APPENDIX A

Information Regarding Neighboring Properties

TrueGuard, LLC

MAUL
FOSTER
ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS
3121 SW Moody Avenue, Suite 200 | Portland, Oregon 97239 | Phone 971.544.2139 | Fax 971.544.2140 | www.MFAinc.org

April 1, 2008
Project No. 9009.01.12

Tom Middleton L.HG
Site Manager
SWRO Toxics Cleanup Program
State of Washington Department of Ecology
P.O. Box 47775
Olympia, Washington 98504-7775

Re: Response to Ecology February 28, 2008 Opinion Pursuant to WAC 173-340-515(5) on Proposed Remedial Action, TrueGuard, LLC
Facility/Site No. 75455855, VCP No. SW0916

Dear Mr. Middleton:

On behalf of TrueGuard, LLC (TrueGuard), Maul Foster & Alongi, Inc. (MFA) has prepared this letter in response to the Washington Department of Ecology's (Ecology) February 28, 2008 opinion on the proposed remedial action on the TrueGuard site located at 725 South 32nd Street in Washougal, Washington. The responses provide additional information and clarification about the proposed action. For readability, Ecology's comments are provided below in italics, followed by TrueGuard's responses.

Ecology Comment 1

It appears from the information provided that the source of arsenic in groundwater has been identified as originating from spillage and leakage of wood treatment chemicals in the retort area. There is limited information on shallow soil testing on the site. We recommend that arsenic, boron, copper and chromium levels in soil across the site also be delineated to determine if these are also impacting the shallow aquifer.

TrueGuard Response 1

TrueGuard expects to conduct limited soil sampling within and adjacent to the source area during the pilot-scale activities. This sampling will occur in the area south of the retorts, in soils within the saturated zone of the upper aquifer. Up to five soil samples from this area will be analyzed for total arsenic by ICPMS methods and total copper, boron and chromium by ICP methods. Sample collection will occur via standard methods, and analysis will be performed by Specialty Analytical Laboratory of Tualatin, Oregon.

In addition to the total metals analysis, up to three soil samples will be collected for arsenic speciation analysis. One sample will be taken from upper aquifer saturated zone soils in the pilot-scale injection area (near monitoring well MW-3). If time permits, a second sample will be taken from the area adjacent to monitoring well MW-11 and a third from the area near monitoring well MW-14 at the eastern property boundary. Results from these samples will be used to help assess the natural reductive capacity of the site soils. Samples will be collected in 2-oz. jars, and every effort will be made to keep the core collected from the geoprobe equipment intact in order to minimize exposure to oxygen. Headspace in the jars will be minimized. These samples will be packed in ice and submitted within 24 hours to Specialty Analytical Laboratory with a rush turn-around time. Arsenic will be extracted using sequential extractions, and separation of the species will occur using quaternary ammonium ion exchange columns. Determination of the individual species will be performed using ICP-MS.

The feasibility of delineating impacts to shallow soil at the TrueGuard site is restricted by the presence of structures and production area floor-slab liners, which limit the areas where samples can be collected. However, these same features act as isolation barriers that prevent direct contact and leaching. Impacted soil would be expected to be found well within this groundwater plume area, with solid-phase concentrations decreasing rapidly with distance from the source. Ultimately, TrueGuard believes that aqueous impacts will drive the risk evaluation for the site, and that solid-phase impacts will be of little relative importance. Consequently, soil sampling will be limited to that described above.

Ecology Comment 2

Although no site drawings have been provided, it appears there is a shallow storm water drainage network on the site that collects water and drains towards the Wildlife Refuge to the east. This drainage network may preferentially divert shallow groundwater. Please provide Ecology with a map of the storm water network and all other buried utilities. We also recommend that a sample of the water within the drainage network, at the outfall located in the Wildlife Refuge, be collected and tested for the constituents of concern including arsenic, boron, copper, and chromium.

TrueGuard Response 2

Please note that currently available information indicates that there is no outfall for TrueGuard stormwater to the wildlife refuge as Ecology's comment suggests.

TrueGuard will have a licensed surveyor measure the location and elevation of all known utility corridors within the eastern portion of the property (through which elevated concentrations of arsenic have been detected). In addition, MFA will review all available City of Washougal and Port of Camus/Washougal as-built drawings relating to the utilities under South 32nd Street between Truman Street and Ford Street. A map showing the location and depths of the subsurface utilities will be generated and submitted with the Full-Scale In-Situ Remediation Plan.

Ecology Comment 3

Two wells in the source area are proposed to be decommissioned with a new product called Holeblok+. Currently Ecology does not have enough information on this product, thus we recommend standard well decommissioning procedures be utilized on the site at this time.

TrueGuard Response 3

TrueGuard will plan on abandoning the monitoring well MW-8 and the extraction well MW-9 by standard methods unless we hear from Ecology that the use of the Holeblok+ product has been approved for this purpose. It is our understanding that Ecology has plans to review the use of this product prior to our expected start-of-work date. MFA plans on contacting Ecology prior to the start date to discuss this issue.

Ecology Comment 4

Please furnish Ecology with details of the current independent remedial action system in place at the site (groundwater extraction). This includes at a minimum, system drawings, pumping rates, radius of influence of the pumping wells, details on the treatment of extracted groundwater, and effects on shallow groundwater flow directions.

TrueGuard Response 4

As discussed during the site walk performed with Mr. Middleton on March 11, 2008, the two extraction wells MW-9 and MW-10 have been used for the extraction of water for use in the treatment process. The extraction rates have been limited to less than 5,000 gallons per day between the two wells. The extraction pumps are automated by use of timers, and the pumping occurs between 12:00 noon and 10:00 pm every night. Extraction well MW-9 will be abandoned during the pilot-scale injection event. TrueGuard has agreed to discontinue use of the remaining extraction well just prior to the pilot-scale injection activities. Also, it is unlikely that MW-10 will continue to be used during full-scale in-situ remediation.

Ecology Comment 5

In accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated for Independent Remedial Actions shall be submitted simultaneously in both a written and electronic format. For additional *information regarding electronic format requirements, see the website http://www.ecy.wa.gov/eim. Be advised that according to the policy, any reports containing sampling data that are submitted for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy. Data must be submitted to Ecology in this format for Ecology to issue a No Further Action determination. Be advised that Ecology requires up to two weeks to process the data once it is received.*

TrueGuard Response 5

TrueGuard intends to submit data in the required electronic format by June 1, 2008.

