 37			P
			4 40			
13-14	113		5 39			P
			5 44			
10-11	22-CR		3 54			P
			3 59			
14-15	79		6 29			P
			6 34			
14-15	33		5 33			P
			5 38			
15-17	80		6 25			P
			6 30			
15-16	30		5 58			P
			6 03			
16-18	31		6 01			P
			6 06			
16-18	22-CR		5 48			P
			5 53			
17-18	106		6 14			P
			6 19			
18-19	104		6 33			P
			6 38			
19-20	104					
20-21	99x3					
21-END						

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

PREWELD LOG

Date	Tech	Machine Number	Machine Temps	Time AM/PM	Peel Values	Shear Values	Pass/ Fail
5-25	KP	w# 8	400/5	1:50.	130. 142 144 138	181-181-184	Pass
-					141 148		
5-25	KO	w# 7	400/5	2:00	130 150 134 151	171-175-179	Pass
					139 137		
5-25	BK	w# 9	740/5.	3:15	138 135 144 132	172-180-173	Pass
					141 137		
5-25	PS	w# 6	270/230	3:20	135-150-162	182-179-180	Pass

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GCL

5-2504

DEPLOYMENT

Panel #	Roll #	Length
27	2194	99
28	2194	49
29	2185	57
30	2185	100
31	2199	13
32	2199	98
33	2199	29
34	1164	73
35	1164	80
36	2206	25
37	2206	93
38	2206	32
39	2196	67
40	2196	87
41	2178	20

SEAMING

Seam	Machine / Tech	Length

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail

GCL
5-25.04

5-25-04

DEPLOYMENT			SEAMING			QUALITY CONTROL						
Panel #	Roll #	Length	Seam	Machine / Tech	Length	Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
1	1274	11										
2	1274	14										
3	1274	25										
4	1274	34										
5	1274	40										
6	1274	45										
7	2166	50										
8	2166	53										
9	2166	54										
10	2167	55										
11	2167	16										
12	2167	65										
13	2167	18										
14	2197	56										
15	2197	75										
16	2197	54										
17	2190	77										
18	2190	75										
19	2142	13										
20	2142	94										
21	2142	40										
22	1248	65										
23	1248	89										
24	2189	24										
25	2189	112										
26	2189	20										

TEXAS ENVIRONMENTAL PLASTICS, LTD.
2500 Farrell Road
Houston, Texas 77073

SUBGRADE SURFACE ACCEPTANCE

Project Name: Alcoa, WA
Project Number:
Location: Vancouver, WA

Customer:
Date: 5-25-04
Partial: X Final:

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Area accepted From Panel 1 - To Panel 21 - accepted area 32,681 SF

For Texas Environmental Plastics, Ltd.:
Joe. Khamta
Joe Khamta

For Contractor/Owner:
Michael Wiltz - CH2M Hill
Michael Wiltz

Acceptance Number: 1 Area Accepted: /SF

Total Area accepted to date: /SF

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa WA **Location:** Vancouver, WA **Job #:** **Date:** 5.26.04

Texas Environmental Plastics Representative: Joe Khamta

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		12
	Foreman		
12	Technician		144
	Labor		
	Operator		
	TOTAL HRS		156

DAILY PRODUCTION

Material	Deployed	Welded	QCed
60mil liner	38,588	1,842 LF	
GCL	35,966		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail
KP	W# 8	400/5	7:13A	Pass
BK	W#9	740/4.5	7:30A	Pass
RO	W#7	400/5.	7:35A	Pass
[illegible]	G#6	275/235	8:00	Pass
KP	W#8	400/5	1:30	Pass
BK	W#9	740/5	1:45	Pass
RO	W#7	400/4.5	1:49	Pass
PS	G#6	270/230	1:25	Pass

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil.	71,264	3,312	
GCL	66,738		

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail
1	KP	8	1-2	5-25-04	5-26-04	5-26-04	2' From. CR-P-22	Pass
2	KP	8	10-12	5-25-04	5-26-04	5-26-04	15' From. CR. 10-11	Pass
3	BK	9	16-17	5-25-04	5-26-04	5-26-04	CR. P. 16-17.	Pass
4	BK	9	16-[illegible]	5-25-04	5-26-04	5-26-04	CR- 6-22-	Pass

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today crew on site deploy GCL and 60mil liner do repair air test V. Box cleane up. The weater today Rain of and on

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60 mil
5-26-04

DEPLOYMENT

Panel #	Roll #	Length
22	8516	425
22	8516	-1-
22	8516	-1-
23	8516	93
24	8506	430
24	-1-	-1-
24	-1-	-1-
25	8506	178
26	8514	189
26	-1-	-1-
26	-1-	-1-
27	8514	251
28	8517	188
23/24	8506	22 CR
25/26	8506 8514	22 CR
27/28	8514 8517	22 CR

SEAMING

Seam	Machine Tech	Length
22-23	W#8 KP	425
22-24	W#8 KP	-1-
22-24	W#8 KP	-1-
22-25	W#8 KP	93
24-25	W#8 KP	430
24.25	W#8 KP	-1-
24-26	W#9 BK	-1-
25-27	W#	178
26-27	W#9 KO	198
26-28	W#9 BK	143
26-28	W#9 BK	-1-
27-		
28-		
23-24	W#8 BK	22-CR
25-26	W#7 KO	22-CR
27-28	W#7 KO	22 CR

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
22-23	93	yen	1	25		P
			1	30		
22-24	114		1	30		P
			1	35		
22-24	195		2	02		P
			2	07		
22-23	93		3	32		P
			3	37		
24-25	26		3	40		P
			3	45		
24-25	76		3	53		P
			3	58		
24-26	328		4	27		P
			4	32		
25-27	178		5	08		P
			5	13		
26-27	75		4	29		P
			4	34		
26-28	143		5	17		P
			5	22		
26-28	46		5	17		P
			5	22		
27-						
28-						
23.24	22-CR		1	24		P
			1	29		
25-26	22-CR		3	36		P
			3	41		
27-28	22-CR		4	36		P
			4	41		

5-26-04

DEPLOYMENT

Panel #	Roll #	Length
22/1	8530	22-CR
22/2	8530	22-CR
22/3	8530	22-CR
22/4	8530	22-CR
22/5	8530	22-CR
22/6	8530	22-CR
22/7	8530	22-CR
22/8	8530	22-CR
22/9	8530	22-CR
22/10	8530	22-CR
22/12	8531	22-CR
22/13	8531	22-CR
22/14	8531	22-CR
22/15	8531	22-CR
22/16	8531	22-CR
22/18	8532	22-CR
22/19	8512	22-CR
22/20	8512	13-CR
22/21	8512	22-CR

SEAMING

Seam	Machine / Tech	Length
22-1	W#9 / BK	22-CR
22-2	W#9 / BK	22-CR
22-3	W#9 / BK	22-CR
22-4	W#9 / BK	22-CR
22-5	W#9 / BK	22-CR
22-6	W#9 / BK	22-CR
22-7	W#7 / KO	22 CR
22-8	W#7 / KO	22-CR
22-8	W#7 / KO	22-CR
22-10	W#7 / KO	22-CR
22-12	W#7 / KO	22-CR
22-13	W#7 / KO	22-CR
22-14	W#7 / KO	22-CR
22-15	W#7 / KO	22-CR
22-16	W#8 / KP	22-CR
22-18	W#8 / KP	22-CR
22-19	W#8 / KP	22-CR
22-20	W#8 / KP	13-CR
22-21	W#8 / KP	22-CR

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
22-1	22-CR		11 27			P
			11	32		
22-2	22-CR		11	23		P
			11	28		
22-23	22-CR		11	20		P
			11	25		
22-4	22-CR		11	17		P
			11	22		
22-5	22-CR	weld	Fail air test		ok	
22-6	22-CR		11	01		P
			11	06		
22-7	22-CR		10	55		P
			11	00		
22-8	22-CR		10	52		
			10	57		
22-9	22-CR		10	50		P
			10	55		
22-10	22-CR		10	19		P
			10	24		
22-12	22-CR		10	14		P
			10	19		
22-13	22-CR		10	12		P
			10	17		
22-14	22-CR		10	00		P
			10	05		
22-15	22-CR		10	38		P
			10	43		
22-16	22-CR		10	35		P
			10	40		
22-18	22-CR		10	30		P
			10	35		
22-19	22-CR		9	50		P
			9	55		
22-20	13-CR		9	44		P
			9	49		
22-21	22-CR		9	38		P
			9	42		

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

PREWELD LOG

Date	Tech	Machine Number	Machine Temps	Time AM/PM	Peel Values	Shear Values	Pass/ Fail
5/26/04	KP	W#9	400/5.00	7:13	164 159 163 162 157 157	216-210-215	pass
5/26/04	BK	W#9	740/450	7:30 AM	125-137-162 133-145-156	198-218-204	Pass
5/26/04	KO	W#7	400/.5.00.	7:35 AM	152145 138 153.136 148.	205. 200. 200	Pass
5/26/04	PS	#6.	230 270.	8:00AM	125.106.130	205.208.204	Pass
~~5/26/04~~	~~KP~~	~~W#6~~	~~400/5.00~~		125.123.132		
5/26/04	PS	G#6	230/270	1:25 P	125.123.132	189.187.191	Pass
5/26/04	KP	W#8	400/5.00	1:30 P	163 163 162 175 165 163	196 204 203	pass
5/26/04	BK	W#9	740/450	1:45 PM	127 130 134 129 128 125	215 215 217	Pass
5/26/04	KO	W#7	400/4.50	1:49	146 140 165 152 149 165	211 200 203	Pass

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GCL

5-26-04

DEPLOYMENT

Panel #	Roll #	Length
42	1278	139
43	2115	148
44	2202	150
45	2170	150
46	2207	150
47	1120	129
48	2093	150
49	2159	149
50	1095	150
51	2137	150
52	1271	149
53	1272	150
54	2144	130
55	1244	20
56	2192	52
57	1087	148
58	2192	98
59		59
60		149
61	2181	149

SEAMING

Seam	Machine / Tech	Length

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/Fail

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

DESTRUCTIVE SAMPLE LOG

DS Number	Seam Number	Date Welded	Machine Number	Tech	Date Pulled	Date Tested	Tested By	Peel Values	Shear Values	Pass/ Fail
#1	1-2	5-25	w#8	KP	5-26	5-26	JOE	139. 138 133. 142	204-201	Pass
								142. 139 135. 167	203-207	
#2	10-12	5-25	w#8	KP	5-26	5-26	JOE	150. 136 150. 149	204. 204	Pass
								151- 150 150- 150	216-201	
#3	16-17-CK	5-25	w#9	BK	5-26	5-26	JOE	141- 141 140-143	209-189	Pass
								142. 152 142-152		
#4	6-22	5-25	w# 9	BK	5.26	5-26	JOE	133. 151 146. 149	206. 204	P
								134, 141 136. 140	209. 199	

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TEXAS ENVIRONMENTAL PLASTICS, LTD.
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Houston, Texas 77073

SUBGRADE SURFACE ACCEPTANCE

Project Name: Alcoa, WA
Project Number:
Location: Vancouver, WA

Customer:
Date: 5-26-04
Partial: ✓ Final:

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Subgrade area accepted From Panel 22-To Panel 28- 38,588 SF

For Texas Environmental Plastics, Ltd.:
Joe Khamta
Joe Khamta

For Contractor/Owner:
Michael Wirtz - CH2M Hill
Michael Wirtz

Acceptance Number: 2 Area Accepted: 38589/SF Total Area accepted to date: /SF

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Vancouver, WA Job #: Date: 5-27-04

Texas Environmental Plastics Representative: Joe Khamta

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		4
	Foreman		
12	Technician		48
	Labor		
	Operator		
	TOTAL HRS		52

DAILY PRODUCTION

Material	Deployed	Welded	QCed
Composite	28,000		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil liner	71,264	3,312	
G-CL	66,738		
Composite	28,000		

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail
5	KP	8	22-23	5-26-04	5.26.04	5.27.04	32' F-CR8-24	P
6	BK	9	24-26	5-26-04	5.26.04	5.27.04	20' F-CR8-22	P
7	KP	7	27-28	5-26-04	5-26-04	5.27.04	14' F-CR-8-28	P

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today crew deploy Composite cont deploy GCL and liner and also can't do Repair too because Raining

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

DESTRUCTIVE SAMPLE LOG

DS Number	Seam Number	Date Welded	Machine Number	Tech	Date Pulled	Date Tested	Tested By	Peel Values	Shear Values	Pass/ Fail
#5	22-23	5-26	W#8	KP	5-26	5-27	JOE	136-146 145-141	201-200	Pass
								143-138 137-149	204-201	
#6	24-26	5-26	W#9	BK	5-26	5-27	JOE	140-143 141-143	202-201	Pass
								140-141 136-127	203-203	
#7	27-28	5-26	W#7	KO	5-26	527	JOE	143-144 144-141	203-201	Pass
								140-143 142-141	203-204	

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Vancouver, WA Job #: Date: 5-28-04

Texas Environmental Plastics Representative: Joe. Khamta.

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		7
	Foreman		
12	Technician		54
	Labor		
	Operator		
	TOTAL HRS		61

DAILY PRODUCTION

Material	Deployed	Welded	QCed
Composite	36,400		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail
K P	GN 6	290/230	6:50	Pass

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
Gomit liner	71,264	3,312	
G-C-L	66,738		
Composite	64,400		

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Crew on site today do Repair work V. Box. and deploy Composite the weather. today Raining of and on

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

PREWELD LOG

Date	Tech	Machine Number	Machine Temps	Time AM/PM	Peel Values	Shear Values	Pass/ Fail
5-08	KP	G#6	270/230	6:50 AM	108-124	~~104~~ 209	Pass
					128	208	

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa **Location:** Vancouver, WA **Job #:** **Date:** 5-29-04

Texas Environmental Plastics Representative: Joe Khamta

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		0
	Foreman		
10	Technician		0
	Labor		
	Operator		
	TOTAL HRS		0

DAILY PRODUCTION

Material	Deployed	Welded	QCed

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil	71,264	3,312	
G-C-L	66,400		
Composite	64,400		

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: weekend no body work

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Man Carrier GA Job #: Date: 5-30-04

Texas Environmental Plastics Representative: Job Khanita

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		0
	Foreman		
10	Technician		0
	Labor		
	Operator		
	TOTAL HRS		

DAILY PRODUCTION

Material	Deployed	Welded	QCed

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil	71.264	3.312	
4-CL	66.738		
composite	64.400		

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: weekend No body work

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Vancouver, WA Job #: Date: 5-31-04

Texas Environmental Plastics Representative: Joe Khamta

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		8
	Foreman		
10	Technician		80
	Labor		
	Operator		
	TOTAL HRS		88

DAILY PRODUCTION

Material	Deployed	Welded	QCed

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil	71.264	3.312	
GCL	66.738		
Composite	64.400		

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today Crew No work because site no body work is it Holyday

2500 Farrell Road - Houston TX 77073 -USA-(281) 821-7320 -Fax (281) 821-7138

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa **Location:** Vancouver. WA **Job #:** **Date:** 6.1.04

Texas Environmental Plastics Representative: Joe Khamfa

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		13
	Foreman		
10	Technician		130
	Labor		
	Operator		
	TOTAL HRS		143

DAILY PRODUCTION

Material	Deployed	Welded	QCed
60mil	80,938	3.429	
GCL	83,460		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail
KP	WH8	400/3.	7:00	P
PS	WH7	270/230	7:30	P
BJ	WH7	400/400	7:35	P
KP	WH9	750/4	7:40	P
KP	WH9	400/5	12:45	P
BJ	WH7	400/5	1:00	P
PS	GH6	270-270	1:30	P

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil	154-824	6741	
G.C.L.	130-198		
Composite. 64-400			
Boot.6'	3. Each		

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today TEP crew on site deploy G.C.L and liner do repair air test clean up. The weather today sunny SKY

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DEPLOYMENT

Panel #	Roll #	Length
28	8517	150
27	1817	255
29	1817	304
30	8499	304
30	8499	—
31	8499	207
32	8515	96
31/32	8499 8515	22-CR
33	8515	307
33	8515	—
33	8515	—
34	8515	120
35	8525	181
36	8525	334
37	8507	306
37	8507	—
34/35	8515 8525	22-CR
38	5807	209
39	8505	100
40	8505	302
38/39	5807 8505	22-CR
40	8505	—
41	8505	113
42	8511	189
43	8511	303
43	—	—

SEAMING

Seam	Machine Tech	Length
28-29	W#8 KD	150
29-27	W#8 KD	255
29-30	W#9 KO	304
30-32	W#7 BJ	304
30-31	W#7 BJ	—
31-33	W#9 KO	207
32-33	W#9 KO	96
31-32	W#8 KD	22-CR
33-34	W#8 KD	307
33-35	W#7 BJ	—
33-35	W#7 BJ	—
34-36	W#8 KD	120
35-36	W#8 KD	181
36-37	W#9 KO	304
37-38	W#7 BJ	306
37-39	W#8 BD	—
34-35	W#8 KD	22-CR
38-40	W#7 BJ	209
39-40	W#7 BJ	100
40-42	W#9 KO	302
38-39	W#9 KO	22-CR
40-41	W#7 KD	304
41-43	W#9 KO	113
42-43	W#8 KD	189
43-44	W#7 BJ	303
43-44	W#8 KD	—

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
28-29	150	YEN	9 53	10 00	1	P
29-27	255		10 41	10 46		P
29-30	304		10 50	10 55		P
30-32	97		11 17	11 22		P
30-31	207		10 50	10 55		P
31-33	207		12 56	1 07		P
32-33	96		11 22	11 27		P
31-32	22-CR		11 07	11 12		P
33-34	120		11 33	11 40		P
33-35	63		12 53	12 58		P
33-35	118		12 53	12 58		P
34-36	120		3 04	3 09		P
35-36	181		3 24	3 29		P
36-37	304		3 53	3 58		P
37-38	208		4 01	4 06		P
37-38	100		4 14	4 19		P
34-35	22-CR		11 48	11 53		P
38-40	209		6 35	6 40		P
39-40	100		5 45	5 50		P
40-42	190		6 44	6 49		P
38-39	22-CR		4 14	4 19		P
40-41	112		7 20	7 25		P
41-43	113		7 17	7 22		P
42-43	189		6 49	6 54		P
43-44	159					
43-44	144					

DEPLOYMENT

Panel #	Roll #	Length
41/42	8505 8511	22-02
44	8560	304
44		

SEAMING

Seam	Machine Tech	Length
41-42	WH 8 KP	22-02
44-45	WH 7 BJ	
44-46	WH 8 KP	

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
41-42	22-02	VEN	6:00	6:05		P
44-45	112		9:00	9:05		P
44-46	98		8:48	8:53		P

GCL 6.1.04.

DEPLOYMENT		
Panel #	Roll #	Length
89	2163	148
90	1185	148
91	1256	148
92	1348	148
93	1296	148
94	2164	148
95	2124	148
96	2155	148
97	2165	148
98	1158	148
99	0148	148
100	0157	148
101	2158	148
102	2182	148
103	2131	148
104	1144	148
105	1342	148
106	2186	148
107	1192	148
108	2148	148
109	2127	148
110	1346	148
		5564.4 LF

SEAMING		
Seam	Machine / Tech	Length

QUALITY CONTROL					
Seam	Length	Tech	AT Start / Stop	VT	Pass/ Fail

Deploy on 6-1-04
GCL

DEPLOYMENT

Panel #	Roll #	Length
P63		47'
P64	1217	148
P65	1271	101
66	1271	47
67	1156	148
68	1343	30
69	1343	30
70	1343	30
71	1343	32
72	1343	24
73	2168	101
74	2168	46
75	1090	148
76	1344	77
77	1344	75
78	1122	148
79	1157	47
80	1157	103
81	1252	148
82	1269	15
83	1269	133
84	2161	148
85	2184	148
86	2167	148
87	2175	148
89		20

SEAMING

Seam	Machine / Tech	Length

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

PREWELD LOG

Date	Tech	Machine Number	Machine Temps	Time AM/PM	Peel Values	Shear Values	Pass/ Fail
6/01/04	KP	WH#8	400/5.00	7:02 am	144 167 162 161 169 157	229.228.237	pass
6/1/04	PS.	#6	230. 270	7:30 AM	15. 136 .147	206 .206 209	Pass
6/1/04	BI	WH#7.	400/4.00	7:35 AM	135 138. 139 142. 142 141	212. 206 219.	Pass
6/1/04	KO	WH#9	750/4.50	7:40 AM	152. 164 170 167 164. 161	209. 214. 218	pass
6/1/04	KP	WH#8	400/5.50	12:45 PM	166 148 167 147 163 148	191. 191. 194	pass
~~6/1/04~~	~~BI~~	~~WH#7~~	~~400/4~~	~~1=PM~~	~~[illegible]~~		
6/1/04	BI	WH#7	400/4	1:PM	160 149 156. 146 [illegible]	176 185 188	Pass
6/1/04	KO	WH 9	750. 4.5	1:00	158. 158 157 155 150. 157	196. 182. 186	Pass
6/1/04	PS	#6.	230 .270	1:30 PM	151. 138. 142	183 .179. 189	Pass

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Vancouver, WA Job #: Date: 6-02-04

Texas Environmental Plastics Representative: Joe Khamla

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		13
	Foreman		
10	Technician		130
	Labor		
	Operator		
	TOTAL HRS		143

DAILY PRODUCTION

Material	Deployed	Welded	QCed
60mil	60,368	3,033	
Liner			
G.C.L.	68,320		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail
KP	WH 8	400/5	6:45	P
KP	WH 9	700/4	6:50	P
BJ	WH 7	400/4	7:00	P
PS	GH 6	275-230	8:00	P
PS	GH 6	275-235	1:00	P
PS	GH 6	230-270	1:00	P
KP	WH 8	400/5	1:10	P
BJ	WH 7	400/5	1:40	P

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil	215,192	9774	
Liner			
GCL	218,318		
Composite		64,400	

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail
~~22-501~~								
8								

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today TEP crew on site deploy G.C.L. deploy 60mil liner do repair air test - V. Box and Clean up site.

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6.2-04

DEPLOYMENT

Panel #	Roll #	Length
44	8560	98
44	8560	211
45	8560	313
45	8560	-"-
46	8559	100
47	8554	313
47	8559	-"-
47	8559	-"-
48	8559	98
48	8559	-"-
49	8532	203
48/49	8559 8523	22-CR
65	5804	300
65	5804	-"-
64		22-CR
64		22-CR
64		22-CR
64		22-CR
64		22-R
64		22-R
64		22-CR
64		22-R
64		
64		
64		
64		

SEAMING

Seam	Machine / Tech	Length
4445	W#1 8 / KP	98
44-45	W#7 / BJ	211
45-47		313
45-47	W#7 / BJ	-"-
46-47	W#8 / KP	100
47-48	W#7 / BJ	313
47-49	W#7 / BJ	-"-
4749	W#7 / BJ	-"-
48-64	W#	98
48-65	W-4	-"-
49-65	W#1	203
48-49	W#8 / KP	22-CR
65-64	W#9 / KP	300
65-64	W#9 / KP	-"-
64-50	W#8 / KP	22-CR
64-51	W#8 / KP	22-CR
64-52	W#8 / KP	22-CR
64-53	W#8 / KP	22-CR
64-54	W#8 / KP	22-CR
64-55	W#7 / BJ	22-CR
64-56	W#7 / BJ	22-CR
64-57	W#7 / BJ	22-CR
64-58	W#7 / BJ	22-CR
64-59	W#7 / BJ	22-CR
64-60	BJ	22-CR

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
44-46	98	YEN	8:48	8:53		P
44-45	211		9:00	9:05		P
45-47	187		10:03	10:08		P
47-49	84		10:14	10:19		P
46-47	100		9:17	9:22		P
47-48	168		10:36	10:41		P
4749	126		10:14	10:19		P
47-48	84		10:14	10:19		P
48-64	44		4:18	4:23		P
48-65	47		4:20	4:25		P
4865	203		3:19	3:24		P
48-49	22-CR		10:29	10:34		P
65-64	300		4:17	4:20		P
65-64	37		4:17	4:21		P
64-50	22-CR		4:12	4:17		P
64-51	22-CR		4:08	4:13		P
64-52	22-CR		4:06	4:11		P
64-53	22-CR		4:03	4:08		P
64-54	22-CR		4:05	4:08		P
64-55	22-CR		3:55	4:00		P
64-56	22-CR		3:53	3:58		P
64-57	22-CR		3:50	3:55		P
64-58	22-CR		3:41	3:46		P
64-59	22-CR		3:36	3:41		P
64-50	22-CR		3:36	3:41		P

6-2-04

DEPLOYMENT

Panel #	Roll #	Length
46	L	22 CR
46		22
46		
50	8532	19
51	8532	26
52	8532	35
53	8532	46
54	8532	55
55	8532	67
56	8487	79
57	8478	80
58	8478	80
59	8478	80
60	8478	80
61	8478	82
61	8478	—
62	8504	80
63	8504	81
66	8501	82
67	8501	[illegible]
68/69		22 CR
67	8501	81
68	8501	50
69	8494	33
70	8494	83

SEAMING

Seam	Machine Tech	Length
61-CR	W#3 KP	22
46-CR	W#8 KP	
46-62	W#7 BJ	
50-51	W#8 KP	19
51-52	W#8 KP	26
52-53	W#9 KO	35
53-54	W#8 KP	46
54-55	W#9 KO	55
55-56	W#8 KP	67
56-57	W#8 KP	79
57-58	W#7 BJ	80
58-59	W#8 KP	80
59-60	W#8 KP	80
60-61	W#9 KO	80
61-62	W#7 BJ	82
61-62	W#7 BJ	—
62-63	W#9 KO	80
63-66	W#8 KP	81
66-67	W#9 KO	82
67-68	W#7 BJ	[illegible]
68-69	W#8 KP	22
67-69	W#8	81
68-70	W#8 KP	50
69-70	W#8 KP	33
70-71	W#9 K	83

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
46 61-CR 22	22	CR	4	32		P
			4	37		
46-CR	22	CR	4	36		P
			4	41		
46-62	22		3	27		P
			3	32		
50-51	19		11	11		P
			11	16		
51-52	26		11	24		P
			11	29		
52-53	35		11	25		P DS
			11	30		
53-54	46		11	42		
			11	47		
54-55	55		11	49		
			11	54		
55-56	67		10	00		P
			1	05		
56-57	79		12	57		P
			1	02		
57-58	80		11	58		P
			12	03		
58-59	80		1	49		P
			1	54		
59-60	80		2	12		P
			2	17		
60-61	80		2	14		P DS
			2	19		2/
61-62	50		2	33		P
			2	38		
61-62	32		2	19		P
			2	24		
62-63	80		2	46		P
			2	51		
63-66	81		6	06		P
			6	11		
66-67	82		6	15		P
			6	20		
67-68	46		6	18		P
			6	23		
68-69	22 CR		6	29		P
			6	34		
67-69	35		6	21		P
			6	26		
68-70	50		6	24		P
			6	29		
69-70	33					
70-71	83		6	40		P
			6	45		

6-204 Liner

DEPLOYMENT			SEAMING			QUALITY CONTROL						
Panel #	Roll #	Length	Seam	Machine / Tech	Length	Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
71	8494	82	71-72	WH7 / BJ	82	71-72	82					
72	8494	72	72			72-						
		34934F										

76-846

6-2-04

DEPLOYMENT

Panel #	Roll #	Length
111	1121	148
112	2126	148
113	2174	148
114	1187	148
115	1189	148
116	1155	148
117	2123	148
118	1297	148
119	1210	148
120	2128	148
121	1243	148
122	2119	148
123	1346	148
124	2172	148
125	~~2127~~	
126	~~2173~~	
127	~~1216~~	
128	~~1220~~	
	~~1080~~	
	~~1173~~	
	~~2157~~	
150	2162	148
151	2130	148
152	1152	148
153	1288	148

SEAMING

Seam	Machine Tech	Length

QUALITY CONTROL

~~Seam~~	~~Length~~	~~Tech~~	AT Start	AT Stop	VT	Pass/ Fail
Panel	Roll	Length				
125	2127	86				
126	2127	64				
127	2173	21				
128	2173	89				
129	2173	38				
130	1216	54				
131	1216	87				
132	1220	100				
133	1220	50				
134	1080	32				
135	1080	86				
136	1080	29				
137	1173	55				
138	1173	85				
139	~~2173~~ 2157	83				
140	2157	70				
141	1173	11				
142	2157	69				
143		61				
144		52				
145		50				
146		41				
147		23				
148		18				
149		134				

(21) Panel

GCL . 6-2-04

DEPLOYMENT			SEAMING			QUALITY CONTROL						
Panel #	Roll #	Length	Seam	Machine / Tech	Length	Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
155		52										
156		31										
157		85										
158		33										
159		30										
160		85										
161		13										
162		72										
163		82										
164		84										
165		65										
166		16										
167		75										
168		33										
169												

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

PREWELD LOG

Date	Tech	Machine Number	Machine Temps	Time AM/PM	Peel Values	Shear Values	Pass/ Fail
6/2/04	KP	WH8	400/5.00	6:45am	176 159 158 164 160 145	208.216.213	pass
6/2/04	KO	WH 9	700/4.05	6:45am	154 150 177 165 145 139	220227220	Pass
6-2-04	BI	W:7	400/5.00	7:00am	174 179 161 179.165.146	212 212 217	pass
6/2/04	PS	GH6	230/270	8:00am	96.132.98	208.215.220	pass
6/2/04	PS	GH6	230/270	1:00 P	132,142.122	177 187 [illegible]	PSS
6/2/04	KP	WH8	400/5.00	1:00 P	155 140 148 129 148 140	170.169.170	Pass
6/2/04	KO	WH 9	7.500	1:00 P	133 125 136 161 142 136	174-158-165	Pass
6/2/04	BI	W:7	400/5.00	1:40:PM	117 134 145 125 131 [illegible]	165 170 [illegible]	BSS

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

DESTRUCTIVE SAMPLE LOG

DS Number	Seam Number	Date Welded	Machine Number	Tech	Date Pulled	Date Tested	Tested By	Peel Values	Shear Values	Pass/ Fail
DS# 14	44/45	6-1.04	wt17	BJ	6.1.04	6/2/04		134/138	215	Pass
								129/142	110	Pass
								134/142	218	pass
								138/142	212	Pass
DS# 7 B	2728	6-1.04	W# 9	KO	6-1-04	6/2/04		160/151	205	Pass
								153/140	210	Pass
								156/143	208	Pass
								134/140	219	Pass

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DESTRUCTIVE SAMPLE LOG

DS Number	Seam Number	Date Welded	Machine Number	Tech	Date Pulled	Date Tested	Tested By	Peel Values	Shear Values	Pass/ Fail
~~DS#7~~ DS#8	27/29	6/1/04	W#8	KP		6/2/04		131 ~~147~~ 156 ~~147~~	230	Pass
								139 147	227	Pass
								148 133	219	Pass
								142 143	245	Pass
DS#9	32/33	6-1-04	W#9	KO		6/2/04		167/153	224	Pass
								144/178	231	Pass
								180/168	240	Pass
								155/155	235	Pass
DS#10	35/36	6-1-04	W#8	KO		6/2/04		151/143	211	Pass
								139/162	232	Pass
								157/150	260	Pass
								156/152	243	Pass
DS#11	37/38	6-1-04	W#7	BJ		6/2/04		137/171	217	Pass
								146/153	232	Pass
								157/158	241	Pass
								153/158	219	Pass
DS#12	39/40	6-1-04	W#7	BJ		6/2/04		125/154	212	Pass
								136/146	221	Pass
								134/130	213	Pass
								146/147	232	Pass
DS#13	42/43	6-1-04	W#8	KP		6/2/04		150/151	210	Pass
								143/141	219	Pass
								143/157	213	Pass
								147/165	220	Pass

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Vancouver. WA Job #: Date: 6-03-04

Texas Environmental Plastics Representative: Joe. Khamfa

HOURS:

No.	Trade	Hrs	Total Hrs
	Supervisor		
	Foreman		
	Technician		
	Labor		
	Operator		
	TOTAL HRS		

DAILY PRODUCTION

Material	Deployed	Welded	QCed
60mil liner	70,026	3,827	
G-CL	61,194		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil liner	285.218	13,661	
G-CL	279.712		
Composite	64.400		
4 Boots		4 boots	6"

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Crew deploy 60mil liner and G-CL do repair and test. Vibox cut destruct and clean up site

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6-03-04

DEPLOYMENT

Panel #	Roll #	Length
[redacted]	8482	140
84	8482	36
84	8482	-"-
83/84		22
83/84		-"-
83	8482	154
83	8482	-"-
83	8482	-"-
85	8464	188
86	8564	195
86	5864	-"-
88	8564	130
87	8557	56
[redacted]	8557	206
90	8557	209
90	8557	-"-
91	8557	40
92		172
93		216
93		-"-
93		-"-
93		-"-
95		125
95		55
94/95		22CR

SEAMING

Seam	Machine Tech	Length
81-83	W#9 KO	140
84-85	W#8 KP	36
84-85	W#8 KP	-"-
83-84	W#9 KO	22
83-84	W#9 KO	-"-
83-85	W#8 KP	154
83-85	W#8 KP	-"-
83-85	W#8 ICP	-"-
85-86	W#9 BJ	188
86-88	W#9 KO	197
86-87	W#9 KO	-"-
88-89	W#8 KP	130
87-89	W#8 ICP	56
89-90	W#7 BJ	206
90-91	W#9 KO	209
90-92	W#9 KO	-"-
91-93	W#8 KP	40
92-93	W#8 KP	172
93-[redacted]	W#8 KP	216
93-94	W#8 KP	-"-
93-94	W#8 KP	-"-
93-95	W#8 KP	-"-
[redacted]-96	W#9 KO	125
95-96	W#9 KO	55
94-95	W#9 KO	22CR

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
81-83	140	YCN	4 28	4 33		P
84-85	36		5 07	5 12		P
84-85	6		5 14	5 19		P
83-84	6		4 40	4 45		P
83-84	18		WELD		OK	
83-85	36		4 57	5 02		P
83-85	64		4 52	4 57		P
83-85	54		5 02	5 07		P
85-86	188		5 16	5 21		P
86-88	143		5 27	5 32		P
86-87	51		5 22	5 27		P
88-89	130		5 37	5 42		P
87-89	56		5 47	5 52		P
89-90	206		6 05	6 10		P
90-91	42		5 57	6 02		P
90-92	167		5 57	6 02		P
91-93	40		7 42	7 47		P
92-93	172		7 47	7 52		P
93-[redacted]	38		8 50	8 55		P
93-94	16		8 47	8 52		P
93-94	169		8 44	8 49		P
93-95	53		8 36	8 41		P
94-96	123		10 16	10 21		P
95-96	55		9 19	9 24		P
94-95	22CR		8 21	8 26		P

603-041

DEPLOYMENT

Panel #	Roll #	Length
[redacted]	8517	148
28	8517	148
29	1817	22
33	8494	150
73	8494	150
29/73	8517 8494	22-CR
74	8494	116
75	8567	43
74/75	8494 8567	22-CR
76	8567	160
76	8567	-"-
77	8567	163
77	8567	|
[redacted]	8567	|
77	8567	-"-
78	8567	153
78	8567	-"-
78	8567	-"-
79	8482	15
36	8525	13
80	8482	149
80	8482	149
78/79	8567 8482	22-CR
81/82	8482 8482	22-CR
82	8482	31
82	8482	-"-
[redacted]		

SEAMING

Seam	Machine Tech	Length
28-29	W#8 KP	148
28-73	W#8 KP	148
29-73	W#7 BJ	22
33-38	W#7 BJ	150
73-75	W#7 BJ	-"-
29-73	W#8 KP	22-CR
74-76	W#7 KO	116
75-76	W#9 K	43
74-75	W#9 KO	22-CR
76-77	W#8 KP	160
76-77	W#8 KO	-"-
77-78	W#7 BJ	163
77-78	W#7 BJ	|
77-78	W#7 BJ	|
77-79	W#7 BJ	-"-
78-36	W#8 KP	153
78-80	W#8 KP	-"-
78-80	W#8 KP	-"-
79-80	W#8 KP	15
36-81	W#8 KP	13
80-81	W#8 KP	149
80-82	W#8 KP	-"-
78-79	W#8 KP	22-CR
81-82	W#9 K	22-CR
82-83	W#8 KP	31
82-84	W#8 KP	-"-

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
28-29	22	Y/N	10	17	1	P
			10	22		
28-73	126		10	45		P
			10	50		
29-73	22		10	22		P
			10	27		
33-38	90		10	41		P
			10	46		
33-75	38		10	51		P
			10	56		
29-73	22-CR		10	08		P
			10	13		
74-76	116		11	06		P
			11	11		
75-76	43		11	14		P
			11	19		
74-75	22-CR		10	31		P
			10	36		
76-77	123		11	17		P
			11	22		
76-77	37		11	22		P
			11	27		
77-78	72		11	27		P
			11	32		
77-78	47		11	31		P
			11	36		
77-78	36		11	34		P
			11	39		
77-79	7		11	38		P
			11	43		
78-36	19		1	35		P
			1	40		
78-80	86		12	47		P
			12	52		
78-80	66		12	50		P
			12	55		
79-80	15		12	56		P
			01	01		
36-81	13		3	52		P
			3	57		
80-81	149		4	12		P
			4	17		
80-82	25		4	24		P
			4	29		
78-79	22-CR		11	43		P
			11	47		
81-82	22-CR		4	03		P
			4	07		
82-83	9		4	32		P
			4	37		
82-84	22		4	35		P
			4	40		

6.3-04

DEPLOYMENT

Panel #	Roll #	Length
[redacted]	8504	42
65/94	8504	22 CR
64/96	8501	22 CR
96	8558	7
96		~~21 7~~
96		22 CR
96		22 CR
96		22 CR
96	8558	16 CR
72	8494	22 CR
72	8494	45
96	8558	207
96	8558	-1-
[redacted]	8558	22 CR
97	8558	22 CR
97	8558	30
98	8558	27
99	8558	19
100		22X15

SEAMING

Seam	Machine / Tech	Length
65-96	W#8 KP	42
65-94	W#9 KO	22 CR
64-96	W#8 KP	22 CR
94-63	W#8 KP	7
96-67	W#1	22 CR
96-69	W#8 KP	22 CR
96-70	W#8 KP	22 CR
96-71	W#8 KP	22 CR
96-72	W#8 KP	16 CR
72-97	W#8 KP	22 CR
72-98	W#8 KP	45
96-97	W#8 KP	207
96-97	W#8 KP	-1-
97-98	W#9 KO	22 CR
97-99	W#9 KO	22 CR
97-100	W#9 KO	30
98-99	W#9 KO	27
99-100	W#9 KO	19
100-END		22X15

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
65-96	42	YEN	10 12	1 18		P
65-94	22 CR		7 55	8 00		P
64-96	22 CR		10 24	10 29		P
94-63	7		10 09	10 14		P
96-67	22 CR		9 ~~45~~ 54	9 59		P
96-69	22 CR		9 52	9 57		P
96-70	22 CR		9 49	9 51		P
96-71	22 CR		9 45	9 50		P
96-72	16 CR		9 40	9 45		P
72-97	22 CR		9 05	9 10		P
72-98	45		10 51	10 56		P
96-97	44		9 34	9 39		P
96-97	75		7 24	9 29		P
97-98	22 CR		10 51	10 56		P
97-99	22 CR		10 40	10 45		P
97-100	30		10 31	10 36		P
98-99	27		10 40	10 45		P
99-100	19		10 35	10 40		P
100-END	22 X 15	YEN	~~END~~			

6-3-04

DEPLOYMENT

Panel #	Roll #	Length
[redacted]	8494 1817	22-ll
74/30	8494 8499	22-ll
76/32	8567 8515	22-ll
77/33	8567 8515	22-ll
78/35	8567 8525	22-ll
80/36	8482 8523	22-ll
81/37	8482 8507	22-ll
84/39	8482 8505	22-ll
85/40	8461 8505	22-ll
86/42	8564 8511	22-ll
88/43	8564	22-ll
89/44	8560	22-ll
90/46		22-ll
[redacted]	8537	22-ll
92/49	8566	22-ll

SEAMING

Seam	Machine / Tech	Length
73-29	W#8 KP	22-ll
74-30	W#8 KP	22-ll
76-32	W#8 KP	22-ll
77-33	W#8 KP	22-ll
78-35	W#8 KP	22-ll
80-36	W#8 KP	22-ll
81-37	W#7 BJ	22-ll
84-39	W#7 BJ	22-ll
85-40	W#7 BJ	22-ll
85-42	W#7 BJ	22-ll
88-43	W#7 BJ	22-ll
89-44	W#9 KO	22-ll
90-46	W#9 KO	22-ll
91-47	W#9 KO	22-ll
92-49	W#9 KO	22-ll

QUALITY CONTROL

Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
73-29	22-ll	YEN	10	08		P
			10	17		
74-30	22-ll		2	09		P
			2	14		
76-32	22-ll		2	11		P
			2	16		
77-33	22-ll		2	16		P
			2	21		
78-35	22-ll		2	20		P
			2	25		
80-36	22-ll		1	46		P
			1	51		
81-37	22-ll		6	17		P
			6	22		
84-39	22-ll	weld			OK	P
85-40	22-ll	weld			OK	
85-42	22-ll	weld	6	41	ok	P
			6	46		
88-43	22-ll		7	21		P
			7	17		
89-44	22-ll		6	54		P
			6	39		
90-46	22-ll		6	58		P
			7	03		
91-47	22-ll		7	06		P
			7	11		
92-49	22-ll		7	53		P
			7	58		

6-3-04 G-CL

DEPLOYMENT			SEAMING			QUALITY CONTROL						
Panel #	Roll #	Length	Seam	Machine Tech	Length	Seam	Length	Tech	AT Start	AT Stop	VT	Pass/ Fail
						Panel	Roll	Length				
170		141				195	1300	40				
171	1218	148				196	1300	49				
172	1159	148				197	0549	148				
173	1088	148				198	1083	149				
174	1190	150				199	1300	50				
175	1084	150				200	0578	106				
176	1124	150				201	1082	98				
177	0552	15				202	1085	149				
178	1322	150				203	1300	15				
179	0553	150				204	1194	43				
180	0552	15				205	1194	60				
181	1245	150				206	0580	150				
[illegible]2	1299	150				207	1072	150				
183	0552	21				208		60				
184	0552	40				209		60				
185	0552	30				210	0550	150				
186	0552	30				211	0549	150				
187	0518	146										
188	1019	144										
189	1125	150										
190	1327	150										
191	0552	30										
192	1300	31										
193	2122	150										
194	1247	150										

10767
8482
8557
8564
Alter

1247 2122 1300 1327 1125 1019 0518 1299 1245 0553 1322 0552 1124 1084 1190 1088 1159 1218 GCL
1091-1091

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

PREWELD LOG

Date	Tech	Machine Number	Machine Temps	Time AM/PM	Peel Values	Shear Values	Pass/ Fail
6/3/04	KP	W#8	400/5.00	7:00 am	142. 145	210	pass
					148. 145	218	pass
					146. 146	221	pass
6/3/04	BI	W#7	400/5.00	7:10 am	139 149	199	pass
					178 150	223	pass
					163 152	216	pass
6/3/04	KO	W#9	740/4.50	7:25 am	151 151	211	Pass
					159 154	204	Pass
					160 142	207	Pass
6/3/04	PS	W#6	230/275	7:30	159	146	pass
					185	192	pass
					123	188	pass
6/3/04	KP	W#8	400/5.50	1:00 P	155 165	160	pass
					143 151	161	pass
					159 155	157	pass
6/3/04	KO	W#9	750. 5.50	1:00P	140 153	144	Pass
~~6/3/04~~	~~BI~~	~~W#7~~	~~400/5.00~~	~~1:25P~~	136 148	150	Pass
					126/129	148	pass
6/3/04	BI	W#7	400/5.00	1-25P	120 132 140 1-13 131 124	145-122131	Pass
6/3/04	PS	W#6	230-270	1-30PM	135 150 146	152. 156. 162	Pass

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

DESTRUCTIVE SAMPLE LOG

DS Number	Seam Number	Date Welded	Machine Number	Tech	Date Pulled	Date Tested	Tested By	Peel Values	Shear Values	Pass/ Fail
DS# 15	47/48					6/3/04		144/136	219	Pass
								134/151	210	Pass
								148/138	221	pass
								146/136	215	Pass
DS# 16	64/65					6/3/04		153/129	206	Pass
								141/142	209	Pass
								150/153	215	pass
								150/138	198	Pass
DS# 17	52/53					6/3/04		139/134	205	Pass
								151/159	212	Pass
								140/144	208	Pass
								157/153	115	Pass
DS# 18	60/61					6/3/04		150/135	207	Pass
								138/140	215	Pass
								142/138	219	Pass
								146/139	201	Pass
DS# 19 A	71/72					6/3/04		160/140	200	Pass
								156/150	212	Pass
								133/148	209	Pass
								137/141	210	Pass
DS# 19 B	71/72					6/3/04		144/137	193	Pass
								140/141	197	Pass
								154/133	202	Pass
								156/148	191	Pass

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Installers, Fabricators & Distributors of Environmental Lining Systems

DESTRUCTIVE SAMPLE LOG

DS Number	Seam Number	Date Welded	Machine Number	Tech	Date Pulled	Date Tested	Tested By	Peel Values	Shear Values	Pass/ Fail
DS#20	73/74					6/3/04		137/127	157	Pass
								136/130	165	Pass
								137/135	147	Pass
								128/130	151	Pass
DS#21	77/78					6/3/04		127/107	167	Pass
								128/130	152	Pass
								140/136	160	Pass
								123/144	149	Pass
DS#22	32/76					6/3/04		150/148	156	Pass
								137/139	169	Pass
								135/138	150	Pass
								134/138	165	Pass

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: A/Coa **Location:** Vancouver, WA **Job #:** **Date:** 6-4-04

Texas Environmental Plastics Representative: Joe Khamta Keophongsavanh

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		13
	Foreman		
10	Technician		110
	Labor		
	Operator		
	TOTAL HRS		123

DAILY PRODUCTION

Material	Deployed	Welded	QCed
Composite	94,500		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60mil liner	285,218	13,601	
G.C.L	279,712		
Composite	158,900		11
T. Boots		T. Boots	6 boot

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today crew deploy Composite and V. Box Clean up site

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Vancouver, WA Job #: Date: 6-5-04

Texas Environmental Plastics Representative: Joe Khamta Kaophongsavanh

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		13
	Foreman		
9	Technician		99
	Labor		
	Operator		
	TOTAL HRS		112

DAILY PRODUCTION

Material	Deployed	Welded	QCed
Composite	110, 250		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
bomit.	285.218	13.601	
G.C.L	280.172		
Composite	269.150		
T. Boots		T. Boots	6" boot

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today crews deploy composite and clean up.

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Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Vancouver. WA Job #: Date: 6.6.04

Texas Environmental Plastics Representative: Joe Khamla Keo Phongsavanh

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		
	Foreman		
10	Technician		
	Labor		
	Operator		
	TOTAL HRS		

DAILY PRODUCTION

Material	Deployed	Welded	QCed

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
60 mil liner	285,218	13.601	
G.C.L	280.172		
7-Boots		7-boots	6" boot

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today crew deploy composite and clean up site.

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TEXAS ENVIRONMENTAL PLASTICS, INC.
3002 Farrell Road
Houston, Texas 77073

SUBGRADE SURFACE ACCEPTANCE

Project Name: ALCOA Vancouver Washington
Customer: ALCOA
Project Number: 14506
Date: 01 JUNE 2004
Location: East Landfill
Partial: _____ Final: X

This document only applies to the acceptability of surface conditions for installation of geosynthetic products. Texas Environmental Plastics, Inc. does not accept responsibility for compaction, elevation or moisture content, nor for the surface condition maintenance during deployment. Structural integrity of the subgrade and maintenance of these conditions are the responsibility of the Owner or Earthwork Contractor.

Subgrade area accepted From Panel #1 To Panel #100. 285,218. SF

For Texas Environmental Plastics, Inc.:
Joe. Khamta
Khamta Joe

For Contractor/Owner:

Acceptance Number: 1 Area Accepted: ALL AREAS

Total Area accepted to date: ALL AREAS

TEXAS ENVIRONMENTAL PLASTICS

FACSIMILE TRANSMITTAL SHEET

TO: Mike Wirtz	FROM: Sam Mangrum
COMPANY: CH2MHILL	DATE: 6/17/2004
FAX NUMBER: 503/736-2000	TOTAL NO. OF PAGES INCLUDING COVER: 9
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Thanks,

Sam Mangrum

2500 FARRELL ROAD *HOUSTON, TEXAS 77073 USA * TEL: 281/821-7320 * FAX: 281/821-7138

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

Job Number:	Client:
Job Name: Alcoa.	Bill To:
Job Description: Install	% Complete 100% Total for Job

Certificate of Acceptance

Material	Estimated SF	Final Quantity/Description
60mil Textured liner		285-218 SF
welding Seams		13,601 LF
G.C.L.		280,172 SF
7 Boots.	6" boots	7 Boots
Composite		318.452 SF
T.E.P Crew line - G.C.L. and	Complete installed 60mil Textured Composite 100% and	clean up

I, the undersigned, duly authorized representative of:
do hereby take over and accept the work described above from the date hereof and confirm that to the best of my knowledge the work has been completed in accordance with specifications and the terms and conditions of the contract.

NAME:	SIGNATURE:	TITLE:	DATE:
William G. Griffin		QC observer	6/6/04

Certificate accepted by Texas Environmental Plastics, Inc.'s Representative

NAME:	SIGNATURE:	TITLE:	DATE:
Joe. Khamta Keophouay Savanh	Khamta Keophu	Superintendent	6-6-04

Texas Environmental Plastics, Inc.

Installers, Fabricators & Distributors of Environmental Lining Systems

REPAIR LOG

Repair Number	Date Welded	Time Welded	Machine Number	Technician	Size
R# 156	6-3-04	6:40	G#6	PS	2X2-R-88-86-87 CR
157	6-3-04	6:50	G#6	PS	2X2-R-88-87-89
158	6-4-04	4.26	G#6	PS	2X4-R-87-89.
159	6-4-04	10-10	G#6	PS	2X2. R-90-91-92
160	6-4-04	10-20	G#6	PS	1X1-R-91-92-93
161	6-4-04	10:24	G#6	PS	1X1-R-93-74-65 CR
162	6-4-04	10:30	G#6	PS.	1X1-R-93-94.
163	6-4-04	10:37	G#6	PS	2X4-R 93-94. DS-27
164	6-4-04	3:15	G#6	PS	2X2-R-93-94-95. CR
165	6-4-04	3:10	G#6	PS	2X2-R 94-95-96-CR
166	6-4-04	3:00	G#6	PS	1X1-R-94-96-65 CR
167	6-4-04	1:16	G#6	PS.	2X2-R-64-65-96-CR
168	6-4-04	1:30	G#6	PS	2X2-R-96-63-66-CR
169	6-4-04	3:20.	G#6	PS.	1X1-R-96-66-67. CR
170	6-4-04	3:30	G#6	PS.	1X1-R-96-67-68 CR
171	6-4-04	3:18	G#6	PS	1X1-R-76-69-70
172	6-4-04	3:66	G#6	PS	1X1-R-96-70-71 CR
173	6-4-04	2:00	G#6	PS	1X-1-R96-71-72-CR
174	6-4-04	2:10	G#6	PS	2X3-R5-19-R-71-72
175	6-4-04	2:17	G#6	PS	1X1-R-96-72-97-CR
176	6-4-04	2:21	G#6	PS	1X1-R96-97
177	6-4-04	2:26.	G#6	PS.	1X1-R-72-97-98 CR
178	6-4-04	2:29	G#6	PS	1X1-R-97-98-99. CR
179	6-4-04	2:36	G#6	PS	3X3 R 97-99-100 CR

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

DESTRUCTIVE SAMPLE LOG

DS Number	Seam Number	Date Welded	Machine Number	Tech	Date Pulled	Date Tested	Tested By	Peel Values	Shear Values	Pass/ Fail
DS#23	81/80					6/4/04		144 128	194	Pass
~~DS#24~~	~~86/85~~							147 144	200	Pass
								142 141	199	Pass
								128 142	195	Pass
DS#24	86/85					6/4/04		159 134	198	Pass
								143 140	194	Pass
								153 137	190	Pass
								149 135	199	Pass
DS#25	89/87					6/4/04		120 152	188	Pass
								123 140	190	Pass
								143 129	185	Pass
								127 145	195	Pass
DS#26	87/91					6/4/04		155 168	191	Pass
								138 121	189	Pass
								139 142	195	Pass
								136 135	187	Pass
DS#27	93/94					6/4/04		137 139	161	Pass
								142 137	175	Pass
								139 132	180	Pass
								119 112	179	Pass

2500 Farrell Road • Houston, Texas 77073 U.S.A. • Tel: 281-821-7320 • Fax: 281-821-7138

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors of Environmental Lining Systems

PREWELD LOG

Date	Tech	Machine Number	Machine Temps	Time AM/PM	Peel Values	Shear Values	Pass/ Fail
6/4/04	KP	w#8	400/5.5	7:20 am	153 146	224	pass
					172 161	217	pass
					160 171	217	pass
6/4/04	KO	w#9	740/5.00	7:30 am	138 127	218	pass
					134 140	221	pass
					136 139	234	pass
6/4/4	PS.	6#6 -	230.270	7:40 AM	151.146 146	187.187.187	Pass
6/4/4	PS	6#6	230 270	1:14 PM	170.169.169	193.179.176	Pass

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa Location: Vancouver WA Job #: Date: 6-6-04

Texas Environmental Plastics Representative: Joe Khamla Keo Phong Savanh

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		9
	Foreman		
10	Technician		90
	Labor		
	Operator		
	TOTAL HRS		99

DAILY PRODUCTION

Material	Deployed	Welded	QCed
Composite	49,280		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

Material	Deployed	Welded	QCed
to mill liner	285,718	13,601	
G.C.L.	279,172		
Composite	318,452		
7-boots		7-boots	6 boots

DESTRUCTIVE SAMPLES

Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: today crew delay Composite and cleaning up Site.

Texas Environmental Plastics, Ltd.

Installers, Fabricators & Distributors

DAILY PROGRESS REPORT

Job Name: Alcoa **Location:** Vancouver, WA **Job #:** **Date:** 6-4-04

Texas Environmental Plastics Representative: Joe Khamta Keophoungsavanh

HOURS:

No.	Trade	Hrs	Total Hrs
1	Supervisor		13
	Foreman		
10	Technician		110
	Labor		
	Operator		
	TOTAL HRS		123

DAILY PRODUCTION

Material	Deployed	Welded	QCed
Composite	94,300		

PREWELDS:

Tech	Machine	Temp.	Time AM/PM	Pass/Fail

CUMMLATIVE PRODUCTION

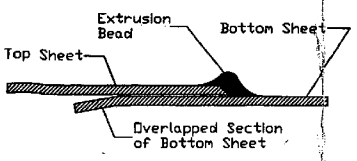
Material	Deployed	Welded	QCed
60mil liner	285,218	13,601	
G.C.L.	279,712		
Composite	158,900		11
7 Boots		7 Boots	6 boot

DESTRUCTIVE SAMPLES

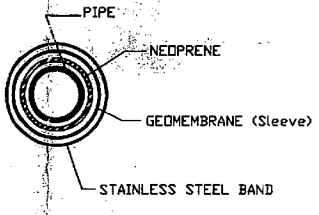
Sample #	Operator	Mach.	Seam	Date Welded	Date Pulled	Date Tested	Location	Field Test Pass/Fail

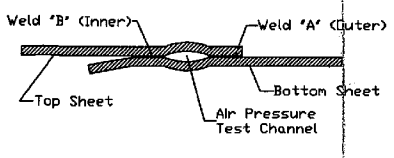
WEATHER CONDITIONS:	High	Low	Winds	Precipitation	Comments

COMMENTS: Today crew deploy Composite and V-Box Cleane Up Site

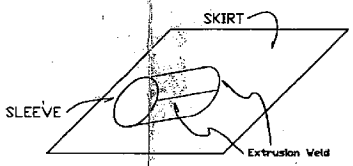


TYPICAL EXTRUSION WELD (n.t.s.)



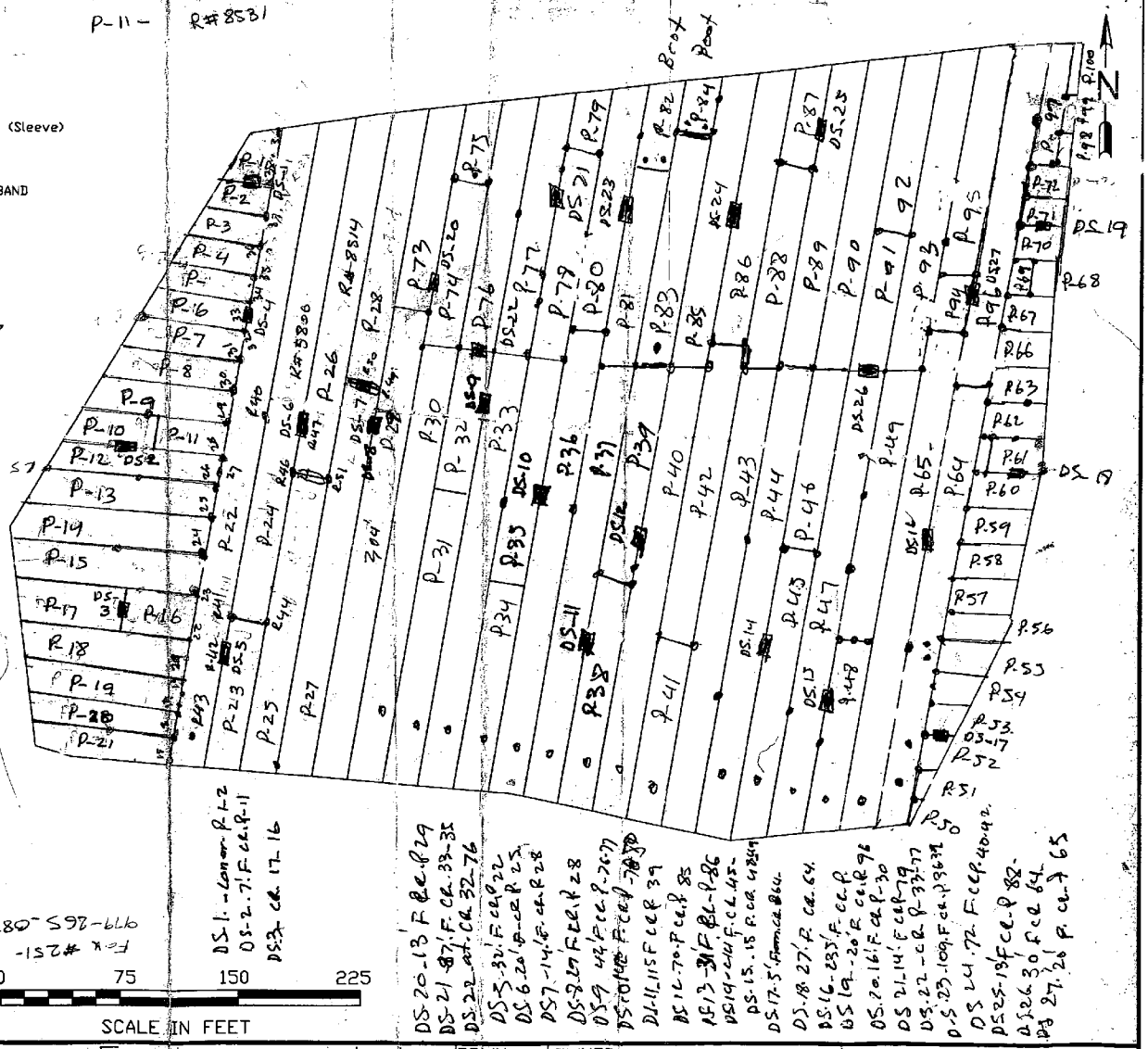


TYPICAL WEDGE WELD (n.t.s.)



TYPICAL BOOT (n.t.s.)

P-1-10 R#8530
P-11- R#8531



NOTES

1. THIS PANEL LAYOUT IS TENTATIVE AND MAY BE REIVISED BY QUALIFIED TEXAS ENVIRONMENTAL PLASTICS SITE MANAGER WITH THE APPROVAL OF THE FIELD ENGINEER TO SUIT FIELD CONDITIONS AT THE TIME OF INSTALLATION. ALL SUCH CHANGES WILL BE REFLECTED IN THE AS-BUILT DRAWINGS.
2. PANEL END SEAMS NOT SHOWN FOR CLARITY
3. FIELD VERIFY NUMBER AND LOCATION OF PENETRATIONS.
4. ALL HDPE PANELS SHALL HAVE A 4' - 6' OVERLAP FOR WEDGE WELDED SEAMS AND A MIMIMUM OF 3' OVERLAP FOR ALL EXTRUSION WELDED SEAMS
5. PANELS PLACED ON SLOPES WILL EXTEND A MINIMUM OF FIVE FEET BEYOND THE GRADE BREAK IN TO THE FLAT AREA OF THE LANDFILL.

DATE	REV	DESCRIPTION	APP	BY
5/24/04	02	CHANGED PANEL ORIENTATION		
4/27/04	01	SUBMITTED FOR REVIEW AND APPROVAL		

Texas Environmental Plastics, Ltd.
2500 Farrell Road
Houston, Texas 77073
tel. (281) 821-7320 fax (281)821-7138

DRWN	
CHK	
EST	
CON	
RE	

OWNER: ALCOA INC.
FORMER VANCOUVER OPERATIONS
EAST LANDFILL CAP CONSTRUCTION

TITLE: PROPOSED HDPE PANEL LAYOUT
EAST LANDFILL CAP

DATE 4/27/04 | SCALE | SHEET 001 | DWG 001 | REV 1

APPENDIX I

STORAGE-OPERATIONS BUILDING CONSTRUCTION INFORMATION

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

ENVIROCON

Submittal

Submittal Number 008

1.0 Name of Submitter	Envirocon, Inc. 10400 North Burgard Way Portland, Oregon 97203
1.1 Contact Name	Steve Holmberg
1.2 Contact Phone	(503) 285-6164
1.3 Contact Fax	(503) 285-6205
2.0 Name of Project	Remediation of North and North 2 Landfills
3.0 Service Order No.	
4.0 Submittal Description resumes	**Building Design Data, Building Drawings,**
5.0 Drawing Number	**NA**
6.0 Specification Section Number	**Section VII,D.1.i.(1)**
7.0 Original Submittal	**YES**
8.0 Manufacture's Information	**H.C.I. STEEL BUILDINGS SYSTEMS, INC.**
9.0 Date of Submittal	**02 DEC 04**
10.0 Person Submitting	**S. F. Holmberg**

Printed Name Signature

Certificate of Design

THIS CERTIFICATE IS TO CONFIRM THAT ALL COMPONENTS OF THE STEEL BUILDING SYSTEM DESCRIBED BELOW, TO BE SUPPLIED BY HCI STEEL BUILDING SYSTEMS, INC. LOCATED IN ARLINGTON, WA HAVE BEEN OR WILL BE DESIGNED IN ACCORDANCE WITH THE FOLLOWING STANDARDS, LOADS AND DESIGN CRITERIA AS SPECIFIED IN THE ORDER DOCUMENTS, AND ARE DESIGNED AND PRODUCED IN AN AISC APPROVED FACILITY BY AN AISC CERTIFIED MANUFACTURER.

1. DESCRIPTION:

HCI Job No: 2493

Project Name: Alcoa Inc.

Customer's Name/Address: Envirocon

10400 N. Burgard Way, Portland, Oregon 97203

Building Type / Size: 12'-0" x 16'-0" x 8'-0" - 1.0:12 Slope

Site Location: Vancouver, Washington

2. DESIGN STANDARDS:

AISC "*Manual of Steel Construction*": 9th edition.

AISI "*Cold Formed Steel Design Manual*": 1996 edition.

AWS D1.1 "*Structural Welding Code-Steel*": 2002 edition.

AWS D1.3 "*Structural Welding Code-Sheet Steel*": 1998 edition.

MBMA "*Low Rise Building Systems Manual*": 2002 edition.

ASTM "*Standards in Building Codes*": 2000 edition.

3. LOADS:

Applicable Building Code(s): 1997 UBC; Occupancy Category: 4

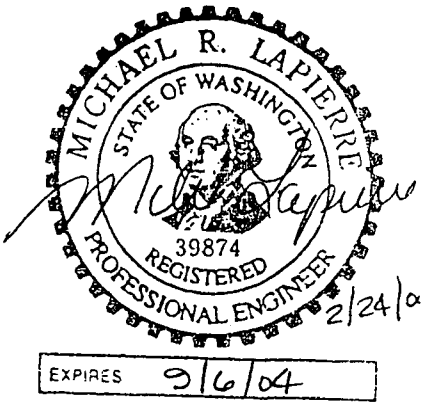
(a) Dead Load- Actual Material Weight

(b) Collateral Load- '3' PSF

(c) Roof Snow Load- '25' PSF, Roof Live Load- '20' PSF

(d) Wind Load- Wind Speed '80' MPH @ Exposure 'C'; Enclosed

(e) Seismic Load- Seismic Zone '3' Ca = 0.36



4. CERTIFICATION BY ENGINEER:

I, Michael R. Lapierre, not a subcontract engineer for HCI Steel Building Systems, Inc. and a licensed Engineer in the State of Washington - certify that I have reviewed the design criteria for the Steel Building System described above and to the best of my knowledge all components have been or will be designed to meet the applicable criteria as specified in the "ORDER DOCUMENTS."

Signature: Michael Lapierre, Date 2/24/04

MAIN BUILDING CALCULATIONS

PROJECT:	ALCOA INC.
JOB NO:	2493
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA
DATE:	2/16/2004

HCI STEEL BUILDING SYSTEMS, INC.			
Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

Table Of Contents

2/24/04

EXPIRES 9/6/04

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

Design Specifications

The Building described in these calculations was designed according to the following design specifications.

1: Hot rolled sections and built up components have been designed in accordance with:
1989 Specification for Structural Steel Buildings - Allowable Stress Design.
AISC "American Institute of Steel Construction"
1 East Wacker Drive, Suite 3100, Chicago, Illinois 60601-2001.

2: Cold formed components have been designed in accordance with:
Specification for the Design of Cold-Formed Steel Structural Members.
AISI "American Iron and Steel Institute" 1996 Edition.
1000 16th Street, NW, Washinghton, DC 20036.

3: Welding has been applied in accordance with:
AWS D1.1.96 "American Welding Society" Structural Welding Code - Steel Manual, 1996 Edition.
550 N.W. Lejeune Road, P.O. Box 351040, Miami,Fl 33135.

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

MATERIAL SPECIFICATIONS

The following is the list of the material standards and specifications for which the building components have been designed:

Sl. No	Materials	Specifications	Grade
1.	Built-Up Members		
	* Hot Rolled Bar	ASTM A529-01 Grade 55	Fy = 55 Ksi Minimum
	* Structural Steel Sheet	ASTM A570-98 Grade 55	Fy = 55 ksi Minimum
	* Structural Steel Plate	ASTM A572-01 Grade 50	Fy = 50 ksi Minimum
2.	Hot-Rolled Members		
	* Beams	ASTM A 992-00	Fy = 50 ksi Minimum
	* Tubes	ASTM A500-99 Grade B	Fy = 46 ksi Minimum
	* Pipes	ASTM A53-00 GR B,Type E	Fy = 35 ksi Minimum
	* Channels	ASTM A36-00a	Fy = 36 ksi Minimum
3.	Cold-Formed Secondary Members		
	* Galvanized	ASTM A653-00 SS Grade 55M	Fy = 55 ksi Minimum Class 1 G-40
	* Primed	ASTM A570-98 Grade 55	Fy = 55 ksi Minimum
4.	Sheeting Panels		
	* Roof & Walls	ASTM A653-00 SS Grade 50	Fy = 50 ksi Minimum Class 1 or 2 G-90
5.	X-Bracing Members		
	* Rods	ASTM A36-01	Fy = 36 Ksi Minimum
6.	High Strength Bolts	ASTM A325-00	TYPE 1, PLAIN
7.	Machine Bolts	ASTM A307-97	GRADE A, PLAIN

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

HCI STEEL PRODUCTS
18520 67 AVE NE
ARLINGTON, WA 98223

STRUCTURAL DESIGN CALCULATIONS
FOR
ENVIROCON INC.
10400 N. BURGARD WAY
PORTLAND, OR 97203

ALCOA INC.
5201 NW LOWER RIVER RD.
VANCOUVER, WA
2493

BUILDING DATA

Width (ft)	= 12.0
Length (ft)	= 16.0
Eave Height (ft)	= 8.0/ 9.0
Roof Slope (rise/12)	= 1.00
Dead Load (psf)	= 2.5
Live Load (psf)	= 20.0
Collat. Load (psf)	= 3.0
Snow Load (psf)	= 25.0
Wind Speed(mph)	= 80.0
Wind Code	= UBC 97
Closed/Open	= C
Exposure	= C
Importance - Wind	= 1.00

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

Importance - Seismic = 1.00
Seismic Zone = 3
Seismic Coeff (Ca) = 0.36

Designer = NAGY MEKHAIL

2/16/04

==========

2493 Design Loads For Each Building Component 2/16/04 9:47am

==========

FRONT SIDEWALL:

WIND PRESSURE/SUCTION:

Wind Press	Wind Suct	Wind Long	
19.5	-19.5		.. Girt/Header
20.8	-20.8		.. Panel
15.6	-15.6		.. Jamb
22.6	-22.6		.. Parapet

BACK SIDEWALL:

WIND PRESSURE/SUCTION:

Wind Press	Wind Suct	Wind Long	
19.5	-19.5		.. Girt/Header
20.8	-20.8		.. Panel
15.6	-15.6		.. Jamb
22.6	-22.6		.. Parapet

LEFT ENDWALL:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Design Loads For Each Building Component 2/16/04 9:47am

BASIC LOADS:

Dead Load	Live Load	Snow Load	Collateral Load	Basic Wind	Wind_Load Ratio
2.5	20.0	25.0	3.0	17.4	1.00

WIND PRESSURE/SUCTION:

Wind Press	Wind Suct	
15.6	-15.6	.. Column
19.5	-19.5	.. Girt/Header
15.6	-15.6	.. Jamb
20.8	-20.8	.. Panel
22.6	-22.6	.. Parapet

WIND COEFFICIENTS:

Surf Id	Rafter_Wind_1 Left	Rafter_Wind_1 Right	Rafter_Wind_2 Left	Rafter_Wind_2 Right	Bracing_Wind Left	Bracing_Wind Right	Long Press	Surface Friction
1	0.80	-0.50	0.80	-0.50	0.80	-0.50	0.00	0.00
2	-0.70	-0.70	-0.70	-0.70	-0.70	-0.70	-0.70	0.00
3	-0.50	0.80	-0.50	0.80	-0.50	0.80	0.00	0.00

COLUMN & BRACING DESIGN LOADS:

Load No	Id	Dead	Dead Coll	Snow/ Live	Rafter_Wind Left	Rafter_Wind Right	Brace_Wind Left	Brace_Wind Right	Long Wind	Column_Wind Press	Column_Wind Suct	Column_Wind Seis	Aux_Load Id	Aux_Load Coef
8	1	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
	2	1.00	0.00	0.50	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0	0.00
	3	1.00	0.00	0.50	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0	0.00
	4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0	0.00
	5	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0	0.00
	6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0	0.00
	7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0	0.00
	8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0	0.00

RAFTER DESIGN LOADS:

No. Load	Id	Dead	Collat	Snow/ Live	Rafter_Wind_1 Left	Rafter_Wind_1 Right	Rafter_Wind_2 Left	Rafter_Wind_2 Right	Seis	Aux_Load Id	Aux_Load Coef
5	1	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0	0.00
	2	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0	0.00
	3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0	0.00

HCI STEEL BUILDING SYSTEMS, INC.				
	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

4	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0	0.00
5	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0	0.00

RIGHT ENDWALL:

BASIC LOADS:

Dead Load	Live Load	Snow Load	Collateral Load	Basic Wind	Wind_Load Ratio
2.5	20.0	25.0	3.0	17.4	1.00

WIND PRESSURE/SUCTION:

Wind Press	Wind Suct	
15.6	-15.6	.. Column
19.5	-19.5	.. Girt/Header
15.6	-15.6	.. Jamb
20.8	-20.8	.. Panel
22.6	-22.6	.. Parapet

WIND COEFFICIENTS:

Surf	Rafter_Wind_1		Rafter_Wind_2		Bracing_Wind		Long	Surface
Id	Left	Right	Left	Right	Left	Right	Press	Friction
1	0.80	-0.50	0.80	-0.50	0.80	-0.50	0.00	0.00
2	-0.70	-0.70	-0.70	-0.70	-0.70	-0.70	-0.70	0.00
3	-0.50	0.80	-0.50	0.80	-0.50	0.80	0.00	0.00

COLUMN & BRACING DESIGN LOADS:

Load		Dead		Snow/	Rafter_Wind		Brace_Wind		Long	Column_Wind			Aux_Load	
No	Id	Dead	Coll	Live	Left	Right	Left	Right	Wind	Press	Suct	Seis	Id	Coef
8	1	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00
	2	1.00	0.00	0.50	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0	0.00
	3	1.00	0.00	0.50	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0	0.00
	4	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0	0.00
	5	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0	0.00
	6	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0	0.00
	7	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0	0.00
	8	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0	0.00

RAFTER DESIGN LOADS:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Design Loads For Each Building Component 2/16/04 9:47am

No. Load			Snow/	Rafter_Wind_1		Rafter_Wind_2			Aux_Load	
Load	Id	Dead	Collat	Live	Left	Right	Left	Right	Seis	Id	Coef
5	1	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0	0.00
	2	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0	0.00
	3	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0	0.00
	4	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0	0.00
	5	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0	0.00

ROOFDES:

BASIC LOADS:

Dead Load	Live Load	Snow Load	Collateral Load	Basic Wind	Wind_Load Ratio	Surface Friction
2.5	20.0	25.0	3.0	17.4	1.00	0.00

WIND PRESSURE/SUCTION:

Wind Press	Wind Suct	Wind Suct_R	
0.0	-17.4		.. Purlins
0.0	-22.6		.. Panels
13.9	-8.7	-12.2	.. Bracing

PURLIN DESIGN LOADS:

Surf Id	No._Des Loads	Load Id	Dead	Collat	Live/ Snow	Wind Press	Wind Suct	Aux Id
2	2	1	1.00	1.00	1.00	0.00	0.00	0
		2	1.00	0.00	0.00	0.00	1.00	0

BRACING DESIGN LOADS:

Surf Id	No._Des Loads	Load Id	Dead	Collat	Live/ Snow	Wind Press	Wind Suct	Aux Id
2	4	1	1.00	0.00	0.00	1.00	1.00	0
		2	1.00	0.00	0.50	1.00	1.00	0
		3	1.00	1.00	1.00	0.50	0.50	0
		4	1.00	1.00	0.00	0.00	0.00	0

RIGID FRAME #1:

BASIC LOADS:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Design Loads For Each Building Component 2/16/04 9:47am

Dead	Live	Snow	Collateral	Basic Wind	Defl Ratio	Seis Load	Weak_Axis_React L_Col	R_Col
2.5	20.0	25.0	3.0	17.4	1.00	0.1	0.3	0.3

WIND COEFFICIENTS:

Surf Id	--Wind_1--- Left	Right	--Wind_2--- Left	Right	Surface Friction
1	0.80	-0.50	0.80	-0.50	0.00
2	-0.70	-0.70	-0.70	-0.70	0.00
3	-0.50	0.80	-0.50	0.80	0.00

DESIGN LOADS:

Load No	Id	Dead	Coll	Live/ Snow	Live Right	-Wind_1-- Lt	Rt	-Wind_2- Lt	Rt	Long_Wind Lt	Rt	-Seismic-- Long	Tran	Aux Id
35	1	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	2	1.00	1.00	0.50	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	3	1.00	1.00	0.50	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	4	1.00	1.00	0.50	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0
	5	1.00	1.00	0.50	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0
	6	1.00	1.00	1.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	7	1.00	1.00	1.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0
	8	1.00	1.00	1.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0
	9	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0
	10	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	11	1.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	12	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0
	13	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0
	14	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0
	15	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0
	16	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0
	17	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0
	18	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0
	19	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.50	0.00	0.00	0.00	0
	20	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0
	21	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.50	0.00	0.00	0
	22	1.00	1.00	0.50	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0
	23	1.00	1.00	0.50	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0
	24	1.00	1.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0
	25	1.00	1.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0
	26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Design Loads For Each Building Component 2/16/04 9:47am

27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0
28	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0
29	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0
30	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0
31	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0
32	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	0
33	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.40	0
34	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	0.00	0
35	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.40	0.00	0

2493 Reactions, Anchor Bolts, & Base Plates 2/16/04 9:47am

Frame Line	Col Line	Max Pos Val Id	Horiz	Vert	Max Neg Val Id	Horiz	Vert	Anc. Bolt No.	Diam	Base Plate Width	Len	Thick
*1	A	1	0.9	1.3	2	-0.9	-1.0	4	0.875	10.00	10.50	0.500
		3	0.6	1.8								
*1	B	4	1.0	-1.2	5	-0.7	1.1	4	0.875	10.00	10.50	0.500
		6	-0.2	1.8	4	1.0	-1.2					

*1 Frame Lines : 1 2

Load Id	Load Combination

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Reactions, Anchor Bolts, & Base Plates 2/16/04 9:47am

1 DL+CO+LL/2+WR2
2 DL+WL1
3 DL+CO+LL+WR1/2
4 DL+WR1
5 DL+CO+LL/2+WL1
6 DL+CO+LL
7 DL+WR1+WS
8 DL+WP
9 DL+CO+SEIS_R

BRACING/PANEL SHEAR REACTIONS:

---Wall--		Col	------Reactions(k)-------				Panel Shear
			----Wind----		--Seismic---		
Loc	Line	Line	Horz	Vert	Horz	Vert	(lb/ft)
L_EW	1	Rigid Frame At Endwall					
F_SW	B	Weak Axis Bending Used					
R_EW	2	Rigid Frame At Endwall					
B_SW	A	Weak Axis Bending Used					

RIGID FRAME COLUMN REACTIONS FROM WEAK AXIS BENDING:

---Wall--		Col	---Reaction(k ,f-k)---			
Loc	Line	Line	Horiz	AB_Vert	Moment	Load_Id
F_SW	B	1	0.3	3.7	2.5	Wind
			0.1	1.7	1.2	Seismic
F_SW	B	2	0.3	3.7	2.5	Wind
			0.1	1.7	1.2	Seismic
B_SW	A	2	0.3	3.1	2.1	Wind
			0.1	1.5	1.0	Seismic
B_SW	A	1	0.3	3.1	2.1	Wind

HCI STEEL BUILDING SYSTEMS, INC.	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

0.1 1.5 1.0 Seismic

==========

2493 Additional Reactions Report 2/16/04 9:47am

==========

Rigid Frame Column Reactions

Frame Line	Col Line	---Dead--- Horiz	Vert	Collateral Horiz	Vert	---Live--- Horiz	Vert	--Live_R-- Horiz	Vert	-Wind_L1- Horiz	Vert
*1	A	0.0	0.3	0.0	0.2	0.2	1.3	0.0	0.0	-1.0	-1.3
*1	B	0.0	0.3	0.0	0.2	-0.2	1.3	0.0	0.0	-0.6	0.0

Frame Line	Col Line	-Wind_R1- Horiz	Vert	-Wind_L2- Horiz	Vert	-Wind_R2- Horiz	Vert	Seismic_L- Horiz	Vert	Seismic_R- Horiz	Vert
*1	A	0.8	0.2	-1.0	-1.3	0.8	0.2	-0.1	-0.1	0.1	0.1
*1	B	1.0	-1.5	-0.6	0.0	1.0	-1.5	-0.1	0.1	0.1	-0.1

Frame Line	Col Line	-LnWind_L- Horiz	Vert	-LnWind_R- Horiz	Vert
*1	A	0.3	-0.6	0.3	-0.6
*1	B	-0.3	-0.6	-0.3	-0.6

*1 Frame Lines : 1 2

Endwall Column Reactions

Frame Line	Col Line	Dead Vert	Collat Vert	Live Vert	-Brc_Wind_L- Horz	Vert	-Brc_Wind_R- Horz	Vert	-Out_Of_Plane- Wind_P Horz	Wind_S Horz

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Additional Reactions Report 2/16/04 9:47am

Endwall Column Reactions

Frame Line	Col Line	-Raf_Wind_L- Horz	Vert	-Raf_Wind_R- Horz	Vert	--Seismic_L- Horz	Vert	--Seismic_R- Horz	Vert

2493 Seismic Design Report 2/16/04 9:47am

Building Data

Code =UBC 97
Length = 16.00
Width = 12.00
Left Eave Height = 8.00
Right Eave Height = 9.00

Seismic Formula

Rigid frame, endwall frame, wind bent, wind column & base reactions
Shear Force, E = Rho*2.5*Ca*Ie*W/(R*1.4)
Diagonal bracing, splice at rigid frame & wind bent knee
Shear Force, Em = Omega*2.5*Ca*Ie*W/R

Note: The value of E is included as E/1.4

Zone = 3
Ca = 0.360

HCI STEEL BUILDING SYSTEMS, INC.				
	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

2493 Seismic Design Report 2/16/04 9:47am

Ie = 1.000

Rho = 2-20/(RMax*SQRT(W*L))

Seismic Dead Load, W

Snow Factor = 0.000

Roof Dead+Collat= 5.50 (psf)

Frame Dead = 2.00 (psf)

Roof	Total	=	7.50 (psf)	, Weight=	1.44	(k)
L_EW	Dead	=	2.00 (psf)	, Weight=	0.10	(k)
R_EW	Dead	=	2.00 (psf)	, Weight=	0.10	(k)
F_SW	Dead	=	2.00 (psf)	, Weight=	0.14	(k)
B_SW	Dead	=	2.00 (psf)	, Weight=	0.13	(k)
				Total =	1.92	(k)

Seismic Forces

Rigid Frames

R = 4.5 , Rho = 1.00, RMax = 0.50, Omega= 1.00

Frame 1 W = 1.68 (k)

Force, E = 0.12 (k)

End Plates

Frame Omega= 2.80

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*=============================================================================
*2493                    Roof Design Input                    2/14/04  5:38pm
*=============================================================================



*----------------------
* < PROGRAM OPERATION >
*----------------------
*
*(1)JOBID: (Max: 60 char)
    '2493'

*(2)PROGRAM OPTIONS:
*    Run      Run      Run
*   Purlin   Panel    Brace
     'Y'      'Y'      'Y'

*(3)DESIGN CODE:
*
*Design  ---Steel_Code---              ---Build---  Seismic
* Code    Cold       Hot       Country  Code   Year   Zone
  'WS'  'AISI96' 'AISC89'     '----'  'UBC '  '97'   '3 '

*(4)DESIGN CONSTANTS:                                          Wind
* -----Steel_Yield(ksi  )----  ------Stress_Ratio------    Lap   Strength
* Purlin  Panel  R_Col  W_Col  Purlin Panel  Wind_Frame   Stiff   Factor
    55.0   50.0   50.0   55.0    1.03  1.03       1.03     0.50   1.3333

*(5)DEFLECTION LIMITS:
* ------Purlin------    ----Extension-----  Facia  ---Panel---  Facia  Wind
* Live    Wind  Total    Live   Wind  Total   Girt  Live   Wind  Panel  Frame
  120.0   90.0    0.0  120.0   90.0    0.0   90.0  90.0   90.0   90.0   80.0

*(6)REPORTS:
*   Input  Purlin  Purlin   Eave   Roof   Cable
*   Echo   Design  Summary  Strut  Panel  Brace
    'I'     'Y'      '2'     'Y'    'Y'    'Y'

*(7)BUILDING TYPE:
* Build  L_Expand_EW  R_Expand_EW  ------Open_Wall-------
* Type   Use  Offset  Use  Offset  L_EW  F_SW  R_EW  B_SW
```

HCI STEEL BUILDING SYSTEMS, INC.	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

'FF-' 'Y ' 15.500 'Y ' 15.500 'N' 'N' 'N' 'N'

*--------------------
* < BUILDING LAYOUT >
*--------------------
*
*(8)BUILDING SHAPE:

* No. Surf	X_Coord (ft)	Y_Coord (ft)
3	0.0000	8.0000
	12.0000	9.0000
	12.0000	0.0000

*(9)WALL BAY SPACING: (Max: 40 bays)

* Wall Id	Sets_Of Bays	Bay Width	No. Bays
1	1	12.0000	1
2	1	16.0000	1
3	1	12.0000	1
4	1	16.0000	1
5	1	16.0000	1

*(10)FRAMED OPENINGS:

* Wall Id	No. Opens	Bay Id	Open Width	Open Height	Open Offset	Open Type
1	0					
2	0					
3	0					
4	0					

*(11)PARTIAL WALLS:

* Wall Id	Set_Of Bays	--Bay_Id-- Start	End	Wall Height	Base Type	Full Load	Use
1	0						
2	0						
3	0						
4	0						

HCI STEEL BUILDING SYSTEMS, INC.	Job No	2493	modify	
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			Checked By	ML

```
*(12)SURFACE EXTENSION/FRAME RECESS:
* Surf  ---Surf_Ext---  Frame_Recess      ----Rafter_Size-----
*  Id    Left    Right   Left    Right    Left         Right
    2   0.0000  0.0000  1.2917  1.2917   'W8x10   '   'W8x10   '

*-------------------
* < FRAMING DESIGN >
*-------------------
*

*(13)PURLINS:
* Surf  Purlin  OS_Flg  IS_Flg    Set       Set_Lap       Max_Unbr
*  Id    Type    Brace   Brace   Depth     Ext    Int      Length
    2    'ZB'     'Y'     'N'    0.000   0.0000  0.0000    0.0000

*(14)PURLIN SPACING:
* Surf   Peak      Max     Set   Set_Of  -Set_Space-
*  Id   Space     Space   Space  Space  Space   No.
    2   0.0000   5.0100  0.0000   0

*(15)PURLIN SIZE:
*   Surf  Set   No.
*    Id   Purl  Purl  Purlin_Size
      2   'N'    0

*(16)PANELS & EAVE STRUT:
*   Panel       Standing  Eave   ---Gutter---    Girt_Depth
*    Size         Seam    Type   F_SW   B_SW    F_SW    B_SW
    'HHR 24  '   'N'     'ZB'   'Y'    'Y'     8.000   8.000

*(17)WIND FRAMING SELECTION:
*        -----------Order_Of_Selection-----------
* Wall   Panel  Diagonal  Wind   Wind   Weak_Axis
*  Id    Shear  Bracing   Bent  Column   Bending
    2     'N'     'N '     'N'    'N'      'Y'
    4     'N'     'N '     'N'    'N'      'Y'
    5     'N'     'N '

*(18)ROOF DIAGONAL BRACING:
*   Max_Pan  Brace   Each  User_Selected_Roof_Bays
*    Shear    Type    EW   No.  Bay_Id
     100.0  'N'       'N'   0
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
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0

*(19)SIDEWALL DIAGONAL BRACING:

* Wall Id	Max_Pan Shear	Brace Type	User_Selected_SW_Bays No.	Bay_Id
2	100.0	'R'	0	
4	100.0	'R'	0	

*(20)WIND BENTS:

*Wall Id	Member Type	Col Depth	Raf Depth	No_Of Bays	Bay_Id
2	'W'	0.00	0.00	0	
4	'W'	0.00	0.00	0	

*(21)WIND COLUMNS:

* Wall Id	--Member-- Type	Depth	No_Of Col	Bay_Id	Left/ Right
2	'W'	0.00	0		
4	'W'	0.00	0		

*(22)WALL BRACING ATTACHMENT

*Wall Id	No_Of Attach	Attach Id	--Bay_Id-- Start	End	No_Of Level	Level_Height
2	1	1	1	1	1	9.0000
4	1	2	1	1	1	8.0000

*(23)EAVE EXTENSIONS SIZE:

*

*Wall Id	No_Of Extend	Ext Id	--Bay_Id-- Start	End	---Extension_Size--- Height	Width	Slope	Edge_Extend Left	Right	Eave Type
2	0									
4	0									

*(24)EAVE EXTENSIONS PURLINS:

*

*Ext Id	Purlin Type	OS_Flg Brace	IS_Flg Brace	Set Depth	Set_Lap Ext	Int	Max_UnBr Length	Peak Space	Max Space	Set Space

*(25)CANOPY SIZE:

*

*Wall	No_Of	Ext	--Bay_Id--	---Extension_Size---	Edge_Extend	Eave

HCI STEEL BUILDING SYSTEMS, INC.

