American Plating Site
Remedial Action Construction Report

2110 East D Street
Tacoma, Washington

for
Foss Waterway Development Authority

May 14, 2013

GeoEngineers
Earth Science + Technology

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1.0 INTRODUCTION

This Remedial Action Construction Report (RACR) documents the remedial action construction activities performed at the American Plating Site (Site) located at 2110 East D Street in Tacoma, Washington. The American Plating Site occupies approximately 1.4 acres of land that is located along the eastern shoreline at the head of the Thea Foss Waterway (Figure 1). The remedial action was conducted by the Foss Waterway Development Authority (FWDA) to satisfy requirements of a Prospective Purchaser Consent Decree (CD) (No. 03 2 14513 6) issued by the Washington State Department of Ecology (Ecology) to address contamination resulting from releases from past metal plating operations at the Site. The American Plating Facility/Site Identification Number (ID) is 1202 and the Cleanup Site ID is 2539. The remedial actions completed at the Site implemented the preferred cleanup alternative specified in the Ecology-approved Cleanup Action Plan (CAP) (GeoEngineers, 2003) prepared for the Site. The remedial actions included excavation and capping of soil with contaminant concentrations greater than the Site cleanup levels.

Remedial action construction activities were performed by Anderson Environmental Construction (AEC) who was the contractor selected to perform the work. GeoEngineers provided construction observation and documentation for the FWDA. Construction activities associated with remedial actions at the Site were performed between April 9, 2012 and December 3, 2012 and included the following:

- Site preparation;
- Demolition;
- Remedial excavation and backfill;
- Utility corridor excavation and backfill;
- Material management, loading, transport and disposal or recycling;
- Site grading and capping; and
- Site restoration.

The remedial actions were completed in general accordance with the Ecology-approved Engineering Design Report (EDR) (GeoEngineers, 2012) prepared for the Site. The EDR prepared for the American Plating Site is provided in Appendix A. The following sections provide the Site background and summarize remedial action construction activities.

2.0 BACKGROUND

The American Plating Site was historically used for metal plating activities including zinc, cadmium, nickel, brass, chromium, and copper plating operations. Former structures included buildings that housed metal plating operations as well as concrete sumps, drainage features, piping, and tanks that supported operations performed at the Site (see Figure 2 in Appendix A).

Multiple environmental investigations were conducted at the Site between 1988 and 2003 that included characterization of soil and groundwater. Additionally, starting in February 2004 and

continuing through October 2011, semi-annual groundwater monitoring was performed at the Site. The results of Site investigations identified the presence of soil and groundwater with metals at concentrations greater than cleanup levels.

In 2003, interim cleanup actions were performed at the Site. The interim actions included the following:

- Characterization, demolition, and disposal of Site buildings;
- Characterization and disposal of a concrete pad located on the southeast portion of the Site;
- Characterization and disposal of approximately 18,000 gallons of water contained in an approximately 25,000 gallon concrete sump;
- Characterization, demolition, and disposal of the 25,000-gallon concrete sump; and
- Removal of a UST from the Site with an estimated capacity of 700 gallons.

The Interim Action Cleanup performed in 2003 addressed some, but not all, of the contamination on the Site.

Remedial actions that remained to be implemented to complete the preferred cleanup alternative specified in the CAP included the following (see Figure 3 in Appendix A):

- Decommissioning of groundwater monitoring wells that were present at the Site from previous investigations;
- Removal and off-site disposal of soil containing cadmium and chromium above Site cleanup levels from two Remedial Excavation Areas (REAs) (i.e., REA 1 and REA 2);
- Construction of utility corridors for installation of stormwater collection, treatment, and conveyance systems and to provide remediated utility corridors to support future redevelopment of the Site;
- Isolation/containment (i.e., capping) of soil on the Site with chemical concentrations greater than Ecology's Model Toxics Control Act (MTCA) unrestricted land use soil cleanup levels; and
- Installation of replacement groundwater monitoring wells.

An EDR was prepared that provides the remedial action plans and specifications and that describes the requirements for implementing the remaining remedial actions at the Site. The plans and specifications were used to solicit bids from prospective contractors and to implement the remaining remedial actions. The EDR specified construction activities to be performed by AEC which was the selected contractor to implement the remaining remedial actions. The EDR is provided in Appendix A. The following sections summarize remedial action construction activities.

3.0 REMEDIAL ACTION CONSTRUCTION ACTIVITIES

3.1. Site Preparation

Site preparation was performed to support completion of the remedial action construction activities. The following sections summarize Site preparation activities.

3.1.1. Erosion Control/Stormwater Pollution Prevention

Temporary erosion and sediment control (TESC) measures that were installed and maintained during remedial action construction activities included silt fencing, filter inserts in catch basins, and sediment traps. The TESC measures were installed prior to initiation of remedial action construction activities and were maintained in general accordance with the project plans as shown on plan Sheets C2.0, C2.1, C2.2 and the specifications presented in the EDR (Appendix A).

A protective barrier wall was installed along the western project boundary between April 9th and 11th, 2012. The western project boundary protection barrier wall was installed along the Ordinary High Water (OHW) line adjacent to the Thea Foss Waterway as shown on Sheet C2.0 and C2.1 of the project plans to contain all project-generated water, stormwater runoff, and other material (i.e., excavated soil, capping material, etc.) within the project boundary. The western project boundary protection barrier wall was removed on November 28, 2012 after the Site was stabilized in accordance with project specifications, the Stormwater Pollution Prevention Plan, and the Restoration Plan shown on Sheet C5.0 of the project plans (Appendix A).

All water generated at the site and stormwater runoff was contained, collected and routed to a water management system for treatment and testing prior to discharge to the City of Tacoma (City) sanitary sewer system. No stormwater runoff or project-generated water was discharged from the Site during the remedial action construction activities. The water that was collected by the water management system was discharged to the City sanitary sewer system under a Special Approved Discharge (SAD) Permit. The water was managed, treated, and tested in accordance with the SAD permit requirements prior to discharge to the sanitary sewer as described in Section 3.1.3 below.

3.1.2. Stockpiled Materials Management Areas

The Stockpiled Materials Management Areas for the excavation of REA 1 and REA 2 were constructed on April 18, 2012. Other Stockpiled Materials Management Areas were constructed as needed during remedial action construction activities. The primary Stockpiled Materials Management Areas were established in the southeastern portion of the Site. The Stockpiled Materials Management Areas were constructed in general accordance with the project plans as shown on Sheet C2.1 (Appendix A) and the specifications.

3.1.3. Water Management and Disposal

All stormwater as well as other water generated at the Site during remedial construction activities was collected and treated prior to discharge to the City sanitary sewer. Water collected at the Site during remedial action construction activities was initially stored in a 20,000 gallon Baker Tank in accordance with the City-approved Water Management Plan prepared by AEC. Approval was received from the City to modify the water treatment system by replacing the one 20,000 gallon

Baker Tank with two 3,000 gallon poly tanks. The treatment process consisted of settling of sediment in the storage tanks followed by physical filtration.

Samples of the treated water (i.e., after settling and filtration) were collected and analyzed in accordance with the SAD Permit. Water samples were transported to TestAmerica Laboratory in Fife, Washington for analysis. The water samples were analyzed for the following:

- pH;
- Total suspended solids (TSS);
- Metals;
- Total and free cyanide;
- Diesel- and oil-range petroleum hydrocarbons;
- Gasoline-range petroleum hydrocarbons; and
- Vinyl chloride.

Chemical analytical data for water characterization samples are included in Appendix B. The treated water was discharged to the City's sanitary sewer system after the City's review of the analytical data from the water samples and receipt of authorization from the City by AEC. A total of approximately 5,700 gallons of treated water were discharged to the sanitary sewer system on June 18, 2012 as part of the remedial action construction activities at the Site.

3.2. Demolition

Demolition activities began on April, 10 2012 and were completed on June 18, 2012. Demolition generally progressed as pre-capping Site grading was performed. The following sections summarize Site demolition activities.

3.2.1. Utility Protection, Relocation and Restoration

One utility was re-located along the southern boundary of the Site during remedial activities. A Qwest/Century-Link (Qwest) communications overhead line located on an existing utility pole was lifted by Qwest crews to increase the height of the line and provide additional clearance for Berg Scaffolding (Berg) equipment, materials, and vehicles operating beneath the overhead communication line.

3.2.2. Clearing and Grubbing

Clearing and grubbing activities were performed to remove brush and existing cottonwood trees present at the Site. Approximately 15 tons of vegetative material generated during clearing and grubbing activities was transported to the LRI landfill (LRI) for recycling.

AEC requested approval from the Tacoma-Pierce County Health Department (TPCHD) for disposal of the cottonwood tree root ball and other Site vegetation in contact with Site soils at LRI. The specifications included sampling of Site vegetation in contact with Site soil to characterize the material prior to disposal. The TPCHD approved disposal of Site vegetation in contact with Site soil at LRI without characterization sampling. The vegetative material in contact with Site soil was

transported to LRI for disposal with other material excavated from the Site that designated as solid waste.

Disposal documentation for material resulting from clearing and grubbing activities is provided in Appendix C.

3.2.3. Existing Trash and Debris Collection

Trash and debris present at the Site was collected and segregated from other Site materials for disposal. Approximately 11 tons of trash and debris were disposed of at the LRI Landfill in Graham, Washington that included, but was not limited to, paper, wood, and remnant asphalt. Additionally, approximately 4 tons of metal debris was transported off site to Cal Steel, LLC in Tacoma, Washington for recycling. Documentation for disposal and recycling of existing trash and debris material is provided in Appendix C.

3.2.4. Monitoring Well Decommissioning

Cascade Drilling was subcontracted by AEC to perform monitoring well decommissioning activities. Cascade Drilling decommissioned monitoring wells MW-1, -2, -3, -4, -5, -7, -9 and -10 on April 10, 2012 in accordance with the project specifications. AEC attempted to locate monitoring well MW-12 by performing clearing and grubbing and potholing with an excavator as required in the project specifications on the northwest portion of the Site in the anticipated area of MW-12 as identified on Sheet C2.0 (Appendix A). However, monitoring well MW-12 was not located during remedial action construction activities.

An additional monitoring well was discovered near the northeast corner of the Site on April 11, 2012. The monitoring well was identified as MW-11. Cascade Drilling returned to the Site on May 4, 2012 to decommission monitoring well MW-11. However, an obstruction was present within MW-11 at approximately 10 feet below ground surface (bgs). Due to the presence of the obstruction, over-drilling was required to decommission the well. Cascade Drilling decommissioned monitoring well MW-11 by over-drilling on May 14, 2012.

The groundwater monitoring wells were decommissioned in accordance with Washington Administrative Code (WAC) 173-160. The monitoring well decommissioning logs are provided in Appendix D.

3.2.5. Removal of Existing Fencing

Existing chain-link fencing within the Site boundaries was temporarily removed, as necessary, to complete remedial action construction activities. Temporary chain-link fencing was also installed by AEC to maintain Site controls and security during all remedial action construction activities. Existing chain-link fencing and associated hardware that was temporarily removed from the Site was stored, protected, and then reused during Site restoration as described in Section 3.8.6.

3.2.6. Demolition of Asphalt and Concrete Surfaces and Structures

Asphalt and concrete surfaces as well as concrete foundations, footings, and other structures within the Site boundaries were demolished to allow for the excavation, grading, and capping of the Site. AEC saw cut asphalt and concrete pavements along the property boundaries, as necessary,

to allow for demolition of the pavements and to prevent impacts to asphalt and concrete pavements and structures on adjacent properties.