Ecology Comment 6

Ecology is not opposed to the implementation of your pilot scale remedial action (the addition of Adventus EHC-M to treat heavy metals in groundwater) prior to addressing the above listed comments; however, these above-noted comments will require attention before implementation of the full scale system.

TrueGuard Response 6

Comment noted.

Thank you for your involvement. We hope to see you during the pilot test, which is slated to begin April 14, 2008.

Sincerely,

Maul Foster & Alongi, Inc.

Matthew Hickey
Matthew Hickey, E.I.T.
Project Engineer

Ted Wall
Ted Wall, P.E.
Director of Engineering

cc: Alan Wade, TrueGuard, LLC
Cheryl Moore, TrueGuard, LLC
Steve Krommenacker, TrueGuard, LLC

TEST REPORT #2 HB HOLEBLOK+™ GROUT CHEMICAL REACTIVITY WITH GROUNDWATER IN MONITORING WELL

Technology Overview

AquaBlok® is a patented, composite-aggregate technology resembling small stones and typically comprised of a dense aggregate core, clay or clay sized materials, and polymers (Figure 1). For typical formulations, AquaBlok's clay (sealant) component consists largely of bentonite clay. However, other clay minerals can be incorporated to meet specific needs. Other technology parameters (particle size, relative clay content, etc.) can also be modified, as appropriate.

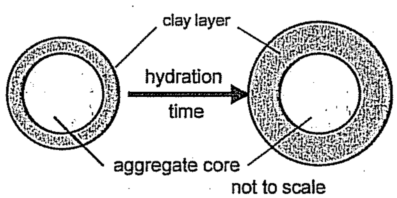

Figure 1. Configuration of Typical AquaBlok Particle.

AquaBlok particles expand when hydrated, with the degree of net vertical expansion determined largely by the formulation, application thickness, and the hardness and salinity of the hydrating water. When a mass of particles is hydrated, the mass coalesces into a continuous body of material. Once developed, the hydrated AquaBlok can act as an effective physical, hydraulic, and chemical barrier by virtue of its relatively cohesive and homogeneous character, and low permeability to water.

Problem Statement

In construction of an environmental monitoring well, a low-permeability, hydraulic seal is required to minimize the potential for vertical transfer of contaminated ground water or oil along the well's annular space. Often standard bentonite grout materials will absorb low levels of contaminants, only to release these constituents later. This can result in false positive readings causing significant added expense and time to monitoring programs. In addition, creating and maintaining a positive seal above the sand/screen interval is important to prevent transfer of contaminants such that pollutant migration does not contaminate adjacent aquifers.

Approach

Current practice for creating a hydraulic seal above a well's screened interval generally involves installation of a low-permeability grout material directly over a well screen sand pack or other granular material previously placed into the well's annular space, adjacent to the well screen (Figure 2). The seal is typically created by pouring an adequate quantity of pure, dry bentonite pellets or chips down the annular space and across the surface of the granular component.

Water present in the formation hydrates the pellets, thus affecting material expansion and sealing of the annular space. Finally, the bentonite chips or concrete/bentonite grout slurry (typically characterized by a low bearing capacity) is tremie-piped over the top of the semi-solid cap. Well construction is then typically completed through application of a surficial concrete cap.

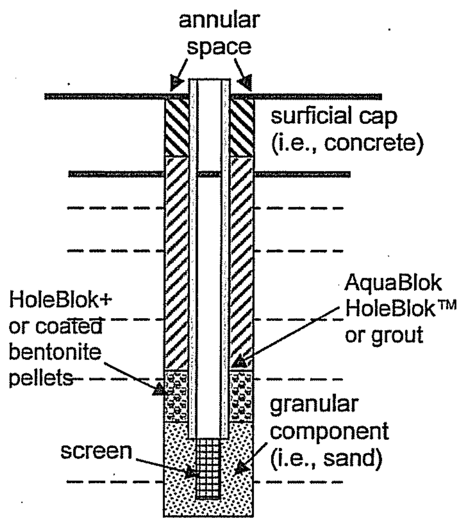

Figure 2. Schematic of common well construction.

Figure 3. Hole Size Application Rates.
D1 = Bore Hole Diameter (Inches)
V1 = Entire Bore Hole Volume (Cu.Ft.)
LF1 = Linear Feet per 50# of HoleBlok
D2 = Well Casing Diameter (Inches)
V2 = Annular Space Volume (Cu.Ft.)
LF2 = Linear Feet per 50# of HoleBlok

D_1	V_1	LF_1	D_2	V_2	LF_2
24	3.142	0.20	16	1.745	0.36
			12	2.356	0.27
18	1.767	0.35	8	1.418	0.44
			6	1.571	0.40
16	1.396	0.45	8	1.047	0.60
			6	1.200	0.52
			4	1.309	0.48
14	1.069	0.58	8	0.720	0.87
			6	0.873	0.72
			4	0.982	0.64
12	0.785	0.80	6	0.589	1.06
			4	0.698	0.90
10	0.545	1.15	4	0.458	1.36
			2	0.524	1.19
8	0.349	1.79	2	0.327	1.91
7	0.267	2.34	2	0.245	2.55
6	0.196	3.18	2	0.175	3.58
			1	0.191	3.27
4	0.087	7.16	2	0.065	9.55
			1	0.082	7.64
3	0.049	12.73	1 1/2	0.037	16.98
			1	0.044	14.32
2	0.022	28.65	1 1/2	0.010	65.48
			1	0.016	38.20
			3/4	0.019	33.34
1 3/4	0.017	37.42	1 1/4	0.008	76.39
1 1/2	0.012	50.93	1	0.007	91.67
1 1/4	0.009	73.34	1	0.003	203.72
1	0.005	114.59	3/4	0.002	261.92

Construction of an effective bentonite seal directly over the top of (and contiguous with) the underlying granular unit can be complicated by a phenomenon known as "bridging." Bridging generally involves a "clogging" of bentonite material within upper reaches of the annular space during its application and descent through the annular space, and can result in gaps.