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Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*Id    Extend  Id  Start  End  Height  Width  Slope  Left  Right     Type
  1       0
  2       0
  3       0
  4       0

*(26)CANOPY          PURLINS:
*
*Ext  Purlin OS_Flg IS_Flg   Set      Set_Lap     Max_UnBr  Peak    Max   Set
*Id    Type   Brace  Brace  Depth    Ext    Int    Length   Space  Space Space

*(27)CANOPY PANELS:
*
*Ext  Panel      Standing
*Id   Size         Seam

*(28)FACIA/PARAPET LAYOUT:
*
*Wall  No_Of  Ext       --Bay_Id--     Edge_Extend            Eave   Use
*Id    Extend  Id Type  Start  End     Left    Right   Mount  Type  Gutter
  1       0
  2       0
  3       0
  4       0

*(29)FACIA/PARAPET SIZE:
*
*Ext  ----Extension_Size-----   ---------Facia---------     Arm   Back    Facia
*Id    Height   Width   Slope     Elev   Height   Slope    Slope Slope  Project

*(30)FACIA/PARAPET PURLINS:
*
*Ext  Purlin OS_Flg IS_Flg   Set      Set_Lap     Max_UnBr  Peak    Max   Set
*Id    Type   Brace  Brace  Depth    Ext    Int    Length   Space  Space Space

*(31)FACIA/PARAPET PANELS:
*
*Ext  ---Roof_Panel--  ----Soffit_Panel---  -Front_Panel--   ----Back_Panel-----
*Id   Size      SSeam  Size      Rot Space  Size      SSeam  Size      Rot Space

*(32)EXTENSION BRACING:
*
*Ext   Max_Pan  Brace  User_Selected_Bays
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
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```
Id      Shear   Type    No.  Bay_Id

*(33)BASE ELEVATION:
*   Sidewalls
* Front   Back
   0.00   0.00

*-----------------
* < DESIGN LOADS >
*-----------------
*

*(34)BASIC LOADS:
* Dead Collat Live  Snow  Basic Wind_Ld_Rat Frict Edge_Strip  --Seis_Coef--  %
* Load  Load  Load  Load  Wind  Defl Factor Coef  Width Ratio Frame   Brace Snow
   2.5   3.0  20.0   25.0  17.4 1.00  1.00  0.00  1.200  1.50 0.0574 0.1768 0.00

*(35)WIND PRESSURE/SUCTION: (psf  )
*
*    Wind    Wind    Wind
*    Press   Suct    Suct_R
       0.0  -17.4             .. Purlins
       0.0  -48.6             .. Gable Extension
       0.0  -22.6             .. Panels
      13.9   -8.7    -12.2    .. Bracing

*(36)EXTENSION BASIC LOADS:
*                       ------Purlin_Wind------   -------Panel_Wind--------
*Ext  Dead  Collat Live  Attach_Beam  Facia_Beam   Attach_Beam   Facia_Beam
*Id   Load   Load  Load  Press  Suct  Press  Suct  Press   Suct  Press  Suct

*(37)PURLIN DESIGN LOADS:
*
* Surf  No_Des  Load              Live/  Wind  Wind   Aux_Load
*  Id    Loads   Id   Dead Collat Snow  Press  Suct   Id  Coef
   2       2      1   1.00  1.00  1.00   0.00  0.00    0  0.00
                  2   1.00  0.00  0.00   0.00  1.00    0  0.00

*(38)PURLIN DESIGN LOADS: Deflection
*
* Surf  No_Des  Load              Live/  Wind  Wind   Aux_Load
*  Id    Loads   Id   Dead Collat Snow  Press  Suct   Id  Coef
   2       0
```

HCI STEEL BUILDING SYSTEMS, INC.

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Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

*(39)BRACING DESIGN LOADS:
*

* Surf Id	No_Des Loads	Load Id	Dead	Collat	Live/ Snow	Wind EW	Wind Roof	Seis	Aux_Load Id	Aux_Load Coef
2	4	1	1.00	0.00	0.00	1.00	1.00	0.00	0	0.00
		2	1.00	0.00	0.50	1.00	1.00	0.00	0	0.00
		3	1.00	1.00	1.00	0.50	0.50	0.00	0	0.00
		4	1.00	1.00	0.00	0.00	0.00	1.00	0	0.00

*(40)EXTENSION DESIGN LOADS:
*

*	No_Des Loads	Load Id	Dead	Collat	Live/ Snow	Wind Press	Wind Suct	Aux_Load Id	Aux_Load Coef
	0								

*(41)EXTENSION DESIGN LOADS: Deflection
*

*	No_Des Loads	Load Id	Dead	Collat	Live/ Snow	Wind Press	Wind Suct	Aux_Load Id	Aux_Load Coef
	0								

*(42)AUXILIARY LOADS:

* No. Aux	Aux Id	Aux Name	No._Add Combs	Add_Load Id	Add_Load Coef
0					

*(43)ADDITIONAL LOADS: (F-lb/ft, W-psf, Dx-ft)

* No. Add	Add Id	Surf Id	Basic Load	Load Type |	Fy W1	W2	Dx Dx1	Dx2	- Concentrated - Distributed
0									

*(44)PURLIN LAPS:

*Surf * Id	Data Opt	Sets	------Set_1------- Left	Right Quan	------Set_2------- Left	Right Quan	------Set_3------- Left	Right Quan
2	'-'	0						

*(45)PURLIN LAPS: Extensions
*

*Ext * Id	Data Opt	Sets	------Set_1------- Left	Right Quan	------Set_2------- Left	Right Quan	------Set_3------- Left	Right Quan

*(46)PURLIN STRAPS:

HCI STEEL BUILDING SYSTEMS, INC.	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

```
*          Data  ---Set_1---  ---Set_2---  ---Set_3---  ---Set_4---
*     Opt  Sets  Strap  Quan  Strap  Quan  Strap  Quan  Strap  Quan
      '-'   0

*(47)PURLIN STRAPS: Extensions
*
*Ext       Data  ---Set_1---  ---Set_2---  ---Set_3---  ---Set_4---
* Id  Opt  Sets  Strap  Quan  Strap  Quan  Strap  Quan  Strap  Quan

* Code file used was C:\MBS\CODE\ROOFUBC.97

================================================================================
2493                  Roof Design Code                          2/16/04  9:47am
================================================================================



   STRUCTURAL CODE:
     Design Basis       - WS
     Hot  Rolled Steel - AISC89
     Cold Formed Steel - AISI96

   BUILDING CODE:
     Wind Code     - UBC
     Year          - 97
     Seismic Zone - 3

================================================================================
2493                  Purlin Design Report                      2/16/04  9:47am
================================================================================


                        ------------------------------
                         ROOF PURLIN

                         DESIGN RUN # 1,  SURFACE # 2
                        ------------------------------


PURLIN LAYOUT:

Bay Span  Purlin      Span  Lap_Dist(ft)        No.   No.     Unit     Total
Id   Id    Size      (ft)  Left   Right  Space Row  Brace   Weight   Weight
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Purlin Design Report 2/16/04 9:47am

	1	8Z25U16	1.29		4.01	2	0	3.6	7.1
1	2	8Z25U16	13.42		4.01	2	0	37.0	74.1
	3	8Z25U16	1.29		4.01	2	0	3.6	7.1
								Total(lb)=	88.3

Purlin DL= 0.69 (psf)

LOAD COMBINATION # 1 : DL+CO+LL

PURLIN ANALYSIS:

Span	--------SHEAR(k)--------				-------MOMENT(f-k)-------					
Id	Left Sup	Left Lap	Right Lap	Right Sup	Left Sup	Left Lap	Mid-Span Mom	Mid-Span Loc	Right Lap	Right Sup
1	0.00			-0.16	0.00		0.00	0.00		0.10
2	0.82			-0.82	0.10		-2.64	6.71		0.10
3	0.16			0.00	0.10		0.00	1.29		0.00

STRENGTH/DEFLECTION:

Span	------SHEAR(k)------				-----MOMENT(f-k)----				Mom+Shr		DEFLECTION(in)	
Id	Loc	Calc	Allow	UC	Loc	Calc	Allow	UC	Loc	UC	Calc	Allow
1	RS	-0.16	2.31	0.07	RS	0.10	4.33	0.02	LS	0.00	0.10	
2	RS	-0.82	2.31	0.35	MS	-2.64	4.33	0.61	LS	0.00	-0.32	1.34
3	LS	0.16	2.31	0.07	LS	0.10	4.33	0.02	LS	0.00	0.10	

UNBRACE LENGTHS

Span		----------Minor----------				
Id	Major	LS	LL	MS	RL	RS

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Purlin Design Report 2/16/04 9:47am

2	13.4	13.4	0.0	0.0	0.0	13.4

WEB CRIPPLING:

WEB CRIPPLING RATIO

End	Bearing Width (in) 3	4	5	6	Reqd_Flg_Width For UC= 1.03
Left	0.70	0.63	0.56	0.51	2.1
Right	0.70	0.63	0.56	0.51	2.1

LOAD COMBINATION # 2 : DL+WS

PURLIN ANALYSIS:

Span Id	SHEAR(k) Left Sup	Left Lap	Right Lap	Right Sup	MOMENT(f-k) Left Sup	Left Lap	Mid-Span Mom	Mid-Span Loc	Right Lap	Right Sup
1	0.00			0.08	0.00		0.00	0.00		-0.05
2	-0.44			0.44	-0.05		1.32	6.71		-0.05
3	-0.08			0.00	-0.05		0.00	1.29		0.00

STRENGTH/DEFLECTION:

Span Id	SHEAR(k) Loc	Calc	Allow	UC	MOMENT(f-k) Loc	Calc	Allow	UC	Mom+Shr Loc	UC	DEFLECTION(in) Calc	Allow
1	RS	0.08	3.08	0.03	RS	-0.05	5.77	0.01	LS	0.00	-0.07	
2	RS	0.44	3.08	0.14	MS	1.32	2.89	0.46	LS	0.00	0.23	1.79
3	LS	-0.08	3.08	0.03	LS	-0.05	5.77	0.01	LS	0.00	-0.07	

UNBRACE LENGTHS

HCI STEEL BUILDING SYSTEMS, INC.				
	Job No	2493	**modify**	
	Customer	ENVIROCON INC.	**Date**	2/16/2004
	Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
			Checked By	ML

2493 Purlin Design Report 2/16/04 9:47am

Span Id	Major	Minor LS	LL	MS	RL	RS
2	13.4	0.0	13.4	13.4	13.4	0.0

2493 Roof Panel Report 2/16/04 9:47am

ROOF PANEL DATA:

Panel: HHR 24 ; Type = HR ; Gage = 24.00 ; Yield = 50.0

MOMENTS & DEFLECTIONS:

Surf Id	Purlin Space	Load Id	Moment (ft-lb/ft) Support Calc	Allow	Ratio	Midspan Calc	Allow	Ratio	Deflect(in) Calc	Allow	Ratio
2	4.014	D+L	44.0	148.3	0.30	-35.2	141.1	0.25	-0.05	0.535	0.09
		D+WP	4.0	197.7	0.02	-3.2	188.1	0.02	0.00	0.535	0.00
		D+WS	-32.4	188.1	0.17	25.9	197.7	0.13	0.04	0.535	0.08

2493 Roof Diagonal Bracing Report 2/16/04 9:47am

PANEL SHEAR:

Allow = 0.0

Calc = 0.0

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Sidewall Diagonal Bracing Report 2/16/04 9:47am

2493 Sidewall Diagonal Bracing Report 2/16/04 9:47am

PANEL SHEAR:

Wall Id	Calc	Allow
2	37.1	100.0
4	35.0	100.0

2493 Weak Axis Bending Report 2/16/04 9:47am

Wall Id: 2
- Design Force (k) : Wind= 0.30, Seismic= 0.14
- Flange Size (in) : 12.00 x 0.750
- Moment(f-k)
  - Calc: 2.47 Allow: 156.00
- Deflection(in)
  - Calc: 0.02 Allow: 1.25

Wall Id: 4
- Design Force (k) : Wind= 0.28, Seismic= 0.14
- Flange Size (in) : 12.00 x 0.750
- Moment(f-k)
  - Calc: 2.05 Allow: 156.00
- Deflection(in)
  - Calc: 0.01 Allow: 1.10

2493 Front Sidewall Eave Strut Report 2/16/04 9:47am

Wall	Bay	Eave	Load	----Axial(k)----	--Moment(f-k)--	Axl+Mom

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Front Sidewall Eave Strut Report 2/16/04 9:47am

Id	Id	Size	Id	Calc	Allow	UC	Calc	Allow	UC	UC
2	1	8Z25U16	1	0.36	8.28	0.04	0.42	4.04	0.10	0.13
			2	0.36	8.28	0.04	-0.12	5.77	0.02	0.06
			3	0.18	8.28	0.02	-1.05	5.77	0.18	0.18
			4	0.17	8.28	0.02	-0.24	5.77	0.04	0.06

2493 Purlin Design Report 2/16/04 9:47am

EAVE STRUT

WALL #2

PURLIN LAYOUT:

Bay Id	Span Id	Purlin Size	Span (ft)	Lap_Dist(ft) Left	Right	Space	No. Row	No. Brace	Unit Weight	Total Weight
	1	8Z25U16	1.29			2.01	1	0	3.6	3.6
1	2	8Z25U16	13.42			2.01	1	0	37.0	37.0
	3	8Z25U16	1.29			2.01	1	0	3.6	3.6
								Total(lb)=		44.2

Purlin DL= 1.38 (psf)

LOAD COMBINATION # 1 : DL+CO+LL

PURLIN ANALYSIS:

HCI STEEL BUILDING SYSTEMS. INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Purlin Design Report 2/16/04 9:47am

Span Id	SHEAR(k) Left Sup	SHEAR(k) Left Lap	SHEAR(k) Right Lap	SHEAR(k) Right Sup	MOMENT(f-k) Left Sup	MOMENT(f-k) Left Lap	MOMENT(f-k) Mid-Span Mom	MOMENT(f-k) Mid-Span Loc	MOMENT(f-k) Right Lap	MOMENT(f-k) Right Sup
1	0.00		-0.08	0.00		0.00	0.00			0.05
2	0.41		-0.41	0.05		-1.32	6.71			0.05
3	0.08		0.00	0.05		0.00	1.29			0.00

STRENGTH/DEFLECTION:

Span Id	SHEAR(k) Loc	SHEAR(k) Calc	SHEAR(k) Allow	SHEAR(k) UC	MOMENT(f-k) Loc	MOMENT(f-k) Calc	MOMENT(f-k) Allow	MOMENT(f-k) UC	Mom+Shr Loc	Mom+Shr UC	DEFLECTION(in) Calc	DEFLECTION(in) Allow
1	RS	-0.08	2.31	0.03	RS	0.05	4.33	0.01	LS	0.00	0.05	
2	RS	-0.41	2.31	0.18	MS	-1.32	4.33	0.30	LS	0.00	-0.16	1.34
3	LS	0.08	2.31	0.03	LS	0.05	4.33	0.01	LS	0.00	0.05	

UNBRACE LENGTHS

Span Id	Major	Minor LS	Minor LL	Minor MS	Minor RL	Minor RS
2	13.4	13.4	0.0	0.0	0.0	13.4

LOAD COMBINATION # 2 : DL+WS

PURLIN ANALYSIS:

Span Id	SHEAR(k) Left Sup	SHEAR(k) Left Lap	SHEAR(k) Right Lap	SHEAR(k) Right Sup	MOMENT(f-k) Left Sup	MOMENT(f-k) Left Lap	MOMENT(f-k) Mid-Span Mom	MOMENT(f-k) Mid-Span Loc	MOMENT(f-k) Right Lap	MOMENT(f-k) Right Sup
1	0.00			0.06	0.00		0.00	0.00		-0.04
2	-0.32			0.32	-0.04		1.03	6.71		-0.04

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Purlin Design Report 2/16/04 9:47am

3	-0.06	0.00	-0.04	0.00	1.29	0.00		

STRENGTH/DEFLECTION:

Span	------SHEAR(k)------				-----MOMENT(f-k)----				Mom+Shr		DEFLECTION(in)	
Id	Loc	Calc	Allow	UC	Loc	Calc	Allow	UC	Loc	UC	Calc	Allow
1	RS	0.06	3.08	0.02	RS	-0.04	5.77	0.01	LS	0.00	-0.05	
2	RS	0.32	3.08	0.10	MS	1.03	4.04	0.25	LS	0.00	0.17	1.79
3	LS	-0.06	3.08	0.02	LS	-0.04	5.77	0.01	LS	0.00	-0.05	

UNBRACE LENGTHS

Span		----------Minor----------				
Id	Major	LS	LL	MS	RL	RS
2	13.4	0.0	13.4	13.4	13.4	0.0

2493 Back Sidewall Eave Strut Report 2/16/04 9:47am

Wall Id	Bay Id	Eave Size	Load Id	----Axial(k)---- Calc	Allow	UC	--Moment(f-k)-- Calc	Allow	UC	Axl+Mom UC
4	1	8Z25U16	1	0.34	8.28	0.04	0.42	4.04	0.10	0.13
			2	0.34	8.28	0.04	-0.12	5.77	0.02	0.06
			3	0.17	8.28	0.02	-1.05	5.77	0.18	0.18
			4	0.17	8.28	0.02	-0.24	5.77	0.04	0.06

2493 Purlin Design Report 2/16/04 9:47am

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Purlin Design Report 2/16/04 9:47am

EAVE STRUT

WALL #4

PURLIN LAYOUT:

Bay Id	Span Id	Purlin Size	Span (ft)	Lap_Dist(ft) Left	Lap_Dist(ft) Right	Space	No. Row	No. Brace	Unit Weight	Total Weight
	1	8Z25U16	1.29			2.01	1	0	3.6	3.6
1	2	8Z25U16	13.42			2.01	1	0	37.0	37.0
	3	8Z25U16	1.29			2.01	1	0	3.6	3.6
										44.2

Total(lb)= 44.2

Purlin DL= 1.38 (psf)

LOAD COMBINATION # 1 : DL+CO+LL

PURLIN ANALYSIS:

Span Id	SHEAR(k) Left Sup	SHEAR(k) Left Lap	SHEAR(k) Right Lap	SHEAR(k) Right Sup	MOMENT(f-k) Left Sup	MOMENT(f-k) Left Lap	MOMENT(f-k) Mid-Span Mom	MOMENT(f-k) Mid-Span Loc	MOMENT(f-k) Right Lap	MOMENT(f-k) Right Sup
1	0.00		-0.08		0.00		0.00	0.00		0.05
2	0.41		-0.41		0.05		-1.32	6.71		0.05
3	0.08		0.00		0.05		0.00	1.29		0.00

STRENGTH/DEFLECTION:

Span Id	SHEAR(k) Loc	SHEAR(k) Calc	SHEAR(k) Allow	SHEAR(k) UC	MOMENT(f-k) Loc	MOMENT(f-k) Calc	MOMENT(f-k) Allow	MOMENT(f-k) UC	Mom+Shr Loc	Mom+Shr UC	DEFLECTION(in) Calc	DEFLECTION(in) Allow

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Purlin Design Report 2/16/04 9:47am

1	RS	-0.08	2.31	0.03	RS	0.05	4.33	0.01	LS	0.00	0.05	
2	RS	-0.41	2.31	0.18	MS	-1.32	4.33	0.30	LS	0.00	-0.16	1.34
3	LS	0.08	2.31	0.03	LS	0.05	4.33	0.01	LS	0.00	0.05	

UNBRACE LENGTHS

Span Id	Major	Minor LS	Minor LL	Minor MS	Minor RL	Minor RS
2	13.4	13.4	0.0	0.0	0.0	13.4

LOAD COMBINATION # 2 : DL+WS

PURLIN ANALYSIS:

Span Id	SHEAR(k) Left Sup	SHEAR(k) Left Lap	SHEAR(k) Right Lap	SHEAR(k) Right Sup	MOMENT(f-k) Left Sup	MOMENT(f-k) Left Lap	MOMENT(f-k) Mid-Span Mom	MOMENT(f-k) Mid-Span Loc	MOMENT(f-k) Right Lap	MOMENT(f-k) Right Sup
1	0.00			0.06	0.00		0.00	0.00		-0.04
2	-0.32			0.32	-0.04		1.03	6.71		-0.04
3	-0.06			0.00	-0.04		0.00	1.29		0.00

STRENGTH/DEFLECTION:

Span Id	SHEAR(k) Loc	SHEAR(k) Calc	SHEAR(k) Allow	SHEAR(k) UC	MOMENT(f-k) Loc	MOMENT(f-k) Calc	MOMENT(f-k) Allow	MOMENT(f-k) UC	Mom+Shr Loc	Mom+Shr UC	DEFLECTION(in) Calc	DEFLECTION(in) Allow
1	RS	0.06	3.08	0.02	RS	-0.04	5.77	0.01	LS	0.00	-0.05	
2	RS	0.32	3.08	0.10	MS	1.03	4.04	0.25	LS	0.00	0.17	1.79
3	LS	-0.06	3.08	0.02	LS	-0.04	5.77	0.01	LS	0.00	-0.05	

UNBRACE LENGTHS

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Purlin Design Report 2/16/04 9:47am

Span Id	Major	Minor LS	LL	MS	RL	RS
2	13.4	0.0	13.4	13.4	13.4	0.0

2493 Strut Bolt Report 2/16/04 9:47am

EAVE STRUTS:

Wall Id	Frm_Line Id	Type	Bolt_Selected No	Type	Diam	Wshr	Bolt_Capacity Calc	Allow	Ratio
2	1	RF	2	A325	0.500	1 **	0.36	4.70	0.08
2	2	RF	2	A325	0.500	1 **	0.36	4.70	0.08
4	1	RF	2	A325	0.500	1 **	0.34	4.70	0.07
4	2	RF	2	A325	0.500	1 **	0.34	4.70	0.07

**NOTE : Not standard bolt connection

2493 Roof Design Weight Summary 2/16/04 9:47am

Roof Purlins	=	88.32
Eave Struts	=	88.32
Total	=	176.64

2493 Roof Design Warning Report 2/16/04 9:47am

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

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2493 Roof Design Warning Report 2/16/04 9:47am

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.. No Warnings

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*=============================================================================
*2493                    Sidewall Design Input                  2/16/04   9:28am
*=============================================================================



*(1)JOBID:
    '2493'

*(2)PROGRAM OPTIONS:
*Sidewall  Run     Run     Lap
*   Id     Girt    Panel Stiff
   'F'      'Y'    'Y'    0.50

*(3)DESIGN CODE:
*
*Design  ---Steel_Code---              ---Build---  Seismic
* Code   Cold       Hot       Country  Code   Year   Zone
  'WS'  'AISI96' 'AISC89'     '----'  'UBC '  '97'   '3 '

*(4)DESIGN CONSTANTS:
*                                          Wind
* ---Steel_Yield(ksi  )--   Stress_Ratio  Strength
* C-Sec  W-Sec R-Sec Panel  Girt    Panel   Factor
   55.0  50.0  50.0  50.0   1.03     1.03   1.3333

*(5)DEFLECTION LIMITS:
*
* ---Girt---  --Panel---  Part
* Wall Facia  Wall Facia  Wall
   90.   90.   90.   90.   90.

*(6) REPORTS:
*   Input  Wall  Door  Wall
*   Echo   Girt  Jamb  Panel
    'I'    '2'   'Y'   'Y'

*(7)BUILDING TYPE:
* Build    L_Expand_EW  R_Expand_EW
*  Type    Use  Offset  Use  Offset
  'FF-'    'Y ' 15.500  'Y ' 15.500
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

*(8)BUILDING SHAPE:

* No. Surf	X-Coord (ft)	Y-Coord (ft)	Offset (in)
3	0.0000	8.0000	8.000
	12.0000	9.0000	8.000
	12.0000	0.0000	8.000

*(9)SIDEWALL BAY SPACING: (Max: 40 bays)

* Sets_Of Bays	Bay Width	No. Bays
1	16.0000	1

*(10)FRAMED OPENINGS:

* No. Open	Bay Id	Open Width	Open Height	Open Offset	Open Type	Sill Height	Base Elev	Set Depth	Member Select	Remove Panels
0										

*(11)PARTIAL WALLS:

* Set_Of Bays	Base Type	Full Load	--Bay_Id-- Start	End	Wall Height
0					

*(12)GIRT DESIGN:

* Girt Type	In_Flg Brace	Set Depth	Set Lap	Max Space	Max_Unbr Length
'ZB'	'N'	8.000	0.0000	7.3333	10.0000

*(13)GIRT LOCATION:

* Set Loc	No. Girt	Girt Location
'Y'	1	3.3333

*(14)SPECIAL GIRT:

* Sets_Of Girts	--Bay_Id-- Start	End	Girt Height	Girt Type	Girt Rotate
0					

*(15)WALL PANELS/GUTTERS:

* Wall Panel	-----Gutter----- Use	Type	Width
'HHR 24	' '-'	'Y'	0.000

HCI STEEL BUILDING SYSTEMS, INC.				
	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

*(16)FACIA/PARAPET:
*
* No_Of -Location Edge_Extend
* Diff Ext Facia Bay Bay Left Right Ext
* Ext Id Type Start End Elev Height (ft) (ft) Mount
0

*(17)FACIA/PARAPET GIRTS:
*
*Ext ----Top---- --Interior- ---Gutter-- ---Back_Panel--- Angle
*Id Type Rotate Type Rotate Type Rotate Part Rotate Spacing

*(18)BASIC LOADS:
* --Edge_Strip_Zone--
* Basic Wind_Load_Ratio Girt Panel
* Wind Deflect Factor Width Ratio Ratio
17.4 1.00 1.00 0.000 1.00 1.00

*(19)WIND PRESSURE/SUCTION:
* Wind Wind
* Pressure Suction
19.5 -19.5 .. Girt/Header
20.8 -20.8 .. Panel
15.6 -15.6 .. Jamb
22.6 -22.6 .. Parapet Girt

*(20)GIRT LAPS:
*
* Data ------Set_1------- ------Set_2------- ------Set_3-------
* Opt Sets Left Right Quan Left Right Quan Left Right Quan
'-' 0

*(21)GIRT STRAPS:
*
* Data ---Set_1--- ---Set_2--- ---Set_3--- ---Set_4---
*Opt Sets Strap Quan Strap Quan Strap Quan Strap Quan
'-' 0

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

==========

2493 Sidewall Design Code 2/16/04 9:47am

==========

STRUCTURAL CODE:

Design Basis - WS

Hot Rolled Steel - AISC89

Cold Formed Steel - AISI96

BUILDING CODE:

Wind Code - UBC

Year - 97

Seismic Zone - 3

MODULUS OF ELASTICITY

Hot Rolled Steel - 29000

Cold Formed Steel - 29500

==========

2493 Girt Design Report 2/16/04 9:47am

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GIRT: LEVEL # 1 ; SPAN # 1

GIRT LAYOUT:

Bay Id	Girt Size	Bay Width	Lap Dist(ft) Left	Lap Dist(ft) Right	Girt Location	No. Brace	Girt Weight
1	8Z25U16	13.42			3.3333	0	37.0
							37.0

WIND PRESSURE :

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

==========

2493 Girt Design Report 2/16/04 9:47am

==========

GIRT ANALYSIS:

Bay	SHEAR(k) Left Sup	SHEAR(k) Left Lap	SHEAR(k) Right Lap	SHEAR(k) Right Sup	MOMENT(f-k) Left Sup	MOMENT(f-k) Left Lap	MOMENT(f-k) Mid-Span Mom	MOMENT(f-k) Mid-Span Loc	MOMENT(f-k) Right Lap	MOMENT(f-k) Right Sup
1	0.55			-0.55	0.00		-1.83	6.71		0.00

STRENGTH/DEFLECTION:

Span Id	SHEAR(k) Loc	SHEAR(k) Calc	SHEAR(k) Allow	SHEAR(k) UC	MOMENT(f-k) Loc	MOMENT(f-k) Calc	MOMENT(f-k) Allow	MOMENT(f-k) UC	Mom+Shr Loc	Mom+Shr UC	DEFLECTION(in) Calc	DEFLECTION(in) Allow
1	LS	0.55	3.08	0.18	MS	-1.83	5.77	0.32	LS	0.00	-0.27	1.79

UNBRACE LENGTHS

Bay Id	Major	Minor LS	Minor LL	Minor MS	Minor RL	Minor RS
1	13.4	13.4	0.0	0.0	13.4	13.4

WIND SUCTION :

GIRT ANALYSIS:

Bay	SHEAR(k) Left Sup	SHEAR(k) Left Lap	SHEAR(k) Right Lap	SHEAR(k) Right Sup	MOMENT(f-k) Left Sup	MOMENT(f-k) Left Lap	MOMENT(f-k) Mid-Span Mom	MOMENT(f-k) Mid-Span Loc	MOMENT(f-k) Right Lap	MOMENT(f-k) Right Sup
1	-0.55			0.55	0.00		1.83	6.71		0.00

STRENGTH/DEFLECTION:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Girt Design Report 2/16/04 9:47am

Span Id	SHEAR(k) Loc	Calc	Allow	UC	MOMENT(f-k) Loc	Calc	Allow	UC	Mom+Shr Loc	UC	DEFLECTION(in) Calc	Allow
1	LS	-0.55	3.08	0.18	MS	1.83	2.89	0.63	LS	0.00	0.27	1.79

UNBRACE LENGTHS

Bay Id	Major	Minor LS	LL	MS	RL	RS
1	13.4	13.4	13.4	13.4	0.0	13.4

2493 Wall Panel Report 2/16/04 9:47am

PANEL REACTIONS: (Front Sidwall, Bay= 1)

Panel: HHR 24 ; Type = HR ; Gage = 24.00 ; Yield = 50

MOMENTS & DEFLECTION:

Span Id	Span (ft)	LD Id	Moment(ft-lb/ft) Support Calc	Allow	UC	Midspan Calc	Allow	UC	Deflect(in) Calc	Allow	UC
1	3.33	WP	50.6	197.7	0.26	-9.1	188.1	0.05	0.00	0.44	0.00
		WS	-50.6	188.1	0.27	9.1	197.7	0.05	0.00	0.44	0.00
2	5.00	WP	50.6	197.7	0.26	-42.2	188.1	0.22	-0.10	0.67	0.15
		WS	-50.6	188.1	0.27	42.2	197.7	0.21	0.10	0.67	0.15

2493 Weight Summary 2/16/04 9:47am

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Weight Summary 2/16/04 9:47am

Girts = 37.03
Frame Openings = 0.00

37.03

2493 Sidewall Design Warning Report 2/16/04 9:47am

.. No Warnings

HCI STEEL BUILDING SYSTEMS. INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*2493                    Sidewall Design Input                    2/16/04   9:28am
*=============================================================================


*(1)JOBID:
    '2493'

*(2)PROGRAM OPTIONS:
*Sidewall  Run     Run     Lap
*   Id     Girt    Panel Stiff
   'B'      'Y'    'Y'    0.50

*(3)DESIGN CODE:
*
*Design  ---Steel_Code---              ---Build---  Seismic
* Code   Cold       Hot       Country  Code   Year   Zone
  'WS'  'AISI96' 'AISC89'     '----'  'UBC '  '97'   '3 '

*(4)DESIGN CONSTANTS:
*                                                  Wind
* ---Steel_Yield(ksi  )--   Stress_Ratio  Strength
* C-Sec  W-Sec R-Sec Panel  Girt   Panel   Factor
   55.0  50.0  50.0  50.0   1.03    1.03   1.3333

*(5)DEFLECTION LIMITS:
*
* ---Girt---  --Panel---  Part
* Wall Facia  Wall Facia  Wall
   90.   90.   90.   90.   90.

*(6) REPORTS:
*   Input  Wall  Door  Wall
*   Echo   Girt  Jamb  Panel
    'I'    '2'   'Y'   'Y'

*(7)BUILDING TYPE:
* Build    L_Expand_EW  R_Expand_EW
*  Type    Use  Offset  Use  Offset
  'FF-'    'Y ' 15.500  'Y ' 15.500
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

(8)BUILDING SHAPE:

* No. Surf	X-Coord (ft)	Y-Coord (ft)	Offset (in)
3	0.0000	8.0000	8.000
	12.0000	9.0000	8.000
	12.0000	0.0000	8.000

*(9)SIDEWALL BAY SPACING: (Max: 40 bays)

* Sets_Of Bays	Bay Width	No. Bays
1	16.0000	1

*(10)FRAMED OPENINGS:

* No. Open	Bay Id	Open Width	Open Height	Open Offset	Open Type	Sill Height	Base Elev	Set Depth	Member Select	Remove Panels
0										

*(11)PARTIAL WALLS:

* Set_Of Bays	Base Type	Full Load	--Bay_Id-- Start	End	Wall Height
0					

*(12)GIRT DESIGN:

* Girt Type	In_Flg Brace	Set Depth	Set Lap	Max Space	Max_Unbr Length
'ZB'	'N'	8.000	0.0000	7.3333	10.0000

*(13)GIRT LOCATION:

* Set Loc	No. Girt	Girt Location
'Y'	1	3.3333

*(14)SPECIAL GIRT:

* Sets_Of Girts	--Bay_Id-- Start	End	Girt Height	Girt Type	Girt Rotate
0					

*(15)WALL PANELS/GUTTERS:

* Wall Panel	-----Gutter----- Use	Type	Width
'HHR 24 '	'-'	'Y'	0.000

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*(16)FACIA/PARAPET:
*
* No_Of           -Location                    Edge_Extend
* Diff  Ext Facia  Bay  Bay                   Left    Right    Ext
* Ext   Id  Type   Start End   Elev  Height    (ft)     (ft)   Mount
   0

*(17)FACIA/PARAPET GIRTS:
*
*Ext ----Top----  --Interior-  ---Gutter--  ---Back_Panel---  Angle
*Id  Type Rotate  Type Rotate  Type Rotate    Part   Rotate  Spacing

*(18)BASIC LOADS:
*                            --Edge_Strip_Zone--
*  Basic   Wind_Load_Ratio          Girt   Panel
*  Wind    Deflect  Factor   Width  Ratio  Ratio
    17.4    1.00     1.00    0.000  1.00   1.00

*(19)WIND PRESSURE/SUCTION:
*     Wind      Wind
*    Pressure  Suction
     19.5      -19.5     .. Girt/Header
     20.8      -20.8     .. Panel
     15.6      -15.6     .. Jamb
     22.6      -22.6     .. Parapet Girt

*(20)GIRT LAPS:
*
*      Data  ------Set_1-------  ------Set_2-------  ------Set_3-------
* Opt  Sets  Left    Right Quan  Left    Right Quan  Left    Right Quan
  '-'   0

*(21)GIRT STRAPS:
*
*     Data  ---Set_1---  ---Set_2---  ---Set_3---  ---Set_4---
*Opt  Sets  Strap  Quan  Strap  Quan  Strap  Quan  Strap  Quan
 '-'   0
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Sidewall Design Code 2/16/04 9:47am

STRUCTURAL CODE:
- Design Basis - WS
- Hot Rolled Steel - AISC89
- Cold Formed Steel - AISI96

BUILDING CODE:
- Wind Code - UBC
- Year - 97
- Seismic Zone - 3

MODULUS OF ELASTICITY
- Hot Rolled Steel - 29000
- Cold Formed Steel - 29500

2493 Girt Design Report 2/16/04 9:47am

GIRT: LEVEL # 1 ; SPAN # 1

GIRT LAYOUT:

Bay Id	Girt Size	Bay Width	Lap Dist(ft) Left	Lap Dist(ft) Right	Girt Location	No. Brace	Girt Weight
1	8Z25U16	13.42			3.3333	0	37.0
							37.0

WIND PRESSURE :

HCI STEEL BUILDING SYSTEMS. INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Girt Design Report 2/16/04 9:47am

GIRT ANALYSIS:

Bay	SHEAR(k) Left Sup	SHEAR(k) Left Lap	SHEAR(k) Right Lap	SHEAR(k) Right Sup	MOMENT(f-k) Left Sup	MOMENT(f-k) Left Lap	MOMENT(f-k) Mid-Span Mom	MOMENT(f-k) Mid-Span Loc	MOMENT(f-k) Right Lap	MOMENT(f-k) Right Sup
Id										
1	0.48			-0.48	0.00		-1.61	6.71		0.00

STRENGTH/DEFLECTION:

Span Id	SHEAR(k) Loc	SHEAR(k) Calc	SHEAR(k) Allow	SHEAR(k) UC	MOMENT(f-k) Loc	MOMENT(f-k) Calc	MOMENT(f-k) Allow	MOMENT(f-k) UC	Mom+Shr Loc	Mom+Shr UC	DEFLECTION(in) Calc	DEFLECTION(in) Allow
1	LS	0.48	3.08	0.16	MS	-1.61	5.77	0.28	LS	0.00	-0.24	1.79

UNBRACE LENGTHS

Bay Id	Major	Minor LS	Minor LL	Minor MS	Minor RL	Minor RS
1	13.4	13.4	0.0	0.0	13.4	13.4

WIND SUCTION :

GIRT ANALYSIS:

Bay	SHEAR(k) Left Sup	SHEAR(k) Left Lap	SHEAR(k) Right Lap	SHEAR(k) Right Sup	MOMENT(f-k) Left Sup	MOMENT(f-k) Left Lap	MOMENT(f-k) Mid-Span Mom	MOMENT(f-k) Mid-Span Loc	MOMENT(f-k) Right Lap	MOMENT(f-k) Right Sup
Id										
1	-0.48			0.48	0.00		1.61	6.71		0.00

STRENGTH/DEFLECTION:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Girt Design Report 2/16/04 9:47am

Span Id	SHEAR(k) Loc	Calc	Allow	UC	MOMENT(f-k) Loc	Calc	Allow	UC	Mom+Shr Loc	UC	DEFLECTION(in) Calc	Allow
1	LS	-0.48	3.08	0.16	MS	1.61	2.89	0.56	LS	0.00	0.24	1.79

UNBRACE LENGTHS

Bay Id	Major	Minor LS	LL	MS	RL	RS
1	13.4	13.4	13.4	13.4	0.0	13.4

2493 Wall Panel Report 2/16/04 9:47am

PANEL REACTIONS: (Back Sidwall, Bay= 1)

Panel: HHR 24 ; Type = HR ; Gage = 24.00 ; Yield = 50

MOMENTS & DEFLECTION:

Span Id	Span (ft)	LD Id	Moment(ft-lb/ft) Support Calc	Allow	UC	Midspan Calc	Allow	UC	Deflect(in) Calc	Allow	UC
1	3.33	WP	35.8	197.7	0.18	-13.8	188.1	0.07	-0.01	0.44	0.02
		WS	-35.8	188.1	0.19	13.8	197.7	0.07	0.01	0.44	0.02
2	4.00	WP	35.8	197.7	0.18	-25.6	188.1	0.14	-0.04	0.53	0.07
		WS	-35.8	188.1	0.19	25.6	197.7	0.13	0.04	0.53	0.07

2493 Weight Summary 2/16/04 9:47am

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

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2493 Weight Summary 2/16/04 9:47am

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==========

Girts = 37.03
Frame Openings = 0.00

37.03

==========

2493 Sidewall Design Warning Report 2/16/04 9:47am

==========

.. No Warnings

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*========================================================================
*2493                  Endwall Design Input                  2/16/04   9:28am
*========================================================================


*(1)JOBID: (Max: 60 char)
    '2493'

*(2)PROGRAM OPTIONS:
* EW    Run    Run  Run   Run   No_Des  Lap
* Id  Col/Raf Girt Brace Panel Cycles Stiff
  'L'   'Y'    'Y'  'N'   'Y'      4   0.50

*(3)DESIGN CODE:
*
*Design  ---Steel_Code---            ---Build---  Seismic
* Code   Cold       Hot      Country  Code   Year   Zone
  'WS'  'AISI96' 'AISC89'    '----'  'UBC '  '97'   '3 '

*(4)DESIGN CONSTANTS:                                                  Wind
* ---------------Steel_Yield(ksi  )--------------  ---Stress_Ratio---  Strength
* Web   Flg  C-Sec W-Sec R-Sec  U-Sec   EP  Panel  Col/Raf Girt Panel   Factor
 50.0  55.0   55.0  50.0  50.0   36.0  55.0  50.0    1.03  1.03  1.03   1.3333

*(5)DEFLECTION LIMITS:
* -----Rafter-----          ---Girt---  --Panel---  Part  Wind
* Live  Wind Total  Column  Wall Facia  Wall Facia  Wall  Bent
  120.   90.    0.    90.    90.   90.   90.   90.   90.   80.

*(6)REPORTS:
*   Input  Column  Wall  Door  Wall   Cable
*   Echo   Rafter  Girt  Jamb  Panel  Brace
    'I'     '3'    '2'   'Y'   'Y'    'Y'

*(7)BUILDING TYPE:
* Build      Build      Build    Expand_EW
*  Type      Width      Length   Use  Offset
  'FF-'    12.0000    16.0000   'Y '  15.50

*(8)SURFACE SHAPE:
*  No.     X-Coord  Y-Coord   Offset
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*  Surf       (ft)       (ft)       (in)
     3       0.0000     8.0000     8.000
            12.0000     9.0000     8.000
            12.0000     0.0000     8.000


*(9)BAY SPACING:
*    Roof     Frame   |  Sets_Of    Bay    No.
*    Bay      Recess  |    Bays    Width  Bays
     1.2917   1.0000         1   12.0000     1


*(10)FRAMED OPENINGS:
*  No.  Bay   Open     Open      Open    Open    Sill    Base     Set   Member Remove
* Open  Id    Width    Height    Offset  Type    Height  Elev     Depth Select Panels
     0

*(11)PARTIAL WALLS:
* Set_Of  Base  Full    --Bay_Id--     Wall
*  Bays   Type  Load    Start  End     Height
      0

*(12)COLUMNS:
* --Left_Corner-- -Right_Corner--  -Int_Facia-- Int_No_Facia      Max_UnBr Base
* Type  Rot Depth  Type  Rot Depth  Type  Depth  Type  Depth Same Length   Elev
*             (in)             (in)         (in)          (in)  Dep   (ft)    (in)
  'R    ' '-'  0.00 'R    ' '-'  0.00 'R    '  0.00 'R    '  0.00 'N'  83.333   0.000

*(13)COLUMN SIZE:
*    Set        No.    Column
*  Member    Column    Size
     'N'

*(14)RAFTERS:
* Rafter     Set     Rafter Flange
* Select    Depth     Same    Brace
   'R    '   0.000     'Y'     'Y'

*(15)RAFTERS SIZE:
*    Set        No.    Rafter
*  Member    Rafter    Size
     'N'
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

(16)RAFTER SPLICES:

* Surf Id	No. Splice	Splice Loc.	Splice Type
2	0		

*(17)GIRT DESIGN:

* Girt Type	In_Flg Brace	Set Depth	Set Lap	Max Space	Girt_To Rafter	One_Girt Depth/Bay	Max_Unbr Length
'ZB'	'N'	8.000	0.0000	7.3333	'N'	'Y'	10.0000

*(18)GIRT LOCATION:

* Set Loc	No. Girt	Girt Location
'Y'	1	3.3333

*(19)SPECIAL GIRT:

* Sets_Of Girts	--Bay_Id-- Start	End	Girt Height	Girt Type	Girt Rotate
0					

*(20)ROOF PURLINS:

* Surf Id	Peak Space	Purl Space	No. Purlin	Surf Ext
2	0.000	4.014	2	0.000

*(21)PANELS:

* Wall Panel
'HHR 24 '

*(22)WIND FRAMING SELECTION:

* -----Order_Of_Selection------			
* Panel Shear	Diagonal Bracing	Wind Bent	Wind Column
'N'	'N'	'N'	'N'

*(23)WALL BRACING:

* Wind Shear	Brace Type	No._Bays Specified	Specified Bays_For_Bracing
100.0	'R '	0	

*(24)WIND BENTS:

* --Member--	No_Of

HCI STEEL BUILDING SYSTEMS, INC.	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

```
*  Type   Depth    Bays    Bay_Id
   '-'     0.00      0

*(25)WIND COLUMNS:
* --Member--     No_Of            Left/
* Type   Depth    Bays    Bay_Id   Right
   '-'     0.00      0

*(26)WALL BRACING ATTACHMENT
*No_Of    Attach    --Bay_Id--   No_Of
*Attach     Id      Start  End   Level          Level_Height
     0

*(27)EAVE EXTENSION:
*
*Wall No_Of Ext -Bay_Id--                              -Edge_Extend-   Ext
*Id     Ext  Id  Start End Height  Width     Slope    Left    Right  Mount
    2    0
    4    0

*(28)CANOPY:
*
*Wall No_Of Ext -Bay_Id--                              -Edge_Extend-   Ext
*Id     Ext  Id  Start End Height  Width     Slope    Left    Right  Mount
    1    0
    2    0
    4    0

*(29)FACIA/PARAPET  :
*
*Wall #Of Ext Fac Bay_Id  ----Attach_Beam---  ---Facia/Parapet---  Edge_Extend Ext
* Id  Ext Id  Typ St End Height Width  Slope  Elev  Height Slope   Left Right Mnt
*           (C,E)        (ft)   (ft)  ?:12   (ft)   (ft)  ?:12    (ft) (ft)
    1   0
    2   0
    4   0

*(30)FACIA/PARAPET GIRTS:
*
*Ext  ----Top----  --Interior-  ---Back_Panel---  Angle
*Id   Type Rotate  Type Rotate  Part      Rotate Spacing

*(31)LOADS FOR EAVE EXTENSION, CANOPY, FACIA, AND PARAPET:
```

HCI STEEL BUILDING SYSTEMS, INC.	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

*
*
*Ext Ext_Beam Facia/Parapet Facia/Parapet_Girt
*Id Dead Collat Live Press Suct Press Suct Press Suct

*(32)BASIC LOADS:
*
--Edge_Strip_Zone--
* Dead Collat Live Snow Basic Wind_Load_Ratio Girt Panel
* Load Load Load Load Wind Deflect Factor Width Ratio Ratio
2.5 3.0 20.0 25.0 17.4 1.00 1.00 0.000 1.00 1.00

*(33)BASIC LOADS AT EAVE:
* Seis_Coeff Seis_Load Torsion_Forces
* Frame Brace Frame Brace Wind Seismic
0.1148 0.3536 0.00 0.06 0.00 0.00

*(34)WIND PRESSURE/SUCTION:
*
* Wind Wind
* Press Suct
15.6 -15.6 .. Column
19.5 -19.5 .. Girt/Header
15.6 -15.6 .. Jamb
20.8 -20.8 .. Panel
22.6 -22.6 .. Parapet Girt

*(35)WIND COEFFICIENTS:
* Surf Rafter_Wind_1 Rafter_Wind_2 Bracing_Wind Long Surface
* Id Left Right Left Right Left Right Wind Friction
1 0.80 -0.50 0.80 -0.50 0.80 -0.50 0.00 0.00
2 -0.70 -0.70 -0.70 -0.70 -0.70 -0.70 -0.70 0.00
3 -0.50 0.80 -0.50 0.80 -0.50 0.80 0.00 0.00

*(36)COLUMN & BRACING DESIGN LOADS:
*
*Load Snow/ Rafter_Wind Brace_Wind Long Column_Wind | Aux_Load
*No Id Dead Coll Live Left Right Left Right Wind Press Suct Seis| Id Coef
8 1 1.00 1.00 1.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0 0.00
2 1.00 0.00 0.50 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0 0.00
3 1.00 0.00 0.50 0.00 0.00 0.00 1.00 0.00 0.00 1.00 0.00 0 0.00
4 1.00 0.00 0.00 0.00 0.00 0.00 0.00 1.00 1.00 0.00 0.00 0 0.00
5 1.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 0.00 1.00 0.00 0 0.00
6 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0 0.00

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
     7  1.00 1.00 0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  1.00    0  0.00
     8  1.00 1.00 0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00 -1.00    0  0.00


*(37)COLUMN & BRACING DESIGN LOADS: Deflection
*
*Load              Snow/ Rafter_Wind Brace_Wind  Long Column_Wind       | Aux_Load
*No Id  Dead Coll Live  Left  Right Left Right  Wind  Press Suct  Seis| Id  Coef
  0

*(38)RAFTER DESIGN LOADS:
*
* No. Load              Snow/ Rafter_Wind_1 Rafter_Wind_2        | Aux_Load
*Load  Id   Dead Collat Live  Left  Right   Left  Right   Seis | Id  Coef
   5    1   1.00  1.00  1.00  0.00  0.00   0.00  0.00    0.00    0  0.00
        2   1.00  0.00  0.00  1.00  0.00   0.00  0.00    0.00    0  0.00
        3   1.00  0.00  0.00  0.00  1.00   0.00  0.00    0.00    0  0.00
        4   1.00  0.00  0.00  0.00  0.00   1.00  0.00    0.00    0  0.00
        5   1.00  0.00  0.00  0.00  0.00   0.00  1.00    0.00    0  0.00


*(39)RAFTER DESIGN LOADS: Deflection
*
* No. Load              Snow/ Rafter_Wind_1 Rafter_Wind_2        | Aux_Load
*Load  Id   Dead Collat Live  Left  Right   Left  Right   Seis | Id  Coef
   0

*(40)AUXILIARY LOADS: (Max: 80 loads, 20 comb/load)
* No.   Aux  Aux          No._Add   Add_Load
* Aux   Id   Name          Combs   Id    Coef
   0

*(41)ADDITIONAL LOADS:

* No. Add Surf  Basic    Load  |     FX        FY      M      X       Y   -Conc.
* Add Id   Id   Load     Type  |     W1        W2      Co     DL1     DL2 -Unif.
   0

*(42)GIRT LAPS:
*
*      Data  ------Set_1-------  ------Set_2-------  ------Set_3-------
* Opt  Sets  Left    Right Quan  Left    Right Quan  Left    Right Quan
  '-'   0
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

*(43)GIRT STRAPS:
*
* Data ---Set_1--- ---Set_2--- ---Set_3--- ---Set_4---
*Opt Sets Strap Quan Strap Quan Strap Quan Strap Quan
'-' 0

* Code file used was C:\MBS\CODE\EW_UBC.97

==========

2493 Endwall Design Code 2/16/04 9:47am

==========

STRUCTURAL CODE:
Design Basis - WS
Hot Rolled Steel - AISC89
Cold Formed Steel - AISI96

BUILDING CODE:
Wind Code - UBC
Year - 97
Seismic Zone - 3

==========

2493 Column & Rafter Design 2/16/04 9:47am

==========

MEMBER SIZES:

Member Id	Member Locate	Member Size	---Web_Size-- Depth	Thick	-Flange_Size- Width	Thick	Member Length	Member Weight
Col-1	0.7	W8x10	7.47	0.170	3.94	0.205	7.2	72.2
Col-2	11.3	W8x10	7.47	0.170	3.94	0.205	8.1	81.1
Raf-1		W8x10	7.47	0.170	3.94	0.205	12.0	0.0
							Total=	153.28

DESIGN ACTIONS/STRESSES: (W/R/U-Section)

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Column & Rafter Design 2/16/04 9:47am

Mem Id	Load Id	Axial Design Load	Axial Calc Stress	Axial Allow Stress	Shear Design Load	Shear Calc Stress	Shear Allow Stress	Moment Design Load	Moment Calc Stress	Moment Allow Stress
		(k ,ksi)	(k ,ksi)	(k ,ksi)	(k ,ksi)	(k ,ksi)	(k ,ksi)	(f-k ,ksi)	(f-k ,ksi)	(f-k ,ksi)
Col-1	1	0.07	0.02	23.48	0.00	0.00	20.00	0.00	0.00	28.74
Col-1	2	0.07	0.02	31.30	-0.32	0.25	26.67	0.58	-0.88	38.33
Col-1	3	0.07	0.02	31.30	-0.32	0.25	26.67	0.58	-0.88	38.33
Col-1	4	0.07	0.02	31.30	0.32	0.25	26.67	-0.58	-0.88	38.33
Col-1	5	0.07	0.02	31.30	-0.32	0.25	26.67	0.58	-0.88	38.33
Col-1	6	0.07	0.02	31.30	-0.32	0.25	26.67	0.58	-0.88	38.33
Col-1	7	0.07	0.02	31.30	0.00	0.00	26.67	0.00	0.00	38.33
Col-1	8	0.07	0.02	31.30	0.00	0.00	26.67	0.00	0.00	38.33
Col-2	1	0.08	0.03	21.28	0.00	0.00	20.00	0.00	0.00	26.41
Col-2	2	0.08	0.03	28.37	-0.36	0.28	26.67	0.73	-1.12	35.21
Col-2	3	0.08	0.03	28.37	-0.36	0.28	26.67	0.73	-1.12	35.21
Col-2	4	0.08	0.03	28.37	0.36	0.28	26.67	-0.73	-1.12	35.21
Col-2	5	0.08	0.03	28.37	-0.36	0.28	26.67	0.73	-1.12	35.21
Col-2	6	0.08	0.03	28.37	-0.36	0.28	26.67	0.73	-1.12	35.21
Col-2	7	0.08	0.03	28.37	0.00	0.00	26.67	0.00	0.00	35.21
Col-2	8	0.08	0.03	28.37	0.00	0.00	26.67	0.00	0.00	35.21
Raf-1	1	0.00	0.00	23.18	0.00	0.00	20.00	0.00	0.00	28.44
Raf-1	2	0.00	0.00	30.90	0.00	0.00	26.67	0.00	0.00	37.92
Raf-1	3	0.00	0.00	30.90	0.00	0.00	26.67	0.00	0.00	37.92
Raf-1	4	0.00	0.00	30.90	0.00	0.00	26.67	0.00	0.00	37.92
Raf-1	5	0.00	0.00	30.90	0.00	0.00	26.67	0.00	0.00	37.92

STRESS RATIO:

Mem Id	Load Id	Axial	Shear	Moment	Axl+Mom	Shr+Mom
Col-1	1	0.00	0.00	0.00	0.00	
Col-1	2	0.00	0.01	0.02	0.02	
Col-1	3	0.00	0.01	0.02	0.02	
Col-1	4	0.00	0.01	0.02	0.02	
Col-1	5	0.00	0.01	0.02	0.02	
Col-1	6	0.00	0.01	0.02	0.02	
Col-1	7	0.00	0.00	0.00	0.00	
Col-1	8	0.00	0.00	0.00	0.00	

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Column & Rafter Design 2/16/04 9:47am

Col-2	1	0.00	0.00	0.00	0.00
Col-2	2	0.00	0.01	0.03	0.03
Col-2	3	0.00	0.01	0.03	0.03
Col-2	4	0.00	0.01	0.03	0.03
Col-2	5	0.00	0.01	0.03	0.03
Col-2	6	0.00	0.01	0.03	0.03
Col-2	7	0.00	0.00	0.00	0.00
Col-2	8	0.00	0.00	0.00	0.00
Raf-1	1	0.00	0.00	0.00	0.00
Raf-1	2	0.00	0.00	0.00	0.00
Raf-1	3	0.00	0.00	0.00	0.00
Raf-1	4	0.00	0.00	0.00	0.00
Raf-1	5	0.00	0.00	0.00	0.00

MEMBER DEFLECTIONS/COLUMN REACTIONS:

Mem Id	Load Id	Deflection (in) Calc	Allow	Reaction (k) Horz(OP)	Vert	Horz(IP)
Col-1	1	0.00	0.96	0.00	0.07	0.00
Col-1	2	0.01	0.96	0.32	0.07	0.00
Col-1	3	0.01	0.96	0.32	0.07	0.00
Col-1	4	-0.01	0.96	-0.32	0.07	0.00
Col-1	5	0.01	0.96	0.32	0.07	0.00
Col-1	6	0.01	0.96	0.32	0.07	0.00
Col-1	7	0.00	0.96	0.00	0.07	0.00
Col-1	8	0.00	0.96	0.00	0.07	0.00
Col-2	1	0.00	1.08	0.00	0.08	0.00
Col-2	2	0.01	1.08	0.36	0.08	0.00
Col-2	3	0.01	1.08	0.36	0.08	0.00
Col-2	4	-0.01	1.08	-0.36	0.08	0.00
Col-2	5	0.01	1.08	0.36	0.08	0.00
Col-2	6	0.01	1.08	0.36	0.08	0.00
Col-2	7	0.00	1.08	0.00	0.08	0.00
Col-2	8	0.00	1.08	0.00	0.08	0.00
Raf-1	1	0.00	1.20			
Raf-1	2	0.00	1.60			
Raf-1	3	0.00	1.60			
Raf-1	4	0.00	1.60			

HCI STEEL BUILDING SYSTEMS, INC.	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

Raf-1 5 0.00 1.60

==========

2493 Column Actions & Unbraced Lengths 2/16/04 9:47am

==========

LOAD COMBINATION # 1

Col Id	Base Offset	Actions Axial k	Actions Shear k	Actions Moment f-k	Unbraced_Length Major ft	Unbraced_Length Minor ft
1	0.00	0.07	0.00	0.00	7.2	3.9
1	3.61	0.04	0.00	0.00	7.2	3.9
1	7.22	0.00	0.00	0.00	7.2	3.9
2	0.00	0.08	0.00	0.00	8.1	4.8
2	4.05	0.04	0.00	0.00	8.1	4.8
2	8.11	0.00	0.00	0.00	8.1	4.8

LOAD COMBINATION # 2

Col Id	Base Offset	Actions Axial k	Actions Shear k	Actions Moment f-k	Unbraced_Length Major ft	Unbraced_Length Minor ft
1	0.00	0.07	-0.32	0.00	7.2	3.9
1	3.61	0.04	0.00	0.58	7.2	3.9
1	7.22	0.00	0.32	0.00	7.2	3.9
2	0.00	0.08	-0.36	0.00	8.1	4.8
2	4.05	0.04	0.00	0.73	8.1	4.8
2	8.11	0.00	0.36	0.00	8.1	4.8

LOAD COMBINATION # 3

Col Id	Base Offset	Actions Axial k	Actions Shear k	Actions Moment f-k	Unbraced_Length Major ft	Unbraced_Length Minor ft

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Column Actions & Unbraced Lengths 2/16/04 9:47am

1	0.00	0.07	-0.32	0.00	7.2	3.9
1	3.61	0.04	0.00	0.58	7.2	3.9
1	7.22	0.00	0.32	0.00	7.2	3.9
2	0.00	0.08	-0.36	0.00	8.1	4.8
2	4.05	0.04	0.00	0.73	8.1	4.8
2	8.11	0.00	0.36	0.00	8.1	4.8

LOAD COMBINATION # 4

		Actions			Unbraced_Length	
Col Id	Base Offset	Axial k	Shear k	Moment f-k	Major ft	Minor ft
1	0.00	0.07	0.32	0.00	7.2	3.9
1	3.61	0.04	0.00	-0.58	7.2	3.9
1	7.22	0.00	-0.32	0.00	7.2	3.9
2	0.00	0.08	0.36	0.00	8.1	4.8
2	4.05	0.04	0.00	-0.73	8.1	4.8
2	8.11	0.00	-0.36	0.00	8.1	4.8

LOAD COMBINATION # 5

		Actions			Unbraced_Length	
Col Id	Base Offset	Axial k	Shear k	Moment f-k	Major ft	Minor ft
1	0.00	0.07	-0.32	0.00	7.2	3.9
1	3.61	0.04	0.00	0.58	7.2	3.9
1	7.22	0.00	0.32	0.00	7.2	3.9
2	0.00	0.08	-0.36	0.00	8.1	4.8
2	4.05	0.04	0.00	0.73	8.1	4.8
2	8.11	0.00	0.36	0.00	8.1	4.8

LOAD COMBINATION # 6

		Actions			Unbraced_Length	
Col	Base	Axial	Shear	Moment	Major	Minor

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Column Actions & Unbraced Lengths 2/16/04 9:47am

Id	Offset	k	k	f-k	ft	ft
1	0.00	0.07	-0.32	0.00	7.2	3.9
1	3.61	0.04	0.00	0.58	7.2	3.9
1	7.22	0.00	0.32	0.00	7.2	3.9
2	0.00	0.08	-0.36	0.00	8.1	4.8
2	4.05	0.04	0.00	0.73	8.1	4.8
2	8.11	0.00	0.36	0.00	8.1	4.8

LOAD COMBINATION # 7

		--------Actions-------			Unbraced_Length	
Col Id	Base Offset	Axial k	Shear k	Moment f-k	Major ft	Minor ft
1	0.00	0.07	0.00	0.00	7.2	3.9
1	3.61	0.04	0.00	0.00	7.2	3.9
1	7.22	0.00	0.00	0.00	7.2	3.9
2	0.00	0.08	0.00	0.00	8.1	4.8
2	4.05	0.04	0.00	0.00	8.1	4.8
2	8.11	0.00	0.00	0.00	8.1	4.8

LOAD COMBINATION # 8

		--------Actions-------			Unbraced_Length	
Col Id	Base Offset	Axial k	Shear k	Moment f-k	Major ft	Minor ft
1	0.00	0.07	0.00	0.00	7.2	3.9
1	3.61	0.04	0.00	0.00	7.2	3.9
1	7.22	0.00	0.00	0.00	7.2	3.9
2	0.00	0.08	0.00	0.00	8.1	4.8
2	4.05	0.04	0.00	0.00	8.1	4.8
2	8.11	0.00	0.00	0.00	8.1	4.8

2493 Base Plate & Anchor Bolt Design 2/16/04 9:47am

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Base Plate & Anchor Bolt Design 2/16/04 9:47am

Column_Base Id	Depth	Max_Reactions(k) Comp	Tens	Shear	--Plate_Size(in)-- Width	Length	Thick	-Bolts(A307)- Row	Diam	Gage
Col-1	7.9	0.1	0.0	0.2				0	0.000	0.00
Col-2	7.9	0.1	0.0	0.3				0	0.000	0.00

2493 Flush Girt Design Report 2/16/04 9:47am

GIRT LOCATION:

Bay Id	No. Girt	Girt Id 1
1	1	3.333

GIRT SPAN:

Bay Id	No. Girt	Girt Id 1
1	1	10.667

GIRT SIZE:

Bay Id	No. Girt	Girt Id 1
1	1	8Z25U16

GIRT INSIDE FLANGE BRACE:

No._Brace/Bay
1
0

GIRT ACTIONS:

Bay	Girt Ld	--Shear(k)---	--Moment(f-k)--	---Deflect(in)--

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Flush Girt Design Report 2/16/04 9:47am

Id	Id	Id	Calc	Allow	UC	Calc	Allow	UC	Calc	Allow	UC
1	1	WP	-0.43	3.08	0.14	-1.15	5.77	0.20	-0.11	1.42	0.08
		WS	0.43	3.08	0.14	1.15	2.89	0.40	0.11	1.42	0.08

2493 Wall Panel Report 2/16/04 9:47am

PANEL DATA: Bay= 1

Panel: HHR 24 , Type = HR ; Gage = 24.00 ; Yield = 50.0

MOMENTS & DEFLECTION:

			Moment(ft-lb/ft)						Deflect(in)		
Span Id	Span (ft)	LD Id	Support Calc	Allow	UC	Midspan Calc	Allow	UC	Calc	Allow	UC
1	3.33	WP	49.7	197.7	0.25	-9.4	188.1	0.05	0.00	0.44	0.00
		WS	-49.7	188.1	0.26	9.4	197.7	0.05	0.00	0.44	0.00
2	4.95	WP	49.7	197.7	0.25	-41.3	188.1	0.22	-0.09	0.66	0.14
		WS	-49.7	188.1	0.26	41.3	197.7	0.21	0.09	0.66	0.14

2493 Endwall Design Warning Report 2/16/04 9:47am

.. No Warnings

2493 Endwall Weight Summary 2/16/04 9:47am

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Endwall Weight Summary 2/16/04 9:47am

FORCED SPACING:

Total Column Weight	=	153.28
Total Rafter Weight	=	0.00
Total Girt Weight	=	29.44
Total Door Jamb Weight	=	0.00
Total Bracing Weight	=	0.00
Total Clips Weight	=	3.30
Total Endwall Weight	=	186.02

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*=============================================================================
*2493                    Endwall Design Input                    2/16/04   9:28am
*=============================================================================


*(1)JOBID: (Max: 60 char)
    '2493'

*(2)PROGRAM OPTIONS:
* EW     Run     Run  Run    Run    No_Des  Lap
* Id  Col/Raf Girt Brace Panel  Cycles Stiff
  'R'    'Y'     'Y'  'N'    'Y'       4    0.50

*(3)DESIGN CODE:
*
*Design  ---Steel_Code---              ---Build---  Seismic
* Code   Cold       Hot       Country  Code   Year   Zone
  'WS'  'AISI96' 'AISC89'     '----'  'UBC '  '97'   '3 '

*(4)DESIGN CONSTANTS:                                                  Wind
* ---------------Steel_Yield(ksi  )--------------  ---Stress_Ratio---  Strength
* Web   Flg  C-Sec W-Sec R-Sec  U-Sec   EP  Panel  Col/Raf Girt Panel   Factor
 50.0  55.0   55.0  50.0  50.0   36.0  55.0  50.0    1.03  1.03  1.03   1.3333

*(5)DEFLECTION LIMITS:
* -----Rafter-----          ---Girt---  --Panel---  Part  Wind
* Live  Wind Total  Column  Wall Facia  Wall Facia  Wall  Bent
  120.   90.    0.    90.    90.   90.   90.   90.   90.   80.