The asphalt debris resulting from demolition of the existing access road was segregated from remnant asphalt debris resulting from trash and debris collection and demolition of other remnant asphalt surfaces. Approximately 160 tons of asphalt debris resulting from demolition of the asphalt access roadway was transported off site to Holroyd Company, Inc. in Lakewood, Washington for recycling. Documentation of the recycling of asphalt debris from the access roadway is provided in Appendix C. Other remnant asphalt debris was disposed off site as discussed in Section 3.2.3.

Concrete surfaces, foundations, footings, and other structures were demolished on site to a maximum size of 8-inches in diameter. The demolished concrete was used on site to establish grades prior to capping.

3.3. Backfill and Capping Material Characterization Sampling

Samples of backfill and capping material were collected and analyzed in accordance with the project specifications prior to transport of the backfill and capping material to the Site. Backfill and capping materials characterization soil samples were collected for chemical analysis on March 30, 2012 at the Holroyd Nisqually Pit and on April 13, 2012 at the Washington Rock Pit. Samples of gravel borrow, gravel base course, gravel top course, and top soil were collected to evaluate the presence of chemical contamination in the backfill and capping material before the material was used at the Site. The soil samples were collected and transported to TestAmerica Laboratory in Fife, Washington for analysis. The backfill and capping material samples were analyzed for the following:

- Metals;
- Diesel- and oil-range petroleum hydrocarbons;
- Gasoline-range petroleum hydrocarbons;
- Volatile organic compounds (VOCs);
- Semi-volatile organic compounds (SVOCs);
- Pesticides;
- Polychlorinated biphenyls (PCBs); and
- Total cyanide.

The results of chemical analyses on the backfill and capping material samples are presented in Table 1. The results from the analyses indicated that the chemical analytes were either not detected or detected at concentrations less than the MTCA Method A and Method B soil cleanup levels based on unrestricted land use. The laboratory analytical data reports for backfill and capping material characterization samples are provided in Appendix E. A data quality review was performed on the backfill and capping material laboratory analytical data and the data quality review identified that the laboratory data was acceptable for use for characterization of backfill and capping materials. The report summarizing the data quality review is provided in Appendix E.

Backfill and capping material were delivered to the Site via truck and trailer from the following quarries:

- Gravel borrow (i.e., bank run), gravel base course, gravel top course and ballast were delivered from the Holroyd Nisqually Pit, in Nisqually, Washington.
- Top Soil was delivered from the Washington Rock Pit in Orting, Washington.

3.4. Remedial Excavation and Backfill

Excavation of REA 1 and REA 2 was performed to remove soil with contaminant concentrations greater than the cleanup levels. Sampling and analysis was performed to verify that soil with contaminant concentrations greater than the site-specific cleanup levels had been removed at the limits of the excavations. Soil samples were collected from the limits of the remedial excavations and transported to Test America Laboratory in Fife, Washington for analysis. Verification samples were analyzed for the following:

- Total cadmium and chromium; and
- Toxicity Characterization Leaching Procedure (TCLP) cadmium and chromium.

The results for the verification samples collected from REA 1 and REA 2 are presented in Table 2. The laboratory analytical data reports for remedial excavation verification samples are provided in Appendix F. A data quality review was performed on the laboratory analytical data and the results of the data quality review identified that the laboratory data was of acceptable for use for verification of the extent of contamination. The report summarizing the data quality review is provided in Appendix F.

Material excavated from each excavation area was stockpiled separately on site in Stockpiled Materials Management Areas prior to transport off site for disposal. Samples were collected from the stockpiled material to characterize the material for off site disposal. The laboratory analytical data reports for stockpile samples are provided in Appendix G. A total of approximately 1,160 tons of material was excavated from REA 1 and REA 2 and transported off site for disposal.

The remedial excavation areas were backfilled prior to capping of the Site. Backfill placement activities in REA 1 and REA 2 were observed by a qualified representative of the Engineer and in-place moisture/density tests were performed as necessary using a nuclear density gauge. In our opinion, the in-place moisture/density tests indicated compaction of remedial excavation backfill was in general accordance with project plans and specifications.

The following sections describe in more detail remedial excavation and backfill activities performed at REA 1 and REA 2.

3.4.1. Remedial Excavation and Backfill of REA 1

The remedial excavation for REA 1 was completed between April 18 and May 3, 2012. REA 1 was initially excavated to the limits identified in the project plans and specifications. A representative of the Engineer collected verification samples from the sidewalls and base of REA 1 to evaluate contaminant concentrations in comparison to Site cleanup levels. Where the sidewall or base verification sample analytical results indicated material with contaminant concentrations greater

than the Site cleanup levels was present, AEC performed additional over-excavation. Over-excavation of REA 1 was required on the northern sidewall, eastern sidewall, southern sidewall and the base of the excavation based on verification sample results. Following the additional over-excavation of the sidewalls and the base of the excavation, additional verification samples were collected and analyzed and the results compared to the Site cleanup levels. The over-excavation and verification sampling and analysis process was repeated until verification sample results from the limits of the excavation were less than the Site cleanup levels at REA 1.

A total of 16 verification samples were collected within REA 1. The samples were analyzed for total cadmium and chromium and Toxicity Characterization Leaching Procedure (TCLP) cadmium and chromium in accordance with the Compliance Monitoring Plan (CMP) (GeoEngineers, 2011a) and Sampling and Analysis Plan (SAP) (GeoEngineers, 2011b). The results for verification samples collected at the final limits of the excavation and analyzed for TCLP cadmium and chromium indicated that the concentrations of leachable cadmium and chromium in soil were either not detected or detected at a concentration less than the Site cleanup levels (i.e., Dangerous Waste Toxicity Characteristic Criteria). Therefore, no additional excavation was required. The results for verification samples collected at the final limits of the excavation and analyzed for total cadmium and chromium indicated that the concentrations of total cadmium in soil were greater than cleanup levels based on unrestricted land use. Therefore, the soil remaining in the excavation required capping in accordance with the Ecology-approved CAP for the Site. The results for the verification samples collected from REA 1 are presented in Table 2. The approximate verification sample locations and the final limits of REA 1 are presented in Figure 2.

Material excavated from REA 1 was stockpiled and sampled to characterize the material for off site disposal. Section 3.6 includes additional detail concerning stockpile sampling and analysis. The results of the sample analyses indicated that the stockpiled material was designated hazardous waste. The material excavated from REA 1 was disposed of at the Waste Management Subtitle C facility in Arlington, Oregon. A total of approximately 960 tons of material was excavated and disposed off site from REA 1.

Groundwater was encountered at the bottom of the REA 1 excavation. Ballast material was placed in the bottom of the excavation to approximately 1-foot above the water table to provide a suitable subgrade for placing gravel base course backfill material in accordance with the project specifications. Ballast backfill material was placed in the bottom of the REA 1 excavation on May 4, 2012 and approximately 75 cubic yards of existing gravel base course was placed on top of the ballast material on May 7, 2012. The base course was compacted with a Caterpillar CS-533E vibratory roller. The remaining REA 1 excavation was backfilled with imported gravel borrow material. The gravel borrow backfill was placed in approximate 1-foot lifts and compacted with the vibratory roller. Backfill placement activities in REA 1 were observed by a qualified representative of the Engineer and in-place moisture/density tests were performed as necessary using a nuclear density gauge. In our opinion, the in-place moisture/density tests indicated compaction of remedial excavation backfill was in general accordance with project plans and specifications. REA 1 was backfilled with gravel borrow backfill material up to a pre-capping elevation prior to placing capping materials.

3.4.2. Remedial Excavation and Backfill of REA 2

The remedial excavation for REA 2 occurred on April 19, 2012. REA 2 was initially excavated to the limits identified in the project plans and specifications. AEC performed additional excavation of the southern side wall based on the visual observation of green stained soil. The stained soil was removed and a representative of the Engineer collected verification samples from the sidewalls and the base of REA 2 to evaluate contaminant concentrations in comparison to Site cleanup levels.

A total of five verification samples were collected from within REA 2. The samples were analyzed for total cadmium and chromium and TCLP cadmium and chromium in accordance with the Site CMP (GeoEngineers, 2011) and SAP (GeoEngineers, 2011). The results for verification samples collected at the limits of the excavation and analyzed for TCLP cadmium and chromium indicated that the concentrations of leachable cadmium and chromium in soil were either not detected or detected at concentrations less than the Site cleanup levels (i.e., Dangerous Waste Toxicity Characteristic Criteria). Therefore, no additional excavation was required. The results for verification samples collected at the limits of the excavation and analyzed for total cadmium and chromium indicated that the concentrations of total cadmium in soil were greater than the cleanup levels based on unrestricted land use. Therefore, the soil remaining in the excavation required capping in accordance with the Ecology-approved CAP for the Site. The results for the verification samples collected from REA 2 are presented in Table 2. Material excavated from REA 2 was stockpiled and sampled to characterize the material for off site disposal. Section 3.6 includes additional detail concerning stockpile sampling and analysis. The results of the sample analyses indicated that the stockpiled material was designated solid waste. The material excavated from REA 2 was disposed of at the LRI Subtitle D landfill in Graham, Washington. A total of approximately 100 tons of material was excavated and disposed off site from REA 2.

The REA 2 remedial excavation was backfilled on April 25, 2012. Existing base course material was placed in approximately 8 to 12-inch lifts. The backfill material was compacted with a Whacker DP6065 plate compactor. Backfill placement activities in REA 2 were observed by a qualified representative of the Engineer and in-place moisture/density tests were performed, as necessary, using a nuclear density gauge. In our opinion, the in-place moisture/density tests indicated compaction of remedial excavation backfill was in general accordance with project plans and specifications. REA 2 was backfilled with existing base course material up to a pre-capping elevation prior to placing capping materials.

3.5. Utility Corridor Excavation, Stormwater System Installation, and Backfill

Excavation of utility corridors was performed in three areas to allow for installation of two new stormwater collection and treatment systems and a corridor for future utility installations to support public park development. The three utility corridor areas were designated Utility Corridor Area (UCA) 1, UCA 2, and UCA 3.

Material excavated from each utility corridor excavation area was stockpiled separately on site in Stockpiled Materials Management Areas prior to transport off site for disposal. Samples were collected from the stockpiled material to characterize the material for off site disposal. The laboratory analytical data reports for stockpile samples area provided in Appendix G. A total of

approximately 430 tons of material was excavated from UCA 1, UCA 2, and UCA 3 and transported off site for disposal.

Backfill placement activities in UCA 1, UCA 2, and UCA 3 were observed by a qualified representative of the Engineer and in-place moisture/density tests were performed as necessary using a nuclear density gauge. In our opinion, the in-place moisture/density tests indicated compaction of utility corridor backfill was in general accordance with project plans and specifications.

3.5.1. Utility Corridor Area 1

UCA 1, located on the northeast portion of the Site, was excavated to the limits described in the plans and specifications on May 15, 2012. The western portion of UCA 1 was located within REA 1 and was excavated as a result of the remedial excavation in REA 1. The western portion of REA 1 had not been backfilled at the time that the eastern portion of the UCA 1 excavation was performed.

Geotextile fabric was placed in the bottom and on the sidewalls of the eastern portion of the UCA 1 excavation prior to backfilling to demarcate the limits of the excavation for the future utility corridor. Geotextile fabric was also placed on the bottom of the western portion of the UCA 1 excavation where the UCA 1 excavation crossed the REA 1 excavation to demarcate the limits of the excavation for the future utility corridor. Geotextile fabric was not placed on the sidewalls of the portion of the UCA 1 corridor that was within REA 1 as gravel barrow backfill material was placed to a distance of 10 of more feet outside the limits (i.e., sidewalls) of the future utility corridor alignment.