Such a hydraulic gap could create pathways for release or the uncontrolled transfer of contaminated ground waters from one aquifer to another.

In addition, the potential for direct contact between the bentonite seal and contaminated groundwater below creates the need for both a very low hydraulic conductivity barrier and also a material that will not react or re-release contaminants once contact is made.

Why HoleBlok+ Is Better

Two important advantages are provided by the use of AquaBlok's unique HoleBlok+ product. First, the more dense, bentonite-bearing particle has both a greater mass and a delayed hydration time to minimize bridging during descent through the annular space, enabling more effective placement of the reactive bentonite component directly overtop the sand unit – thus resulting in formation of a continuous and effective well seal. The settling velocity of dry AquaBlok particles through a water column within the annular space equals that of coated bentonite pellets and is faster than that of pure chips (see Figure 6, page 2).

Second, the reactive material contained in the HoleBlok+ will both minimize the potential for contaminant rebound within an environmental monitoring well, but also provide some level of pollution prevention as described further below.

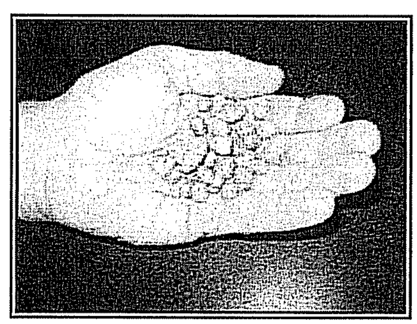

Figure 4. AquaBlok HoleBlok™ and HoleBlok+™ grout particles are easy to handle and place. No mixing or special equipment is required.

AquaBlok HoleBlok+ Reactive Sealant for Pollution Prevention

By adding reactive media or catalysts to AquaBlok, such as Zero Valent Iron, hydrated composite particles quickly form subsurface seals around targeted objects such as well casings, piping, or other structures and provide treatment of residual pollution. The reactive nature of the amended sealant is such that organic compounds that partition into the sealant can be destroyed. Inorganic compounds, which tend to migrate along the preferred path of the boreholes or engineered structures, will also be effectively sequestered, thereby minimizing extended or cross-contamination of sub-aqueous environments. AquaBlok HoleBlok+ helps minimize cross contamination of aquifers during site investigation, delineation and remedial actions. In addition, the potential for rebound of contaminants of concern, which may be attributed to the sorptive nature of conventional sealants, can be minimized (PATENTS PENDING).

Impact/Reactivity of HoleBlok+ with Groundwater

Independent lab tests were performed to access potential impact on groundwater chemistry from the use of HoleBlok+ or standard HoleBlok products. Leachability in a simulated well/annular environment was tested. Comparison was made to control, where no sealant was used. This study provides additional data beyond prior tests which were performed to compare AquaBlok to other currently commercially available well sealant products.

The below table presents a selected, partial summary of key analytical results:

Indicator, Major Ions, Metals	Drinking Water Stds	Control	Bentonite	HP+
Specific Conductance	–	2160	2480	2430
pH	6.5-8.5	7.28	7.22	7.29
Calcium	–	328000	315000	330000
Chloride	250	74	80	72
Iron	300	4910	1380	3750
Potassium	–	3810	7230	6720
Magnesium	–	147000	135000	145000
Sodium	–	57200	153000	113000
Sulfate	250	1240	1320	1280
Arsenic	10	<3.0	<3.0	<3.0
Copper	1300	<5.0	<5.0	<5.0
Lead	15	<1.0	1.54	1.7

HoleBlok+ did not materially affect analytical groundwater data. Also, previous studies indicate that non-reactive HoleBlok is an effective alternative to traditional annular sealant, which compares favorably from a chemical perspective. This additional data now indicates that HoleBlok+ performs as well as non-reactive HoleBlok and may offer additional protective measures to further assure the accuracy of ground water samples by minimizing the potential impact of organic pollutant rebound issues.

Settling Characteristics

To obtain a comparison of the rate of descent of AquaBlok to alternative products, two formulas of AquaBlok were used: a 4060 No. 9 AquaBlok HoleBlok, having an average particle size of ~1/4"; and a 4060 uniform No. 8 AquaBlok HoleBlok, having an average particle size of ~3/8". The two formulations of AquaBlok were compared to bentonite chips, 1/4" coated tablets, and 3/8" coated tablets. To perform the comparison, an 8.5'x11"x11" acrylic testing apparatus was used. The 8.5- foot column was filled to six-inches from the top of the column to obtain an eight-foot water column. A dropping apparatus was then utilized to consistently drop approximately 200 cm^3 of each product. The rate of descent was timed from the moment of opening the dropping apparatus until the majority of the product had reached the floor of the testing column. A total of ten repetitions were completed for each product. As shown on Figure 5, the average drop rates for the AquaBlok HoleBlok grout particles are equivalent to the coated bentonite pellets.

Permeability

Representative samples of freshwater AquaBlok (4060 FW) were used to determine saturated hydraulic conductivity in general conformance with ASTM Method D 5084.

AquaBlok HoleBlok Formulation	Hydraulic Conductivity Values (cm/sec)
4060 FW	3.94×10^{-9}

Figure 5. Comparative Drop Test Results.

TEST #	Bentonite Chips	1/4" Coated Bentonite Pellets	AquaBlok 4060 No.9's	3/8" Coated Bentonite Pellets	AquaBlok 4060 No. 8's
	Time (sec)	Time (sec)	Time (sec)	Time (sec)	Time (sec)
AVG	*11.46*	*10.44*	*10.46*	*8.22*	*8.31*

Additional Application Data

The following additional data is provided for better understanding of the physical and application characteristics of HoleBlok and HoleBlok+ products.