*(6)REPORTS:
*   Input  Column  Wall  Door  Wall   Cable
*   Echo   Rafter  Girt  Jamb  Panel  Brace
    'I'     '3'    '2'   'Y'    'Y'    'Y'

*(7)BUILDING TYPE:
* Build      Build      Build    Expand_EW
*  Type      Width      Length   Use  Offset
  'FF-'    12.0000    16.0000   'Y '  15.50

*(8)SURFACE SHAPE:
*  No.     X-Coord  Y-Coord   Offset
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*  Surf       (ft)       (ft)      (in)
     3       0.0000     9.0000    8.000
            12.0000     8.0000    8.000
            12.0000     0.0000    8.000


*(9)BAY SPACING:
*    Roof     Frame   |  Sets_Of    Bay    No.
*    Bay      Recess  |    Bays     Width  Bays
     1.2917   1.0000        1    12.0000    1


*(10)FRAMED OPENINGS:
*  No.  Bay   Open     Open      Open    Open   Sill   Base    Set   Member Remove
* Open  Id    Width    Height    Offset  Type   Height Elev    Depth Select Panels
     0

*(11)PARTIAL WALLS:
* Set_Of  Base  Full    --Bay_Id--     Wall
*  Bays   Type  Load    Start  End     Height
      0

*(12)COLUMNS:
* --Left_Corner-- -Right_Corner--  -Int_Facia-- Int_No_Facia     Max_UnBr Base
* Type  Rot Depth  Type  Rot Depth  Type  Depth  Type  Depth Same Length  Elev
*             (in)             (in)         (in)          (in) Dep   (ft)    (in)
  'R    ' '-'  0.00 'R    ' '-'  0.00 'R    '  0.00 'R    '  0.00 'N' 83.333   0.000

*(13)COLUMN SIZE:
*    Set        No.    Column
*  Member    Column    Size
     'N'

*(14)RAFTERS:
* Rafter     Set     Rafter Flange
* Select    Depth     Same     Brace
   'R    '   0.000     'Y'      'Y'

*(15)RAFTERS SIZE:
*    Set        No.    Rafter
*  Member    Rafter    Size
     'N'
```

HCI STEEL BUILDING SYSTEMS. INC.				
	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

```
*(16)RAFTER SPLICES:
*   Surf     No.     Splice     Splice
*    Id    Splice     Loc.       Type
      2       0

*(17)GIRT DESIGN:
* Girt  In_Flg     Set      Set      Max     Girt_To  One_Girt   Max_Unbr
* Type  Brace     Depth     Lap     Space    Rafter   Depth/Bay   Length
  'ZB'   'N'      8.000  0.0000   7.3333     'N'       'Y'       10.0000

*(18)GIRT LOCATION:
* Set    No.    Girt
* Loc  Girt    Location
  'Y'     1     3.3333

*(19)SPECIAL GIRT:
* Sets_Of  --Bay_Id--   Girt  Girt   Girt
*  Girts   Start  End  Height Type  Rotate
     0

*(20)ROOF PURLINS:
*   Surf  Peak    Purl      No.    Surf
*    Id   Space   Space   Purlin   Ext
      2   0.000   4.014      2     0.000

*(21)PANELS:
*   Wall
*   Panel
  'HHR 24  '

*(22)WIND FRAMING SELECTION:
* -----Order_Of_Selection------
* Panel  Diagonal  Wind   Wind
* Shear  Bracing   Bent  Column
   'N'      'N'       'N'    'N'

*(23)WALL BRACING:
*   Wind   Brace      No._Bays  Specified
*  Shear   Type      Specified  Bays_For_Bracing
   100.0    'R '         0

*(24)WIND BENTS:
* --Member--     No_Of
```

HCI STEEL BUILDING SYSTEMS, INC.				
	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

```
* Type  Depth   Bays   Bay_Id
  '-'    0.00     0

*(25)WIND COLUMNS:
* --Member--    No_Of          Left/
* Type  Depth   Bays   Bay_Id  Right
  '-'    0.00     0

*(26)WALL BRACING ATTACHMENT
*No_Of   Attach   --Bay_Id--   No_Of
*Attach    Id     Start  End   Level        Level_Height
    0

*(27)EAVE EXTENSION:
*
*Wall No_Of Ext -Bay_Id--                          -Edge_Extend-   Ext
*Id    Ext  Id  Start End Height  Width    Slope   Left    Right  Mount
   2    0
   4    0

*(28)CANOPY:
*
*Wall No_Of Ext -Bay_Id--                          -Edge_Extend-   Ext
*Id    Ext  Id  Start End Height  Width    Slope   Left    Right  Mount
   3    0
   2    0
   4    0

*(29)FACIA/PARAPET  :
*
*Wall #Of Ext Fac Bay_Id  ----Attach_Beam--- ---Facia/Parapet--- Edge_Extend Ext
* Id  Ext Id  Typ St End Height Width  Slope  Elev  Height Slope  Left Right Mnt
*           (C,E)        (ft)   (ft)  ?:12   (ft)   (ft)  ?:12   (ft) (ft)
  3   0
  2   0
  4   0

*(30)FACIA/PARAPET GIRTS:
*
*Ext  ----Top----  --Interior-  ---Back_Panel---  Angle
*Id   Type Rotate  Type Rotate  Part      Rotate Spacing

*(31)LOADS FOR EAVE EXTENSION, CANOPY, FACIA, AND PARAPET:
```

HCI STEEL BUILDING SYSTEMS, INC.

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		Checked By	ML

```
*
*
*Ext                          Ext_Beam   Facia/Parapet  Facia/Parapet_Girt
*Id  Dead  Collat  Live      Press Suct   Press  Suct      Press  Suct

*(32)BASIC LOADS:
*                                                          --Edge_Strip_Zone--
* Dead    Collat  Live    Snow   Basic  Wind_Load_Ratio          Girt    Panel
* Load     Load    Load    Load   Wind  Deflect  Factor  Width  Ratio   Ratio
   2.5      3.0    20.0    25.0   17.4   1.00      1.00   0.000   1.00    1.00

*(33)BASIC LOADS AT EAVE:
*   Seis_Coeff      Seis_Load     Torsion_Forces
*  Frame  Brace    Frame  Brace    Wind  Seismic
  0.1148 0.3536     0.00   0.06    0.00    0.00

*(34)WIND PRESSURE/SUCTION:
*
*   Wind      Wind
*   Press     Suct
     15.6     -15.6     .. Column
     19.5     -19.5     .. Girt/Header
     15.6     -15.6     .. Jamb
     20.8     -20.8     .. Panel
     22.6     -22.6     .. Parapet Girt

*(35)WIND COEFFICIENTS:
*  Surf  Rafter_Wind_1   Rafter_Wind_2   Bracing_Wind    Long     Surface
*   Id    Left  Right     Left  Right     Left  Right     Wind     Friction
     1    0.80  -0.50     0.80  -0.50     0.80  -0.50     0.00      0.00
     2   -0.70  -0.70    -0.70  -0.70    -0.70  -0.70    -0.70      0.00
     3   -0.50   0.80    -0.50   0.80    -0.50   0.80     0.00      0.00

*(36)COLUMN & BRACING DESIGN LOADS:
*
*Load              Snow/  Rafter_Wind  Brace_Wind   Long  Column_Wind       | Aux_Load
*No Id  Dead Coll  Live   Left  Right  Left  Right  Wind  Press Suct  Seis| Id  Coef
  8  1  1.00 1.00  1.00   0.00  0.00   0.00  0.00   0.00  0.00  0.00  0.00  0  0.00
     2  1.00 0.00  0.50   0.00  0.00   1.00  0.00   0.00  0.00  1.00  0.00  0  0.00
     3  1.00 0.00  0.50   0.00  0.00   0.00  1.00   0.00  0.00  1.00  0.00  0  0.00
     4  1.00 0.00  0.00   0.00  0.00   0.00  0.00   1.00  1.00  0.00  0.00  0  0.00
     5  1.00 0.00  0.00   1.00  0.00   0.00  0.00   0.00  0.00  1.00  0.00  0  0.00
     6  1.00 0.00  0.00   0.00  1.00   0.00  0.00   0.00  0.00  1.00  0.00  0  0.00
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
     7  1.00 1.00 0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  1.00   0  0.00
     8  1.00 1.00 0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00 -1.00   0  0.00


*(37)COLUMN & BRACING DESIGN LOADS: Deflection
*
*Load              Snow/ Rafter_Wind Brace_Wind  Long Column_Wind      | Aux_Load
*No Id  Dead Coll Live  Left  Right Left Right  Wind  Press Suct  Seis| Id  Coef
  0

*(38)RAFTER DESIGN LOADS:
*
* No. Load              Snow/ Rafter_Wind_1 Rafter_Wind_2        | Aux_Load
*Load  Id   Dead Collat Live  Left  Right   Left  Right   Seis | Id  Coef
   5    1   1.00  1.00  1.00  0.00  0.00   0.00  0.00    0.00   0  0.00
        2   1.00  0.00  0.00  1.00  0.00   0.00  0.00    0.00   0  0.00
        3   1.00  0.00  0.00  0.00  1.00   0.00  0.00    0.00   0  0.00
        4   1.00  0.00  0.00  0.00  0.00   1.00  0.00    0.00   0  0.00
        5   1.00  0.00  0.00  0.00  0.00   0.00  1.00    0.00   0  0.00


*(39)RAFTER DESIGN LOADS: Deflection
*
* No. Load              Snow/ Rafter_Wind_1 Rafter_Wind_2        | Aux_Load
*Load  Id   Dead Collat Live  Left  Right   Left  Right   Seis | Id  Coef
   0

*(40)AUXILIARY LOADS: (Max: 80 loads, 20 comb/load)
* No.   Aux  Aux          No._Add   Add_Load
* Aux   Id   Name          Combs    Id    Coef
   0

*(41)ADDITIONAL LOADS:

* No. Add Surf  Basic    Load  |     FX        FY      M       X       Y   -Conc.
* Add Id   Id   Load     Type  |     W1        W2      Co      DL1     DL2 -Unif.
   0

*(42)GIRT LAPS:
*
*      Data  ------Set_1-------  ------Set_2-------  ------Set_3-------
* Opt  Sets  Left    Right Quan  Left    Right Quan  Left    Right Quan
  '-'   0
```

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

*(43)GIRT STRAPS:
*
* Data ---Set_1--- ---Set_2--- ---Set_3--- ---Set_4---
*Opt Sets Strap Quan Strap Quan Strap Quan Strap Quan
 '-'   0

* Code file used was C:\MBS\CODE\EW_UBC.97

==========

2493 Endwall Design Code 2/16/04 9:47am

==========

STRUCTURAL CODE:
Design Basis - WS
Hot Rolled Steel - AISC89
Cold Formed Steel - AISI96

BUILDING CODE:
Wind Code - UBC
Year - 97
Seismic Zone - 3

==========

2493 Column & Rafter Design 2/16/04 9:47am

==========

MEMBER SIZES:

Member Id	Member Locate	Member Size	---Web_Size-- Depth	Thick	-Flange_Size- Width	Thick	Member Length	Member Weight
Col-1	0.7	W8x10	7.47	0.170	3.94	0.205	8.1	81.1
Col-2	11.3	W8x10	7.47	0.170	3.94	0.205	7.2	72.2
Raf-1		W8x10	7.47	0.170	3.94	0.205	12.0	0.0
							Total=	153.28

DESIGN ACTIONS/STRESSES: (W/R/U-Section)

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Column & Rafter Design 2/16/04 9:47am

Mem Id	Load Id	--- Axial (k ,ksi)----- Shear (k ,ksi)---Moment (f-k ,ksi)- Design Load	Calc Stress	Allow Stress	Design Load	Calc Stress	Allow Stress	Design Load	Calc Stress	Allow Stress
Col-1	1	0.08	0.03	21.28	0.00	0.00	20.00	0.00	0.00	26.41
Col-1	2	0.08	0.03	28.37	-0.36	0.28	26.67	0.73	-1.12	35.21
Col-1	3	0.08	0.03	28.37	-0.36	0.28	26.67	0.73	-1.12	35.21
Col-1	4	0.08	0.03	28.37	0.36	0.28	26.67	-0.73	-1.12	35.21
Col-1	5	0.08	0.03	28.37	-0.36	0.28	26.67	0.73	-1.12	35.21
Col-1	6	0.08	0.03	28.37	-0.36	0.28	26.67	0.73	-1.12	35.21
Col-1	7	0.08	0.03	28.37	0.00	0.00	26.67	0.00	0.00	35.21
Col-1	8	0.08	0.03	28.37	0.00	0.00	26.67	0.00	0.00	35.21
Col-2	1	0.07	0.02	23.48	0.00	0.00	20.00	0.00	0.00	28.74
Col-2	2	0.07	0.02	31.30	-0.32	0.25	26.67	0.58	-0.88	38.33
Col-2	3	0.07	0.02	31.30	-0.32	0.25	26.67	0.58	-0.88	38.33
Col-2	4	0.07	0.02	31.30	0.32	0.25	26.67	-0.58	-0.88	38.33
Col-2	5	0.07	0.02	31.30	-0.32	0.25	26.67	0.58	-0.88	38.33
Col-2	6	0.07	0.02	31.30	-0.32	0.25	26.67	0.58	-0.88	38.33
Col-2	7	0.07	0.02	31.30	0.00	0.00	26.67	0.00	0.00	38.33
Col-2	8	0.07	0.02	31.30	0.00	0.00	26.67	0.00	0.00	38.33
Raf-1	1	0.00	0.00	23.18	0.00	0.00	20.00	0.00	0.00	28.44
Raf-1	2	0.00	0.00	30.90	0.00	0.00	26.67	0.00	0.00	37.92
Raf-1	3	0.00	0.00	30.90	0.00	0.00	26.67	0.00	0.00	37.92
Raf-1	4	0.00	0.00	30.90	0.00	0.00	26.67	0.00	0.00	37.92
Raf-1	5	0.00	0.00	30.90	0.00	0.00	26.67	0.00	0.00	37.92

STRESS RATIO:

Mem Id	Load Id	Axial	Shear	Moment	Axl+Mom	Shr+Mom
Col-1	1	0.00	0.00	0.00	0.00	
Col-1	2	0.00	0.01	0.03	0.03	
Col-1	3	0.00	0.01	0.03	0.03	
Col-1	4	0.00	0.01	0.03	0.03	
Col-1	5	0.00	0.01	0.03	0.03	
Col-1	6	0.00	0.01	0.03	0.03	
Col-1	7	0.00	0.00	0.00	0.00	
Col-1	8	0.00	0.00	0.00	0.00	

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Column & Rafter Design 2/16/04 9:47am

Col-2	1	0.00	0.00	0.00	0.00
Col-2	2	0.00	0.01	0.02	0.02
Col-2	3	0.00	0.01	0.02	0.02
Col-2	4	0.00	0.01	0.02	0.02
Col-2	5	0.00	0.01	0.02	0.02
Col-2	6	0.00	0.01	0.02	0.02
Col-2	7	0.00	0.00	0.00	0.00
Col-2	8	0.00	0.00	0.00	0.00
Raf-1	1	0.00	0.00	0.00	0.00
Raf-1	2	0.00	0.00	0.00	0.00
Raf-1	3	0.00	0.00	0.00	0.00
Raf-1	4	0.00	0.00	0.00	0.00
Raf-1	5	0.00	0.00	0.00	0.00

MEMBER DEFLECTIONS/COLUMN REACTIONS:

Mem Id	Load Id	Deflection (in) Calc	Allow	Reaction (k) Horz(OP)	Vert	Horz(IP)
Col-1	1	0.00	1.08	0.00	0.08	0.00
Col-1	2	0.01	1.08	0.36	0.08	0.00
Col-1	3	0.01	1.08	0.36	0.08	0.00
Col-1	4	-0.01	1.08	-0.36	0.08	0.00
Col-1	5	0.01	1.08	0.36	0.08	0.00
Col-1	6	0.01	1.08	0.36	0.08	0.00
Col-1	7	0.00	1.08	0.00	0.08	0.00
Col-1	8	0.00	1.08	0.00	0.08	0.00
Col-2	1	0.00	0.96	0.00	0.07	0.00
Col-2	2	0.01	0.96	0.32	0.07	0.00
Col-2	3	0.01	0.96	0.32	0.07	0.00
Col-2	4	-0.01	0.96	-0.32	0.07	0.00
Col-2	5	0.01	0.96	0.32	0.07	0.00
Col-2	6	0.01	0.96	0.32	0.07	0.00
Col-2	7	0.00	0.96	0.00	0.07	0.00
Col-2	8	0.00	0.96	0.00	0.07	0.00
Raf-1	1	0.00	1.20			
Raf-1	2	0.00	1.60			
Raf-1	3	0.00	1.60			
Raf-1	4	0.00	1.60			

HCI STEEL BUILDING SYSTEMS, INC.			
Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

Raf-1 5 0.00 1.60

==========

2493 Column Actions & Unbraced Lengths 2/16/04 9:47am

==========

LOAD COMBINATION # 1

Col Id	Base Offset	Actions Axial k	Actions Shear k	Actions Moment f-k	Unbraced_Length Major ft	Unbraced_Length Minor ft
1	0.00	0.08	0.00	0.00	8.1	4.8
1	4.05	0.04	0.00	0.00	8.1	4.8
1	8.11	0.00	0.00	0.00	8.1	4.8
2	0.00	0.07	0.00	0.00	7.2	3.9
2	3.61	0.04	0.00	0.00	7.2	3.9
2	7.22	0.00	0.00	0.00	7.2	3.9

LOAD COMBINATION # 2

Col Id	Base Offset	Actions Axial k	Actions Shear k	Actions Moment f-k	Unbraced_Length Major ft	Unbraced_Length Minor ft
1	0.00	0.08	-0.36	0.00	8.1	4.8
1	4.05	0.04	0.00	0.73	8.1	4.8
1	8.11	0.00	0.36	0.00	8.1	4.8
2	0.00	0.07	-0.32	0.00	7.2	3.9
2	3.61	0.04	0.00	0.58	7.2	3.9
2	7.22	0.00	0.32	0.00	7.2	3.9

LOAD COMBINATION # 3

Col Id	Base Offset	Actions Axial k	Actions Shear k	Actions Moment f-k	Unbraced_Length Major ft	Unbraced_Length Minor ft

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Column Actions & Unbraced Lengths 2/16/04 9:47am

1	0.00	0.08	-0.36	0.00	8.1	4.8
1	4.05	0.04	0.00	0.73	8.1	4.8
1	8.11	0.00	0.36	0.00	8.1	4.8
2	0.00	0.07	-0.32	0.00	7.2	3.9
2	3.61	0.04	0.00	0.58	7.2	3.9
2	7.22	0.00	0.32	0.00	7.2	3.9

LOAD COMBINATION # 4

		Actions			Unbraced_Length	
Col Id	Base Offset	Axial k	Shear k	Moment f-k	Major ft	Minor ft
1	0.00	0.08	0.36	0.00	8.1	4.8
1	4.05	0.04	0.00	-0.73	8.1	4.8
1	8.11	0.00	-0.36	0.00	8.1	4.8
2	0.00	0.07	0.32	0.00	7.2	3.9
2	3.61	0.04	0.00	-0.58	7.2	3.9
2	7.22	0.00	-0.32	0.00	7.2	3.9

LOAD COMBINATION # 5

		Actions			Unbraced_Length	
Col Id	Base Offset	Axial k	Shear k	Moment f-k	Major ft	Minor ft
1	0.00	0.08	-0.36	0.00	8.1	4.8
1	4.05	0.04	0.00	0.73	8.1	4.8
1	8.11	0.00	0.36	0.00	8.1	4.8
2	0.00	0.07	-0.32	0.00	7.2	3.9
2	3.61	0.04	0.00	0.58	7.2	3.9
2	7.22	0.00	0.32	0.00	7.2	3.9

LOAD COMBINATION # 6

		Actions			Unbraced_Length	
Col	Base	Axial	Shear	Moment	Major	Minor

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Column Actions & Unbraced Lengths 2/16/04 9:47am

Id	Offset	k	k	f-k	ft	ft
1	0.00	0.08	-0.36	0.00	8.1	4.8
1	4.05	0.04	0.00	0.73	8.1	4.8
1	8.11	0.00	0.36	0.00	8.1	4.8
2	0.00	0.07	-0.32	0.00	7.2	3.9
2	3.61	0.04	0.00	0.58	7.2	3.9
2	7.22	0.00	0.32	0.00	7.2	3.9

LOAD COMBINATION # 7

		--------Actions-------			Unbraced_Length	
Col Id	Base Offset	Axial k	Shear k	Moment f-k	Major ft	Minor ft
1	0.00	0.08	0.00	0.00	8.1	4.8
1	4.05	0.04	0.00	0.00	8.1	4.8
1	8.11	0.00	0.00	0.00	8.1	4.8
2	0.00	0.07	0.00	0.00	7.2	3.9
2	3.61	0.04	0.00	0.00	7.2	3.9
2	7.22	0.00	0.00	0.00	7.2	3.9

LOAD COMBINATION # 8

		--------Actions-------			Unbraced_Length	
Col Id	Base Offset	Axial k	Shear k	Moment f-k	Major ft	Minor ft
1	0.00	0.08	0.00	0.00	8.1	4.8
1	4.05	0.04	0.00	0.00	8.1	4.8
1	8.11	0.00	0.00	0.00	8.1	4.8
2	0.00	0.07	0.00	0.00	7.2	3.9
2	3.61	0.04	0.00	0.00	7.2	3.9
2	7.22	0.00	0.00	0.00	7.2	3.9

2493 Base Plate & Anchor Bolt Design 2/16/04 9:47am

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Base Plate & Anchor Bolt Design 2/16/04 9:47am

Column_Base Id	Depth	Max_Reactions(k) Comp	Tens	Shear	--Plate_Size(in)-- Width	Length	Thick	-Bolts(A307)- Row	Diam	Gage
Col-1	7.9	0.1	0.0	0.3				0	0.000	0.00
Col-2	7.9	0.1	0.0	0.2				0	0.000	0.00

2493 Flush Girt Design Report 2/16/04 9:47am

GIRT LOCATION:

Bay Id	No. Girt	Girt Id 1
1	1	3.333

GIRT SPAN:

Bay Id	No. Girt	Girt Id 1
1	1	10.667

GIRT SIZE:

Bay Id	No. Girt	Girt Id 1
1	1	8Z25U16

GIRT INSIDE FLANGE BRACE:

No._Brace/Bay
1
0

GIRT ACTIONS:

Bay	Girt Ld	--Shear(k)---	--Moment(f-k)--	---Deflect(in)--

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Flush Girt Design Report 2/16/04 9:47am

Id	Id	Id	Calc	Allow	UC	Calc	Allow	UC	Calc	Allow	UC
1	1	WP	-0.43	3.08	0.14	-1.15	5.77	0.20	-0.11	1.42	0.08
		WS	0.43	3.08	0.14	1.15	2.89	0.40	0.11	1.42	0.08

2493 Wall Panel Report 2/16/04 9:47am

PANEL DATA: Bay= 1

Panel: HHR 24 , Type = HR ; Gage = 24.00 ; Yield = 50.0

MOMENTS & DEFLECTION:

			Moment(ft-lb/ft)						Deflect(in)		
Span Id	Span (ft)	LD Id	Support Calc	Allow	UC	Midspan Calc	Allow	UC	Calc	Allow	UC
1	3.33	WP	49.7	197.7	0.25	-9.4	188.1	0.05	0.00	0.44	0.00
		WS	-49.7	188.1	0.26	9.4	197.7	0.05	0.00	0.44	0.00
2	4.95	WP	49.7	197.7	0.25	-41.3	188.1	0.22	-0.09	0.66	0.14
		WS	-49.7	188.1	0.26	41.3	197.7	0.21	0.09	0.66	0.14

2493 Endwall Design Warning Report 2/16/04 9:47am

.. No Warnings

2493 Endwall Weight Summary 2/16/04 9:47am

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Endwall Weight Summary 2/16/04 9:47am

FORCED SPACING:

Total Column Weight	=	153.28
Total Rafter Weight	=	0.00
Total Girt Weight	=	29.44
Total Door Jamb Weight	=	0.00
Total Bracing Weight	=	0.00
Total Clips Weight	=	3.30
Total Endwall Weight	=	186.02

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
*=============================================================================
*2493                    Rigid Frame Design Input Echo          2/14/04  5:38pm
*=============================================================================

*(1)JOBID:
    '2493

*(2)PROGRAM OPTIONS:
*Frame  Frame  Stress  Frame  No_Of  End_Conn  Splice    Frame    Frame
* Id    Type   Space   Space  Cycle  Lt   Rt   Fix       Option   Option_Id
   1    'RFE'   5.00   8.70    7    'P'  'P'   1.00       '-'     '            '

*(3)ANALYSIS OPTIONS:
*Plate Depth Frame Column_Dep_Opt(in)  Rafter_Dep_Opt(in)  Web_Stiffener    P
* Opt   Opt   Sym  Typ    Min    Max   Typ    Min    Max   Use Ratio Side Delta
  'Y'   'Y'   'N'  'C '  7.50  36.00   'C ' 10.00  82.00   'N'  0.00 'Y '  'S'

*(4)DESIGN CODE:
*
*Design  ---Steel_Code---             ---Build---  Seismic
* Code   Cold       Hot       Country  Code   Year   Zone
  'WS ' 'AISI96' 'AISC89'     '----'  'UBC '  '97'   '3 '

*(5)DESIGN CONSTANTS:
*                                                                    Wind
* ----------Steel_Yield(ksi  )----------  ----Stress_Ratio----  Strength
* Web   Flg  R_Frm P_Frm T_Frm   EP    BP   Frame  Col  EP   BP    Factor
  50.0  55.0  50.0  35.0  46.0  55.0  55.0  1.03  1.03 1.00 1.00   1.3333

*(6)DEFLECTION LIMITS:
*                Total   Weak
*  Horz    Vert  Vert    Axis
   60.0   120.0    0.0   80.0

*(7)REPORTS:
* Input Design   End  Base  Revise Action Sec  Flange Segment Unbrc Floor Cable
* Echo  Summary Plate Plate Input  Stress Prop Brace  Displ.   Len  React React
  'I'    'Y'     'Y'   'Y'   'Y'    'N'   'N'   'Y'     'N'    'N'   'Y'   'Y'

*(8)BUILDING SHAPE:
```

HCI STEEL BUILDING SYSTEMS, INC.	Job No	2493	modify	
	Customer	ENVIROCON INC.	Date	2/16/2004
	Description	ALCOA INC.	Designed By	NAGY MEKHAIL
			Checked By	ML

```
*   No.     X_Coord    Y_Coord    Offset
*   Surf      (ft)       (ft)      (in)
      3      0.0000     8.0000    8.000
            12.0000     9.0000    8.000
            12.0000     0.0000    8.000


*(9)MEMBER DEPTHS:
*   Surf     Member       --Depth(in)--    No.    Interior_Depths
*    Id       Size         Start    End    Dep    Loc.(ft)  Depth(in)
      1   '--------'      10.000  10.000    0
      2   '--------'      10.000  10.000    0
      3   '--------'      10.000  10.000    0

*(10)MEMBER SPLICES:
*   Surf     No.    Splice   Splice
*    Id    Splice  Loc(ft)   Type
      1       0
      2       1      0.0000  'VEE'
      3       1      0.0000  'VEE'

*(11)SEGMENT PLATES:
*   Mem  No.  Seg     Len     Flange          Plate Thickness (in)
*    Id  Seg   Id    (ft)      Width      Web     O.S.Flg    I.S.Flg
      1   1    1   0.0000      5.00    0.1345     0.2500     0.2500

      2   1    2   0.0000      5.00    0.1345     0.2500     0.2500

      3   1    3   0.0000      5.00    0.1345     0.2500     0.2500


*(12)INTERIOR COLUMNS:
* No.  Col  Col  Col    Col   Connection  Unbrace_Length  Col  Col
* Col   Id  Typ  Rot    Loc   Bot    Top  Major    Minor  Set  Size
   0

*(13)TAPERED INTERIOR COLUMNS:
*Col  Col  ---Depth----  No.  Start  --Web_Depth---   Web    Flg  OS_Flg IS_Flg
* Id Shape  Min    Max   Mem  Locate  Start    End   Thick  Width  Thick  Thick

*(14)BASE ELEVATION:
* Elev
  0.00   Left  Column
```

HCI STEEL BUILDING SYSTEMS, INC.				
	Job No	2493	**modify**	
	Customer	ENVIROCON INC.	**Date**	2/16/2004
	Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
			Checked By	ML

0.00 Right Column

*(15)WALL GIRTS:

*Surf Id	Girt Type	Girt Depth	Girt Project	Girt Lap	No. Girt	Location(ft)
1	'ZB'	8.00	0.00	0.875	1	3.333
3	'ZB'	8.00	0.00	0.875	1	3.333

*(16)ROOF PURLINS:

*Surf Id	Purl Type	Purl Depth	Purl Project	Purl Lap	No. Purlin	Peak Space	Set_Of Space	-Set_Space- Space	No.
2	'ZB'	8.00	0.00	0.000	2	0.000	0		

*(17)FLANGE BRACES:

* Surf Id	No. Brace	Flange_Brace_At Girt/Purlin Number	
1	1	1	
2	2	1	2
3	1	1	

*(18)SIDEWALL EXTENSIONS:

*Surf Id	No Ext Ext	-------Extension_Size------- Type	Elev	Width	Slope	----Facia_Size---- Elev	Height	Slope	Load Width
1	0								
3	0								

*(19)EXTENSION LOADS:

*Ext Id	Dead psf	Collat psf	Live psf	Wind1_Coeff Left	Wind1_Coeff Right	Wind2_Coeff Left	Wind2_Coeff Right	Facia_Wind Left	Facia_Wind Right

*(20)BASIC LOADS:

* Dead psf	Live psf	Snow psf	Collat psf	Basic Wind psf	Wind Load Ratio
2.50	20.00	25.00	3.00	17.37	1.00

*(21)BASIC LOADS AT EAVE:

* Load k	----Seismic----- SpcEP k	Coef	Weak_Axis_L Wind k	Weak_Axis_L Seis k	Weak_Axis_R Wind k	Weak_Axis_R Seis k	--Torsion-- Wind k	--Torsion-- Seis k	-EW_Brace-- Wind k	-EW_Brace-- Seis k
0.06	0.24	0.36	0.28	0.14	0.30	0.14	0.00	0.00	0.00	0.00

*(22)WIND COEFFICIENTS:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

* Surf	--Wind_1---		--Wind_2---		Long_Wind_1		Surface
* Id	Left	Right	Left	Right	Lt	Rt	Friction
1	0.80	-0.50	0.80	-0.50	-0.70	-0.70	0.00
2	-0.70	-0.70	-0.70	-0.70	-0.70	-0.70	0.00
3	-0.50	0.80	-0.50	0.80	-0.70	-0.70	0.00

*(23)LONGITUDINAL BRACING LOADS:

*

* ----Wind-----		---Seismic---		
* Horiz	Vert	Horiz	Vert	
0.28	0.00	0.28	0.00	.. Left Column
0.30	0.00	0.28	0.00	.. Right Column

*(24)DESIGN LOADS:

*				----------Load_Coefficients----------									
*Load			Live/	Live	-Wind_1-		-Wind_2-		Long_Wind		-Seismic--		Aux_Load
*No	Id	Dead Coll	Snow	Right	Lt	Rt	Lt	Rt	Lt	Rt	Long	Tran	Id Coeff
35	1	1.00 1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	2	1.00 1.00	0.50	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	3	1.00 1.00	0.50	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	4	1.00 1.00	0.50	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	5	1.00 1.00	0.50	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0 0.00
	6	1.00 1.00	1.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	7	1.00 1.00	1.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	8	1.00 1.00	1.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0 0.00
	9	1.00 1.00	1.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0 0.00
	10	1.00 0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	11	1.00 0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	12	1.00 0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0 0.00
	13	1.00 0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0 0.00
	14	1.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0 0.00
	15	1.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0 0.00
	16	1.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0 0.00
	17	1.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0 0.00
	18	1.00 1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0 0.00
	19	1.00 1.00	1.00	0.00	0.00	0.00	0.00	0.00	-0.50	0.00	0.00	0.00	0 0.00
	20	1.00 1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0 0.00
	21	1.00 1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.50	0.00	0.00	0 0.00
	22	1.00 1.00	0.50	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0 0.00
	23	1.00 1.00	0.50	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0.00	0 0.00
	24	1.00 1.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0 0.00
	25	1.00 1.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0.00	0 0.00
	26	0.00 0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0 0.00

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0	0.00
28	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0	0.00
29	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0	0.00
30	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0	0.00
31	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.00	0.00	0	0.00
32	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	0	0.00
33	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.40	0	0.00
34	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	0.00	0	0.00
35	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.40	0.00	0	0.00

*(25)DESIGN LOADS:

*(26)AUXILARY LOADS:

*No. Aux	Aux		No._Add	Add_Comb	
*Aux	Id	Name	Loads	Id	Coeff
0					

*(27)ADDITIONAL LOADS: (F-k , W-k/ft, Dx,Dy,Dl-ft)

*No. Add	Surf	Basic	Load	Fx	Fy	M	Dx	Dy	-Conc
*Add	Id	Type	Type	W1	W2	Co	Dl1	Dl2	-Dist
0									

*(28)FLOOR BEAMS:

* Bay	No.	Beam	Beam	Con_Type		Con_Loc		Beam Properties	
* Id	Beam	Id	Ht	Lt	Rt	Lt	Rt	Area	Ixx
1	0								

*(29)CABLES:

* Bay	No.	Cable	Cable	Cable	Cable
* Id	Cable	Id	Level	Type	Area
1	0				

*(30)CRANE BRACKET:

*Crane Bay	Id	Crane	Crane	Beam	----Offset----		---Bracket----		Col_Sup Load		
*No	Id	Lt	Rt	Type	Height	Depth	Left	Right	Type	Select	L	R	(k)
0													

*(31)FRAME LINES:

HCI STEEL BUILDING SYSTEMS, INC.			
Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

```
* No
*Line    Frame_Line_Id
    2       1  2

*(32)DESIGN PLATES:
*No.    ---Plate--    --Plate_Size-  Bolt   Bolt  ---Top----  -Bottom--
*Plt    Type    Id    Width   Thick  Dia    Gage  Row  Space  Row Space
  0

*(33)SPECIAL FAB DATA
* No.  Piece  Piece
*Piece  Id     Key
   0
```

2493 Rigid Frame Design Code 2/16/04 9:47am

STRUCTURAL CODE:
- Design Basis - WS
- Hot Rolled Steel - AISC89
- Cold Formed Steel - AISI96

BUILDING CODE:
- Wind Code - UBC
- Year - 97
- Seismic Zone - 3
- Seismic Coef - 0.36

2493 Base Plate and Anchor Bolt Design 2/16/04 9:47am

--Column_Base--			Max_Reactions(k)			Weak Axis	--Plate_Size(in)--			--Bolts(A307)-		
Loc.	Typ	Depth	Comp	Tens	Shear	Tens	Width	Length	Thick	Row	Diam	Gage
Left	P	10.5	1.7	-0.7	-0.7	2.3	10.0	10.50	0.500	2	0.875	6.00
Right	P	10.5	1.8	-0.9	0.7	2.8	10.0	10.50	0.500	2	0.875	6.00

WELDS:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Base Plate and Anchor Bolt Design 2/16/04 9:47am

Base Id	Outside_Flange Size	Typ	Shear(k/in) Calc	Allow	Inside_Flange Size	Typ	Shear(k/in) Calc	Allow	Web Size	Typ	Shear(k/in) Calc	Allow
Left	0.188	F1	0.07	2.78	0.188	F1	0.07	2.78	0.188	F	0.03	2.78
Right	0.188	F1	0.09	2.78	0.188	F1	0.09	2.78	0.188	F	0.04	2.78

2493 Bolted-End-Plate Design 2/16/04 9:47am

Splice Id	Member Typ	Loc.	Web Depth	Splice(in) Width	Thick	Ten Loc	Id	Load(k ,f-k) Axl	Shr	Mom	Bolts(A325) Row	Diam	Space	Gage
1	VEE	1- 2	10.00	6.0	0.375	Top	3x	0	1	4	2	0.750	4.00	3.00
						Bot	10x	0	-1	3	2	0.750	4.00	3.00
2	VEE	2- 3	10.00	6.0	0.375	Top	4x	0	-1	3	2	0.750	4.00	3.00
						Bot	13x	0	1	4	2	0.750	4.00	3.00

x Loads shown are full loads. Design results are adjusted for wind strength factor (1.333)

WELDS:

Splice Id	Side	Outside_Flange Size	Typ	Shear(k/in) Calc	Allow	Inside_Flange Size	Typ	Shear(k/in) Calc	Allow	Web Size	Typ	Shear(k/in) Calc	Allow
1	L	0.188	F	0.32	2.78	0.188	F	0.25	2.78	0.188	F	0.04	2.78
1	R	0.188	F	0.32	2.78	0.188	F	0.25	2.78	0.188	F	0.04	2.78
2	L	0.188	F	0.23	2.78	0.188	F	0.28	2.78	0.188	F	0.04	2.78
2	R	0.188	F	0.23	2.78	0.188	F	0.28	2.78	0.188	F	0.04	2.78

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Stiffener Report 2/16/04 9:47am

2493 Stiffener Report 2/16/04 9:47am

Stiff Location	No.	Web Depth	-Stiffener_Size(in)- Width	Thick	Length	Load Id	-----Force(k)---- Calc	Allow	UC
Left Col	1	10.00	2.50	0.250	10.00	3	10.0	50.4	0.20
Right Col	1	10.00	2.50	0.250	10.00	4	10.0	50.4	0.20

Stiffener Yield = 50.0 ksi

2493 Flange Brace Report 2/16/04 9:47am

Flange Brace Yield= 50.0 ksi
Flange Brace Bolt = 0.500 (A307)

Surf Id	No. Brace		Flange_Braces	
1	0			
2	2	Locate:	1	2
		Sides :	1	1
		Part :	L2x.075	L2x.075
		WebDep:	10.00	10.00
		BrcDst:	22.50	22.50
		Force :	0.04	0.03
		BrcUC :	0.03	0.02
		ConUC :	0.02	0.01
3	0			

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Weak-Axis Bending Report 2/16/04 9:47am

2493 Weak-Axis Bending Report 2/16/04 9:47am

Column	Force(k) Wind	Force(k) Seis	Moment (f-k)	Flange_Fb(ksi) Calc	Flange_Fb(ksi) Allow	Deflection(in) Calc	Deflection(in) Allow
Left	0.28	0.14	2.06	11.88	41.00	0.43	1.11
Right	0.30	0.14	2.48	14.26	41.00	0.64	1.24

2493 Weld Report: Web To Flange 2/16/04 9:47am

Member Id	Segment Id	Max_Weld_Shear Section Id	Max_Weld_Shear Load Id	Max_Weld_Shear Shear (k/in)	Weld_Provided Size (in)	Weld_Provided Shear (k/in)	Weld_Provided Type	Weld_Provided No. Side
1	1	1	12	0.08	0.188	3.71	F	1
2	2	8	1	0.10	0.188	2.78	F	1
3	3	12	11	0.08	0.188	3.71	F	1

2493 Special Segment Report 2/16/04 9:47am

TOP OF LEFT COLUMN:

	Reqd	Initial
Web Thick=	0.135	(0.135)
Flange Width=	5.000	(5.000)
Flange Thick=	0.250	(0.250)

TOP OF RIGHT COLUMN:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Special Segment Report 2/16/04 9:47am

	Reqd	Initial
Web Thick=	0.135	(0.135)
Flange Width=	5.000	(5.000)
Flange Thick=	0.250	(0.250)

2493 Design Summary Report 2/16/04 9:47am

FRAME:
Id = 1
Type = RF
Line Id= 1 2

MEMBERS:

Mem Id	Seg Id	Flange Len	Flange Wid	Web_Depth Strt	Web_Depth End	Plate_Thickness Web	Plate_Thickness O-flg	Plate_Thickness I-flg	Max_UCV Id	Max_UCV Ld	Max_UCV Ucv	Max_UCO Id	Max_UCO Ld	Max_UCO Uco	Max_UCI Id	Max_UCI Ld	Max_UCI Uci
1	1	7.4	5.0	10.0	10.0	0.135	0.250	0.250	1	10	0.04	3	3	0.07	3	3	0.09
2	2	9.8	5.0	10.0	10.0	0.135	0.250	0.250	8	1	0.06	4	3	0.07	4	3	0.08
3	3	8.3	5.0	10.0	10.0	0.135	0.250	0.250	12	11	0.04	9	11	0.08	9	11	0.08

No. Cycles For Plate Optimization= 6

LOAD COMBINATIONS:
1 - DL+CO+LL
3 - DL+CO+LL/2+WR1
10 - DL+WL1
11 - DL+WR1

WEIGHTS:

Member :	1	2	3
Weight (lb) :	99	118	111

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Design Summary Report 2/16/04 9:47am

Total Weight (lb) : Frame Members = 328
Interior Col. = 0
Conn. Plates = 43
Base Plates = 30
Trans Stiff = 0

400

REACTIONS: (Sidewall Columns)

Load	Left_Column				Right_Column			
Id	Fx(k)	Fy(k)	Fz(k)	M(f-k)	Fx(k)	Fy(k)	Fz(k)	M(f-k)
1	0.20	1.72	0.00	0.00	-0.20	1.79	0.00	0.00
2	-0.83	-0.17	0.00	0.00	-0.71	1.11	0.00	0.00
3	0.91	1.28	0.00	0.00	0.89	-0.34	0.00	0.00
4	-0.83	-0.17	0.00	0.00	-0.71	1.11	0.00	0.00
5	0.91	1.28	0.00	0.00	0.89	-0.34	0.00	0.00
6	-0.27	1.09	0.00	0.00	-0.50	1.78	0.00	0.00
7	0.59	1.82	0.00	0.00	0.30	1.06	0.00	0.00
8	-0.27	1.09	0.00	0.00	-0.50	1.78	0.00	0.00
9	0.59	1.82	0.00	0.00	0.30	1.06	0.00	0.00
10	-0.93	-0.97	0.00	0.00	-0.61	0.29	0.00	0.00
11	0.81	0.49	0.00	0.00	0.99	-1.17	0.00	0.00
12	-0.93	-0.97	0.00	0.00	-0.61	0.29	0.00	0.00
13	0.81	0.49	0.00	0.00	0.99	-1.17	0.00	0.00
14	0.30	-0.35	0.28	0.00	-0.30	-0.33	0.30	0.00
15	0.30	-0.35	0.00	0.00	-0.30	-0.33	0.00	0.00
16	0.30	-0.35	0.28	0.00	-0.30	-0.33	0.30	0.00
17	0.30	-0.35	0.00	0.00	-0.30	-0.33	0.00	0.00
18	0.34	1.40	0.14	0.00	-0.34	1.48	0.15	0.00
19	0.34	1.40	0.00	0.00	-0.34	1.48	0.00	0.00
20	0.34	1.40	0.14	0.00	-0.34	1.48	0.15	0.00
21	0.34	1.40	0.00	0.00	-0.34	1.48	0.00	0.00
22	0.40	0.45	0.28	0.00	-0.40	0.49	0.30	0.00
23	0.40	0.45	0.00	0.00	-0.40	0.49	0.00	0.00
24	0.40	0.45	0.28	0.00	-0.40	0.49	0.30	0.00
25	0.40	0.45	0.00	0.00	-0.40	0.49	0.00	0.00

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Design Summary Report 2/16/04 9:47am

26	-0.07	-0.09	0.00	0.00	-0.05	0.09	0.00	0.00
27	0.07	0.09	0.00	0.00	0.05	-0.09	0.00	0.00
28	-0.02	0.35	0.00	0.00	-0.10	0.55	0.00	0.00
29	0.11	0.53	0.00	0.00	0.01	0.37	0.00	0.00
30	0.04	0.44	0.28	0.00	-0.04	0.46	0.28	0.00
31	0.04	0.44	0.00	0.00	-0.04	0.46	0.00	0.00
32	-0.05	0.31	0.00	0.00	-0.12	0.59	0.00	0.00
33	0.13	0.57	0.00	0.00	0.03	0.34	0.00	0.00
34	0.04	0.44	0.39	0.00	-0.04	0.46	0.39	0.00
35	0.04	0.44	0.00	0.00	-0.04	0.46	0.00	0.00

DEFLECTIONS : (in)

Load Id	Lateral Defl @ Top Of Col Left	Right	Vert Defl @ Midspan
1	0.00	0.00	-0.01
2	0.07	0.07	-0.01
3	-0.09	-0.09	0.00
4	0.07	0.07	-0.01
5	-0.09	-0.09	0.00
6	0.04	0.04	-0.01
7	-0.04	-0.04	-0.01
8	0.04	0.04	-0.01
9	-0.04	-0.04	-0.01
10	0.07	0.07	0.00
11	-0.09	-0.09	0.01
12	0.07	0.07	0.00
13	-0.09	-0.09	0.01
14	0.00	0.00	0.00
15	0.00	0.00	0.00
16	0.00	0.00	0.00
17	0.00	0.00	0.00
18	0.00	0.00	-0.01
19	0.00	0.00	-0.01
20	0.00	0.00	-0.01
21	0.00	0.00	-0.01
22	0.00	0.00	0.00

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Design Summary Report 2/16/04 9:47am

23	0.00	0.00	0.00
24	0.00	0.00	0.00
25	0.00	0.00	0.00
26	0.01	0.01	0.00
27	-0.01	-0.01	0.00
28	0.01	0.01	0.00
29	-0.01	-0.01	0.00
30	0.00	0.00	0.00
31	0.00	0.00	0.00
32	0.01	0.01	0.00
33	-0.01	-0.01	0.00
34	0.00	0.00	0.00
35	0.00	0.00	0.00

DEFLECTIONS RATIO:

Load Id	Lateral Defl @ Top Of Col Left	Right	Vert Defl @ Midspan
1	32452	38941	12516
2	1279	1431	26190
3	1034	1153	53822
4	1279	1431	26190
5	1034	1153	53822
6	2425	2724	14070
7	2165	2406	16569
8	2425	2724	14071
9	2165	2406	16569
10	1304	1458	38154
11	1018	1137	18554
12	1304	1458	38154
13	1018	1137	18554
14	32305	46023	99999
15	32305	46023	99999
16	32305	46023	99999
17	32305	46024	99999
18	73911	75170	13879
19	73910	75169	13879

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	modify	
Customer	ENVIROCON INC.	Date	2/16/2004
Description	ALCOA INC.	Designed By	NAGY MEKHAIL
		Checked By	ML

2493 Design Summary Report 2/16/04 9:47am

20	73910	75170	13879
21	73910	75169	13879
22	62921	99999	30510
23	62921	99999	30510
24	62921	99999	30510
25	62921	99999	30510
26	10291	11495	99999
27	10291	11495	99999
28	9642	10817	52747
29	11033	12265	60285
30	99999	99999	58707
31	99999	99999	58707
32	7014	7859	49557
33	7722	8596	58961
34	99999	99999	58707
35	99999	99999	58707

Max Live Vertical = -0.01, Span/Deflection =15909. (Limit= 120.)

Max Horizontal Drift= -0.09, Eave Height/Drift= 1019. (Limit= 60.)

P-DELTA CHECK:

	Design_Load				Stability_Coeff	
	Load Id	P,Axial k	Moment f-k	Deflect in	Cd	Calc	Limit
Left Column:	6	1.01	-0.43	0.036	4.00	0.002	0.100
Right Column:	7	0.96	0.54	-0.041	4.00	0.002	0.100

2493 Flange Hole Check 2/16/04 9:47am

OUTSIDE FLANGE CHECK:

HCI STEEL BUILDING SYSTEMS, INC.

Job No	2493	**modify**	
Customer	ENVIROCON INC.	**Date**	2/16/2004
Description	ALCOA INC.	**Designed By**	NAGY MEKHAIL
		Checked By	ML

2493 Flange Hole Check 2/16/04 9:47am

Surf Id	Mem Id	Seg Id	Sec Id	Girt/ Purlin	---Flange--- Width	Thick	Hole Dia	Limit	Max_UC Load	UC	UC/Limit
1	1	1	2	1	5.000	0.250	0.625	0.795	10	0.05	0.06
2	2	2	5	1	5.000	0.250	0.625	0.795	11	0.04	0.05
2	2	2	7	2	5.000	0.250	0.625	0.795	10	0.03	0.03
3	3	3	11	1	5.000	0.250	0.625	0.795	13	0.05	0.06

2493 Rigid Frame Clearances 2/16/04 9:47am

VERTICAL CLEARANCE:

Left Col : 6'07-00" (X= 1'06-08", Y= 6'07-00")
Right Col : 7'03-14" (X= 10'05-08", Y= 7'03-14")
Midspan : (X= , Y=)

HORIZONTAL CLEARANCE:

Left Col - Right Col : 8'11-00" (X1= 1'06-08", X2= 10'05-08")

2493 Rigid Frame Design Warnings 2/16/04 9:47am

.. No Warnings

ADDITIONAL CALCULATIONS

PROJECT:	ALCOA INC.
JOB NO:	2493
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA
DATE:	2/16/2004

SEISMIC LOAD CALCULATIONS PER 1997 UBC

DATE: 2/14/2004

JOB NO:	2493
PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

General Description: This program calculates the Seismic Loads for Rigid Frames and Braced Frames. It follows equations in 1997 UBC Seismic Design.

Input Data: Input items are shown bold red & italic blue. Items in blue may change for each project. A description of the input item is located to the right of the box, or see UBC for definitions of specific terms.

Output Interpretation: The resulting graphic output shows the loads to the rigid frames and braced frames.

BUILDING GEOMETRY:

SPAN	12.00	ft.
LENGTH	16.00	ft.
BAY	8.00	ft.
EAVE HEIGHT	8.00	ft.
ROOF SLOPE	1	: 12
EWAVE. EAVE HEIGHT	8.50	ft.

DESIGN LOADS:

SNOW LOAD =	25.0	psf
25% SNOW LOAD =	0.0	psf
Collateral Load =	3.0	psf
D. Wt. Roof =	4.5	psf
D. Wt. Front Sidewall =	2.0	psf
D. Wt. Back Sidewall =	2.0	psf
D. Wt. Left Endwall =	2.0	psf
D. Wt. Right Endwall =	2.0	psf

ROOF EXTENSION GEOMETRY:

Front Sidewall Proj. =	0	ft.
Back Sidewall Proj. =	0	ft.
Left Gable Proj. =	0	ft.
Right Gable Proj. =	0	ft.

Total Building Weight

Item	Area,sf	psf	Wt., kips
Roof	192.00	7.5	1.44
Front Sidewall	64.00	2.0	0.13
Back Sidewall	64.00	2.0	0.13
Left Endwall	51.00	2.0	0.10
Right Endwall	51.00	2.0	0.10
Additional Seismic Weight: Cranes, etc.			0.00
		W=	1.90 kips

Tributary Rigid Frame Weight

Item	Area,sf	psf	Wt., kips
Roof	96.00	7.5	0.72
Front Sidewall	32.00	2.0	0.06
Back Sidewall	32.00	2.0	0.06
Additional Seismic Weight: Cranes, etc.			0.00
		W=	0.85 kips

SEISMIC DESIGN COEFFICIENTS AND INFORMATION:

	Ω_o= 2.8	RIGID FRAME	1	= Number of bays
	Ω_o= 2.2	BRACING	0	= Number of braced bays per sidewall
	Ω_o= 2.8	PORTALS	0	= Number of PORTALS per sidewall
Zone = 3	Ω_o= 2.0	WEAK AXIS	2	= Number of WEAK AXIS colums per sidewall
I = 1.00	Ω_o= 2.0	FIXED BASE	0	= Number of FIXED BASE columns per sidewall
Ca = 0.36				

R =	4.5	RIGID FRAME
R =	2.2	BRACING
R =	4.5	PORTALS
R =	2.2	WEAK AXIS
R =	2.2	FIXED BASE

DESIGN BASE SHEAR FORMULA:

V =(2.5*Ca*I/R)*W =

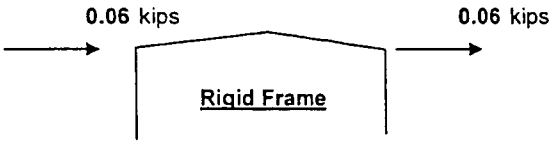
0.200 *W (RIGID FRAME)
0.409 *W (SIDEWALL ROD BRACING)
0.200 *W (SIDEWALL PORTAL FRAMES)
0.409 *W (SIDEWALL WEAK AXIS COLUMN BENDING)
0.409 *W (SIDEWALL FIXED BASE COLUMN)

SEISMIC LOAD CALCULATIONS PER 1997 UBC

DATE: 2/14/2004

JOB NO:	2493
PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

SEISMIC LOADS TO RIGID FRAME



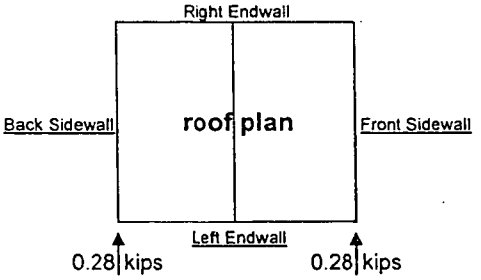
Total W = 0.85 kips
V = (2.5*Ca*I/R)*W = 0.17 kips
F_{MEMBER} = ρ*V/1.4 = 0.12 kips

r(max) = 1.00
ρ = 1.00 ρ(max) = 1.5 (or 1.0 in Zones 0, 1 & 2)

Note to Design Engineer: Value of **0.06** to match the value listed as Seismic Load on Line 21 of MBS RfDes.in file.
Note to Design Engineer: Seismic end plate connection moment is calculated using Ω_o times base shear per UBC clause 2213.6 item 2.
Note to Design Engineer: Value of **0.24** to match the value listed as Seismic SpcEP on Line 21 of MBS RfDes.in file.

SEISMIC LOADS TO WEAK AXIS COLUMNS (in the sidewall)

Total W = 1.90 kips
V = (2.5*Ca*I/R)*W = 0.78 kips
$F_{CONNECTION}$ = V = 0.78 kips
F_{MEMBER} = ρ*V/1.4 = 0.56 kips
r(max) = 0.25
ρ = 1.00 ρ(max) =1.5 (or 1.0 in Zones 0, 1 & 2)



Load per sidewall
WEAK AXIS COLUMN = 0.14 kips 0.5 F_{MEMBER} =

Note to Design Engineer: Value of **0.14** to match value listed as Seismic Weak Axis Force on line 21 of the MBS RfDes.in file.

SIDEWALL WEAK AXIS COLUMN GEOMETRY

BAY	8.00	ft.
EAVE HEIGHT	8.00	ft.
ROOF SLOPE	1	: 12
PURLIN DEPTH	8	in.
GIRT WIDTH	8	in.

HEIGHT OF WEAK AXIS COLUMN 7.39 ft.
COLUMN BASEPLATE Ω_o = 2.0

BASEPLATE MOMENT 2.87 k-ft
COLUMN MOMENT 1.03 k-ft

BASEPLATE WEAK AXIS GEOMETRY

BASEPLATE WIDTH	10.0	in.
ANCHOR BOLT GAGE	6.0	in.
NUMBER OF A. BOLTS	4	

TENSION PER ANCHOR BOLT 0.77 kips

Note to Design Engineer: This moment to match value listed as Moment in Weak-Axis Bending Report in MBS RfDes.out file.

Purlin Web Crippling Design Check - For Flange Bolted Purlins

DATE:	2/14/04
JOB NO:	2493
PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

Usage: Use this program to check AISI-96 Web Crippling, Section C3.4

General Description: The purpose of this spread sheet is to check if stub purlin reinforcement is required at bearing locations due to reaction forces from purlins.

Input Data: Input the purlin and frame information below. Items in blue italic may change for each job.

Output interpretation: The output will compare the purlin reaction force with the web yielding and the web crippling equations of Chapter K,Equations (K1-2) & (K1-4), and determines if stiffeners are required.
Note: Single web cantilevers are NOT checked.

Inputs:

Purlin Depth:	*8*	in.	Purlin Web Yield Stress:	55	ksi
Purlin Spacing:	*4*	ft	Inside Bend Radius, R:	0.1875	in.
Purl.Nom. Flg Width	*2.5*	in. (2.5,3.0 or 3.5)	Web depth, h:	7.507	in.
			Bearing Angle, θ:	90	deg.
End Frame:					
Bearing Length, N: (Frame Flg. Width)	*5*	in.	Modulus of Elasticity, E	29000	ksi
Frame Flg. Thick:	*0.25*	in.			
1/2 End Bay Spacing:	*8*	ft.	Loads:		
End Bay Offset:	*15.5*	in.	Dead Load:	**2.5**	psf
Purlin Thickness:	*0.0588*	in.	Collateral Load:	*3.0*	psf
F.O.S., Ω_w	1.85		Live / Snow Load:	*25.0*	psf
Interior Frame:					
Bearing Length, N: (Frame Flg. Width)		in.			
Frame Flg. Thick:		in.			
Bay Spacing:		ft.			
Purlin Thickness 1:		in.			
Purlin Thickness 2:		in.			

Gage Equivalents		
16 Ga.	0.0588	in.
14 Ga.	0.0725	in.
12 Ga.	0.1030	in.
10 Ga.	0.1345	in.

Calc. Values and Constants:

	End	Int. 1	Int. 2
k	1.696		
m	0.784	0.0	0
C_1	0.847		
C_2	0.869	#####	#####
C_3	0.770		
C_4	0.672	#####	#####
C_9	1.0		
C_θ	1.0		
Eq. C3.4-1 Increase Factor per AISI-96	1.0		

Portion of AISI-96 Table C3.4-1 for Single Web, Stiffened Flanges

Opposing Loads Spaced > 1.5*h	End Reaction	1.56	P_n, kips	(Eq. C3.4.1-1)
	Interior 1 Reaction	#DIV/0!	P_n, kips	(Eq. C3.4.1-4)
	Interior 2 Reaction	#DIV/0!	P_n, kips	(Eq. C3.4.1-4)
Opposing Loads Spaced ≤ 1.5*h	End Reaction	1.06	P_n, kips	(Eq. C3.4.1-6)
	Interior 1 Reaction	#DIV/0!	P_n, kips	(Eq. C3.4.1-8)
	Interior 2 Reaction	#DIV/0!	P_n, kips	(Eq. C3.4.1-4)

Web Crippling Strength Check

Location	Equation	Limit	U.C.	Result
End Reaction (AISI C3.4)	$(\Omega_w * P)/P_n$	1.0	1.16	**REINF. REQ'D**
Interior Reaction (AISI C3.5.1)	$(M/M_{no})+(P/P_n)$	1.0	#N/A	**#N/A**

SHEETING SCHEDULE

	TYPE	COLOR	GA.
ROOF PANEL	HHR	TAHOE BLUE	24
WALL PANEL	HHR	MALIBU WHITE	24
LINER PANEL			
SOFFIT PANEL			
RAKE/EAVE TRIM		TAHOE BLUE	24
WALL TRIM		MALIBU WHITE	24
CORNER TRIM		MALIBU WHITE	24
JAMB/HEAD TRIM		MALIBU WHITE	24
GUTTER		TAHOE BLUE	24

SCREWS SCHEDULE

MARK	SIZE	LENGTH
FRAMING SCREW W/O WASHER	12-14	1"
ROOF FRAMING SCREW	12-14	1"
WALL FRAMING SCREW	12-14	1"
TRIM FRAMING SCREW	12-14	1"
STITCH SCREW	1/4"-14	7/8"
STRUCTURAL SCREW	12-24	1 1/4"
WAFER HEAD SCREWS	8-18	2 3/8"
WAFER HEAD SCREWS	10-24	1"

FRAMED OPENING SCHEDULE

QNTY.	DESCRIPTION

MAN DOOR SCHEDULE

QNTY.	MARK	DESCRIPTION
1	6070M	MAN DOOR

WINDOW SCHEDULE

QNTY.	DESCRIPTION

INSULATION

	THICKNESS	BY HCI	NOT BY HCI
ROOF			
WALL			
ROOF T-BLOCK			
WALL T-BLOCK			

SKYLIGHT/WALLITE PANELS SCHEDULE

PROFILE	QNTY.	LENGTH
HUSKY HI RIB		
WEATHER SPAN		

GENERAL NOTES:

1.) **MATERIALS**

	ASTM DESIGNATION
HOT ROLLED BAR	A529 GRADE 55 Fy = 55 ksi MIN.
STRUCTURAL WIDE FLANGE SHAPES	A992 Fy = 50 ksi MIN.
STRUCTURAL CHANNEL/ANGLE	A36 Fy = 36 ksi MIN.
STRUCTURAL STEEL SHEET	A570 GRADE 50 Fy = 50 ksi MIN.
STRUCTURAL STEEL PLATE	A572 GRADE 50 Fy = 50 ksi MIN.
COLD FORMED SHAPES	A570 GRADE 55 Fy = 55 ksi Min.
COLD FORMED SHAPES (GALV.)	A653 55M GRADE 55 CLASS 1 G40 Fy = 55 ksi Min.
ROOF & WALL SHEETING (SCREW DOWN ROOF)	A653 SS GRADE 50 CLASS 1 OR 2 G90 26 Ga. Fy = 50 ksi Min.
ROOF & WALL SHEETING (STANDING SEAM ROOF)	A653 SS GRADE 40 G90 24 Ga. Fy = 40 ksi Min.
BOLTS	A307 & A325

HCI STEEL BUILDING SYSTEMS RESERVES THE RIGHT TO SUBSTITUTE THE ABOVE MATERIALS WITH EQUAL OR BETTER MATERIALS.

2.) **A325 BOLT TIGHTENING REQUIREMENTS.** ALL HIGH STRENGTH BOLTS ARE A325 UNLESS NOTED OTHERWISE. HIGH STRENGTH BOLTS SHALL BE TIGHTENED BY THE "TURN OF THE NUT" METHOD IN ACCORDANCE WITH THE LATEST EDITION OF AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS". A325 BOLTS SHALL BE INSTALLED WITHOUT WASHERS WHEN TIGHTENED BY THE "TURN OF THE NUT" METHOD. ALL BOLTED CONNECTIONS, FOR SHEAR/BEARING CONNECTION TYPE WITH BOLT THREADS EXCLUDED FROM THE SHEAR PLANE SHALL BE SNUG TIGHT ONLY.

3.) ALL STRUCTURAL STEEL SHALL RECEIVE A RUST INHIBITIVE PRIMER. THIS PAINT IS NOT INTENDED FOR LONG TERM EXPOSURE TO THE ELEMENTS.

4.) PRE-FORMED CLOSURE STRIPS ARE PROVIDED AT THE EAVE BENEATH THE ROOF SHEETS, AT THE ENDWALL BETWEEN THE RAKE TRIM AND THE ENDWALL SHEETS AND AT THE SIDEWALL BETWEEN THE EAVE TRIM AND THE SIDEWALL SHEETS.

5.) ALL BRACING SHOWN AND PROVIDED BY HCI STEEL BUILDING SYSTEMS FOR THIS BUILDING IS REQUIRED AND SHALL BE INSTALLED BY THE ERECTOR AS A PERMANENT PART OF THE STRUCTURE. IF ADDITIONAL BRACING IS REQUIRED FOR STABILITY DURING ERECTION, IT SHALL BE THE ERECTOR'S RESPONSIBILITY TO DETERMINE THE AMOUNT OF SUCH BRACING, AND TO PROCURE AND INSTALL AS NEEDED.

6.) **ERECTOR NOTE:** OSHA 2001 STEEL ERECTION STANDARDS - SUBPART "R" 1926.758(e) , REQUIRES THAT, "IN GIRT AND EAVE STRUT-TO-FRAME CONNECTIONS, WHEN GIRTS OR EAVE STRUTS SHARE COMMON CONNECTION HOLES, AT LEAST ONE BOLT WITH ITS WRENCH TIGHT NUT REMAIN CONNECTED TO THE FIRST MEMBER SO THAT THE GIRT OR EAVE STRUT IS ALWAYS SECURED AGAINST DISPLACEMENT. HCI HAS PROVIDED AN ADEQUATE QTY OF THINHEAD BOLTS FOR THIS PURPOSE. HOWEVER, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UNDERSTAND AND FOLLOW OSHA SAFETY REGULATIONS AND PROCEDURES.

CUSTOMER RESPONSIBILITIES

1.) IT IS THE RESPONSIBILITY OF THE ERECTOR TO PERFORM THE WORK IN A SAFE MANNER AND TO OBEY ALL THE SAFETY CODES.

2.) IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THAT ALL PROJECT PLANS, SPECIFICATIONS AND APPLIED DESIGN LOADS FULLY MEET THE PROPOSED INTENT AS WELL AS COMPLY WITH ALL APPLICABLE REQUIREMENTS OF ANY GOVERNING AUTHORITES, AND OBTAIN THE APPROPRIATE APPROVALS AND/OR PERMITS AS MAY BE REQUIRED FROM CITY, COUNTY, STATE OR FEDERAL AGENCIES.

3.) THE BUILDING WILL BE SUPPLIED AS THE HCI DRAWINGS INDICATE. IT IS THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THE THE BUILDING BEING SUPPLIED MEETS THE PROJECT REQUIREMENTS.

4.) IT IS THE RESPONSIBILITY OF THE CUSTOMER FOR OVERALL PROJECT COORDINATION, INTERFACE, COMPATIBILITY AND DESIGN CONCERNING ANY MATERIALS NOT SUPPLIED BY HCI STEEL BUILDING SYSTEMS, INC. WITH THE BUILDING TO BE SUPPLIED BY HCI STEEL BUILDING SYSTEMS, INC. THE SPECIFIC DESIGN CRITERIA CONCERNING THIS INTERFACE BETWEEN MATERIALS MUST BE FURNISHED BY THE CUSTOMER PRIOR TO RELEASE FOR FABRICATION, OR THE DESIGN ASSUMPTIONS OF HCI STEEL BUILDING SYSTEMS WILL GOVERN.

5.) IT IS THE RESPONSIBILITY OF THE CUSTOMER TO VERIFY ALL DESIGN CRITERIA INCLUDING DEFLECTIONS AND TO NOTIFY HCI STEEL BUILDING SYSTEMS OF ANY DISCREPANCIES OR INCONSISTENCIES PRIOR TO RELEASE FOR FABRICATION.

6.) THE CUSTOMER IS RESPONSIBLE FOR THE ACCURATE SETTING OF ANCHOR BOLTS AND ERECTION OF STEEL IN ACCORDANCE WITH THE "FOR CONSTRUCTION" DRAWINGS ONLY. (SEE ANCHOR BOLT PLAN FOR ADDITIONAL FOUNDATION AND ANCHOR BOLT NOTES)

7.) UNLESS SPECIFICALLY STATED OTHERWISE WITHIN THE HCI STEEL BUILDING SYSTEMS PURCHASE AGREEMENT, THE FOLLOWING SHALL GOVERN:

a.) THIS BUILDING DRAWING PACKAGE AND ANY ACCOMPANYING CALCULATIONS REPRESENT THE PROJECT AS IT WILL SUPPLIED. THE BUILDING WILL BE SUPPLIED EXACTLY AS THE DRAWINGS INDICATE.

b.) ANY FIELD MODIFICATIONS, ALTERATIONS, OR THE ATTACHMENT OF ANY EQUIPMENT OR COMPONENT TO THIS HCI STEEL BUILDING SYSTEM, OR THE OMITTED INSTALLATION OF ANY PARTS OR PIECES, WITHOUT THE EXPRESS WRITTEN APPROVAL OF HCI STEEL BUILDING SYSTEM, INC. SHALL VOID ANY AND ALL WARRANTIES.

CUSTOMER APPROVAL:

ALL INFORMATION CONTAINED HEREIN HAS BEEN REVIEWED AND FOUND TO BE CORRECT AND CONSISTENT WITH MY INTENT AND PURPOSE. I REQUEST THAT H C I STEEL BUILDING SYSTEMS PROCEED WITH FABRICATION. I UNDERSTAND AND ACCEPT ALL CUSTOMER RESPONSIBILITIES.

CHECK ONE	
	REVISE AND RESUBMIT
	APPROVED FOR FABRICATION AS NOTED
X	APPROVED FOR FABRICATION

SIGNED: ON FILE DATE: 3/4/04

BASIC BUILDING SIZE: SPAN 12'-0" x LENGTH 16'-0" x EAVE HT. 8'-0", 9'-0"
ROOF PITCH: 1.0:12
DESIGN CODE/ED.: UBC 97 EXPOSURE: C SEISMIC ZONE: 3
LIVE LOAD: 20 psf. DEAD LOAD: 2.5 psf. SNOW LOAD: 25 psf. WIND LOAD: 80 mph.
CLOSURE: Enclosed COLLATERAL LOAD: 3 psf ADDITIONAL LOAD:

REV	DATE	REVISION
0	3/19/04	FOR CONSTRUCTION
A	2/24/04	FOR APPROVAL

HCI STEEL BUILDING SYSTEMS, INC.
18520 67th AVE. N.E.
ARLINGTON, WA 98223
(360) 435-8871
FAX (360) 435-9267

BUILDING DRAWING PACKAGE

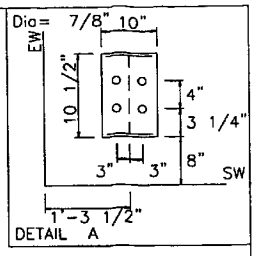
CUSTOMER: ENVIROCON INC.
ADDRESS: 10400 N. BURGARD WAY
PORTLAND, OR 97203
PHONE: (360) 737-1992 FAX: (360) 737-1995
PROJECT: ALCOA INC.
LOCATION: VANCOUVER, WA

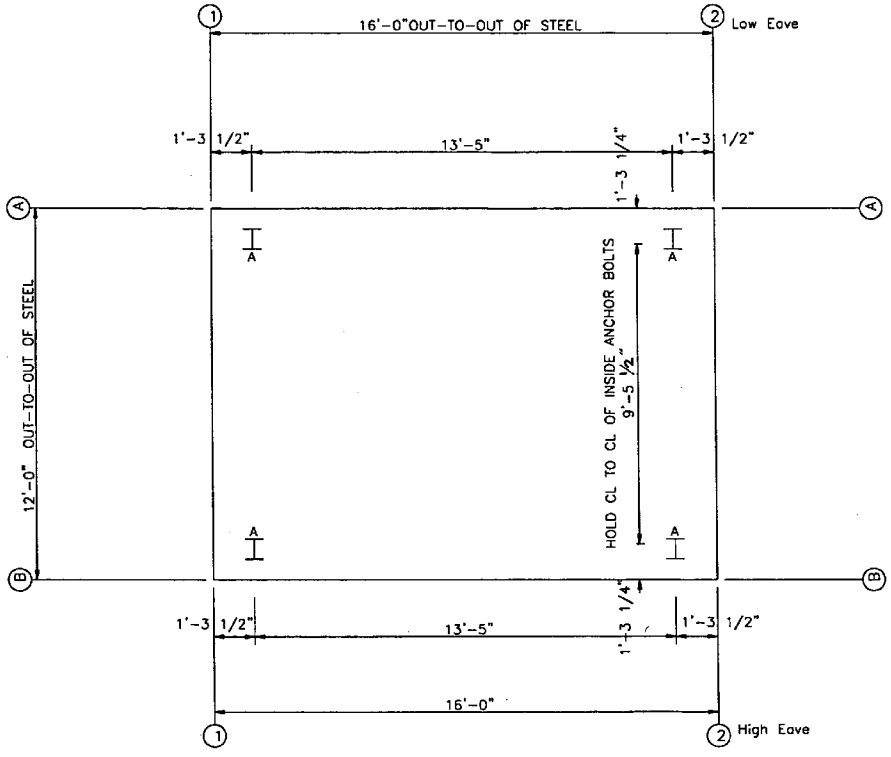
DRAWING RECORD

DESCRIPTION	PAGE NO.
ANCHOR BOLT PLAN	PEB-1
REACTION PAGE	PEB-2
ROOF PLAN	PEB-3
SIDEWALL ELEVATIONS	PEB-4
ENDWALL ELEVATIONS	PEB-5
CROSS SECTION	PEB-6
FLANGE BRACE DETAILS	PEB-7
MANDOOR DETAILS	PEB-8
ROOF DETAILS	PEB-9
GUTTER DETAILS	PEB-10
WALL DETAILS	PEB-11
DETAILS	PEB-
DETAILS	PEB-
DETAILS	PEB-

JOB NO.: 2493

MICHAEL R. LAPIERRE STATE OF WASHINGTON 39874 REGISTERED PROFESSIONAL ENGINEER
2/24/04
EXPIRES 3/16/04





ANCHOR BOLT PLAN

NOTE: All Base Plates @ 100'-0" (U.N.)

MICHAEL R. LAPIERRE
STATE OF WASHINGTON
39874
REGISTERED
PROFESSIONAL ENGINEER
2/24/04

EXPIRES 2/6/04

REV.	DATE	DESCRIPTION

REVISIONS

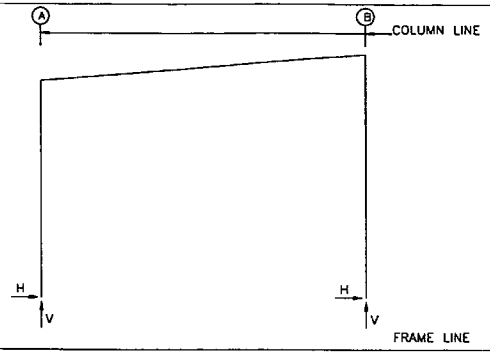
REV.	DATE	DESCRIPTION
B	2/19/04	FOR CONSTRUCTION
A	2/24/04	FOR APPROVAL & JOB

REVISIONS

HCI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

DRAWN:	DATE:	JOB NO.	PAGE:
ET/FT	2/19/04	2493	PEB-1
CHECK: TAM	DATE: 2/24/04		



RIGID FRAME: MAXIMUM REACTIONS, ANCHOR BOLTS, & BASE PLATES

Frm Line	Col Line	Load Id	Hmax H	V Vmax	Load Id	Hmin H	V Vmin	Anc. No	Bolt D(in)	Base Plate (in) Wid	Len	Thk	Grout (in)
1 *	A	3	0.9	1.3	5	-0.9	-1.0	4	0.875	10.00	10.50	0.500	0.0
		4	0.6	1.8									
1 *	B	6	1.0	-1.2	2	-0.7	1.1	4	0.875	10.00	10.50	0.500	0.0
		1	-0.2	1.8	6	1.0	-1.2						

1 * Frame lines: 1 2

NOTES FOR REACTIONS

1. All loading conditions are examined and only maximum/minimum H or V and the corresponding H or V are reported.
2. Positive reactions are as shown in the sketch. Foundation loads are in opposite directions.
3. Bracing reactions are in the plane of the brace with the H pointing away from the braced bay. The vertical reaction is downward.
4. Building reactions are based on the following building data:

Width (ft)	=	12.0
Length (ft)	=	16.0
Eave Height (ft)	=	8.0/ 9.0
Roof Slope (rise/12)	=	1.0
Dead Load (psf)	=	2.5
Collateral Load (psf)	=	3.0
Live Load (psf)	=	20.0
Snow Load (psf)	=	25.0
Wind Speed (mph)	=	80.0
Wind Code	=	UBC 97
Exposure	=	C
Closed/Open	=	C
Importance - Wind	=	1.00
Importance - Seismic	=	1.00
Seismic Zone	=	3
Seismic Coeff (Ca)	=	0.36

5. Loading conditions are:
   1 DL+CL+LL
   2 DL+CL+LL/2+WL1
   3 DL+CL+LL/2+WR2
   4 DL+CL+LL+WR1/2
   5 DL+WL1
   6 DL+WR1

RIGID FRAME: BASIC COLUMN REACTIONS (k)

Frame Line	Column Line	Dead Horiz	Dead Vert	Collateral Horiz	Collateral Vert	Live Horiz	Live Vert	Wind_L1 Horiz	Wind_L1 Vert	Wind_R1 Horiz	Wind_R1 Vert	Wind_L2 Horiz	Wind_L2 Vert
1 *	A	0.02	0.29	0.02	0.15	0.16	1.28	-0.95	-1.25	0.78	0.20	-0.95	-1.25
1 *	B	-0.02	0.30	-0.02	0.16	-0.16	1.33	-0.59	-0.02	1.01	-1.47	-0.59	-0.02

Frame Line	Column Line	Wind_R2 Horiz	Wind_R2 Vert	Seismic_L Horiz	Seismic_L Vert	Seismic_R Horiz	Seismic_R Vert	LnWind_L Horiz	LnWind_L Vert	LnWind_R Horiz	LnWind_R Vert
1 *	A	0.78	0.20	-0.07	-0.09	0.07	0.09	0.27	-0.63	0.27	-0.63
1 *	B	1.01	-1.47	-0.05	0.09	0.05	-0.09	-0.27	-0.63	-0.27	-0.63

1 * Frame lines: 1 2

BRACING REACTIONS:

Wall Loc	Wall Line	Col Line	± Reactions (k) Wind Horz	Wind Vert	Seismic Horz	Seismic Vert
L_EW	1	Rigid Frame At Endwall				
F_SW	B	Weak Axis Bending Used				
R_EW	2	Rigid Frame At Endwall				
B_SW	A	Weak Axis Bending Used				

RIGID FRAME REACTIONS: WEAK AXIS BENDING

Wall Loc	Wall Line	Col Line	Reactions(k ,f-k) Horiz	AB_Vert	Moment	Load_Id
F_SW	B	1	0.3	3.7	2.5	Wind
F_SW	B	1	0.1	1.7	1.2	Seismic
F_SW	B	2	0.3	3.7	2.5	Wind
F_SW	B	2	0.1	1.7	1.2	Seismic
B_SW	A	1	0.3	3.1	2.1	Wind
B_SW	A	1	0.1	1.5	1.0	Seismic
B_SW	A	2	0.3	3.1	2.1	Wind
B_SW	A	2	0.1	1.5	1.0	Seismic

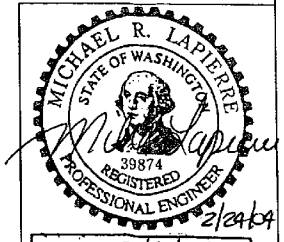
ANCHOR BOLT SUMMARY

Qnt	Loc	Dia (in)	Proj (in)
O 16	RF	7/8"	4.00

GENERAL NOTES

FOUNDATION NOTES:

1. ANCHOR BOLTS, EMBEDDED ITEMS AND FOUNDATION DESIGN ARE NOT BY HCI AND REQUIRE SPECIAL REINFORCEMENT.
2. FOUNDATION MUST BE SQUARE, LEVEL AND SMOOTH. ALL ANCHOR BOLTS MUST BE PLACED ACCURATELY IN THE POSITIONS SHOWN OR STEEL WILL NOT FIT.
3. BOTTOM OF ALL BASE PLATES TO BE AT SAME ELEVATION UNLESS NOTED.
4. COLUMN REACTIONS ARE IN THOUSANDS OF POUNDS.
5. ANCHOR BOLTS ARE TO BE TYPE A36 AND REQUIRE FLAT WASHERS.
6. REACTIONS SHOULD BE CONSIDERED SWITCHABLE WHEN LOADS ARE APPLIED FROM THE OPPOSITE SIDE.
7. ALLOWABLE CONCRETE BEARING PRESSURE USED FOR BASE PLATE DESIGN IS 1.05 KSI.



EXPIRES 3/6/04

REV.	DATE	DESCRIPTION

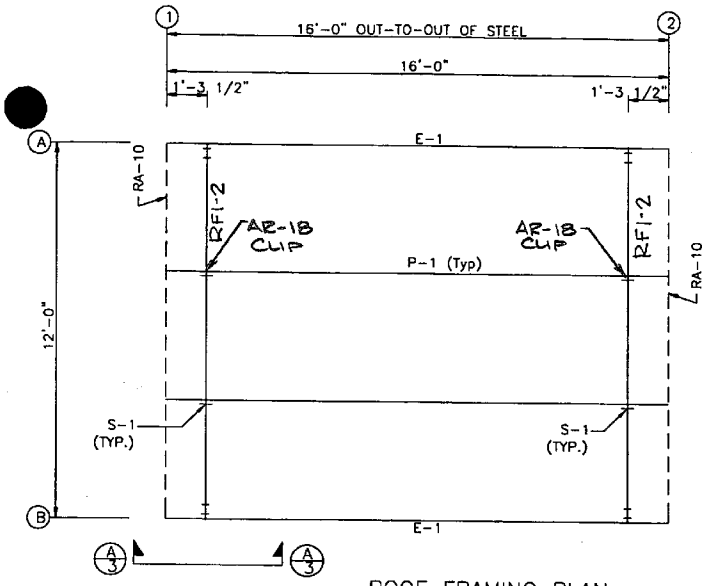
REVISIONS

REV.	DATE	DESCRIPTION
A	3/19/04	FOR CONSTRUCTION
A	2/24/04	FOR APPROVAL

REVISIONS

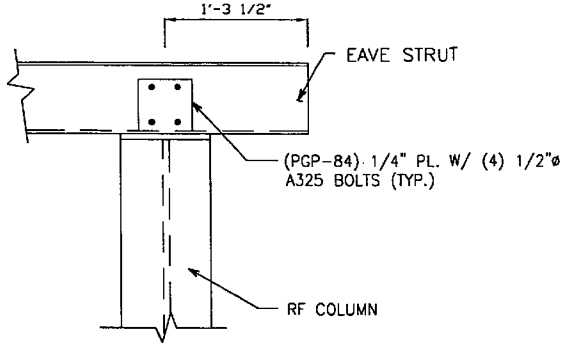
HCI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.	DRAWN: ET/FT	DATE: 2/19/04	JOB NO. 2493	PAGE: PEB-2
CUSTOMER:	ENVIROCON INC.	CHECK:	DATE:		
LOCATION:	VANCOUVER WA				

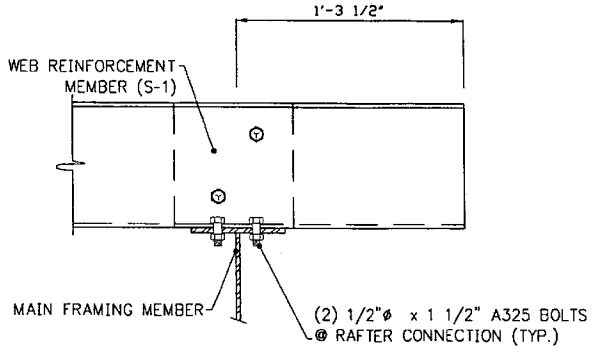


ROOF FRAMING PLAN

MEMBER TABLE ROOF PLAN	
MARK	SIZE
P-1	8Z25U16
E-1	8Z25U16
S-1	8Z25U16



A/3 TYP. EAVE STRUT CONNECTION DETAIL



ENDBAY CONDITION

ERECTOR NOTE:
PIECE MARKS ARE LOCATED ON THE LEFT END OF MEMBER AS DETAILED. ERECT MEMBER SO PIECE MARK IS IN POSITION SHOWN ON ERECTION DRAWINGS.

MICHAEL R. LAPIERRE STATE OF WASHINGTON 39874 REGISTERED PROFESSIONAL ENGINEER
2/24/04
EXPIRES 2/6/04

REV.	DATE	DESCRIPTION
		REVISIONS

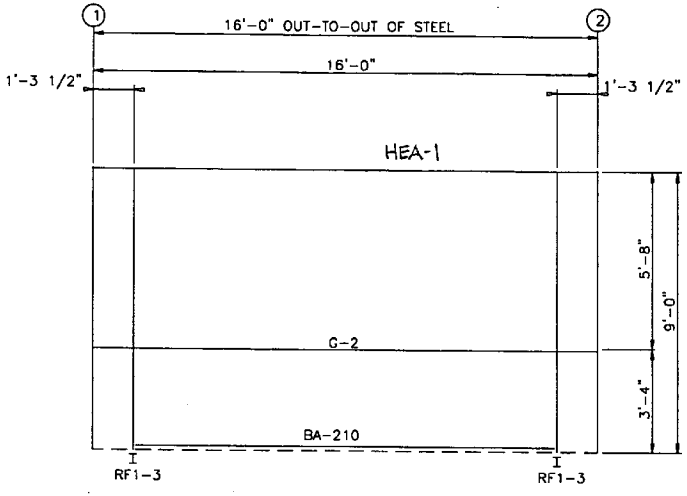
REV.	DATE	DESCRIPTION
0	3/19/04	FOR CONSTRUCTION
1	2/24/04	FOR APPROVAL
		REVISIONS

HCI STEEL BUILDING SYSTEMS INC.

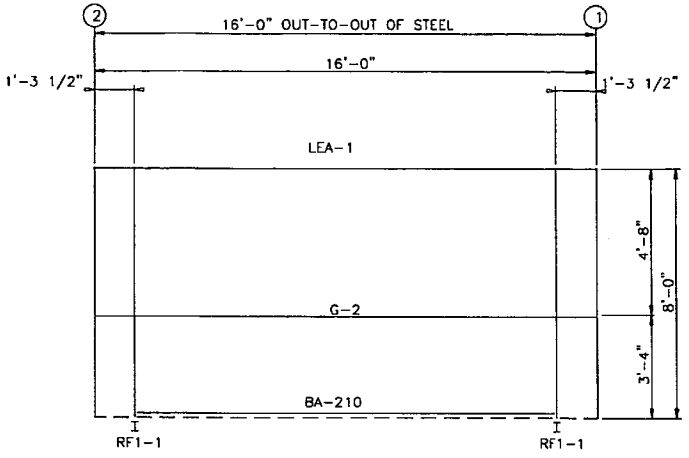
PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER WA

DRAWN:	DATE:	JOB NO.	PAGE:
ET/FT	2/19/04	2493	PEB-3
CHECK:	DATE:		

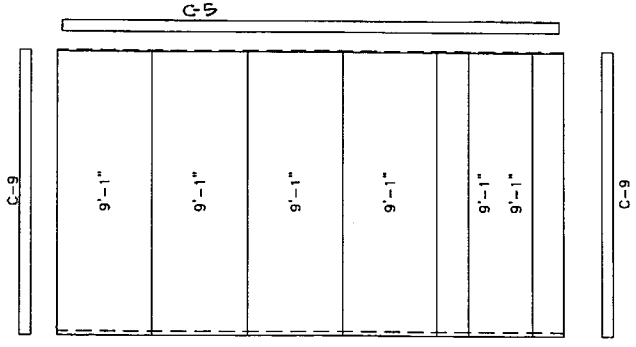
MEMBER TABLE LINE B	
MARK	SIZE
G-2	8Z25U16



FRONT SIDEWALL FRAMING: LINE B

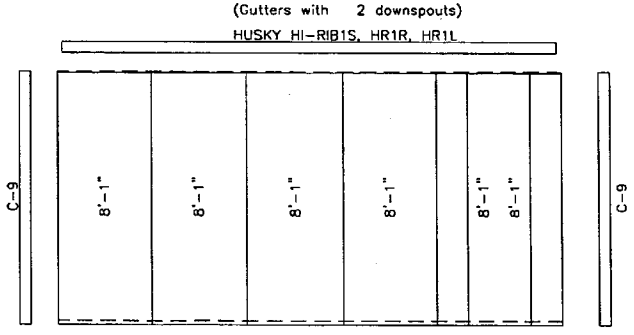


BACK SIDEWALL FRAMING: LINE A



FRONT SIDEWALL SHEETING & TRIM: LINE B

PANELS: 24 Ga. HUSKY HI-RIB - MALIBU WHITE



BACK SIDEWALL SHEETING & TRIM: LINE A

PANELS: 24 Ga. HUSKY HI-RIB - MALIBU WHITE

ERECTOR NOTE:
PIECE MARKS ARE LOCATED ON THE LEFT END OF MEMBER AS DETAILED. ERECT MEMBER SO PIECE MARK IS IN POSITION SHOWN ON ERECTION DRAWINGS.

MICHAEL R. LAPIERRE
STATE OF WASHINGTON
39874
REGISTERED
PROFESSIONAL ENGINEER
2/24/04
EXPIRES 2/16/04

REV.	DATE	DESCRIPTION
REVISIONS		

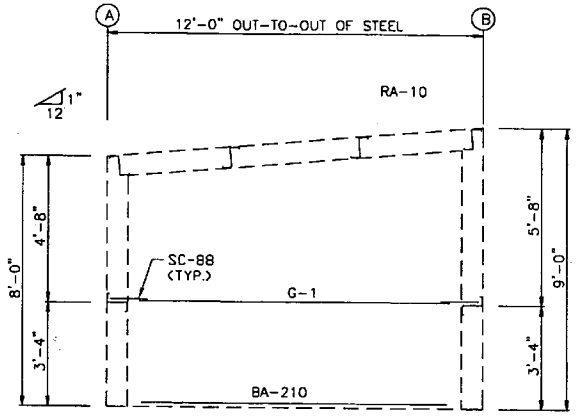
REV.	DATE	DESCRIPTION
1	8/19/04	FOR CONSTRUCTION
2	2/24/04	FOR APPROVAL JBB
REVISIONS		

HCI STEEL BUILDING SYSTEMS INC.

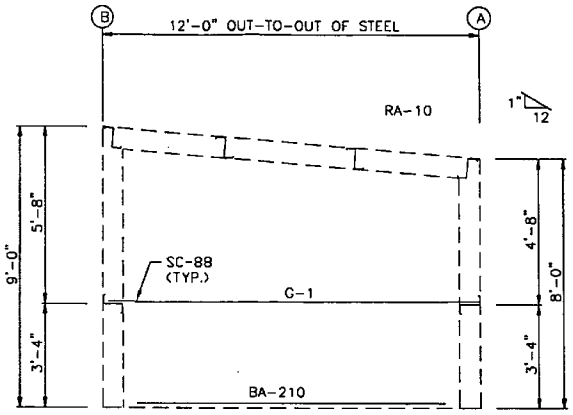
PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

DRAWN:	DATE:	JOB NO.	PAGE:
ET/FT	2/19/04	2493	PEB-4
CHECK:	DATE:		

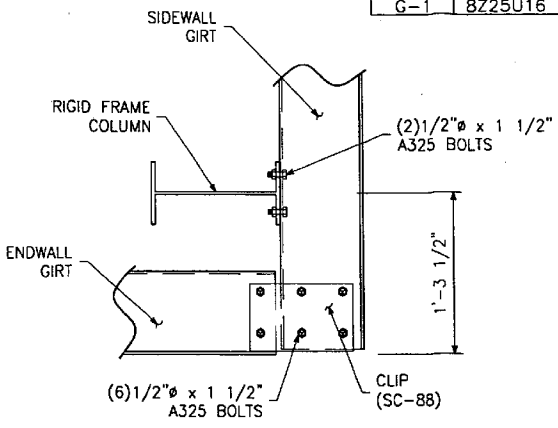
MEMBER TABLE LINE 1	
MARK	SIZE
G-1	8Z25U16



LEFT ENDWALL FRAMING: LINE 1

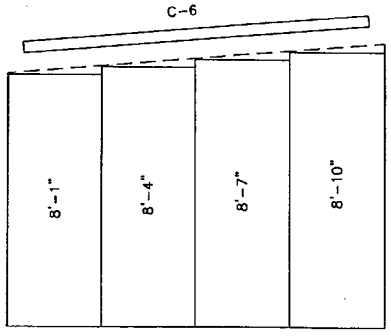


RIGHT ENDWALL FRAMING: LINE 2



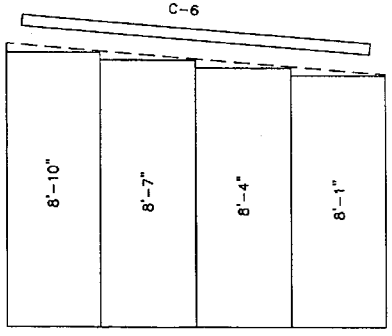
RIGID FRAME ENDWALL CORNER

WITH BYPASS SIDEWALLS



LEFT ENDWALL SHEETING & TRIM: LINE 1

PANELS: 24 Ga. HUSKY HI-RIB - MALIBU WHITE



RIGHT ENDWALL SHEETING & TRIM: LINE 2

PANELS: 24 Ga. HUSKY HI-RIB - MALIBU WHITE

ERECTOR NOTE:
PIECE MARKS ARE LOCATED ON THE LEFT END OF MEMBER AS DETAILED. ERECT MEMBER SO PIECE MARK IS IN POSITION SHOWN ON ERECTION DRAWINGS.

MICHAEL R. LAPIERRE
STATE OF WASHINGTON
39874
REGISTERED
PROFESSIONAL ENGINEER
2/24/04

EXPIRES 9/6/04

REV.	DATE	DESCRIPTION
		REVISIONS
A	2/19/04	FOR CONSTRUCTION
B	2/24/04	FOR APPROVAL

HCI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

DRAWN:	DATE:	JOB NO.	PAGE:
ET/FT	2/19/04	2493	PEB-5
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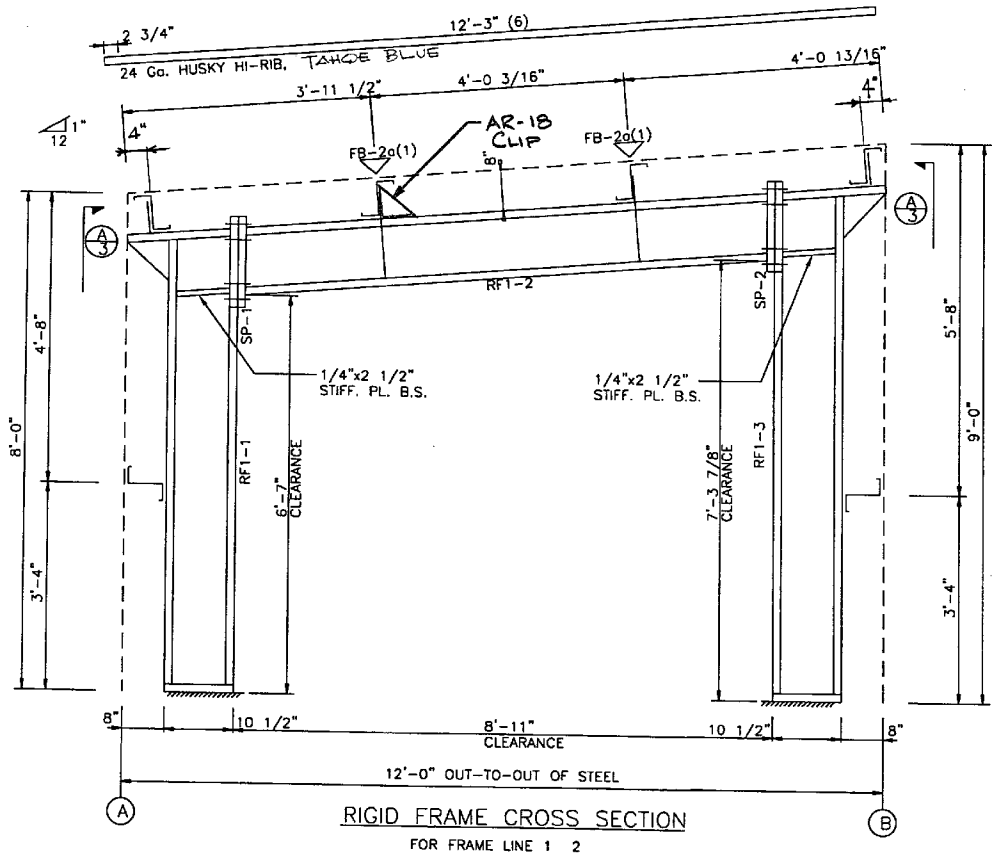
SPLICE PLATES & BOLTS										
Splice Mark	Quan Top	Quan Bot	Quan Int	Bolt Type	Bolt Dia	Bolt Len	Plate Size Wid	Plate Size Thick	Plate Size Length
Sp- 1	4	4	0	A325	0.750	1.75	6"	3/8"	1'-5 1/4"
Sp- 2	4	4	0	A325	0.750	1.75	6"	3/8"	1'-5 1/4"

NGE BRACES: B.S.(U.N.) FIELD CUT FB IF REQ
– L2x2x14Ga.