The portion of UCA 1 that was outside of REA 1 was backfilled and compacted with gravel borrow backfill material up to a pre-capping elevation prior to placing capping materials. The portion of UCA 1 located within REA 1 was backfilled as described in Section 3.4.1. The gravel borrow backfill was placed in approximate one-foot lifts and compacted with a Caterpillar CS-533E vibratory roller.

Material excavated from UCA 1 that was outside of the limits of REA 1, was stockpiled and sampled to characterize the material for off site disposal. Section 3.6 includes additional detail concerning stockpile sampling and analysis. The results of the sample analyses indicated that the stockpiled material was designated hazardous waste. The material excavated from UCA 1 outside of REA 1 was disposed of at the Waste Management Subtitle C facility in Arlington, Oregon. A total of approximately 180 tons of material was excavated and disposed of off site from UCA 1.

3.5.2. Utility Corridor Area 2

UCA 2, located on the southern boundary of the Site, was excavated and a new stormwater collection and treatment system was installed between May 31 and June 12, 2012.

Due to a conflict with an existing utility line (City of Tacoma sanitary sewer line), the location of UCA 2 and the new catch basins, seven-filter Contect stormwater vault, and stormwater piping were modified from the project plans and specifications as approved by the Engineer. In general, the new stormwater system components were installed approximately five to 10 feet north of the original design location. The new stormwater system was connected to City manhole #5000

located on the parcel south of the Site (i.e., Parcel No. 8950001791). The UCA 2 stormwater system installation was observed by a representative of the City and the Engineer and was completed in general accordance with the project plans and specifications.

Geotextile material was placed within the UCA 2 excavation, excluding the area between the new Contect stormwater vault and the City manhole located on the parcel south of the Site, prior to placing backfill materials. UCA 2 was then backfilled and compacted with pipe bedding and gravel borrow material up to the pre-capping elevation prior to placing capping materials. The backfill material was compacted with a Whacker DP6065 plate compactor and/or a vibratory plate compactor attached to an excavator.

Material excavated from UCA 2 was stockpiled and sampled to characterize the material for off site disposal. Section 3.6 includes additional detail concerning stockpile sampling and analysis. The results of the sample analyses indicated that the stockpiled material was designated solid waste. The material excavated from UCA 2 was disposed of at the LRI Subtitle D landfill in Graham, Washington. A total of approximately 230 tons of material was excavated and disposed of off site from UCA 2.

3.5.3. Utility Corridor Area 3

UCA 3, located on the northeast boundary of the Site, was excavated and a new stormwater collection and treatment system was installed between May 8 and 17, 2012.

A new catch basin, three-filter Contech stormwater vault/catch basin, and stormwater piping was installed and connected to the City stormwater manhole #601 located in East D Street. The UCA 3 stormwater system installation was observed by a representative of the City and the Engineer and was completed in general accordance with the project plans and specifications.

Geotextile material was placed within the UCA 3 excavation prior to placing backfill materials. UCA 3 was then backfilled and compacted with pipe bedding and gravel borrow material up to a pre-capping elevation prior to placing capping materials. The backfill material was compacted with a Whacker DP6065 plate compactor and/or a vibratory plate compactor attached to an excavator.

Material excavated from UCA 3 was stockpiled and sampled to characterize the material for off site disposal. Section 3.6 includes additional detail concerning stockpile sampling and analysis. The results of the sample analyses indicated that the stockpiled material was designated solid waste. The material excavated from UCA 3 was disposed of at the LRI Subtitle D landfill in Graham, Washington. A total of approximately 20 tons of material was excavated and disposed off site from UCA 3.

3.6. Material Management, Loading, Transport, and Disposal, or Recycling

As stated in previous sections, a separate stockpile management area was constructed for each remedial and utility corridor excavation area before excavation activities began. Other materials, such as trash, debris, clearing and grubbing vegetation, were also stockpiled separately until they were transported off site for recycling or disposal. The stockpile management areas were constructed in general accordance with the project plans and specifications.

Materials excavated and stockpiled from REA 1, REA 2, UCA 1, UCA 2, and UCA 3 were characterized prior to transport off site for disposal. Stockpile characterization sampling and analysis was performed in accordance with the CMP (GeoEngineers, 2011a) and SAP (GeoEngineers, 2011b). Stockpile samples were analyzed for the following;

- Total RCRA metals:
- Diesel- and oil-range petroleum hydrocarbons;
- Gasoline-range petroleum hydrocarbons;
- Volatile organic compounds (VOCs); and
- Total cyanide.

Follow up analyses for TCLP metals were also performed on samples in which the total concentration of a specific metal or metals were detected at concentrations that were greater than the 20 times rule. The results for TCLP analyses were used to further characterize stockpiled material for disposal. The laboratory analytical reports for stockpile sample analyses are provided in Appendix G. The landfill weight tickets for disposal of the stockpiled material are provided in Appendix C.

The following sections further describe the stockpile characterization and disposal activities.

3.6.1. REA 1 and UCA 1

Five samples (REA1-STK1-042712 through REA1-STK5-042712) were collected from the stockpile generated by the excavation of REA 1. Stockpile characterization sample results for the material excavated from REA 1 indicated that the material designated as a hazardous waste. A total of approximately 960 tons of material excavated from REA 1 was transported to Waste Management's Subtitle C facility located in Arlington, Oregon for disposal between May 15 and June 5, 2012.

Five samples (UCA1-STK1-052212, UCA1-STK1A-052512, UCA1-STK1B-052512, UCA1-STK1C-052512, and UCA1-STK1D-052512) were collected from the stockpile generated by the excavation of UCA 1. Stockpile characterization sample results for the material excavated from UCA 1 indicated that the material designated as a hazardous waste. A total of approximately 180 tons of material excavated from UCA 1 was transported to Waste Management's Subtitle C facility located in Arlington, Oregon for disposal between May 31 and June 5, 2012.

3.6.2. REA 2, UCA 2 and UCA 3

Three samples were collected from the stockpiles generated by the excavation of REA 2 (REA2-STK1-042712), UCA 2, (UCA2-STK1-060612), and UCA 3 (UCA3-STK1-052212). Stockpile characterization sample results for the material excavated from REA 2, UCA 2, and UCA 3 indicated that the material was designated as solid waste. A total of approximately 350 tons of material excavated from REA 2, UCA 2, and UCA 3 was transported to the LRI Subtitle D landfill located in Graham, Washington for disposal.

3.7. Site Grading and Capping

Site grading and capping activities were performed between April 10 and July 6, 2012. Grading and capping activities generally progressed from the western to the eastern portions of the Site.

Grading activities began on April 10, 2012 on the western portion of the Site after installation of the TESC including the western project boundary protection barrier. Grading followed by placement of the initial two feet of capping material on the western portion of the Site was performed between April 10 and April 26, 2012. The final one-foot layer of topsoil capping material was placed across the western portion of the Site between June 12 and 18, 2012.

Grading and capping activities were completed on the remaining portions of the Site between April 20 and July 6, 2012. Grading and capping activities on the remaining portions of the Site generally progressed as remedial excavation and backfill (i.e., REA 1 and REA 2), utility corridor excavation and backfill (UCA 1, UCA 2, and UCA 3), and stockpiled material transport off site was completed. The central portion of the Site encompassing REA 1, REA 2, UCA 1, and UCA 3 and the access roadway was graded upon completion of excavation, verification sampling and analysis, and backfill of the excavation areas. The southeastern portion of the Site was graded after excavated materials that were stockpiled on the southeastern portion of the Site were transported off site for disposal and excavation and backfilling of UCA 2 were completed. Capping of the central and southeastern portions of the Site with gravel borrow, gravel base course, and gravel top course materials was completed between June 6 and 26, 2012. Capping of the access roadway with asphalt was performed on July 5 and 6, 2012.

Cap thickness verification was confirmed using a combination of methods and information that included the following:

- Physical measurements by AEC utilizing a laser level and survey rod and/or measuring tape along the southern, western, and northern boundaries of the Site where excavation to a minimum depth of three feet was performed to grade the Site so that the three foot thick cap could be placed up to the Site boundaries.
- Comparison of pre-capping surveyed elevations to post-capping surveyed elevations. AEC provided surveys performed after Site grading had been completed in a specific area prior to capping and surveys of the same areas upon completion of Site capping. The surveyed pre-capping and post-capping elevations were compared to each other to identify where the minimum cap thicknesses had been placed per the project plans and specifications during capping activities. The comparison of the pre-capping and post-capping survey elevations also identified locations where the minimum cap thickness appeared to not have been achieved.
- Where the minimum cap thicknesses appeared to have not been achieved based on comparison of the surveyed elevations, AEC performed posthole excavations to allow direct measurement of the cap thickness. Cap thickness measurements were collected from each posthole excavation that verified that the minimum cap thickness had been placed per the project plans and specifications.

Cap thickness verification identified that the minimum requirements specified in the project plans and specifications had been met at the Site.

Capping of the Site was observed by a qualified representative of the Engineer. The capping material was placed in approximate one-foot lifts and compacted with a Caterpillar CS-533E vibratory roller. In-place moisture/density tests were performed as necessary using a nuclear density gauge. In our opinion, the in-place moisture/density tests indicated compaction of the capping materials was in general accordance with project plans and specifications.

The following sections summarize the capping materials placed at the Site.

3.7.1. Three Foot Cap With Vegetative Surface

The western portion of the Site and the northern boundary of the Site were capped with a 3-foot-thick soil cap with a vegetated surface. The 3-foot-thick soil cap is comprised of the following:

- Approximately one foot of soil from an existing soil stockpile;
- Approximately one foot of imported gravel borrow; and
- Approximately one foot of imported top soil.

The western boundary of the Site includes a 3-foot-wide habitat enhancement area that was planted with native plant species. Hydro-seed was applied across the remaining portion of the top soil surface on the western portion of the Site.

3.7.2. Three Foot Cap With Gravel Surface

An area within the northwest portion of the Site as well as the eastern portion of the Site was capped with a 3-foot-thick soil cap with gravel surface. The 3-foot-thick cap with gravel surface consists of the following:

- Approximately 33 inches of imported gravel borrow; and
- Approximately 3 inches of imported top course gravel.

3.7.3. Eighteen Inch Soil And Asphalt Cap

The central portion of the Site was capped with a soil and asphalt cap. The soil and asphalt cap consists of the following:

- Approximately 13 inches of imported base course gravel;
- Approximately 2 inches of imported top course gravel; and
- Approximately 3 inches of asphalt.

3.8. Site Restoration

Site restoration activities were completed after Site grading and capping activities had been performed and were completed in general accordance with the project plans and specifications. The following sections further describe Site restoration activities.

3.8.1. City ROW and Utility Restoration

The section of sidewalk and asphalt that was removed as part of the UCA 3 excavation and installation of the new stormwater system was restored in general accordance with City code requirements and the project specifications. The sidewalk was restored on May 25 and the asphalt was restored on July 6, 2012.

3.8.2. Habitat Enhancement Area Plantings

The western boundary of the Site includes a three foot wide habitat enhancement area that was restored by planting native plant species. The plantings were installed in the habitat enhancement area between November 28 and December 3, 2012. Installation of the plants within the habitat enhancement area was completed in general accordance with the project specifications and the planting plan provided on Sheet C5.1 of project plans. AEC is responsible for maintaining the habitat plantings and the habitat plantings are under warranty for one year from the planting date in accordance with the requirements of the EDR and as specified on Plan Sheets C5.0 and C5.1.