Figure 6. Mean Moisture Content

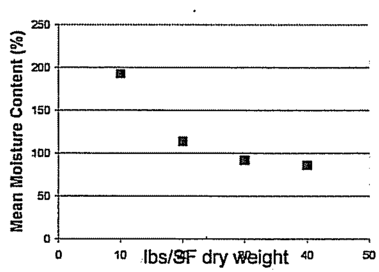

Figure 7. Mean Moisture Content

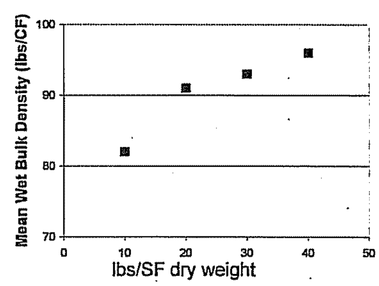

Figure 8. Typical Dry Bulk Density for AquaBlok HoleBlok+

Product Formulation	Aggregate Core	Dry Bulk Density, Typical Range (lbs/ft^3) 75 80 85
4060 FW	No. 8	

For more information, call AquaBlok, Ltd. at (800) 688-2649, fax us at (419) 385-2990, or email us at services@aquablokinfo.com.

The test reports are also available on our web site at: www.aquablokinfo.com.

Last Revised 12/19/07.

AquaBlok®
Composite Particle System

WASHINGTON STATE DEPARTMENT OF ECOLOGY
TOXICS CLEANUP
VOLUNTARY CLEANUP PROGRAM SITE LOG

SITE NAME TruGuard - Washougal **MONTH** April **YEAR** 2008
NAME Thomas Middleton **PAYROLL** **1-15** X
SIC J1C55 **VCP ID#:SW0916** **FS ID #75455855** **PERIOD** **16-31**

DATE WORKED	HOURS	ACTIVITY DESCRIPTION
4-14-2008	4	Site visit to observe soil sampling program.
4-15-2008	4	Site visit to observe pilot test of Adventus EHC injection.

EMPLOYEE'S SIGNATURE **Ecology Site Manager** Thom Mm **DATE** 4/16-08

DATA ON THIS FORM IS IN AGREEMENT WITH EMPLOYEE TIME SHEETS.

SUPERVISOR'S SIGNATURE **Ecology Supervisor** Scott Rose **DATE** 4/16/08

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Development date: August 8, 2005

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TOXICS CLEANUP
VOLUNTARY CLEANUP PROGRAM SITE LOG

SITE NAME TruGuard - Washougal **MONTH** Mar **YEAR** 2008
NAME Thomas Middleton **PAYROLL** 1-15 X
SIC J1C55 **VCP ID#:SW0916** **FS ID #75455855** **PERIOD** 16-31

DATE WORKED	HOURS	ACTIVITY DESCRIPTION
3-11-2008	6	Site visit to review well locations and meet with client to discuss proposed remedial action pilot test.

EMPLOYEE'S SIGNATURE **Ecology Site Manager** Tom Mid **DATE** 3-11-08

DATA ON THIS FORM IS IN AGREEMENT WITH EMPLOYEE TIME SHEETS.

SUPERVISOR'S SIGNATURE **Ecology Supervisor** Dom Reale for Scott Rose **DATE** 3-19-08

Development date: August 8, 2005

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

CERTIFIED MAIL

February 28, 2008

Mr. Alan Wade
TrueGuard, LLC
PO Box 227
Washougal, WA 98671

Re: Opinion pursuant to WAC 173-340-515(5) on Proposed Remedial Action for the following Hazardous Waste Site:

- Name: TrueGuard, LLC
- Address: 725 South 32nd Street, Washougal, Washington
- Facility/Site No.: 75455855
- VCP No.: SW0916

Dear Mr. Wade:

Thank you for submitting your independent remedial action report for the TruGuard Facility (Site) for review by the State of Washington Department of Ecology (Ecology) under the Voluntary Cleanup Program (VCP). Ecology appreciates your initiative in pursuing this administrative option for cleaning up hazardous waste sites under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

This letter constitutes an advisory opinion regarding whether your proposed remedial action is likely to be sufficient to meet the specific substantive requirements of MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing the following release(s) at the Site:

- Arsenic, boron, copper, and chromium in Soil and Ground Water,

Ecology is providing this advisory opinion under the specific authority of RCW 70.105D.030(1)(i) and WAC 173-340-515(5).

This opinion does not resolve a person's liability to the state under MTCA or protect a person from contribution claims by third parties for matters addressed by the opinion. The state does not have the authority to settle with any person potentially liable under MTCA except in accordance with RCW 70.105D.040(4). The opinion is advisory only and not binding on Ecology.

Ecology's Toxics Cleanup Program has reviewed the following information regarding the Site:

1. Groundwater Remediation Plan: Pilot Test, TrueGuard LLC, Washougal, Washington, dated January 31, 2008 by Maul Foster Alongi Inc.

The document listed above will be kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. Appointments can be made by calling the SWRO resource contact at (360) 407-6365.

The Site is defined by the extent of contamination caused by the following release(s):

- Arsenic, boron, copper, and chromium in soil and groundwater.

The Site is more particularly described in Enclosure A to this letter, which includes a detailed Site diagram. The description of the Site is based solely on the information contained in the document listed above.

Based on a review of the independent remedial action report and supporting documentation listed above, **Ecology has determined that the independent remedial action(s) performed at the Site are not sufficient to meet the substantive requirements contained in MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing any of the contamination at the Site.** Therefore, pursuant to WAC 173-340-515(5), Ecology is issuing this opinion that **further remedial action is necessary** at the Site under MTCA.

Based on a review of the above listed document, Ecology has the following comments:

1. It appears from the information provided that the source of the arsenic in groundwater has been identified as originating from spillage and leakage of wood treatment chemicals in the retort area. There is limited information on shallow soil testing on the site. We recommend that arsenic, boron, copper, and chromium levels in soil across the site also be delineated to determine if these are also impacting the shallow aquifer.

2. Although no site drawings have been provided, it appears there is a shallow storm water drainage network on the site that collects storm water and drains towards the Wildlife Refuge to the east. This drainage network may preferentially divert shallow groundwater. Please provide Ecology with a map of the storm water network and all other buried utilities. We also recommend that a sample of the

water within the drainage network, at the outfall located in the Wildlife Refuge, be collected and tested for the constituents of concern including arsenic, boron, copper, and chromium.

3. Two wells in the source area are proposed to be decommissioned with a new product called Holeblok +. Currently Ecology does not have enough information on this product, thus we recommend standard well decommissioning procedures be utilized on the site at this time.