MEMBER SIZE TABLE (in)					
MARK	WEB DEPTH START/END	WEB PLATE THICK	WEB PLATE LENGTH	OUTSIDE FLANGE T x W x LEN	INSIDE FLANGE T x W x LEN
RF1-1	10.0/10.0	0.135	88.7	1/4" x 5 x 87.9 1/4" x 5 x 18.3	1/4" x 5 x 75.1
RF1-2	10.0/10.0	0.135	107.2	1/4" x 5 x 106.3	1/4" x 5 x 106.3
RF1-3	10.0/10.0	0.135	98.5	1/4" x 5 x 18.3 1/4" x 5 x 98.5	1/4" x 5 x 84.0



RIGID FRAME CROSS SECTION

FOR FRAME LINE 1 2

MICHAEL R. LAPIERRE
STATE OF WASHINGTON
39874
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PROFESSIONAL ENGINEER
2/24/04
EXPIRES 9/6/04

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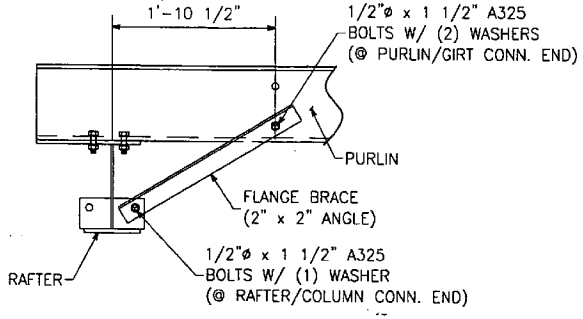
		REVISIONS
0	3/19/04	FOR CONSTRUCTION
A	2/24/04	FOR APPROVAL
REV.	DATE	DESCRIPTION
		REVISIONS

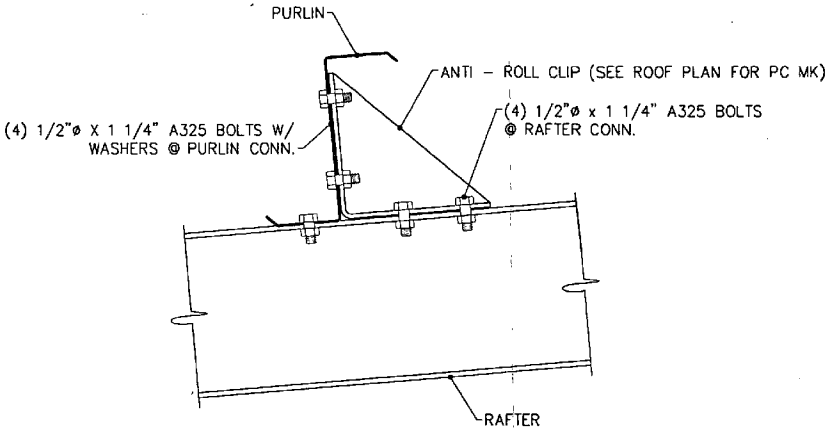
HCI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

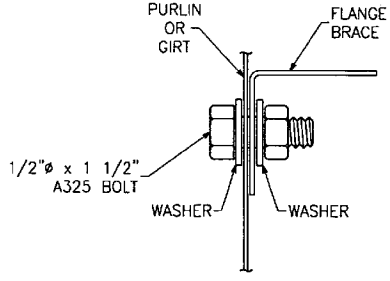
DRAWN:	DATE:	JOB NO.	PAGE:
ET/FT	2/20/04	2493	PEB-6
CHECK:	DATE:		



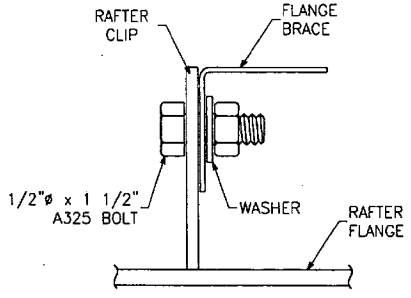
FLANGE BRACE DETAIL
(ENDBAY CONDITION)



ANTI - ROLL CLIP DETAIL - AR18



WASHER PLACEMENT DETAIL
(CONNECTION @ PURLIN/GIRT)



WASHER PLACEMENT DETAIL
(CONNECTION @ RAFTER/COLUMN)

ERECTOR NOTE:
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MICHAEL R. LAPIERRE
STATE OF WASHINGTON
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REVISIONS

REV.	DATE	DESCRIPTION
1	3/19/04	FOR CONSTRUCTION
2	2/24/04	FOR APPROVAL

REVISIONS

HCI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

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ET/FT	2/20/04	2493	PEB-7
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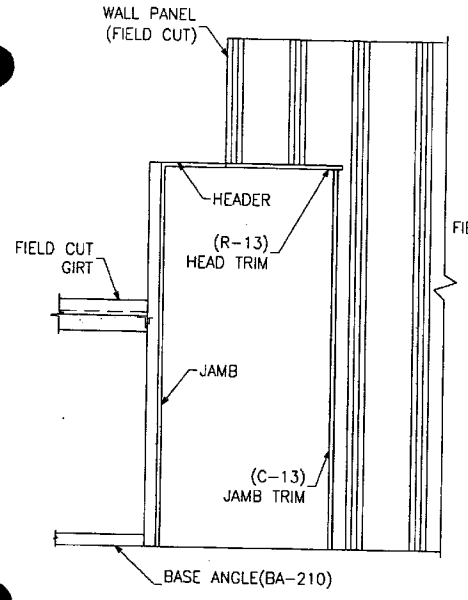
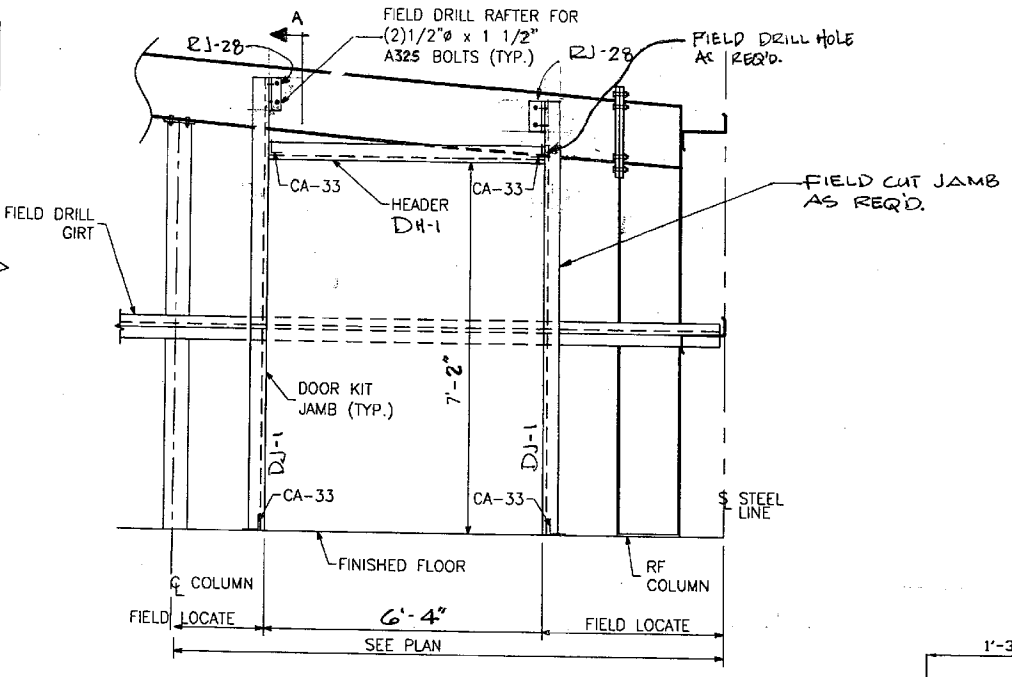


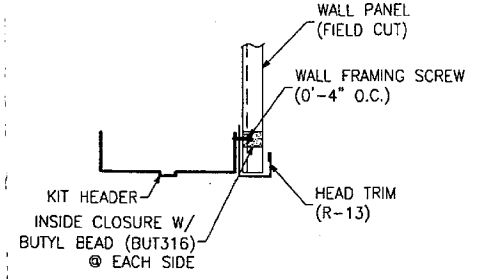
MAN DOOR ELEVATION

(FIELD LOCATED)
(ONE) 6070 REQUIRED



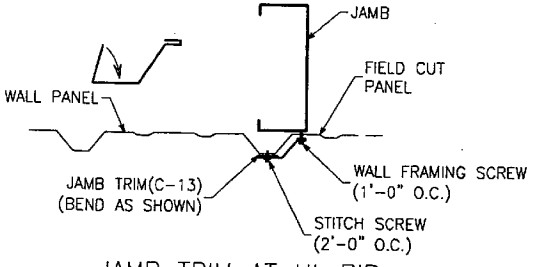
MAN DOOR FRAME ELEVATION

(ONE) MANDOOR @ LINE 2)

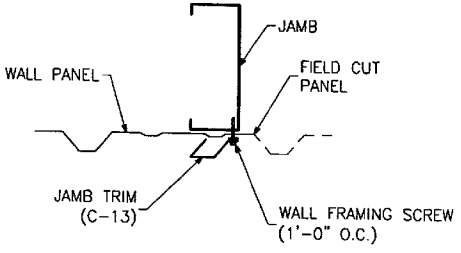


HEADER DETAIL

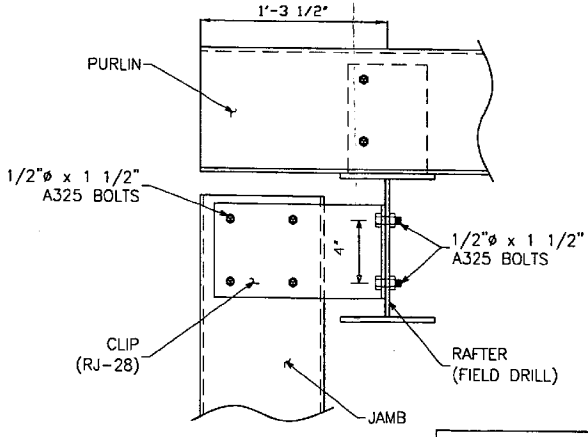
©MANDOOR



JAMB TRIM AT HI-RIB



JAMB TRIM AT LOW RIB



SECTION "A"

ERECTOR NOTE:
PIECE MARKS ARE LOCATED ON THE LEFT END OF MEMBER AS DETAILED. ERECT MEMBER SO PIECE MARK IS IN POSITION SHOWN ON ERECTION DRAWINGS.

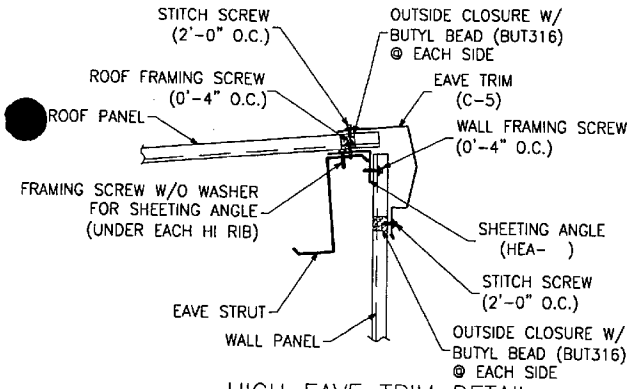
MICHAEL R. LAPIERRE
STATE OF WASHINGTON
39874
REGISTERED
PROFESSIONAL ENGINEER
2/24/04
EXPIRES 3/6/04

REV.	DATE	DESCRIPTION
		REVISIONS
1	2/19/04	FOR CONSTRUCTION
2	2/24/04	FOR APPROVAL

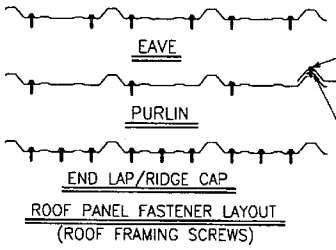
HCI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER WA

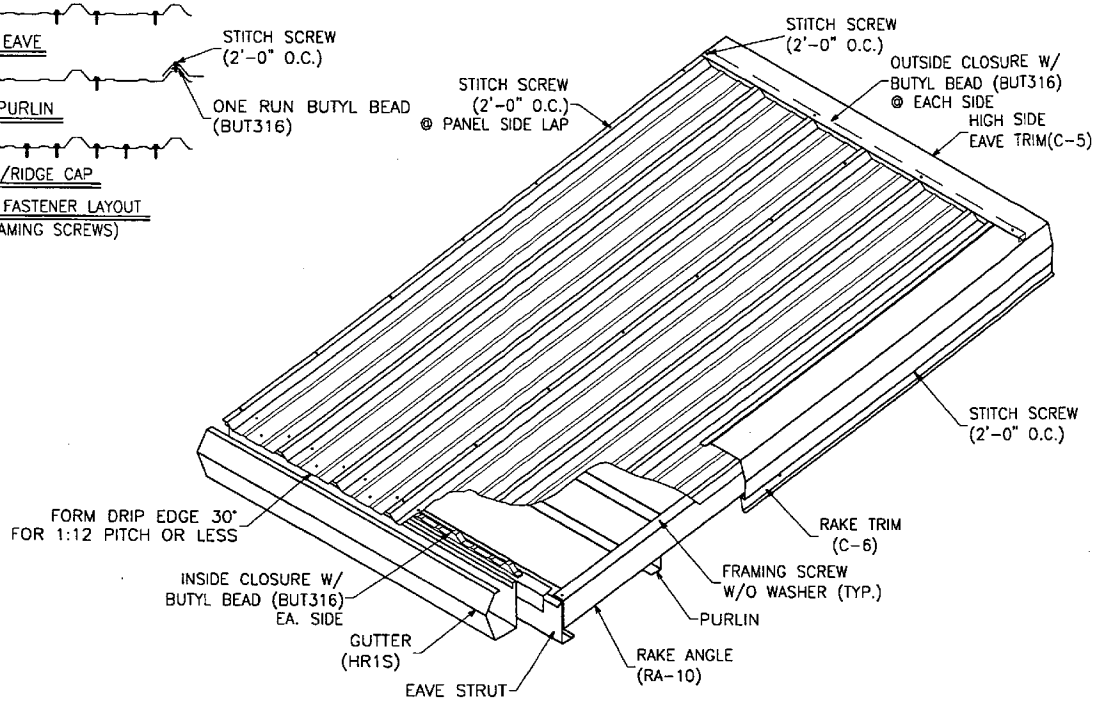
DRAWN:	DATE:	JOB NO.	PAGE:
ET/FT	2/20/04	2493	PEB-8
CHECK:	DATE:		



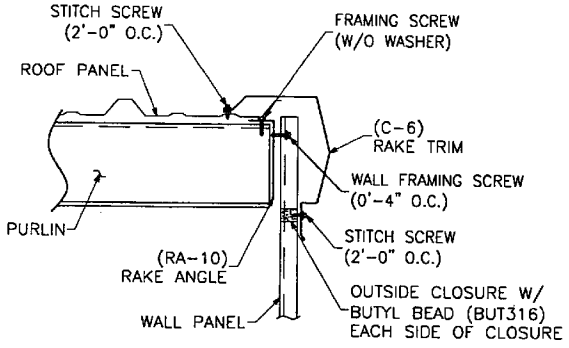
HIGH EAVE TRIM DETAIL



ROOF PANEL FASTENER LAYOUT
(ROOF FRAMING SCREWS)



HHR ROOF PANEL LAYOUT



RAKE TRIM DETAIL

ERECTOR NOTE:
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MICHAEL R. LAPIERRE
STATE OF WASHINGTON
39874
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PROFESSIONAL ENGINEER
2/24/04
EXPIRES 3/6/04

REV.	DATE	DESCRIPTION
		REVISIONS
1	2/6/04	FOR CONSTRUCTION
2	2/24/04	FOR APPROVAL

REVISIONS

HCSI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER WA

DRAWN:	DATE:	JOB NO.	PAGE:
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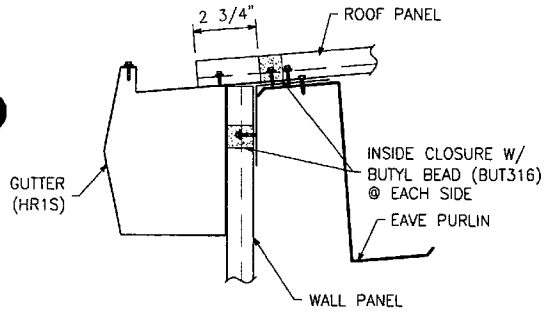
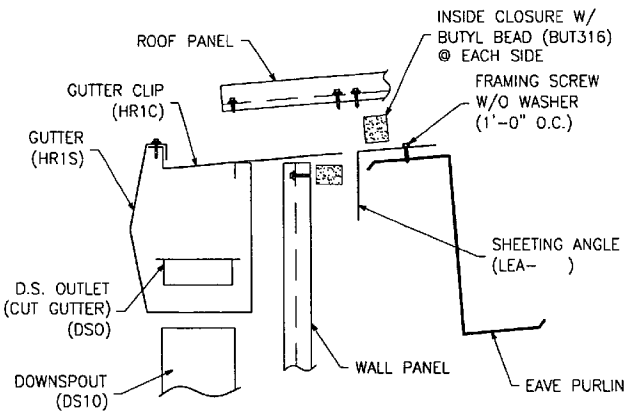
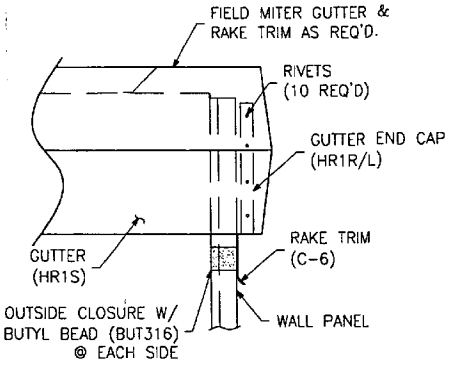
CHECK:	DATE:		



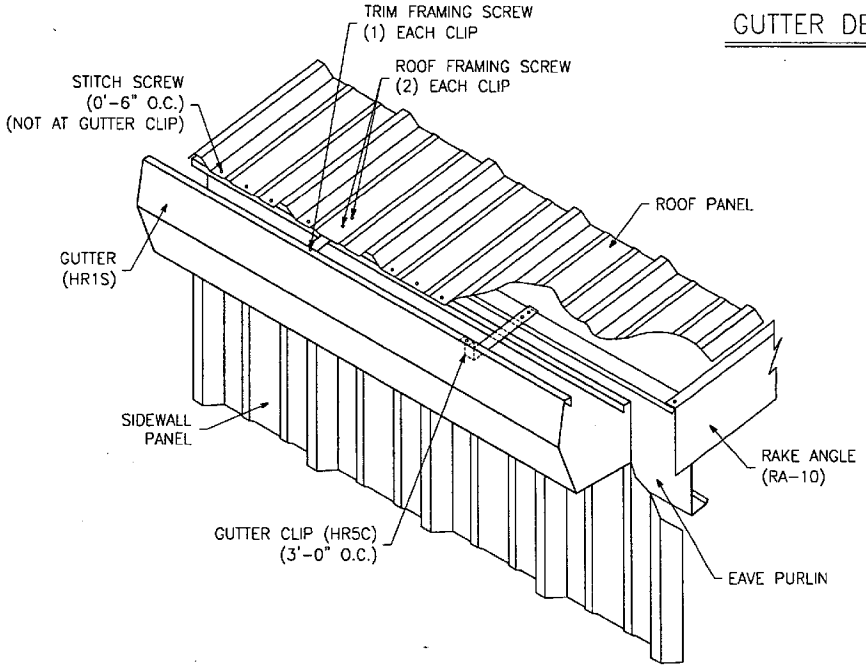
ASSEMBLED GUTTER DETAIL



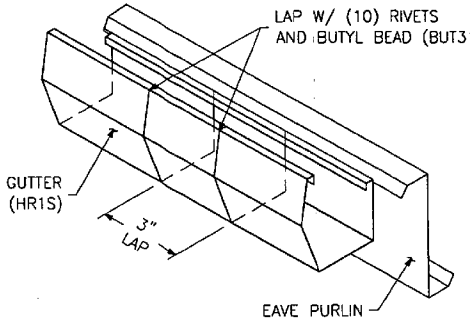
GUTTER DETAIL – EXPLODED VIEW



GUTTER END DETAIL



GUTTER ATTACHMENT DETAIL



GUTTER LAP DETAIL

ERECTOR NOTE:
PIECE MARKS ARE LOCATED ON THE LEFT END OF MEMBER AS DETAILED. ERECT MEMBER SO PIECE MARK IS IN POSITION SHOWN ON ERECTION DRAWINGS.

MICHAEL R. LAPIERRE STATE OF WASHINGTON 39874 REGISTERED PROFESSIONAL ENGINEER
2/24/04
EXPIRES 3/6/04

REV.	DATE	DESCRIPTION

REVISIONS

REV.	DATE	DESCRIPTION
A	9/19/04	FOR CONSTRUCTION
A	2/24/04	FOR APPROVAL

REVISIONS

HCI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER, WA

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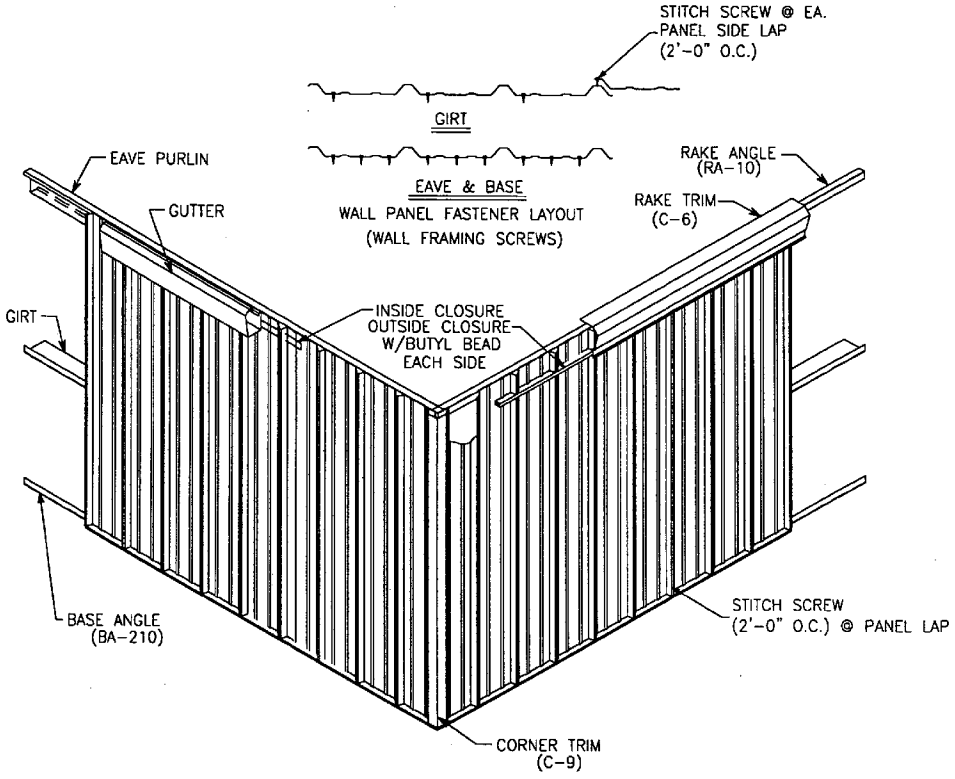
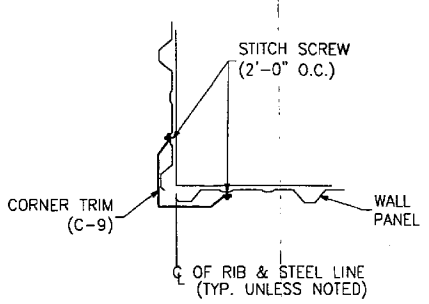
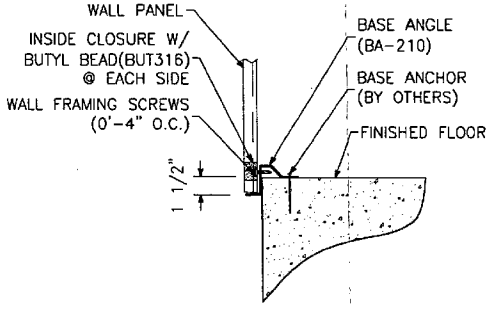


HHR WALL PANEL LAYOUT



OUTSIDE CORNER TRIM



BASE ANGLE DETAIL

ERECTOR NOTE:
PIECE MARKS ARE LOCATED ON THE LEFT END OF MEMBER AS DETAILED. ERECT MEMBER SO PIECE MARK IS IN POSITION SHOWN ON ERECTION DRAWINGS.

MICHAEL R. LAPIERRE
STATE OF WASHINGTON
39874
REGISTERED
PROFESSIONAL ENGINEER
2/24/04

EXPIRES 3/6/04

REV.	DATE	DESCRIPTION
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REVISIONS

REV.	DATE	DESCRIPTION
0	9/19/03	FOR CONSTRUCTION
1	2/24/04	FOR APPROVAL VSB

REVISIONS

HCI STEEL BUILDING SYSTEMS INC.

PROJECT:	ALCOA INC.
CUSTOMER:	ENVIROCON INC.
LOCATION:	VANCOUVER. WA

DRAWN:	DATE:	JOB NO.	PAGE:
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APPENDIX J

PHOTOGRAPHIC SUMMARY

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

AUGUST, 2005
REVISED FEBRUARY 2007

4169 November, 2003- Fill Placement activities along shoreline of Columbia River, in anticipation of ‘Armorflex’ installation. Note jersey barrier erosion fence along water’s edge. Looking east.

4182 November, 2003 – Fine grading of 2.5H:1V slope prior to ‘Armorflex’ installation. Looking east.

4170 November, 2003 – Installation of the first full panel of ‘Armorflex’ at west end of regraded shoreline along Columbia River. Looking west.

4176 November, 2003 – Crane and Spreader bar assembly used to lift and place ‘Armorflex’ panels. Panels delivered by truck and temporarily stored at top of embankment, if deliveries advance in front of placement. Looking west.

80016 November, 2003 – Installation of tapered ‘Armorflex’ panel along Columbia River. Note jersey barrier erosion fence in background. Looking south.

80022 November, 2003 – Placement of tapered “Armorflex’ panels. Space between panels to be filled with grout. Looking north.

30086 December, 2003 – Placement of topsoil with open spaces of “Armorflex’ panels using extend reach excavator. Looking east.

30088 December, 2003 – Placement of topsoil within open spaces of ‘Armorflex’ panels at west end of shoreline, above elevation 18 ft. AMSL. ‘Armorflex’ panel installation continuing at right, above elevation 18 ft. AMSL. Looking northwest.

40100 December, 2003 - Placement of topsoil within open spaces of ‘Armorflex’ panels at west end of shoreline, above elevation 18 ft. AMSL. Black line gaps in panels (from topo fof slope to bottom) are tapered panel locations (to be filled with grout). Looking west.

80021 December, 2003 - Installation of anchor screws at elevation 30 ft. AMSL for securing top of ‘Armorflex’ panels. Looking west.

50011 December, 2003 – Marking of locations and driving of rods into subsoils through openings in ‘Armorflex’ panels prior to insertion of live stakes. Looking east.

50012 December, 2003 – Staging of shrubs (foreground) and live stakes (background) to top of slope at East Landfill in preparation for planting.

50017 December, 2003 - Live stakes delivered in container filled with water, per the requirements of the vendor and the specifications.

4312 April 2004 – Delineation of ‘Contaminated Material Haul Road from North and North2 landfills to East Landfill using metal posts and rope/flagging. Posts capped to protect against impalement. Looking north.

90054 April, 2004 – Construction of anchor trench embankment along south side of East Landfill. Note Waste Soils previously placed to right. Looking west.

4320 April, 2004 – Spreading of 'Waste Soils' on surface of East Landfill, northeast corner. Waste Soils obtained from North2 Landfill. Looking west.

4326April, 2004 – Density testing of ‘Waste Soils’ on East Landfill. Due to variability of soil makeup, a test fill was constructed to optimize compactive effort.

4331 April, 2004 – Excavation of ‘Waste Soils’ at east end of North 2 Landfill. Looking east.

90061 April, 2004 – Excavation of Waste Soils from North 2 Landfill. Looking west.

4314 April, 2004 – Low-density concrete backfill of an abandoned culvert formerly used to divert flow from adjacent area to North 2 Landfill. Looking north.

4337 April, 2004 – Completed construction of ‘Armorflex’ concrete revetment along reconstructed embankment of Columbia River. Vegetation inpicture is 3 months old. Looking east.

4340 April, 2004 – The grout filled anchor trench at the downstream end of the ‘Armorflex’ revetment, required by the manufacturer’s installation manual. Trench is 3 feet deep. Looking north.

4348 April, 2004 – Completed ‘Armorflex’ installation. Note jersey barrier erosion fence along waters edge, used for erosion and sediment control. Looking northwest.

4545 May, 2004 – North 2 Landfill, after complete removal of Waste Soils and regrading of slopes. Vegetation applied in October of 2004. Looking east.

4473 May, 2004 – Anchor trench platform adjacent to ‘Armorflex’ revetment on south side of East Landfill. Monitoring well cluster 94-1 in foreground and monitoring well cluster 94-2 in background. Looking east.

4486 May, 2004 – Placement of geosynthetic Clay Liner (GCL) over prepared soil surface of East Landfill. Looking southeast.

50071 May, 2004 Installation of Geosynthetic Clay Liner (GCL) within anchor trench on east side of East Landfill. Looking North.

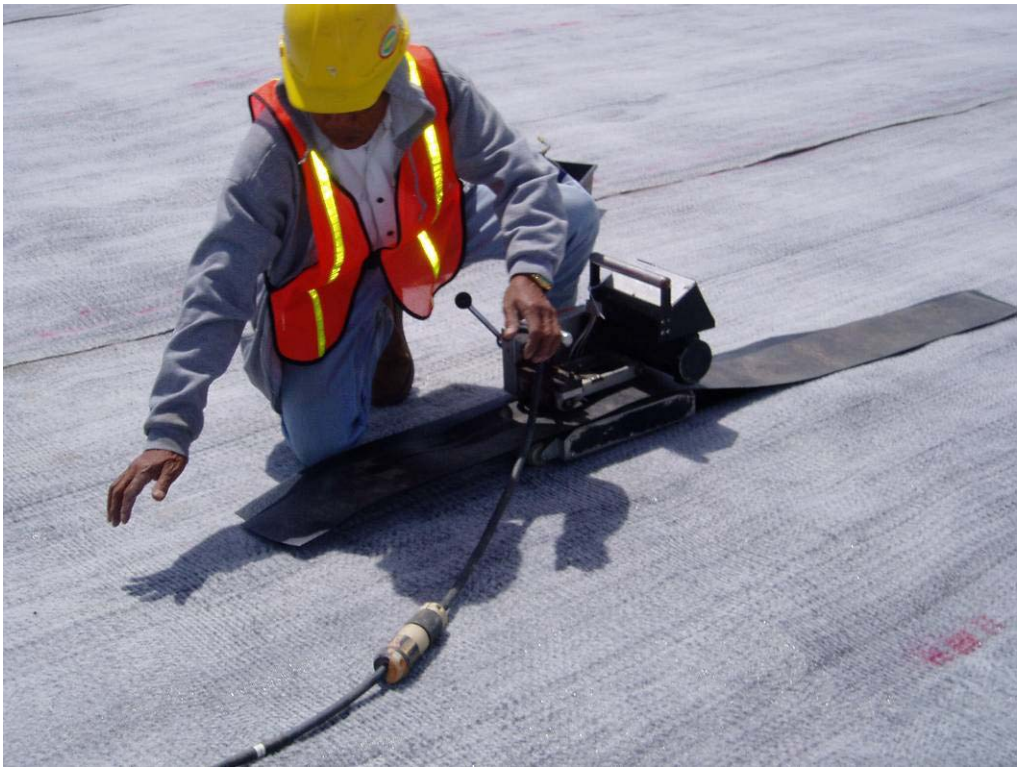
4510 May, 2004 – Geosynthetic Clay Liner (GCL) installed in southern anchor trench, along Columbia River. Looking west.

4501 May, 2004 – Application of a bead of bentonite prior to installation of adjacent Geosynthetic Clay Liner (GCL) panel. Bentonite bead required per specifications.

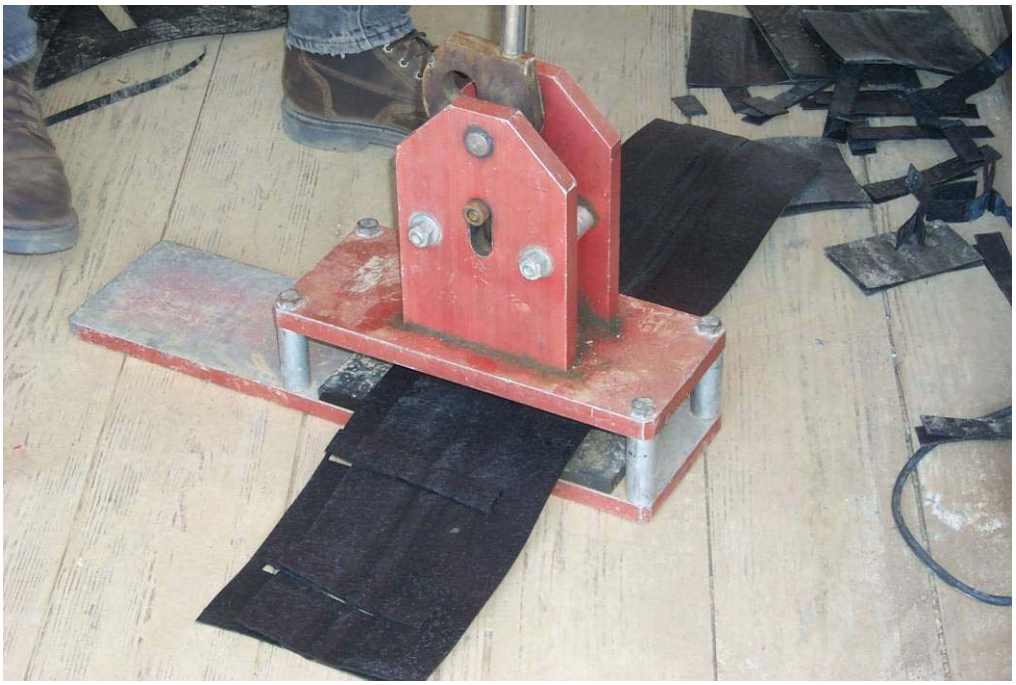
4452 May, 2004- Placement of ‘Waste Soils’ against anchor trench platform on north side of East Landfill. Looking west.

50073 May, 2004 – Geomembrane technician using a die to cut test specimen from a test weld strip. The dual wedge weld is located on the longitudinal centerline of the strip; the die cuts a 1-inch by 6-inch test specimen perpendicular to the weld. The weld of the specimen is field tested for peel and shear using a field tensiometer.

50066 May, 2004 – Field testing of test specimen weld using a field tensiometer. Specimen is tested in peel and shear modes until failure and result is compared with manufacturer's values for conformance.



50068 May, 2004 – Field technician creating a test weld strip. The test must be performed on surface over which geomembrane is to be installed. Surface shown is Geosynthetic Clay Liner (GCL).

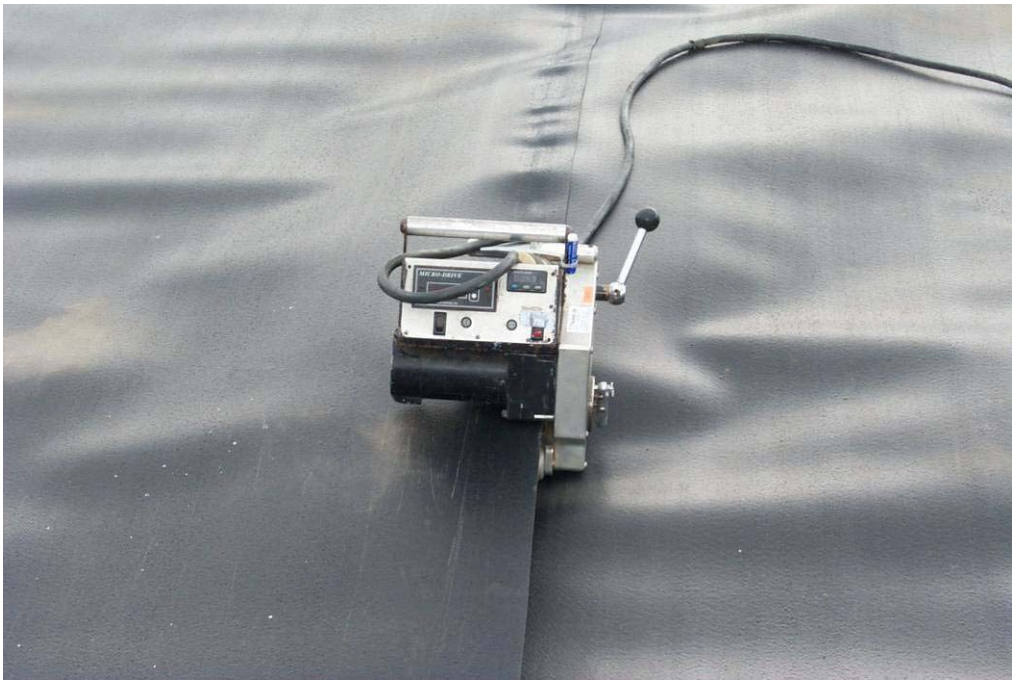


4488 May, 2004 – Closeup view of die cutting a test specimen. Dual wedge weld is centered on longitudinal centerline of test strip.

20125 June, 2004- Unrolling of geomembrane over geosynthetic clay liner (GCL). Geomembrane pulled across East Landfill with ATV. Spreader bar used to suspend geomembrane roll in air for ease of deployment.

4490 May, 2004 – Field seaming of adjacent HDPE geomembrane sheets at northwest corner of East Landfill. Welding machine temperature and speed based upon thickness of geomembrane and results of peel and shear testing from test weld strip.

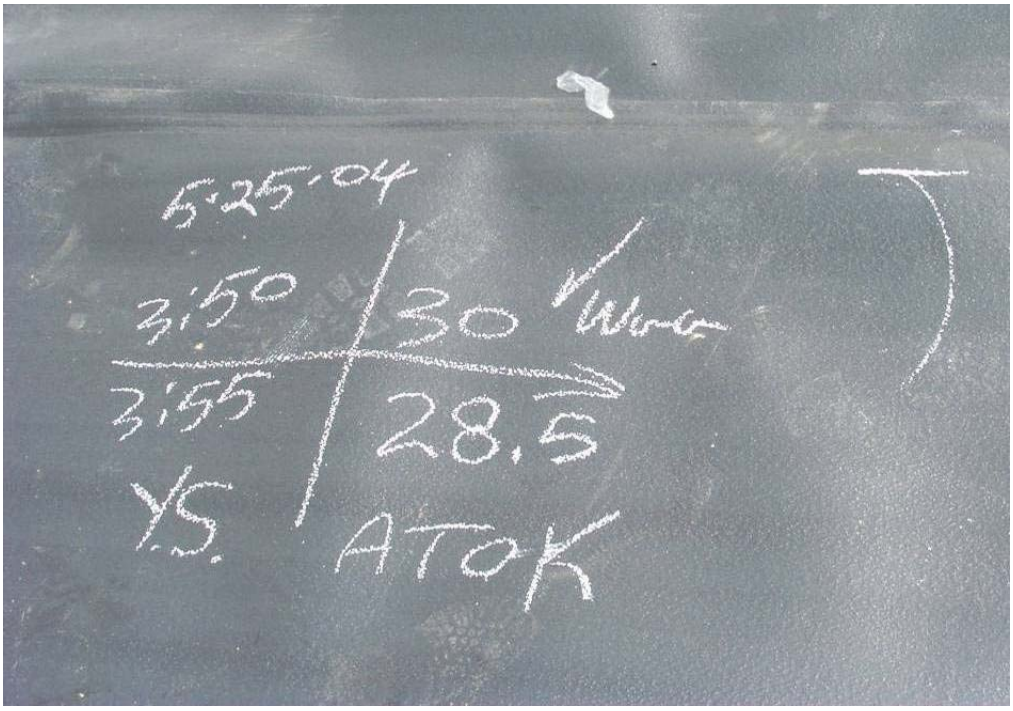
50079 May 2004 – Field Seaming of adjacent geomembrane panels. Operator removes fine debris from top and underside of geomembrane with brush to ensure quality seam.



4537 May, 2004 Welding machine creating dual wedge weld for connecting adjacent HDPE geomembrane panels. Completed weld in background.

50082 May 2004- Field technician checking weld using pressurized dual seam process. The 1/4-inch wide air channel created by dual wedge weld is pressurized to approximately 30 psi and monitored for pressure loss for 5 minutes.

50083 May, 2004- Monitoring of air pressure in channel between welds with gauge.



4498 May, 2004-Quality Control data written on geomembrane for air test. Information includes date (at top), start time of test, pressure at start of test, end time of test, pressure at end of test, initials of tester, Air Test OK (ATOK) and direction of air channel tested.

4507 May, 2004 – Grinding of geomembrane surface in preparation for extrusion welding process. Extrusion welding used at locations inaccessible to dual wedge welding machine. Grinding required to roughen surface for extrusion weld.

4506 May, 2004 – Extrusion fillet welding of a geomembrane patch adjacent to anchor trench. Left foot on patch. Extrusion fillet welding places ribbon of molten polymer over the edges of two geomembrane panels to be joined.

40181 June, 2004- Extrusion weld placed over end of air chamber test.

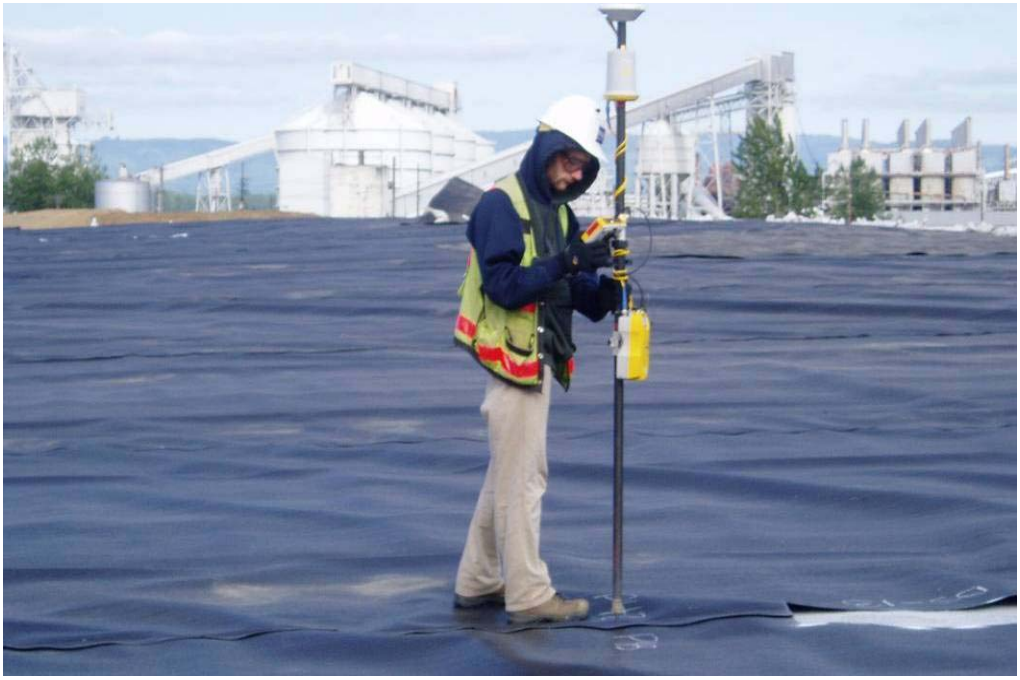
20140 June, 2004 – Completed installation of a ‘boot’ around a monitoring well. Boot is constructed using extrusion fillet welds, one at base of boot, one at patch over geomembrane and one vertical weld to create geomembrane column around well. Stainless steel straps secure boot to well casing.

30166 June, 2004 – Vacuum chamber box for testing extrusion fillet welds. The box, with a transparent lid, applies a vacuum of approximately 3 psi to weld. Soap solution placed over weld prior to application of vacuum will bubble if weld is not constructed correctly.

4512 May, 2004. Typical quality control inspection information. To right is inspection of welded seam. Information shown includes date, time and pressure to start test, time and pressure at end of 5 minute test, inspector initials and 'Air Test OK' To left is patch over destructive test sample location with extrusion fillet weld. Operator initials, date and time are provided.

20127 June, 2004 – Field technician using field tensiometer to check shear and peel strengths of destructive test samples removed from completed geomembrane panel welds.

4518 May, 2004 – Destructive test samples cut and removed from HDPE geomembrane after welding process completed. Information on sample includes panel location, date, time and welding operator initials. One sample tested infield, one sample tested at approved off-site lab and one sample archived by Alcoa. Peel and shear tests conducted and compared to minimum requirements of manufacturer specifications.



20129 June, 2004 – W&H Pacific technician locating edge of seam with global positioning system (GPS). Information to be used in development of as-built drawings.

70087 May, 2004 – Placement of geosynthetic drainage netting, subsurface drainage pipe and gravel backfill in perimeter anchor trench. Filter fabric cover over gravel not present. Looking South.

4521 May 2004 – Excavation of anchor trench on south side of East Landfill. HDPE geomembrane (black) and Geosynthetic Clay Liner (white) installed in conjunction with anchor trench excavation. Sandbags used to temporarily hold geosynthetics in place. Looking east.

4492 May, 2004 – Installation in progress of the Geosynthetic Clay Liner (GCL) and the HDPE geomembrane at the East Landfill. Installation initiated at the west perimeter of the landfill. Geomembrane being installed at north end of landfill. Looking east.

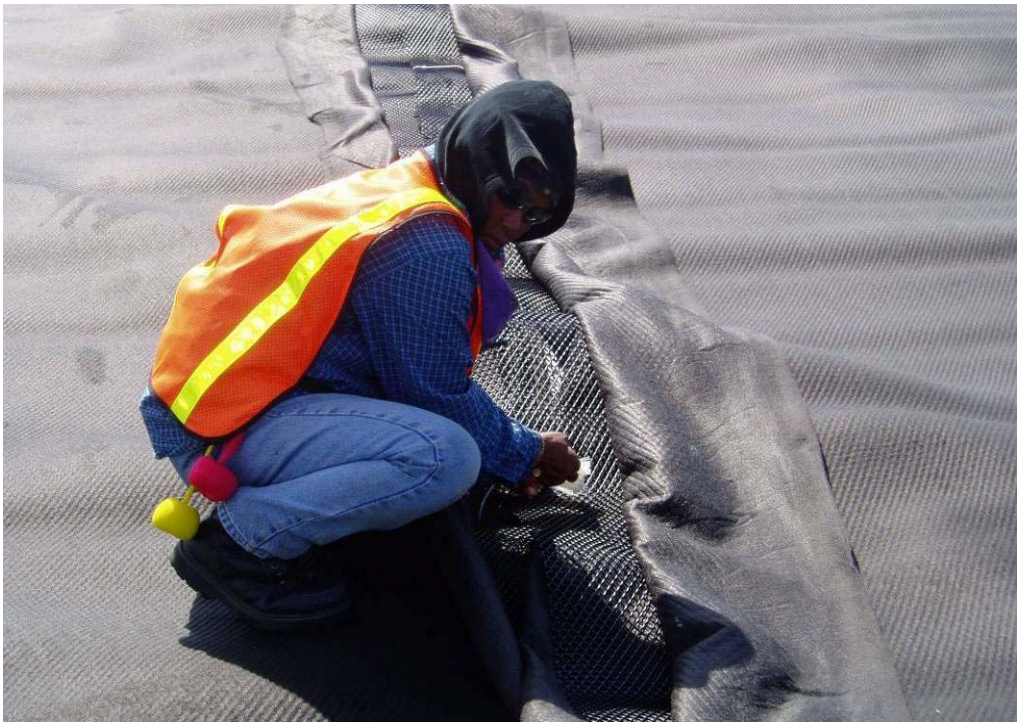
20120 June, 2004 – Excavation of Biodiffuser trench on east side of East Landfill. Perimeter anchor trench in foreground, perpendicular to biodiffuser. Looking east.

20138 June, 2004 – Stockpile of sand for construction of 18-inch thick random fill layer.

30148 June, 2004 – Biodiffuser unit with gravel backfill.

40177 June, 2004 – Completed Biodiffuser trench with gravel backfill. Exposed pipe to be connected to tee from perimeter anchor trench drain.

40183 June, 2004 – Panoramic view of East Landfill. Geosynthetic drainage netting (black surface) covered by random fill (gray soils). White sandbags delineate anchor trench location (sandbags used to prevent wind uplift). Note cleanout pipe in foreground at middle left. Looking east.



40186 June, 2004 – Field technician using white plastic zip fasteners to secure adjacent panels of drainage netting. The white color allow for quality control inspection of location (one fastener every 1.5 or 5 feet, depending on location). Filter fabric bonded to netting covers netting.

40185 June, 2004 – Field technician sewing adjacent panels of filter fabric seam bonded to synthetic drainage netting. White thread allows for quality control inspection.

10127 June, 2004 – Spreading of 6-inch thick topsoil layer over 18-inch thick random fill layer. Both layers installed over geosynthetic layers. Looking north.

50004 June, 2004 - Spreading of 6-inch thick topsoil layer over 18-inch thick random fill layer. Both layers installed over geosynthetic layers. Looking east.

50006 June, 2004 - Spreading of 6-inch thick topsoil layer over 18-inch thick random fill layer at south anchor trench location. Monitoring well cluster 94-1 in foreground. Looking east.

90007 July, 2004 – Installation of water pipeline and electrical conduit for sprinkler system along south embankment of East Landfill. Gray pipe is airline for use in monitoring well sampling. Looking east.

90002 July, 2004 - Installation of water pipeline and electrical conduit for sprinkler system. Lines extending from northeast corner of East Landfill (foreground) to storage-operations building foundation (background). Looking northeast.

90004 July, 2004 - Concrete foundation and slab of Storage –Operations Buliding. Looking northwest.

20055 August, 2004 – Structural assemblage of Storage-Opeartions building. Pipes extending up from center of floor are water supply line (originating from east (right side) of picture) and water feed line for sprinkler system (extending to west (left side) of picture.

20061 August, 2004 – Placement of concrete for flush mount monitoring well pad. Concrete to be amended with 'Fibermesh' to increase tensile strength.

20058 August, 2004 – Laborers finishing concrete monitoring well pads. Looking east.

60043 July, 2004 – Gravel access road along north side of East Landfill. Culvert in foreground to transfer flow from drainage swale (sloping from background to foreground) to drainage swale on east side of landfill flowing to Columbia River.

60066 August, 2004 – Electric transformer and power meter for sprinkler system. Storage-Operations building in background. Looking northeast.

5208 March, 2005 – Active sprinkler system for maintaining vegetation within open space of 'Armorflex' revetment. Sprinkler heads spaced on 50 feet centers and designed to water 65 feet radius. Looking east.

0218 October, 2004 Chainlink fence on east side of East Landfill property line, adjacent to Northwest Gateway Avenue. Looking south.

0224 October, 2004 Chainlink fence on west side of East Landfill property line. Looking northwest.

0221 October, 2004 –Completed and vegetated surface of East Landfill and shoreline embankment. Looking west.

0228 October, 2004 – Completed and vegetated surface of East Landfill. Looking north.

0610 October 4, 2006 – Excavation of shoreline bench area. Excavator tracking on access raod constructed from riprap. Looking west.

0603 October 5, 2006 – Placement of ecology block , in preparation for rootwad installation. Placement over filterfabric. Looking west.

0605 October 6, 2006 – Installation of rootwad adjacent to ecology block. Looking west.

0612 October 6, 2006 – Connection of rootwad to ecology blocks using –chain. Note excavation of bench area and installation of filterfabric. Looking east.

015 October 17, 2006 – Completed riprap toe repair. Note rootwad to left of picture and gravelly soils from bench area excavation infilling larger riprap. Looking east.

005 October 17, 2006 – Riprap stockpile located in area of former South Bank Area of Concern. Looking northeast.

0867 January 30, 2007 – Driving of rods to create hole for planting of live stakes. Laborers standing on riprap toe. Note rootwad in background at water's edge. Looking east.

0868 January 30, 2007 – Planting of live stakes. Looking east.

APPENDIX K

DAILY PROGRESS REPORTS

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

October, 2003

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-08-03
Contractor: Envirocon		
Subcontractor(s) Mofford		
No. of workers: 8	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Rain 50 Deg	Scattered Showers 60 Deg

Comments and/or supporting calculations:

Grubbing of trees along south shoreline continued. Continued construction of the Jersey barriers and silt fence. Barriers set in area just south of the South Bank area of concern. Started attaching fabric to Concrete Jersey barriers on the east end with epoxy. Adhesion may not be adequate and direct fastening may be required to keep the fabric in place.

Installed barrier fence around exclusion zone for South Bank area of concern excavation area. Started and completed excavation of area at P2-11 in X-4 to elevation called for on drawing. The material from this excavation is less than 50 mg/kg and the material was placed on the East Landfill. Screening sample taken from P2-1 in the afternoon and will be screened for PCB by Marc. Sample screening was attempted under the watchful eye of Mike Dreweit but the battery was not charged on the spectrometer and screening was delayed until Thursday morning.

Excavation of area X-3 was started and will be finished on Thursday.

Dust monitoring in the excavation area detected very little dust due to the rain in the morning.

Valdez also used a PID to analyze the excavation area for VOC's but none were detected.

Water truck with hose and nozzle spray is being used periodically as required to control visible emission.

Mofford Electrical installed conduit to the office trailer in preparation for power. Clark PUD awaiting a transformer that won't be available for 2 weeks.

Evergreen Aluminum electricians disconnected and removed overhead power line running from the sewage treatment plant to the old SPL load out structure near the east landfill.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER OPERATIONS – North & North 2 Landfills East Landfill Cap	**Date: 08 OCT 03**
Contractor Envirocon	
Subcontractor(s)	
No. of workers: 6	**Equipment: Komatsu P220 trackhoe, Komatsu 300 trackhoe,**

Morning Weather Conditions:	**Afternoon Weather Conditions**
	Partly Cloudy – Rain @ Times 65 F

Comments and/or supporting calculations:

1530

Marc Krekos and Mike Drewett on site.

1545

PCB – Immunoassay screen taken at X4 P211. Sample taken from 5 locations at bottom of excavation.

1600

Sample mixed and begin extraction process.

1715

Equipment problems with Spectrometer, unable to get results, will retest on Thursday.

1800

Marc and Mike off site.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed Marc Krekos		**Title**	**No.**

GENERAL INSPECTION/TESTING FORM
MISCELLANEOUS FIELD TESTS

Project Name/No. **VANALCO – South Bank Area of Concern**

Date: 10-08-03 **Weather:** Partly Cloudy 65

Report By: Marc Krekos

Test Location	Test Type	Sample Name	Parameter	Test Results	Unit
X4 P211	Immunoassay		Soil	None	

Sketch

Remarks

Signed **Title** **No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-09-03
Contractor: Envirocon		
Subcontractor(s)		
No. of workers: 8	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Rain heavy at times 50 Deg	Scattered Showers 60 Deg

Comments and/or supporting calculations:

Completed excavation of area X-3 & X-8 and Marc took screening samples from these locations.
Started excavation of X-4 at SB-1B-1 and found a large concrete block along the north edge of area.
A screening sample was taken from SB-1B-1. Started excavation of X-4 at P2-05 which contains +50
Mg/kg PCB material at 6 to 7 feet. Removed approx. 5' and took screening sample to check PCB level.
A large concrete box/vault was found running through this excavation area. Material excavated around
the concrete. The water truck was used with hose and nozzle to control visible emissions. Air monitor-
ing continued with PID but no hits were encountered.
Vegetation and trees at the center of the East landfill were grubbed off.
Approximately 16 sections of Jersey barrier on the west end were checked and found to be 1' to high.
Envirocon personnel removed these Jersey barriers and reset them to proper elevation. Lost one day on
the Jersey barrier installation due to this error.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER OPERATIONS – North & North 2 Landfills East Landfill Cap	**Date: 09OCT 03**
Contractor Envirocon	
Subcontractor(s)	
No. of workers: 6	**Equipment: Komatsu P220 trackhoe, Komatsu 300 trackhoe,**

Morning Weather Conditions:	**Afternoon Weather Conditions**
	Partly Cloudy – 62F

Comments and/or supporting calculations:

1430

Marc Krekos on site. Check areas to be sampled.

1530

Areas ready for PCB – Immunoassay screening. Samples taken from 5 locations at bottom of excavation.

Time	Elev.	Sample #	10 or 50 ppm screen
1545	34'	X8 P220	10
	28'	X4 P211	Re-test 10
1550	21'	X4 SBTB-1	10
1600	22'	X3 P207	10
1605	20'	X4 P205	50
1555	24'	X3 P210	10

1600 Envirocon pulled slopes at X4 P205 back to a 2 to 1 and then stopped for day.

1615 Marc off site, go over to Glacier to get a sample for grain size and proctor D698.

1625 Glacier closed will get sample on Friday.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed Marc Krekos		**Title**	**No.**

GENERAL INSPECTION/TESTING FORM
MISCELLANEOUS FIELD TESTS

Project Name/No. **VANALCO – South Bank Area of Concern**

Date: 10-09-03 **Weather:** Partly Cloudy 62

Report By: Marc Krekos

Test Location	Test Type	Sample Name	Parameter	Test Results	Unit
X8	Immunoassay	ELEV 34'	Soil	None	
X4 PSBTB-1	Immunoassay	ELEV 21'	Soil	None	
X4 P205	Immunoassay	ELEV 20'	Soil	None	
X3 P207	Immunoassay	ELEV 22'	Soil	None	
X3 P210	Immunoassay	ELEV 24'	Soil	None	

Sketch

Remarks

Signed	**Title**	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-10-03
Contractor: Envirocon		
Subcontractor(s)		
No. of workers: 7	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Rain	Sunny

Comments and/or supporting calculations:

Marc completed screening tests on six samples from the excavation sites. X-8 was the only one that tested less than 10 mg/kg PCB. Approximately 2 foot additional was excavated from the other areas and additional screening tests will be performed on Saturday morning.

Placement of the Jersey barriers was completed and the short reach LC 200 excavator was moved to the South Bank Area of Concern to work with the long reach LC 200. A Waste Management roll off box was moved to X-4 area and the long reach excavator is being used to load PCB waste greater than 50 Mg/kg directly into the box. Fabric is being installed on the Jersey barriers.

A Komatsu excavator was delivered to the site. Envirocon plans to work on Saturday.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER OPERATIONS – North & North 2 Landfills East Landfill Cap	**Date: 10OCT 03**
Contractor Envirocon	
Subcontractor(s)	
No. of workers: 6	**Equipment: Komatsu P220 trackhoe, Komatsu 300 trackhoe,**

Morning Weather Conditions:	**Afternoon Weather Conditions**
Overcast to Partly Cloudy 57 F	Partly Cloudy – 62F

Comments and/or supporting calculations:

0630 Marc on site. Activity run immunoassay screens on samples collected on 10-09.

0720 Set up to run immunoassay test.

0930 Screening completed.

Standard # 1 = -0.57

Elev.	Sample #	10 or 50 ppm screen	Result	< > 10 or 50
34'	X8	10	0.27	< 10ppm PASS
28'	X4 P211	Re-test 10	-0.75	> 10ppm FAIL
21'	X4 SBTB-1	10	-0.74	> 10ppm FAIL
22'	X3 P207	10	-0.74	> 10ppm FAIL
20'	X4 P205	50	0.03	~ 50ppm FAIL
24'	X3 P210	10	-0.74	> 10ppm FAIL

1000 Informed Envirocon of results, they will excavate the pits down in question and call me when they need me to come back out.

1115 Marc off site.

1715 Marc back on site to take new samples for screening at new elevations.

1815 Marc off site. Will run screenings on new samples on 10-11.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed Marc Krekos		**Title**	**No.**

GENERAL INSPECTION/TESTING FORM
MISCELLANEOUS FIELD TESTS

Project Name/No. VANALCO – South Bank Area of Concern

Date: 10-10-03 **Weather:** Partly Cloudy 57

Report By: Marc Krekos

Test Location	Test Type	Sample Name	Parameter	Test Results	Unit
X8	Immunoassay	ELEV 34'	Soil	0.27	<10 PASS
X4 SBTB-1	Immunoassay	ELEV 21'	Soil	-0.74	>10 FAIL
X4 P205	Immunoassay	ELEV 20'	Soil	0.03	~50 FAIL
X3 P207	Immunoassay	ELEV 22'	Soil	-0.74	>10 FAIL
X3 P210	Immunoassay	ELEV 24'	Soil	-0.74	>10 FAIL
X4 P211	Immunoassay	ELEV 28'	Soil	-0.75	>10 FAIL
1715 Re-Sample					
X3 P210	Immunoassay	ELEV 22'	Soil		
X3 P207	Immunoassay	ELEV 20'	Soil		
X4 P205	Immunoassay	ELEV 18'	Soil		
X4 P211	Immunoassay	ELEV 26'	Soil		
X4 SBTB-1	Immunoassay	ELEV 19'	Soil		
X4 P206	Immunoassay	ELEV 26'	Soil		

Sketch

Remarks

Signed | **Title** | **No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER OPERATIONS – North & North 2 Landfills East Landfill Cap	**Date: 11OCT 03**
Contractor Envirocon	
Subcontractor(s)	
No. of workers: 6	**Equipment: Komatsu P220 trackhoe, Komatsu 300 trackhoe,**

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

0800 Not on site today, but running Immunoassay screens on samples collected on 10-10-03.

0830 Start screen process by extracting sample.

1030 Screening completed. This is the second round of screenings on these samples.

Standard # 1 = -0.51

Elev.	Sample #	10 or 50 ppm screen	Result	< > 10 or 50
26'	X4 P206	50	-0.74	> 50 ppm
26'	X4 P211	10	-0.74	> 10 ppm
19'	X4 SBTB-1	10	-0.74	> 10 ppm
20'	X3 P207	10	-0.16	> 10 ppm
18'	X4 P205	50	-0.27	> 50 ppm
22'	X3 P210	10	-0.75	> 10 ppm

1045 Informed Envirocon of results, told them all areas > 10 ppm excavate down 2 more feet, place material in landfill. The two areas >50 ppm excavate 1 foot and place in container. I will wait on a call to come back and re-sample those areas.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-13-03
Contractor: Envirocon		
Subcontractor(s) Mofford & W H Pacific		
No. of workers: 7	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Overcast	Partly cloudy

Comments and/or supporting calculations:

Two additional roll off boxes filled with greater than 50 PCB materials. A characterization sample was taken from the six roll off boxes that are filled with greater than 50 PCB materials. The composite sample will be sent to the lab for RCRA 8 Haz Metal TCLP analysis required by Waste Mgt for the profile.

WH Pacific surveyed the east landfill and silt fence was installed on the north and west perimeter.

Trees were removed from the shoreline on the south side of the east landfill.

Mofford personnel were on site to run power to the field office.

Marc submitted verification soil samples SBAC –5-001 through 008. Analysis was expedited with 24 to 48 hour turn around to determine if the screening tests are providing accurate results.

Gray and Bruce discussed sampling methods being used by CH2Mhill. Discrete samples will be taken in The future rather than composite samples that Marc has been taking.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANALCO – South Bank Area of Concern	**Date: 13 OCT 03**
Contractor Envirocon	
Subcontractor(s)	
No. of workers: 6	**Equipment: Komatsu P220 trackhoe, Komatsu 300 trackhoe,**

Morning Weather Conditions:	**Afternoon Weather Conditions**
Overcast 55-65 F	

Comments and/or supporting calculations:

0645 On site to take samples for Immunoassay screens..

0700 Envirocon Tailgate meeting.

0715 Set up to Resample Pits.

Elev.	Sample #	10 or 50 ppm screen
25'	X4 P206	50
24'	X4 P211	10
17'	X4 SBTB-1	10
18'	X3 P207	10
17'	X4 P205	50
20'	X3 P210	10
22'	X2 P209	10
20	X1 P215	10

0815 Called Bruce, gave him results from 10-11(Sat), results still false. It has been decided that we need to take some lab conformation samples to see if the Immunoassay kits are giving a false positive.

0900 Marc off site, return to Troutdale to run the immunoassays.

0930 Air dry samples, most of the samples are wet to saturated.

1200 Set up to extract 8 samples.

1245 Begin the dilution and sample process.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title**	**No.**

Additional Comments/Supporting Calculations	**Date: 13 OCT 03**
1400 Results reported to both Alcoa and Envirocon RESULTS BELOW.	
1415 Per Alcoa quick turnaround on lab analysis will be performed on the tests run today. X4 P205 will not be run. All others will have a 24-48 hr TAT.	
1500 Bruce has brought a composite sample from the first 4 PCB containers on site. Random samples were taken from each box. This will be profiled for RCRA 8 metals with a rapid 3-5 day TAT.	
1600 X4 P206 >50 ppm will not be excavated any more until results are returned.	
1745 Samples shipped out.	

Preparer Initials Mk

GENERAL INSPECTION/TESTING FORM
MISCELLANEOUS FIELD TESTS

Project Name/No. _____

Date: 13 OCT 03 **Weather:** _____

Report By: Marc Krekos _____

Test Elev.	Test Type	Tested 10 or 50 ppm	Test Results	Pass / Fail	Comments
25	X4 P206	50	-0.74	>50 FAIL	
24	X4 P211	10	0.88	**<10 PASS**	
17	X4 SBTB-1	10	0.85	**<10 PASS**	
18	X3 P207	10	0.80	**<10 PASS**	
17	X4 P205	10	0.77	**<10 PASS**	
20	X3 P210	10	-0.74	>10 FAIL	
22	X2 P209	10	-0.74	>10 FAIL	
20	X1 P215	10	-0.74	>10 FAIL	

Sketch

Remarks

Signed _____ **Title** **No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-14-03
Contractor: Envirocon		
Subcontractor(s) Mofford & W H Pacific		
No. of workers: 7	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Light rain	Sunny

Comments and/or supporting calculations:

Steve Holmberg took samples of the sand fill material from Glacier Sand & Gravel for proctor compaction test & sieve analysis. A 5-gallon bucket of the material was delivered to CH2Mhill.

Glacier has no current proctor or analysis data for the sand material they sell. Their data was 2 years old.

Steve and Jeff discovered interference between the toe of the revetment wall and the Jersey barriers.

The Jersey barriers were set at 7 ft. elevation per the detail drawings, which is at the toe of the JB's.

The general arrangement drawings show the barriers & silt fence located at the 4 ft. elevation.

Discussed the situation with Pat and decided to move the JB's to eliminate the interference. It also appears that some soil erosion has occurred along the sandy shoreline. The sand elevation in the area at the east end near Glacier is no longer at the same elevation as it was when surveyed in 1999.

Envirocon started relocation of the JB's at 15:30. Envirocon will do this work on a T&M basis with daily Work summaries provided by the end of the following day. Elevation of the JB's is not critical, they just need to be moved away from the toe of the revetment.

Trees along the Columbia river shoreline were all removed and piled on the east landfill area.

Two more roll off boxes were delivered by Waste Mgt. and filled with greater than 50 waste materials.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

(b)

Post-it® Fax Note 7671 | Date | # of pages ▶
To Marc Krekos | From Kathy McKinley
Co./Dept. | Co. CVO
Phone # | Phone #
Fax # 503/736-2040 | Fax #

CVO 2300 NW Walnut Boulevard
Corvallis, OR 97330-3638
(541) 752-4271 FAX (541) 752-0276

CH2M HILL Applied Sciences L
CHAIN OF CUSTODY RECORD

Project/Contact Inf	
Project #	184717.01.01.08
Project Name	ALCOA-Vanalco
Report Copy to	Marc Krekos / pdx
Company Name/Contact	CH2MHILL- Mike Drewett/pdx

Sampling Date	Sampling Time	Type: Comp	Type: Grab	Matrix: Water	Matrix: Soil	Matrix: Air	Client Sample ID (8 Characters Max)	LAB QC	Total Number of Containers	PCB 8082	PAH SW 8270 SIM	Rcra 8 metals	Preservative												Alternate Description	Lab ID
										none	none	none	none		none	none	none	none	none	none	none	none			
10/13/2003	8:40		X		X		SBAC-S-001		1	X			X	8										24-48HR TAT	-1
10/13/2003	8:35		X		X		SBAC-S-002		1	X			X	1		P2	15							5 Day TAT	-2
10/13/2003	8:25		X		X		SBAC-S-003		1	X			X	4		SB	TB	1						24-48HR TAT	-3
10/13/2003	8:30		X		X		SBAC-S-004		1	X			X	3		P2	07							24-48HR TAT	-4
10/13/2003	08:15		X		X		SBAC-S-005		1	X			X	4		P2	11							24-48HR TAT	-5
10/13/2003	08:32		X		X		SBAC-S-006		1	X			X	2		P2	09							24-48HR TAT	-6
10/13/2003	08:20		X		X		SBAC-S-007		1	X			X	3		P2	10							24-48HR TAT	-7
10/13/2003	08:50		X		X		SBAC-S-008		1	X			X	4		P2	06							24-48HR TAT	-8
10/13/03	1500		X		X		Pb profile		2	X	KM 9016 10/14/03				X								5 day	~~24-48HR TAT~~ 2	-9

THIS AREA FOR LAB USE ONLY	
Lab # C2236	Pg 1 of 1
Lab PM	Custody Review
Log In	LIMS Verification
pH	Cust Seals Y N / Ice Y N
QC Level 1 2 3	
Cooler Temperature	4°C

Sampled By: Marc Krekos
Received By:
Received By: Kathy Duncan 10/14/03 1030
Special Instructions:

Relinquished By: Marc Krekos 10-13-03 1750
Relinquished By:
Date/Time:

File: CoC-Vanalco.xls

10/14/03 10:51 ☎541 752 0276 CH2M HILL 001/001

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-15-03
Contractor: Envirocon		
Subcontractor(s)		
No. of workers: 9	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Rain heavy at times	Overcast

Comments and/or supporting calculations:

Relocation of the Jersey barriers was suspended in the morning as the clamp used to lift the JB's was slipping due to the wet surfaces and it was unsafe to lift the blocks. Drier conditions in the late morning and afternoon allowed relocation work to continue. Approximately ½ the blocks were relocated.

- Envirocon encountered wire bundles along the shoreline and started moving the material at 12:30.
- The wire material will be piled then a hole dug to bury it in the east landfill.

Clark PUD inspected and approved the power connection to the field office transformer.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-16-03
Contractor: Envirocon		
Subcontractor(s)		
No. of workers: 9	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Overcast light rain	Overcast

Comments and/or supporting calculations:

Continued moving wire bundles from Columbia river shoreline. Very large pile of wire that appears to be galvanized. Considered recycling the wire but impractical due to galvanizing.

Continued relocation of Jersey barriers. Dozer operator contouring shoreline slope.

Mark Stiffler and Greg Rutherford visited the site to review progress and safety.

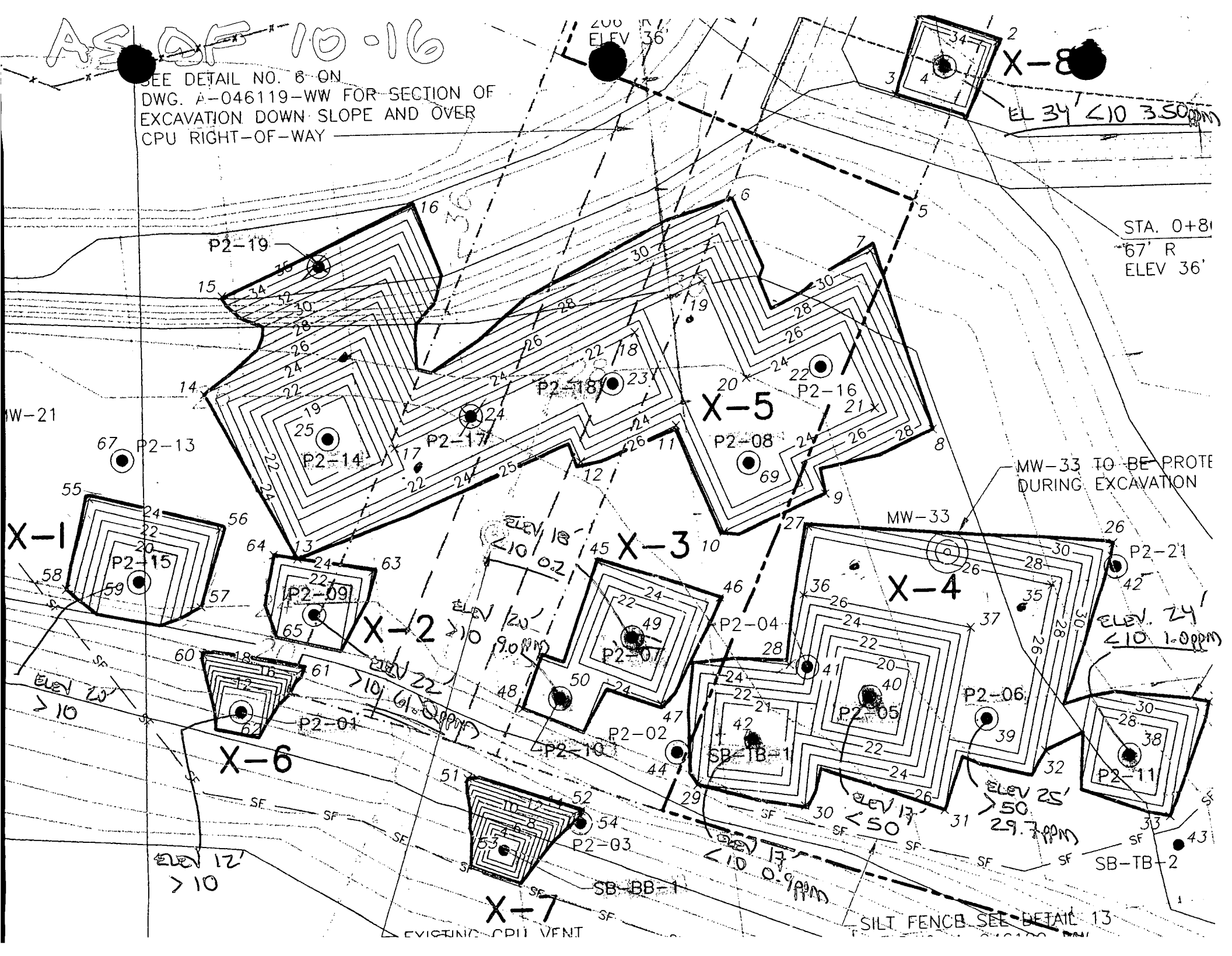
Six empty Waste Mgt roll off boxes were available at the start of the day. Two were filled with greater than 50 mg/kg waste material.

Steve Holmberg mixed a sample of mulch (1 part) and sand (2 parts) and provided a 5 gallon sample for proctor testing. This material will be used as fill in the lower part of the revetment.

The blended material will also be tested for lead, cadmium, and arsenic to insure it is clean.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.


AS OF 10-16
SEE DETAIL NO. 6 ON DWG. A-046119-WW FOR SECTION OF EXCAVATION DOWN SLOPE AND OVER CPU RIGHT-OF-WAY
ELEV 36'
X-8
EL 34' <10 3.50ppm
STA. 0+8
67' R
ELEV 36'
P2-19
X-5
P2-18
P2-17
P2-16
P2-14
P2-08
P2-13
MW-21
MW-33 TO BE PROTE
DURING EXCAVATION
MW-33
X-1
P2-15
X-2
P2-09
X-3
P2-04
P2-07
X-4
P2-21
ELEV 18'
<10 0.2
ELEV 20'
9.0ppm
ELEV 24'
<10 1.0ppm
ELEV 20'
>10
ELEV 22'
>10 61.0ppm
P2-01
X-6
P2-10
P2-02
SB-TB-1
P2-05
P2-06
ELEV 17'
<50
ELEV 25'
>50
29.7ppm
P2-11
SB-TB-2
ELEV 12'
>10
P2-03
SB-BB-1
X-7
ELEV 17'
<10 0.9ppm
SILT FENCE SEE DETAIL 13
EXISTING CPU VENT

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-17-03
Contractor: Envirocon		
Subcontractor(s)		
No. of workers: 7	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Partly cloudy	Partly Cloudy

Comments and/or supporting calculations:

Finished relocation of the Jersey barriers and silt fence. The Columbia river level is at the base of the Jersey barrier wall. River waster is seeping through the soil under the JB's and filling X-7 excavation.

A soil sample was taken from the bottom of x-7 at the water line.

Soil samples were also taken from X-2 P2-09, X-6 P2-01, X-4 P2-05, & X-4 P2-06.

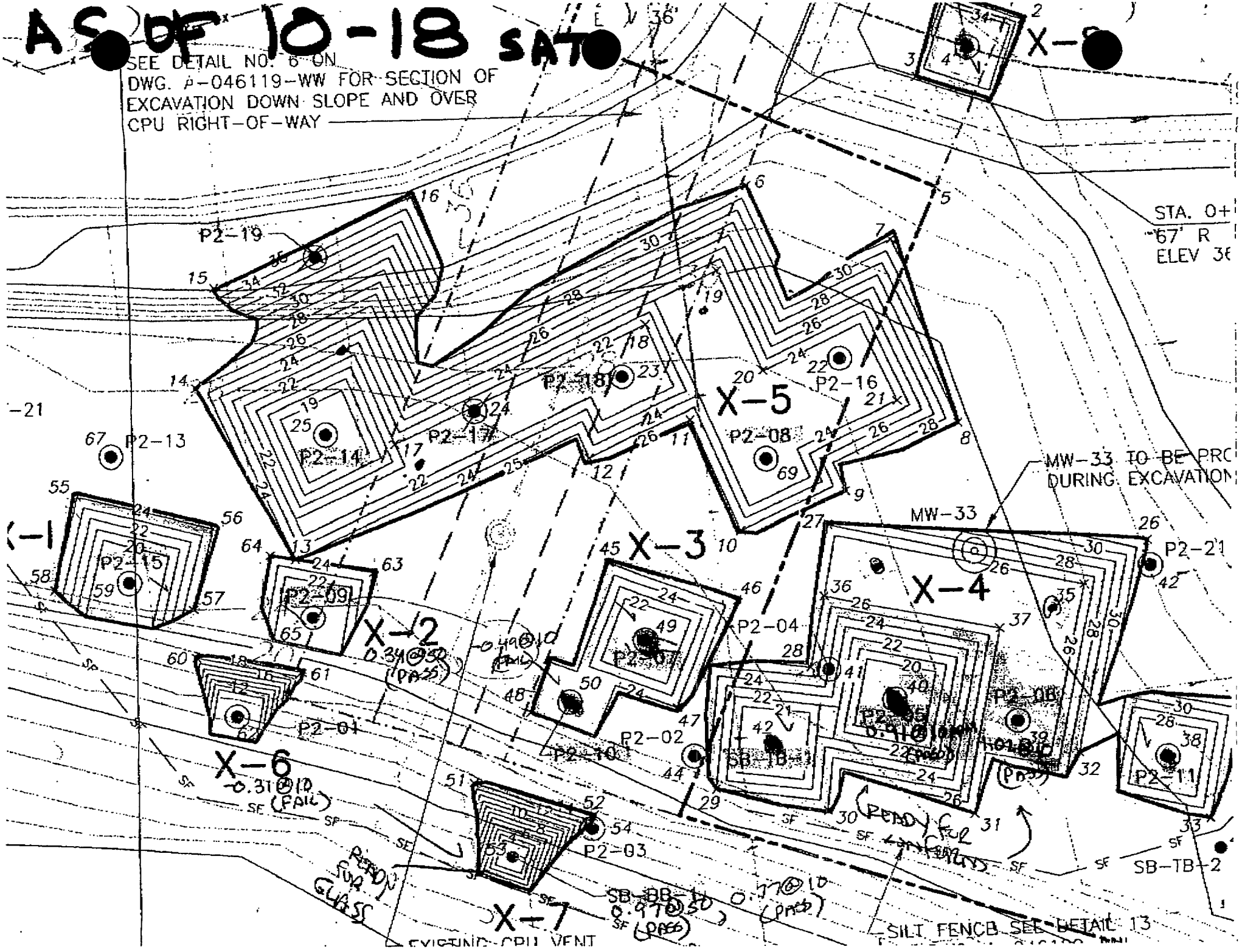
- The wire bundles removed from the cut area on the riverbank were buried on the east landfill.
- Excavation and transport is in progress for the cut material from the riverbank.

Cascade finished their drilling work and decontaminated their equipment to remove from the site.

Gray, Marc, and Bruce discussed confirmation sampling and agreed that both PCB and PAH will be analyzed to meet AO requirements.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.