3.8.3. New Groundwater Monitoring Well Installation

Three new monitoring wells; MW-20, MW-21, and MW-22; were installed upon completion of Site grading and capping on the western portion of the Site. The new monitoring well borings were drilled and the wells were installed by Cascade Drilling on May 14, 2012 using hollow-stem auger drilling equipment. The monitoring wells were drilled and installed in general accordance with the project plans and specifications. A licensed geologist observed the monitoring well drilling and installation activities and documented the observations on boring logs. The well logs prepared for the new monitoring wells are provided in Appendix H.

3.8.4. New Tree Installation

A new deciduous tree was planted on the western portion of the Site on December 3, 2012. The Oregon ash tree installation was completed in general accordance with the project plans and specifications.

3.8.5. Vegetative Surface Area Restoration

Hydro-seeding of the capped surface on the western portion of the Site and adjacent to the northern boundary of the Site was performed on July 6, 2012. Hydro-seeding was completed in general accordance with the project plans and specifications. Watering was performed periodically to promote grass establishment starting in August 2012. Grass was generally observed to be established in November 2012.

3.8.6. Fencing Restoration

Fence restoration activities were completed between July 10 and July 13, 2012. Site fencing was installed along the northern, northeastern, and southwestern property boundaries and in the central portion of the Site west and adjacent to the asphalt roadway. Fencing materials, including existing chain-link fencing and associated hardware salvaged during Site preparation activities, was re-installed in general accordance with the project specifications and plans.

4.0 CLOSURE

Remedial construction activities were performed at the American Plating Site in Tacoma, Washington between April 9, 2012 and December 3, 2012. The remedial action was conducted by the FWDA to satisfy requirements of a Prospective Purchaser Consent Decree (CD) (No. 03 2 14513 6) issued by Ecology and to address contamination resulting from releases from past metal plating operations at the Site. The remedial actions completed at the Site implemented the preferred cleanup alternative specified in the Ecology-approved CAP prepared for the Site.

The remedial actions included excavation and capping of soil with contaminant concentrations greater than the Site cleanup levels in general accordance with the EDR plans and specifications. Verification soil samples collected at the limits of the remedial excavations indicate that materials with TCLP cadmium and chromium concentrations greater than the Site cleanup levels were removed from the remedial excavations. Following backfilling of the remedial excavations, the entire Site was graded and capped. Restoration activities were performed upon completion of Site capping activities.

It is our opinion that the remediation activities at the Site were performed in general accordance with the EDR plans and specifications prepared for remediation of the Site.

5.0 REFERENCES

GeoEngineers, 2003. Cleanup Action Plan (CAP) American Plating Site Remediation Project. November 24, 2003.

GeoEngineers, 2011a. Draft Compliance Monitoring Plan (CMP) American Plating Site Remediation Project. October 4, 2011.

GeoEngineers, 2011b. Draft Sampling and Analysis Plan (SAP) American Plating Site Remediation Project. October 4, 2011.

GeoEngineers, 2012. Engineering Design Report (EDR) American Plating Site Remediation Project. January 27, 2012.

6.0 LIMITATIONS

This Remedial Action Construction report has been prepared for use by the Foss Waterway Development Authority. GeoEngineers observed performance of the remedial action construction activities at the American Plating Site, Tacoma, Washington and prepared this remedial action construction report in accordance with the scope and limitations of the project proposal.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted environmental science practices for Remedial Action Construction reporting at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix H titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.

TABLE 1

SUMMARY OF ANALYTICAL RESULTS FOR BACKFILL AND CAPPING MATERIAL

REMEDIAL ACTION CONSTRUCTION REPORT
AMERICAN PLATING REMEDIATION SITE
TACOMA, WASHINGTON

Material Type	Gravel Borrow	Base Coarse	Top Coarse	Top Soil	MTCA Method A[1]	MTCA Method B[1]
Sample Name	GRAVEL BORROW	BASE COARSE - 1	TOP COARSE - 1	TOPSOIL - 1		
Date	3/30/2012	3/30/2012	3/30/2012	4/13/2012		
Analytes						
Metals (mg/kg)						
Antimony	1.7 U	2.3 U	2.5 U	3.1 U	2	32
Arsenic	**1.7**	2.3 U	2.5 U	**7.4**	20[2]	0.67[3]
Beryllium	**0.27**	**0.19**	**0.22**	**0.67**	-	160
Cadmium	0.29 U	0.39 U	0.42 U	**0.59**	2	-
Chromium	**13 J**	**8.4 J**	**9.9 J**	**24**	2,000	120,000
Chromium, Hexavalent	0.24 U	0.24 U	0.27 U	0.27 U	19	240
Copper	**13**	**12**	**14**	**21**	-	3,200
Lead	**1.8**	**1.5**	**2.3**	**2.5**	250	-
Mercury	**0.023**	0.014 U	0.014 U	**0.043**	2	-
Nickel	**16**	**6.8**	**10**	**33**	-	1,600
Selenium	2.9 U	3.9 U	4.2 U	5.2 UI	-	400
Silver	0.58 U	0.77 U	0.84 U	1 U	-	400
Thallium	2.9 U	3.9 U	4.2 U	5.2 UI	-	-
Zinc	**26**	**18**	**26**	**37**	-	24,000
Total Petroleum Hydrocarbons (mg/kg)						
Gasoline-Range Hydrocarbons	3.6 U	5.3 U	5.3 U	4.6 U	100	-
Diesel-Range Hydrocarbons	25 U	26 U	26 U	27 U	2,000	-
Oil-Range Hydrocarbons	50 U	52 U	51 U	53 U	2,000	-
PAHs (µg/kg)						
1-Methylnaphthalene	5 U	5.1 U	5 U	5.4 U	-	24,000
2-Methylnaphthalene	5 U	5.1 U	5 U	5.4 U	-	320,000
Acenaphthene	5 U	5.1 U	5 U	5.4 U	-	4,800,000
Acenaphthylene	5 U	5.1 U	5 U	5.4 U	-	-
Anthracene	5 U	5.1 U	5 U	5.4 U	-	24,000,000
Benzo(a)anthracene	5 U	5.1 U	5 U	5.4 U	-	1,400
Benzo(a)pyrene	5 U	5.1 U	5 U	5.4 U	100	140
Benzo(b)fluoranthene	5 U	5.1 U	5 U	5.4 U	-	1,400
Benzo(ghi)perylene	5 U	5.1 U	5 U	5.4 U	-	-
Benzo(k)fluoranthene	5 U	5.1 U	5 U	5.4 U	-	14,000
Chrysene	5 U	5.1 U	5 U	5.4 U	-	140,000
Dibenzo(a,h)anthracene	5 U	5.1 U	5 U	5.4 U	-	140
Fluoranthene	5 U	5.1 U	5 U	5.4 U	-	3,200,000
Fluorene	5 U	5.1 U	5 U	5.4 U	-	3,200,000
Indeno(1,2,3-cd)pyrene	5 U	5.1 U	5 U	5.4 U	-	1,400
Naphthalene	5 U	5.1 U	5 U	5.4 U	5,000	1,600,000
Phenanthrene	5 U	5.1 U	5 U	5.4 U	-	-
Pyrene	5 U	5.1 U	5 U	5.4 U	-	2,400,000
Total cPAH TEQ (ND=0.5RL)[4]	3.775 UT	3.8505 UT	3.775 UT	4.077 UT	100	
VOCs (µg/kg)						
1,1,1,2-Tetrachloroethane	0.93 U	1 U	0.98 U	1.2 U	-	38,000
1,1,1-Trichloroethane	0.93 U	1 U	0.98 U	1.2 U	2,000	160,000,000
1,1,2,2-Tetrachloroethane	1.9 U	2 U	2 U	2.3 U	-	5,000
1,1,2-Trichloroethane	0.93 U	1 U	0.98 U	1.2 U	-	18,000
1,1-Dichloroethane	0.93 U	1 U	0.98 U	1.2 U	-	16,000,000
1,1-Dichloroethene	4.6 U	5 U	4.9 U	5.8 U	-	4,000,000
1,1-Dichloropropene	0.93 U	1 U	0.98 U	1.2 U	-	-
1,2,3-Trichlorobenzene	1.9 U	2 U	2 U	2.3 U	-	-
1,2,3-Trichloropropane	0.93 U	1 U	0.98 U	1.2 U	-	33.3
1,2,4-Trichlorobenzene	1.9 U	2 U	2 U	2.3 U	-	35,000
1,2,4-Trimethylbenzene	1.9 U	2 U	2 U	2.3 U	-	-
1,2-Dibromo-3-Chloropropane	1.9 U	2 U	2 U	2.3 U	-	1,250
1,2-dibromoethane (EDB)	0.93 U	1 U	0.98 U	1.2 U	5	500
1,2-Dichlorobenzene (o-Dichlorobenzene)	0.93 U	1 U	0.98 U	1.2 U	-	7,200,000
1,2-Dichloroethane (EDC)	0.93 U	1 U	0.98 U	1.2 U	-	11,000
1,2-Dichloropropane	0.93 U	1 U	0.98 U	1.2 U	-	-
1,3,5-Trimethylbenzene	4.6 U	5 U	4.9 U	5.8 U	-	800,000
1,3-Dichlorobenzene (m-Dichlorobenzene)	0.93 U	1 U	0.98 U	1.2 U	-	-
1,3-Dichloropropane	0.93 U	1 U	0.98 U	1.2 U	-	-
1,4-Dichlorobenzene (p-Dichlorobenzene)	0.93 U	1 U	0.98 U	1.2 U	-	-
2,2-Dichloropropane	0.93 U	1 U	0.98 U	1.2 U	-	-
2-Chlorotoluene	1.9 U	2 U	2 U	2.3 U	-	1,600,000
4-Chlorotoluene	1.9 U	2 U	2 U	2.3 U	-	-
Benzene	0.93 U	1 U	0.98 U	1.2 U	30	18,000
Bromobenzene	1.9 U	2 U	2 U	2.3 U	-	-
Bromochloromethane	0.93 U	1 U	0.98 U	1.2 U	-	-
Bromodichloromethane	0.93 U	1 U	0.98 U	1.2 U	-	16,000
Bromoform (Tribromomethane)	0.93 U	1 U	0.98 U	1.2 U	-	130,000
Bromomethane	0.93 U	1 U	0.98 U	1.2 U	-	110,000
Carbon Tetrachloride	0.93 U	1 U	0.98 U	1.2 U	-	14,300
Chlorobenzene	0.93 U	1 U	0.98 U	1.2 U	-	1,600,000
Chloroethane	0.93 U	1 U	0.98 U	1.2 U	-	-
Chloroform	0.93 U	1 U	0.98 U	1.2 U	-	800,000
Chloromethane	0.93 U	1 U	0.98 U	1.2 U	-	-
Cis-1,2-Dichloroethene	0.93 U	1 U	0.98 U	1.2 U	-	160,000
Cis-1,3-Dichloropropene	0.93 U	1 U	0.98 U	1.2 U	-	-
Dibromochloromethane	0.93 U	1 U	0.98 U	1.2 U	-	12,000
Dibromomethane	0.93 U	1 U	0.98 U	1.2 U	-	800,000