4. Please furnish Ecology with details of the current independent remedial action system in place at the site (groundwater extraction). This includes at a minimum, system drawings, pumping rates, radius of influence of the pumping wells, details on treatment of extracted groundwater, and effects on shallow groundwater flow directions.

5. In accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated for Independent Remedial Actions shall be submitted <u>simultaneously</u> in both a written and electronic format. For additional information regarding electronic format requirements, see the website http://www.ecy.wa.gov/eim. Be advised that according to the policy, any reports containing sampling data that are submitted for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy. **Data must be submitted to Ecology in this format for Ecology to issue a No Further Action determination.** Be advised that Ecology requires up to two weeks to process the data once it is received.

6. Ecology is not opposed to the implementation of your pilot scale remedial action (the addition of Adventus EHC-M to treat heavy metals in groundwater) prior to addressing the above listed comments; however, these above-noted comments will require attention before implementation of the full scale system.

Please note that this opinion is based solely on the information contained in the documents listed above. Therefore, if any of the information contained in those documents is materially false or misleading, then this opinion will automatically be rendered null and void.

The state, Ecology, and its officers and employees make no guarantees or assurances by providing this opinion, and no cause of action against the state, Ecology, its officers or employees may arise from any act or omission in providing this opinion.

Again, Ecology appreciates your initiative in conducting independent remedial action and requesting technical consultation under the VCP. As the cleanup of the Site progresses, you may request additional consultative services under the VCP, including assistance in identifying applicable regulatory requirements and opinions regarding whether remedial actions proposed for or performed at the Site meet those requirements.

If you have any questions regarding this opinion, please contact me at (360) 407-7263.

Sincerely,

Tom Middleton

Tom Middleton L.HG.
Site Manager
SWRO Toxics Cleanup Program

TM/ksc:TruGuard Further Action

Enclosures:
Site Summary
Table 1 – Dissolved Metals in Groundwater from Monitoring Wells
Table 3 – Metals in Reconnaissance Groundwater
Table 4 – Metals in Soil
Figure 1 – Site Location
Figure 2 – Monitoring Wells Locations and December 2007 Groundwater Contours
Figure 3 – Well Locations and Groundwater Monitoring Results
Figure 5 – Reconnaissance Groundwater Results

Cc: Ted Wall, Maul Foster Alongi Inc
Bryan DeDoncker, Clark Co. Health
Scott Rose – Ecology

Enclosure A

Site Summary

The site is located at 725 South 32nd Street in Washougal, Clark County, Washington. It is situated on 12 acres of industrial property located approximately one-eighth of a mile south of the Lewis and Clark Highway in the Camas/Washougal Industrial Park adjacent to the Steigerwald Lake National Wildlife Refuge. Pressure treated wood has been manufactured at the property since approximately 1984. The previous owner, Allweather, treated wood with chromated copper arsenate (CCA) in the original retort (retort one) since 1984. A second retort was added adjacent to the first in 1993. Both retorts used CCA exclusively until February 2002, when retort one was switched to alkaline copper quaternary (ACQ) formulation with boric acid. The process in retort two was switched to the same ACQ formulation in January 2004. Beginning in October 2004, both borates and the CCA formulation were used in retort one and have been used in this retort to the present day. Retort two was switched to a formulation of ACQ without boric acid in January 2006, and this formulation has been used since.

The site lies within the Williamette Lowland Aquifer system, approximately 0.3 miles from the Columbia River. Annual average precipitation in Clark County is 48.14 inches. Surface-water runoff from the property is ultimately discharged to Gibbons Creek, which flows to the Columbia River. Groundwater from the shallow aquifer under the property may ultimately discharge to Gibbons Creek or the Columbia River. Based on data from a site characterization as well as data from an adjacent site (Philip Services), there are three primary hydrogeologic units beneath the property: a shallow aquifer, an upper confining unit, and a deep aquifer. Geology within the shallow aquifer consists of dark yellowish-brown to dark grey, poorly-sorted, fine- to medium-grained sands, and the unit contains a saturated and unsaturated zone. This unit extends from the ground surface to a thickness of approximately 9 to 12 feet below ground surface (bgs). Geology within the upper confining layer consists of a relatively impermeable silt layer derived from marsh that was present at the property before it was filled with dredge sands. This layer consists of dark greenish-grey to black, well-sorted silt and clay, with some sand. This unit overlies and hydraulically confines the deep aquifer. Philip Services confirmed by ground penetrating radar that the upper confining unit was laterally continuous in the area of the adjacent site (to the north) and the property. The thickness of this silt layer is approximately 18 feet or more. Geology within the deeper aquifer consists of dark greenish-grey to olive brown, poorly sorted, fine to medium gravel intermixed with silt and sand, or yellowish-brown, moderately-sorted, fine to medium sand and silt. Shallow groundwater has been observed on the property and neighboring properties. Recent depth to groundwater measurements on the site indicate a shallow aquifer groundwater gradient of 0.0056 trending southeast. The gradient measured on the neighboring property to the north indicates a gradient of

0.003 to the east with a northerly component at times. This discrepancy may be due to the lack of recharge under the subject property because it is paved and covered with building structures. Much of the property to the north is permeable by comparison. Horizontal hydraulic conductivity testing in the shallow aquifer on the adjacent site yielded conductivities ranging from 1.7×10^{-3} to 3.2×10^{-2} centimeters per second (cm/s).

Groundwater sampling has shown elevated levels of arsenic in shallow groundwater in samples collected near the wood treating retorts. Allweather has indicated that there were occasional spills of treatment chemicals from the primary containment area resulting in diluted chemicals sitting in the channel area. From the 1990's to the early 2000's, the retort door sump experienced overflows due to operator error and equipment failures. Overflows occurred in the area where a crack was recently observed and repaired. These overflows are suspected as the source of the high levels of arsenic in groundwater. Background levels of arsenic in groundwater range from Non Detect to 5 micrograms per liter (ug/L), increase to approximately 30 ug/L in the downgradient direction. In the source area, concentrations were approximately 3,300 ug/L. Further downgradient of the source area, the concentrations of arsenic drop an order of magnitude to approximately 300 ug/L. Arsenic levels in soil have not been fully investigated on the site. Site characterization efforts have basically defined the source area of the arsenic in groundwater to be approximately 30 feet wide, by 50 feet long by 15 feet deep and encompassed by wells MW-3, MW-8, MW-9, and MW-10. Stormwater drainage channels may affect shallow groundwater flow preferentially diverting impacted groundwater offsite. This requires further investigation.