AS OF 10-18 SAT
SEE DETAIL NO. 6 ON
DWG. P-046119-WW FOR SECTION OF
EXCAVATION DOWN SLOPE AND OVER
CPU RIGHT-OF-WAY
X-5
X-3
X-4
X-2
X-6
X-7
X-1
P2-19
P2-18
P2-17
P2-16
P2-14
P2-13
P2-08
P2-15
P2-09
P2-01
P2-10
P2-02
P2-04
P2-03
P2-05
P2-06
P2-07
P2-11
MW-33
MW-33 TO BE PRO
DURING EXCAVATION
SB-TB-1
SB-TB-2
SB-BB-1
0.31@10
(FAIL)
0.97@10
(PASS)
SILT FENCE SEE DETAIL 13
EXISTING CPU VENT

GENERAL INSPECTION/TESTING FORM
IMMUNOASSAY PCB FIELD SCREENS

Project Name/No. Vancouver Operations

Date: 10-18-03 **Weather:**

Report By: Marc Krekos

Test Location	Sample Elevation	Test Type	Parameter 10 / 50 ppm	Test Results	Pass / Fail
Standard # 1		PCB		-0.22	PASS
Standard # 2		PCB		0.15	
X-6	12'	PCB	10	-0.31	FAIL
P205	15'	PCB	10	0.91	PASS
P206	23'	PCB	10	1.02	PASS
X-7	20'	PCB	50	0.97	PASS
X-2	20'	PCB	50	0.34	PASS
X-7	2'	PCB	10	0.77	PASS
X-2	20'	PCB	10	-0.49	FAIL
Sketch	**Remarks**				

-USED STANDARD #1
-SAMPLES WERE COLLECTED OCTOBER 17, 2003

Signed Michael West **Title** **No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-20-03
Contractor: Envirocon		
Subcontractor(s) Quest		
No. of workers: 7	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Overcast 60 deg	Sunny 75 deg windy

Comments and/or supporting calculations:
Uncovered more wire along the southwest shoreline. Removed and buried in east landfill.
Greg Rutherford visited the site to review safety. Requested that safety fence be installed around open excavations with steep walls at X-4 and X-2. Fence was installed to eliminate the fall hazard.
X-4 excavation was completed and Mike of CH2Mhill took verification samples.
An excavator and dozer worked along the SE shoreline to slope this area.
Contacted Bob Yazdaniha of Contech regarding status of the revetment PO and delivery status.
Bob had just returned from vacation and will provide an update on Tuesday.
Dave Jacobs called regarding a call he got from Waste Mgt. concerned about shipping the roll off boxes.
We are awaiting TCLP sample results to finalize the profile. Analysis is to be complete by 10/24.
Cascade moved their drilling rig & support truck off site.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

(7)

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER OPERATIONS	Date: 10-20-03
Contractor ENVIROCON	
Subcontractor(s)	
No. of workers:	Equipment:
1	SAMPLING SUPPLIES: BAGS, GLOVES, GLASS JARS

Morning Weather Conditions:	Afternoon Weather Conditions
PARTLY CLOUDY	SUNNY, WIND GUSTS

Comments and/or supporting calculations:

1300: LEFT TO SITE WITH GREG (ALCOA)
1330: ARRIVAL, SIGN IN AND LED TO EXCAVATED PITS
1345: X-7 WAS UNDER WATER
X-6 SAMPLE WAS COLLECTED AT 10' ELEVATION } 3 BAG SAMPLES
X-7 SAMPLE WAS COLLECTED AT 20' ELEVATION }
X-4 P206 CONFIRMATION SAMPLE COLLECTED AT EXISTING DEPTH
X-4 P205 CONFIRMATION SAMPLE COLLECTED AT EXISTING DEPTH
X-4 TWO MORE CONFIRMATION SAMPLES COLLECTED ON EAST END OF BENCH AT 26' ELEVATION
1836: CLOCKED OFF SITE

NOTE: ALL SAMPLES HAD DEBRIS (BRICK + SCRAP METAL) IN EXCAVATIONS EXCEPT X-4 P205 WHICH WAS IN SAND

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed	Title	No.
[signature]	FIELD TECH	

Additional Comments/Supporting Calculations Date: 10-20-03

- ONCE ARRIVAL BACK AT REYNOLDS METALS, PCB ANALYSIS WAS CONDUCTED TO DETERMINE ~~AT~~ IF PCB CONCENTRATION WAS LESS THAN 10 PPM FOR SAMPLE X-6, X-2
- ~~ON~~ UPON COMPLETION OF ~~SAMPLE~~ ANALYSIS BOTH RESULTS BOTH X-6 AND X-2 SHOWED CONCENTRATIONS GREATER THAN 10 PPM. RECOMMEND NEW ANALYSIS OF X-6 AND X-2 IN CASE OF ERROR IN FIRST ANALYSIS (~~RESULTS~~

10-21-03

RE ANALYZED X-6 AND X-2 USING NEW STANDARD, BOTH RESULTS SHOWED CONCENTRATIONS GREATER THAN 10 PPM.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-21-03
Contractor: Envirocon		
Subcontractor(s)		
No. of workers: 6	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Sunny & Clear 60 deg	Partly cloudy 82 deg

Comments and/or supporting calculations:

Work continued on the shoreline sloping until noon at which time George sent crew home. Surveyors are due in on Wed. to check elevations so work can continue in this area.

Received a sample analysis from the greater than 50 mg/kg PCB material in the roll off boxes. CH2Mhill ran a total RCRA metals analysis rather than a TCLP as requested. Waste Mgt will not accept this for waste profiling and will run the sample to provide TCLP analysis.

Screening samples for greater than 10 mg/kg PCB from X-2 & X-6 failed. Envirocon will remove 2 ft. of additional material from each on Wed.

Received sample analysis for sand and sand/mulch mixture Envirocon plans to use on the shoreline. Faxed information to Pat Sullivan for review to determine if acceptable.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

GENERAL INSPECTION/TESTING FORM
IMMUNOASSAY PCB FIELD SCREENS

Project Name/No. Vancouver Operations

Date: 10-21-03 **Weather:**
Report By: Marc Krekos

Test Location	Sample Elevation	Test Type	Parameter 10 / 50 ppm	Test Results	Pass / Fail
Standard # 1	NA	PCB		-0.05	
Standard # 2	NA	PCB		-0.06	
X-6	10'	PCB	10	-0.74	FAIL
X-2	20'	PCB	10	-0.71	FAIL
Sketch	**Remarks**				

- USED STANDARD # 2
- SAMPLES COLLECTED OCTOBER 20, 2003

Signed Marc Krekos **Title** FIELD TECHNICIAN **No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-22-03
Contractor: Envirocon		
Subcontractor(s) WH Pacific		
No. of workers: 6	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Overcast warm	Overcast warm

Comments and/or supporting calculations:

Removed the 2' of additional material from X-2 & X-6 and samples pulled for screening test.

WH Pacific survey crew is today to check elevations along shorelines to determine sub grade.

The excavator hit more wire bundles on the shoreline slope and will remove and bury on east landfill.

High water level in the river is causing infiltration and pooling on the north side of the Jersey barriers.

The ground at the toe of the revetment slope was too soft for backfilling until the water level dropped.

It appears to be tidal influence and possibly release of water from Bonneville dam causing the problem.

The screening test showed X-6 passing but X-2 failed for less that 10 mg/kg. Another 2 ft. of material was excavated from X-2. A screening sample was taken and it passed at less than 10 mg/kg PCB.

Confirmation samples for both X-2 & X-6 were sent via Fedex for 24-hour turn around.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No.	VANCOUVER OPERATIONS	**Date:** 10-22-05
Contractor	ENVIROCON	
Subcontractor(s)		
No. of workers:	**Equipment:**	
1		

Morning Weather Conditions:	**Afternoon Weather Conditions**
	CLEAR BECOMING CLOUDY

Comments and/or supporting calculations:

930: LEFT TO SITE
960: ARRIVAL ON SITE, SIGNED IN AND HEADED TOWARDS EXCAVATION
1000: COLLECTED SOIL SAMPLE FROM X-6 AT 8'
- SAMPLE WAS TAKEN IN CLAY
1005: COLLECTED SAMPLE X-2 AT 18'
- EXCAVATION X-2 HAS BRICK AND OTHER DEBRIS THROUGHOUT
1030: BACK AT PENNICOS
- BEGIN DRYING OUT X-6 TO RUN ANALYSIS
1300: RAN PCB'S IN PPM ANALYSIS ON BOTH X-6 AND X-2
1330: X-6 PASSED
X-2 FAILED

MARK WILL RESAMPLE ONCE X-2 IS EXCAVATED ANOTHER 2'

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		Title FIELD TECH	No.

Additional Comments/Supporting Calculations Date: 10-22-03

1400: X-2 WAS EXCAVATED DOWN ANOTHER 2' TO 16' AND RE SAMPLED
- RAN ANALYSIS ON X-2 AT 16'

1430: RESULTS OF ANALYSIS SHOW X-2 PASSED THE ≤10 PPM PCB

GENERAL INSPECTION/TESTING FORM
IMMUNOASSAY PCB FIELD SCREENS

Project Name/No. Vancouver Operations

Date: 10-22-03 **Weather:** SUNNY
Report By: Marc Krekos

Test Location	Sample Elevation	Test Type	Parameter 10 / 50 ppm	Test Results	Pass / Fail
Standard # 1	~~-0.03~~	PCB		-0.03	
Standard # 2	~~-0.06~~	PCB		-0.06	
X-6	~~0-1~~ 8'	PCB	10	0.14	PASS
X-2	18'	PCB	10	-0.74	FAIL
Sketch	**Remarks**				

- SAMPLE COLLECTED 10-22-03
- STANDARD # 2 USED

Signed Michael Wolf **Title** FIELD TECHNICIAN **No.**

GENERAL INSPECTION/TESTING FORM
IMMUNOASSAY PCB FIELD SCREENS

Project Name/No. Vancouver Operations

Date: 10-22-03 **Weather:**
Report By: Marc Krekos

Test Location	Sample Elevation	Test Type	Parameter 10 / 50 ppm	Test Results	Pass / Fail
Standard # 1				-0.01	
Standard # 2				-0.06	
X-2	16'	PCB	10	0.12	PASS
Sketch	**Remarks**				

- SAMPLE COLLECTED 10-22-03
- USE STANDARD #2

Signed Michael Wirt **Title** FIELD TECH **No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-23-03
Contractor: Envirocon		
Subcontractor(s) WH Pacific		
No. of workers: 8	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Sunny & warm	Sunny & warm

Comments and/or supporting calculations:

Received PAH confirmation sample results and only X-1 excavation are failed with a reading of 22.5 Mg/Kg. Other areas sampled ranged from .2 to 6.2 mg/kg and passed for PAH. An additional 2' of Soil was removed from X-1 and a new soil sample was taken to screen test for PAH.

- Continued working on filling and compacting the area at the toe of the revetment wall. The river level has dropped below the base of the Jersey barriers and not causing problems today.
- The surveyors are checking the shoreline slope.
- Progress pictures were taken by BKR for the east landfill area and shoreline.
- Pat Sullivan did not like the proctor test results for the borrow material sand. Steve Holmberg is obtaining a sample of silt containing soil to evaluate for possible use as a blend material to improve cohesiveness. The borrow sand will be mixed with approximately 15% silt and a proctor test completed by Carlson.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No.	VANCOUVER OPERATIONS	**Date:** 10-28-05
Contractor	ENVIROCON	
Subcontractor(s)		
No. of workers:	**Equipment:**	

Morning Weather Conditions:	**Afternoon Weather Conditions**
FOGGY	PARTLY SUNNY

Comments and/or supporting calculations:

UPON RECEIVING RESULTS FROM SAMPLES SENT TO THE LAB, X-1 CAME BACK WITH A PAH GREATER THAN 20 PPM. ENVIROCON EXCAVATED X-1 DOWN ANOTHER TWO FEET AND A SAMPLE WAS COLLECTED FOR ANALYSIS

1430 RAN ANALYSIS FOR PAH ON SAMPLE X-1
1530 RESULTS OF ANALYSIS SHOW X-1 FAILED THE TEST WITH PAH CONCENTRATION GREATER THAN 20 PPM. EXCAVATION WILL NEED TO BE EXCAVATED DOWN ANOTHER TWO FEET AND RE-ANALYZED

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

GENERAL INSPECTION/TESTING FORM
MISCELLANEOUS FIELD TESTS

Project Name/No. VANCOUVER OPERATIONS

Date: 10-23-03 **Weather:** SUNNY 60s

Report By: MIKE WIETZ

Test Location	Test Type	Sample Name	Parameter	Test Results	Unit
X-1	PAH	X-1		-0.28	~~Ppm~~ FOK
STD #1	PAH	PAHSTD#1		-0.26	
STD #2	PAH	PAHSTD#2		0.18	

Sketch

Remarks

- SAMPLE X-1 COLLECTED 10-23-03
- USE STANDARD #2

Signed Mike Wietz **Title** FIELD TECH **No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. Vancouver Landfill Remediation CEAT 2		**Date:** 10-24-03
Contractor: Envirocon		
Subcontractor(s)		
No. of workers: 7	**Equipment:** JD Backhoe, JD 650 Dozer, PC-200 Long Reach Excavator,	
	PC-200 Excavator, JD-300 Dump Truck, Water Truck, Water Wagon,	
	Kamatsu excavator	

Morning Weather Conditions:	**Afternoon Weather Conditions**
Cool & partly cloudy 45 deg	Sunny & warm 70 deg

Comments and/or supporting calculations:

X-1 failed the screening test for PAH greater than 20 so Envirocon removed another 2' of soil and a sample was taken for screening.

Confirmation sample results for PCB were received and all areas passed except one test point in the NE Corner of X-4. This area had approximately 2' of soil removed and we did not screen test before the confirmation sample analysis because this area had not been identified as a contaminated area.

Envirocon excavated another 2' of soil and a sample was taken for screen testing for less than 10 mg/kg.

TCLP test results were received for the greater than 50 PCB material in the roll off boxes. All metals were below limits & Kristin can finalize the waste profile and sent to Waste Mgt. for approval.

Envirocon took delivery of several truckloads of the mulch material for use in the vegetated areas.

Envirocon started grubbing and removing trees from the infiltration basin area on the east side.

Loren Gunderson was on site and introduced me to Jim Perkins, a newly hired safety specialist.

Marc finished screening samples from X-1 & X-4 and both failed again. Envirocon was told to remove 3' of additional soil from each spot so new samples can be taken. Marc will collect the samples in PM.

Steve gave me a sample of the silt material and it looks more like sand than silt. I call Steve and told him he had better start looking for a better quality silt source as a back up.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANALCO – South Bank Area of Concern	**Date:**24 October, 2003
Contractor Envirocon	
Subcontractor(s)	
No. of workers: 6	**Equipment: Komatsu P220 trackhoe, Komatsu 300 trackhoe,**

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

10-23-03 Thursday

Screen samples collected from X1 P215 @ elev. 18 feet – PAH

X4 ~25 ft. north of P206 @ elev. 24 ft. - PCB

10-24-03 Friday

Above samples screened along with the addition of the additive material for the sand backfill. The additive material was screened for PAH.

See screen results below. All samples FAILED, X1, X4 and Sand #2. Sand #2 was run twice to confirm a failed test.

Notified Envirocon of the failed tests and had them excavate down 3-4 feet in X1 and X4 NE Corner so we could re-sample later in the day to re-test.

1600 On site to take samples of X1 P215 @ elev. 12 feet.

X4 NECorner @ elev. 20 feet

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title**	**No.**

GENERAL INSPECTION/TESTING FORM
IMMUNOASSAY PCB FIELD SCREENS

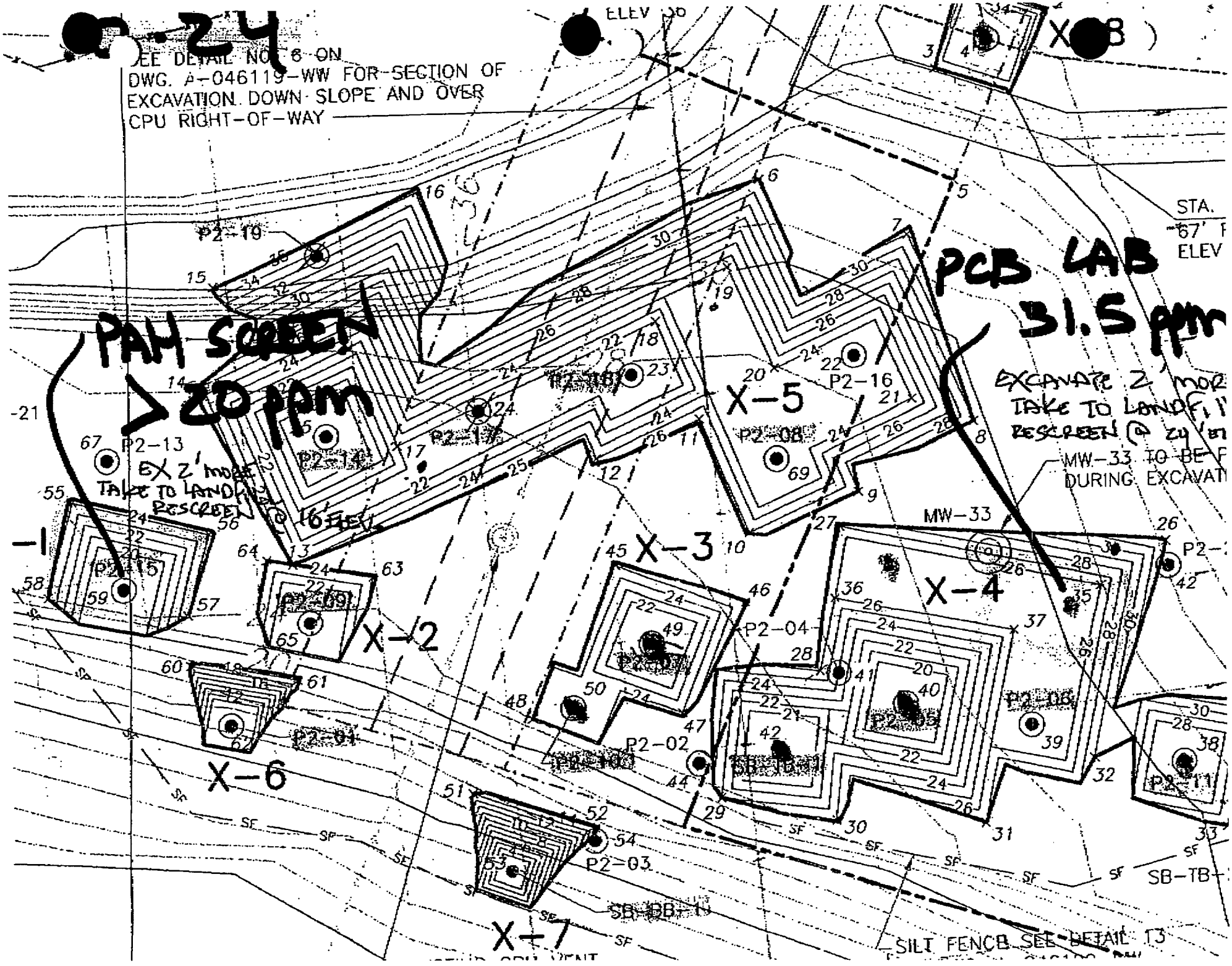
Project Name/No. Vancouver Operations South Bank of Concern

Date: 10-24-03 **Weather:**

Report By: Marc Krekos

Test Location	Sample Elevation	Test Type	Parameter 10 / 50 ppm	Test Results	Pass / Fail
Standard # 1		PCB			
Standard # 2		PCB			
X-4		PCB	10	-0.74	FAIL
X-1		PAH	20	-0.74	FAIL
SAND #2		PAH	20	-0.74	FAIL
SAND #2		PAH	20	-0.74	FAIL
Sketch	**Remarks**				

Signed	**Title**	


SEE DETAIL NO. 6 ON
DWG. A-046119-WW FOR SECTION OF
EXCAVATION DOWN SLOPE AND OVER
CPU RIGHT-OF-WAY
PAH SCREEN
> 20 ppm
PCB LAB
31.5 ppm
EXCAVATE 2' MOR
TAKE TO LANDFI
RESCREEN @ 2'
MW-33 TO BE P
DURING EXCAVAT
EX 2' more
TAKE TO LANDFILL
RESCREEN
@ 16' ELEV.
X-1
X-2
X-3
X-4
X-5
X-6
X-7
P2-19
P2-18
P2-17
P2-16
P2-15
P2-14
P2-13
P2-12
P2-11
P2-10
P2-09
P2-08
P2-07
P2-06
P2-05
P2-04
P2-03
P2-02
P2-01
MW-33
SB-TB-1
SB-TB-
SILT FENCE SEE DETAIL T3
SF
STA.
ELEV

GEORGE 503-784-1208

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 10/7/03
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 6	**Equipment:** SAME AS 10/24/03	

Morning Weather Conditions: COOL, SOME PM CLD	**Afternoon Weather Conditions** 72° CLEAR, LOW WIND

Comments and/or supporting calculations:

8 HOUR REFRESHER TRAINING FOR PARTIAL CREW

3½ HOURS INDICATED FOR STAND BY AWAITING FILL MIX APPROVAL

GRAY - DROVE TO MORRIS BRO. IN GRESHAM TO INSPECT FILL MIX. COLLECTED BAG SAMPLE. ENVIROCON DELIVERED BULK SAMPLE TO TESTING LAB FOR PROCTORS/TESTING.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed GRAY LEGNE		**Title**	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 10/28/03
Contractor ENVIROCON		
Subcontractor(s) N/A		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
COOL / CLOUDY - RAIN OCCASIONALLY	60° - CLOUDY / WINDY

Comments and/or supporting calculations:

NO WORK - STAND BY FOR FILL & FOR ANALYTICAL ON AOC REMEDIATION WORK

CONTINUED TO LOOK FOR FILL SOURCES

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed GARY KEENE		**Title**	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 10/29/03
Contractor ENVIROCON		
Subcontractor(s) N/A		
No. of workers: 8	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
SLIGHT RAIN, COOL, WINDY	COOL SOME, WINDY

Comments and/or supporting calculations:

ENVIROCON IMPORTED SILT MATERIAL FROM GRESHAM/MORRIS BROTHERS TO MIX WITH SAND MATERIAL. - MATERIAL TO BE USED IN SOUTH BANK AREA OF CONCERN.

MATERIAL IS BEING MIXED ON THE GROUND USING AN EXCAVATOR. RATIO USED IS 1 TO 5

30 LOADS IMPORTED @ 14 TO 17 TONS A LOAD.

PLACED FILL MATERIAL AT JERSEY BARRIER WALL WITH DOZER

OVER EXCAVATION OF X-4 AND CONFIRMATORY SAMPLES COLLECTED.

ALLOY INSPECTS ANOTHER SOURCE OF FILL MIX FROM I-5 ROAD CUT. TWO SOURCE AREAS; ONE SILT, ONE MIX OF CL, F, TRG & S - VY. WET. SAMPLES TO LAB FOR TESTING

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed GRAY KLEINE		**Title**	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 10/30/03
Contractor ENVIROCON		
Subcontractor(s) N/A		
No. of workers: 7	**Equipment:** SAME	

Morning Weather Conditions: COLD, CLOUDY 41°	**Afternoon Weather Conditions** COOL, CLOUDY 48°

Comments and/or supporting calculations:

BEGAN IMPORTING 1-5 FILL MIX - 32 LOADS @ 24 CY PER LOAD. MATERIAL WAS MIX WITH ORGANIC COMPOST FOR PLACEMENT IN THE LOWER BENCH AND TOE OF THE REVETMENT

MIXED SILT & SAND WITH COMPOST - STOCKPILED FOR RAIN DAY USE

IMPORTED SAND FOR MIX WITH SILT - 14 LOADS @ 16 TONS

WEEKLY PROGRESS MEETING - SEE TELE CONF. NOTES

LOADED OUT 5 ROLL-OFFS OF PCB SOILS. ENVIROCON SIGNED MANIFESTS BY MISTAKE. SEE PCB SHIPMENT INCIDENT RPT. IN PROJECT FILES FOR DETAILS.

MOBILIZE CRANE TO SITE TO OFF-LOAD CONCRETE REVETMENT PANELS

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed GRAY KLOHE		**Title**	**No.**

17

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 10/31/03
Contractor ENVIROCON		
Subcontractor(s) N/A		
No. of workers: 7	**Equipment:** SAME	

Morning Weather Conditions: COLD / LOW 30's CLEAR, WINDY	**Afternoon Weather Conditions** COOL 40's CLEAR & WINDY

Comments and/or supporting calculations:

CONTINUED MIXING SOILS FOR PLACEMENT ON THE SO. BANK BY THE GOC

INSPECTED INITIAL 1 FOOT LIFT & COMPACTED. 3RD PARTY QC ON SITE TO VERIFY 95% STD. COMPACTION CRITERIA.

LOADED OUT THREE (3) ROLL-OFFS OF PCB SOILS. ALL 4 MANIFESTED LOADS.

INSTRUCTED ENVIROCON (GEORGE LOPEZ) ON PROPER PCB STORAGE, DOCUMENTATION, OSD's AND MANIFESTING.

AWAITING X-4 CONFIRMATORIES

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed GARY KLEINE		**Title**	**No.**

November, 2003

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION.		**Date:** 11/03/2003
Contractor ENVIROCON.		
Subcontractor(s)		
No. of workers: 8	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
COLD CLEAR 27°	COOL CLEAR 40°

Comments and/or supporting calculations:

I-5 FILL MATERIAL PLACED ALONG SOUTH SHORELINE & COMPACTED. MATERIAL DELIVERED IN AFTERNOON WAS WET CLAY AND DECISION WAS MADE TO MIX WITH SAND FROM GLACIER TO PROVIDE DRIER MATERIAL. TWO TO THREE PARTS SAND TO ONE PART CLAY.

TWO ROLLOFF BOXES OF PCB WASTE HAULED FROM SITE BY WASTE MANAGEMENT. MANIFESTS SIGNED BY GREG RUTHERFORD.

RECEIVED CHANGE ORDER STATUS WITH JEFF JOHNSON AND DISCUSSED OCTOBER INVOICE TO BE SUBMITTED BY 11/05.

X-4 CONFIRMATION SAMPLE TESTED CLEAN FOR PAH'S AND GEORGE NOTIFIED THAT EXCAVATION CAN BE FILLED. THE SOUTH BANK AREA OF CONCERN IS NOW CLEAN OF PCB & PAH EXCEPT FOR X-5 EXCAVATION AREA.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLH		**Title**	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11/04/03
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 8	**Equipment:** STAGE.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
OVERCAST 34°	OVERCAST 42°

Comments and/or supporting calculations:

CONTINUED RECEIVING MATERIAL FROM I-5 WHICH WAS WET IN THE MORNING THEREFORE SAND FROM GLACIER WAS BLENDED TO IMPROVE COMPACTION. THE I-5 MATERIAL WAS MUCH DRIER IN THE AFTERNOON AND WAS PLACED ON THE SOUTH SLOPE WITHOUT BLENDING WITH SAND. MATERIAL BEING PLACED AND COMPACTED WITH A STATIC ROLLER & COMPACTION LOOKS GOOD. WILL HAVE CH2MHILL MAKE COMPACTION TESTS ON WEDNESDAY MORNING.

TWO ROLL OFF BOXES OF PCB WASTE WERE MANIFESTED AND TRANSPORTED FROM THE SITE BY WASTE MANAGEMENT. BOTH BOXES WERE OVERWEIGHT AND APPROX. 5000 KG WERE REMOVED FROM EACH BOX PRIOR TO SHIPMENT. ONE ROLL OFF BOX REMAINS ON SITE WITH PCB WASTE AND WILL BE PICKED UP BY WM ON WED. MORNING.

AL BURBA, PAT SULLIVAN, MARK STIEGLER & ROB BEAR VISITED THE SITE IN THE AFTERNOON FOR A TOUR & VIEWING OF ACTIVITIES.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title**	**No.**

Additional Comments/Supporting Calculations **Date:** 11/04

15:30 EXCAVATOR SCRAPED LOWER SLOPE FROM TOE TO ELEVATION 16 WITH SMOOTH EDGED BUCKET TO ACHIEVE FINAL SLOPE FROM -.50 TO 2.25 STATIONS.

Preparer Initials AKL

outer shell
construction
sand - mulch

(two sleep - PJs
throughout)

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No.	VANCOUVER LANDFILL REMEDIATION	**Date:**	11-05-03
Contractor	ENVIROCON		
Subcontractor(s)	AXYS WA. PACIFIC		
No. of workers:	8	**Equipment:**	STAND

Morning Weather Conditions:	**Afternoon Weather Conditions**
CLEAR & COLD 34° LIGHT WIND	42° CLEAR TO PARTLY CLOUDY

Comments and/or supporting calculations:

07:30 WASTE MANAGEMENT CAME IN AND PICKED UP THE LAST ROLL OFF BOX FULL OF PCB WASTE. MANIFEST WAS PREPARED & SIGNED.
10:30 CARLSON TESTING TECH. ARRIVED AND TOOK COMPACTION TESTS ON SOUTH SHORE WITH ALL READINGS 95% OR HIGHER
1:00 MIXING SAND 2/3 AND MULCH 1/3 AND PLACING MIX AT TOE OF SLOPE 2+00 THROUGH 5+00.
PLACING I-5 MATERIAL ONLY ON SLOPE FROM STATIONS 2+25 THROUGH 4+00 FROM ELEVATION 18' TO 30',
STATIC ROLL PACKING TOE OF SLOPE STATION 2+25 TO 5+00.
BACKFILLED K-4 EXCAVATION WITH I 5 MATERIAL.
TAKING DELIVERY OF I 5 MATERIAL ALL DAY. GOOD DRY SOIL CONSISTING OF PRIMARILY SILT W/ SOME CLAY & SAND.
AXYS STARTED SETTING UP CRANE WITH BOOM INSTALLATION.
SAFETY ORIENTATION GIVEN TO 2 AXYS EMPLOYEES BY JIM PERKINS.
1400 LONG REACH EXCAVATOR CUTTING BENCH TO 18' ELEVATION FROM STATIONS -.50 TO 1+00. DOZER GRADED SURFACE OF SLOPE IN PREPARATION FOR PLACEMENT OF FABRIC AND REVETMENT.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title**	**No.**
BILL			

Additional Comments/Supporting Calculations **Date:** 11-05-03

14:15 DOZER & TRUCK PLACING SAND/MULCH MIX ON 18' LEVEL BETWEEN STATIONS 2+68 AND 3+50. PAT STOPPED WORK BECAUSE SLOPE WAS BEING BUILT TO A SLOPE OF APPROX 1:1 RATHER THAN 2.5:1. A NEW DOZER OPERATION. EXCESS MATERIAL WILL BE REMOVED TO GET BACK TO SOLID GROUND SO FILL MATERIAL CAN BE KEYED IN PROPERLY. RICK & GEORGE HAD BEEN FOCUSED ON PREPARING THE WEST END OF THE REVETMENT AND LET THIS GET BY THEM. RICK DIRECTED OPERATORS TO CORRECT PROBLEM.

15:00 OBSERVED 9 ROLLS OF GEOTECH FABRIC WITH DESCRIPTION GFG GIF-200 180"x 360'/1800 SY WOVEN BUNDLE BY NW. LININGS & GEOTEXTILE PROD. CO. SEY GW 6031 WEIGHT: 597

16:00 LONE REACH EXCAVATOR CUTTING 2.5:1 SLOPE FROM STATIONS 2+68 TO 3+75 BETWEEN ELEVATIONS 7.5 & 18'. ENTIRE SLOPE WILL HAVE TO BE CUT BACK 8 TO 10 FEET BETWEEN THESE STATIONS.

Preparer Initials BKR

Revetment
arrives

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** (Thurs) 11/06/03	
Contractor ENVIRO CON			
Subcontractor(s) W.H. PACIFIC			
No. of workers: 11	**Equipment:** STONE		

Morning Weather Conditions:	**Afternoon Weather Conditions**
COLD 30° CLEAR	50° COOL & CLEAR

Comments and/or supporting calculations:

08:15 FIRST TRUCK LOAD OF REVETMENT MATS ARRIVED WITH SPREADER BAR. PINS FOR LOCKING SPREADER BAR WITH EXTENDED, WERE MISSING. STEVE HOLMBERG WENT TO VANCOUVER TO OBTAIN SUITABLE FASTENERS. ASSEMBLY OF SPREADER BAR WAS COMPLETED @ 10:30

09:30 SECOND TRUCK LOAD OF REVETMENT MATS ARRIVED. SLOPE AT -.50 TO #25 COVERED WITH GEOTECH FABRIC SIX SECTIONS OF FABRIC IN PLACE FROM ELEVATION 7.5' TO 18'. FABRIC SECURED TO GROUND WITH WIRE STAPLES ON APPROX. 3' CENTERS.

EXCAVATORS CUTTING DOWN BANK BETWEEN STATIONS 3.00 & 4.00 AT ELEVATIONS 7.5' TO 18' AND 18' TO 30'

SURVEYORS LAYING OUT MAT CORNERS AND STAKING

11:15 SET FIRST 8' REVETMENT MAT AT WEST END OF SHORELINE. EXTREME WEST END MAT AND ANCHOR TRENCH WILL BE INSTALLED LATER.

11:30 PAUL SKILLINGSTAD OF WDOE VISITED SITE FOR TOUR WITH AL BURBA, PAT SULLIVAN, BRUCE RICHARDT, GARY KLEIN

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title**	**No.**

Additional Comments/Supporting Calculations **Date:** 11/06/03

JOHN EDWARDS & TIM STONE OF ANCHOR ENVIRONMENTAL AND JEFF JOHNSON OF CONVECON. DISCUSSED CLEAN UP LEVELS AND CONFIRMATION RESULTS FOR SOUTH BANK AREA OF CONCERN. ALSO DISCUSSED GROUND WATER SAMPLING REQUIREMENTS FOR 4TH QTR. TESTING. DISCUSSION & TOUR CONCLUDED @ 1430

1430 EIGHT 8' WIDE REVETMENT MATS HAVE BEEN SET IN PLACE. LOCATING BOTTOM OF SOUTH END OF MATS @ ELEV. 7.5'±. TOP OF CONCRETE IS APPROX. 8'.
PAT TOLD JOE TO MOVE THE MATS APPROX 18" TO THE SOUTH TO OBTAIN THE ABOVE DESCRIBED ELEVATIONS. THE SURVEYORS STAKED IN NEW POINTS. PAT WANTS APPROX. 3 1/2 REVETMENT BLOCKS SITTING ON THE 18' LEVEL BENCH.
1600 EXCAVATOR & DOZER FINISHED CUTTING BANK AND BUILDING BENCH AT 18' LEVEL FROM STATIONS 3.0 TO 4.0 AT ELEVATIONS 7.5' TO 18'
EXCAVATOR SLOPING SHORE 2.5:1 FROM STATIONS 4.0 TO 6.0 AT ELEVATIONS 7.5' TO 18'.
BACKBLADED SLOPE WITH DOZER FROM .75 TO 2.68 TO PROVIDE SMOOTH SURFACE AS REQUESTED BY MAX OF CONTECH.
1710 SIXTEEN 8' WIDE REVETMENT MATS WERE SET IN PLACE FROM STATION -.50 TO +.75. STOPPED FOR DAY. DELIVERY OF I-5 SOIL WAS STEADY ALL DAY. THE SOIL IS NOW PRIMARILY SILT WITH A LITTLE CLAY. THE SOIL DOES NOT EXHIBIT CLAY CHARACTERISTICS.
NO COMPACTION TESTING TODAY.

Preparer Initials BKL

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11/07/03
Contractor ENVIROCON		
Subcontractor(s) W.H. PACIFIC, AXUS CRANE		
No. of workers: 11	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
40° OVERCAST	PARTLY CLOUDY 55°

Comments and/or supporting calculations:

07:45 CHECKED WITH STEVE HORNBERG ON TIMING FOR ANCHOR PULL TEST. THE ANCHOR WAS INSTALLED 3 DAYS AGO. CARLSON TESTING SCHEDULED FOR 08:30.
EXCAVATOR SLOPING SHORELINE @ ELEV. 7.5' TO 18' BETWEEN STATIONS 6.0 & 7.0, KOMATSU DOZER BUILDING AND LEVELING THE 18' BENCH FROM STATION 4.5 TO 6.0.
LONG REACH EXCAVATOR WAS PULLING SOIL AWAY FROM WATTLES AT BASE OF JERSEY BARRIERS FROM STATION 2.68 TO 3.50.
JOHN DEERE DOZER CONTOURING & BACK BLADING LOWER SLOPE AT ELEV. 7.5' TO 8' FROM STATION 2.68 TO 4.50.
08:00 STARTED SETTING FIRST 8' MAT. PLAN IS TO TRY TO SET 32 MATS ON FRIDAY. TOOK PICTURES OF MAT #17 BEING PLACED ON SHORELINE WITH 100 TON CRANE.
PICTURE OF K-1 EXCAVATION LOOKING EAST
" " " " SOUTH SIDE LOOKING EAST
" " " " LOOKING WEST
" LOOKING EAST AT STATION 2.68 AT ELEVATION 15'
" LOOKING EAST AT STATION 2.68 CLEARING OF SOIL FROM WATTLES
" LIFTING MAT FROM TRUCK BED.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title**	**No.**

cable pullout

sand mulch mix
2:1

Additional Comments/Supporting Calculations **Date:** 11-07-03

PICTURE OF CRANE LIFTING MAT FROM TRUCK BED.
PICTURE OF DOZER BACK BLADING SURFACE OF SLOPE ELEV. 7.5' TO 18'
PICTURE REMOVING SAND FROM BARN AREA @ SE CORNER OF PROPERTY.
PICTURE OF EXCAVATOR STACKING I-5 SOIL AND BLENDING SAND/MULCH.
09:00 ANCHOR PULL OUT TEST ATTEMPTED ON TWO PLATIPUS TYPE CABLE ANCHORS. BOTH CABLES ON THE ANCHOR FAILED AT APPROX. 1100 PSI GAGE PRESSURE WHICH EQUATES TO APPROX. 2500 TO 3000 POUNDS OF PULL. THE CABLE DIA. IS 4 MM OR .155". IT WAS OBVIOUS THAT THE SMALL STAINLESS STEEL CABLE WAS NOT CAPABLE OF A 5000 LB LOAD.
STEVE CALLED PAT & LEFT VOICE MESSAGE REGARDING THE TEST FAILURE. STEVE ALSO CALLED MARK OF CONTECH AND ERIC FISH OF ARMORTECH. ERIC SAID HE WOULD PONDER THE SITUATION AND TALK TO PAT.
@ 9:30 SAND/MULCH MIX PLACED AND SPREAD AT ELEVATION 18' BETWEEN STATIONS 2.68 & 5.00
I-5 SOIL BEING PLACED AND SPREAD ON ELEVATION 18' TO 30' BETWEEN STATIONS 4.5 & 6.0.
@ 9:45 FINISHED SETTING THE FIRST EIGHT 8' PANELS SO FAR TODAY. WAITING FOR TRUCK DELIVERY OF ADDITIONAL MATS.
NOTICED THAT NEW DOZER OPERATOR HAD SCRAPED OFF THE HINGE POINT AND BADLY USED THE TURN. I POINTED THIS OUT TO STEVE AND GEORGE AND TOLD THEM AN EDGE WITHOUT RADIUS WAS NEEDED AND THE PARTIAL PANELS WILL COMPENSATE FOR GAP AT THE TURNING POINT. PROBLEM WAS ADDRESSED AND CORRECTED.
THE BACKHOE WAS OPERATED ALL DAY TO PUSH I-5 DELIVERY MATERIAL ONTO THE PILE. AN EXCAVATOR WAS USED PERIODICALLY TO STACK THE MATERIAL HIGHER.
THE LONG REACH EXCAVATOR WAS MIXING SAND & MULCH 2:1 RATIO.
10:00 THIRD LOAD OF REVETMENT MATS ARRIVED - (4 ea 8' WIDE)
TALKED TO ERIC RE: DISPOSAL OF DRILLING WASTE WATER ON SITE WITH PCB WASTE. KRISTIN NADERMANN RESEARCHED AND THIS IS NOT AN OPTION UNLESS OK IN THE AGREED ORDER WITH WDOE.
READ AO AND FOUND THAT CLEAN UP LEVEL FOR PAH'S IS 20 mg/kg AND NOT 2.0 mg/kg AS CALLED FOR IN SPECIFICATIONS. CHECKED CONFIRMATORY SAMPLE RESULTS AND THREE POINTS SHOW FINAL CLEAN UP ABOVE THE 2.0 TARGET. X-8 IS 6.0, X-3 IS 6.0, AND X-4 IS 3.5. X-8 CAN BE EASILY ADDRESSED BUT X-3 & X-4 ARE COVERED WITH BACKFILL MATERIAL AND NEED TO BE PAT FOR REVETMENT INSTALLATION AT THE SECOND TIER LEVEL. WILL CALL PAUL @ WDOE TO SEE IF VARIANCE POSSIBLE.

Preparer Initials BKL

Compaction
testing

tapered panels

Armortec
testing - pullout
2500 psi

tapered panels set

not installed
Summary

Additional Comments/Supporting Calculations **Date:** 11-07-03

12:30 CARLSON TESTING ON SITE & MADE COMPACTION TESTS AT ELEVATION 18' @ STATIONS 3+50 4+25, & 4+75. ALL PASSED ICE TO 11 MOISTURE LEVEL WAS GOOD AT 14% MATERIAL WAS PRIMARILY E.S MATERIAL WITH A LITTLE SAND & MULCH MIXED IN. BECAUSE THE COMPACTION NUMBERS WERE SO HIGH CARLSON TOOK ANOTHER SAMPLE OF E.S MATERIAL TO THE LAB FOR PROCTOR TEST. THE COMPACTION TESTING RESULTS ARE PENDING ON SAMPLE TAKEN.

14:30 TALKED TO JEFF JOHNSON RE: PAH CLEAN UP LEVELS TO 2 MG/KG. WILL PLAN TO EXCAVATE X-B 2' ADDITIONAL, X-3 P2-10 ADDL. 2', AND X-4 SB-TB-1 ADD'L 2' AND TAKE NEW CONFIRMATION SAMPLES FOR ANALYSIS. JEFF WILL HAVE RICK MARK THE SAMPLE POINTS TO SEE WHERE THEY ARE RELATIVE TO THE UPPER REVETMENT WALL.

15:00 SIXTEEN 8' WIDE MATS SET IN PLACE SO FAR TODAY. PLUS ONE 4' WIDE MAT. TRUCK ARRIVED WITH ANGLE MATS FOR HINGE POINT @ STATION 2+50.

15:30 TALKED TO ERIC FISH OF ARMORTECH REGARDING ANCHOR CABLE FAILURE. ERIC STATED THAT THESE ARE THE STANDARD ANCHOR USED BY ARMORTECH AND THEY HAVE WORKED ON REVETMENT SET AT STEEPER SLOPES. I ASKED FOR & ERIC AGREED TO PROVIDE CONTECH & ARCH WITH A LETTER STATING THAT THE ANCHORS ARE ACCEPTABLE AND THEY WILL GUARANTEE PERFORMANCE. MADE THE DECISION TO USE ANCHORS AND 3 EACH/8' WIDE MAT. INFORMED STEVE & JEFF OF DECISION AND ANCHOR INSTALLATION WILL START SATURDAY.

16:15 ANGLE MATS SET IN PLACE AT HINGE POINT. EXCAVATED BUILDING ROAD FOR CRANE AT 30' ELEV. FROM STATION 3+75 TO 5+50. 8' BENCH BETWEEN STATIONS 6+00 & 7+00 BEING BUILT. TOOK PICTURE LOOKING EAST @ 30' ELEVATION ROAD CONSTRUCTION

16:00 ANOTHER TRUCK W/ MATS ARRIVED

15:00 SEVENTH TRUCK W/ MATS ARRIVED. TOO DARK TO OFFLOAD & DRIVER DROPPED TRAILER WITH MATS TO BE UNLOADED ON MONDAY.

TWENTY FOUR MATS & HINGE SET IN PLACE ON FRIDAY PLUS THE TWO HINGE MATS AND ONE 4' WIDE MAT.

Preparer Initials BKR

anchor
installation

DAILY INSPECTOR'S PROGRESS REPORT

Saturday

Project Name/No. VANCOUVER LANDFILL PHASE 3, AREA 1		**Date:** 11-08-03
Contractor ENVIROCON		
Subcontractor(s) AXIS CRANE		
No. of workers: 7	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
42° PARTLY CLOUDY - RAIN OVERNIGHT	50° OVERCAST

Comments and/or supporting calculations:

8:00 TALKED TO JEFF JOHNSON ABOUT MAT DELIVERY BY CONTECH. SITUATION HAS IMPROVED WITH FEWER DELAYS. WILL MONITOR SITUATION.
8:30 ENVIROCON PLACING SAND/MULCH MIX AT 18' ELEVATION FROM STATION 5+50 TO 6+50.
SLOPE BETWEEN 1+675 AND EAST SIDE OF PROPERTY NEARLY COMPLETE. SAND WAS REMOVED AT EXTREME EAST END OF SLOPE AREA AND ITS FILL MATERIAL WAS PLACED AND COMPACTED IN THIS AREA TO PROVIDE STABILITY.
TOOK PICTURES LOOKING WEST FROM EAST SIDE OF PROPERTY AT ELEVATION 18'.
10:00 TOOK PICTURES OF WORKERS INSTALLING ANCHORS FOR MATS. USING ROTARY DRILL/HAMMER TO INSTALL PLATAPUS ANCHORS WITH CABLES SUPPLIED BY ENVIROCON THROUGH CONTECH.
TOOK PICTURES OF HINGE POINT OF REVETMENT AT STATION 2+68.
12:00 COMPLETED INSTALLATION OF ANCHORS FOR ALL MATS WHICH HAVE BEEN SET IN PLACE SO FAR.
12:30 DOZER & ROLLER WORKING ON ROAD FOR AXIS CRANE ALONG 30' ELEVATION. TOOK PICTURE OF ROAD CONSTRUCTION LOOKING WEST.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BCA		**Title** PROJ. ENGR	**No.**

Additional Comments/Supporting Calculations **Date:** 11/09/23

13:15 DOZER & EXCAVATOR PUTTING FINISHING TOUCHES ON LAST SECTION OF LOWER SLOPE ELEVATION 7.5' TO 18' ON EAST END OF PROPERTY. TOOK PICTURE OF WALL ON LOWER SLOPE IN THIS AREA.

Preparer Initials BLA

rebar in loops of mat

DAILY INSPECTOR'S PROGRESS REPORT

Monday

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11 / 10 / 03	
Contractor ENVIROCON			
Subcontractor(s) AMS CRANE WITH PACIFIC			
No. of workers: 10	**Equipment:** SAME		

Morning Weather Conditions:	**Afternoon Weather Conditions**
45° RAIN	55° LIGHT RAIN

Comments and/or supporting calculations:

8:00 TRUCKS ARRIVED WITH MATS AND STARTED SETTING IN PLACE PLAN TO SET 36 MATS PLUS 2 HINGE POINT MATS TODAY ON LOWER SLOPE.

8:30 INSTALLED REBAR IN LOOPS OF MATS & INSTALLED ANCHORS FROM STATIONS -.5 TO 3+25

9:00 STARTED HAULING & COMPACTING I-5 MATERIAL AT 18' ELEVATION FROM STATIONS -.5 TO 2+68.

DECIDED TO DIG OUT X-3 & X-4 OF BACKFILL MATERIAL PLUS GO 2' DEEPER IN ATTEMPT TO REMOVE PAH > 10. ORIGINAL CLEAN UP TARGET OF 20 WAS NOT AS REQUIRED IN THE AGREED ORDER. WILL TAKE OUT FILL MATERIAL PLUS ADDITIONAL 2' THEN TAKE CONFIRMATION SAMPLES. HOLES WILL BE REFILLED WITHOUT SAMPLE RESULTS SO ENVIROCON WILL NOT BE HELD UP & CAN CONTINUE CONSTRUCTION OF THE UPPER SLOPE AT THE WEST END. X-8 WILL ALSO BE DUG OUT & RESAMPLED FOR PAH's.

10:30 BACKFILLED X-1 AND CLEANED UP SHORE LINE SLOPE AT WEST END OF SOUTH BANK AREA OF CONCERN.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ ENGR	**No.**

brooms / shovels
push sand-mulch
into holes

Long wash-out for

fill of upper
slope 18' - 30'

Additional Comments/Supporting Calculations **Date:**

12:00 MARC TOOK CONFIRMATION SAMPLES FOR TESTING PAH's FROM X-3, X-4, & X-8.
DISCUSSED WITH JR BURBA CLEANUP LEVELS FOR PAH's IN SOUTH BANK AREA OF CONCERN. REQUIRED BY THE AGREED ORDER, SPECS, SAY CLEAN UP TO 20 BUT A 0 MAY BE 10 ?
12:30 X-3 & X-4 EXCAVATIONS BACKFILLED & COMPACTED.
13:00 USING BROOMS & SHOVELS & HOES TO PUSH SAND/MULCH MIXTURE INTO HOLES AND LEVEL SURFACE ON LOWER REVETMENT.
14:00 PLACED INSIDE HINGE POINT MATS ON LOWER SLOPE AND THEY FIT WELL. MAT INSTALLATION CONTINUED TO STATION 6+00. NO WIND TODAY MADE PLACEMENT MUCH EASIER.
LONG REACH EXCAVATOR PLACING SAND/MULCH MIX ON MATS FROM STATIONS -50 TO 3+00
15:30 UNITED RENTAL DELIVERED A BACKHOE WITH IMPACT HAMMER TO BREAK UP CONCRETE AT BUILDING DEMO SITE.
I-5 MATERIAL DUMPED AT TOP OF 30' ELEVATION FROM STATIONS -.5 TO 3+00. READY TO BE PUSH IN AND COMPACTED WHEN [redacted] ELEVATION IS COMPLETE.
16:00 STARTED PLACING & COMPACTING I-5 FILL MATERIAL ON UPPER SLOPE FROM ELEVATION 18' TO 30' BETWEEN STATIONS -.50 AND +.50
16:15 CARLSON TESTING IN AND TOOK COMPACTION TESTS @ ELEVATION 19.5' AT STATIONS +.25, 1+20, 2+00. COMPACTION TESTS SHOWED 95% TO 96% . THIS IS 100% I-5 FILL MATERIAL.
16:30 STARTED PLACING & COMPACTING I-5 FILL MATERIAL FROM ELEVATION 18' TO 30' FROM STATIONS +50 TO 2+68.
17:00 I-5 MATERIAL RECEIVED ALL DAY. WEIGHT TICKETS FROM DELIVERY TRUCKS ARE NOW SHOWING LOAD QUANTITIES OF 22 YD^3, DOWN FROM 29 YD^3 USED PREVIOUSLY. RICK GATHERS DELIVERY SLIPS FROM DRIVERS @ END OF EACH DAY.

Preparer Initials BAR

spread sand-mulch
on lower
blocks

25% of block
in A.T. not 50%

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No.	JACOBSON LANDFILL REMEDIATION	**Date:**	11-11-03
Contractor	ENVIROCON		
Subcontractor(s)	ARIS		
No. of workers:	10	**Equipment:**	SAME

Morning Weather Conditions:	**Afternoon Weather Conditions**
50° OVERCAST RAINED DURING THE NIGHT	55° PARTLY CLOUDY

Comments and/or supporting calculations:

8:30 GREG RUTHERFORD VISITED SITE TO OBSERVE SAFETY OF WORK.
9:00 EXCAVATOR SPREADING SAND/MULCH MIX ON LOWER REVETMENT MATS FROM STATION 2+60 TO 5+75. HAND WORK TO LEVEL REMAINS INSTALLING REBAR & ANCHORS FOR REVETMENT MATS STATION 3+00 TO 5+50
9:30 FIRST TRUCK LOAD OF REVETMENT MATS ARRIVED AT APPROX. THIS TIME. DELIVERY WAS DELAYED DUE TO A SHORTAGE OF TIEWRAPS USED IN CONSTRUCTING THE MATS. CONTECH RECEIVED NEW SHIPMENT AND NO FURTHER DELAYS ARE EXPECTED. STARTED PLACEMENT OF MATS @ STATION 5+75 & WORKING EAST.
10:00 DISCUSSED ANCHOR TRENCH DESIGN FOR THE EAST & WEST ENDS OF THE REVETMENT. ENVIROCON CONCERNED THAT IF INSTALLED PER DRAWINGS, THE MATS WILL SLIDE INTO ANCHOR TRENCH WHEN RELEASED. DECIDED TO JUST HAVE 25% OF THE MAT IN THE TRENCH (1 BLOCK WIDTH) RATHER THAN 50% OF THE MAT. FLOW CRETE WOULD BE POURED INTO TRENCH TO SECURE MAT.
11:00 CARLSON TESTING WAS IN TO TAKE COMPACTION TESTS AT STATIONS 1+25, 3+50, 4+25, & 5+00 AT ELEVATION 26' TO 30'. ALL TESTS PASSED AND RANGED BETWEEN 98% TO 100%.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed	BKL		**Title**	PROJ. ENGR.	**No.**

Additional Comments/Supporting Calculations	Date:

12:00 COMPLETED MAT INSTALLATION ON LOWER SLOPE UP TO THE LAST HINGE POINT ON EAST SIDE.

12:30 INSTALLING REBAR AND ANCHORS FOR REVETMENT MATS FROM STATION 5+50 TO 7+25.

13:00 STARTED BACKFILLING AND COMPACTING 18' ELEVATION BENCH FROM STATION ~~5+00~~ 5+50 USING I 5 SOIL.

13:30 TALKED TO JEFF REGARDING I 5 SOIL DELIVERY. ENVIROCON HAS ENOUGH MATERIAL TO COMPLETE THE SHORELINE WORK AND WILL STOP RECEIVING MATERIAL AT THE END OF TODAY. DISCUSSED WITH JEFF ACOE'S DESIRE TO COVER THE SHORELINE AND AREA WEST OF THE REVETMENT MATS, WITH APPROX. 8" OF SOIL AND THEN HYDROSEED THE AREA. THIS WILL BE EXTRA WORK AND A CHANGE ORDER WILL BE ISSUED LATER FOR THIS WORK.

14:30 FIRST TRUCK LOAD OF 36' LONG REVETMENT MATS ARRIVED FOR UPPER SLOPE. WILHELM TRUCKING CO. OUT OF PORTLAND IS DELIVERING MATS IN THE AFTERNOON 14:30 & 15:00 LOADS. A 4TH MORE TRUCK IS WAITING FOR THE FINAL DELIVERY OF THE DAY.

15:00 AKLS PLACED THE LAST REVETMENT MAT AT THE EASTERNMOST EAST END OF THE LOWER SLOPE. THE CRANE IS BEING MOVED TO THE WEST END OF THE REVETMENT TO FINISH SETTING THE WEST END MATS AND START WORK ON THE UPPER SLOPE.

15:30 SOIL BEING SPREAD AND COMPACTED AT ELEVATION 18' TO 30' BETWEEN STATIONS 3+00 AND 5+00 USING I 5 SOIL.

16:00 WEST END REVETMENT MAT SET IN PLACE ON LOWER SLOPE COMPLETING THE LOWER LEVEL MATS. TWO TRUCK LOADS OF MATS WAITING AND WILL BE UNLOADED BUT NOT SET IN PLACE UNTIL TOMORROW.

16:15 FIRST MAT SET IN PLACE (36') ON THE UPPER SLOPE AT THE WEST END.

16:30 STEVE TOLD ME ENVIROCON PLANS TO USE A FLOW FILL CONCRETE MIXED USING PEA GRAVEL AND PUMP THE CONCRETE INTO PLACE AFTER ALL THE MATS ARE SET IN PLACE.

Preparer Initials BLR

Spread sand-mulch
mix on lower
mortar block

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL RECLAMATION		**Date:** 11-12-03
Contractor ENVIROCON		
Subcontractor(s) AK'S WITH PACIFIC		
No. of workers: 10	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
40° COOL FOGGY	65° CLEAR & SUNNY

Comments and/or supporting calculations:

8:00 STARTED PLACING 36' LONG MATS ON UPPER SLOPE STARTING AT STATION +50. BOBCAT BACK BLADING UPPER SLOPE AND GEO FABRIC BEING PLACED ON GROUND IN PREP FOR MAT INSTALLATION. JEFF STARTED TAKING DELIVERY OF I 5 SOIL AGAIN AS IT APPEARED WE WOULD NEED MORE. THE PILE WAS DISAPPEARING QUICKLY.

8:30 STEVE REPORTED THAT IT APPEARED CONCRETE BLOCKS WERE CRACKING & CORNERS BREAKING OFF MORE EASILY. BLOCKS MAY NOT BE FULLY CURED? I LOOKED AT THE MATS & THEY APPEARED TO BE OK BUT I DID CALL BOB & DISCUSSED THE BREAKAGE.

9:00 SPREADING SAND/MULCH MIX ON LOWER REVETMENT MATS FROM STATION 4+00 TO EAST PROPERTY BOUNDARY. BUILDING & COMPACTING UPPER SLOPE ELEVATION 18' TO 30' BETWEEN STATION 4+50 & 6+50.

12:00 COMPLETED MAT INSTALLATION ON UPPER SLOPE FROM STATION 4+50 TO THE FIRST HINGE POINT @ 2+50. THE TWO MATS FOR THE HINGE POINT DID NOT ARRIVE AS THEY WERE NOT MADE YET AS CONTECH RAN OUT OF CABLE. WILL SKIP HINGE MAT INSTALLATION FOR NOW & INSTALL LATER.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

sand-mud unit
on upper portion
18-30

to station 4+00
on upper levee by
end of day

Additional Comments/Supporting Calculations **Date:** 11-12-03

13:00 LONG REACH EXCAVATOR SPREADING SAND/MULCH MIX ON UPPER REVETMENT SLOPE BETWEEN STATIONS -50 TO 1+50. REBAR PIN ANCHORS BEING INSTALLED BETWEEN STATIONS -50 TO 1+50 ON UPPER LEVEL

SMALL TRACK EXCAVATOR BEING USED TO DIG ANCHOR TRENCH FOR LOWER MAT ON EAST END OF SLOPE.

14:30 COMPLETED SETTING REVETMENT MATS ON UPPER LEVEL TO STATION 4+00. 36 TOTAL MATS PLACED BY 14:30 TODAY.

15:00 DISCOVERED THAT THE EXISTING GROUND WATER MONITORING WELLS ON THE SOUTH SHORE WILL INTERFER WITH THE REVETMENT MAT INSTALLATION AT STATION 6+20. WILL REMOVE BOLLARDS AROUND WELLS AND REMOVE BLOCKS FROM MATS AS NECESSARY TO PLACE OVER THE WELL PIPES.

Preparer Initials BKL

amb constr
6+75 to E end
15 ol to 30 ol

and/or trench
west end

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11-13-03
Contractor ENVIRO CON		
Subcontractor(s) AXIS		
No. of workers: 9	**Equipment:** STONE	

Morning Weather Conditions:	**Afternoon Weather Conditions**
42° CLEAR COOL FOG IN MORNING	CLEAR SUNNY 55°

Comments and/or supporting calculations:

8:00 PLACING FILL AND COMPACTING SOIL (I 5) ON UPPER SLOPE AT ELEVATION 18' TO 30' BETWEEN STATION 6+75 TO THE EAST PROPERTY BOUNDARY.

9:00 SMALL EXCAVATOR DIGGING ANCHOR TRENCH AT WEST END OF LOWER SLOPE.

TRUCK DELIVERING MATS BACKED TO CLOSE TO GROUND WATER MONITORING WELLS AND KNOCKED OVER ONE BALLARD POST. NO WELL PIPE DAMAGE.

9:30 TRACK EXCAVATOR STARTED BURYING A PILE OF WIRE THAT HAD BEEN REMOVED. WILL TAKE ½ 2 HOURS PER GEORGE.

I 5 SOURCE OF BORROW MATERIAL IS NO LONGER AVAILABLE. MATERIAL ON SITE WILL BE ENOUGH TO FINISH THE UPPER SHORELINE SLOPE BUT NONE WILL BE LEFT FOR COVERING THE SHORE AREA WEST OF THE REVETMENT, JUST SOUTH OF THE SANITARY TREATMENT FACILITY.

FINISHED PLACING & COMPACTING I 5 SOIL AT EAST END OF THE UPPER SLOPE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR	**No.**

FRI 3pm 11-14-03
cancels pour
of paper blocks

Thurs

Additional Comments/Supporting Calculations **Date:** 11-13-03

10:00 CHECKED THE REVETMENT LAYOUT AT THE EAST END OF THE TOP SLOPE AND IT APPEARS IT WILL END JUST SHORT OF THE PROPERTY BOUNDARY. RIP RAP AT THIS LEVEL MAY EXTEND ONTO PORT PROPERTY IF CAVE IS NOT TAKEN.

10:30 TALKED TO JOE AND ENVIRCON WILL BREAK OUT A COUPLE OF CONCRETE BLOCKS THAT INTERFER WITH THE GROUNDWATER MONITORING WELL PIPES.

11:00 FINISHED BURYING WIRE BUNDLES IN ELF.
ENVIROCON IS BACKFILLING AND COMPACTING EXTREME WEST END OF UPPER SLOPE IN PREPARATION FOR SETTING FINAL MATS.

12:00 TALKED TO JOE AND TIME FOR FILL CONCRETE AND PUMPER TRUCK IS SCHEDULED FOR 3:00PM ON FRIDAY. TO POUR HINGE POINTS AND ANCHOR TRENCHES IN REVETMENT

14:30 SET NEXT TO LAST TRUCK LOAD OF REVETMENT MATS ON UPPER SLOPE. 32 MATS SET IN PLACE SO FAR UP TO STATION 6+60.

15:50 LAST TRUCK OF MATS ARRIVED FOR THE DAY AND UNLOADED. REBAR AND MAT ANCHORS INSTALLED ON UPPER LEVEL FROM STATIONS 4+50 TO 5+50.

16:00 TALKED TO GEORGE & RICK REGARDING THE LOCATION OF PCB CONTAMINATED SOILS LOCATED IN X-5 EXCAVATION. PLAN TO REMOVE MATERIAL AT POINTS THAT TESTED HIGH BUT LEAVE SOIL IN PLACE WHEN POSSIBLE TO MINIMIZE REMOVAL.

Preparer Initials BJR

3+5 to 5+0 (upper slope)
excavator
spr sand/mulch
or revetment

final set of Armor
from 7+00 to E end

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11-14-03
Contractor ENVIROCON		
Subcontractor(s) AXIS		
No. of workers: 11	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
45° OVERCAST	57° OVERCAST

Comments and/or supporting calculations:

8:00 EXCAVATOR SPREADING MULCH/SAND MIX ON UPPER REVETMENT FROM STATION 3+50 TO 5+00. HAND RAKING SAND/MULCH MIX ON LOWER REVETMENT FROM STATION 3+50 TO 6+00.
8:30 MET MICHELE METCALF OF THE WASHINGTON STATE DNR TO REVIEW REVETMENT INSTALLATION AND SITE WORK.
SETTING UPPER SLOPE REVETMENT MATS FROM STATION 7+00 TO THE EAST SIDE OF THE PROPERTY.
9:15 TOOK PICTURES OF WORK FROM GLACIER BADGE - SIGNED RELEASE FORM & WORE LIFE JACKET.
9:30 TALKED TO RICK REGARDING EXCAVATION ENVIROCON IS DOING IN THE N.W. POINT OF THE ELF. I DIDN'T UNDERSTAND WHY THIS EXCAVATION WAS REQUIRED OUTSIDE THE SILT FENCE AREA. RICK TOLD ME THE DRAWINGS CALL FOR TAKING THIS AREA DOWN TO ELEVATION 30'. WILL DISCUSS WITH PAT.
10:00 TALKED TO JEFF REGARDING X-5 AREA EXCAVATION STATEGY. X 20'x 20' x TO DEPTH OF CONTAMINATION TEST POINT. THEN GO 2' DEEPER TO REMOVE HIGH PCB SOIL THEN SCREEN TEST. THIS WILL MINIMIZE THE AMOUNT OF MATERIAL REMOVED.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR	**No.**

Additional Comments/Supporting Calculations **Date:** 11-14-03

20 x 20 x 6' = 2400 FT3 OR 95 YD3

11:30 DISCUSSED K-5 EXCAVATION STRATEGY WITH GRAY KEEN & HE RECOMMENDED SLOPING THE 20' x 20' AREA TOWARD THE CONTAMINATION POINT TO REMOVE A CONE SHAPED SECTION RATHER THAN RECTANGULAR/SQUARE. GRAY WILL DISCUSS WITH JEFF DURING HIS VISIT IN PM.

11:45 JEFF CALLED REGARDING THE EXCAVATION WORK IN THE NW CORNER OF ELF. I TOLD HIM TO CLARIFY WITH PAT BUT I DIDN'T SEE A NEED TO EXCAVATE THE ROADWAY OUTSIDE THE ELF.

13:00 FINISHED SETTING REMAINING REVETMENT MATS ON UPPER SLOPE

13:30 POURED FLOW CRETE AT MAT HINGE POINTS AND IN ANCHOR TRENCHES AT ENDS OF REVETMENT MATS.

16:00 CREW SIZE WILL BE REDUCED TO 6 ENVIROCON LOCAL PERSONNEL STARTING ON MONDAY PER GEORGE.

Preparer Initials GEO

12"

+ excavator
+ sand/mulch
+ upper revetment

exc pole
bldg aves

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11-17-03
Contractor ENVIROCON		
Subcontractor(s) AMS W.H. PACIFIC		
No. of workers: 6	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
48° OVERCAST LIGHT RAIN	53° OVERCAST.

Comments and/or supporting calculations:

10:00 EXCAVATOR SPREADING SAND/MULCH MIX ON UPPER REVETMENT BETWEEN STATIONS 4+00 TO 6+00
CREW MANUALLY RAKING SAND/MULCH MIX INTO LOWER REVETMENT BLOCKS.
11:00 PAUL SKILLINGSTAD AND BILL HARRIS OF THE WASH. STATE DEPT. OF ECOLOGY VISITED THE SITE TO REVIEW REVETMENT INSTALLATION AND CONTAMINATED SOIL REMOVAL/DISPOSAL. PAUL INQUIRED AS TO OUR PLANS FOR THE AREA WEST OF THE REVETMENT. PAULS UNDERSTANDING WAS THAT THIS AREA WOULD BE COVERED WITH RIP RAP TO STABILIZE THE GROUND. WILL DISCUSS WITH AL BURBA.
11:30 ENVIROCON EXCAVATING THE CUT & FILL AREA NEAR THE PORT BUILDING DEMO SITE IN N.W. CORNER OF ELF. TALKED TO STEVE HOLMBERG REGARDING THE CUT OUTSIDE THE ELF. PAT SULLIVAN HAD BEEN CONTACTED ON 11/14 PM AND IT WAS DECIDED THAT IT WAS NOT NECESSARY TO CUT THE SLOPE TO BURBA ROAD. THE EXCAVATED AREA WILL SERVE AS A DRAINAGE BASIN FOR PART OF THE ELF AREA

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BHL		**Title** PROJ. ENGR.	**No.**

Additional Comments/Supporting Calculations **Date:** 11-17-03

I CALLED MARK FLEMING AT WASTE MANAGEMENT AND DISCUSSED THE NEED TO PICKUP FOUR FULL ROLLOFF BOXES AND DELIVER SEVEN MORE. DISCUSSED THE USE OF DUMP TRUCKS BUT DECIDED TO STAY WITH ROLL OFF BOXES SINCE THE QUANTITY OF MATERIAL REMAINING TO BE HAULED OFF SITE IS ONLY ± 100 TONS. MARK SAID HE WOULD TRY TO GET BOXES DELIVERED ON 11-19.

13:30 CUT & FILL WORK CONTINUED IN THE NW CORNER OF THE ELF.

SPREADING OF SAND/MULCH MIX CONTINUED ON LOWER SLOPE OF REVETMENT

CONFERRED WITH GEORGE REGARDING THE REQUIREMENT TO SURVEY THE ANCHOR LOCATION FOR AS BUILTS. ELEVATIONS BEING TAKEN EVERY 40'.

15:00 JEFF CALLED REGARDING THE VANCOUVER CITY WATER LINE CONNECTION. CITY OF VANCOUVER WANTS $13,000 FOR CONNECTION FEE. WILL TALK TO AL BURBA TO SEE IF WE HAVE ANY OPTIONS.

Preparer Initials BGR

Sand mulch
in revetment

wire in NW
area of EF

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. J AN COUVER LAND FILL REMEDIATION		**Date:** 11-18-03
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers: 6	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
52° OVERCAST RAIN	55° OVERCAST LIGHT RAIN

Comments and/or supporting calculations:

8:00 TALKED TO AL BURBA REGARDING THE WATER SUPPLY LINE FOR THE IRRIGATION SYSTEM. TEMPORARY WATER SUPPLY IS NOT ACCEPTABLE. NEED A PERMANENT SUPPLY WHICH WILL BE USED BY FUTURE OWNERS. THEREFORE WORK WITH THE CITY OF VANCOUVER TO SEE IF COST CAN BE REDUCED.

9:00 CONTINUED SPREADING SAND/MULCH MIX ON UPPER REVETMENT SLOPE WITH EXCAVATOR

CONTINUED CUT AND FILL WORK IN NW. AREA OF ELF NEAR THE POLE BUILDING DEMO SITE.

10:00 CALLED MARK KRENING TO SEE WHEN ADDITIONAL ROLL OFF BOXES WOULD BE AVAILABLE TO ENABLE COMPLETION OF EXCAVATION WORK IN AREA X & S.

13:00 GEORGE CALLED TO REPORT THAT THEY HIT WATER IN N.W. AREA OF ELF NEAR THE BUILDING DEMO SITE. WATER WILL BE REMOVED AND BURIED IN ELF.

15:00 MARK KRENING CALLED TO REPORT THAT TWO ROLL OFF BOXES WILL BE DELIVERED ON 11-19 @ 7:30 AM AND THE TRUCK WILL PICKUP TWO FULL ROLL OFF BOXES.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

Additional Comments/Supporting Calculations **Date:** 11-18-03

15:30. GEORGE REQUESTED CARLSON TESTING TO COMPLETE COMPACTION TEST ON N.W. AREA NEAR THE POND BUILDING DEMO SITE WHERE NEW CONTOURING HAD BEEN COMPLETED. I TALKED TO MARK VREKOS AND ASKED HIM TO SCHEDULE CARLSON TO PERFORM TESTS 11-19-03 @ 9 AM.

Preparer Initials BKR

drop & pickup
of Roll off

remove old
fence east side

capacity tests

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11-19-03
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 6	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
43° HEAVY RAIN	50° OVERCAST

Comments and/or supporting calculations:

7:30 WASTE MANAGEMENT DELIVERED TWO ROLL OFF BOXES AND PICKED UP TWO FILLED WITH PCB WASTE SOIL FROM THE X-5 EXCAVATION AREA. MANIFESTS WERE REVIEWED & SIGNED.

8:30 REMOVING OLD FENCE ON EAST SIDE OF PROPERTY NEAR GLACIER SAND & GRAVEL, CUTTING ELEVATION TO 32' PER THE DRAWING WITH FLAT AREA FOR THE NEW FENCE. I TOLD GEORGE THAT THE NEW FENCE WILL FOLLOW THE SAME LINE AS THE OLD ONE.

10:00 CARLSON TESTING ON SITE TO CHECK COMPACTION IN ELF NW. AREA. TESTED 98% TO 100+ %.

13:00 TALKED TO JEFF ABOUT THE PLAN FOR THE SHORELINE WEST OF THE REVETMENT. RIPRAP BELOW THE 18' ELEVATION. ABOVE THE 18' ELEVATION, COVER WITH 8" SOIL & HYDROMULCH SURFACES INSIDE JERSEY BARRIERS UP TO DIKE WHERE EXCAVATION OCCURED.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVR		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11-20-03
Contractor		
Subcontractor(s)		
No. of workers: 6	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
46° OVERCAST	52° OVERCAST

Comments and/or supporting calculations:

8:00 STARTED BUILD UP OF ANCHOR TRENCH EMBANKMENT BEGINNING AT THE S.E. SECTION OF THE PROPERTY NEAR GLACIER SAND & GRAVEL AND EXTENDING DOWN STREAM TO THE WEST ALONG THE TOP OF THE UPPER REVETMENT SLOPE TO STATION 5+00.

9:00 TOOK SOIL SAMPLES FROM K-5 EXCAVATION AREA AT P2-14 & P2-17. SAMPLES DELIVERED TO MARC KREKOS OF CH2M HILL FOR PCB SCREENING.

10:00 TODD COLEMAN of POV CALLED REGARDING DREDGE SAND/SEDIMENT FROM THE COLUMBIA RIVER AT THE FLUSHING CHANNEL FROM VANCOUVER LAKE. TODD WANTS TO KNOW IF ACM WOULD BE INTERESTED IN THE MATERIAL. POV WOULD REMOVE MATERIAL AND DELIVER IT TO THE SITE. WILL MEET WITH TODD 2PM 11-25-03.

13:00 MARC KREKOS OF WM CALLED REGARDING ROLL OFF BOX AVAILABILITY. NONE AVAILABLE UNTIL 11-25. TALK TO JEFF AND DECIDED TO USE TWO DUMP TRUCKS ON MONDAY 11-24 TO HAUL THE PCB WASTE. THE REMAINING FOUR ROLLOFF BOXES WILL HANDLE THE PCB WASTE TO BE REMOVED.

14:00 JEFF CALLED REGARDING ANCON'S PREFERENCE FOR WILLOWS TO PLANT ALONG THE SHORE. DRAWINGS SHOW 5 VARIETIES THAT ARE ACCEPTABLE.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLR		**Title** PROJ. ENGR	**No.**

Additional Comments/Supporting Calculations **Date:** 11-20-03

DECIDED TO USE 20% OF EACH TYPE OF THE FIVE WILLOWS. ALTERNATING ROWS AS THEY ARE PLANTED. IN EACH REVETMENT MAT.

Preparer Initials BLR

anchor tr.
emb castr
S & W side

compact
testing
A.T. emb

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11-21-03
Contractor ENVIROCON		
Subcontractor(s) W.H. PACIFIC		
No. of workers: 6	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
OVERCAST 40° RAIN	48° OVERCAST RAIN

Comments and/or supporting calculations:

8:00 CONTINUED TO WORK ON EAST FENCE LINE AREA TO BRING IT UP TO ELEVATION IN PREPARATION FOR THE NEW FENCE.
CONTINUED TO BUILD THE ANCHOR TRENCH EMBANKMENT WITH FILL MATERIAL BEING PICKED UP AT GLACIER SAND & GRAVEL. PLACING, GRADING, & ROLLER PACKING FROM THE EAST PROPERTY BOUNDARY FROM GLACIER TO STATION 6+00.
10:00 THE ANCHOR TRENCH EMBANKMENT IS PARTIALLY BUILT UP ALONG THE ENTIRE SOUTH SIDE AND APPROX 1/2 THE WEST SIDE OF THE ELF.
I TALKED TO GEORGE AND TOLD HIM THAT WE COULD NOT ALLOW WATER TO POND BEHIND THE ANCHOR TRENCH. WILL NEED TO PROVIDE DRAINAGE TO INFILTRATION BASIN OR INTO GROUND.
CARLSON TESTING WAS IN TODAY AND MADE COMPACTION TESTS AT 4 LOCATIONS ON ANCHOR TRENCH EMBANKMENT ALONG SHORELINE. ALL LOCATIONS TESTED 95% OR GREATER.
12:00 I TALKED TO GEORGE ABOUT ANCHOR ENVIRONG. TO USING THEIR WATER TRUCK TO FLUSH OUT & CLEAN THE BAKER TANK USED TO COLLECT DRILL MUD WASTE WATER. ANCHOR IS PLANNING TO CLEAN & DRAIN

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVR		**Title** PROJ. ENGR.	**No.**

Additional Comments/Supporting Calculations	Date:

THE TANK ON H-24 IN THE AFTERNOON.
13:00 I TRAVELLED DOWN STREAM TO THE FLUSHING CHANNEL FOR VANCOUVER LAKE AND TOOK A 5 GALLON SAMPLE OF THE SAND/SEDIMENT FOR TESTING TO SEE IF IT IS ACCEPTABLE FOR USE AS FILL MATERIAL.

Preparer Initials BVR

another trend
amb constr
$\leq$ s.do

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11-24-03
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 6	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

8:00 WORK CONTINUING ON BUILD UP & COMPACTION OF ANCHOR TRENCH EMBANKMENT ON THE SOUTH SIDE OF THE EAST LANDFILL. COLUMBIA RIVER LEVEL IS RISING DUE TO RAIN AND IS OVER TOP OF THE JERSEY BARRIERS AROUND STATION 4+50 THIS IS THE HIGHEST RIVER LEVEL WE'VE SEEN SO FAR.

11:30 TWO DUMP TRUCKS ARRIVED TO PICK UP PCB CONTAMINATED SOIL. ENVIROCON GOT THEM LOADED OUT, THE MANIFESTS WERE SIGNED AND THE TRUCKS WERE ON THEIR WAY BY 12:45PM

14:15 THE WASTE MANAGEMENT WATER TRUCK ARRIVED TO VACUUM WATER OUT OF THE ~~BAKER~~ TANK THAT ANCHOR ENVIRONMENTAL WAS USING FOR DRILL WASTE WATER. THE TANK WAS DRAINED AND SEDIMENT FLUSHED OUT IN PREPARATION FOR SHIPMENT.

15:00 ENVIROCON STARTED BUILD UP OF THE ANCHOR TRENCH EMBANKMENT ON THE NORTH SIDE OF THE EAST LANDFILL JUST WEST OF THEIR OFFICE. THE ANCHOR TRENCH EMBANKMENT ON THE SOUTH & WEST SIDES OF THE EAST LANDFILL IS COMPLETE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

Additional Comments/Supporting Calculations **Date:** 11-24-03

ENVIROCON EXCAVATED HIGH PCB SOIL FROM SAMPLE POINT P2-18 IN X-5 AND PLACED THE WASTE SOIL IN ROLL OFF BOXES FOR SHIPMENT. SAMPLE POINT P2-08 WAS ALSO EXCAVATED AND THIS MATERIAL THAT IS LESS THAN 50 Mg/KG PCB, WAS MOVED ONTO THE EAST LAND FILL.

THESE TWO POINTS P2-08 & P2-18 ARE NOW READY FOR SAMPLE TESTING. SOIL SAMPLES WERE TAKEN FROM X-5 EXCAVATION AREA AT POINTS P2-08, P2-16, & P2-18.

Preparer Initials BKR

anchor trench
emb centr.
N & E s. de

opens in anchor
tr emb.
for delivery

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 11-25-03	
Contractor ENVIROCON			
Subcontractor(s)			
No. of workers: 6	**Equipment:** SAME		

Morning Weather Conditions:	**Afternoon Weather Conditions**
44° OVERCAST	50° OVERCAST

Comments and/or supporting calculations:

8:00 WORK CONTINUES ON BUILD UP & COMPACTION OF THE ANCHOR TRENCH EMBANKMENT ON NORTH AND EAST SIDES OF THE ELF.

10:00 THE TRUCK ARRIVED AND LOADED OUT THE BAKER TANK THAT ANCHOR ENVIRONMENTAL WAS USING TO HOLD DRILL WASTE-WATER.

14:30 ENVIROCON COMPLETED ANCHOR TRENCH EMBANKMENT ON NORTH AND WEST SIDES OF THE ELF. OPENINGS WERE LEFT IN THE NORTH & WEST EMBANKMENTS TO FACILITATE VEHICLE TRAFFIC THROUGH THE SITE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VAN COUVER LANDFILL REMEDIATION		**Date:** 11-26-03
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers: 0	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
LIGHT RAIN 40°	OVERCAST 53°

Comments and/or supporting calculations:

NO WORK WAS DONE TODAY. EXTENDED HOLIDAY.
MARC KREKOS RECEIVED NEW ANALYSIS INSTRUMENT AND RAN SCREEN TEST FOR PCB'S ON X-5 EXCAVATION POINTS PZ-14, PZ-16, PZ-07, PZ-18, & PZ-08. ALL POINTS TESTED CLEAN. CONFIRMATION SAMPLES WILL BE TAKEN ON 12-01-03.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 12/01/03
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 6	**Equipment:** SAME.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
41° RAIN	49° SUNNY TO PARTLY CLOUDY

Comments and/or supporting calculations:

CONTINUED BUILD UP & COMPACTING OF ANCHOR TRENCH EMBANKMENT WITH MATERIAL FROM GLACIER SAND & GRAVEL. ONE EXCAVATOR WAS CUTTING EDGES OF COMPACTED ANCHOR TRENCH TO APPROX 1:1 SLOPE.

MARC KREKOS TOOK CONFIRMATION SAMPLES FROM X-5 EXCAVATION AT POINTS PZ-14, PZ-16, PZ-17, PZ-18, AND PZ-08. WILL SEND IN TO CARO FOR 3 DAY TURNAROUND ON ANALYSIS.

TALKED TO GEORGE ABOUT RAIN WATER LEAKING/SEEPING UNDER SAND ANCHOR TRENCH ON THE NORTH SIDE OF THE UPPER REVETMENT. WATER IS WASHING DOWN FACE OF REVETMENT @ STATION , SAND/MULCH MIX WILL NEED TO BE REPLACED IN THE BLOCKS. GEORGE WILL USE SOME CLAY/SOIL TO SEAL THE SAND TO REDUCE SEEPAGE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

December, 2003

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANALCO – South Bank Area of Concern	Date: 01 December, 2003
Contractor Envirocon	
Subcontractor(s)	
No. of workers: 6	Equipment: Komatsu P220 trackhoe, Komatsu 300 trackhoe,

Morning Weather Conditions:	Afternoon Weather Conditions
Overcast Rain at times 50	

Comments and/or supporting calculations:

10:15 Marc on site to take PCB conformation samples from X-5.

11:00 X-5 P217 elevation 28 feet, taken from bottom of excavation. COC ID **SBAC-S-025.**

11:05 X-5 P214 elevation 16 feet, taken from bucket of trackhoe due to depth of test pit. COC ID **SBAC-S-026.**

11:10 X-5 P218 elevation 23 feet, taken from bucket of trackhoe due to depth of test pit slopes. COC ID **SBAC-S-027.**

11:15 X-5 P208 elevation 24 feet, taken from bucket of trackhoe due to depth of test pit slopes. COC ID **SBAC-S-028.**

11:20 X-5 P216 elevation 19 feet, taken from bottom of excavation. COC ID **SBAC-S-029.**

11: 35 Sampling complete,

11:45 Marc off site

13:30 Samples packaged and shipped to Lab via Fed-X

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed MK		Title CHRMN	No.