Material Type	Gravel Borrow	Base Coarse	Top Coarse	Top Soil	MTCA Method A[1]	MTCA Method B[1]
Sample Name	GRAVEL BORROW	BASE COARSE - 1	TOP COARSE - 1	TOPSOIL - 1		
Date	3/30/2012	3/30/2012	3/30/2012	4/13/2012		
Analytes						
Dichlorodifluoromethane (CFC-12)	0.93 U	1 U	0.98 U	1.2 U	-	16,000,000
Ethylbenzene	0.93 U	1 U	0.98 U	1.2 U	6,000	8,000,000
Hexachlorobutadiene	0.93 U	1 U	0.98 U	1.2 U	-	13,000
Isopropylbenzene (Cumene)	1.9 U	2 U	2 U	2.3 U	-	8,000,000
Methyl t-butyl ether	0.93 U	1 U	0.98 U	1.2 U	100	-
Methylene Chloride	14 U	15 U	15 U	18 U	20	130,000
Naphthalene	4.6 U	5 U	4.9 U	5.8 U	5,000	1,600,000
n-Butylbenzene	1.9 U	2 U	2 U	2.3 U	-	-
n-Propylbenzene	0.93 U	1 U	0.98 U	2.3 U	-	-
p-Isopropyltoluene	1.9 U	2 U	2 U	2.3 U	-	-
Sec-Butylbenzene	1.9 U	2 U	2 U	2.3 U	-	-
Styrene	1.9 U	2 U	2 U	2.3 U	-	16,000,000
Tert-Butylbenzene	1.9 U	2 U	2 U	2.3 U	-	-
Tetrachloroethene	0.93 U	1 U	0.98 U	1.2 U	50	480,000
Toluene	1.9 U	2 U	2 U	2.3 U	7,000	6,400,000
Trans-1,2-Dichloroethene	0.93 U	1 U	0.98 U	1.2 U	-	1,600,000
Trans-1,3-Dichloropropene	0.93 U	1 U	0.98 U	1.2 U	-	-
Trichloroethene (TCE)	0.93 U	1 U	0.98 U	1.2 U	30	1,200
Trichlorofluoromethane (CFC-11)	0.93 U	1 U	0.98 U	1.2 U	-	24,000,000
Vinyl Chloride	0.93 U	1 U	0.98 U	1.2 U	-	670
Xylene, m-,p-	1.9 U	2 U	2 U	2.3 U	9,000	16,000,000
Xylene, o-	0.93 U	1 U	0.98 U	1.2 U	9,000	16,000,000
SVOCs (µg/kg)						
1,2,4-Trichlorobenzene	50 U	51 U	50 U	54 U	-	800,000
1,2-Dichlorobenzene (o-Dichlorobenzene)	55 U	56 U	55 U	60 U	-	7,200,000
1,3-Dichlorobenzene (m-Dichlorobenzene)	50 U	51 U	50 U	54 U	-	-
1,4-Dichlorobenzene (p-Dichlorobenzene)	50 U	51 U	50 U	54 U	-	-
2,2'-Oxybis[1-chloropropane]	250 U	250 U	250 U	270 U	-	14,000
2,4,5-Trichlorophenol	100 U	100 U	100 U	110 U	-	8,000,000
2,4,6-Trichlorophenol	150 U	150 U	150 U	160 U	-	81,000
2,4-Dichlorophenol	100 U	100 U	100 U	110 U	-	240,000
2,4-Dimethylphenol	100 U	100 U	100 U	110 U	-	1,600,000
2,4-Dinitrophenol	1,000 U	1,000 U	1,000 U	1,100 U	-	160,000
2,4-Dinitrotoluene	100 U	100 U	100 U	110 U	-	160,000
2,6-Dinitrotoluene	100 U	100 U	100 U	110 U	-	81,000
2-Chloronaphthalene	20 U	20 U	20 U	22 U	-	6,400,000
2-Chlorophenol	100 U	100 U	100 U	110 U	-	400,000
2-Nitroaniline	100 U	100 U	100 U	110 U	-	800,000
2-Nitrophenol	100 U	100 U	100 U	110 U	-	-
3,3'-Dichlorobenzidine	200 U	200 U	200 U	220 U	-	2,200
3-Nitroaniline	100 U	100 U	100 U	110 U	-	-
4,6-Dinitro-2-Methylphenol	1,000 U	1,000 U	1,000 U	1,100 U	-	-
4-Bromophenyl phenyl ether	100 U	100 U	100 U	110 U	-	-
4-Chloro-3-Methylphenol	100 U	100 U	100 U	110 U	-	-
4-Chloroaniline	100 U	100 U	100 U	110 U	-	500
4-Chlorophenyl-Phenylether	100 U	100 U	100 U	110 U	-	-
4-Nitroaniline	100 U	100 U	100 U	110 U	-	-
4-Nitrophenol (p-Nitrophenol)	1,000 U	1,000 U	1,000 U	1,100 U	-	-
Benzoic Acid	2,500 U	2,500 U	2,500 U	2,700 U	-	320,000,000
Benzyl Alcohol	100 U	100 U	100 U	110 U	-	8,000,000
Bis(2-Chloroethoxy)Methane	100 U	100 U	100 U	110 U	-	-
Bis(2-Chloroethyl)Ether	100 U	100 U	100 U	110 U	-	910
Bis(2-Ethylhexyl) Phthalate	610 U	610 U	600 U	650 U	-	71,000
Butyl benzyl phthalate	200 U	200 U	200 U	220 U	-	530,000
Carbazole	100 U	100 U	100 U	110 U	-	-
Dibenzofuran	100 U	100 U	100 U	110 U	-	80,000
Dibutyl phthalate	500 U	510 U	500 U	540 U	-	8,000,000
Diethyl phthalate	200 U	200 U	200 U	220 U	-	64,000,000
Dimethyl phthalate	100 U	100 U	100 U	110 U	-	-
Di-N-Octyl Phthalate	500 U	510 U	500 U	540 U	-	-
Hexachlorobenzene	50 U	51 U	50 U	54 U	-	630
Hexachlorobutadiene	50 U	51 U	50 U	54 U	-	13,000
Hexachlorocyclopentadiene	100 U	100 U	100 U	110 U	-	480,000
Hexachloroethane	100 U	100 U	100 U	110 U	-	71,000
Isophorone	100 U	100 U	100 U	110 U	-	1,100,000
Nitrobenzene	100 U	100 U	100 U	110 U	-	160,000
N-Nitrosodi-n-propylamine	100 U	100 U	100 U	110 U	-	140
N-Nitrosodiphenylamine	50 U	51 U	50 U	54 U	-	200,000
o-Cresol (2-methylphenol)	100 U	100 U	100 U	110 U	-	4,000,000
p-Cresol (4-methylphenol)	200 U	200 U	200 U	220 U	-	400,000
Pentachlorophenol	200 U	200 U	200 U	220 U	-	2,500
Phenol	100 U	100 U	100 U	110 U	-	24,000,000
PCB Aroclors (µg/kg)						
PCB-aroclor 1016	10 U	10 U	9.8 U	11 UJ	-	5,600
PCB-aroclor 1221	11 U	11 U	11 U	12 UJ	-	-
PCB-aroclor 1232	11 U	11 U	11 U	12 UJ	-	-
PCB-aroclor 1242	10 U	10 U	9.8 U	11 UJ	-	-
PCB-aroclor 1248	10 U	10 U	9.8 U	11 UJ	-	-
PCB-aroclor 1254	10 U	10 U	9.8 U	11 UJ	-	500
PCB-aroclor 1260	10 U	10 U	9.8 U	11 UJ	-	500
Total Aroclors	11 UT	11 UT	11 UT	12 UJT	1,000	500

Material Type	Gravel Borrow	Base Coarse	Top Coarse	Top Soil	MTCA Method A[1]	MTCA Method B[1]
Sample Name	GRAVEL BORROW	BASE COARSE - 1	TOP COARSE - 1	TOPSOIL - 1		
Date	3/30/2012	3/30/2012	3/30/2012	4/13/2012		
Analytes						
Pesticiedes (µg/kg)						
4,4'-DDD	2 U	2 U	2 U	2.2 U	-	-
4,4'-DDE	2 U	2 U	2 U	2.2 U	-	-
4,4'-DDT	2 U	2 U	2 U	2.2 U	3,000	-
Aldrin	1 U	1 U	0.98 U	1.1 U	-	-
Alpha-BHC	1 U	1 U	0.98 U	1.1 U	-	-
alpha-Chlordane (cis)	1 U	1 U	0.98 U	1.1 U	-	-
beta or gamma-Chlordane (trans)	1 U	1 U	0.98 U	1.1 U	-	-
Beta-BHC	1 U	1 U	0.98 U	1.1 U	-	-
Delta-BHC	1 U	1 U	0.98 U	1.1 U	-	-
Dieldrin	2 U	2 U	2 U	2.2 U	-	-
Endosulfan I	1 U	1 U	0.98 U	1.1 U	-	-
Endosulfan II	2 U	2 U	2 U	2.2 U	-	-
Endosulfan Sulfate	2 U	2 U	2 U	2.2 U	-	-
Endrin	2 U	2 U	2 U	2.2 U	-	-
Endrin Aldehyde	2 U	2 U	2 U	2.2 U	-	-
Endrin Ketone	2 U	2 U	2 U	2.2 U	-	-
Heptachlor	2 U	2 U	2 U	2.2 U	-	-
Heptachlor Epoxide	1 U	1 U	0.98 U	1.1 U	-	-
Lindane (Gamma-BHC)	1 U	1 U	0.98 U	1.1 U	10	-
Methoxychlor	10 U	10 U	9.8 U	11 U	-	-
Toxaphene	100 U	100 U	98 U	110 U	-	-

Notes:

[1] MTCA cleanup levels for unrestricted land use.

[2] Based on background arsenic concentrations in Washington State.

[3] Concentration below background for Washington State. Therefore, background concentration is applicable for screening the analytical results for backfill and capping material.

[4] Total carcinogenic Polycyclic Aromatic Hydrocarbon (cPAH) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of one half of the detection limit for these calculations.

µg/kg = microgram per kilogram

mg/kg = milligram per kilogram

U = The analyte was not detected at a concentration greater than the identified reporting limit.

J = The analyte was detected and the detected concentration is considered an estimate.

T = The analyte total concentration was calculated by GeoEngineers.

I = The reporting limit was elevated due to chromatographic overlap with either another analyte or a compound outside the analysis.

- - = MTCA value has not been established.

Bold indicates analyte was detected.