No cleanup of the impacted areas has occurred. A work plan outlining a pilot study has been provided and describes the addition of Adventus EHC-M to reduce the dissolved metals (arsenic) in groundwater. This product is designed to immobilize the arsenic through precipitation. Possible side effects are noted as the increased mobility and toxicity of chromium. The proposed sampling program includes analysis of total/dissolved arsenic, iron, boron, chromium, manganese, hexavalent chromium, as well as sulfate, chloride, nitrate, and total organic carbon. There are two proposed monitoring events over a period of six months. Following the pilot test, the results will be analyzed and data will be used to design a full-scale in-situ remediation approach. Two wells in the source area are proposed to be decommissioned with a new product called Holeblok +. Currently Ecology does not have enough information on this product, thus we recommend standard well decommissioning procedures be utilized on the site at this time.

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-1	04/25/86	0.033	<0.005	<0.002	--
	04/20/87	0.030	<0.005	<0.005	--
	01/27/88	0.055	<0.005	<0.010	--
	03/23/88	0.043	<0.005	<0.010	--
	05/11/88	0.047	<0.01	0.01	--
	10/14/88	0.082	<0.01	<0.01	--
	04/28/89	0.045	<0.005	<0.01	--
	10/24/89	0.072	<0.01	<0.01	--
	04/25/90	0.056	<0.005	<0.01	--
	09/19/90	0.072	<0.005	<0.01	--
	01/24/91	0.043	<0.005	<0.01	--
	06/18/92	0.064	<0.005	<0.010	--
	05/10/93	0.029	<0.005	<0.010	--
	04/22/94	0.029	<0.005	<0.010	--
	04/25/95	0.019	<0.005	<0.010	--
	04/18/96	0.023	<0.005	<0.010	--
	05/02/97	0.028	<0.005	<0.010	--
	04/09/98	0.024	<0.005	<0.010	--
	05/14/99	0.029	<0.005	<0.010	--
	06/23/00	0.038	<0.005	<0.010	--
	04/25/01	0.0337	<0.005	<0.010	--
	03/28/02	0.0235	<0.005	<0.010	--
	02/28/03	0.012	<0.005	0.03	--
	02/21/06	0.0108	0.0261	0.0347	--
	02/08/07	0.0189	<0.005	<0.010	--
	06/25/07	0.045	<0.005	<0.010	0.0234
MW-2	04/25/86	0.030	<0.005	<0.002	--
	04/20/87	0.044	<0.005	<0.005	--
	01/12/88	0.040	<0.005	<0.010	--
	02/16/88	0.031	<0.005	<0.010	--
	03/23/88	0.032	<0.005	<0.010	--
	05/11/88	0.039	<0.01	<0.01	--
	10/14/88	0.086	<0.01	<0.01	--
	04/28/89	0.034	<0.005	<0.01	--
	10/24/89	0.075	<0.01	<0.01	--
	04/25/90	0.034	<0.005	<0.01	--
	09/19/90	0.064	<0.005	<0.01	--
	01/24/91	0.042	<0.005	<0.01	--
	06/18/92	0.045	<0.005	<0.010	--
	05/10/93	0.032	<0.005	<0.010	--
	04/22/94	0.028	<0.005	<0.010	--
	04/25/95	0.019	<0.005	<0.010	--
	04/18/96	0.020	<0.005	<0.010	--

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-2 cont.	05/02/97	0.020	<0.005	<0.010	--
	04/09/98	0.019	<0.005	<0.010	--
	05/14/99	0.022	<0.005	<0.010	--
	06/23/00	0.025	<0.005	<0.010	--
	04/25/01	0.0266	<0.005	0.0183	--
	03/28/02	0.0206	<0.005	<0.010	--
	02/28/03	0.020	<0.005	0.0052	--
	02/21/06	0.0111	0.0292	0.0397	--
	02/08/07	0.0166	<0.005	<0.010	--
	06/25/07	0.033	<0.005	<0.010	0.0206
MW-3	04/25/86	0.023	<0.005	<0.002	--
	04/20/87	0.063	<0.005	<0.005	--
	01/12/88	0.060	<0.005	<0.010	--
	02/16/88	0.076	<0.005	<0.010	--
	03/23/88	0.049	<0.005	<0.010	--
	05/11/88	0.065	<0.01	<0.01	--
	10/14/88	0.076	<0.01	<0.01	--
	04/28/89	0.056	<0.005	<0.01	--
	10/24/89	0.134	<0.01	<0.01	--
	04/25/90	0.252	<0.005	<0.01	--
	09/19/90	0.477	<0.005	<0.01	--
	01/24/91	0.382	<0.005	<0.01	--
	04/19/91	0.063	<0.005	<0.01	--
	03/11/92	0.210	<0.005	<0.01	--
	06/18/92	0.287	<0.005	<0.010	--
	02/05/93	0.188	<0.005	<0.010	--
	05/10/93	0.150	<0.005	<0.010	--
	04/22/94	0.142	<0.005	<0.010	--
	04/25/95	0.094	<0.005	<0.010	--
	04/18/96	0.094	<0.005	<0.010	--
	05/02/97	0.076	<0.005	<0.010	--
	04/09/98	0.500	<0.005	<0.010	--
	05/14/99	0.654	0.041	<0.010	--
	06/23/00	0.895	0.008	<0.010	--
	04/25/01	1.490	<0.005	<0.010	--
	03/28/02	1.270	0.0542	<0.010	--
	02/21/06	0.0325	0.0195	0.0271	--
	02/08/07	0.639	<0.005	<0.010	--
	03/07/07	0.760	<0.005	<0.010	--
	06/25/07	0.600	<0.005	<0.010	0.746
	08/01/07	0.690	<0.005	<0.010	0.507