CH2M HILL Applied Sciences Laboratory
CVO 2300 [redacted] Walnut Boulevard
Corvallis, OR 97330-3638
(541) 752-4271 FAX (541) 752-0276

CHAIN OF CUSTODY RECORD

Project/Contact Information	
Project #	184717.01.01.08
Project Name	ALCOA-Vanalco
Report Copy to	Marc Krekos / pdx
Company Name/Contact	CH2MHILL- Mike Drewett/pdx

Sampling		Type		Matrix					Requested Analysis														
Date	Time	Comp	Grab	Water	Soil	Air	Client Sample ID (9 Characters Max)	LAB QC	Total Number of Containers	PCB 8082		PAH SW 8270 SIM											
										Preservative													
										none	none	none	none		none	none	none	none	none	none	none	none	
12/01/2003	11:00		X		X		SBAC-S-025		1	X		X5 P217 ELEV. 28 FT											
12/01/2003	11:05		X		X		SBAC-S-026		1	X		X5 P214 ELEV. 16 ft											
12/01/2003	11:10		X		X		SBAC-S-027		1	X		X5 P218 ELEV. 23 FT											
12/01/2003	11:15		X		X		SBAC-S-028		1	X		X5 P208 ELEV. 24 FT											
12/01/2003	11:20		X		X		SBAC-S-029		1	X		X5 P216 ELEV. 19 FT											

THIS AREA FOR LAB USE ONLY		
Lab #	Pg 1	of 5
Lab PM	Custody Review	
Log In	LIMS Verification	
pH	Cust Seals Y N Ice Y N	
QC Level 1 2 3		
Cooler Temperature		

Alternate Description	Lab ID
3 Day TAT	
3 Day TAT	
3 Day TAT	
3 Day TAT	
3 Day TAT	

Sampled By: Marc Krekos	Relinquished By: Marc Krekos
Received By	Relinquished By
Received By	Date/Time
Special Instructions	

TOTAL P.02

File: CoC-Vanalco.xls

anchor trench
emb. constr
NE & E side

compaction
tests of

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 12-02-03
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers: 6	**Equipment:** SAND	

Morning Weather Conditions:	**Afternoon Weather Conditions**
42° OVERCAST	47 OVERCAST W/ LT RAIN

Comments and/or supporting calculations:

CONTINUED BUILD UP AND COMPACTION OF ANCHOR TRENCH EMBANKMENT ON N.E. AND EAST SECTIONS USING MATERIAL FROM GLACIER SAND & GRAVEL.

CARLSON TESTING WAS ON SITE TO CHECK COMPACTION ON FINISHED SECTIONS OF THE ANCHOR TRENCH EMBANKMENT. EIGHT COMPACTION TESTS WERE MADE ON SOUTH, WEST AND NORTH SIDES WITH ALL READINGS 100±%.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title**	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 12-03-03
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 6	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
40° OVERCAST	49° OVERCAST.

Comments and/or supporting calculations:

ENVIROCON COMPLETED BUILD UP AND COMPACTION OF THE ANCHOR TRENCH EMBANKMENT ON THE N.E. AND EAST SIDES. CREW WAS RELEASED EARLY IN AFTERNOON AND WILL NOT RETURN UNTIL DIRT WORK RESUMES IN THE SPRING

STEVE HOLMBERG AND GEORGE WILL BE AT THE SITE PERIODICALLY BUT NO WORK IS ANTICIPATED UNTIL PLANTING OF WILLOWS AND SCRUBS STARTS. GEORGE WILL CONTINUE TO OVERSEE VEGETATION WORK.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ. ENGR.	**No.**

(7)

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 12/04/03
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 0	**Equipment:** SAME	
RICK MARTIN &		
GEORGE LOTZE		

Morning Weather Conditions:	**Afternoon Weather Conditions**
38° LIGHT RAIN	44° OVERCAST

Comments and/or supporting calculations:

WASTE MANAGEMENT TRUCK WAS IN AT 08:15 TO PICKUP ROLLOFF BOX OF PCB WASTE SOIL. ONE BOX REMAINS & WILL BE PICKED UP ON FRIDAY.

GEORGE & RICK TOOK BACKHOE TO NORTH & NORTH 2 LANDFILLS & DUG PITS TO TEST / SEE WHAT LANDFILL MATERIAL CONSISTED OF. NORTH 2 MATERIAL PRIMARILY BROWN & SAND WHICH SHOULD COMPACT WELL ENOUGH IN WET WEATHER. THIS MAY ALLOW FOR STARTING WORK ON NORTH 2 EARLIER IN THE SPRING THAN ANTICIPATED. THE NORTH LANDFILL SEEMS TO BE MADE UP OF FINER MATERIAL W/ SILTS & CLAYS & WILL NEED TO BE MOVED & COMPACTED IN DRY WEATHER.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ ENGR.	**No.**

(2)

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LAND FILL		**Date:** 12/05/03
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 0	**Equipment:** MOVED CAT DOZER OFF SITE	
RICK MARTIN		
GEORGE LOTZE		

Morning Weather Conditions:	**Afternoon Weather Conditions**
RAIN 40°	OVERCAST 46

Comments and/or supporting calculations:

WASTE MANAGEMENT TRUCK ARRIVED @ 07:30 TO PICK UP LAST ROLL OF BOX LOCATED ON ROADWAY JUST WEST OF ANCHOR TRENCH EMBANKMENT. HYDRAULIC LINE ON TRACTOR BROKE AS BOX WAS BEING PULLED ONTO BED, STOPPED OPERATION & CALLED FOR DISPATCH OF ANOTHER TRUCK TRACTOR TO CONNECT TO TRAILER TO FINISH LOADING. TRUCK ARRIVED AT 13:45 PM. & COMPLETED LOADING & MANIFESTING CARGO WORK. THE OIL SPILL (≈ 1 GALLON) WAS CLEANED UP BY ENVIROCON USING ABSORBANT DIAPERS. OIL WAS CONTAINED QUICKLY & EFFECTIVELY THANKS TO ENVIROCON.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed B KR		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VAN COUVER LANDFILL REMEDIATION		**Date:** 12/8/03 THRU 1-12-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 0	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

NO WORK PERFORMED DURING THIS PERIOD DUE TO HOLIDAYS AND COLD/FREEZING WEATHER.
VEGETATION PLANTING WAS SCHEDULED TO START ON 1/5/04 BUT WAS POSTPONED DUE TO SNOW & ICE ON SHORELINE & RIVER BANK.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

January, 2004

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No.	VANCOUVER LANDFILL REMEDIATION	**Date:**	1/13/04
Contractor	ENVIROCON		
Subcontractor(s)	ABOVO		
No. of workers:	6	**Equipment:**	SAME.

Morning Weather Conditions:	**Afternoon Weather Conditions**
36° OVERCAST.	46° PARTLY CLOUDY

Comments and/or supporting calculations:

ABOVO MOVED ON SITE TO START PLANTING WILLOWS ON LOWER SHORE LINE REVETMENT.
WILLOW STICKS HAVE BEEN SOAKING IN TUBS FOR ABOUT 2 WEEKS IN PREPARATION FOR PLANTING.
SAFETY TRAINING ORIENTATION WAS COMPLETED WITH THE CREW BY TIM PERKINS. STICKS 1" TO 2" IN DIAMETER EXCEPT FOR THE COLUMBIA RIVER WILLOWS WHICH ARE APPROX. 1/2" IN DIAMETER. THE WILLOWS ARE BEING PLANTED APPROX 12" DEEP AND CUT BACK TO ABOUT 6" ABOVE THE CONCRETE BLOCKS. TIM HAS ABOVO CUTTING THE TOP ON A DIAGONAL WITH THE SLOPED SURFACE FACING SOUTH. THE SUN WILL DRY THE TOPS TO PREVENT FUNGUS GROWTH.
DISCUSSED THE PLANTING PLAN WITH TIM. ABOVO IS ALTERNATING SPECIES IN 16' WIDTHS ON THE LOWER LEVEL.
SOME OF THE WILLOW STAKES ARE CUT FROM MATURE PLANTS AND SOME OF THE STICKS ARE CROOKED & DIFFICULT TO DRIVE INTO THE SOIL. THE PLANTED ENDS ARE BEING CUT TO A TAPERED POINT & THE TOPS ARE FLAT. THE PLANTING CREW IS INTERVIEWED AND TIM

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

Additional Comments/Supporting Calculations **Date:** 1/13/04

FOUND SOME STICKS PLANTED UPSIDE-DOWN. THIS WAS QUICKLY CORRECTED & CREWS SHOWN HOW TO CHECK FOR TOPS & BOTTOMS OF THE STICKS. THE BUDS ARE MUCH DIFFICULT TO SEE ON THE MATURE STICKS THAN THE YOUNGER WILLOW SPROUTS.

TIM ALSO SAW THAT SOME OF THE LARGER SITKA OR WOOD STICKS APPEARED TO BE DISEASED WITH WORM HOLES IN THE WOOD. THESE STICKS ARE BEING PULLED OUT AND SET ASIDE FOR RETURN TO THE NURSERY WHO PROVIDED THEM. THE SPECIFICATIONS ON THE DRAWINGS CALLED FOR A 2' SPACING FOR THE WILLOW STICKS. THE BLOCKS IN THE ERUCTAUGHT MATS ARE 16" WIDE WHICH MADE A 32" SPACING FIT BETTER SO THAT IS WHAT TIM HAD THEM USE RATHER THAN 24" SPACING.

I WILL CHECK THE SCHRUB SPACING SPECIFICATION. THE DRAWINGS CALL FOR 40' ROW SPACING WITH SCHRUBS ON 5' CENTERS BUT I THINK THIS WAS CHANGED.

WILLOW PLANTING WAS STARTED ON THE EAST SIDE OF THE PROPERTY AND MOVED WEST

TIM & BRUCE REVIEWED WITH GEORGE LOTZE THE NEED TO KEEP A CLOSE EYE ON THE PLANTING OPERATION TO INSURE QUALITY.

Preparer Initials BKR

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 1/14/04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 6	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
40° RAINING	46° OVERCAST LIGHT RAIN

Comments and/or supporting calculations:

TIM STONE REVIEWED WITH GEORGE LOTZE & CREWS OF ABOVO THE NEED TO MAKE SURE WILLOW STICKS ARE FREE OF VISUAL DISEASE AND BLUNT ON THE TOP AND POINTED ON THE BOTTOM. STICKS TO BE DRIVEN INTO GROUND APPROX. 18" TO SECURE SO THEY WON'T WASH OUT DURING HIGH WATER.

I CHECKED THE ADDENDUM #2 ISSUE FOR THE BID PACKAGE REGARDING SCRUB SPACING. SHRUBS TO BE ON 2.5' CENTERS IN ROWS 24' APART. APPROX. 6 PLANTS/ROW.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 1/15/04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
OVERCAST 38° LIGHT RAIN	46° OVERCAST

Comments and/or supporting calculations:

CONTINUED PLANTING OF WILLOW STICKS. THE LAYOUT AND SPACING OF THE PLANTS IS GOOD. TOOK SEVERAL PICTURES OF THE PLANTING PROCESS TO DOCUMENT THEIR METHOD.

ABOVO HAS MARKED THE LOCATION OF THE SCHRUB ROWS USING COLORED FLAGS. EACH COLOR REPRESENT THE TYPE OF SPECIES. ROW LOCATION IS ON 24' CENTERS AND THE PLANTS ± 5' APART.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 1/16/04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 4	**Equipment:** SAND	

Morning Weather Conditions:	**Afternoon Weather Conditions**
36° OVERCAST	45° OVERCAST

Comments and/or supporting calculations:

ABOVO FINISHED PLANTING THE WILLOW STICKS. THEY NOW WILL TAMP EACH ONE TO INSURE THAT THE STICKS ARE SECURE AND PASS THE TWO FINGER PULL TEST.

PLANTING OF THE SCHRUBS WAS STARTED ON THE EAST SIDE WORKING WEST. HOLES IN THE CONCRETE BLOCKS ARE DUG OUT & THE GEOTEXTILE FABRIC CUT SO THE BARE ROOTS CAN BE INSERTED AND THEN COVERED & TAMPED WITH THE SAND MULCH MIX.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BHL		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 1/19/04	
Contractor ENVIROCON			
Subcontractor(s) ABOUD			
No. of workers: 4	**Equipment:** SAME		

Morning Weather Conditions:	**Afternoon Weather Conditions**
36° OVERCAST	45° OVERCAST

Comments and/or supporting calculations:

ABOUD COMPLETED PLANTING OF THE SHRUBS AND MOVED OFFSITE.

THE LOWER 4 BLOCKS OF THE REVETMENT MATS HAVE BEEN COVERED WITH WATER. THE WAVE ACTION HAS WASH ALL THE SAND & MULCH OUT OF THE HOLES IN THE CONCRETE BLOCKS. THE SOIL IN THE AREA BELOW THE HIGH WATER MARK WILL NEED TO BE REPLACED WHEN THE WATER RECEDES NEXT SUMMER. HYDRO MULCHING SHOULD HOLD THE SOIL IN PLACE IF A GOOD ROOT SYSTEM CAN BE ESTABLISHED BEFORE THE NEXT HIGH WATER EVENT.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** RES. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 1/20/04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
32° CLEAR SUNNY	46° CLEAR SUNNY

Comments and/or supporting calculations:

NO WORK AT THE SITE 1/20/04 THROUGH 4/02/04

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJECT ENGR **No.**

April, 2004

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER ELF PROJECT	**Date:** 4/05/04 MON
Contractor ENVIROCON	
Subcontractor(s) N/A	
No. of workers: 7 plus Mgt. 3	**Equipment:** 2 TRACK HOES / 2 OFF ROADS / 1 DOZER FIELD VEHICLES / ROLLER COMPACTOR BACKHOE

Morning Weather Conditions:	**Afternoon Weather Conditions**
N/A	COOL/OVERCAST / LOW 50's

Comments and/or supporting calculations:

REVIEW PROJECT STATUS, UPDATE PROJECT SCHEDULE
REVIEW PROJECT SPECIFICATION. FIELD VERIFICATION OF EXCAVATION LAYOUT PLAN.

REVIEW SAFETY CONTROLS SITE LAYOUT —

PODS & TAILGATES ARE BEING PERFORMED.

→ TOMORROW →
10:00 AM CARLISLE GEOTECH TEST.
PLAN TO TEST DEBRIS PLACEMENT

Items	Description and Location of Item	Quantity	Unit
0			

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title**	**No.**
		SITE MANAGER	4/5/04

Additional Comments/Supporting Calculations **Date:** 4/5

LOCATION OF GW MW CLUSTER IN S. AOC APPEAR TO BE INSTALLED IN WRONG LOCATION — NEED TO VERIFY

MAKE SURE TO GRADE DIKE CUTS BACK TO TRANSITION WITH SURROUNDING AREAS TO ALLOW FOR SAFE MAINTENANCE/LAWN CUTTING ETC.

TO DO:

CALL MARK KREMLING SCHED 2 ROLL-OFFS FOR DROP OFF BY THIS WEEK
- REFER SCHED. TO JEFF OR GEORGIE

SET-UP CH2M HILL FOR SCREENING SAMPLES ON PCB HOT SPOT

Preparer Initials DBK

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER ELF	**Date:** 4/6/04 (Tues)
Contractor ENVIROCON	
Subcontractor(s) CLARSON TESTING - DAVID IRISH	
No. of workers:	**Equipment:** EL 700/400, DOZER, 2 40 TON OFF-ROADS
11	
2 (ALCOA)	

Morning Weather Conditions:	**Afternoon Weather Conditions**
COOL / P-CLOUDY →	STAT — 50's (MID)

Comments and/or supporting calculations:

PERFORMED PLACEMENT OF WASTE FROM NORTH (2) LANDFILL IN ELF. (~~METHANE~~ DGC) TO TEST DENSITY OF LIFTS

DENSITY TESTING SHOWED COMPACTION IN EXCESS OF 100% AFTER TWO PASSES

DETERMINE TO USE ~~THREE~~ TWO PASS ON SLOW VIBRATION TO COMPACT LIFTS AS WASTE IS PLACED

WASTE / CLEAN FILL INTERFACE — ENVIROCON WILL ENSURE REMOVAL OF WASTE TO INTERFACE IF QTY. BECOMES DEEP OR EXCESSIVE WILL CONTACT GRAY OR BRUCE

TOOK PHOTOGRAPHS OF N(2) LF

HS7 DOCUMENT GIVEN TO AL BURBA

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** SITE MGR.	**No.**

Additional Comments/Supporting Calculations **Date:** 4/6/04

WALKED RIVER SIDE EMBANKMENT — REVIEWED EROSION THAT OCCURRED OVER THE WINTER.

VEGETATION (WILLOW PLANTINGS) LOOK VERY GOOD — LOW LOSS GOOD SPRING GROWTH.

PHOTO'S ON ARMORFLEX TAKEN.

Preparer Initials DLO

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 4-13-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 7 OPERATORS + STAFF	**Equipment:** TWO - 35 TON HAUL TRUCKS ONE LARGE EXCAVATOR, ONE SMALL EXCAVATOR, ONE DOZER, ONE WATER TRUCK, ONE VIBRATORY ROLLER, ONE BACKHOE,	

Morning Weather Conditions:	**Afternoon Weather Conditions**
SUNNY CLEAR 50°	MOSTLY SUNNY 70°

Comments and/or supporting calculations:

COMPLETED EXCAVATION OF NORTH 2 LANDFILL EXCEPT FOR SOME MINOR CLEAN UP AROUND THE EDGES.
TWO ROLL OFF BOXES FILLED WITH WASTE SOIL CONTAMINATED WITH PCB 7 50 mg/Kg. FROM HOT SPOT AREA C/M HILL, MIKE WIRTZ WAS ON SITE AND TOOK SAMPLES TO SCREEN TEST TO SEE IF PCB < 50 mg/Kg. TOOK SAMPLES FROM TOP SOIL REMOVED FROM HOT SPOT AND FROM EXCAVATION HOLE ITSELF. MIKE WILL TEST THIS AFTERNOON AT HIS OFFICE AND WILL HAVE RESULTS ON WEDNESDAY MORNING.
WATER TRUCK IN USE TO SUPPRESS DUST ON HAUL ROAD AND SPRAY EXCAVATION AREA.
GEORGE SAID THEY HAVE NOT ENCOUNTERED ANY LARGE PIECES OF MATERIAL THAT ONE EXCAVATOR COULD NOT HANDLE EXCEPT ONE PIECE OF CONCRETE, THEY WILL LIFT & LOAD IT USING TWO EXCAVATORS WORKING TOGETHER.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed RKP		**Title** PROJECT ENGR.	**No.**

survey cont sam
grid points

anchor trench
and mtl
more cohesive

compaction tests

Additional Comments/Supporting Calculations **Date:** 4/13/04

ENVIROCON HAS INSTALLED BARRICADES AROUND EXCAVATION AREAS AS REQUESTED BY GREG RUSHFORD ATTORNEYS AND ET LAST WEEK. REVIEWED WORK WITH JIM PERKINS AT NORTH & NORTH 2 LAND FILL EXCAVATION SITES.

TALKED TO STEVE HOLMBERG REGARDING CH2M HILLS NEED TO SURVEY CONFIRMATION SAMPLE GRID POINTS. TOLD STEVE THAT CH2M HILL WOULD UTILIZE W.H. PACIFIC TO DO THE SURVEY WORK & THIS WORK IS NOT THE RESPONSIBILITY OF ENVIROCON.

TALKED TO STEVE & GEORGE ABOUT THE ANCHOR TRENCH MATERIAL REGARDING ITS SUITABILITY. MAY NEED TO USE A MORE COHESIVE MATERIAL BUT DECISION WILL BE MADE AFTER DISCUSSION WITH AL & PAT.

TALKED TO GEORGE REGARDING SOIL COMPACTION. CARLSON TESTING IS COMING IN EACH DAY TO TAKE COMPACTION TESTS AND ALL HAVE BEEN 96% OR GREATER. MOISTURE CONTENT IS LOW BUT THIS WILL IMPROVE WITH RAIN THAT IS FORECAST TUESDAY NIGHT & THROUGHOUT THE WEEK. COMPACTION VALUES FOR ELF TODAY RANGED FROM 106.9 TO 137.5 %.

Preparer Initials BKR

NORTH LF exc

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 4-14-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 7 T	**Equipment:** STAKE	
STAFF		

Morning Weather Conditions:	**Afternoon Weather Conditions**
OVERCAST LIGHT RAIN 44°F	OVERCAST RAIN SHOWERS 60°F

Comments and/or supporting calculations:

CONTINUED EXCAVATION OF NORTH LANDFILL. COMPLETED CLEAN UP OF CONTAMINATED SOIL AROUND NORTH 2 LANDFILL. CONTACTED MARK KRENING OF WASTE MANAGEMENT TO NOTIFY HIM THAT THE TWO DROPOFF BOXES WERE READY TO BE PICKED UP. MARK CALLED BACK & ONE BOX WILL BE PICKED UP ON FRIDAY 4/16 @ 8AM. THE OTHER WILL BE PICKED UP ON MONDAY @ 8AM. DID NOT ORDER ANOTHER BOX AS WE MAY NOT NEED IT.

MIKE WORTH CALLED AND SAID THEY FOUND THE REAGENT FOR PCB IMMUNOASSAY TESTS WAS DISCOLORED AND BEGAN BEYOND ITS SHELF LIFE. CH2MHILL HAS ORDERED ADDITIONAL KITS THAT WILL BE RECEIVED ON FRIDAY 4/16

COMPACTION TESTS RESULTS RANGED FROM 104.6 TO 130.5%

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 4/15/04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 7 + STAFF	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
OVERCAST 46°F	OVERCAST 62°F

Comments and/or supporting calculations:

CH2M HILL, MIKE WRIGHT VISITED SITE AND TOOK ADDITIONAL SOIL SAMPLES FOR IMMUNOASSAY TESTING FOR PCB's. NEW KITS SHOULD BE IN ON FRIDAY. CALLED PAUL SKILLINGSTAD AT WDOE TO NOTIFY HIM OF OUR RESTART OF THE PROJECT. PAUL MADE TENTATIVE PLANS TO VISIT ON TUESDAY 4/20/04 TO REVIEW PROGRESS. PAUL INDICATED THAT HE WANTS TO SEE THE LINER INSTALLATION AS WELL.

GEORGE LOTZ SAID THEY ARE FINISHED IN THE N2 LANDFILL. TOTAL VOLUME REMOVED IS APPROX. 11,600 C.Y. AS COMPARED TO 10,000 + C.Y. ESTIMATED BY DAT. THEY HAVE UNCOVERED A LARGE CONCRETE, STEEL & REFRACTORY CHUNK OF MATERIAL THAT CAN'T BE LOADED & HAULED IN ONE PIECE. COULD SLIDE OR DRAG IT EXCEPT FOR RR TRACK WHICH MIGHT GET DAMAGED. ANOTHER OPTION WOULD BE TO BRING IN EQUIPMENT TO BREAK IT UP.

COMPACTION TESTS RANGED FROM 95.5 TO 128.6%

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No.	VANCOUVER LANDFILL REMEDIATION	**Date:**	4-(6-04
Contractor	ENVIROCON		
Subcontractor(s)			
No. of workers:	7	**Equipment:**	SAME

Morning Weather Conditions:	**Afternoon Weather Conditions**
45° OVERCAST	61° OVERCAST W/ RAIN SHOWERS

Comments and/or supporting calculations:

ENVIROCON MAKING GOOD PROGRESS IN N. LANDFILL WITH PRODUCTION ± 2000 CY3/DAY.

CHEM WASTE MGT. WAS IN WITH TWO TRUCKS TO PICK UP THE ROLL OFF BOXES OF PCB WASTE SOIL. HAD TO USE TWO EXCAVATORS TO MOVE ROLL OFF BOXES TO SOLID GROUND WHERE THE TRUCKS COULD HOOK UP & DRAG BOXES ON TO THEIR FRAMES. MANIFESTS PREPARED AND SIGNED BY BCR.

CH2M HILL PROVIDED THE FIRST PCB SCREEN ANALYSIS FOR THE N2LF.

TALKED TO JEFF REGARDING ANCHOR TRENCH PLATFORM TOP MODIFICATION. WILL DISCUSS WITH AL & PAT TO DECIDE ON ACTION TO TAKE. ALSO DISCUSSED THE NEED TO TURN AROUND SOIL ANALYSIS QUICKLY TO AVOID DELAY IN WORK BY ENVIROCON.

TALKED TO PAT SULLIVAN REGARDING REMOVING & REPLACING TOP OF ANCHOR TRENCH. PAT AGREED THAT IT WOULD BE BETTER TO REPLACE THE SAND WITH A SILT OR CLAY SOIL.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BCR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

MON

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 4-19-04	
Contractor ENVIROCON			
Subcontractor(s)			
No. of workers: 7	**Equipment:** SAME		

Morning Weather Conditions:	**Afternoon Weather Conditions**
OVERCAST 48°F	58°F RAIN

Comments and/or supporting calculations:

CH2M HILL PROVIDED SECOND SCREEN ANALYSIS FOR PCB SOIL IN N2LF. THE AREA'S THAT SHOWED HIGH READINGS ON THE FIRST SCREEN WERE TESTED AT 12" & 24" BELOW THE SURFACE TO DETERMINE DEPTH FOR ADDITIONAL DIGGING. ALL BUT 3 PASSED AT 12" DEPTH. THREE FAILED AT 12" AND WILL BE DUG DOWN APPROX 2½ FT. (A-11, E-11, & E-7)

CH2M HILL PROVIDED FIRST SCREEN ANALYSIS FOR THE N. LF. A1 & A3 FAILED & WILL BE DUG DOWN APPROX. 2½'.

ANALYSIS OF THE TWO STOCK PILES FROM THE HOT SPOT EXCAVATION SCREENED LESS THAN 50 mg/kg AND THE MATERIAL WILL BE PLACED ON THE EBF.

COMPACTION TESTS BY CARLSON RANGED BETWEEN 102.2 & 125.8 % FOR MATERIAL PLACED IN THE EBF.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No.	VANCOUVER LAND FILL REMEDIATION	**Date:**	4-20-04
Contractor	ENVIROCON		
Subcontractor(s)			
No. of workers:	7	**Equipment:**	SAME

Morning Weather Conditions:	**Afternoon Weather Conditions**
47°F OVERCAST	53°F OVERCAST

Comments and/or supporting calculations:

ENVIROCON WENT BACK INTO THE N2 LANDFILL TO EXCAVATE 18" FROM THE AREAS THAT TESTED GOOD AT 12". AND 30" FROM THE AREAS THAT FAILED AT 12". THE PILES OF MATERIAL FROM THE HOT SPOT EXCAVATION WERE REMOVED AND HAULED TO THE ELF.

PAUL SKLUNGSTAD OF THE WASH STATE DEPT. OF ECOLOGY VISITED THE SITE TO REVIEW PROGRESS AT N & N2 LANDFILLS. PAUL WAS IMPRESSED WITH THE PROGRESS. I UPDATED HIM ON SCREEN ANALYSIS RESULTS TO DATE. PAUL SAID HE & BILL HARRIS WANT TO VISIT THE SITE WHEN THE HDPE LINER IS BEING INSTALLED.

GEORGE LOTTE WENT OFF SITE AND GOT TWO SOIL SAMPLES FROM POTENTIAL SOURCES FOR THE ANCHOR TRENCH. ONE WAS SILT BASED AND ONE WAS CLAY BASED

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVR		**Title** PROJ ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. JACKSONVILLE LANDFILL REMEDIATION		**Date:** 4/20/04	
Contractor ENVIROCON.			
Subcontractor(s)			
No. of workers: 7	**Equipment:** SAME		

Morning Weather Conditions:	**Afternoon Weather Conditions**
46°F PARTLY CLOUDY	60°F PARTLY CLOUDY

Comments and/or supporting calculations:

CH2M HILL CALLED TO SAY THAT ALL THE SCREEN SAMPLES FOR PCB FOR THE N2LF HAD PASSED AT < 10 mg/kg.

ENVIROCON REMOVED ADDITIONAL 2'/2' FROM A1 & A3 IN N LF. CH2M HILL TOOK NEW SCREEN SAMPLES AT THAT DEPTH.

SENT E-MAIL TO JEFF JOHNSON REQUESTING A LUMP SUM. COST FOR THE ANCHOR TRENCH TOP REPLACEMENT. AGREED TO USE THE CLAY BASED SOIL, ENVIROCON CAN HAVE THE SOIL IF THEY PAY FOR HAULING. THE SOURCE IS FROM A FIELD BEING EXCAVATED BY A CONTRACTOR FOR RESIDENTIAL USE.

WALKED THE ELF WITH GEORGE TO REVIEW HOW IT WAS SHAPING UP. ENVIROCON CUTTING SLOPES TO GRADE. GEORGE ESTIMATES THAT THEY WILL HAVE ± 3000 CYDS MORE MATERIAL THAN ORIGINALLY PLANNED

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVR		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No.	VANCOUVER LANDFILL RENEWAL	**Date:**	THURS 4-22-04
Contractor	ENVIROCON		
Subcontractor(s)			
No. of workers:	7	**Equipment:**	SAME

Morning Weather Conditions:	**Afternoon Weather Conditions**
40° LIGHT OVERCAST	65°F MOSTLY SUNNY.

Comments and/or supporting calculations:

GEORGE & CREW ARE PUSHING HARD TO FINISH EXCAVATION OF N LF TODAY SO THE 400 EXCAVATOR CAN BE MOVED TO A JOB IN TACOMA ON MONDAY. TRUCKS ARE HAVING SOME TROUBLE NEGOTIATING STEEPER SECTIONS OF N LF.

THE CREW WORKED IN N LF HAULING SOIL UNTIL ABOUT 17:30 THEN GEORGE & A COUPLE OF WORKERS HOOKED ON TO THE LARGE FURNACE BOTTOM SECTION WITH TWO EXCAVATORS USING CABLES & CHAINS, LIFTED & DRAGGED THE PIECE OVER TO THE EAST LANDFILL WEST EDGE.

BASED ON THE ADDITIONAL MATERIAL TO BE PLACED ON THE ELF, ESTIMATED AT 4000 CYDS. I TOLD GEORGE TO RAISE THE ANCHOR TRENCH @ ELF BY 6" TO COMPENSATE. THIS WILL MAINTAIN THE SURFACE SLOPES AT ± 3:3 %.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR	**No.**

(5a)

DAILY INSPECTOR'S PROGRESS REPORT

FRI

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 4-23-04
Contractor ENVIROCON		
Subcontractor(s) W.H. PACIFIC		
No. of workers: 5	**Equipment:** SAME EXCEPT 450 EXCAVATOR WAS MOVED OFFSITE TO TACOMA TODAY.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
PARTLY CLOUDY 47°	69° MOSTLY SUNNY

Comments and/or supporting calculations:

ENVIROCON CUT CREW B4 TWO SENDING THEM TO TACOMA. STARTED MOVING MATERIAL ON TOP OF ELF TO SHAPE IT TO THE 6" HIGHER ELEVATION.

CH2M HILL WAS IN TO COLLECT CONFIRMATION SOIL SAMPLES FROM THE N2LF. ALL SAMPLES COLLECTED AND SENT TO THE LAB FOR ANALYSIS.

GEORGE SAID THAT A COUPLE OF PEOPLE WILL BE IN ON SATURDAY TO CONTINUE SHAPING OF THE ELF TOP SURFACE.

W.H. PACIFIC WAS IN TO SURVEY THE SOIL SAMPLE GRID FOR OBTAINING THE CONFIRMATION SAMPLES. WHP WAS DELAYED WHILE CONTRACT WITH CH2M HILL WAS NEGOTIATED OTHERWISE THEY COULD HAVE DONE THIS WORK IN N2LF SEVERAL DAYS AGO.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKA		**Title** PROJECT ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 4-26-04 MON
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	
ONE ENVIR. WORKER		
QUIT ON SATURDAY.		

Morning Weather Conditions:	**Afternoon Weather Conditions**
50° CLEAR	82° SUNNY & HOT

Comments and/or supporting calculations:

PAT HOLTS OF CH2MHILL WAS IN TO TAKE CONFIRMATION SOIL SAMPLES FROM THE NLF. ALL SAMPLES WERE COLLECTED AND SHIPPED TO THE LAB'S FOR ANALYSIS.
ENVIROCON CONTINUED SHAPING THE TOP OF THE ELF. AND STARTED WORK ON THE ANCHOR TRENCH MODIFICATION THE SAND ON TOP OF THE ANCHOR TRENCH (3') IS BEING MOVED ONTO THE ELF FOR USE AS A CUSHION LAYER ON TOP OF THE DEBRIS.
GEORGE & JEFF CALLED AT 1700 TO SAY THAT A LOCOMOTIVE HAD PARTIALLY DERAILED AT THE TRUCK CROSSING JUST SOUTH OF THE NLF. THE BN CREW GOT IT BACK ON THE TRACK AND MOVED OFF SITE. I CALLED LARRY McCLELLAN AT EVERGREEN TO REPORT THE TRACK PROBLEM & WARN HIM THAT REPAIRS WOULD HAVE THE TRACK DOWN FOR A FEW DAYS. EVERGREEN HAD 13 FULL CARS OF ALUMINA TO GO OUT & 14 EMPTY CARS TO BRING IN.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKA		**Title** PROJ. ENGR.	**No.**

(PP)

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 4-27-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
48°F CLEAR	72°F LIGHT OVERCAST

Comments and/or supporting calculations:

CHECKED OUR RAIL ROAD DERAILMENT AREA. LOCOMOTIVE PARTIALLY DERAILED (ONE SIDE) AT THE TRUCK CROSSING INSTALLED BY ENVIROCON. MEASURED GAGE OF RAILS & TRACK IS SEPARATED BY APPROX. 2".

CALLED MRC, ISY AGUIRRE @ 360 225-6673 TO DISCUSS NEEDED REPAIRS. RANDLE KEITHLEY DISPATCHED TO SITE TO REVIEW WORK AND PROVIDE COST ESTIMATE. DISCUSSED WITH JEFF JOHNSON & DECIDED TO BRING MRC IN AS SUB TO ENVIROCON, REPAIR COST FROM MRC IS $3700.

JEFF AGREED & WAS ABLE TO GET CONTRACT IN PLACE W/MRC TO PERFORM WORK ON WEDNESDAY. CONTACTED LARRY @ EVERGREEN & LEFT VOICE MESSAGE TO UPDATE.

TALKED TO AL PIGNA & PETE MCKEE TO MAKE SURE ALCOA IS RESPONSIBLE FOR TRACK MAINTENANCE. EVERGREEN HAS AN EASEMENT TO USE THE TRACKS AND MAINTENANCE COSTS ARE SHARED WITH ALCOA

ENVIROCON CONTINUED WITH REBUILDING THE TOP OF THE ANCHOR TRENCH

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJECT ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL.		**Date:** 4-28-04
Contractor ENVIROCON		
Subcontractor(s) MRC		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
48°F LIGHT OVERCAST	67°F SUNNY

Comments and/or supporting calculations:

ENVIROCON IS FOCUSING ON SHAPING THE TOP GRADE OF THE ELF IN PREPARATION FOR LINER WORK. A FEW DUMP TRUCKS DELIVERED CLAY SOIL TO THE SITE. VERY LITTLE WORK WAS DONE ON THE ANCHOR TRENCH TODAY AS GEORGE NEED TO GET GRADE ESTABLISHED ON THE ELF.

DUMP TRUCK DELIVERY OF CLAY SOIL WILL INCREASE ON THURSDAY & MATERIAL WILL BE DUMPED IN PLACE ON THE ANCHOR TRENCH WHEN POSSIBLE.

MRC MOVED ON SITE WITH 4 PERSON CREW TO MAKE RR REPAIRS. THEY REMOVED THE COVERING FROM THE TRACK TIES REMOVED THE INSIDE RAIL, PLUGGED SPIKE HOLES, REGAGED THE TRACK SECURED THE TRACK, & INSTALLED 12 TIE RODS TO HOLD THE TRACK TOGETHER. THEY SET THE GAGE APPROX. 1/8" NARROW.

WENT TO EVERGREEN ALUMINUM @ 14:30 TO INFORM BOB STEWART THAT BN COULD INSPECT THE REPAIRED SECTION OF TRACK SO THEA CARS COULD BE MOVED.

MRC COMPLETED THE REPAIR WORK AT 16:30.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJECT ENGR	**No.**

NO importing soil to
shape w/ N2 LF
grade to create
soil

Additional Comments/Supporting Calculations **Date:** 4-28-04

B&O YARD MASTER WAS NOTIFIED AND THEY SENT AN INSPECTOR WHO CLEARED TRACK FOR USE.

DISCUSSED WITH GEORGE & STEVE THE NEED TO GRADE AT N & N2 LAND FILLS SO A MOWER CAN MANUEVER SAFELY. AL BURBA SAID THERE WAS NO NEED TO IMPORT SOIL TO THE N LF AS ORIGINALLY PLANNED. ≈ 2000 CY. JUST USE MATERIAL IN THE N & N2 LFs TO RECONTOUR THE GRADE.

Preparer Initials BVL

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION.		**Date:** 4-29-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
45°F CLEAR	68°F CLEAR.

Comments and/or supporting calculations:

CONTINUED WORKING ON FINISHING THE TOP GRADE OF ELF. IT APPEARS THAT THE TOTAL AMOUNT OF MATERIAL EXCAVATED FROM N & N2 LF'S MAY BE AS MUCH AS 6000 YD³ MORE THAN ORIGINALLY CALCULATED. THE EAST LF ELEVATION IS APPROX. 3' HIGHER THAN GRADE SHOULD BE. ENVIROCON PLANS TO KEEP THE CENTER ELEVATION APPROX 18" HIGHER WHICH WILL RESULT IN STEEPER GRADES THAN 3.3% ORIGINALLY PLANNED. STEVE HOLMBERG POINTED OUT THAT WITH THE EXTRA MATERIAL REMOVED FROM N & N2, FINISHED GRADE CONTOURS PER THE DRAWINGS COULD NOT BE MET, ESPECIALLY IF WE DO NOT WANT TO IMPORT MATERIAL. NEED TO FILL IN DEEP HOLES & SLOPE GRADES FOR MOWER ACCESS.

AGREED TO RELOCATE THE WELL ACCESS ROAD TO THE WEST AND CROSS THE TRACKS WHERE THE TEMPORARY CROSSING WAS LOCATED. THIS WILL ALLOW ENVR TO BORROW MATERIAL FROM THE SW PORTION OF THE NORTH LAND FILL TO FILL LOW SPOTS & ACHIEVE GRADES.

ENVIROCON CONTINUED TO TAKE DELIVERY OF CLAY/SILT SOIL

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJECT ENGR	**No.**

Additional Comments/Supporting Calculations **Date:** 4-29-04

FROM THE BORROW SOURCE OFF SITE. CONTINUED TO REBUILD THE TOP OF THE ANCHOR TRENCH WITH WORK MOSTLY ON THE SOUTH SIDE OF THE ELF AT THE TOP OF THE REVETMENT WALL.

Preparer Initials BKR

DAILY INSPECTOR'S PROGRESS REPORT

F121

Project Name/No. VANCOUVER LANDFILL	**Date:** 4-30-04
Contractor ENVIROCON	
Subcontractor(s)	
No. of workers: 4	**Equipment:** SAME.

Morning Weather Conditions:	**Afternoon Weather Conditions**
47°F CLEAR	72°F CLEAR.

Comments and/or supporting calculations:

CH_2M HILL WAS IN WITH 2 PEOPLE TO RUN SOIL GAS VAPOR ANALYSIS IN THE N & N2 LANDFILL EXCAVATION SITES. STEVE SHAW ACCOMPANIED BER TO REVIEW WORK. TESTING WAS DONE AT THE RATE OF ONE SAMPLE PER 1/2 ACRE. PAT HINES & DAN? (CHEMIST FOR CH_2M) DID THE TEST WORK. THEY FOUND ONE SPOT THAT SHOWED A TRACE OF TCE IN THE N. LANDFILL, CONCENTRATION WAS ABOUT 150 PPB. OTHERWISE ALL POINTS TESTED WERE CLEAN.

TALKED TO JEFF REGARDING THE ELF PROFILE & SENT AN E-MAIL WITH DIRECTION ON HANDLING ADDITIONAL MATERIAL EXCAVATED FROM N & N2.

STARTED RECEIVING SOIL ANALYSIS RESULTS FOR PCB's FROM N2 LANDFILL DIRECT FROM KATHY @ THE LAB BUT COULD NOT INTERPRET CONTAMINATION LEVELS

ENVIROCON CONTINUED REBUILDING THE ANCHOR TRENCH PLATFORM AND RECEIVING SOIL. GEORGE SAID THEY PLAN TO WORK SATURDAY ON RESHAPING TOP OF ELF WITH SMALL CREW.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJECT ENGR.	**No.**

May, 2004

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-3-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F MOSTLY SUNNY.	76° SUNNY.

Comments and/or supporting calculations:

DUMP TRUCKS DELIVERING SOIL TO THE SITE ARE NO LONGER USING THE GATEWAY ROAD DUE TO COMPLAINTS FROM THE PORT OF VANCOUVER. NOW WILL USE BURBA ROAD EXCLUSIVELY.

THE REVETMENT MATS AT THE TOE HAVE BEGUN UNDERMINING FROM THE WEST END TO THE SAND BAR AT THE EAST END. THE JERSEY BARRIERS ARE HOLDING THE WASHED OUT SOIL & PREVENTING FURTHER EROSION.

N2 LF TWO POINTS 23 & 24 ANALYZED HIGH IN PAH & WILL BE RE-EXCAVATED TO REMOVE ADD'L. MATERIAL.

FINISHED PLACING LAST LOAD OF SOIL ON ANCHOR TRENCH PLATFORM. THE CLAY SOIL IS A GOOD IMPROVEMENT

TALKED TO AL & PAT RE: ADDITIONAL QUANTITY OF MATERIAL IN ELF. PAT FAXED ME A SKETCH OF WHAT HE GAVE STEVE HOLMBERG TO EXTEND THE SLOPE (2:1) ALONG THE TOP OF THE REVETMENT ANCHOR TRENCH PLATFORM.

TALKED TO PAT ABOUT THE HDPE BREAKING STRENGTH FOR SMOOTH VS. ROUGH MATERIAL. SPECIFICATION VALUE OF 240 LB/IN SHOULD ACTUALLY BE 90 LB/IN.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVL		**Title** PROJ. ENGR.	**No.**

Additional Comments/Supporting Calculations **Date:**

PAT AGREED AND WILL FAX AGREEMENT TO SAM AT TCP. % ELONGATION SHOULD ALSO BE 150% RATHER THAN THE 700% IN THE SPECS.
CONFIRMATION SOIL SAMPLE RESULTS STILL OUTSTANDING.

Preparer Initials BKL

3 points in N_2 LF
are high PCB
2 points in N_2 LF
are high in PAH

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-4-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
50°F CLOUDY	67°F OVERCAST

Comments and/or supporting calculations:

ENVIROCON CONTINUED TO SHAPE THE TOP OF THE ELF. RECEIVED CONFIRMATION SAMPLE RESULTS AND 3 POINTS IN N2 LF ARE HIGH PCB & 2 POINTS ARE HIGH PAH.

TOOK APPROX 3' OUT OF POINTS 23, 24 & 29 FOR PCBs & 2 & 5 FOR PAH's. NEW CONFIRMATION SAMPLES WILL BE LOCATION & SENT OUT TO LAB ON WEDNESDAY. IN N2 LF, 4 MORE POINTS CAME IN WITH HIGH PCB #'s POINTS 35, 36, 40 & 41

N2 LF POINT 32 HAS HIGH PAH.

DURING TELCON TODAY DECIDED TO HOLD OFF ON LINING CONTRACTOR AS THE CONFIRMATION SAMPLES ARE TAKING LONGER TO GET THROUGH THE LAB THAN ANTICIPATED. MOVED ONE WEEK TO MAY 17. THIS WILL ALSO GIVE ENVIROCON TIME TO FINISH ELF.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ. ENGR.	**No.**

(cy)

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL PROJECT		**Date:** 5-5-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** Shovel	

Morning Weather Conditions:	**Afternoon Weather Conditions**
49°F OVERCAST SHOWERS	64°F OVERCAST

Comments and/or supporting calculations:

MIKE WIRTZ OF CH_2M HILL CORRECTED NEW CONFIRMATION SOIL SAMPLES FROM THE N2 LANDFILL REDIG SITES. RESULTS SHOULD BE AVAILABLE 5-12-04.

STARTED RECEIVING GCL ROLLS TODAY. ENVIROCON UNLOADING & STORING IN ACPC BUILDINGS.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed [signature]		**Title** PROJECT ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-6-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
50°F OVERCAST	65°F RAIN

Comments and/or supporting calculations:

CH2MHILL RECEIVED TCE ANALYSIS FOR SOIL SAMPLES FROM THE NORTH LANDFILL AND ALL ARE CLEAN; CONFIRMATION SAMPLES FOR N LF ARE COMING IN. 2 POINTS COME IN WITH HIGH PAH; POINTS #3 & #8. POINT #8 HAS LEVEL OF 685; BER & GRAY REGENT WILL VISIT SITE FRIDAY AM FOR DIGGING OF THIS SITE & OBSERVE TO SEE WHY IT'S SO HIGH.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLH		**Title** PROJECT ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-7-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
50°F OVERCAST	62°F RAIN

Comments and/or supporting calculations:

BKR & GRAY WENT TO SITE IN AM TO CHECK POINT #9 IN NW LF. FOUND LOTS OF FINE COAL TAR PITCH IN AREA SAMPLE WAS TAKEN & ENVIROCON STARTED DIGGING & ABOUT 3' DOWN HIT A SEAM OF DARK MATERIAL.. STARTED CRABBING A 100' TO NW & 50' WIDE. MATERIAL APPEARS TO BE DARK CLAY AS WE FOUND SOME DECAYED VEGETATION EMBEDDED. CLASED TO EXTENTS & REMOVED & HAULED TO ELF. MIKE WIRTZ TOOK NEW CONFIRMATION SAMPLES FROM THESE TWO POINTS FOR REANALYSIS. ENVIROCON STOPPED WORK AT NOON DUE TO RAIN IN THE AFTERNOON

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-10-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** STAKE EXCEPT LONG REACH EXCAVATOR IS NO LONGER ON SITE.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
40°F OVERCAST/CLOUDY	59°F RAIN

Comments and/or supporting calculations:

EXCAVATED POINT 33 IN N. LF WHICH HAD A PAH LEVEL OF 111. MKB WILL RESAMPLED POINT 33 AND SENT IT IN TO GET A NEW ANALYSIS. ALL THE PCB SAMPLES IN THE N. LF TESTED LESS THAN 10 mg/kg. RAIN IN AFTERNOON FORCED ENVIROCON TO STOP WORKING ON ELF SHAPING; WILL RESUME WORK ON TUESDAY.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BHR		**Title** PWS. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-11-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
47° OVERCAST SCATTERED SHOWERS	63°F OVERCAST.

Comments and/or supporting calculations:

STILL TO WET TO WORK ON RESHAPING ELF SO ENVIROCON NOT WORKING ON IT.

DISCOVERED A WASH SPOT ON THE ANCHOR TRENCH EMBANKMENT ON THE SOUTH SIDE NEAR THE WEST END. RAIN WATER IS RUNNING OF THE ELF & CUTTING SAND UNDER THE CLAY LAYER ON TOP OF THE ANCHOR TRENCH. THE WASH TOOK SOME OF THE TOP SOIL/MULCH OFF THE TOP SECTION OF THE REVETMENT BLOCKS IN THIS AREA. TOOK GEORGE OUT & DISCUSSED PROBLEM OF DRAINAGE. GEORGE WILL CUT TOP OF ANCHOR TRENCH TO DIVERT WATER TO THE WEST END OF THE ELF SO IT DOES NOT WASH DOWN OVER THE REVETMENT WALL. THIS WILL PROTECT THE AREA FROM FURTHER DAMAGE IF WE HAVE A BIG RAIN EVENT. ENVIROCON REPAIRED THE WASHED OUT SECTIONS OF THE ANCHOR TRENCH PLATFORM

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed KL		**Title** PROJECT ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-12-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
51°F PARTLY SUNNY	60°F OVERCAST.

Comments and/or supporting calculations:

TIM STONE VISITED THE ELF SITE TODAY. WE DISCUSSED A PROPOSAL THEY HAVE PUT TOGETHER FOR ELECTRONIC STORAGE, RETRIEVAL, AND DISPLAY OF GW MONITORING SAMPLE. CAN ALSO INCLUDE WELL LOG INFORMATION, WATER DEPTHS, ETC. WILL REVIEW WITH AL BURBA NEXT WEEK.

TIM & I TOOK A WALK ALONG THE REVETMENT WALLS TO CHECK OUT THE VEGETATION & TAKE SOME PICTURES ALONG THE SHORE LINE. WE ALSO LOOKED AT THE EXCAVATION AT THE N & N2 LF'S.

MIKE DREWITT CALLED TO REPORT THAT CONFIRMATION SAMPLES FROM THE 2ND TESTING HAVE PASSED FOR PAH. 3 IN N2LF & 2 IN N. LF. STILL WAITING FOR ALL THE PCB SAMPLE ANALYSIS FOR NLF WHICH ARE DUE WEDNESDAY.

TALKED GEORGE LOTZE REGARDING THE WELL ACCESS ROAD THAT'S GOING IN ALONG THE WEST SIDE OF THE NLF. AGREED TO USE THE SAME RR CROSSING THEY USED FOR THE OFFROAD HAUL TRUCKS TO TAKE

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKA		**Title** PROJECT ENGR **No.**

Additional Comments/Supporting Calculations **Date:** 5-12-04

MATERIAL TO THE ELF. THE ROAD WILL TURN AFTER CROSSING THE TRACKS AND COME THROUGH THE GATE ORIGINALLY PLANNED FOR THIS ACCESS.

TALKED TO STEVE HOLMBERG. HE GOT A CALL FROM TEP AND THEY ARE LOOKING FOR AN APPROVAL ON THE CERTIFICATION SHEETS FOR THE HDPE MATERIAL. TEP IS HOLDING UP SHIPMENT UNTIL THEY GET APPROVAL. STEVE TALKED TO PAT SULLIVAN WHO WILL SEND E-MAIL TO TEP WITH APPROVAL.

TALKED TO RICK MATTSON REGARDING THE NEED TO SURVEY THE TOP OF THE ELF BEFORE THE HOPE GOES DOWN. IT TURNS OUT THAT PAT HAD TALKED TO STEVE & ONLY ONE TOPO SURVEY WILL BE NEEDED OF ELF & IT WILL BE MADE AFTER THE LINER IS INSTALLED. ENVIRO CON NEEDS TO INSURE TOP GRADES ON ELF ARE NOT LESS THAN 3% BEFORE THE LINER IS INSTALLED

Preparer Initials BKR

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-13-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
47°F CLOUDY	69°F PARTLY SUNNY

Comments and/or supporting calculations:

MIKE DREWITT CALLED FROM CH2M HILL TO REPORT THAT RESAMPLES FROM RE-EXCAVATIONS FOR POINTS 35 & 36 IN NZLF CAME IN WITH PCB LEVELS JUST OVER 150 mg/kg PREVIOUSLY THEY TESTED AT 24 & 46 mg/kg.

ENVIROCON DUG ANOTHER 3' OUT OF EACH POINT AND MIKE WRITE SAMPLED & DID A SCREEN TEST TO SEE IF THEY ARE UNDER 50 mg/kg. ALSO POINT #10 IN NZLF IS STILL OVER 10 @ 26 mg/kg SO ENVIROCON TOOK ANOTHER 3' OUT OF THAT POINT & MIKE TOOK ANOTHER CONFIRMATION SAMPLE. WATER IS STARTING TO LEAK INTO THESE HOLES & WE WILL BE INTO GROUND WATER SOON.

CALLED MIKE DREWITT AFTER READING THROUGH THE COAP FOR ELF CAP LINER & WE SET UP A MEETING FOR 9 AM FRIDAY TO DISCUSS DOCUMENTATION REQUIRED IN THE PLAN.

ENVIROCON HAS BEEN ROLLING & HAND PICKING ROCKS FROM THE TOP SURFACE OF THE EAST LANDFILL. IT'S STARTING TO LOOK REAL GOOD ON THE SURFACE

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLH		**Title** PROJ. ENGR.	**No.**

Final quantities of N/N2 LF exc

Additional Comments/Supporting Calculations **Date:** 5-13-04

AFTER TELCON WITH PITTSBURGH PERSONNEL, IT WAS DECIDED THAT RICK MARTIN SHOULD CHECK THE SLOPE OF THE ELF IN THE EAST WEST DIRECTION TO INSURE ± 3%. THE N & S CONTOURS LOOK GOOD ACCORDING TO ELEVATION CHECKS RICK HAS MADE.

STEVE HOLMBOE RECEIVED THE SURVEY QUANTITIES OF MATERIAL REMOVED FROM THE N & N2 LF's AND ± 38,000 CYDS WERE REMOVED FROM THE TWO LF's, APPROX. 10,000 YD³ MORE THAN ANTICIPATED.

THE MATERIAL FROM N2LF POINTS 35 & 36 WAS EXCAVATED AND PLACED IN THE BEDS OF THE TWO 35 TON OFFROAD HAUL TRUCKS. CALLED MARK KREVING OF CHEMWASTE MGT AND MADE ARRANGEMENTS TO HAVE TWO DUMP TRUCKS W/ PUPS ON SITE MONDAY AM AT 7:30 TO PICK UP THE > 50 MG/KG PCB SOIL FOR T & D.

Preparer Initials BKR

DAILY INSPECTOR'S PROGRESS REPORT

FRI

Project Name/No. VANCOUVER LANDFILL REMEDIATION	**Date:** 5-14-04
Contractor ENVIROCON	
Subcontractor(s)	
No. of workers: 4	**Equipment:** SAME

Morning Weather Conditions:	**Afternoon Weather Conditions**
48°F CLEAR	72°F CLEAR

Comments and/or supporting calculations:

TALKED TO RICK MARTIN & JEFF JOHNSON REGARDING SLOPES ON ELF. RICK FOUND THAT THE VERY TOP WAS FLAT & NEEDED SOME MATERIAL (≈ 2 TRUCKLOADS) TO ENABLE SLOPING TO 3% MIN. MUM. JEFF ASKED IF THEY COULD USE MATERIAL FROM N LF ? I AGREED.

MIKE WIRTZ OF CH2M HILL CALLED TO REPORT THAT RESULTS OF CONFIRMATION SAMPLE FROM POINT 33 IN N LF WERE RECEIVED AND THE POINT IS NOW CLEANED OF PAH. ALL POINTS IN N LF HAVE NOW PASSED CLEAN UP LEVELS FOR PCB, PAH, & TCE. THE AREA CAN NOW BE BACKFILLED/GRADED.

JEFF CALLED TO REPORT THAT TEP CAN NOT MOBILIZE TO SITE ON MONDAY AS ORIGINALLY PLANNED DUE TO RAIL DELAYS ON OTHER JOBS. DELAY WILL BE ONE WEEK.

MARK BROWNING OF CHEM WASTE CALLED TO CONFIRM ACKNOWLEDGEMENT OF WASTE SOIL ON MONDAY AND FAXED INFORMATION NEEDED FOR THE MANIFESTS.

MET WITH MIKE DRENNITT & MIKE WIRTZ OF CH2MILL TO REVIEW INSPECTION & DOCUMENTATION REQUIREMENTS FOR ELF CAP.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BW		**Title** PROJ. ENGR.	**No.**

(59)

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-17-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
46°F CLEAR SUNNY	68°F CLEAR SUNNY

Comments and/or supporting calculations:

CALLED AL BURBA RE: TEP DELAY & TO SEE IF AL WAS GOING TO DELAY HIS TRIP. AL WILL STAY ON SCHEDULE AS THERE ARE OTHER ISSUES TO DISCUSS. PAT WILL DELAY HIS VISIT UNTIL THE LINING CONTRACTOR IS ON SITE.

CHEM. WASTE / ENVIROCON TRUCKING WAS ON SITE TO PICKUP PCB WASTE SOIL. MANIFESTED TWO LOADS WHICH LEFT SITE @ 8:30 (28,500KG & 13,360 KG.)

TALKED TO PAT SULLIVAN & AGREED TO LET ENVIROCON START FILLING HOLES & SHAPING N LANDFILL WITH SLOPES THAT MOWER CAN NEGOTIATE. I CHECKED WITH CH2M HILL & MIKE DRAVITT NEEDED FINAL DIG ELEVATION FOR POINT 33 IN N LF, RICK MARTIN SHOT ELEVATION

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-18-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 2	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
50°F OVERCAST	64° OVERCAST

Comments and/or supporting calculations:

ENVIROCON FINISHED ROUGH GRADING OF THE NORTH LANDFILL AND STARTED RE CONTOURING N2 LF EXCEPT FOR AREAS AROUND POINT 23 & 35 FOR WHICH WE ARE STILL WAITING FOR CONFIRMATION SAMPLE RESULTS

AL BURBA VISITED THE SITE AND WE MET WITH THE PORT OF VANCOUVER, TODD COLEMAN, LINDA CARLSON, KEN, & MICK TO DISCUSS EASEMENT LOCATION FOR THE NEW WATER SERVICE TO BE INSTALLED BY THE CITY OF VANCOUVER.

MICK RECOMMENDED THAT WE INSTALL A 1½" Ø SERVICE TO REDUCE DEVELOPMENT COSTS BY ± $5000.

MIKE WIRTZ CALLED TO REPORT POINT 35 IN N2 LF HAS PASSED CLEANUP REQUIREMENTS.

I ASKED STEVE HOLMBERG TO PASS ON DEPTHS OF FINAL EXCAVATION FOR POINTS 35, 36, & 40 IN N2 LF.

AL, BILL, GEORGE LOTZE & STEVE HOLMBERG TOURED THE N & N2 LF'S AND THE ROUGH GRADING WAS ACCEPTABLE WITH THE EXCEPTION OF A COUPLE OF STEEP SLOPES WHICH GEORGE SAID THEY WOULD TAKE CARE OF.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLR		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION.		**Date:** 5-10-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 1	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
48°F OVERCAST	68°F OVERCAST.

Comments and/or supporting calculations:

AL BRUCE & KRISTOF NADERMANN VISITED THE VANCOUVER SITE PRIMARILY TO REVIEW THE BUILDING STRUCTURES & CONTAMINATION LEVELS IN THE STEEL.

ENVIROCON STARTED RECEIVING THE HDPE ROLLS & OFF LOADING THEM IN OR NEAR THE AEPC BUILDINGS.

ENVIROCON STARTED TAKING DELIVERY OF MORE TOP SOIL FOR THE EAST LAND FILL. THE MATERIAL IS BEING STOCK PILED NEAR THE WEST END OF THE ELF.

MIKE WIRTZ CALLED TO SAY THAT POINT 23 IN N2LF PASSED FOR PCB's. ALL POINTS ARE NOW CLEAN & N2LF CAN BE ROUGH GRADED.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLA		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL		**Date:** 5-20-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers:	**Equipment:** SAME	
2		

Morning Weather Conditions:	**Afternoon Weather Conditions**
46°F CLEAR SUNNY	

Comments and/or supporting calculations:

ENVIRO CON INITIATED ROUGH GRADING OF N2LF.
AL & BRUCE MET WITH TIM STONE TO REVIEW GROUND WATER SAMPLE ANALYSIS FOR 4TH QTR 2003 & 1ST QTR 2004. & DISCUSS ELECTRONIC DATA FORMATTING.
WE MET WITH LON O
TO REVIEW THE VANCOUVER PROPERTY & DOCK. FERGUSON IS IN THE MARKET FOR APPROX. 18 ACRES TO USE AS A PIPE LAY DOWN YARD & DISTRIBUTION CENTER. THEY BRING PIPE IN BY SHIP, ABOUT 22 PORTS OF CALL PER YEAR. DISTRIBUTION OF THE PIPE IS NORMALLY BY TRUCK WITH SOME RAIL SHIPMENTS. WE GAVE LON A COPY OF THE SITE MAP SHOWING PROPERTY BOUNDARIES.
AL, BRUCE, & GEORGE LOTTE WALKED THE EAST LAND FILL TO LOOK AT SURFACE PREP. FOUND SEVERAL ROCKS, PIECES OF REBAR, CONCRETE CHUNKS, ETC. THAT NEED TO BE REMOVED BEFORE THE LINER CAN BE INSTALLED.
ENVIRO CON UNLOADED ANOTHER LOAD OF HDPE LINER ROLLS.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJECT ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-21-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 2	**Equipment:** SAME.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
47°F OVERCAST LT. RAIN.	67°F OVERCAST

Comments and/or supporting calculations:

ENVIROCON CLEANED UP MATERIAL FROM THE TOP OF THE CLF. ANOTHER TRUCK LOAD OF HDPE WAS RECEIVED AND OFF LOADED. MIKE WIRTZ OF CH2M HILL SENT COPIES OF THE QC CHECK LISTS FOR THE GCL, HDPE, & DRAINNET INSTALLATION. STEVE HOLMBERG GOT A PHONE CALL & THE LINING CONTRACTOR WILL BE ON SITE MONDAY 5-24.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BMR		**Title** PROJECT ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-24-04
Contractor ENVIROCON		
Subcontractor(s) TEP		
No. of workers: 2 ENV	**Equipment:** SAME	
7 TEP		

Morning Weather Conditions:	**Afternoon Weather Conditions**
50°F LIGHT OVERCAST.	72°F SUNNY

Comments and/or supporting calculations:

7 TEP CREW MEMBERS ARRIVED & RECEIVED SITE SAFETY TRAINING BY JIM PERKINS. GREG RUTHERFORD VISITED SITE TO CONDUCT SAFETY AUDIT BUT MAIN CREW WILL NOT BE ON SITE UNTIL TUESDAY AM. TEP EMPLOYEES DID NOT HAVE HIP TUBS BOOTS OR HARD HATS OR SAFETY VESTS. SENT TO STORE & THEY PURCHASED WHAT THEY NEEDED. 7 MAN CREW FILLED SAND BAGS DURING THE DAY.

PAT SULLIVAN ARRIVED AT SITE AND WE VISITED CH2M HILL OFFICE @ LLOYD CENTER. REVIEWED COAP WITH MIKE DRESETT, MIKE WHITE, & BILL GRIFFIN. DISCUSSED & REVIEWED DOCUMENTATION SHEETS TO BE USED FOR RECORDING INFORMATION. WE CALLED SAM MAUGHAM AT TEP & HE AGREED THAT PANEL LAYOUT COULD BE CHANGED TO SIMPLIFY IF REQUIREMENT TO ENTER ANCHOR TRENCH @ 90° DROPPED. PAT SAID 70° ANGLE ACCEPTABLE & SAM REVISED DRAWINGS TO REFLECT USING FULL LENGTH PANELS RUNNING NORTH & SOUTH.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION	**Date:** 5-25-04
Contractor ENVIROCON	
Subcontractor(s) TEP	
No. of workers: 3 ENVIR	**Equipment:** SAME.
13 - TEP	TEP TRAILER ARRIVED WITH WELDING MACHINES.

Morning Weather Conditions:	**Afternoon Weather Conditions**
50° SUNNY	75°F SUNNY

Comments and/or supporting calculations:

NEW TEP CREW MEMBERS & BILL GRIFFIN OF CH2M HILL RECEIVED SITE SAFETY ORIENTATION IN PREPARATION FOR WORK. BKL, PATS, MIKE & BILL W/ CH2MHILL, STEVE HOLMBERG, & JOE KEOPHONGSAVANH OF TEP MET & REVIEWED QA/QC/TESTING REQUIREMENTS FOR THE JOB. JOE WANTED TO ADD AN EAST/WEST SEAM IN LONG SLOPE PANELS TO REDUCE WEIGHT OF PANELS AS THEY WILL BE MOVED BY HAND. JOE WILL LOOK INTO TRACKED VEHICLE TO PULL PANELS TO REDUCE STRAIN POTENTIAL. ENVIROCON AGREED TO PROVIDE JOE WITH A TRAILER TO HAUL ROLLS FROM STORAGE TO ELF. JOE WANTS TO WORK MONDAY IF NECESSARY BUT GEORGE WILL NEED TO DISCUSS WITH CREW. SHOULD FINISH ON SATURDAY IF GOOD WEATHER HANGS IN THERE.

ENVIROCON STARTED DIGGING THE ANCHOR TRENCH ON THE WEST END OF THE ELF WHERE THE LINING INSTALLATION WILL START. PAT TOLD GEORGE & STEVE THAT THE ANCHOR TRENCH CAN BE DUG WITH VERTICLE SIDEWALLS RATHER THAN SLOPED 1:1 & THAT'S WHAT THEY DID.

JOE SAID THEY WOULD OPERATE 3 WELDING MACHINES & COVER ABOUT 1 ACRE/DAY.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR	**No.**

Additional Comments/Supporting Calculations **Date:** 5-25-04

THE WELDING CREW STARTED MAKING TEST WELDS IN PREPARATION FOR HDPE WELDS. TEP CREW STARTED ON THE WEST END OF THE ELF LAYING OUT GCL PANELS THEN COVERING WITH HDPE SHEETS. IT TOOK 3 PRACTICE RUNS TO GET ACCEPTABLE WELDS. JOE WORKED WITH THE WELDERS TO GET TEMP, SPEED, & PRESSURE SET CORRECTLY. AIR TESTING OF SEAMS WAS STARTED AND ONE LEAK WAS DETECTED AND REPAIRED ON THE THIRD WELD. THE CREW COMPLETED ABOUT 75% OF THE WEST END ON THE FIRST DAY.

Preparer Initials BCA

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 5-27 & 28, 2004
Contractor ENVIROCON		
Subcontractor(s) TEP		
No. of workers: 13-TEP	**Equipment:** SAME	
ENVIR.-3		

Morning Weather Conditions:	**Afternoon Weather Conditions**
50°F OVERCAST RAIN	63°F OVERCAST RAIN

Comments and/or supporting calculations:

ALL WORK ON THE SITE WAS STOPPED ON THURSDAY & FRIDAY DUE TO RAIN. NO WORK 5/29, 5/30, OR 5/31 DUE TO MEMORIAL DAY HOLIDAY.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BTAR		**Title** PROJ. ENGR.	**No.**

June, 2004

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-1-04
Contractor ENVIROCON		
Subcontractor(s) TEP		
No. of workers: 3	**Equipment:** SAME	
TEP 1		

Morning Weather Conditions:	**Afternoon Weather Conditions**
CLEAR 50°F	CLEAR W/ SOME CLOUDS 75°F

Comments and/or supporting calculations:

TEP LAYED DOWN ± 110 FT WIDE SECTION OF GCL FROM STATION 4+75. HDPE WAS THEN PLACED ON TOP OF GCL (5 WIDTHS) AND WELDING COMPLETED BY NOON. THIS WORK WAS ON THE SOUTH SLOPE OF ELF ONE FAILED SEAM D7 WAS REPAIRED & TESTED OK IN FIELD. SAMPLE TAKEN FOR LAB TESTING AFTER LUNCH MORE GCL APPROX 3 WIDTHS OF HDPE LAYED FOLLOWED BY WELDING THAT WAS COMPLETED BY ~ 4 PM. AIR TESTING COMPLETED W/ NO LEAKS ADDITIONAL GCL WAS LAYED FOLLOWED BY 3 WIDTHS OF HDPE, ~~SEVERAL~~. AND WELDING RESUMED APPROX 5:45 PM. AIR TESTING WAS COMPLETED AND WORK CEASED FOR THE DAY @ 7:45 PM. TALKED TO GEORGE ABOUT ANCHOR TRENCH & PIPE LEADING TO BIODIFFUSER PANELS. DROP APPROX 3" FROM TRENCH BOTTOM TO BIODIFFUSER PANELS. TRENCH W/ PIPE & ROCK INSTALLED.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR	**No.**

Additional Comments/Supporting Calculations **Date:** 6-1-04

ENVIROCON STARTED HAULING SAND FILL FROM GLOUCER & PLACED THE MATERIAL ON THE SOUTH WEST SECTION OF THE GLF. PRIMARY REASON WAS TO BUILD A ROAD ALONG THE NORTH SIDE OF THE ANCHOR TRENCH AT THE SOUTH PORTION OF THE GLF SO THEY COULD PUT ROCK IN THE ANCHOR TRENCH

TOTAL HDPE INSTALLED ON TUESDAY WAS 79,000 FT2 ALMOST 2 ACRES.

Preparer Initials BKR

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-2-04
Contractor ENVIROCON		
Subcontractor(s) TEP WH PACIFIC		
No. of workers: 4	**Equipment:** SAME	
1L TEP, 1 WHP		

Morning Weather Conditions:	**Afternoon Weather Conditions**
50° OVERCAST	75° SUNNY

Comments and/or supporting calculations:

TEP STARTED LAYING GCL & HDPE WORKING TO THE EAST. AFTER 3 WIDTHS OF HDPE WERE PLACED, THEY STARTED WORKING ON THE EAST END OF THE ELF. THIS WAS FOLLOWED BY TWO WIDTHS OF HDPE TO FINISH THE SOUTH 2/3 OF THE ELF. JOE WORKED IT THIS WAY TO AVOID RUNNING OVER GCL & HDPE MATERIAL WITH THE EQUIPMENT. FINISHED WELDING SOUTH 2/3 OF HDPE AT 4PM & MOVED TO NORTH SIDE OF ELF.

ENVIROCON CONTINUED HAULING SAND & PLACING ON SOUTH SIDE OF ELF. ENVIROCON DUG IN THE DITCH FOR THE PIPE & BIO DIFFUSER ON THE EAST SIDE OF THE ELF.

BKR MET WITH KIM SHAFFER OF THE PORT OF VANCOUVER TO REVIEW WATER LINE EASEMENT LAYOUT WHICH WAS CHANGED TO AVOID THE NEED FOR AN EASEMENT FROM ~~CHARK~~ CLARK COUNTY. BKR MARKED OUT PROPOSED EASEMENT & PIPE LINE LOCATION

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJECT ENGR **No.**

Additional Comments/Supporting Calculations **Date:** 6-2-04

& THE PORT WILL GET IT SURVEYED.

STEVE HOLMBERG, BKR & WHP SURVEYOR SHOT IN THE PROPERTY BOUNDRY BETWEEN ALCOA & CLARK CO. ALONG THE NORTH SIDE OF THE EAST LANDFILL. THE BUILDING IS ABOUT 6' SOUTH OF THE PROPERTY BOUNDRY. STEVE CHECKED AND THERE IS NO REQUIRED SETBACK FOR BUILDINGS ON INDUSTRIAL/COMMERCIAL ZONED AREAS OF THE CITY OF VANCOUVER.

BILL HARRIS OF WDOE CALLED ABOUT 2PM TO CANCEL HIS VISIT TO THE SITE DUE TO FAMILY HEALTH PROBLEMS. HE WILL NOT BE ABLE TO VISIT THE SITE BEFORE IT IS COVERED STARTING NEXT WEEK.

Preparer Initials BKR

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-3-04
Contractor ENVIROCON		
Subcontractor(s) TEP W.H. PACIFIC		
No. of workers: 4	**Equipment:** SAME	
TEP-VI WHAP-1		

Morning Weather Conditions:	**Afternoon Weather Conditions**
57°F CLEAR SUNNY	80°F CLEAR SUNNY.

Comments and/or supporting calculations:

TEP STARTED LAYING GCL ON NORTH SIDE OF ELF STARTING AT 4+75 TO 5+75 FOLLOWED BY HDPE WHICH WAS WELDED & TESTED BY EARLY AFTERNOON. STARTED LAYING GCL FROM 5+75 TO EAST SIDE OF ELF FOLLOWED BY HDPE STARTED WELDING APPROX 13:45 PM. COMPLETED HDPE WELDING OF PANELS UP TO N.E. CORNER OF ELF

ENVIROCON CONTINUED HAULING SAND FROM GLACIER FILLED & COMPACTED AREA IN S.W. CORNER OF ELF.

MIKE WINTZ SAID HE GOT TEST RESULTS FOR HDPE SAMPLES AND ALL PASSED FOR SOUTH SIDE OF LANDFILL FROM 4+75 TO EAST SIDE OF ELF WHICH IS APPROX 1/3 OF ELF SURFACE. TEP CLEARED TO PLACE DRAINNET ALTHOUGH THIS WORK WILL NOT BE DONE UNTIL HDPE WORK COMPLETED.

FOUND A FAILURE OF HDPE AROUND WELL PENETRATIONS. HDPE SHRINKAGE AT NIGHT CAUSED TEARING OF MATERIAL. TEP WILL REPLACE WHEN AIR-TEMP COOL.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

Additional Comments/Supporting Calculations **Date:** 6-3-04

STEVE HOLMBERG SAID THEY SHOT ELEVATIONS FOR NEW LOAD ON ABUTTING OF ELF & IT WILL TAKE ≈ 1100 YD³ OF FILL TO RAISE EAST WEST DRAINAGE OF WATER. COST BASED ON UNIT PRICE FOR FILL & COMPACTION WOULD BE ≈ $10,000 + COST OF FABRIC, ROCK, & INSTALLATION LABOR.

REVIEWED FENCE LINE FOR EAST SIDE OF ELF. WILL HAVE TO RESPECT BOUNDARY TO AVOID REMOVAL OF 12" TO 15" TREES.

Preparer Initials BHL

fence
[illegible] on-site

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-4-04
Contractor ENVIRO CON		
Subcontractor(s) TEP, WH. PACIFIC		
No. of workers:	**Equipment:** SAME	
ENVR. 4 TEP-11		

Morning Weather Conditions:	**Afternoon Weather Conditions**
54°F SUNNY	85°F SUNNY HOT.

Comments and/or supporting calculations:

TEP LAYED BENTOMAT & HDPE ON N.E. CORNER OF ELF. STARTED FINAL WELDING OF HDPE SEAMS. WELDERS FINISHED WELDING IN LATE AFTERNOON. MID MORNING THE LAYOUT CREW STARTED PLACING DRAINNET ON THE SOUTH CENTRAL PORTION OF ELF.

ENVIRO CON CUT THE FINAL SECTION OF THE ANCHOR TRENCH AT N.E. CORNER SO HDPE COULD BE COMPLETED.

ENVIRO CON CONTINUED TO HAUL & PLACE SAND ON THE SW SIDE OF ELF BUT RAN OUT OF SAND IN LATE MORNING. GLACIER IS GETTING IN ANOTHER BARGE OF SAND WHICH WILL BE DEWATERED AND AVAILABLE TO HAUL ON MONDAY.

WILLAMETTE FENCE CO. OWNER DENNIS WAS ON SITE AND WE DISCUSSED FENCE PROJECT & SAFETY REQUIREMENTS FOR CREW.

I TALKED TO STEVE HOLMBERG REGARDING THE NEED TO ISSUE AN ADDENDUM LETTER FOR THE HASP & EMERGENCY PLAN WITH CHANGES NEEDED TO COVER RESPONSIBILITIES OF JIM PERKINS, SAFETY PERSON, WHO IS NO LONGER

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJECT ENGR	**No.**

Additional Comments/Supporting Calculations **Date:** 6-4-64

WORKING FOR ENVIROCON.
TEP STOPPED WORKING AT 15:30 SO CREW COULD GO OUT TO DINNER & CELEBRATE FINISHING THE WELDING.

Preparer Initials BKR

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-5-04
Contractor ENVIROCON		
Subcontractor(s) TEP		
No. of workers: ENVIROCON (1)	**Equipment:** SAME	
TEP (11)		

Morning Weather Conditions:	**Afternoon Weather Conditions**
57° OVERCAST	67°F OVERCAST

Comments and/or supporting calculations:

TEP STARTED PLACING, TYING, & STITCHING DRAINNET MATERIAL ON ELF FROM SOUTH CENTRAL TO NORTH. FINISHED APPROXIMATELY 1/3 of LANDFILL AREA WITH DRAINNET. TEP FINISHED MAKING EXTRUSION WELDS AND PATCHES INCLUDING REPAIRING ONE END SEAM THAT DID NOT PASS THE LAB TEST. D 26 SHOWED OK TENSILE STRENGTH BUT THE PEEL TEST FAILED. EXAMINATION OF JOINT SHOWED SAND INCLUSIONS. TOOK SAMPLES 10' ON EACH SIDE OF TEST POINT & RETESTED WITH SIMILAR RESULTS WITH PEEL TEST FAILURES. DECIDED TO PATCH & EXTRUSION WELD THE ENTIRE END SEAM. IT WAS TO LATE TO TEST ANY MORE END SEAMS AS SAMPLES COULD NOT GO OUT UNTIL MONDAY WITH RESULTS TUESDAY. TEP DEMOBING ON SUNDAY.

TEP's GATOR WOULD NOT START IN THE MORNING SO THEY BORROWED ENVIROCON'S UNTIL UNITED RENTAL REPAIRED THEIR GATOR.

BILL GRIFFIN WAS COVERING QUALITY WORK FOR CH2M HILL IN THE ABSENCE OF MIKE WIRTZ.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** RESI. ENGR.	**No.**

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DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-6-04
Contractor ENVIROCON		
Subcontractor(s) TEP		
No. of workers: ENVIRO (1)	**Equipment:** STONE	
TEP (11)		

Morning Weather Conditions:	**Afternoon Weather Conditions**
52°F CLOUDY W/ RAIN SHOWERS	62°F CLOUDY W/ SHOWERS

Comments and/or supporting calculations:

TEP FINISHED PLACING, TYING, & SEWING THE FINAL 15 ROLLS OF DRAINNET & SECURED THEM WITH SANDBAGS ON TOP OF THE HDPE. RAIN SHOWERS SLOWED WORK AS CREW WAS FORCED TO TAKE COVER SEVERAL TIMES. TEP CLEANED UP THE SITE AND DEMOBILIZED. BKR WALKED SITE & REVIEWED WORK WITH BILL GRIFFIN AT 16:00

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-7-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
51°F CLOUDY	67°F CLOUDY

Comments and/or supporting calculations:

ENVIROCON STARTED HAULING SAND FROM GLACIER AND FILLING AND BUILDING A ROAD ALONG THE SOUTH SIDE OF THE EAST LANDFILL NEXT TO THE ANCHOR TRENCH. PLACED APPROX. 1700 TONS OF FILL AND FILLED APPROX 300' OF ANCHOR TRENCH W/ ROCK & PIPE. ENVIROCON CONTINUED TO IMPORT TOP SOIL FROM OFF SITE AND NOW HAS APPROX. 75% OF TOP SOIL NEEDED FOR THE ELF.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ. ENGR	**No.**

(3)

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-8-04
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
55° OVERCAST RAIN	67°F OVERCAST SCATTERED SHOWERS

Comments and/or supporting calculations:

ENVIRO CON HAULED AND PLACED 800 TONS OF SAND FROM QUARRY ON THE EAST SIDE OF THE ELF STARTING AT THE N.E. CORNER & WORKING SOUTH. NOW HAVE A ROAD ALONG THE SOUTH SIDE OF ELF. ENVIRO CON CONTINUED PUTTING DRAIN ROCK & PIPE IN ANCHOR TRENCH. RECEIVED EXTRA WORK ORDER REQUEST FROM ENVIROCON FOR BUILDING THE ROAD ON THE NORTH SIDE OF THE ELF. SENT COPY TO AL & GRAY. AL SAID TO GO AHEAD WITH ROAD WORK UNDER.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLR		**Title** PROJECT GEOL **No.**


-3

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-9-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
56°F OVERCAST LT RAIN	63 OVERCAST SHOWERS.

Comments and/or supporting calculations:

GLACIER RECEIVED SAND BY BARGE BUT IT WAS TOO WET FOR ENVIROCON SINCE IT IS PURCHASED BY THE TON. ENVIROCON FOCUSED ON THE ANCHOR TRENCH DRAIN ROCK & PIPE INSTALLATION & SAND COVER.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-10-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME.	

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

ENVIROCON PLACED APPROX 1400 TONS OF SAND ON THE EAST LANDFILL ON WEST CENTRAL END. REVIEWED WITH STEVE HORNBERG THE FENCING CONTRACTORS QUOTE. COST WAS HIGHER THAN BID USED AS THE ORIGINAL FENCING CONTRACTOR DID NOT MEET ALCOA PREQUALIFICATION REQUIREMENTS. AGREED TO DROP REQUIREMENT FOR 3 STRANDS OF BARB WIRE ON TOP OF FENCE THAT IS INSIDE ALCOA PROPERTY LINE. WILL RETAIN IT ON GLACIER PROPERTY BOUNDARY. ALSO AGREED TO USE GALVANIZED STEEL FENCE WITHOUT GREEN PVC COATING. THIS BROUGHT COST OF FENCE DOWN TO ORIGINAL BID LEVEL. [redacted]

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL PROJECT		**Date:** 6-11-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME.	

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

GUSCHOR DID NOT HAVE ANY SAND AVAILABLE TODAY SO ENVIROCON CUT DRAINAGE DITCH FROM THE INFILTRATION BASIN TO THE REVETMENT WALL AT THE S.E CORNER OF THE ELF. APPROX. 2' DROP AVAILABLE FOR DITCH. ENVIROCON STARTED PLACING SOME TOP SOIL ON THE WEST END OF THE ELF, APPROX 500 TONS.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJECT ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION	Date: 6-14-04
Contractor ENVIROCON	
Subcontractor(s)	
No. of workers: 4	Equipment: SAME

Morning Weather Conditions:	Afternoon Weather Conditions
54°F OVERCAST	69°F MOSTLY SUNNY.

Comments and/or supporting calculations:

ENVIROCON HAULED AND PLACED APPROX 1400 TONS OF SAND FROM GLACIER WORKING TO THE EAST FROM WEST SIDE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BWR		Title PROJ. ENGR	No.

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-15-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
48°F CLEAR	75°F CLEAR

Comments and/or supporting calculations:

ENVIROCON HAULED AND PLACED APPROX. 1800 TONS OF SAND FROM GLACIER WORKING FROM WEST TO EAST. STEVE ESTIMATES THAT THE 18" FILL IS APPROX. 1/2 COMPLETE. CHECKED AREA WHERE SOIL HAS BEEN PLACED & STEVE DUG DOWN TO THE SAND. DEPTH WAS APPROX. 7" DEEP.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BEL		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION.		**Date:** 6-16-04
Contractor ENVIROCON		
Subcontractor(s) CARLSON TESTING.		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
50°F CLEAR	80°F CLEAR.

Comments and/or supporting calculations:

GREG RUTHERFORD VISITED THE SITE AND CONDUCTED A SAFETY AUDIT. ITEMS IDENTIFIED THAT NEED CORRECTION WERE LISTED AND GIVEN TO STEVE HOLMBERG WHO ALONG WITH GEORGE LOTZE HAVE SAFETY RESPONSIBILITY FOR THE SITE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJECT ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-17-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAND	

Morning Weather Conditions:	**Afternoon Weather Conditions**
53°F CLEAR	CLEAR 84°F

Comments and/or supporting calculations:

GLACIER DID NOT HAVE ANY SAND AVAILABLE IN AM.
ENVIROCON HAULED & PLACED TOP SOIL ON ELF.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-18-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAND	

Morning Weather Conditions:	**Afternoon Weather Conditions**
58°F CLEAR	CLEAR HOT 92°F.