MTCA = Model Toxics Control Act

ULU = Unrestricted Land Use

TABLE 2

SUMMARY OF ANALYTICAL RESULTS FOR CONFIRMATION SOIL SAMPLES

REMEDIAL ACTION CONSTRUCTION REPORT
AMERICAN PLATING REMEDIATION SITE
TACOMA, WASHINGTON

Location	Sample ID	Cleanup Criteria	Excavation Cleanup Level [1]		Capping Cleanup Level [2]	
		Analytical Method	TCLP-Metals		Total Metals	
		Analyte	Cadmium	Chromium	Cadmium	Chromium
		Units	mg/L	mg/L	mg/kg	mg/kg
		Site Cleanup Level	1	5	2	2,000
REA1						
Bottom	REA1-B1-3-041912	4/19/2012	**2.4**	**0.077**	**120**	**380**
	REA1-B1A-4-042412	4/24/2012	**0.47**	**0.053**	**38 J**	**240**
Sidewall 1	REA1-SW1-0-3-041912	4/19/2012	**1**	0.025 U	**220**	**130**
Sidewall 2	REA1-SW2-0-3-041912	4/19/2012	**9.3**	0.025 U	**630**	**530**
	REA1-SW2A-0-4-042412	4/24/2012	**1.5**	0.025 U	**80 J**	**90**
	REA1-SW2B-D-4-042712	4/27/2012	**0.17**	0.025 U	**9**	**41**
Sidewall 3	REA1-SW3-0-3-041912	4/19/2012	**6.7**	**0.069**	**240**	**290**
	REA1-SW3A-0-4-042412	4/24/2012	**5.6**	**0.15**	**170 J**	**690**
	REA1-SW3B-D-4-042712	4/27/2012	**13**	**0.16**	**430**	**300**
	DUPE-042712	4/27/2012	**11**	**0.16**	**430**	**360**
	REA1-SW3C-0-4-050112	5/1/2012	**0.93**	0.025 U	**43 J**	**31**
Sidewall 4	REA1-SW4-0-3-041912	4/19/2012	**5**	**0.058**	**500**	**750**
	REA1-SW4A-0-4-042412	4/24/2012	**1.2**	0.025 U	**58 J**	**140**
	REA1-SW4B-D-4-042712	4/27/2012	**2.3**	0.025 U	**85**	**53**
	REA1-SW4C-0-4-050112	5/1/2012	**4.3**	0.025 U	**110 J**	**25 J**
	REA1-SW4D-0-4-050312	5/3/2012	0.01 U	0.025 U	0.5 U	**12 J**
Sidewall 5	REA1-SW5-0-3-041912	4/19/2012	**0.015 J**	0.025 U	**10 J**	**55**
	DUPE1-041912	4/19/2012	**0.037 J**	0.025 U	**5.9 J**	**44**
REA2						
Bottom	REA2-B1-2-041912	4/19/2012	**0.033**	**0.037**	**3.9**	**95**
Sidewall 1	REA2-SW1-0-2-041912	4/19/2012	**0.26**	**0.078**	**32**	**840**
Sidewall 2	REA2-SW2-0-2-041912	4/19/2012	**0.083**	**0.17**	**12**	**1,200**
Sidewall 3	REA2-SW3-0-2-041912	4/19/2012	**0.027**	0.025 U	**3**	**79**
Sidewall 4	REA2-SW4-0-2-041912	4/19/2012	**0.036**	0.025 U	**1.4**	**32**

Notes:

[1] Cleanup criteria for excavation of soil from Remedial Action Area (REA) 1 and REA 2. Soil with concentrations of cadmium or chromium greater than the Dangerous Waste Criteria were excavated and disposed off site.

[2] Cleanup criteria for capping of site soil . Soil with concentrations of cadmium and chromium greater than MTCA cleanup criteria for unrestricted land use were capped at the site.

mg/L = milligram per liter

mg/kg = milligram per kilogram

U = The analyte was not detected at a concentration greater than the identified reporting limit.

J = The analyte was detected and the detected concentration is considered an estimate.

- - = MTCA value has not been established.

Bold type indicates analyte was detected.

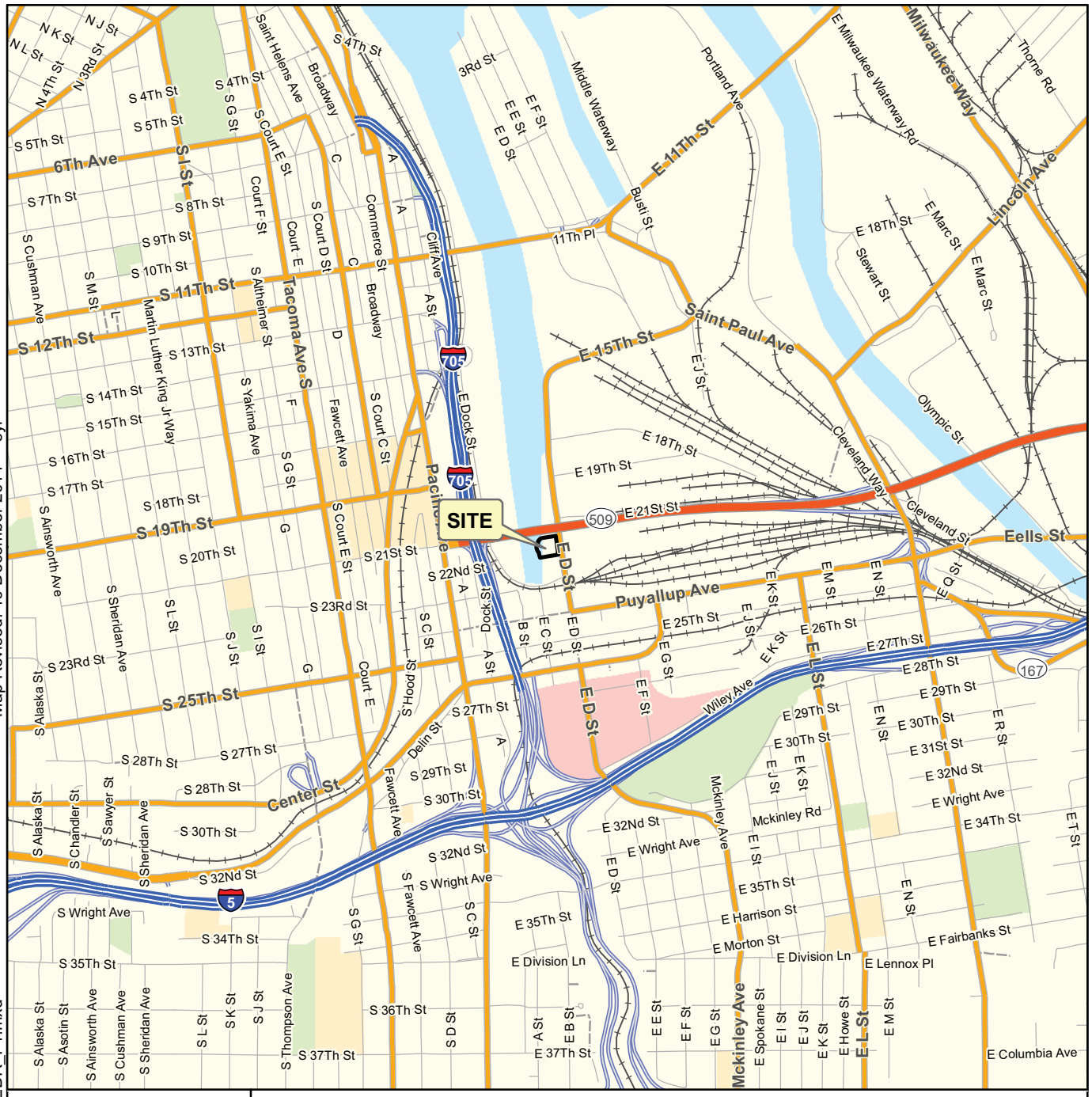
REA = Remedial excavation area

TCLP = toxicity characteristic leaching procedure

MTCA = Model Toxics Control Act

ULU = Unrestricted Land Use

Shading indicates concentrations greater than site cleanup level.



2,000 0 2,000

Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. can not guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.

Data Sources: ESRI Data & Maps

Projection: NAD 1983 UTM Zone 10N

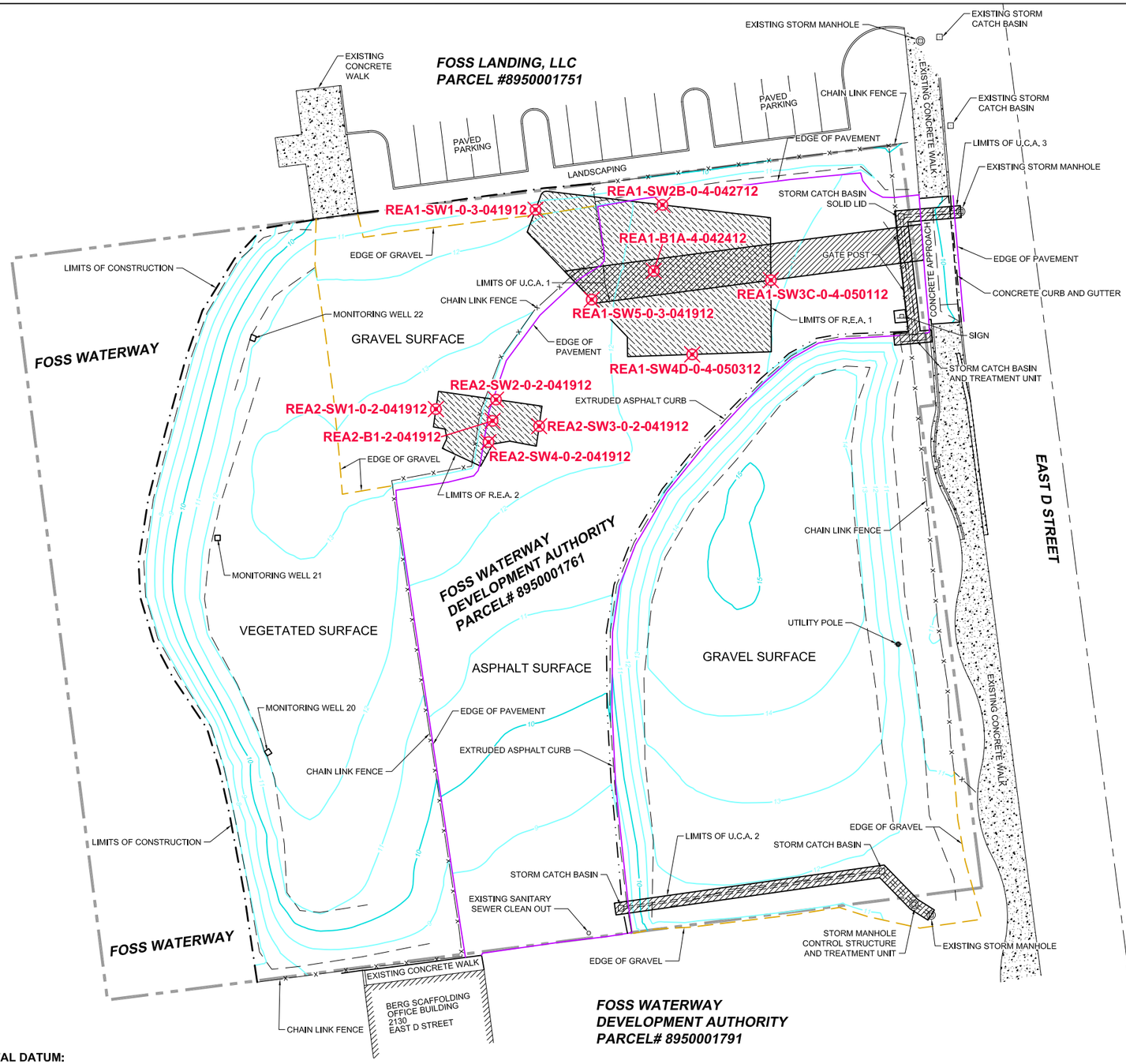
Vicinity Map

Remedial Action Construction Report
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

Figure 1

Office: TAC Path: P:\10\10751002\GIS\10751002001_EDR_F1.mxd Map Revised: 16 December 2011 syi



LEGEND

- REA1-SW1-0-3-041912 — REMEDIAL EXCAVATION CONFIRMATION SOIL SAMPLE LOCATION
- MONITORING WELL
- BOUNDARY LINE
- LIMITS OF REMEDIAL EXCAVATION AREA (REA)
- LIMITS OF UTILITY CORRIDOR EXCAVATION AREA (UCA)
- REA 1 — REMEDIAL EXCAVATION AREA 1
- UCA 1 — UTILITY CORRIDOR EXCAVATION AREA 1
- BUILDING LINE
- STREET CENTERLINE
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- FLOW LINE
- TOP BACK OF CURB LINE
- EDGE OF CONCRETE
- LIMITS OF CONSTRUCTION
- GROUND BREAK LINE
- FENCE LINE
- CULVERT LINE
- INDEX CONTOUR (5 FOOT INTERVAL)
- CONTOUR (1 FOOT INTERVAL)
- STORM MANHOLE
- UTILITY POLE
- SIGN
- STORM CATCH BASIN

N W E S

40 0 40
Feet

Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base CAD drawing provided by Van Aller Surveying, dated 03-25-2013.