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-4	04/25/86	0.015	<0.005	<0.002	--
	04/20/87	0.009	<0.005	<0.005	--
	01/27/88	0.082	<0.005	<0.010	--
	03/23/88	0.027	<0.005	<0.010	--
	05/11/88	0.047	<0.01	<0.01	--
	10/14/88	0.095	<0.01	<0.01	--
	04/28/89	0.013	<0.005	<0.01	--
	10/24/89	0.086	<0.01	<0.01	--
	04/25/90	0.076	<0.005	<0.01	--
	09/19/90	0.092	<0.005	<0.01	--
	01/24/91	0.081	<0.005	<0.01	--
MW-5	01/12/88	0.003	<0.005	<0.010	--
	01/12/88	0.003	<0.005	<0.010	--
	03/23/88	0.005	<0.005	<0.010	--
	05/11/88	--	--	--	--
	10/14/88	0.055	<0.01	0.01	--
	04/28/89	<0.005	0.006	0.025	--
	10/24/89	--	--	--	--
	04/25/90	0.0640	<0.005	<0.01	--
	09/19/90	0.062	<0.005	<0.01	--
	01/24/91	0.019	<0.005	<0.01	--
	06/18/92	0.024	<0.005	<0.010	--
	05/10/93	0.013	<0.005	<0.010	--
	04/22/94	0.007	<0.005	<0.010	--
	04/25/95	0.006	<0.005	<0.010	--
	04/18/96	0.044	<0.005	<0.010	--
	05/02/97	0.005	0.006	<0.010	--
	04/09/98	--	<0.005	<0.010	--
	05/14/99	<0.005	<0.005	<0.010	--
	06/23/00	0.009	<0.005	<0.010	--
	04/25/01	0.013	<0.005	<0.010	--
	03/28/02	<0.0100	<0.005	<0.010	--
	02/28/03	0.045	0.023	0.063	--
	02/21/06	0.010	0.0372	0.057	--
	02/08/07	0.0074	<0.005	<0.010	--
	06/25/07	0.061	<0.005	<0.010	<0.010
MW-6	01/12/88	0.005	<0.005	<0.010	--
	03/23/88	--	<0.005	<0.010	--
	05/11/88	--	--	--	--
	10/14/88	0.009	<0.01	<0.01	--
	04/28/89	--	--	--	
	02/08/07	0.0053	<0.005	<0.010	--
	11/06/07	0.0015		<0.010	0.494

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-7	12/30/91	0.041	<0.005	<0.01	--
	06/18/92	0.047	<0.005	<0.010	--
	05/10/93	0.040	<0.005	<0.010	--
	04/22/94	0.027	<0.005	<0.010	--
	04/25/95	0.012	<0.005	<0.010	--
	04/18/96	0.022	<0.005	<0.010	--
	05/02/97	0.074	0.008	<0.010	--
	04/09/98	0.018	<0.005	<0.010	--
	05/14/99	0.020	<0.005	<0.010	--
	06/23/00	0.031	<0.005	<0.010	--
	04/25/01	0.0299	<0.005	0.0138	--
	03/28/02	0.0133	<0.005	<0.010	--
	02/28/03	0.063	<0.005	0.037	--
	02/21/06	<.010	0.0229	0.0281	--
MW-8	03/07/07	2.900	<0.005	<.010	--
	06/25/07	1.400	<0.005	<0.010	0.567
	08/01/07	3.300	<0.005	<0.010	0.627
	11/06/07	0.72		0.01 U	0.106
MW-9	06/25/07	2.900	<0.005	<0.010	1.13
	08/01/07	2.600	<0.005	<0.010	0.893
MW-10	06/25/07	4.800	0.0057	<0.010	0.529
	08/01/07	6.400	<0.005	<0.010	0.914

NOTES:
Data have not yet been independently verified by Maul Foster and Alongi, Inc.
-- = analysis not performed for analyte shown.
< = analyte not detected at or above the reported method reporting limit.
mg/L = milligrams per liter (or parts per million).

Table 3
Metals in Reconnaissance Groundwater (µg/L)
TrueGuard LLC
Washougal, Washington

Location	Sample Name	Date	Depth (feet bgs)	Arsenic	Boron	Chromium	Copper
GP-1	GP-1-W-8	07/30/2007	8	49	< 10	< 5	< 10
GP-2	GP-2-W-8	07/30/2007	8	51	< 10	< 5	< 10
GP-3	GP-3-W-8	07/30/2007	8	18	170	< 5	33.0
GP-4	GP-4-W-8	07/30/2007	8	75	203	< 5	< 10
GP-5	GP-5-W-8	07/30/2007	8	100	1550	< 5	< 10
GP-6	GP-6-W-8	07/30/2007	8	77	497	< 5	< 10
GP-7	GP-7-W-8	07/30/2007	8	41	32.7	< 5	< 10
GP-8	GP-8-W-8	07/30/2007	8	360	185	< 5	< 10
GP-9	GP-9-W-7	07/31/2007	7	48	< 10	< 5	< 10
GP-10	GP-10-W-7	07/31/2007	7	33	88.1	< 5	< 10
GP-11	GP-11-W-7	07/31/2007	7	55	< 10	< 5	< 10
GP-12B	GP-12B-W-7.5	07/31/2007	7.5	28	77.3	< 5	< 10
GP-13	GP-13-W-7	07/31/2007	7	15	20.1	< 5	< 10
GP-14	GP-14-W-7	07/31/2007	7	5.9	251	< 5	< 10
GP-15	GP-15-W-7	07/31/2007	7	5	22.2	< 5	< 10
GP-16	GP-16-W-7	07/31/2007	7	32	49.3	< 5	< 10
GP-17	GP-17-W-7	07/31/2007	7	24	13.9	< 5	< 10
GP-18	GP-18-W-7	07/31/2007	7	61	55.4	< 5	< 10
GP-19	GP19-8	09/06/2007	8	73	343	< 5	< 10
GP-20	GP20-10	09/06/2007	10	120	< 10	< 5	< 10
GP-21	GP21-11	09/06/2007	11	310	94.6	< 5	< 10
GP-22	GP22-8	09/06/2007	8	44	160	< 5	< 10
GP-23	GP23-11	09/06/2007	11	96	17.4	< 5	< 10
GP-24	GP24-11	09/06/2007	11	62	< 10	< 5	< 10
GP-25	GP25-8	09/06/2007	8	30	1170	< 5	< 10
GP-26	GP26-9.5	09/06/2007	9.5	62	1180	< 5	< 10
GP-27	GP27-7	09/06/2007	7	83	418	< 5	< 10

NOTES:
bgs = below ground surface.
< = analyte not detected at or above the reported method reporting limit.
µg/L= micrograms per liter.