Comments and/or supporting calculations:

ENVIROCON HAULED & PLACED 760 TONS OF SAND FROM GLACIER ON EAST LANDFILL

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed B VR		**Title** PROJ ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6/21/04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
54°F OVERCAST	68°F OVERCAST

Comments and/or supporting calculations:

ENVIROCON HAULED & PLACED 1569 TONS OF SAND ON ELF.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6/22/04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F OVERCAST	68°F OVERCAST

Comments and/or supporting calculations:

ENVIROCON HAULED & PLACED 288 TONS OF SAND ON EAST LAND FILL. EXCAVATOR BROKE DOWN & RAN TRACK OFF ONE SIDE. UNABLE TO HAUL & PLACE TOP SOIL. MECHANIC STARTED REPAIR ON EXCAVATOR.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-23-04
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers: 1	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

NO HAULING DUE TO LACK OF SAND & EXCAVATOR BEING DOWN FOR TRACK REPAIR.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKA		**Title** FIRST ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-24-04
Contractor GNUVILCO		
Subcontractor(s)		
No. of workers: 1	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

NO HAULING AT SITE DUE TO LACK OF SAND FROM GLACIER. COMPLETED REPAIR TO EXCAVATOR. COMPLETED SOME SITE CLEANUP.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ ENGR	**No.**

topsoil placed

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL		**Date:** 6-25-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
54°F OVERCAST	72°F CLEAR

Comments and/or supporting calculations:

ENVIROCON HAULED & PLACED 600 TONS OF SAND FROM GLACIER THEN HAULED & PLACED TOP SOIL ON ELF. APPROX 75% COMPLETE WITH CONTOURING ON ELF CAP.

LINDA CARLSON OF PDV SAID THEY WERE TAKING THE WATERLINE EASEMENT TO THE CITY OF VANCOUVER FOR FINAL SIGNATURES.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed [illegible]		**Title** PROJ ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. JAMCOUVER LANDFILL REMEDIATION		**Date:** 6-28-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
CLEAR 59°F	77°F CLEAR

Comments and/or supporting calculations:

ENVIROCON HAULED & PLACED 1344 TONS OF SAND ON EAST LAND FILL.
AL BURBA & PAT SULLIVAN VISITED VANCOUVER & PREPARED FOR MEETING WITH BILL O'ROURKE, ROB BEAR & MARK STAFFER

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REVEGETATION		**Date:** 6/29/04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F CLEAR	78°F CLEAR

Comments and/or supporting calculations:

NO SAND AVAILABLE FROM GLACIER. ENVIROCON DID SOME SHAPING OF SLOPES ALONG ANCHOR TRENCH EMBANKMENT. BILL, ROB & MARK TOURED THE SITE WITH BRUCE AL, & PAT.

WALKED THE SITE IN AFTERNOON WITH JEFF JOHNSON GEORGE LOTZE & DISCUSSED LAND CONTOURING AROUND ELF. ALSO REVIEWED REVETMENT TOE EROSION & MARKED JERSEY BARRIERS THAT CAN BE REMOVED.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKA		**Title** PROJ ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 6-30-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
56°F CLEAR	72°F CLEAR

Comments and/or supporting calculations:

AL BURBA & PAT SULLIVAN VISITED THE SITE AND WE MET WITH BILL HARRIS, WDOE ENVIRONMENTAL ENGINEER IN SOLID WASTE DIVISION, TO REVIEW FML INSTALLATION ON THE EAST LANDFILL.

REVIEWED THE JUNE INVOICE WITH JEFF JOHNSON & APPROVED DRAFT.

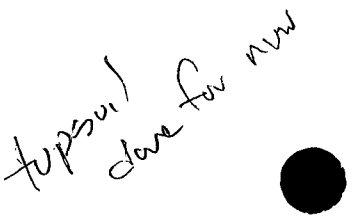
JEFF REQUESTED A COPY OF THE WATERLINE EASEMENT THE POV PROVIDED FOR RUNNING THE CITY OF VANCOUVER WATER LINE TO THE SITE.

ENVIROCON HAULED 1000 TONS OF SAND & PLACED IT ON THE EAST LANDFILL.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BM		**Title** PROJ. ENG'R.	**No.**


tupsu!
dave for now

July, 2004

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-1-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
56°F OVERCAST	72°F CLEAR

Comments and/or supporting calculations:

E-MAILED A COPY OF THE POV EASEMENT & LEGAL DESCRIPTIONS FOR WATER SERVICE BY CITY OF VANCOUVER TO STEVE HORNBERG & JEFF JOHNSON.

CALLED STEVE & TOLD HIM AL WANTED TO RETAIN THE PVC GREEN FENCE COLOR ON EAST SIDE (GREATER SIDE OF PROPERTY. ALSO EXTEND EAST SIDE FENCE TO CLARK COUNTY PROPERTY BOUNDARY. PART OF THIS NEW FENCE WILL PARALLEL THE EXISTING BARBED WIRE FENCE.

ENVIROCON HAULED 1450 TONS OF SAND ON EAST LANDFILL & FINISHED PLACING ALL THE TOP SOIL THEY HAD ON SITE. GEORGE IS LOOKING FOR MORE TOP SOIL.

NEED APPROX. 3000 YD^3 OR 3700 TONS OF SAND TO FINISH EAST LANDFILL CAP.

MET WITH STEVE HORNBERG & CITY OF VANCOUVER TO SIGN RELEASE TO INSTALL 2" WATER SERVICE FOR VANCOUVER SITE. STEVE SUBMITTED THE CHECK

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR	**No.**

Additional Comments/Supporting Calculations **Date:** 7-1-04

FOR THE DEVELOPMENT COSTS AND SERVICE HOOKUP.

Preparer Initials BKA

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-2-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
56°F PARTLY CLOUDY	72°F PARTLY CLOUDY.

Comments and/or supporting calculations:

ENVIRO CON HAULED & PLACED 1055 TONS OF SAND FROM GLACIER TO THE ELF. ENVIRO CON STARTED TAKING DELIVERY OF ADDITIONAL TOP SOIL. THE SOURCE IS A RESIDENTIAL DEVELOPMENT SITE NORTH of CAMAS. SOIL SAMPLES WERE TAKEN FOR HEAVY METALS LEAD, ARSENIC & CADMIUM. APPROX 2000 YD^3 of TOP SOIL WAS DELIVERED TO THE SITE ON FRIDAY. THE TRUCKING FIRM DELIVERING THE SOIL WAS ONLY AVAILABLE TO MAKE ADDITION DELIVERIES ON SAT - 7/3 SO GEORGE HAD THEM DELIVER ANOTHER 2000 YD^3 WHICH SHOULD BE ALL THAT IS NEEDED FOR THE ELF COVER.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVR		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LAND RECLAMATION		**Date:** 7-6-04
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME EXCEPT ONE OFF ROAD 35 TON HAUL TRUCK HAS BEEN REMOVED FROM SERVICE & WILL BE RETURNED TO THE RENTAL AGENCY.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F CLOUDY	75°F CLOUDY/PARTLY SUNNY.

Comments and/or supporting calculations:

ENVIRO CON HAULED AND PLACED 1423 TONS OF SAND FROM GLACIER TO THE ELF. MOVED & PLACED TOP SOIL ON ELF AFTER 13:30.
CITY OF VANCOUVER WATER DEPT. PERSONNEL VISITED THE SITE TO CHECK ON THE LOCATION OF THE METER VAULT & MAIN LINE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-7-05
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F CLOUDY	73°F MOSTLY SUNNY

Comments and/or supporting calculations:

NO SAND AVAILABLE FROM GLACIER TODAY
ENVIROCON PLACED TOP SOIL ON SAND FILL WHERE THEY COULD & DRESSED UP THE TOP OF THE REVETMENT SLOPE
TYLER RENTAL PICKED UP THE 35 TON OFF-ROAD HAULTRUCK.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VAN COVER LANDFILL REMEDIATION		**Date:** 7-8-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F CLOUDY	72°F PARTY CLOUDY.

Comments and/or supporting calculations:

ENVIROCON HAULED AND PLACED 500 TONS OF SAND FROM GLACIER ON EAST LAND FILL.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-9-04
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
57°F MOSTLY SUNNY	78°F SUNNY

Comments and/or supporting calculations:

ENVIRO CON IS UTILIZING THEIR 10 TON DUMP TRUCK IN ADDITION TO THE 35 TON OFF ROAD TRUCK TO HAUL & PLACE SAND TODAY. 780 TONS OF SAND WAS HAULED FROM GUTTERED & PLACED ON THE ELF. THE FORMS & REBAR WILL BE SET FOR THE SMALL BUILDING ON SATURDAY.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title**	**No.**

Alborg
sprinkler
on site

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-12-04	
Contractor ENVIROCON			
Subcontractor(s) ABOVO			
No. of workers: 4	**Equipment:** SAME		
ABOVO 3			

Morning Weather Conditions:	**Afternoon Weather Conditions**
60°F CLEAR	90°F CLEAR

Comments and/or supporting calculations:

NO SAND WAS AVAILABLE FROM GIBSON TODAY.
ENVIROCON WORKED ON TOP OF TREATMENT SLOPE & SET ECOLOGY BLOCKS AROUND PIPES AT GROUND WATER MONITORING WELLS.
ABOVO MOVED ON SITE AND AFTER SAFETY ORIENTATION, STARTED TRENCHING FOR SPRINKLER PIPELINES. MET TALKED TO CRAIG RICH, ABOVO SITE FOREMAN/SUPT. MET WITH THE CITY OF VANCOUVER WATER LINE LOCATOR BRUCE?, AT THE SITE. STAKED OUT THE WATER METER LOCATION, IN PREPARATION FOR SERVICE INSTALLATION, REVIEWED EASEMENT LOCATION & PIPELINE ROUTE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVGR		**Title** PROJ ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. JAN CONVER LANDFILL REMEDIATION		**Date:** 7-13-04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 4	**Equipment:** STONE	
ABOVO 4		

Morning Weather Conditions:	**Afternoon Weather Conditions**
60°F CLEAR	85°F CLEAR

Comments and/or supporting calculations:

ENVIROCON HAULED & PLACED 1000 TONS OF STONE FROM GUNTHER ON THE EAST LANDFILL.
ABOVO PLACED IRRIGATION PIPE IN TRENCH ON EAST HALF OF ELF ALONG TOP OF REVETMENT WALL.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

structural fill for acc rd

Above

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-14-04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 3	**Equipment:** SAME	
ABOVO 3		

Morning Weather Conditions:	**Afternoon Weather Conditions**
60°F LIGHT OVERCAST	84°F CLEAR.

Comments and/or supporting calculations:

ENVIROCON HAULED & PLACED 200 TONS OF SAND FROM GLACIER ON THE EAST LANDFILL FINISHING THE 18" THICK LAYER OF SAND FILL. TWO LOADS OF SAND WERE HAULED & PLACED ON THE NEW ROAD BEING CONSTRUCTED ON THE N. SIDE OF THE E.L.F. GEORGE STOPPED HAULING SAND AS WE HAS ARRANGED FOR RECEIPT OF STRUCTURAL/SOIL FILL FROM A RESIDENTIAL DEVELOPMENT SITE WHICH WILL BE DELIVERED BY BELLY DUMP TRUCKS ON THURSDAY.

ABOVO CONTINUED WITH TRENCHING & INSTALLATION OF IRRIGATION WATER LINES ON SOUTH SIDE OF EAST LANDFILL. WALKED SITE WITH DAN STONE & STAKED OUT THE AIR LINE STUBUPS AT THE WELLS & AT THE NEW ROADWAY AREA. REVIEWED LOCATION WITH ABOVO FOREMAN AS THEY WILL BE INSTALLING THE 1" SCH. 80 PVC LINE.

REVIEWED WITH GEORGE LOWE THE NEED TO MOVE THE ECOLOGY BLOCKS AWAY FROM THE WELL CASINGS SO MONUMENTS CAN BE PLACED & CONCRETE POURED PER DRAWINGS.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-15-04
Contractor ENVIRO CON		
Subcontractor(s) ABOVO		
No. of workers: 3	**Equipment:** SAME	
ABOVO 3		

Morning Weather Conditions:	**Afternoon Weather Conditions**
58°F LIGHT OVERCAST	75°F CLEAR

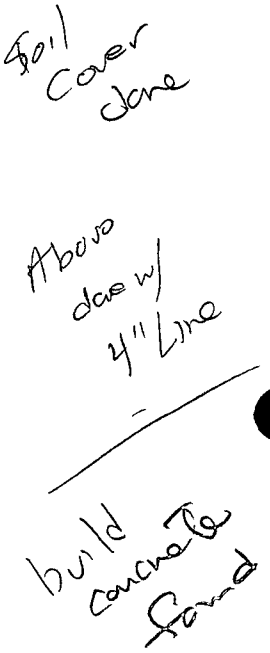
Comments and/or supporting calculations:

ENVIRO CON PLACED TOP SOIL ON EAST LANDFILL AND COMPLETED EXCEPT FOR 100'x 20' STRIP AS THEY RAN OUT OF MATERIAL. MORE TOP SOIL TO BE DELIVERED ON FRIDAY.
ABOVO CONTINUED WITH INSTALLATION OF 4" WATER LINE & SPRINKLERS AT WEST END OF RETENTION WALL. INSTALLED TRENCHES FOR PIPELINE TO NEW BUILDING.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**


foil
Cover
done
Above
done w/
4" Line
build
concrete
form

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL RECLAMATION		**Date:** 7-16-04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 2	**Equipment:** SAME	
ABOVO 2		

Morning Weather Conditions:	**Afternoon Weather Conditions**
58°F OVERCAST	82°F SUNNY

Comments and/or supporting calculations:

ENVIROCON TOOK DELIVERY OF 900 YD³ OF TOP SOIL & STRUCTURAL FILL DIRT. TOP SOIL WAS USED TO FINISH COVERING THE EAST LANDFILL.

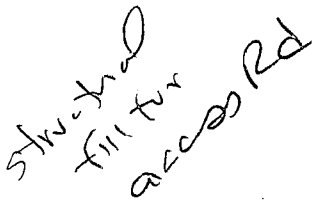
ABOVO FINISHED THE NEW 4" WATER LINE INSTALLATION TO THE BUILDING & INSTALLED 1" AIR LINE FOR WELL PUMPS.

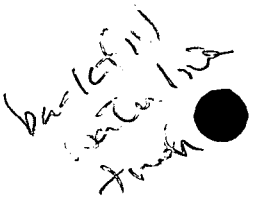
ENVIROCON POURED THE FOUNDATION FOR THE NEW BUILDING IN THE MORNING. TOTAL QUANTITY 13 YD³ OF CONCRETE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJECT ENGR **No.**


stockpile
fill for
access Rd


backfill
Above
due
temporarily

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL RECLAMATION		**Date:** 7-19-04
Contractor ENVIROCON		
Subcontractor(s) ABOUD		
No. of workers: 2	**Equipment:** SAME	
ABOUD 2		

Morning Weather Conditions:	**Afternoon Weather Conditions**
57°F OVERCAST	76°F PARTLY CLOUDY

Comments and/or supporting calculations:

ENVIROCON TOOK DELIVERY OF 1400 YD³ OF STRUCTURAL FILL DIRT ON SATURDAY. LARRY WAS RECLAIMING FROM THE PILE & SPREADING & COMPACTING ON THE NEW WELLHEAD ROAD ON THE NORTH SIDE OF THE EAST LANDFILL. GEORGE SAID HE DECIDED TO GET THE STRUCTURAL FILL DIRT RATHER THAN SAND FROM GLACIER SINCE SAND AVAILABILITY CONTINUED TO BE HIT & MISS.

FORMS FOR THE NEW BUILDING FOUNDATION WERE STRIPPED ABOUD STARTED AND COMPLETED BACKFILLING THE WATER LINE TRENCHES. THE AIR LINE TO THE WELL PUMP NEED A TEE INSTALLED AT THE CENTER WELL CLUSTER. GEORGE SAID HE WOULD INSTALL THE TEE WHEN IT ARRIVES ON TUESDAY.

ABOUD IS FINISHED WITH WORK UNTIL NEW WATER SERVICE & BUILDING INSTALLATION COMPLETE. THEN THEY WILL BE BACK TO INSTALL BACKFLOW PREVENTOR, MOUNT SPRINKLER CONTROLS & CHECK OUT WATER SPRAY/NOZZLES.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKG		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-20-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
60°F OVERCAST LT. SHOWERS	82°F CLEAR

Comments and/or supporting calculations:

RICK MARTIN & DENNIS WRIGHT BROUGHT TO SITE TO ERECT THE STEEL BUILDING. FOR THE WATER SYSTEM.

CITY OF VANCOUVER INSTALLED THE 2" WATER SERVICE & INSTALLED THE METER

ENVIROCON CONTINUED PLACING STRUCTURAL FILL DIRT ON NEW WELL ACCESS ROADWAY.

ENVIROCON SET THE 4 ECOLOGY BLOCKS ON THE NORTH SIDE OF THE TWO WELLS AT THE TOP OF THE REVETMENT WALL.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-21-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 2	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
58° LIGHT OVERCAST	85°F CLEAR

Comments and/or supporting calculations:

ENVIROCON STARTED PLACING FABRIC & ROCK ON WELL ACCESS ROAD & FINISHED THE ROAD ON THE NORTH SIDE OF THE ELF. ALSO PULLED 7 JERSEY BARRIERS FROM EAST END OF FENCE. STARTED SHAKING OUT MATERIAL FOR STEEL BUILDING & MOVING TO THE BUILDING FOUNDATION. LARRY USED THE DOZER TO SHAPE AND CONTOUR THE AREA FROM THE WEST SIDE OF THE ELF TO THE FENCE ON THE WEST SIDE OF THE SBAC.

DISCUSSED WITH GEORGE & WALKED THE REVETMENT WALL THE NEED TO REMOVE THE WEEDS FROM THE SLOPES PRIOR TO HYDROSEEDING THEM. NEED TO PULL BY HAND & NOT SPRAY DUE TO CLOSE PROXIMITY TO COLUMBIA RIVER.

RICK & DENNIS WERE RECALLED TO THE TACOMA PROJECT AND NO PROGRESS WAS MADE ON BUILDING ERECTION TODAY.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVL		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-22-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 2	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
58°F CLEAR	92°F CLEAR.

Comments and/or supporting calculations:

ENVIROCON COMPLETED THE WELL ACCESS ROAD ON THE WEST SIDE OF THE EAST LANDFILL. LARRY WAS FINISHING CONTOURING & SHAPING THE DRAINAGE SWALE FROM THE INFILTRATION BASIN OVERFLOW OUTLET TO THE TOP OF THE REVETMENT WALL. GEORGE SAID THE DOZER WILL BE SENT BACK TO TYLER RENTAL ON FRIDAY. 7/23.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BHL		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-23-04
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** SAME EXCEPT DOZER NO LONGER ON SITE.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
60° F CLEAR	100 °F CLEAR

Comments and/or supporting calculations:

ENVIRO CON STARTED ASSEMBLY OF THE BUILDING. FOUND AN ERROR IN ANCHOR BOLT SPACING & HAD TO INSTALL NEW ANCHOR BOLTS. THEY WERE ABLE TO SALVAGE 4 ORIGINAL ANCHOR BOLTS. SHUT DOWN WORK AT 15:30 DUE TO EXTREME HEAT.

CASCADE DRILLING WAS ON SITE WITH JEFF JOHNSON TO DISCUSS REMARKING WORK ON MONITORING WELLS.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-26-04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 4	**Equipment:**	
ABOVO 1		

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F OVERCAST	85°F CLEAR

Comments and/or supporting calculations:

ENVIROCON CONTINUED ASSEMBLY OF THE MAIN BUILDING WITH THE STEEL COLUMNS, GIRTS, & PURLINS COMPLETED ENVIROCON INSTALLED THE CULVERT ENDS FOR NEW WELL ACCESS ROAD.

ENVIROCON REMOVED WATTLES FROM THE EAST END OF THE JERSEY BARRIER & STORED ON ELF IN PREP FOR DISPOSAL. THE JERSEY BARRIERS ON THE EAST END HAVE NOW BEEN REMOVED.

ABOVO WAS ON SITE TO BACKFILL THE WATER LINE FROM THE ELF TO THE MAIN BUILDING. THEY ALSO TRENCHED FROM THE WATER METER TO THE NEW BUILDING IN PREP FOR MAKING THE FINAL LINE CONNECTION.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-27-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** STAKE	

Morning Weather Conditions:	**Afternoon Weather Conditions**
56°F LIGHT OVERCAST	83°F CLEAR

Comments and/or supporting calculations:

ENVIROCON CONTINUED ASSEMBLY OF THE NEW BUILDING.
ENVIROCON STARTED BUILDING FORMS FOR CONCRETE POURS AROUND DRAIN LINE CLEAN OUTS & AROUND GW. MONITORING WELLS.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed		**Title** PROJ ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-28-04
Contractor ENVIRO CON		
Subcontractor(s)		
No. of workers:	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
58°F LIGHT OVERCAST	87°F CLEAR.

Comments and/or supporting calculations:

ENVIRO CON CONTINUED WORKING ON THE NEW BUILDING ERECTION & SET THE FORMS AROUND THE CLEANOUTS & WELL PIPES. ADDED MORE ROCK AROUND CULVERT OPENINGS ON NEW ROAD.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7/29/04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 4	**Equipment:** STAKE	

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F LIGHT OVERCAST	82°F PARTLY SUNNY.

Comments and/or supporting calculations:

ENVIROCON CONTINUED WORKING ON THE BUILDING FOUNDATION. DISCOVERED PROBLEM WITH FIT TO FOUNDATION. THE CONCRETE SLAB WAS POURED 12.5' x 16.5' WHILE THE BUILDING DESIGN WAS FOR A 16' x 12' SLAB. ENVIROCON LOOKED AT GETTING NEW BASE ANGLES MADE BUT IS LEANING TOWARD SAW CUTTING 3" OFF EACH SIDE OF FOUNDATION.

ENVIROCON ADDED SOME ROCK TO THE DRAIN CHANNEL AT THE S.E. END OF THE EAST LANDFILL NEXT TO THE RETAINING WALL. CONTINUED DRESSING UP AREA AROUND EAST LANDFILL.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKA		**Title** PROJECT ENGR	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 7-30-04
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 3	**Equipment:** SAME	
2 ABOVO		

Morning Weather Conditions:	**Afternoon Weather Conditions**
51°F CLOUDY	72°F CLOUDY

Comments and/or supporting calculations:

ENVIROCON LOADED OUT ALL THE JERSEY BARRIERS THAT HAVE BEEN REMOVED SO FAR & RETURNED TO THE SUPPLIER. ENVIROCON DUG IN THE TRENCH FOR THE POWERLINE TO THE NEW BUILDING. CONTINUED WORKING ON NEW BUILDING ASSEMBLY.

ABOVO WAS ON SITE AND CONNECTED THE 4" WATER SUPPLY LINE TO THE NEW WATER METER. JEFF WAS NOT HAPPY WITH THE WAY ABOVO ELEVATED THE PIPE AND ENVIROCON WILL CORRECT ONE CONNECTION NEXT TO BUILDING.

GEORGE SAID ENVIROCON WILL POUR AN APPROACH PAD IN FRONT OF THE NEW BUILDING DOORS. THIS WAS NOT ON THE DRAWINGS BUT NEEDED AS DOORS OPEN OUTWARD AND THE STEP WOULD BE SAND GROUND.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BVL		**Title** PROJ. ENGR.	**No.**


setting plates
on ELF

August, 2004

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 8-02-04
Contractor ENVIROCON		
Subcontractor(s) CASCADE DRILLING INC.		
No. of workers: 3	**Equipment:** SAME	
1 - CASCADE		

Morning Weather Conditions:	**Afternoon Weather Conditions**
54°F OVERCAST	90°F CLEAR

Comments and/or supporting calculations:

ENVIROCON CONTINUED DRESSING THE TOP SURFACE OF THE EAST LAND FILL.

CASCADE DRILLING WAS ON SITE TO CUT OFF WELL CASING IN STEEL MONUMENTS, AND POUR CONCRETE AROUND WELLS. CASCADE WAS NOT PREPARED & CONCRETE TRUCK ARRIVED AT 10 AM. CONCRETE POUR NOT COMPLETED UNTIL @ 1:30 PM. CASCADE CUT OFF INNER SAMPLE TUBES ON TWO WEST WELLS ON NORTH SIDE OF THE EAST LAND FILL BUT SAID THEY WOULD REPAIR THE TUBES AFTER CONCRETE WORK IS FINISHED

TOLD GEORGE LOWE TO PLACE THE THREE SETTLING MONUMENTS, ONE AT HIGHEST POINT OF ELF & THE OTHER TWO, ONE HUNDRED FEET TO EAST & WEST OF THE HIGH MONUMENT. AL WILL FAX BER INFO ON SETTLING MONUMENT CONSTRUCTION. STEEL PLATE WITH PIN TO SECURE IN PLACE. NO REF ON DRAWINGS FOR SETTLEMENT MONUMENTS.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLR		**Title** PROJ ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 8-03-04
Contractor ENVIROCON		
Subcontractor(s) @		
No. of workers: 2	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
53°F OVERCAST	83°F SUNNY

Comments and/or supporting calculations:

ENVIROCON RESUMED WORK ON THE BUILDING ERECTION. ALSO BACKFILLED AROUND NEW CONCRETE SLABS FOR THE WELLS & CLEANOUTS AFTER FORMS WERE STRIPPED. LARRY WAS MOVED TO A PROJECT IN TACOMA. MARK & KYLE ARE TWO LABORERS REMAINING ON SITE WITH GEORGE.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLR		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 8-4-04
Contractor GUNROCON		
Subcontractor(s)		
No. of workers: 2	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
56° PARTLY CLOUDY.	80° MOSTLY CLOUDY

Comments and/or supporting calculations:

GUNROCON CONTINUED ASSEMBLY & ERECTION OF THE BUILDING WHICH IS ± 90% COMPLETE. SHOULD FINISH ON THURSDAY. SIDING & ROOFING INSTALLED WITH TRIM REMAINING. ~~NO~~ ELECTRICAL WILL BE SCHEDULED IN TO WIRE BUILDING ON FRIDAY 8/6

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKA		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 8-5-04
Contractor ENVIROCON		
Subcontractor(s)		
No. of workers: 2	**Equipment:** SAME	

Morning Weather Conditions:	**Afternoon Weather Conditions**
56°F OVERCAST LT. RAIN	78°F PARTLY SUNNY.

Comments and/or supporting calculations:

ENVIROCON FINISHED ERECTION & ASSEMBLY OF THE NEW BUILDING. WALKED THE WEST FENCE LINE WITH GEORGE TO LOCATE END POINTS. WEST SIDE ROAD WILL NEED TO BE MOVED TO THE SOUTH AT THE TURN TO THE GLF. IT NOW SWEEPS THROUGH THE FENCE LINE AT THE GATES WHICH ARE A TOTAL OF 24' WIDE. GEORGE SAID THEY BUILT THE SWEEPING ROAD TO ACCOMODATE TRUCK TURNING RADIUS BUT WILL CHANGE CORNER TO FIT GATES. AL BUBBA WANTS THE FENCE LINE ON THE PROPOSED FUTURE BOUNDARY BETWEEN PARCEL 1 & 2.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 8-6-04
Contractor ENVIRO CON		
Subcontractor(s) MOFFATT		
No. of workers: 2	**Equipment:** SAME.	
2 MOFFATT		

Morning Weather Conditions:	**Afternoon Weather Conditions**
55°F CLOUDY W/ RAIN	70°F CLOUDY W/ SHOWERS

Comments and/or supporting calculations:

MOFFATT ELECTRICAL WAS ON SITE TO RUN POWER FROM THE ELECTRICAL MOTOR TO THE BUILDING & INSTALL PANEL & ELECTRICAL SERVICE TO THE NEW BUILDING.

POWER WAS DISCONNECTED FROM THE OFFICE TRAILER IN PREPARATION FOR DEMOB ON MONDAY.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 8-9 THRU 8-13
Contractor ENVIRO CON		
Subcontractor(s) ABCO MOFFORD ELECTRICAL		
No. of workers:	**Equipment:**	

Morning Weather Conditions:	**Afternoon Weather Conditions**

Comments and/or supporting calculations:

LANDFILL WORK IS COMPLETE. MISC CLEANUP ITEMS REMAIN. TRAILER OFFICE MOVED FROM SITE ON MONDAY. MOFFORD NEEDS TO FINISH INTERIOR WIRING FOR BUILDING SO ABOVE CAN CHECK OUT SPRINKLER SYSTEM. WIRE TRENCH FROM BUILDING TO ELECTRICAL METER NEEDS TO BE BACKFILLED.

GOT WDOT SEED MIX FROM STEVE HORNBERG.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

September, 2004

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 9/9 THRU 9/17
Contractor ENVIROCON		
Subcontractor(s) ABOVO		
No. of workers: 6 TO 10	**Equipment:** EXCAVATOR, DUMPTRUCK, DOZER, HYDROSEEDER	
4 TONNES POLYSWOOL		

Morning Weather Conditions:	**Afternoon Weather Conditions**
50 - 55°F	60 - 70°F PERIODIC RAIN

Comments and/or supporting calculations:

REMOVED REMAINING 1/2 OF JERSEY BARRIERS & SHIPPED OFF SITE.
REPAIRED THE WASHOUTS ALONG THE REVETMENT WALL.
REPAIRED BROKEN WATER LINE AT TOP OF REVETMENT @ STA 1+4.00.
HYDROSEED TRUCK ON SITE MONDAY & TUESDAY & COMPLETED WORK ON N, N2, ELF, SBAC, & REVETMENT WALL. ALL WEEDS WERE PULLED & REMOVED FROM REVETMENT WALL BEFORE HYDROSEEDING COMPLETED.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKR		**Title** PROJ ENGR	**No.**

October, 2004

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL PERMIT D. BRAN		**Date:** 10/04 THRU 10/08
Contractor ENVIROCON		
Subcontractor(s) WILLAMETTE FENCE, WH. PACIFIC, ABOVO		
No. of workers:	**Equipment:**	
VARIED	EXCAVATORS, AUGER, TRUCKS, BOB CAT	

Morning Weather Conditions:	**Afternoon Weather Conditions**
50's DRY	60's & 70's DRY.

Comments and/or supporting calculations:

10/04 WILLAMETTE FENCE MOVED ONSITE & LAYED OUT FENCE POSTS LOCATION
10/05 " " DUG HOLES, SET POSTS, & POURED CONCRETE AROUND POSTS ON WEST FENCE. ENVIROCON STARTED PLACING THE JUTE MAT ON THE EMBANKMENT WALL SLOPE USING STAPLES TO SECURE IT IN PLACE.
10/06 WILLAMETTE DUG HOLES, SET POSTS & POURED CONCRETE ON EAST SIDE FENCE. ENVIROCON CONTINUED JUTE MAT INSTALLATION. ABOVO WAS ON SITE TO TEST FLOW THE SPRINKLER SYSTEM. ALL 4 ZONES OF THE FOUR ZONES CYCLED THROUGH WITH NO PROBLEM EXCEPT THE WEST END SPRINKLER HEAD WAS MISSING ITS NOZZLE. ABOVO INSTALLED A NOZZLE & SPRAY WAS SATISFACTORY.
10/07 WILLAMETTE SET THE TOP FENCE RAILS ON THE WEST SIDE. ENVIROCON CONTINUED JUTE MAT INSTALL.
10/08 WILLAMETTE SET THE TOP FENCE RAILS & BARB WIRE SUPPORTS ON THE EAST SIDE. THE VANCOUVER CITY BUILDING INSPECTOR REVIEWED THE NEW BUILDING INSTALLATION AND ISSUED AN APPROVED FINAL INSPECTION REPORT.

Items	**Description and Location of Item**	**Quantity**	**Unit**

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BKL		**Title** PROJ. ENGR.	**No.**

FINAL INSPECTION REPORT

DATE 10-8-04 TIME _____ A.M. P.M.

CONTRACTOR/OWNER _____

JOB ADDRESS 5201 NW Lower River Rd Permit # Com 2004-00065

☐ CORRECTIONS REQUIRED ☒ NO CORRECTIONS REQUIRED

CODE SECTION	
	Job Complete

C. Tonnee

Building Inspector

A re-inspection of the correction of the violations noted above is required to be arranged within _____ days of the date of inspection. To make a re-inspection appointment, call the Building Inspection Message Line at **(360) 696-8137.**

The City of Vancouver

Occupancy of this structure is

Job Complete.

If occupancy is approved, this report will serve as a Temporary Certificate of Occupancy valid through _____ at which time all violations must be corrected and a re-inspection completed.

C Tonnee

Building Inspector

DAILY INSPECTOR'S PROGRESS REPORT

Project Name/No. VANCOUVER LANDFILL REMEDIATION		**Date:** 10/11 THRU 10/14
Contractor ENVIROCON		
Subcontractor(s) W.H. PACIFIC, WILLAMETTE FENCE		
No. of workers: VARIED	**Equipment:** STONE.	

Morning Weather Conditions:	**Afternoon Weather Conditions**
50's OVERCAST	60's OVERCAST

Comments and/or supporting calculations:

10/11 - WILLAMETTE FENCE STRUNG CYCLONE FENCE & BARB WIRE ON EAST SIDE SECTION. ENVIROCON CONTINUED PLACING JUTE MAT.

10/12 WILLAMETTE FENCE STRUNG CYCLONE FENCE & GATE ON WEST SIDE & MOVED OFF SITE. W.H. PACIFIC SURVEYED FOR AS BUILT CONDITIONS

10/13 ENVIROCON REMOVED ROCK & DRAIN PIPES FROM REVETMENT SLOPE AND REPLACED WITH TOP SOIL & COVERED WITH JUTE MAT

10/14 ENVIROCON SEEDED NEW TOP SOIL AREAS & FERTILIZED.

Items	Description and Location of Item	Quantity	Unit

The item(s) and Material(s) listed above were inspected and found to conform with the plans and specification except as noted.

Signed BLA		**Title** PROJ. ENGR.	**No.**

ATTACHMENT A

JARPA AND CITY OF VANCOUVER APPROVAL LETTERS

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

JUN 26 2002

RECEIVED
JUL 2 2002
J.L.M.

Regulatory Branch

Mr. Jaw K. Fu
Alcoa Inc. Remediation Work Group (RWG)
Alcoa Technical Center, Building C, Dept. ER
100 Technical Drive
Alcoa Center, Pennsylvania 15069

Reference: 2000-2-01106
Alcoa Inc. Remediation
Work Group

Dear Mr. Fu:

This letter is in response to your application, requesting Department of the Army authorization to provide bank stabilization to 1,000 feet of Columbia River shoreline at river mile 103.4 at Vancouver, Washington. The regulations, which govern our permit program contain a series of Nationwide Permits (NWP's). Each NWP authorizes a specific category of work, provided certain conditions are met. The NWP 13 (*Federal Register*, January 15, 2002, Vol. 67, No. 10) authorizes "Bank Stabilization." The entire text of NWP 13 including its specific regional conditions is enclosed.

The proposed work would excavate 1,650 cubic yards of material from the upper slope of the bank and place it at a lower elevation along the bank. An additional 7,150 cubic yards of clean fill and precast concrete armament (Armorflex) would be placed along the shoreline. All work would occur along 1,000 feet of shoreline between elevations 7 foot and 30 foot NGVD. The NWP 13 authorizes the above-described proposed project. The work must be performed as depicted on the enclosed drawings and in accordance with the enclosed Nationwide Permit Conditions in order to remain authorized by the nationwide permit.

I have completed the necessary coordination under Section 7 of the Endangered Species Act (ESA). I have added the following special condition to your permit:

a. You must implement the Endangered Species Act (ESA) requirements and/or agreements set forth in the Biological Evaluation, Columbia River Shoreline Stabilization Project at former Alcoa Facility in Vancouver, Washington, revised October 17, 2001. The U.S. Fish and Wildlife Service (USFWS) concurred with a finding of "may affect, not likely to adversely affect" based on this document on May 1, 2002 (USFWS Reference Number # 1-7-02-I-606). The National Marine Fisheries Service (NMFS) concurred with a finding of "may affect, not likely to

adversely affect" based on this document on February 13, 2002. Both agencies will be informed of this permit issuance and will enforce any known violations of the commitments made in this document pursuant to the ESA.

The Corps has completed the necessary review and coordination under Section 106 of the National Historic Preservation Act (NHPA). The Corps has determined that no historic properties are affected by the project as proposed. Unless new information arises, no further consultation is necessary under Section 106 of NHPA.

In order for this NWP to be valid, you must obtain and comply with an individual Water Quality Certification (WQC) from the State of Washington prior to commencing any work. Please telephone or send your plans to:

Washington State Department of Ecology
Southwest Regional Office
Post Office Box 47600
Olympia, Washington 98504-7600
Telephone (360) 407-6926

If more than 180 days pass and the State has not responded to your individual WQC request, the WQC requirement becomes waived.

This NWP verification will be valid for 2 years from the date of this letter, or until the date the NWPs are modified, reissued, or revoked, whichever is sooner. If the authorized work has not been completed by that date, you should contact us to find out what permit requirements are then in effect.

If the project meets all the conditions, you will need no further authorization from us for the above-described project. You must still comply with other Federal, State, and local requirements, which may pertain to the project. When you have finished the work, please fill out and return the enclosed Certificate of Compliance. If you have any questions, please contact me at telephone (360) 750-9046.

Sincerely,

Chris McAuliffe for
Ron Klump, Project Manager
Southwest Washington Field Office

Enclosures

P.O. Box 1995
Vancouver, WA 98668-1995

City of VANCOUVER WASHINGTON

www.ci.vancouver.wa.us

RECEIVED
NOV 1 1 2003
ARMI REMEDIATION

October 24, 2003

Ali Wick
Anchor Environmental, LLC
1423 3rd Avenue, Suite 300
Seattle, WA 98101

ALCOA
PRJ2003-00991/TRE2003-00141/FLP2003-00002

This letter is to inform you that your application for the above-named project has been approved as noted in the attached staff report.

A 14-day appeal period is now in effect, within which no building or construction permits may be issued. The appeal period will expire at **5 p.m. on Friday, November 7, 2003.** You will be notified immediately upon receipt of any appeal of this decision.

If you should have any questions in regard to this approval, please call 360/735-8873, ext. 8314, or email jon.wagner@ci.vancouver.wa.us.

JON WAGNER, AICP, SENIOR PLANNER
Planning Review Team
Development Review Services

c Bruce Richartz
Alcoa RWG
Fruit Valley Neighborhood Association

Attachment

PRJ2003-00991\Staff Report\FLP03-2 AprvLtr.doc

P.O. Box 1995
Vancouver, WA 98668-1995

City of VANCOUVER WASHINGTON

www.ci.vancouver.wa.us

Staff Report and Decision

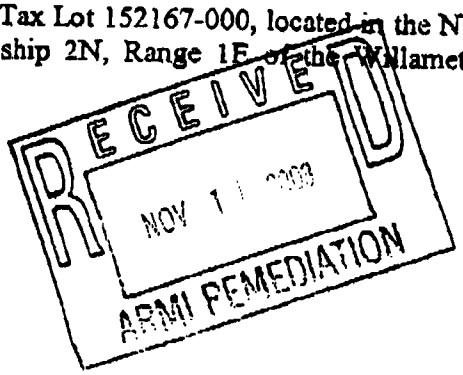
Project Name: Alcoa
PRJ2003-00991/TRE2003-00141/FLP2003-00002

Report Date: October 24, 2003

Proposal: Soil with elevated levels of TCE, PAH and metals will be removed from three locations, placed, compacted and capped in a new location.

The project is being processed in compliance with an agreed order that is being administered by the Department of Ecology. Ecology will be the lead agency on the shoreline permit requirements.

Location: 5701 NW Lower River Road, Tax Lot 152167-000, located in the NW Quarter of Section 20, Township 2N, Range 1E of the Willamette Meridian



Contact: Ali Wick
Anchor Environmental, LLC
1423 3rd Avenue, Suite 300
Seattle, WA 98101
206/287-9130

Applicant: Bruce Richartz
5100 NE Sundial Road
Troutdale, OR 97060

Property Owner: Alcoa RWG
201 Isabella Street @ 7th Street Bridge
Pittsburgh, PA 15212

Neighborhood Association: Fruit Valley

Staff: Jon Wagner, Senior Planner and Case Manager
Jeff Brown, Engineering Specialist, Sewer
Elaine Spray, Civil Engineer, Water
Debi Davis-Turman, Engineering Technician, Water
Mike Swanson, Civil Engineer, Surface Water
Sree Thirunagari, Building Plans Examiner
Scott Tkach, Civil Engineer, Transportation
Chad Lawry, Fire Code Plans Examiner

ATTACHMENT B

ARCHAEOLOGICAL SURVEY, SOIL GAS SURVEY AND TREE SURVEY RESULTS

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

ABSTRACT

In August 2003, Applied Archaeological Research (AAR) conducted a cultural resource study of approximately 13 acres at the former Alcoa Aluminum Facility (Alcoa) located south of Lower River Road in Vancouver, Washington. The Alcoa Remediation Work Group has proposed to clean and decontaminate the area, which is adjacent to the former smelting and manufacturing facility and which contains sediment laden with industrial contaminants. AAR conducted the cultural resources study to assist the Alcoa Remediation Work Group in its compliance with Vancouver Municipal Code (VMC) Chapter 20.99.200. Pursuant to VMC Chapter 29.99.300B, AAR conducted a survey-level investigation rather than a predetermination survey, due to the location of the project area relative to the Shoto Villages/Vancouver Lake Archaeological District, which was determined to be eligible for listing in the National Register of Historic Places in 1988. The purpose of AAR's study was to determine if archaeological resources are present in the project area and to assess the potential that such resources, if present, would be impacted by the remediation efforts.

The study included background research and a field survey. As it was known at the beginning of the study that the property was mantled with river dredge spoil, the background research focused on determining the age and thickness of the fill. This task entailed analysis of historical photographs and maps in conjunction with bore log data. The primary aim of the research was to determine if the remediation excavations would intersect native soil or be confined to the fill. The field study consisted of a pedestrian survey of the project area conducted on August 12, 2003. No historic-era or prehistoric cultural resources were identified during the survey.

As described in this report, based on previous archeological investigations in the general vicinity of the project area, and AAR's review of local history, the Alcoa facility is likely to contain archaeological resources below the fill material. Based on the analysis of bore log data combined with engineering specifications for the remediation efforts, native soil would be intersected to two areas. In those areas, the remediation excavations have the potential to impact unrecorded cultural resources.

Because of the high potential for archaeological material beneath the fill, AAR recommends that the remediation excavations in those two areas (the North and North 2 landfills) be monitored by an archaeologist. The monitor would need only be present at such times that the excavations intersect the pre-fill grade.

Based on the best available information, excavations in the other parts of the overall project area will not intersect native soil and no monitoring is recommended for the remediation excavations in those areas.

Alcoa Soil Gas Investigation

PREPARED FOR: Mike Drewett/PDX

PREPARED BY: Ben Thompson/CVO

DATE: May 3, 2004

On April 30, 2004, soil gas samples were collected from fourteen locations across the North and North 2 landfills at the former Alcoa Vancouver Operations site. Soil gas samples were analyzed using an on-site portable Photovac Voyager gas chromatograph to assess trichloroethene (TCE) vapor concentrations in shallow subsurface soils. The methodology used and results obtained during this effort are described below.

Methodology

Soil gas probes consisting of 3 to 4 foot long sections of hollow steel tubing fitted with a retractable soil gas probe tip were driven using a 'slam' bar to a depth of approximately 3-feet below ground surface (BGS). A piece of clean flexible FEP tubing was run through the steel tube and attached to a barbed fitting on the probe tip. Once the desired sampling depth was reached, the probes were pulled back several inches to expose the sample collection void and allowed to equilibrate 20 minutes. Modeling clay was used to seal the area around the probe at ground surface prior to sample collection. A sampling manifold equipped with isolation valves, a pressure gauge, and a septum sampling port was attached to the exposed end of the flexible FEP tubing. The probe and sample manifold were purged with 3 dead volumes, then, a sample was collected and analyzed using an on-site portable Photovac Voyager gas chromatograph (GC) equipped with a photoionization detector (PID) and a capillary column. The GC was calibrated using a five point curve with a low point at the project reporting limit of 10 parts per billion vapor (ppbv) and a high point of 1000 ppbv. A method blank was analyzed before each sample analysis to ensure the instrument was free of contamination.

Results

TCE was detected at two sample locations above the method reporting limit of 10 ppbv. NOLF-035 was detected at 160 ppbv and N2LF-028 was detected at 114 ppbv. A field duplicate and split sample were collected sample location NOLF-35. The field duplicate result was 161 ppbv. The split sample was taken in a passivated SUMMA® canister for fixed lab EPA Method TO-15 confirmation analysis. The result from this method was 231 ppbv, which is within acceptable limits for a field versus fixed lab analysis.

In order to obtain a valid sample, the vacuum in the probe sample system should be less than 10" Hg after purging and before sampling. Soil composition and water content can cause a vacuum greater than this which indicates low volumes of available soil gas and a reduced chance for obtaining a representative sample. Both sample location NOLF-035 and N2LF-028 exhibited high water content in the soil. Probes had to be driven twice due to a

high sampling vacuum. No sample was collected from the initial probe driven at NOLF-035 because water was drawn into the sample line. TCE in the initial sample collected at N2LF-028 was detected at 10 ppbv, however, the probe was installed at a depth of 1' BGS allowing for possible ambient air intrusion. A second probe was driven to 2' BGS and re-sampled.

Two extra probes were installed at the request of the client 18' to the north east and 36' to the north west of NOLF-035 in order to assess the extent of TCE in the surrounding area. TCE was not detected in either sample above the method reporting limit of 10 ppbv. A summary of sample results are presented below in Table 1.

Table 1 – Onsite Laboratory Analytical Results

Sample Location	Depth	Comment	Trichloroethene (ppbv)
NOLF-005	3'		ND
NOLF-013	3'		ND
NOLF-016	3'		ND
NOLF-018	3'		ND
NOLF-021	3'		ND
NOLF-030	3'		ND
NOLF-035	3'		**160**
NOLF-035 FD	3'	Field Duplicate	161
NOLF-035 NE	2' 6"	18' NE of NOLF-035	ND
NOLF-035 NW	3'	36' NW of NOLF-035	ND
N2LF-008	3'		ND
N2LF-018	3'		ND
N2LF-023	3'		ND
N2LF-028	1'	Bad Sample-high vacuum	10
N2LF-028 R	2'	Re-Sample	**114**
N2LF-039	3'		ND

ND=Not Detected above 10 ppbv

SUBMIT TO:
City of Vancouver
Development Review Services
1313 Main Street
Vancouver, WA 98660

www.ci.vancouver.wa.us

For Office Use Only

DATE RECEIVED:

CASE NUMBER:

MINISTERIAL DEVELOPMENTS

A ministerial development review results in an administrative decision. The application is subject to standards that are clear and objective or standards that require the exercise of professional judgment about technical issues and is exempt from environmental review.

- ☐ Land Use Permit issued under clear and objective standards
- ☐ Boundary Line Adjustments which do not increase the allowable density on a site or require one or more variances
- ☐ Sign Permits that do not require variances
- ☐ Grading Permits which do not require a Minor or Major Development approval or SEPA determination pursuant to VMC Title 21
- ☐ Accessory Dwelling Unit approvals
- ☒ **Tree Plan/Tree Removal Permit**

SUBMITTING PLANS FOR REVIEW:

Counter complete status:

An application will be accepted by the City of Vancouver only after the City finds that the application appears to include all the information required. No effort will be made to evaluate the substantive adequacy of the information. If all required information is not submitted, the application shall not be accepted.

Technically complete status:

Within 28 days of acceptance of a counter complete application, the City shall notify the applicant, in writing, as to the completeness of the application. An application shall not be deemed technically complete until all information necessary to evaluate the proposed activity, its impacts, and its compliance with the provisions of the Vancouver Municipal Code and other applicable codes and statutes have been provided.

Decision:

The review authority for an application subject to Ministerial procedure shall *approve, approve with conditions, or deny* the application within twenty-one (21) calendar days after the date the application was accepted as technically complete.

Notification:

Notice of a decision regarding a Ministerial process shall be mailed to the applicant and applicant's representative. Ministerial decisions are subject to appeal pursuant to Section 20.00.810.

Incomplete applications shall not be accepted.

SUBMIT TO:
City of Vancouver
Development Review Services
1313 Main Street
Vancouver, WA 98660

www.ci.vancouver.wa.us

For Office Use Only

DATE RECEIVED: _____

CASE NUMBER: _____

Tree Plan/Tree Removal Permit Application

APPLICANT: *Alcoa, Inc.* (Print Name) Telephone: *(412) 553-2007* Fax: *(412)553-2661*

Mailing Address: *201 Isabella Street, Pittsburgh, PA 15212-5858* (Number, City, State, ZIP)

PROPERTY OWNER: *Same as above* (Print Name) Telephone: (------) Fax: (------)

Mailing Address: *Same as above* (Number, City, State, ZIP)

CONTACT PERSON *Al Burba, Alcoa, Inc.* (Print Name) Telephone: *(412)553-1658* Fax: *(412)553-2661*

Mailing Address: *201 Isabella Street, Pittsburgh, PA 15212-5858* (Number, City, State, ZIP)

Site address (or side of fronting street and distances and direction from nearest cross street):

Approximately 800 ft from intersection of 2nd and D streets, Vancouver, Washington

General physical description of site. (Include current uses): *Former site of Alcoa Vancouver*

Is this permit application associated with a development proposal? ☐ Yes ☑ No

If yes, describe development proposal: _____

Tax Assessor Serial #s: *152166-000* Qtr. Sec., Township, Range *T2N, R1E, NE & NW* Zoning Designation: *Industrial*

Legal description of site as given by a title company, surveyor licensed by the State of Washington, or other party approved by the Planning Director:

Lot(s): ------ Block(s): ------ Plat Name: ------

⇒ ☐ *Check here if a Metes and Bounds description and attach narrative to this application*

5

I/we understand that per Vancouver Municipal Code (VMC) 20.00.425 if it is determined that this application is not complete, the City of Vancouver shall immediately reject and return the application and identify in writing what is needed to make the application counter complete.

I/we agree that City of Vancouver staff may enter upon the subject property at any reasonable time to consider the merits of the application, to take photographs and to post public hearing notices.

Signature of Applicant: _____ Date: _____

Signature of Property Owner: _____ Date: _____

Signature of Counter Person: _____ Date: _____

Tree Plan/Tree Removal Permit Submittal Requirements

A Tree Plan is required to obtain a Tree Removal Permit. Specific Tree Plan requirements are delineated in Chapter 1 of the City of Vancouver's Urban Forestry Manual.

Level I. **Residential short subdivisions (1-4 lots), Developing Single-Family Lots, Developed Single-Family Residential on parcels which can be short-platted, Multifamily (1-4 units):**

- ☐ Site Plan
- ☐ Tree Density calculation
- ☐ Planting Plan (on landscaping plan)

Level II. **Developed Commercial/Industrial/Multifamily project with proposed building addition or other site disturbance:**

- ☑ Site Plan
- ☑ Tree Protection Plan (on grading plan)
- ☑ Tree Density calculation
- ☑ Planting Plan (on landscaping plan)

Level III. **Nuisance Tree Removal:**

- ☐ Site Plan
- ☐ Narrative Report on criteria met for removal
- ☐ Tree Density Calculation
- ☐ Tree Replacement Plan

Level IV. **Residential subdivisions (more than 4 lots), Commercial / Industrial / Multifamily (over 4 units), Planned Residential Development or Mobile Home Park *with no existing trees, or trees not impacted by development:***

- ☐ Tree Inventory (on Site Plan)
- ☐ Tree Density calculation
- ☐ Planting Plan (on landscaping plan)

Level V. **Residential subdivisions (more than 4 lots), Commercial / Industrial / Multifamily (over 4 units), Planned Residential Development or Mobile Home Park *in which existing trees are proposed for removal or impacted by development:***

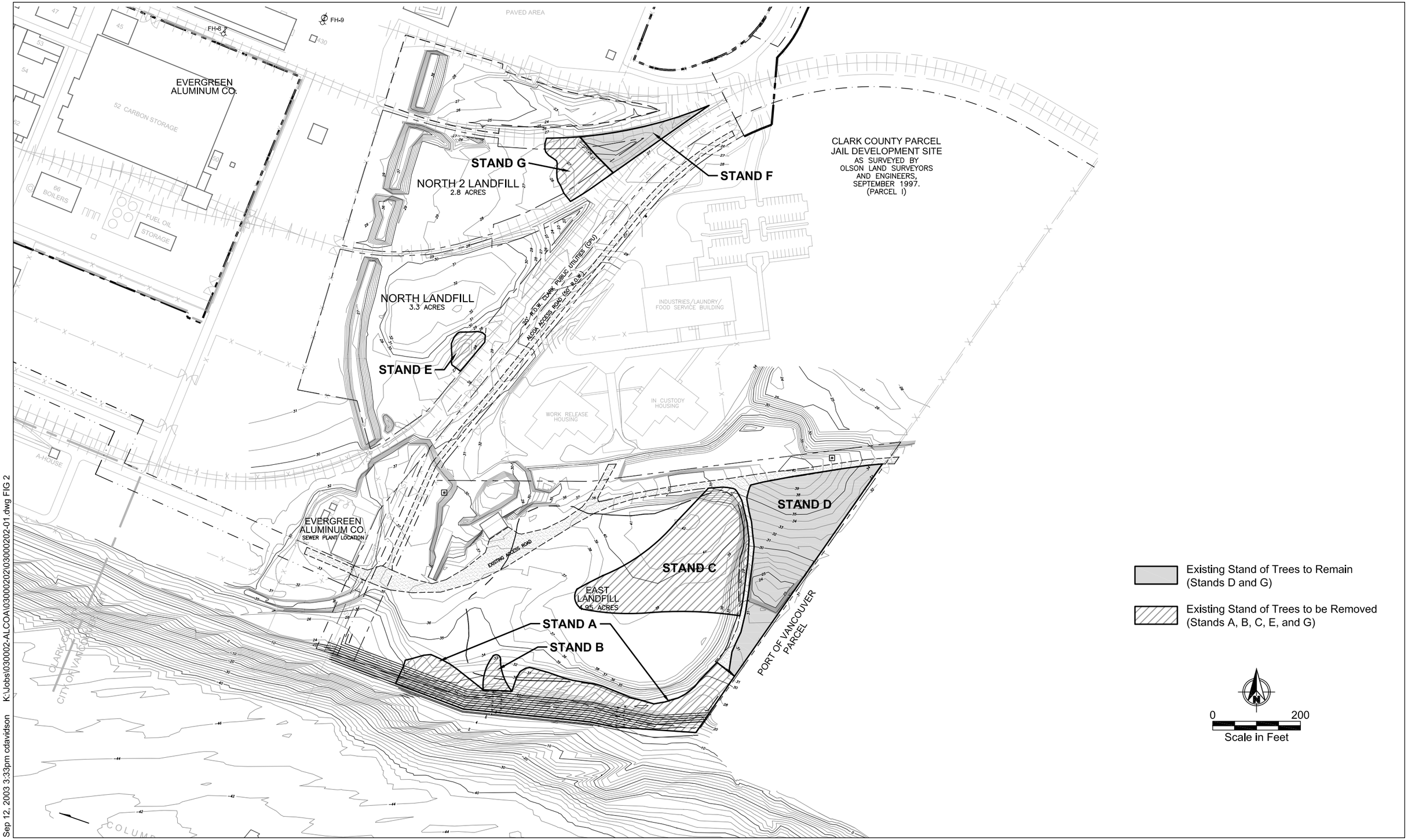
- ☐ Tree Inventory (on Site Plan)
- ☐ Tree Protection Plan (on grading plan)
- ☐ Tree Density calculation
- ☐ Planting Plan (on landscaping plan)
- ☐ Arborist Report

Level VI. **Conversion Option Harvest Permit:**

- ☐ Forest Inventory
- ☐ Harvest Plan
- ☐ Reforestation Plan

Level VII. **Undeveloped Parcels with tree removal above exemption:**

- ☐ Site Plan
- ☐ Narrative Report
- ☐ Tree Replacement Plan



Sep 12, 2003 3:33pm cdavidson K:\Jobs\030002-ALCOA\03000202\03000202-01.dwg FIG 2

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2
Site Plan
Alcoa Vancouver

ATTACHMENT C

LANDFILL AS-BUILT DRAWINGS

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

DRAWING NUMBER A-046140-WW

OFFICE Pittsburgh, PA

ALCOA

EVERGREEN ALUMINUM CO.

"D" STREET

"2nd" STREET

NORTH 2 LANDFILL

NORTH LANDFILL

EAST LANDFILL

CLARK COUNTY PARCEL
JAIL DEVELOPMENT SITE
AS SURVEYED BY
OLSON LAND SURVEYORS
AND ENGINEERS,
SEPTEMBER 1997.
(PARCEL I)

PAVED AREA

INDUSTRIES/LAUNDRY/
FOOD SERVICE BUILDING

WORK RELEASE HOUSING

IN CUSTODY HOUSING

50' R.O.W. CLARK PUBLIC UTILITIES (CPU)

ALCOA ACCESS ROAD (60' R.O.W.)

EXISTING ACCESS ROAD

ALCOA CONSTRUCTION BASELINE

BENCH MARK #2
N 121,927.8
E 1,070,824.3
ELEV. 37.89 FT.

BENCH MARK #1
N 122,006.6
E 1,071,707.9
ELEV. 38.04 FT.

EVERGREEN ALUMINUM CO.
SEWER PLANT LOCATION

SOUTHBANK AREA OF CONCERN

UNITED STATES ARMY CORPS
OF ENGINEERS - PALMER POINT
N 121,496.0
E 1,070,803.2
STA 1+40.7
R428.1

SW CORNER, HENRY VAN ALMAN
DONATION LAND CLAIM
N 121,365.9
E 1,070,780.6
STA 1+06.5
R555.7

CLARK COUNTY/
CITY OF VANCOUVER
PROPERTY LINE

PORT OF VANCOUVER
PARCEL

COLUMBIA RIVER

FH-8

FH-9

N 123,000

N 122,000

N 121,000

E 1,071,000

E 1,072,000

SCALE
0 100 200 300 FEET

VERIFY SCALE
0 1"

LEGEND:

- EXISTING CONTOUR ELEVATION (FT-AMSL)
- EXISTING FENCE (CHAINLINK OR BARB WIRE)
- EXISTING RAILROAD TRACKS
- EXISTING ACCESS ROAD
- ALCOA PROPERTY BOUNDARY
- CLARK COUNTY BOUNDARY
- PROPERTY BOUNDARY/NORTH AND NORTH 2 LANDFILL AREAS
- PROPERTY BOUNDARY/ EAST LANDFILL
- APPROXIMATE LIMITS OF EAST LANDFILL AS DEFINED BY HART-CROWSER AND ICF KAISER
- EXISTING STORM LINE
- FUTURE 50' R.O.W. FOR ALCOA/VANALCO ACCESS ROAD
- CLARK PUBLIC UTILITY R.O.W. (CPU)
- ALCOA/VANALCO EASEMENT

NOTES:

1. EXISTING TOPOGRAPHIC MAP PREPARED BY OLSON ENGINEERING, VANCOUVER, WA IN 1996.
2. EAST LANDFILL DEPICTED INCLUDES WASTE SOILS FROM NORTHEAST PARCEL WORK PERFORMED BY ALCOA IN 1996.

Q:\Vancouver\5726.00\Cert Report\Existing Conditions
Image:
Xref: XTOPO-6
Plot Date/Time: 9/16/05 10:30am
Format: Revised:

DRAWING ISSUED

DATE: 06/28/05

- ☐ PRELIMINARY
- ☐ APPROVAL
- ☐ BIDDING
- ☐ MATERIAL ORDERING
- ☐ CONSTRUCTION
- ☐ REFERENCE
- ☐ REVISION
- ☒ AS-BUILT

SEPIA MADE

NOTE: NO REVISIONS OR ADDITIONS TO THIS DRAWING SHALL BE MADE WITHOUT APPROVAL OF THE ALCOA CORPORATE ENGINEERING SERVICES DUE TO PERMIT, LICENSE, OR DESIGN LIABILITIES.

DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
			0	ORIGINAL DRAWING DATE			

THIS DRAWING AND ALL INFORMATION ON IT IS THE PROPERTY OF ALCOA INC. IT IS CONFIDENTIAL AND IS GIVEN YOU FOR A LIMITED PURPOSE AND MUST BE RETURNED ON REQUEST. NEITHER THIS DRAWING NOR ANY PART OF IT NOR ANY INFORMATION CONCERNING IT MAY BE COPIED, EXHIBITED OR FURNISHED TO OTHERS NOR MAY PHOTOGRAPHS BE TAKEN OF ANY ARTICLE FABRICATED OR ASSEMBLED FROM THIS DRAWING WITHOUT THE CONSENT OF ALCOA INC.

ALCOA INC.
FORMER VANCOUVER OPERATIONS

AS-BUILT CONDITIONS - NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

PRE CONSTRUCTION EXIST. CONDITIONS, SITE MAP AND PROPERTY BOUNDARY

IN CHARGE OF: MARK STIFFLER	DWG CLASS:	DESIGNED BY: BERGMANN ASSOCIATES
SCALE: 1" = 100'	EQUIP. NO.:	DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046140-WW	SHEET NUMBER: C-1	CHECKED BY: A.BURBA
		APPROVED BY: P. SULLIVAN

OFFICE Pittsburgh, PA
DRAWING NUMBER A-046141-WW

NORTH LANDFILL

ALCOA ACCESS ROAD (50' R.O.W.)

WORK RELEASE HOUSING

IN CUSTODY HOUSING

BENCH MARK #2
N 121,927.8
E 1,070,824.3
ELEV. 37.89 FT.

BENCH MARK #1
N 122,006.6
E 1,071,707.9
ELEV. 38.04 FT.

SEDIMENT FENCE INSTALLED ALONG PROPERTY LINE FROM STA. 2+00 TO STA. 9+00

ALCOA CONSTRUCTION BASELINE

CONTRACTORS ENTRANCE

POWER METER

ELECTRIC TRANSFORMER

N.W. GATEWAY AVENUE

EVERGREEN ALUMINUM CO.
SEWER PLANT LOCATION

POWER POLE

FORMER BUILDING LOCATION

LOADOUT AREA (DEMOLISHED BUILDING BURIAL LOCATION)

EAST LANDFILL

INFILTRATION BASIN AND DISCHARGE SWALE CONSTRUCTED IN APRIL OF 2004

PORT OF VANCOUVER PARCEL

SOUTH BANK AREA OF CONCERN EXCAVATED BY CONSTRUCTION CONTRACTOR IN OCTOBER AND NOVEMBER OF 2003

SEDIMENT FENCE INSTALLED ALONG PROPERTY LINE

BENCH MARK #11
ELEV = 30.08'

APPROXIMATE LIMITS OF GRADING

APPROXIMATE LIMITS OF FILL PLACEMENT

COLUMBIA RIVER

WASTE SOILS FROM NORTH AND NORTH 2 LANDFILLS PLACED AND COMPACTED BY CONSTRUCTION CONTRACTOR IN APRIL AND MAY OF 2004. WASTE SOILS COVERED WITH SAND LAYER 3 TO 6 INCHES THICK TO PROVIDE SMOOTH SURFACE FOR GEOSYNTHETIC INSTALLATION

SHORELINE EMBANKMENT RECONSTRUCTED BY CONSTRUCTION CONTRACTOR IN OCTOBER AND NOVEMBER OF 2003 USING EXISTING SOILS AND IMPORTED FILL

N 122,000

N 121,500

E 1,070,500

E 1,071,000

E 1,071,500

VERIFY SCALE 0 1"

LEGEND:

- 35 — EAST LANDFILL AS-BUILT INITIAL GRADING CONTOURS ELEVATION (FT-AMSL)
- 30 — EXISTING CONTOUR ELEVATION (FT-AMSL)
- x — EXISTING FENCE
- RAILROAD TRACKS
- EXISTING ACCESS ROAD
- PROPERTY BOUNDARY FOR EAST LANDFILL AND ACCESS ROAD
- EXISTING STORM LINE
- FUTURE 50' R.O.W. FOR ALCOA/VANALCO ACCESS ROAD
- CLARK PUBLIC UTILITY R.O.W. (CPU)
- MONITORING WELL (SEE NOTES)
- EXCAVATION AREAS FOR SOUTH BANK AREA OF CONCERN

SCALE
0 50 100 150 FEET

NOTES:

- (A) MONITORING WELL MW-35S STA. 6+06.04, 64.15 RT PVC ELEV = 43.79'
- (B) MONITORING WELL MW-35I STA. 6+14.09, 63.95' RT PVC ELEV = 43.88'
- (C) MONITORING WELL MW-35D STA. 6+23, 63.49 RT. PVC ELEV = 44.12'
- (D) MONITORING WELL MW-35A STA. 6+32.91, 62.51 RT. PVC ELEV = 44.13'
- (E) MONITORING WELL MW-41I STA. 12+18.17, 3.61 RT. PVC ELEV = 35.39'
- (F) MONITORING WELL MW-41S STA. 12+24.83, 4.39 RT. PVC ELEV. = 35.37'
- (G) MONITORING WELL MW-41D STA. 12+32.60, 5.26 RT. PVC ELEV. = 35.02'
- (H) MONITORING WELL MW-94-2A STA. 5+61.92, 507.91 RT. PVC ELEV. = 36.02'
- (I) MONITORING WELL MW-94-2D STA. 5+54.12, 516.59 RT. PVC ELEV. = 30.19'
- (J) MONITORING WELL MW-94-2I STA. 5+64.31, 518.54 RT. PVC ELEV. = 30.14'
- (K) MONITORING WELL MW-94-1I STA. 3+69.12, 447.30 RT. PVC ELEV. = 37.48'
- (L) MONITORING WELL MW-94-1D STA. 3+81.88, 451.54 RT. PVC ELEV. = 36.93'
- (M) MONITORING WELL MW-94-1A STA. 3+96.98, 455.96 RT. PVC ELEV. = 36.94'
- (Q) MONITORING WELL STA. 0+67.49, 155.23 LT.
- (R) MONITORING WELL STA. 0+66.40, 149.61 LT.
- (S) MONITORING WELL STA. 0+66.76, 143.03 LT.
- (T) MONITORING WELL MW-46I STA. 0+63.46, 309.81 RT. PVC ELEV = 34.86'
- (U) MONITORING WELL MW-46D STA. 0+70.22, 310.56 RT. PVC ELEV = 34.72'
- (V) MONITORING WELL MW-46A STA. 0+68.16, 317.76 RT. PVC ELEV = 34.95'

SITE BENCH MARKS

BENCH MARK #1
BRASS DISC IN CONCRETE
STA 10+87.15, 0.00 RT/LT
NORTHING: 122006.609
EASTING: 1071707.901
ELEVATION: 38.04 FEET

BENCH MARK #11
BRASS DISC IN CONCRETE
STA. -0+20.75, 325.61 RT
NORTHING: 121583.82
EASTING: 1070633.323
ELEVATION: 38.04 FEET

Image: Xref: XTOPO-14ps
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Plot Date/Time: 9/16/05 10:30am
Format Revised: 11/22/99

DRAWING ISSUED
DATE: 06/28/05
- ☐ PRELIMINARY
- ☐ APPROVAL
- ☐ BIDDING
- ☐ MATERIAL ORDERING
- ☐ CONSTRUCTION
- ☐ REFERENCE
- ☐ REVISION
- ☒ AS-BUILT

SEPIA MADE

YR.	MO.	DAY	NO.	REVISION RECORD	DR.	CK.	ZONE
			0	ORIGINAL DRAWING DATE			

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ALCOA INC.
FORMER VANCOUVER OPERATIONS

AS-BUILT CONDITIONS – NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

EAST LANDFILL AREA, AS-BUILT INITIAL GRADING PLAN AND MW LOCATIONS

IN CHARGE OF: MARK STIFFLER	DWG CLASS:		DESIGNED BY: Bergmann Associates
SCALE: 1"=50'	EQUIP. NO.:		DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046141-WW	SHEET NUMBER: C-2		CHECKED BY: P. SULLIVAN
			APPROVED BY: P. SULLIVAN

OFFICE Pittsburgh, PA | DRAWING NUMBER A-046142-WW

NORTH LANDFILL

GRAVEL ROAD

ALCOA ACCESS ROAD (50' R.O.W.)

LAND AREA COVERED BY GEOMEMBRANE PANELS: 281,222 SQUARE FEET

WORK RELEASE HOUSING

IN CUSTODY HOUSING

ANCHOR TRENCH BENCH:
CUT: 25 CUBIC YARDS
FILL: 4,149 CUBIC YARDS
NET FILL: 4,123 CUBIC YARDS

NEW ACCESS ROAD

DIRT ROAD

GATE

ALCOA CONSTRUCTION BASELINE

BENCH MARK #1
N 122,006.6
E 1,071,707.9
ELEV. 38.04 FT.

CULVERT
I.E. 36.88'

MAINTENANCE BUILDING
FF = 33.68'

BOLLARDS

WATER METER

WATER LINE

STORM MANHOLE
RIM = 31.41'

CULVERT
I.E. 36.75

POWER METER

ELECTRIC TRANSFORMER

FORMER CONTRACTOR STAGING AREA

CLEAN OUT
ELEV = 43.31'

CLEAN OUT
ELEV = 39.63'

EVERGREEN ALUMINUM CO.
SEWER PLANT LOCATION

CLEAN OUT
ELEV = 41.59'

NEW 6 FT. HIGH CHAINLINK FENCE AND GATE ALONG LANDFILL BOUNDARY

BIODIFFUSER CLEAN OUT
ELEV = 34.23'

BIODIFFUSER (APPROX. LOCATION)

CLEAN OUT
ELEV = 33.90'

BOUNDARY LINE

CLEAN OUT
ELEV = 41.26'

EAST LANDFILL

UNDERGROUND AIRLINE

CLEAN OUT
ELEV = 34.36'

CLEAN OUT
ELEV = 34.51'

PORT OF VANCOUVER PARCEL

ANCHOR TRENCH CONSTRUCTED AROUND PERIMETER OF EAST LANDFILL IN MAY OF 2004

GEOMEMBRANE PANELS WITH PANEL INDICATOR NUMBERS (P) AND DESTRUCTIVE SAMPLE (DS) LOCATIONS. GEOMEMBRANE INSTALLED IN MAY AND JUNE OF 2004. SEE SECTION ON DRAWING A-046144

ELEV = 29.63'

ELEV = 7.27'

BENCH MARK #11
ELEV = 30.08'

ELEV = 29.47'

RIPRAP INSTALLED AT UPSTREAM END OF SHORELINE IN APRIL OF 2004

ELEV = 10.89'

ORIENTATION OF ARMORFLEX PANELS AND BENCHES OVER RECONSTRUCTED FILL EMBANKMENT

RECONSTRUCTED EMBANKMENT TO EL. 30, SEE SHEET 4

EDGE OF WATER

COLUMBIA RIVER

E 1,070,500

E 1,071,000

E 1,071,500

N 122,000

VERIFY SCALE 0 1"

LEGEND:

- 30 — EXISTING (OUTSIDE EAST LANDFILL LIMITS) / AS-BUILT INITIAL GRADING CONTOURS (WITHIN EAST LANDFILL LIMITS) (FT-AMSL)
- x — EXISTING FENCE
- RAILROAD TRACKS
- NEW AND EXISTING GRAVEL ROAD
- PROPERTY BOUNDARY FOR EAST LANDFILL
- ST — ST — EXISTING STORM LINE
- FUTURE 50' R.O.W. FOR ALCOA/VANALCO ACCESS ROAD
- CLARK PUBLIC UTILITY R.O.W. (CPU)
- ALCOA/VANALCO EASEMENT
- MONITORING WELL (SEE NOTES)
- NEW CHAIN LINK AS-BUILT FENCE LOCATION
- ANCHOR TRENCH CLEANOUT

NOTES:

1. SEE SHEET C-2 FOR MONITORING WELL INFORMATION.
2. AREA COVERED BY GEOMEMBRANE PANELS: 281,222 SQUARER FEET.
3. ANCHOR TRENCH BENCH:
   CUT: 25 CUBIC YARDS
   FILL: 4,419 CUBIC YARDS
   NET FILL: 4,123 CUBIC YARDS

SCALE 0 50 100 150 FEET

DESTRUCTIVE SAMPLE LOCATIONS

INDICATOR NUMBER	LOCATION	INDICATOR NUMBER	LOCATION
DS-1	CENTER OF P-1 AND P-2	DS-15	15' FROM CORNER OF P-48 AND P-49
DS-2	7' FROM CORNER OF P-11 AND P-10	DS-16	235' FROM CORNER OF P-64 AND P-65
DS-3	CENTER OF P-16 AND P-17	DS-17	3' FROM CORNER OF P-52 AND P-53
DS-4	CENTER OF P-6	DS-18	27' FROM CORNER OF P-60 AND P-61
DS-5	32' FROM CORNER OF P-22 AND P-23	DS-19	20' FROM CORNER OF P-70 AND P-71
DS-6	20' FROM CORNER OF P-25 AND P-26	DS-20	16' FROM CORNER OF P-30 AND P-74
DS-7	14' FROM CORNER OF P-28	DS-21	14' FROM CORNER OF P-79 AND P-78
DS-8	29' FROM CORNER OF P-28 AND P-27	DS-22	CENTER OF P-33 AND P-77
DS-9	42' FROM CORNER OF P-33 AND P-77	DS-23	109' FROM CORNER OF P-37 AND P-81
DS-10	142' FROM CORNER OF P-78 AND P-33	DS-24	72' FROM CORNER OF P-40 AND P-85
DS-11	115' FROM CORNER OF P-39 AND P-38	DS-25	13' FROM CORNER OF P-88 AND P-87
DS-12	70' FROM CORNER OF P-85 AND P-40	DS-26	CENTER OF P-49 AND P-91
DS-13	31' FROM CORNER OF P-86 AND P-42	DS-27	20' FROM CORNER OF P-65 AND P-94
DS-14	44' FROM CORNER OF P-45 AND P-46		

SITE BENCH MARKS

BENCH MARK #1
BRASS DISC IN CONCRETE
STA 10+87.15, 0.00 RT/LT
NORTHING: 122006.609
EASTING: 1071707.901
ELEVATION: 38.04 FEET

BENCH MARK #11
BRASS DISC IN CONCRETE
STA. -0+20.75, 325.61 RT
NORTHING: 121583.82
EASTING: 1070633.323
ELEVATION: 38.04 FEET

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YR. MO. DAY
SEPIA MADE

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--	--	--	0	ORIGINAL DRAWING DATE	--	--	--

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ALCOA INC.
FORMER VANCOUVER OPERATIONS

AS-BUILT CONDITIONS - NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

EAST LANDFILL AREA
AS-BUILT HDPE PANEL LAYOUT

IN CHARGE OF: MARK STIFFLER	DWG CLASS:	DESIGNED BY: Bergmann Associates
SCALE: 1"=50'	EQUIP. NO.:	DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046142-WW	SHEET NUMBER C-3	CHECKED BY: P. SULLIVAN
		APPROVED BY: P. SULLIVAN

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Plot Date/Time: 9/16/05 10:30am
Format Revised:
Image: Xref: XTOPO-17ps

OFFICE Pittsburgh, PA
DRAWING NUMBER A-046143-WW

NORTH LANDFILL

GRAVEL ROAD

ALCOA ACCESS ROAD (50' R.O.W.)

LAND AREA COVERED BY GEOMEMBRANE PANELS: 281,222 SQUARE FEET

WORK RELEASE HOUSING

IN CUSTODY HOUSING

ANCHOR TRENCH BENCH:
CUT: 25 CUBIC YARDS
FILL: 4,149 CUBIC YARDS
NET FILL: 4,123 CUBIC YARDS

BARB WIRE FENCE

BENCH MARK #1
N 122,006.6
E 1,071,707.9
ELEV. 38.04 FT.

MAINTENANCE BUILDING
FF = 33.68'

BOLLARDS

WATER METER

WATER LINE

STORM MANHOLE
RIM = 31.41'

CULVERT
I.E. 36.88'

CULVERT
I.E. 36.75

POWER METER

ELECTRIC TRANSFORMER

ALCOA CONSTRUCTION BASELINE

POND AREA

POND AREA:
CUT: 1,961 CUBIC YARDS
FILL: 2,255 CUBIC YARDS
NET FILL: 294 CUBIC YARDS

DIRT ROAD

GATE

POWER POLE WITH GUY ANCHORS

EVERGREEN ALUMINUM CO.
SEWER PLANT LOCATION

POWER POLE

6 FT. HIGH CHAINLINK FENCE AND GATE ALONG NEW LANDFILL BOUNDARY

EAST LANDFILL

RANDOM FILL LAYER AND VEGETATIVE LAYER AT ELEVATIONS SHOWN

BOUNDARY LINE

LOCATION OF BURIED WATERLINE EXTENDING FROM BUILDING TO SHORELINE SPRINKLERS

18" THICK RANDOM FILL LAYER COVERED BY 6" THICK SOIL COVER, INSTALLED BY CONSTRUCTION CONTRACTOR OVER GEOSYNTHETICS IN JUNE AND JULY OF 2004

ANCHOR TRENCH

EXISTING CHAINLINK FENCE ALONG PROPERTY LINE REMOVED AND REPLACED WITH 6 FT HIGH CHAINLINK FENCE

GEOMEMBRANE PANELS.

UNDERGROUND AIRLINE

ELEV = 29.63'

ELEV = 7.27'

BENCH MARK #11
ELEV = 30.08'

SHORELINE RESTORATION AREA:
CUT: 1,466 CUBIC YARDS
FILL: 6,982 CUBIC YARDS
NET FILL: 5,516 CUBIC YARDS

ELEV = 7.65'

CONCRETE REVETMENT PANELS
54,869 SQUARE FEET

ELEV = 7.43'

560 FT. LONG RIPRAP TOE INSTALLED ALONG SHORELINE IN OCTOBER 2006. SEE DETAILS.

ELEV = 8.86'

EDGE OF WATER

ELEV = 29.47'

RIPRAP

ELEV = 10.89'

RECONSTRUCTED EMBANKMENT TO EL. 30

COLUMBIA RIVER

N 122,000

E 1,071,500

E 1,071,000

LEGEND:

- 35 — AS-BUILT FINAL GRADING CONTOURS ELEVATION (FT-AMSL)
- 30 — EXISTING / AS-BUILT INITIAL GRADING CONTOURS (FT-AMSL)
- EXISTING FENCE
- RAILROAD TRACKS
- GRAVEL ROAD
- PROPERTY BOUNDARY FOR COLUMBIA II PARCEL I (11.39 ACRES)
- APPROXIMATE LIMITS OF EAST LANDFILL AS DEFINED BY HART-CROWSER AND ICF KAISER
- EXISTING STORM LINE
- FUTURE 50' R.O.W. FOR ALCOA/VANALCO ACCESS ROAD
- CLARK PUBLIC UTILITY R.O.W. (CPU)
- ALCOA/VANALCO EASEMENT
- SPRINKLER SYSTEM WATERLINE
- SPRINKLER HEAD (UNLESS OTHERWISE NOTED)
- MONITORING WELL (SEE NOTES)
- IRRIGATION CONTROL VALVE
- ANCHOR TRENCH CLEANOUT
- X — AS-BUILT FENCE

SITE BENCH MARKS

BENCH MARK #1
BRASS DISC IN CONCRETE
STA 10+87.15, 0.00 RT/LT
NORTHING: 122006.609
EASTING: 1071707.901
ELEVATION: 38.04 FEET

BENCH MARK #11
BRASS DISC IN CONCRETE
STA. -0+20.75, 325.61 RT
NORTHING: 121583.82
EASTING: 1070633.323
ELEVATION: 38.04 FEET

SCALE
0 50 100 150 FEET

NOTES:

A. MONITORING WELL MW-35S
STA. 6+06.04, 64.15 RT
PVC ELEV = 43.79'

B. MONITORING WELL MW-35I
STA. 6+14.09, 63.95' RT
PVC ELEV = 43.88'

C. MONITORING WELL MW-35D
STA. 6+23, 63.49 RT.
PVC ELEV = 44.12'

D. MONITORING WELL MW-35A
STA. 6+32.91, 62.51 RT.
PVC ELEV = 44.13'

E. MONITORING WELL MW-41I
STA. 12+18.17, 3.61 RT.
PVC ELEV = 35.39'

F. MONITORING WELL MW-41S
STA. 12+24.83, 4.39 RT.
PVC ELEV. = 35.37'

G. MONITORING WELL MW-41D
STA. 12+32.60, 5.26 RT.
PVC ELEV. = 35.02'

H. MONITORING WELL MW-94-2A
STA. 5+61.92, 507.91 RT.
PVC ELEV. = 36.02'

I. MONITORING WELL MW-94-2D
STA. 5+54.12, 516.59 RT.
PVC ELEV. = 30.19'

J. MONITORING WELL MW-94-2I
STA. 5+64.31, 518.54 RT.
PVC ELEV = 30.14'

K. MONITORING WELL MW-94-1I
STA. 3+69.12, 447.30 RT.
PVC ELEV = 37.48'

L. MONITORING WELL MW-94-1D
STA. 3+81.88, 451.54 RT.
PVC ELEV. = 36.93'

M. MONITORING WELL MW-94-1A
STA. 3+96.98, 455.96 RT.
PVC ELEV. = 36.94'

Q. MONITORING WELL
STA. 0+67.49, 155.23 LT.

R. MONITORING WELL
STA. 0+66.40, 149.61 LT.

S. MONITORING WELL
STA. 0+66.76, 143.03 LT.

T. MONITORING WELL MW-46I
STA. 0+63.46, 309.81 RT.
PVC ELEV = 34.86'

U. MONITORING WELL MW-46D
STA. 0+70.22, 310.56 RT.
PVC ELEV = 34.72'

V. MONITORING WELL MW-46A
STA. 0+68.16, 317.76 RT.
PVC ELEV = 34.95'

W. SETTLEMENT PLATE
STA. 3+65.92, 198.61 RT.
ELEV = 47.40'

X. SETTLEMENT PLATE
STA. 4+65.41, 193.80 RT.
ELEV = 49.91'

Y. SETTLEMENT PLATE
STA. 5+68.09, 188.09 RT.
ELEV = 48.40'

PARTIAL ANCHOR SCREW LOCATION & ELEVATION

1	29.72	10	30.08	19	29.93
2	30.00	11	30.17	20	29.81
3	30.08	12	30.05	21	30.27
4	30.25	13	30.13	22	30.01
5	30.05	14	30.15	23	29.93
6	30.36	15	29.83	24	29.87
7	30.18	16	30.05	25	29.99
8	30.02	17	30.08	26	29.79
9	29.90	18	30.21	27	29.69

VERIFY SCALE 0 1"

Image: Xref: XTOPO-13ps

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Plot Date/Time: 9/16/05 10:30am
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DATE: 02/12/07
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- ☐ REVISION
- ☒ AS-BUILT

YR. MO. DAY
SEPIA MADE

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			0	ORIGINAL DRAWING DATE			

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ALCOA INC.
FORMER VANCOUVER OPERATIONS

AS-BUILT CONDITIONS – NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

EAST LANDFILL AREA AS-BUILT FINAL GRADING PLAN

IN CHARGE OF: MARK STIFFLER
DWG CLASS:
DESIGNED BY: Bergmann Associates
SCALE: 1"=50'
EQUIP. NO.:
DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046143-WW
SHEET NUMBER: C-4
CHECKED BY: P. SULLIVAN
APPROVED BY: P. SULLIVAN

DRAWING NUMBER A-046144-WW

OFFICE Pittsburgh, PA

PROPERTY OF CLARK COUNTY

ALCOA

NORTH LANDFILL INITIAL EXCAVATION: CUT: 24,133 CUBIC YARDS

LIMIT OF NORTH LANDFILL (±3.3 ACRES)

ACPC TRACT ALCOA

LIMIT OF NORTH 2 LANDFILL (±2.8 ACRES)

NORTH 2 LANDFILL INITIAL EXCAVATION: CUT: 14,468 CUBIC YARDS

(±1.6 ACRES)

NORTH LANDFILL LIMITS OF EXCAVATION

CONTAMINATED MATERIAL HAUL ROAD

PW-22

NORTH 2 LANDFILL LIMITS OF EXCAVATION

PW-21

NORTH LANDFILL

NORTH 2 LANDFILL

EAST LANDFILL

ALCOA CONSTRUCTION BASELINE

WORK RELEASE HOUSING

20' R.O.W. CLARK PUBLIC UTILITIES (CPU)

ALCOA ACCESS ROAD (50' R.O.W.)