HORIZONTAL DATUM:
PER FIELD TIES TO EXISTING FEATURES AS SHOWN ON SHEET C1.0 OF THE AMERICAN PLATING SITE REMEDIATION PROJECT, TACOMA, WASHINGTON, DATED 1/26/2012, PUBLISHED BY GEOENGINEERS INC. AND BASED ON A SURVEY PROVIDED BY AHBL DATED 08/26/11.

VERTICAL DATUM:
PER FIELD TIES TO EXISTING FEATURES AS SHOWN ON SHEET C1.0 OF THE AMERICAN PLATING SITE REMEDIATION PROJECT, TACOMA, WASHINGTON, DATED 1/26/2012, PUBLISHED BY GEOENGINEERS INC. AND BASED ON A SURVEY PROVIDED BY AHBL DATED 08/26/11.

NOTES:
1. THIS MAP IS BASED ON FIELD SURVEY CONDUCTED IN AUGUST, 2012 BY VAN ALLER SURVEYING FOR ANDERSON ENVIRONMENTAL CONTRACTING LLC.
2. NO UNDERGROUNG UTILITIES WERE LOCATED PER THIS SURVEY.

Completed Remedial Actions

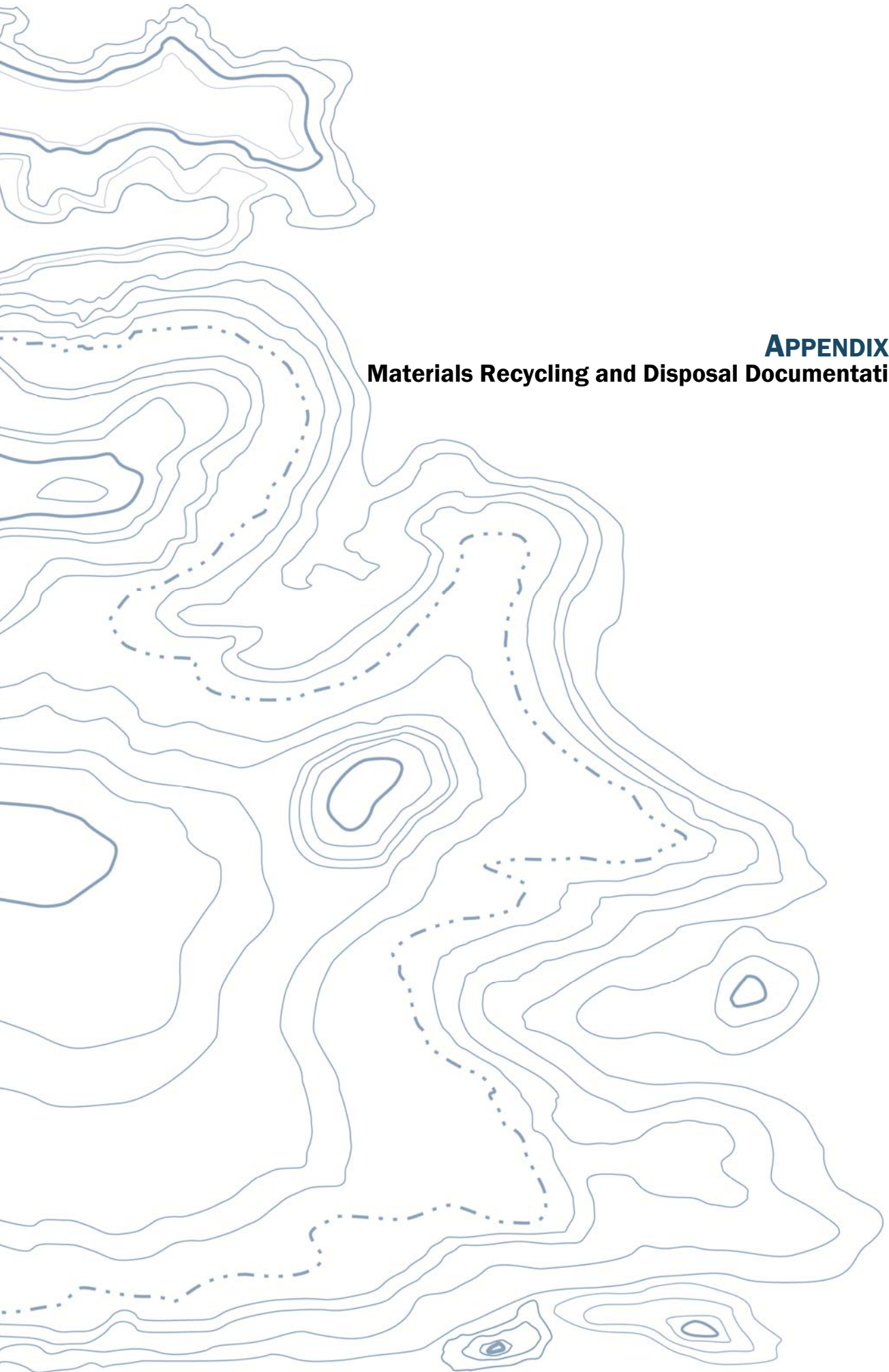
Remedial Action Construction Report
American Plating Site Remediation Project
Tacoma, Washington

GeoEngineers

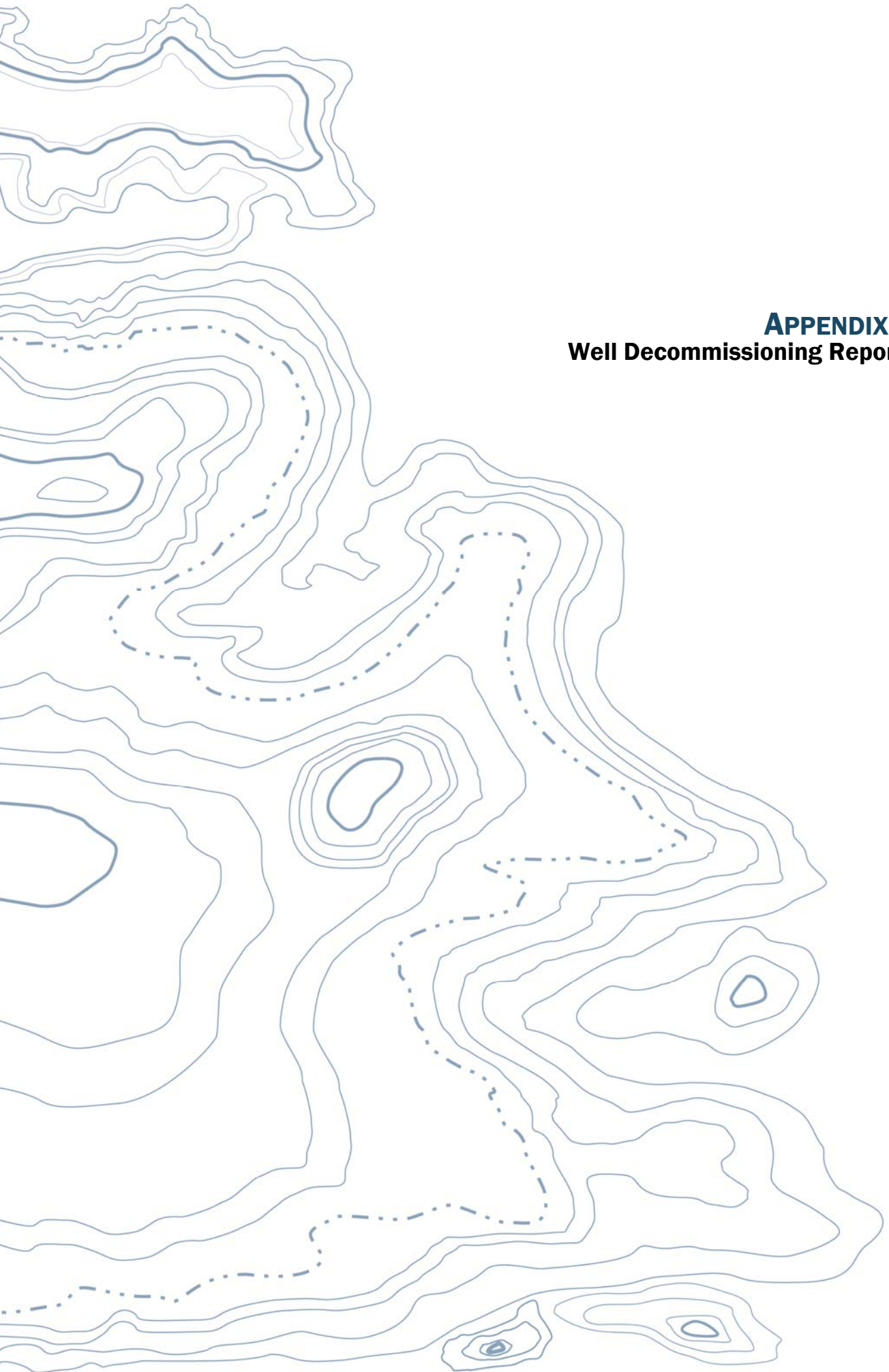
Figure 2

APPENDIX A
American Plating Site Engineering Design Report

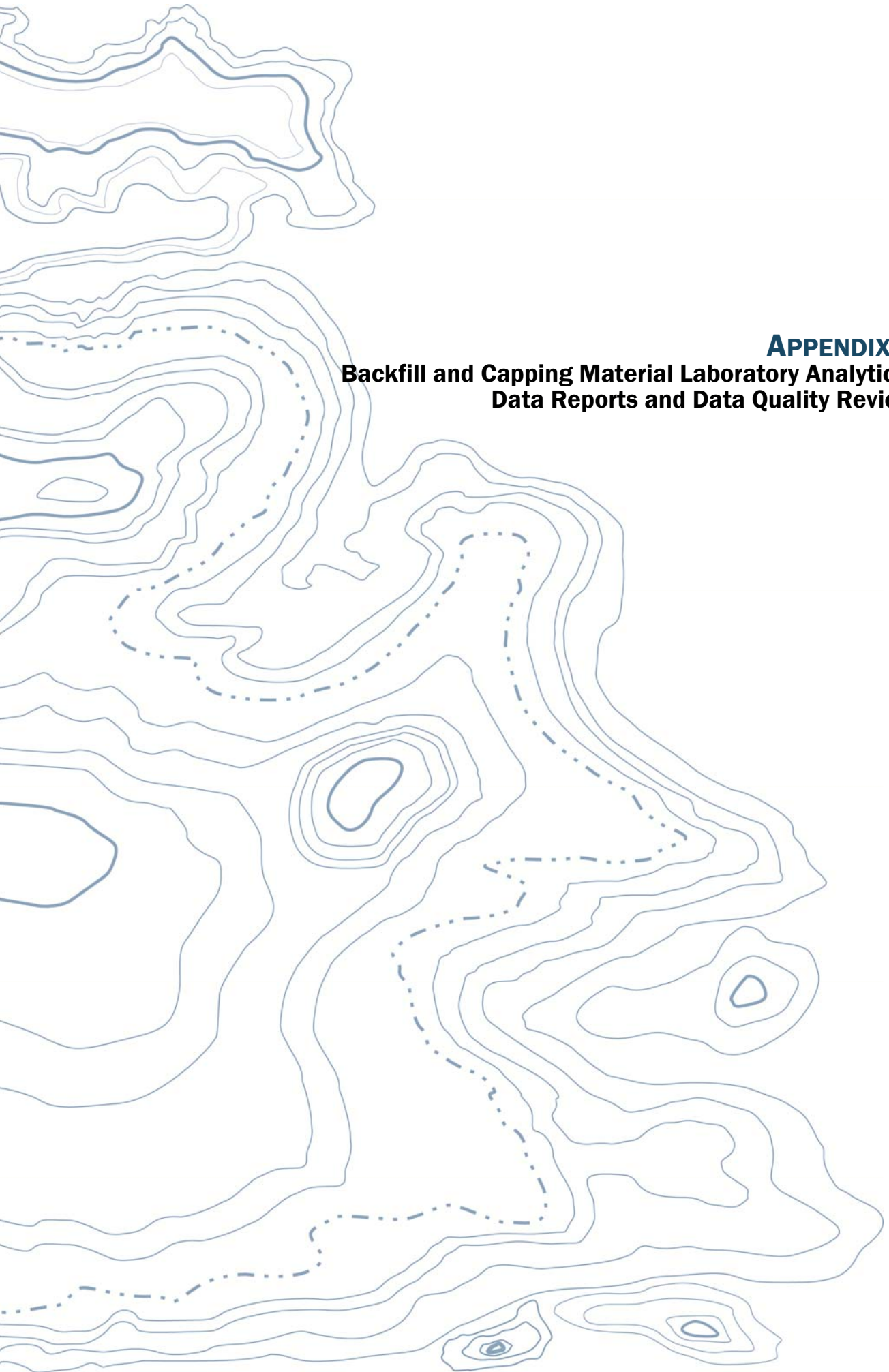
APPENDIX B
Water Characterization Laboratory Analytical Data Reports



APPENDIX C
Materials Recycling and Disposal Documentation

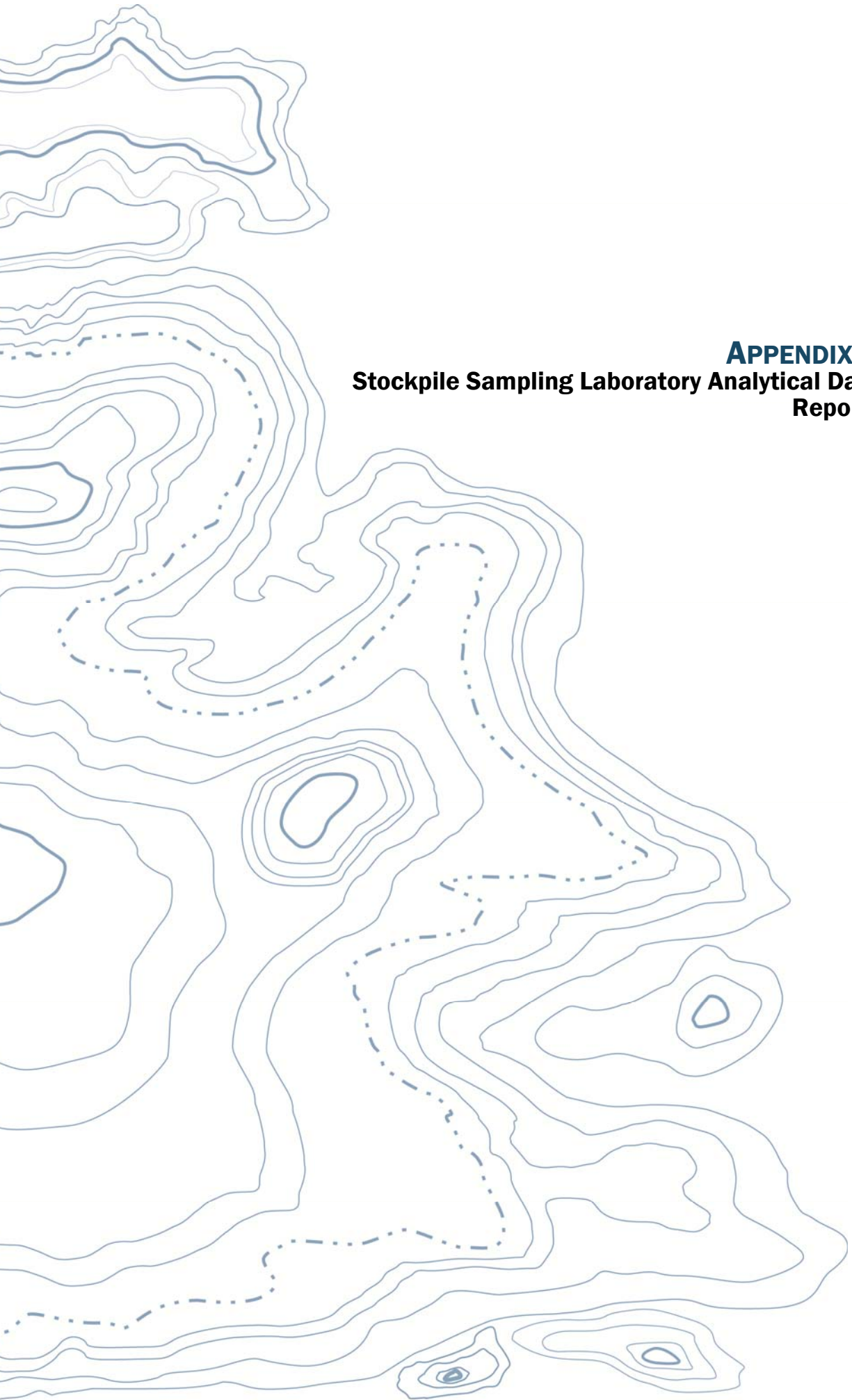


APPENDIX D
Well Decommissioning Reports

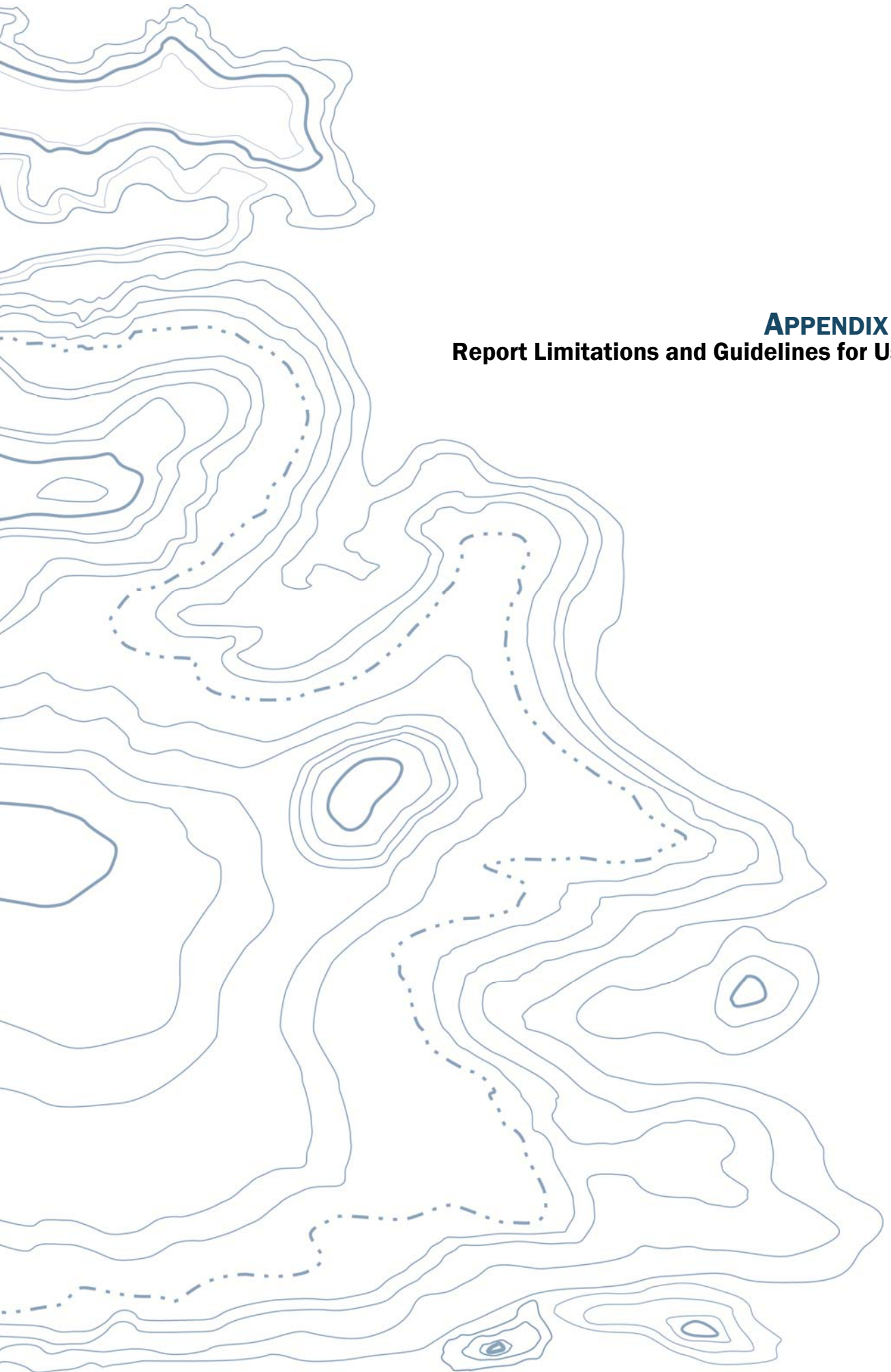


APPENDIX E
Backfill and Capping Material Laboratory Analytical Data Reports and Data Quality Review

APPENDIX F
Verification Sampling Laboratory Analytical Data Reports and Data Quality Review



APPENDIX G
Stockpile Sampling Laboratory Analytical Data Reports



APPENDIX H
Report Limitations and Guidelines for Use

APPENDIX H
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Environmental Services Are Performed for Specific Purposes, Persons and Projects

GeoEngineers has completed this Remedial Action Construction Report for the American Plating Site in general accordance with the scope and limitations of our proposal, dated July 25, 2011. This report has been prepared for the exclusive use of Foss Waterway Development Authority, their authorized agents and regulatory agencies. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an ESA study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and property. No one except Foss Waterway Development Authority should rely on this environmental report without first conferring with GeoEngineers. Use of this report is not recommended for any purpose or project except the one originally contemplated.

This Environmental Report is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the American Plating Site. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

If important changes are made to the project or property after the date of this report, we recommend that GeoEngineers be given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Reliance Conditions for Third Parties

Our report was prepared for the exclusive use of our Client. No other party may rely on the product of our services unless we agree to such reliance in advance and in writing. This is to provide our

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and generally accepted environmental practices in this area at the time this report was prepared.

Environmental Regulations Are Always Evolving

Some substances may be present in the vicinity of the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substances, change or if more stringent environmental standards are developed in the future.

Conditions Can Change

This environmental report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the subject property, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Please contact GeoEngineers before applying this report for its intended purpose so that GeoEngineers may evaluate whether changed conditions affect the continued applicability of the report.

Most Environmental Findings Are Professional Opinions

Our interpretations of site conditions are based on field observations and analytical data from widely spaced sampling locations at the subject property. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an informed opinion about subsurface conditions throughout the property. Actual subsurface conditions may differ, sometimes significantly, from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are less exact than other engineering and natural science disciplines. Without this understanding, there may be expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you need to know more about how these “Report Limitations and Guidelines for Use” apply to your project or property.