FINAL LIMITS OF EXCAVATION BY CONTRACTOR (AFTER RECEIPT OF CONFIRMATION SAMPLES) MAY 2004

PROPERTY OF CLARK COUNTY

50' INGRESS, EGRESS AND UTILITY EASEMENT PER CLARK COUNTY COURT DOCUMENT NO. 98040348(KPFF)

IN CUSTODY HOUSING

INDUSTRIES/LAUNDRY/ FOOD SERVICE BUILDING

ALCOA CLARK COUNTY

ACPC TRACT

N 122,000

E 1,071,000

LEGEND:

- 25 — AS-BUILT EXCAVATION CONTOUR ELEVATION (FT-AMSL)
- 30 — EXISTING CONTOUR ELEVATION (FT-AMSL)
- x — EXISTING FENCE
- RAILROAD TRACKS
- EXISTING ACCESS ROAD
- CONTAMINATED MATERIAL HAUL ROAD
- ALCOA NORTH AND NORTH 2 LANDFILL AREA
- CLARK COUNTY/ALCOA OR ACPC PROPERTY BOUNDARY
- CLARK PUBLIC UTILITY R.O.W. (CPU)
- SF — SILT FENCE
- POWER LINE AND POLES
- CULVERT
- PW-22 PRODUCTION WELLS TO REMAIN
- MONITORING WELL (SEE NOTES)

NOTES:

(N) MONITORING WELL STA. 1+00.23, 518.41 LT.

(O) MONITORING WELL STA. 0+95.86, 512.99 LT.

(P) MONITORING WELL STA. 0+93.07, 507.31 LT.

(Q) MONITORING WELL STA. 0+67.49, 155.23 LT.

(R) MONITORING WELL STA. 0+66.40, 149.61 LT.

(S) MONITORING WELL STA. 0+66.76, 143.03 LT.

VERIFY SCALE 0 1"

SCALE 0 40 80 120 FEET

DRAWING ISSUED

DATE: 06/28/05

- ☐ PRELIMINARY
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- ☒ AS-BUILT

SEPIA MADE

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ALCOA INC.
FORMER VANCOUVER OPERATIONS

AS-BUILT CONDITIONS - NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

NORTH AND NORTH 2 LANDFILLS - AS-BUILT EXCAVATION PLAN

IN CHARGE OF: MARK STIFFLER	DWG CLASS:	DESIGNED BY: BERGMANN ASSOCIATES
SCALE: 1" = 40'	EQUIP. NO.:	DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046144-WW	SHEET NUMBER: C-5	CHECKED BY: A. BURBA
		APPROVED BY: P. SULLIVAN

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Format Revised:
Image: Xref: XTOPO-11

DRAWING NUMBER A-046145-WW

OFFICE Pittsburgh, PA

PROPERTY OF CLARK COUNTY

ALCOA

NEW FENCE INSTALLED AROUND PRODUCTION WELL

LIMIT OF NORTH LANDFILL (±3.3 ACRES)

LIMIT OF NORTH 2 LANDFILL (±2.8 ACRES)

ACPC TRACT

ALCOA

(±1.6 ACRES)

ACCESS ROAD CONSTRUCTED IN JUNE 2004

GRAVEL ROAD

PW-22

PW-21

NORTH LANDFILL

NORTH 2 LANDFILL

NORTH 2 LANDFILL FINAL GRADING:
FILL: 1,227 CUBIC YARDS
CUT: 815 CUBIC YARDS
NET FILL: 412 CUBIC YARDS

GRADING OF NORTH AND NORTH 2 LANDFILLS PERFORMED BY CONTRACTOR USING IN-SITU "CLEAN" SOILS IN JUNE OF 2004

NORTH LANDFILL FINAL GRADING:
FILL: 1,787 CUBIC YARDS
CUT: 1,768 CUBIC YARDS
NET FILL: 19 CUBIC YARDS

ACCESS ROAD

20' R.O.W. CLARK PUBLIC UTILITIES (CPU)

ALCOA ACCESS ROAD (50' R.O.W.)

EAST LANDFILL

ALCOA CONSTRUCTION BASELINE

WORK RELEASE HOUSING

PROPERTY OF CLARK COUNTY

50' INGRESS, EGRESS AND UTILITY EASEMENT PER CLARK COUNTY COURT DOCUMENT NO. 98040348(KPFF)

IN CUSTODY HOUSING

INDUSTRIES/LAUNDRY/ FOOD SERVICE BUILDING

NORTH LANDFILL LIMITS OF EXCAVATION

NORTH 2 LANDFILL LIMITS OF EXCAVATION

ACPC TRACT

ALCOA

CLARK COUNTY

N 122,000

E 1,071,000

LEGEND:

- 28 — AS-BUILT CONTOUR ELEVATION (FT-AMSL)
- 30 — EXISTING CONTOUR ELEVATION (FT-AMSL)
- EXISTING FENCE
- RAILROAD TRACKS
- EXISTING ACCESS ROAD
- CONTAMINATED MATERIAL HAUL ROAD
- WELL ACCESS ROAD
- ALCOA NORTH AND NORTH 2 LANDFILL AREA
- CLARK COUNTY/ALCOA OR ACPC PROPERTY BOUNDARY
- CLARK PUBLIC UTILITY R.O.W. (CPU)
- POWER LINE AND POLES
- CULVERT
- PW-22 — PRODUCTION WELLS TO REMAIN
- MONITORING WELL (SEE NOTES)
- GRAVEL ROAD

NOTES:

(N) MONITORING WELL STA. 1+00.23, 518.41 LT.

(O) MONITORING WELL STA. 0+95.86, 512.99 LT.

(P) MONITORING WELL STA. 0+93.07, 507.31 LT.

(Q) MONITORING WELL STA. 0+67.49, 155.23 LT.

(R) MONITORING WELL STA. 0+66.40, 149.61 LT.

(S) MONITORING WELL STA. 0+66.76, 143.03 LT.

VERIFY SCALE 0 1"

SCALE 0 40 80 120 FEET

G:\Vancouver\5726.00\Cert Report\WN2Final Plot Date/Time: 9/16/05 10:15am Format Revised: Image: Xref: XTOPO-12

DRAWING ISSUED

DATE: 06/28/05

- ☐ PRELIMINARY
- ☐ APPROVAL
- ☐ BIDDING
- ☐ MATERIAL ORDERING
- ☐ CONSTRUCTION
- ☐ REFERENCE
- ☐ REVISION
- ☒ AS-BUILT

SEPIA MADE

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ALCOA INC.

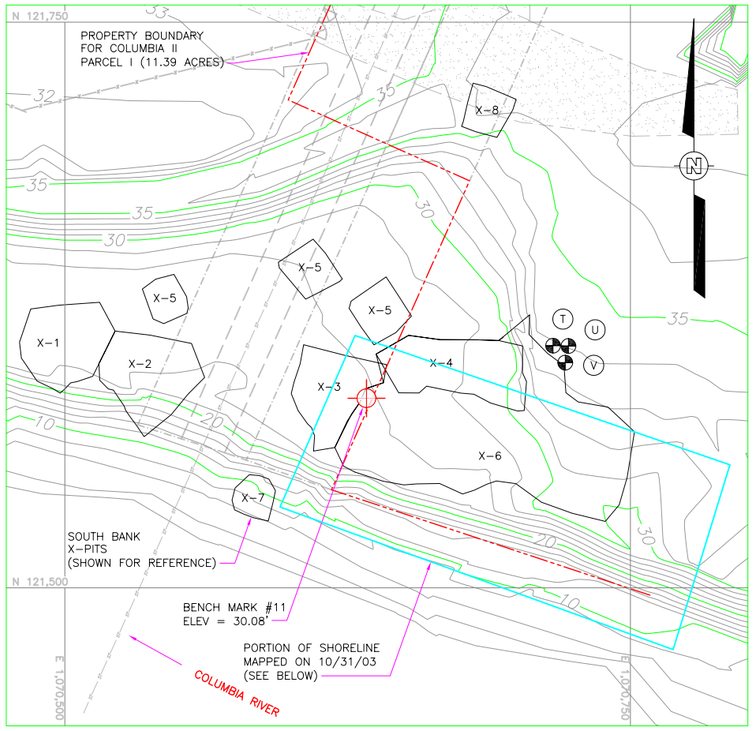
FORMER VANCOUVER OPERATIONS

AS-BUILT CONDITIONS – NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

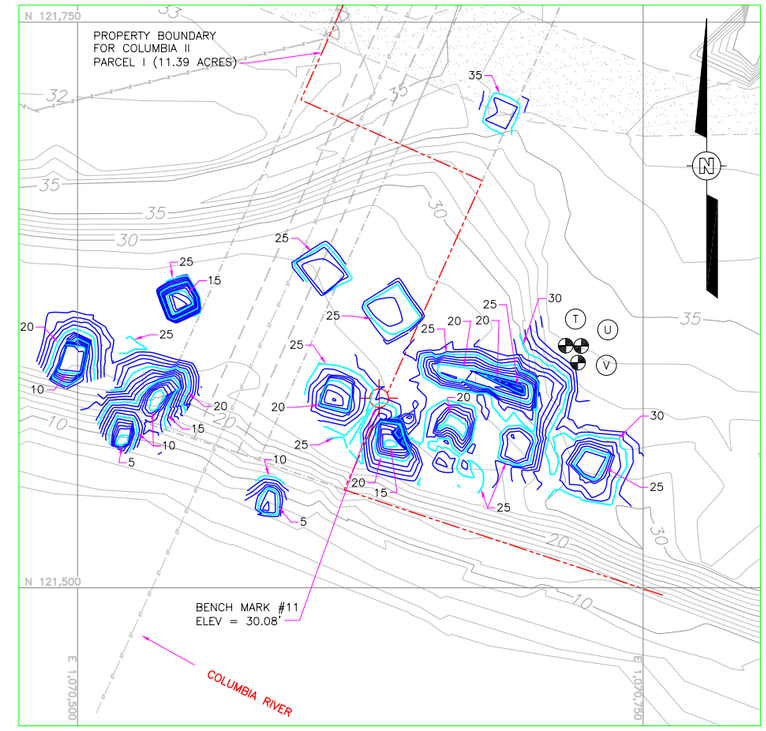
NORTH AND NORTH 2 LANDFILLS – AS-BUILT FINAL GRADING PLAN

IN CHARGE OF: MARK STIFFLER	DWG CLASS:	DESIGNED BY: BERGMANN ASSOCIATES
SCALE: 1" = 40'	EQUIP. NO.:	DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046145-WW	SHEET NUMBER: C-6	CHECKED BY: A. BURBA
		APPROVED BY: P. SULLIVAN

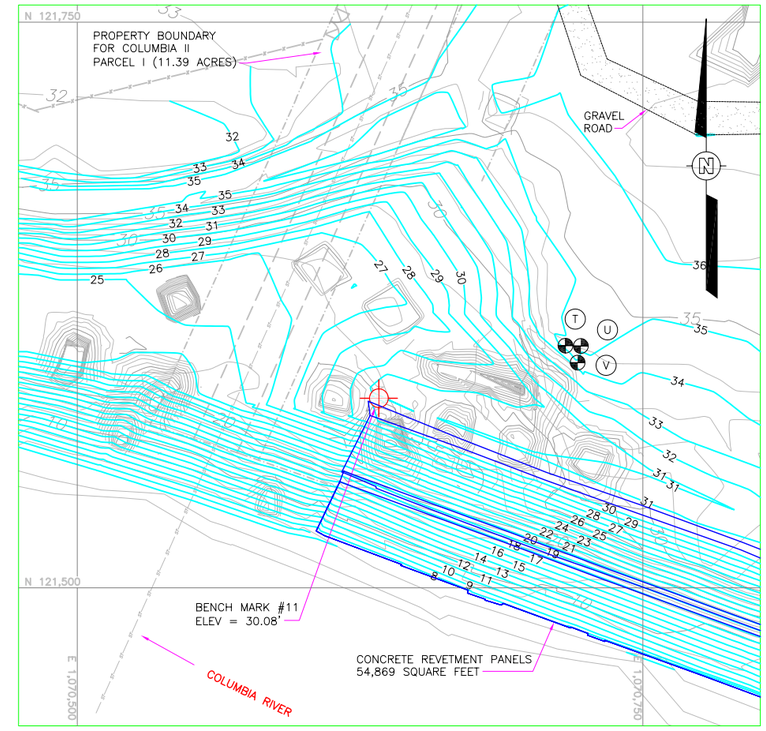
OFFICE Pittsburgh, PA
DRAWING NUMBER A-046146-WW



SHORELINE RESTORATION AREA AND SOUTH BANK AREA OF CONCERN PRIOR TO EXCAVATION

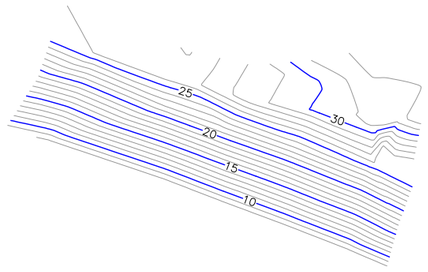


POST CONFIRMATION SAMPLING PLAN – SOUTH BANK AREA OF CONCERN AFTER EXCAVATION



SHORELINE RESTORATION AREA AND SOUTH BANK AREA OF CONCERN FINAL AS-BUILT GRADING

VERIFY SCALE 0 1"



PORTION OF SHORELINE AFTER EXCAVATION

PORTION OF SHORELINE AREA MAPPED 10/31/03
CUT: 1,527 CUBIC YARDS

SOUTH BANK AREA OF CONCERN:

AREA X-1: 188 CUBIC YARDS
AREA X-2: 156 CUBIC YARDS
AREA X-3: 74 CUBIC YARDS
AREA X-4: 735 CUBIC YARDS
AREA X-5: 143 CUBIC YARDS
AREA X-6: 66 CUBIC YARDS
AREA X-7: 35 CUBIC YARDS
AREA X-8: 16 CUBIC YARDS

TOTAL EXCAVATION: 1270 CUBIC YARDS

SHORELINE RESTORATION AREA:

CUT: 1,466 CUBIC YARDS
FILL: 6,982 CUBIC YARDS

NET FILL: 5,516 CUBIC YARDS

(T) MONITORING WELL MW-46I
STA. 0+63.46, 309.81 RT.
PVC ELEV = 34.86'

(U) MONITORING WELL MW-46D
STA. 0+70.22, 310.56 RT.
PVC ELEV = 34.72'

(V) MONITORING WELL MW-46A
STA. 0+68.16, 317.76 RT.
PVC ELEV = 34.95'

SCALE
0 30 60 90 FEET

DRAWING ISSUED
DATE: 09/07/03
- ☐ PRELIMINARY
- ☐ APPROVAL
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- ☐ CONSTRUCTION
- ☐ REFERENCE
- ☐ REVISION
- ☒ AS-BUILT

YR. MO. DAY
SEPIA MADE

DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
--	--	--	0	ORIGINAL DRAWING DATE	--	--	--

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ALCOA INC.
FORMER VANCOUVER OPERATIONS

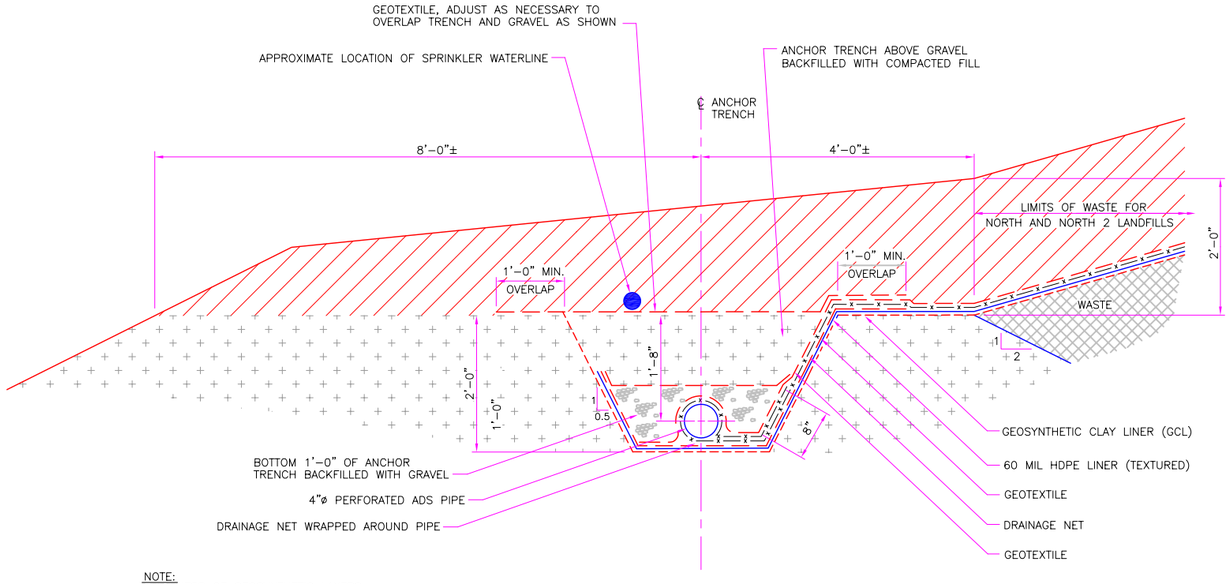
AS-BUILT CONDITIONS – NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

SOUTH BANK AREA OF CONCERN AS-BUILT EXISTING/FINAL CONDITIONS

IN CHARGE OF: MARK STIFFLER	DWG CLASS:	DESIGNED BY: BERGMANN ASSOCIATES
SCALE: 1" = 30'	EQUIP. NO.:	DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046146-WW	SHEET NUMBER: C-7	CHECKED BY: A. BURBA
		APPROVED BY: P. SULLIVAN

G:\Vancouver\5726.00\Cert Report\South Bank AOC
Plot Date/Time: 9/16/05 10:30am
Format Revised:
Image:
Xref:

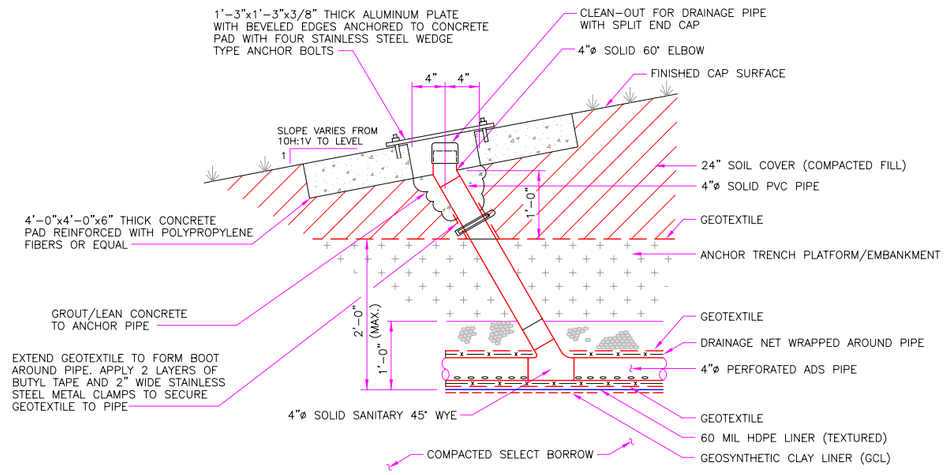
OFFICE Pittsburgh, PA
DRAWING NUMBER A-046147-WW



NOTE:
THICKNESS OF GEOSYNTHETIC LAYERS EXAGGERATED FOR CLARITY. ACTUAL THICKNESS OF GEOSYNTHETICS SHOWN IN DETAIL IS LESS THAN 1 INCH.

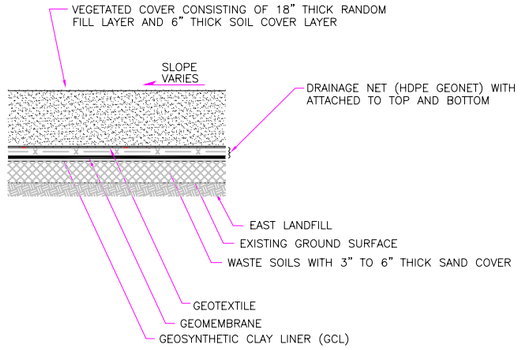
AS-BUILT LANDFILL CROSS SECTION – SHORELINE

NOT TO SCALE



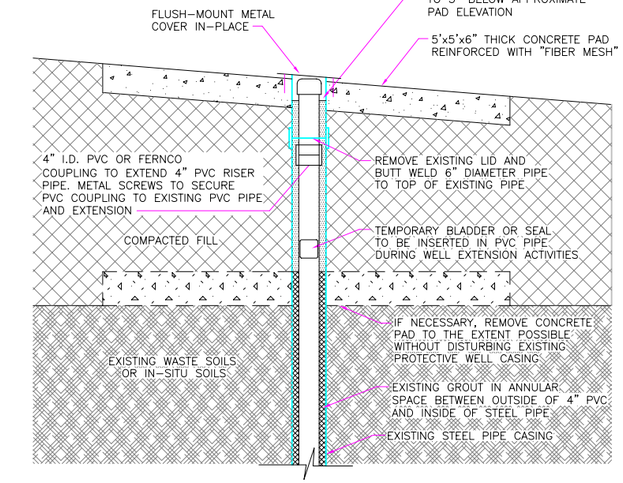
AS-BUILT ANCHOR TRENCH CLEAN-OUT

SCALE: 1"=1'-0"



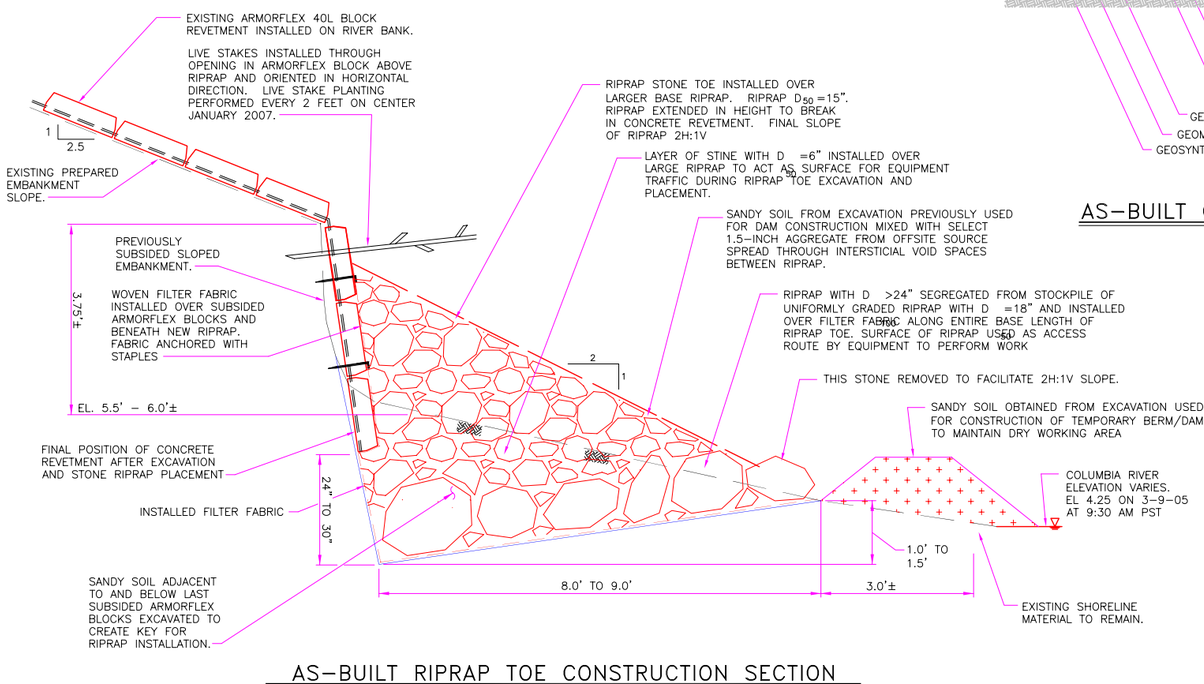
AS-BUILT GEOSYNTHETIC CAP SECTION

NOT TO SCALE



AS-BUILT MONITORING WELL EXTENSION

NOT TO SCALE



AS-BUILT RIPRAP TOE CONSTRUCTION SECTION

NOT TO SCALE

VERIFY SCALE 0 1"

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Plot Date/Time: 9/16/2005 10:30am
Format Revised: 11/25/99
Image: .
Xref: .

DRAWING ISSUED
DATE: 02/12/07
☐ PRELIMINARY
☐ APPROVAL
☐ BIDDING
☐ MATERIAL ORDERING
☐ CONSTRUCTION
☐ REFERENCE
☐ REVISION
☒ AS-BUILT

YR.	MO.	DAY
SEPIA MADE		

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DAY	MONTH	YEAR	NO.	REVISION RECORD		DR.	CK.	ZONE

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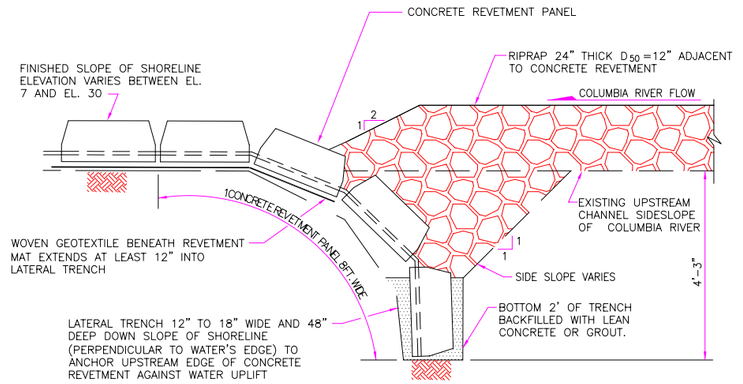
ALCOA INC.
FORMER VANCOUVER OPERATIONS

AS-BUILT CONDITIONS – NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

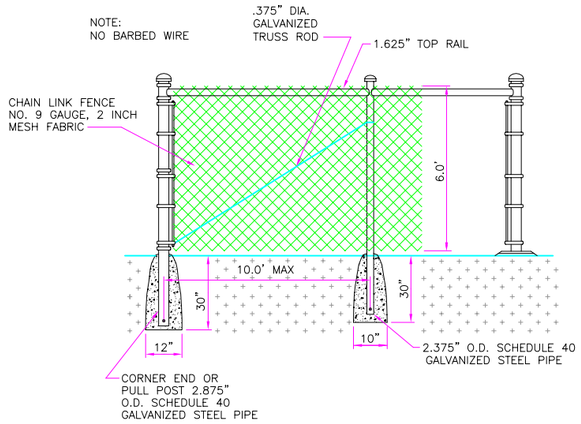
AS-BUILT DETAILS

IN CHARGE OF: MARK STIFFLER	DWG CLASS:	DESIGNED BY: Bergmann Associates
SCALE: AS SHOWN	EQUIP. NO.:	DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046147-WW	SHEET NUMBER C-8	CHECKED BY: P. SULLIVAN
		APPROVED BY: P. SULLIVAN



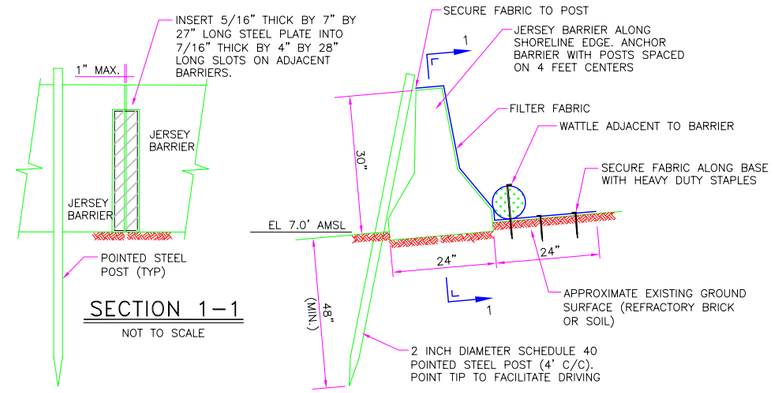
AS-BUILT CONCRETE REVETMENT UPSTREAM AND DOWNSTREAM ANCHOR TRENCH DETAIL

NOT TO SCALE



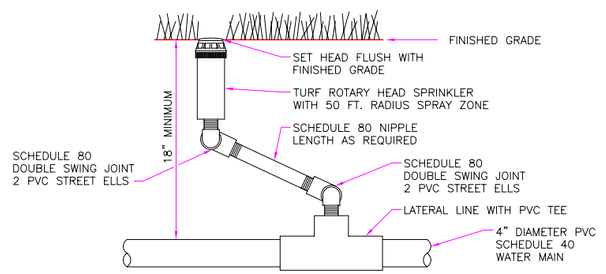
AS-BUILT FENCE

NOT TO SCALE



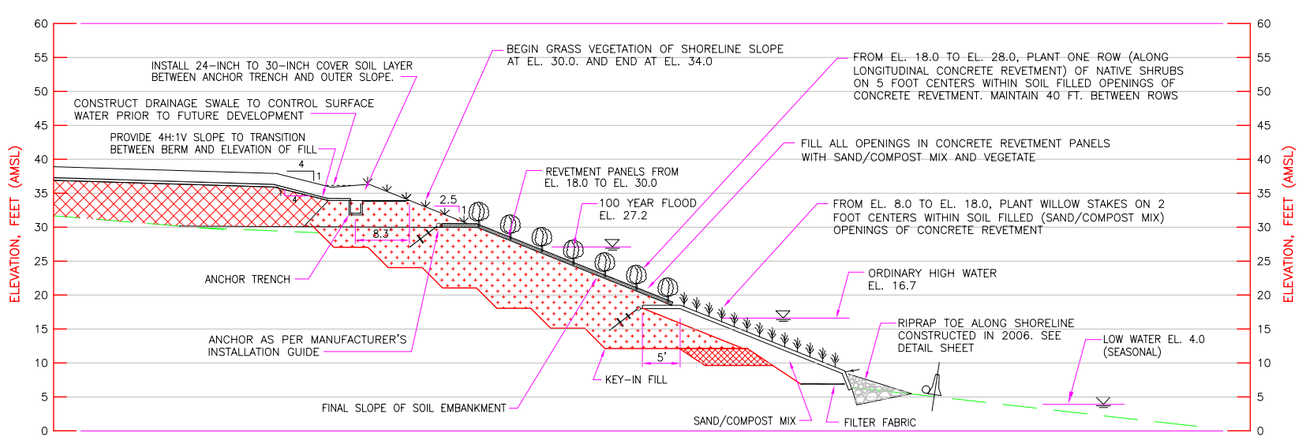
AS-BUILT SHORELINE SILT BARRIER INSTALLATION

NOT TO SCALE



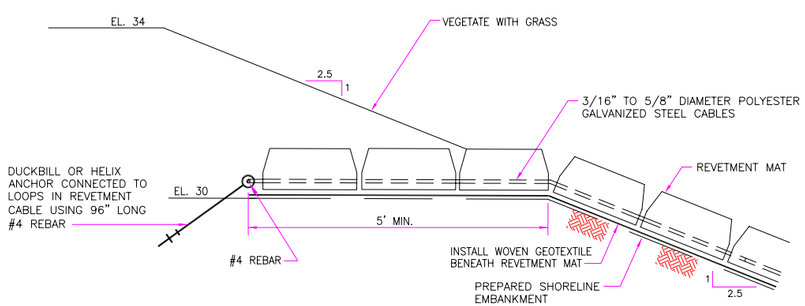
AS-BUILT SPRINKLER HEAD ASSEMBLY

NOT TO SCALE



AS-BUILT SHORELINE EMBANKMENT SECTION

NOT TO SCALE



AS-BUILT REVETMENT ANCHOR/BENCH DETAIL AT EL. 30

NOT TO SCALE

VERIFY SCALE 0 1"

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Plot Date/Time: 9/16/2005 10:30am Xref: .
Format Revised: 11/25/99

DRAWING ISSUED
DATE: 02/12/07
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- ☐ APPROVAL
- ☐ BIDDING
- ☐ MATERIAL ORDERING
- ☐ CONSTRUCTION
- ☐ REFERENCE
- ☐ REVISION
- ☒ AS-BUILT

YR. MO. DAY: SEPIA MADE

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DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
–	–	–	0	ORIGINAL DRAWING DATE	–	–	–

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ALCOA INC.
FORMER VANCOUVER OPERATIONS

AS-BUILT CONDITIONS – NORTH AND NORTH 2 LANDFILLS AND EAST LANDFILL CAP

AS-BUILT DETAILS

IN CHARGE OF: MARK STIFFLER	DWG CLASS:	DESIGNED BY: Bergmann Associates
SCALE: AS SHOWN	EQUIP. NO.:	DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046148-WW	SHEET NUMBER C-9	CHECKED BY: P. SULLIVAN
		APPROVED BY: P. SULLIVAN

ATTACHMENT D

ARMORFLEX CERTIFICATE OF COMPLIANCE

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

ARMORTEC
Erosion Control Solutions

January 29th, 2004

Mr. Al Burba
ALCOA Inc.
201 Isabella Street
RWG 5K04
Pittsburgh, PA. 15212

RECEIVED
FEB = 4 2004
ARMI REMEDIATION

Re: ALCOA Landfill
Alcoa P.O. 190004527
Certificate of Compliance

Dear Mr. Burba:

This Certificate of Compliance is in reference to the revetment block mats that were furnished to Alcoa under purchase order No. 190004527, dated August 5th, 2003. This material was installed along the bank of the Columbia River at the Alcoa Vancouver Works property located at 5701 NW River Road, Vancouver, Washington.

The ArmorFlex Class 40L Articulating Concrete Block System furnished by Contech on this project utilized open-celled half blocks, rather than solid-celled half blocks that were originally specified. In addition, Armortec warranties the open-celled half blocks performance to meet or exceed the solid-celled half blocks.

Thank you.

Sincerely,
ARMORTEC
Derek Dice
Director of Engineering

c.c. Pat Sullivan, Bergmann and Associates
Jeff Johnson, Envirocon
Bruce Richartz, ALCOA
Bob Yazdaniha, Oregon Culvert

State of Kentucky
County of Warren

Subscribed and Sworn to before me this 29th day of January, 2004.
My commission expires: June 16, 2006.

Notary Public, Warren County, Kentucky

ORIGINAL

tackie,
PLEASE HAVE THIS SCANNED AND ORIGINAL TO PATTIC

4301 Industrial Drive • P.O. Box 20308 • Bowling Green, Kentucky 42102 • Phone 270.843.4659 • Fax 270.783.8952

ARMORTEC
Erosion Control Solutions

January 29th, 2004

Mr. Al Burba
ALCOA Inc.
201 Isabella Street
RWG 5K04
Pittsburgh, PA. 15212

Re: ALCOA Landfill
Alcoa P.O. 190004527
Certificate of Compliance

Dear Mr. Burba:

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Thank you.

Sincerely,
ARMORTEC
Derek Dice
Director of Engineering

c.c. Pat Sullivan, Bergmann and Associates
Jeff Johnson, Envirocon
Bruce Richartz, ALCOA
Bob Yazdaniha, Oregon Culvert

State of Kentucky
County of Warren

Subscribed and Sworn to before me this 29th day of January, 2004.
My commission expires: June 16, 2006.

Notary Public, Warren County, Kentucky

COPY

4301 Industrial Drive • P.O. Box 20308 • Bowling Green, Kentucky 42102 • Phone 270.843.4659 • Fax 270.783.8952

ATTACHMENT E

HYDROSEEDING INFORMATION

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

FEBRUARY, 2006

BRIAR GROUP, INC.
P.O. Box 23220
Federal Way, WA 98093-0220

Envirocon Inc.
Attention: Jeff Johnson

August 13, 2004

Re: **Alcoa Vancouver Project**

12-15 acres DOT Application

2000#	Wood Fiber
80#	40% Per Rye, 40% Creeping Red Fescue, 10% Highland Bent, 10% White Clover
250#	21-7-14 Fertilizer
40#	Tac

The above specification is the basis for our quote. Quote is based on 10 acre minimum with one site visit. We understand that pressurized water source will be available to us on the site.

We look forward to working with you on this project. If we can provide any additional information please call at 1-800-635-TURF.

Sincerely,

Carol Davis
President
Briar Group Inc.

WBE Certified

ATTACHMENT F

RIPRAP REPAIR DESIGN DRAWINGS

REMEDIATION OF NORTH AND NORTH 2 LANDFILLS

AND EAST LANDFILL CAP CONSTRUCTION PROJECT

FORMER VANCOUVER OPERATIONS
VANCOUVER, WASHINGTON

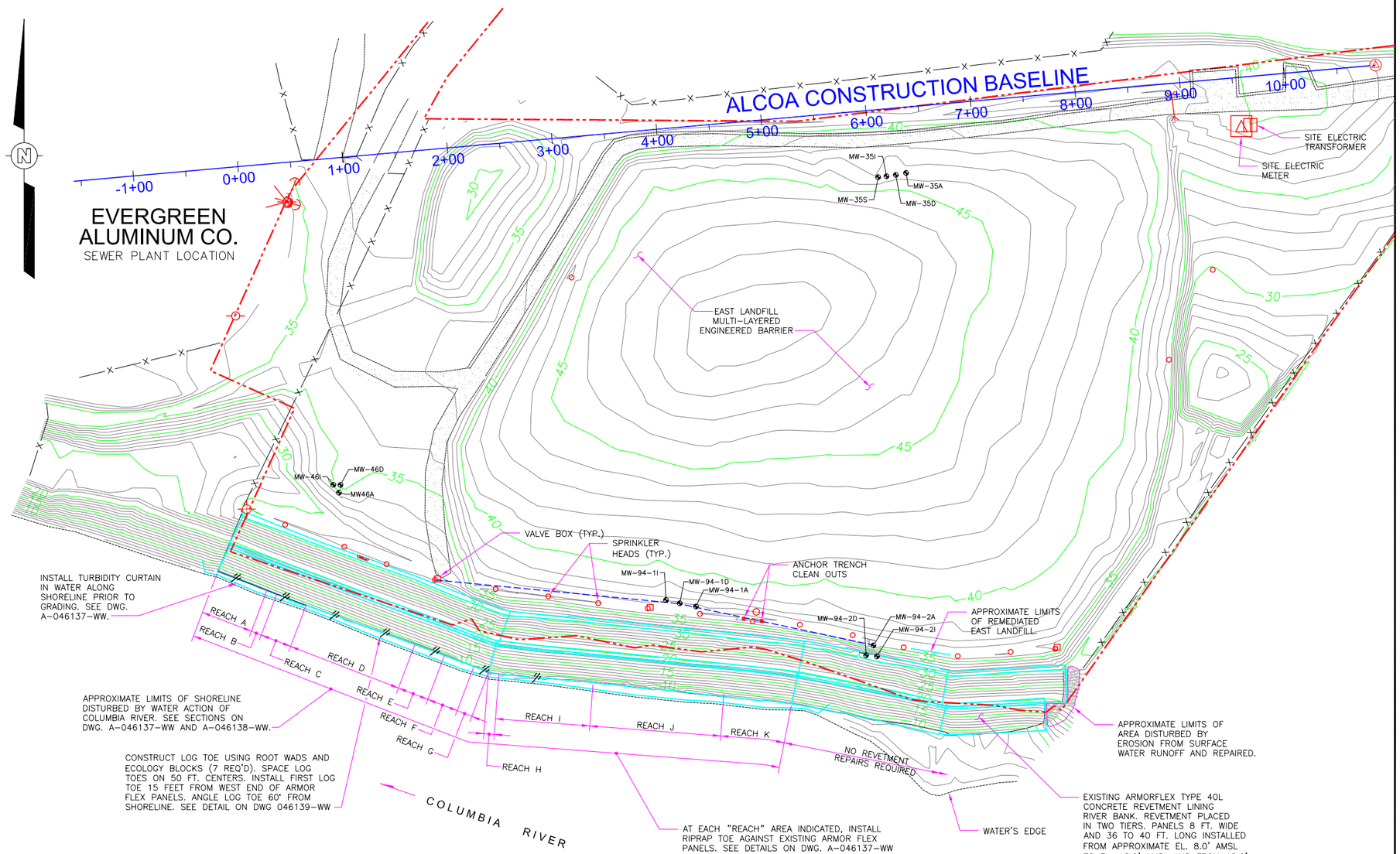
FEBRUARY, 2006

DRAWING NUMBER A-046136-WW

OFFICE PITTSBURGH, PA

EVERGREEN ALUMINUM CO.

SEWER PLANT LOCATION



PLAN OF SHORELINE RIPRAP PLACEMENT

SCALE 1" = 50'

VERIFY SCALE 0 1"

LEGEND:

- EXISTING CONTOUR ELEVATION (FT-AMSL)
- EXISTING FENCE
- EXISTING ACCESS ROAD
- PROPERTY BOUNDARY FOR COLUMBIA II PARCEL I (11.39 ACRES)
- MONITORING WELL
- SPRINKLER HEAD
- VALVE BOX

GENERAL NOTES:

1. THIS DRAWING IS REPRESENTATIVE OF THE CONDITIONS IN THE FIELD. APPROXIMATE EXISTING GROUND SURFACE OBTAINED FROM TOPOGRAPHIC AND HYDROGRAPHIC SURVEY CONDUCTED BY KPFF CONSULTING ENGINEERS ON MARCH 22, 2000 AND SUPPLEMENTED FROM THE AS-BUILT SURVEY PERFORMED ON NOVEMBER 5, 2004 BY W&H PACIFIC ENGINEERS AND SURVEYORS.
2. ALL REPAIR WORK TO THE REVETMENT LINING THE BANK SHALL BE PERFORMED FROM A FLOATING PLANT ON THE COLUMBIA RIVER.

REVETMENT REPAIR SCHEDULE

REACH	APPROXIMATE REPAIR LENGTH	REPAIR DETAIL
A	50 FEET	DETAIL 4 – 3 BLOCK
B	10 FEET	DETAIL 2 – 2 BLOCK
C	30 FEET	DETAIL 4 – 3 BLOCK
D	110 FEET	DETAIL 5 – 3 BLOCK
E	30 FEET	DETAIL 3 – 4 BLOCK
F	30 FEET	DETAIL 5 – 3 BLOCK
G	15 FEET	DETAIL 4 – 3 BLOCK
H	10 FEET	DETAIL 3 – 4 BLOCK
I	90 FEET	DETAIL 1 – 3.5 BLOCK
J	125 FEET	DETAIL 3 – 4 BLOCK
K	65 FEET	DETAIL 1 – 3.5 BLOCK

FOR DETAILS ON THE REPAIRS SEE DRAWINGS A-046137-WW AND A-046137-WW

ESTIMATED QUANTITIES

ITEM	QUANTITIES
EXCAVATION	230 CY
FILTER FABRIC	950 SY
STONE RIPRAP	900 TONS

SCALE 0 50 100 150 FEET

DRAWING ISSUED

DATE: 03/15/05

- ☐ PRELIMINARY
- ☐ APPROVAL
- ☐ BIDDING
- ☐ MATERIAL ORDERING
- ☒ CONSTRUCTION
- ☐ REFERENCE
- ☒ REVISION
- ☐

YR. MO. DAY

SEPIA MADE

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DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
1	NOV	05	2	ADDED LOG TOES	RWH	PJS	--
15	MAR	05	1	REVISED REACH LENGTH AND QUANTITIES	RJB	PJS	--
04	MAR	05	0	ORIGINAL DRAWING DATE	RJB	PJS	--

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ALCOA INC.

FORMER VANCOUVER OPERATIONS

EAST LANDFILL REHABILITATION PROJECT

PLAN OF PROPOSED WORK

IN CHARGE OF: MARK STIFFLER	DWG CLASS:		DESIGNED BY: BERGMANN ASSOCIATES
SCALE: 1"=50'	EQUIP. NO.:		DRAWN BY: RJB / RWH
DRAWING NUMBER: A-046136-WW		SHEET NUMBER C-1	CHECKED BY: P. SULLIVAN
			APPROVED BY: P. SULLIVAN

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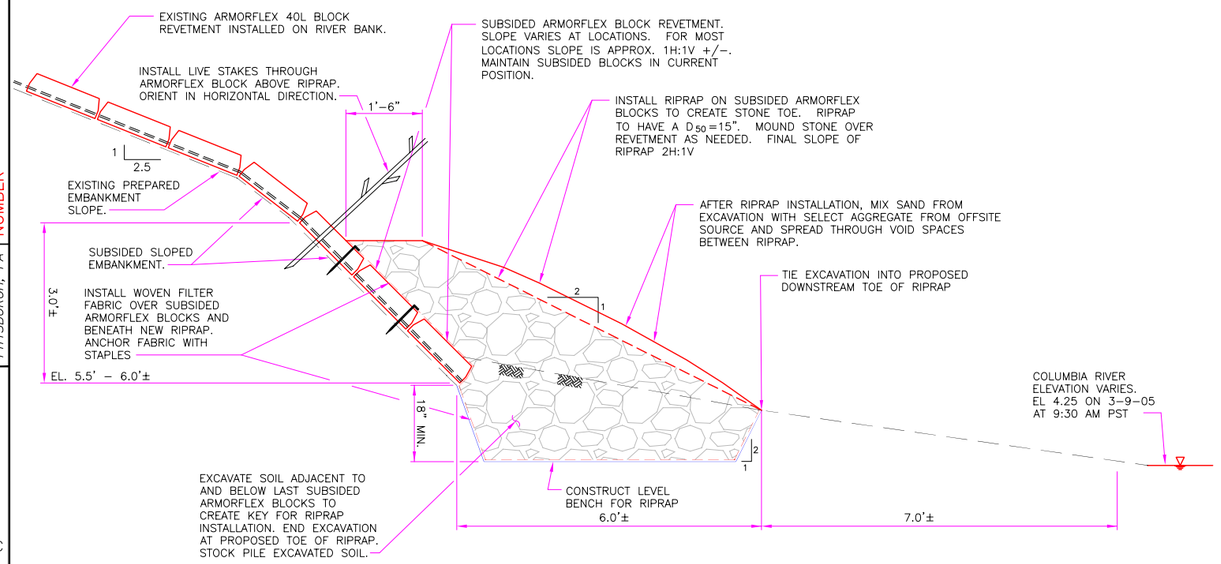
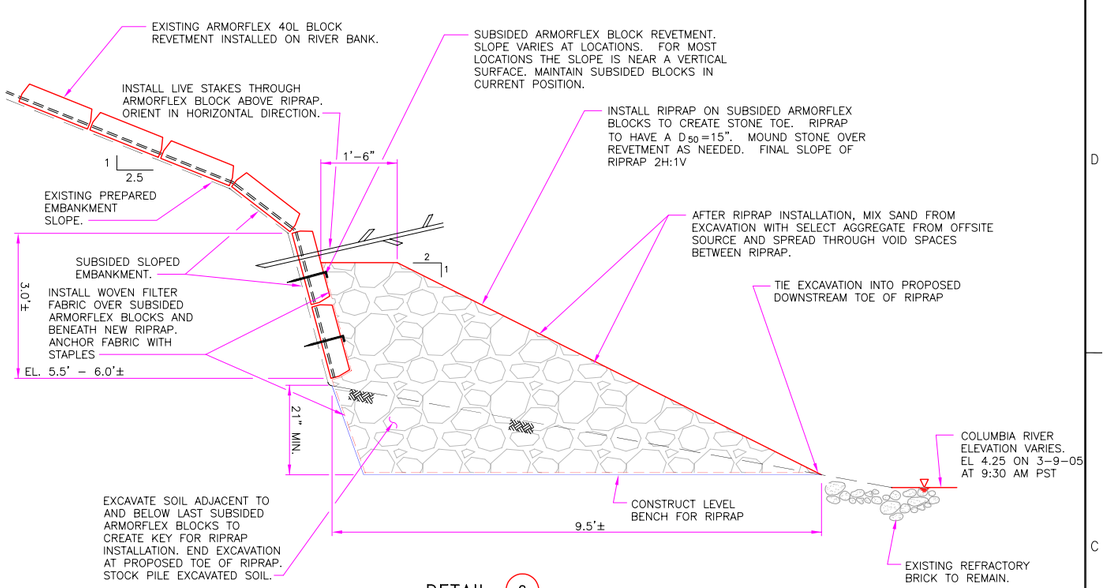
Plot Date/Time: 11/1/05 2:07pm
Format Revised:
Images:
Xref:

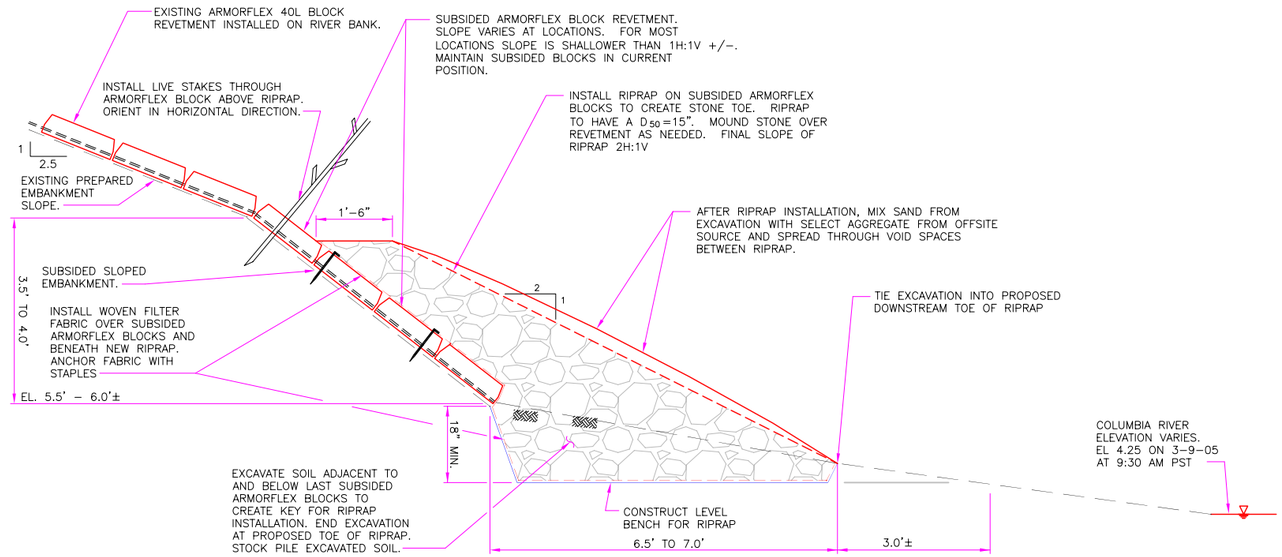
OFFICE PITTSBURGH, PA
DRAWING NUMBER A-046137-WW



DETAIL 1
3.5 BLOCK RIPRAP DETAIL
SCALE 3/4" = 1'-0"



DETAIL 2
2 BLOCK RIPRAP DETAIL
SCALE 3/4" = 1'-0"



DETAIL 3
4 BLOCK RIPRAP DETAIL
SCALE 3/4" = 1'-0"

VERIFY SCALE 0 1"

S C A L E
0 1 2 3 4 FEET

DRAWING ISSUED
DATE: 03/15/05
- ☐ PRELIMINARY
- ☐ APPROVAL
- ☐ BIDDING
- ☐ MATERIAL ORDERING
- ☒ CONSTRUCTION
- ☐ REFERENCE
- ☒ REVISION
- ☐

YR. MO. DAY
SEPIA MADE

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DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
22	MAR	05	1	revise sections based on reconnaissance	RJB	PJS	--
04	MAR	05	0	ORIGINAL DRAWING DATE	RJB	PJS	--

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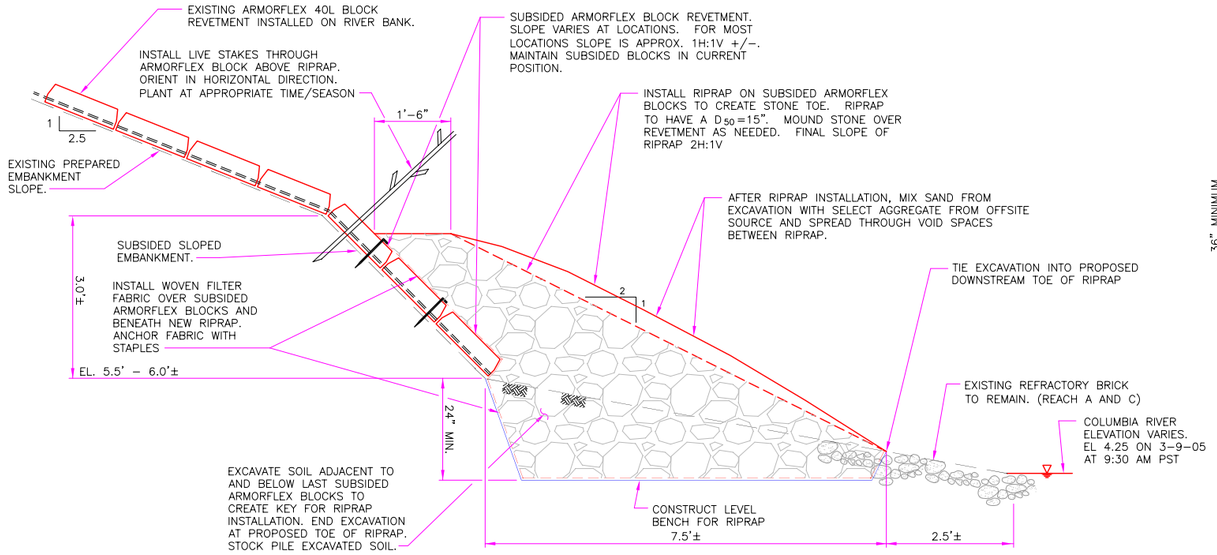
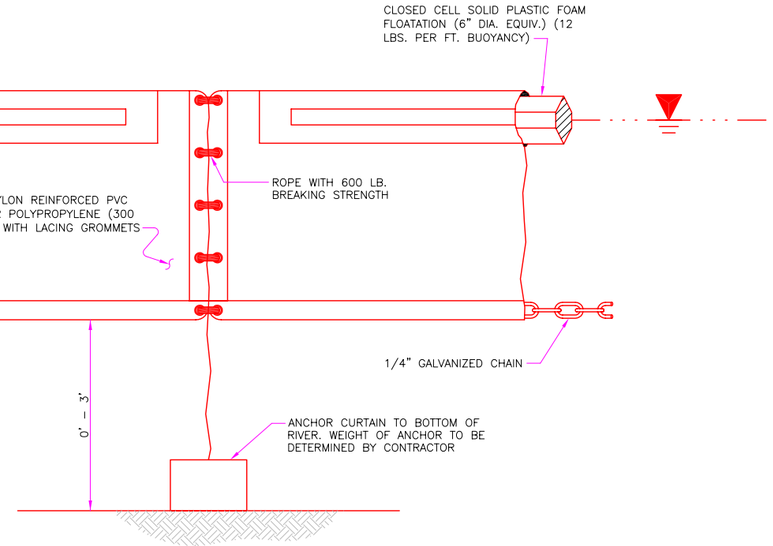
ALCOA INC.
FORMER VANCOUVER OPERATIONS
EAST LANDFILL REHABILITATION PROJECT
DETAILS

IN CHARGE OF: MARK STIFFLER	DWG CLASS:		DESIGNED BY: BERGMANN ASSOCIATES
SCALE: 3/4"=1'-0"	EQUIP. NO.:		DRAWN BY: RJB / RWH
DRAWING NUMBER: A-046137-WW		SHEET NUMBER C-2	CHECKED BY: P. SULLIVAN
			APPROVED BY: P. SULLIVAN

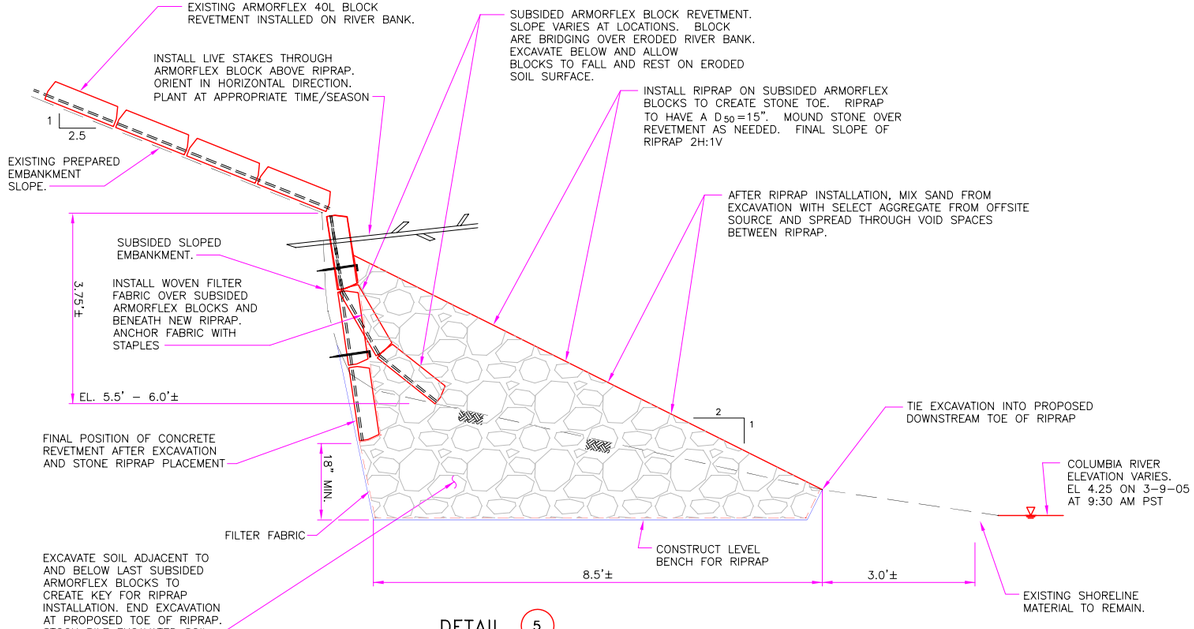
Q:\Vancouver\5726.00\Revetment Repairs\REVETMENT-SECTIONS
Plot Date/Time: 3/7/05 11:46am
Format Revised:
Image:
Xref:



DETAIL 4
3 BLOCK RIPRAP DETAIL
SCALE 3/4" = 1'-0"



DETAIL 6
FLOATING TURBIDITY BARRIER
NOT TO SCALE



DETAIL 5
3 BLOCK RIPRAP DETAIL
SCALE 3/4" = 1'-0"

VERIFY SCALE 0 1"

SCALE 0 1 2 3 4 FEET

Q:\Vancouver\5726.00\Revetment Repairs\REVETMENT-SECTIONS
Plot Date/Time: 3/7/05 11:46am
Format Revised: Image:
Xref:

DRAWING ISSUED
DATE: 03/15/05
- ☐ PRELIMINARY
- ☐ APPROVAL
- ☐ BIDDING
- ☐ MATERIAL ORDERING
- ☒ CONSTRUCTION
- ☐ REFERENCE
- ☐ REVISION

YR. MO. DAY
SEPIA MADE

DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
22	MAR	05	1	revise sections based on reconnaissance	RJB	PJS	
15	MAR	05	0	ORIGINAL DRAWING DATE	RJB	PJS	--

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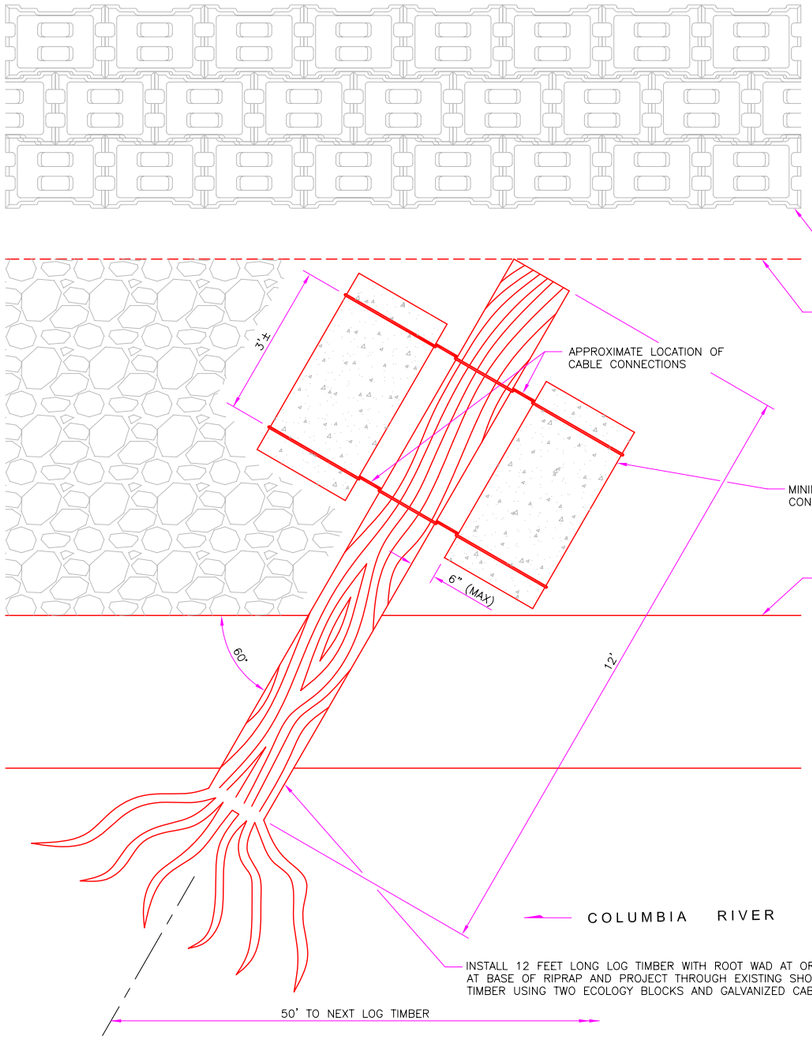
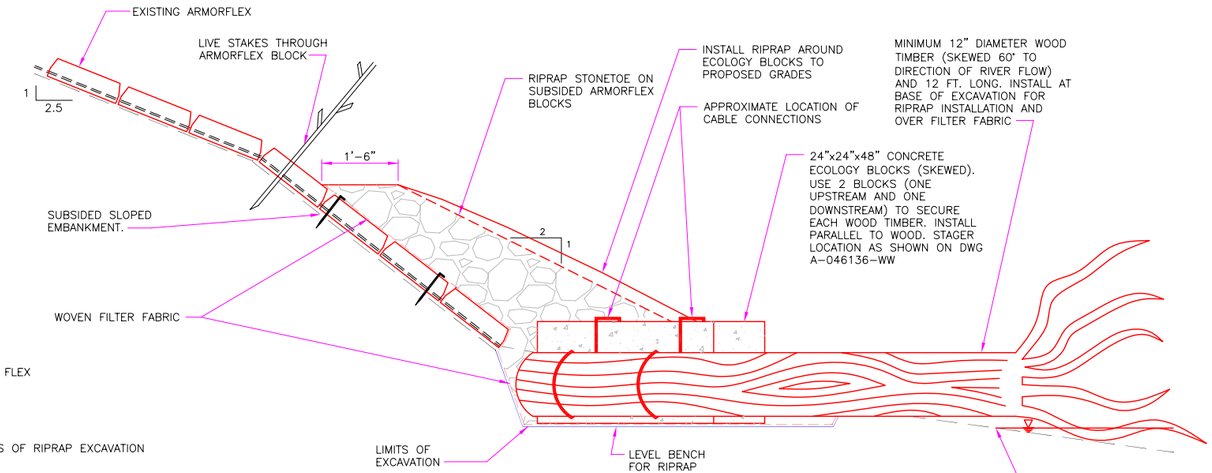
ALCOA INC.
FORMER VANCOUVER OPERATIONS
EAST LANDFILL REHABILITATION PROJECT
DETAILS

IN CHARGE OF: MARK STIFFLER	DWG CLASS:	DESIGNED BY: BERGMANN ASSOCIATES
SCALE: 3/4"=1'-0"	EQUIP. NO.:	DRAWN BY: RJB / RWH
DRAWING NUMBER: A-046138-WW	SHEET NUMBER C-3	CHECKED BY: P. SULLIVAN
		APPROVED BY: P. SULLIVAN

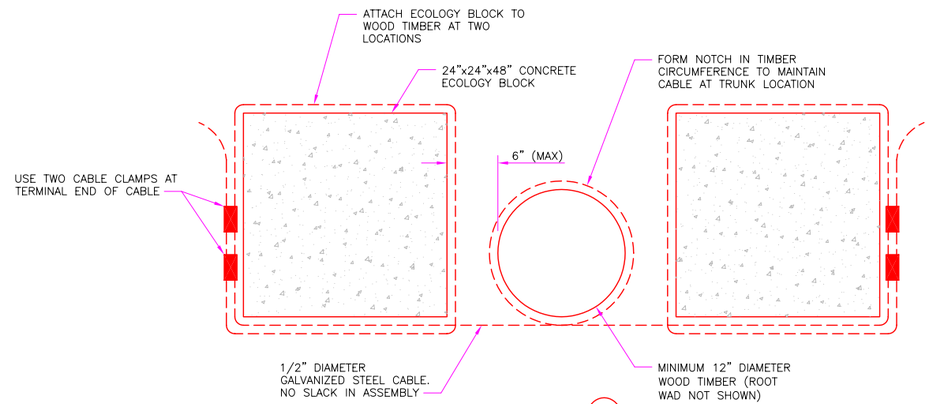
OFFICE PITTSBURGH, PA
DRAWING NUMBER A-046139-WW



DETAIL 7
ENLARGED PLAN
SCALE 3/4" = 1'-0"



DETAIL 8
LOG TOE ELEVATION
SCALE 3/4" = 1'-0"



DETAIL 9
LOG TOE SECTION
NOT TO SCALE

SCALE
0 1 2 3 4 FEET

VERIFY SCALE 0 1"

Q:\Vancouver\5726.00\Revetment Repairs\REVETMENT-SECTIONS
Plot Date/Time: 11/1/05 4:26pm
Format Revised:
Xref:

DRAWING ISSUED
DATE: 11/1/05
- ☐ PRELIMINARY
- ☐ APPROVAL
- ☐ BIDDING
- ☐ MATERIAL ORDERING
- ☒ CONSTRUCTION
- ☐ REFERENCE
- ☐ REVISION
- ☐

YR. MO. DAY
SEPIA MADE

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DAY	MONTH	YEAR	NO.	REVISION RECORD	DR.	CK.	ZONE
1	NOV	05	0	ORIGINAL DRAWING DATE	RWH	PJS	--

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ALCOA INC.
FORMER VANCOUVER OPERATIONS
EAST LANDFILL REHABILITATION PROJECT
DETAILS

IN CHARGE OF: MARK STIFFLER	DWG CLASS:		DESIGNED BY: BERGMANN ASSOCIATES
SCALE: 3/4"=1'-0"	EQUIP. NO.:		DRAWN BY: R. HARRISON
DRAWING NUMBER: A-046139-WW		SHEET NUMBER C-4	CHECKED BY: P. SULLIVAN
			APPROVED BY: P. SULLIVAN

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Oregon Fish and Wildlife Office
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266
Phone: (503)231-6179 FAX: (503)231-6195

Reply To: 8330.06854(05)
File Name: Alcoa bank stabilization LOC (TS05-3254).doc
TS Number: 05-3254

OCT 17 2005

Colonel Debra M. Lewis, Commander
U.S. Army Corps of Engineers
CENWS-OD-RG ATTN: Ron Klump / 200500271
P.O. Box 3755
Seattle, Washington 98124-2255

Subject: Request for informal consultation to provide bank protection along the Columbia River shoreline near Vancouver, Clark County, Washington; 1-7-05-I-0685, Corps Reference Number: 200500271.

Dear Colonel Lewis:

The U.S. Fish and Wildlife Service (Service) has received your biological evaluation (BE) for the proposed Bank Stabilization Project along the Columbia River near Vancouver, Washington. Your letter, dated August 30, 2005, requesting section 7 consultation in accordance with the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), was received on September 8, 2005. Of interest to the Service are effects to bald eagle (*Haliaeetus leucocephalus*) and bull trout (*Salvelinus confluentus*) from your proposed action.

The Corps had previously authorized shoreline stabilization at this location as part of the Remediation of the East Landfill Project (Corps number 200400401). The Service consulted on the Corps previous action and concurred with a "may affect, not likely to adversely affect" determination for ESA listed species at that time (Consultation number 1-7-02-I-606).

The purpose of the current proposed action is to provide additional bank stabilization to nearly 1000 feet of shoreline along the north shore of the Columbia River at river mile 103.4 approximately three miles north of the City of Vancouver, Washington. The 1000-foot embankment that was constructed as part of the previous shoreline stabilization has now begun to erode. As a result, Alcoa, Incorporated is now proposing to place riprap at the toe of the embankment. Willow stakes will then be planted in the interstitial spaces of the riprap to "soften" the design.

A detailed discussion of the techniques, procedures, and timing used to accomplish bank stabilization at this site are presented in the BE, and are in our administrative record and incorporated herein by reference.

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TAKE PRIDE IN AMERICA

Based upon information in the BE, and information in our files, we concur with the Corps determination that the proposed action "may affect, but is not likely to adversely affect" bald eagle and bull trout for the following reasons:

1. Proposed project activity could temporarily displace foraging bald eagles; however, there is abundant suitable foraging habitat throughout this reach of the lower Columbia River, and displaced eagles would likely forage elsewhere during disposal activities.

2. The nearest bald eagle nest or communal roost is greater than one-mile from the proposed project area. Further, because of the level of human activity, and absence of bald eagle nesting or roosting habitat near the scour holes, it is unlikely that bald eagles will use these areas for nesting or communal roosting.

3. Bull trout are known to have occurred historically in the Columbia River, but now appear to occur incidentally. In fact, bull trout occurrence in the lower Columbia River, while not unheard of, is sporadic at best, with very few confirmed observations. Further, the lower Columbia River does not contain spawning or rearing habitat for bull trout. The nearest known spawning areas for are greater than 100 river miles from the action area, so it is unlikely that juvenile bull trout would be present in the area.

If you have any questions or concerns about this consultation or the consultation process in general, please feel free to contact Greg Smith of my staff at (503) 231-6179.

Sincerely,

Kemper M. McMaster
State Supervisor

Cc:
Michelle Walker (Corps)
Stephanie Ehinger (NMFS)

Printed on 100 percent chlorine free/60 percent post-consumer content paper.

P.O. Box 1995
Vancouver, WA 98668-1995

City of VANCOUVER WASHINGTON

www.ci.vancouver.wa.us

LETTER OF TRANSMITTAL

TO: BRUCE RICHARTZ TO ALCOA PO BOX 115 ADDY WA 99101. .
FROM: Development Services Division
DRS Engineering– Katherine Marcaida
1313 Main Street - (360) 735-8873 x 8745
DATE: May 18, 2006
SUBJECT: Revetment Wall/GRD2005-00134[redacted]

Requirements: **SUBMIT for SIGNATURE**

Please submit the following:

- ☒ **1 Mylar Cover Sheet** with ALL **Plan/Profile & Detail** sheets. All **Reports** labeled as **FINAL**. ALL 'Redline' revisions from prior reviews addressed.
- ☒ **1 FULL SET PAPER COPIES FOR CHECKPRINTS**
- ☒ Previous 'Redlines' from **Last Review** by each Discipline (Water / Sewer / Storm / Transportation / Fire / Building / Planning)
- ☒ Copy of this Transmittal.

Where to submit:
Development Review Services Information Counter
Citizens Service Center (1st first floor)
1313 Main Street, Vancouver WA
****Request Engineering for Assistance****

PLEASE NOTE: The following proportionate share fee has been assessed and will require payment prior to the release of signed mylar [redacted] Payment needs to made at 610 Esther Street, Vancouver, WA. Submit a copy of a paid receipt to Development Review Services. You may contact us at (360) 735-8873 x8678 for additional information. The following fees have been assessed and will require payment prior to release of mylars $ 949.00

***** COMMENTS: Mailing storm/bldg/trans and planning 2nd review redlines***ATTN: BRUCE RICHARTZ TO ALCOA PO BOX 115 ADDY WA 99101. Revise and submit mylars for signature. 05/18/2006 kjm.**

Inspection fees may be assessed once mylars have been submitted for signature.

City of VANCOUVER WASHINGTON

P.O. Box 1995
Vancouver, Wa
98665-1995
1313 Main Street
Phone: 360-696-8105

APPLICATION SUMMARY
Grading Permit
GRD2005-00134

Status: WCI
Entered By: DC

Received: 11/8/2005
Eng Site Visit:
Approved Plans:
Apprv to Construct:
Finaled:
Expired:

Team: CNTR Project Name: REVETMENT WALL Project #: GRD2005-00134

Site Address: 3702 NW GATEWAY AV - Parcel #: 1521670000

Scope of Work: STND_ALONE Review Type: Cross Reference #:

Work Order#:

Sect/Twnshp/Range: 20 / 2 / 11
Est. Parcel Area (Acre): 45.92
Est. Parcel Area (Sq. Ft.): 0.00

School Imp Fee Dist: VC
Transp Imp Fee Dist: VC
Park Imp Fee Dist: 1
Transp Overlay Fee Dist:

Description:
2nd GRADING CIVIL REVIEW DUE DATE 05/15/2006 working with Jon Wagner on this

First Line Legal:
#2 HENRY VAN ALMAN DLC 45.92A

Applicant:
BRUCE RICHARTZ
PO BOX 115
ADDY WA 99101

Phone: 509-935-3210

Owner:

Today's Activities:	Activity Date:	Assigned To:	Done By:	Notes:
1.) Print Application Summary	5/18/2006		KJM	
2.) Return Redlines to Applicant	5/18/2006		KJM	Mailing storm/bldg/trans and planning 2nd review redlines***ATTN: BRUCE RICHARTZ TO ALCOA PO BOX 115 ADDY WA 99101. Revise and submit mylars for signature. 05/18/2006 kjm.

CONDITIONS:

Printed: 5/18/2006 1:13:37PM

FCOVERSHT99-01.RP

Modified Date: 5/18/2006

Fees Associated With

5/18/2006
1:16:44PM

Case #: GRD2005-00134

Fee Type	Start Date	End Date	Description	Revenue Account Number	Created By	Date	Fee	Amount Paid
GRPM	1/1/1999	12/31/2050	Grading Plng/Eng 51 + cy	00121100034589200000000000	JES	11/21/2005	770.00	770.00
GBPR	10/4/2001	12/31/2050	Building Grading Plan Review	48321100034584100000000000	JES	11/21/2005	37.00	37.00
GBP	10/4/2001	12/31/2050	Building Grading Permit	48321100034584100000000000	JES	11/21/2005	142.00	142.00
							Total Due:	**$949.00**

05/23/2006 11:15 5099353414 NWA PAGE 04

CaseFees.rpt

P.O. Box 1995
Vancouver, WA 98668-1995

City of VANCOUVER WASHINGTON

www.ci.vancouver.wa.us

July 03,2006

ALCOA INC.
201 ISABELLA ST
PITTSBURG PA 15212-5858

RE: Plan Approval Letter for REVETMENT WALL - **GRADING ONLY**
GRD2005-00134; GRD2005-00134

Engineering Plans for grading only for the above project are hereby approved for construction. This approval is good for one year, and is effective from the date shown on the City of Vancouver approval block on the plans. Final acceptance is dependent on complying with the requirements (erosion control and grading requirements) of the City of Vancouver Erosion Control Specialist. This is to ensure that the City Standards are met and that the site will be stabilized in the event the following approvals for **REVETMENT WALL** are delayed.

Grading may not begin until the grading permit(s) have been obtained. Once erosion control measures are in place the Contractor must call the Erosion Control Specialist (360) 619-4145 for a Pre-Con meeting and a Pre-Con meeting must be held with the Zoning Inspector (360) 619-1200 prior to any grading or private storm construction being done. The preconstruction meeting will be held within 48 hours of the notification from the contractor.

If you have any questions, please call the Engineering Review Team @ 360-696-8105.

Respectfully,

Sharon O. Derby
DRS Engineering

cc: Engineering Firm
Erosion Control
Zoning Inspector
File

*** Additional Information & Fees may be required.**

Northwest Alloys, Inc.

P.O. Box 115
Addy, Washington 99101-01
509-935-3300

FACSIMILE TRANSMITTAL

Priority: ~~URGENT~~ (STANDARD)

Deliver to:

Name: AL BURBA

Company: ALCOA

Facsimile No.: (412) 553-4822

Telephone No.: (412) 553-2007

Date: 2/5/07

Number of pages including cover page: _____

From:

NORTHWEST ALLOYS, INC.
1560A MARBLE VALLEY BASIN ROAD
P. O. BOX 115
ADDY, WASHINGTON 99101-0115

BRUCE RICHARTZ
Sender's Name

(509) 935-3414
Facsimile Number

(509) 935-3210
Telephone Number

Please call (509) 935-3210 if message is not received complete.

Message: ~~ATTACHED~~ IS A COPY OF THE FINAL INSPECTION SIGN OFF BY MANUEL CAMPOS, CITY OF VANCOUVER ZONING INSPECTOR, FOR THE VANCOUVER SITE REINFORCEMENT WALL JOB REPAIR PROJECT. THIS DOCUMENT SHOWS FINAL SIGN OFF FOR GRADING INSPECTION, EROSION, & ZONING ON 2/1/07.

/mh/fax/2

Bruce.

DEVELOPMENT REVIEW SERVICES

JOB SITE COPY

ADDRESS: 3702 NW GATEWAY

BUILDING PERMIT NUMBER: GRD 2005-00134

JOB SITE INSPECTION RECORD - APPROVAL SHALL BE POSTED ON SITE

INSPECTION		CN	RESULT	DATE	BY
410	Erosion Control Measures in Place				
140	Tree Protection Barrier				
	REQUIRED NOT TO POUND FOOTINGS				
130	Setback / Footings				
115	Foundation Steel				
116	Foundation Stem Walls				
375	Hold Downs Embedments				
125	MISC Reinforced Steel				
150	Ufer Ground				
	DO NOT POUR SLAB UNTIL ABOVE IS APPROVED				
155	Under Slab Electrical				
135	Under Slab Mechanical				
135	Insulation Slab				
105	Groundwork Plumbing				
106	GWP Grease Trap / Interceptor				
120	Interior Footings/Slab				
105	Bond Beam / Masonry Steel				
115	Fireplace Steel				
	DO NOT FRAME UNTIL ABOVE IS APPROVED				
145	Post & Beam / Underfloor framing				
	DO NOT SHEETROCK UNTIL ABOVE IS APPROVED				
150	Exterior Shear Nailing				
152	Interior Shear Nailing				
155	Roof Sheathing Nailing				
175	Hold Downs Installation				
140	Rough Plumbing				
160	Rough Tub / Shower Pan				
165	Rough Gas Piping / TEST				
170	Rough Mechanical				
185	Rough Electrical				
190	Electrical Service				
195	Rough AG Fire / TEST				
201	Med Gas / Start Test				
202	Med Gas / Finish Test				
198	Fire Caulking				
210	Rough Framing				
	DO NOT COVER UNTIL ABOVE IS APPROVED				
163	Insulation Walls / Ceiling / Vault				
183	Final Insulation Floors / Attics				
210	Exhaust Fan Ducts				
	DO NOT COVER UNTIL ABOVE IS APPROVED				
165	Sheetrock 1st Layer				
166	Sheetrock 2nd Layer				
	DO NOT TAPE UNTIL ABOVE IS APPROVED				
	Ceiling Mechanical				
	Ceiling Electrical				
	Ceiling Fire / SPRINKLERS ONLY				
	Ceiling Grid Installation				
	DO NOT COVER UNTIL ABOVE IS APPROVED				

INSPECTION		CN	RESULT	DATE	BY
620	Rough UG Fire /HYDRO TEST				
623	Under Ground FLUSH				
215	Infiltration				
220	Sewer				
230	Water				
370	Storm Drain /Storm Sewer				
425	Site Drainage				
735	Underground Electrical				
	DO NOT BACKFILL UNTIL ABOVE IS APPROVED				

	DEMOLITION INSPECTIONS:				
560	Septic Tank Fill / Pump Receipt				
645	UG Storage Tank Removal & Fill				
527	Final Demolition -DMO only				
	GRADING INSPECTIONS:				
435	Grading Site Inspection				
527	Final Grading Inspection -GRD only		AP 2-1-07		MMC
	MANUFACTURED HOMES - MOH PERMITS				
220	Sewer				
230	Water				
735	Underground Electrical				
375	Tie Downs/Blocking				
720	Electrical Service				
710	Final Electrical				
527	Final Mobile Home Inspection				
	SIGN INSPECTIONS:				
130	Setback				
110	Footings / Steel				
705	Ele Equip Connection/if illuminated				
570	Size / Final Zoning				

NO USE OR OCCUPANCY UNTIL BELOW ARE APPROVED

FINAL INSPECTIONS:

	ROW [696-8018 to schedule]				
~~415~~	~~Irrigation System/Backflow Test Report~~				
~~410~~	~~Deduct Meter~~				
~~546~~	~~Grease Trap/Interceptors~~				
~~505~~	~~Re-roofing~~				
~~535~~	~~Landscaping~~				
~~540~~	~~Parking Lot Striping~~				
~~565~~	~~Sidewalks~~ [Private Property]				
~~520~~	~~Gas Piping~~				
~~525~~	~~Mechanical~~				
~~545~~	~~Plumbing~~				
595	Erosion		AP 2-1-07		MMC
585	Zoning		AP 2-1-07		MMC
~~605~~	~~Fire~~				
710	Electrical				
~~505~~	~~Building~~				