Table 4
Metals in Soil (mg/kg)
TrueGuard LLC
Washougal, Washington

Location	Sample Name	Date	Depth (feet bgs)	Arsenic	Boron	Chromium	Copper
GP-15	GP-15-S-4	07/31/2007	4	1.94	< 1.01	7.60	4.75
GP-18	GP-18-S-4.5	07/31/2007	4.5	2.00	< 0.86	9.34	5.69

NOTES:
bgs = below ground surface.
< = analyte not detected at or above the reported method reporting limit.
mg/kg = milligrams per kilogram.

MAUL FOSTER ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS
Vancouver, WA | Portland, OR | www.MFAinc.org

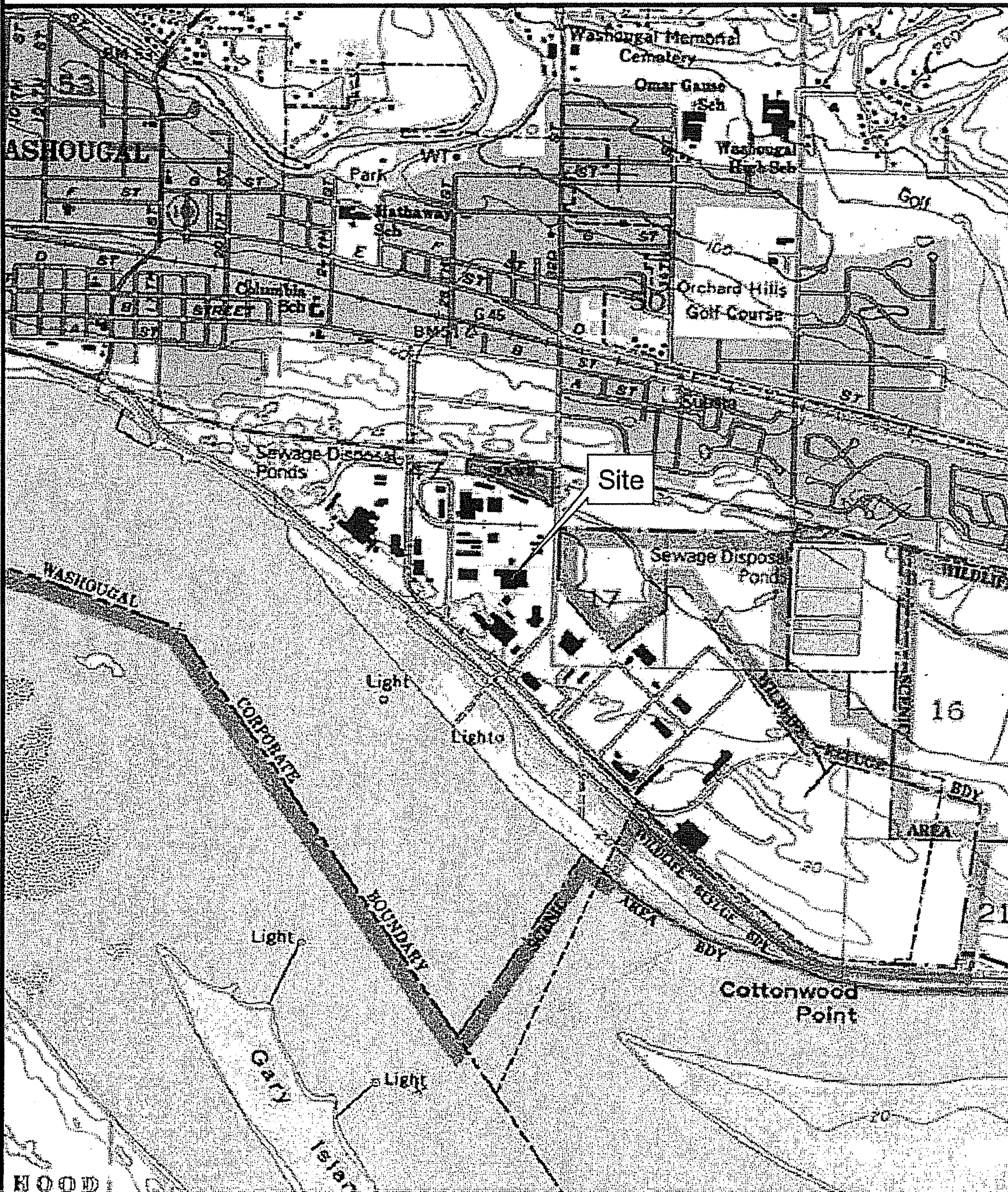
0 1,500 3,000
Feet

N

Figure 1
Site Location
TrueGuard LLC
Washougal, Washington

Site Address: 725 S. 32nd Street, Washougal, Washington
Source: USGS (1990) 7.5 Minute Topo Quad Washougal:
Section 17, Township 1 North, Range 4 East

Site Taxlot Boundaries



not delinquent
no em

SWRO
VCP SITE REVIEW SUMMARY

Site Name: TruGuard, LLC
Site Manager: Tom Middleton

VCP Number: SW0916
F/S Number: 75455855

☐ **Final NFA** (attach draft NFA/opinion letter and previous opinion or NFA letter(s))
☒ **Opinion Letter** ☐ **Other: Explain:**

Part I: Administrative Information

Priority: ☐ **High** (pending property transaction, bank loan, etc.)
☒ **Normal**

☒ Yes ☐ No **Have you reviewed the VCP application to ensure all information is current (correct applicant name, correct billing name, correct mailing addresses, etc)?**

☒ Yes ☐ No **Have you informed the VCP Unit Manager and the Data Coordinator of any site reports submitted to Ecology by the applicant?**

Project Activity Status: (What is the purpose of this Opinion Letter?)

☐ **Remedial Investigation Work Plan**
☐ **Remedial Investigation Report**
☐ **Feasibility Study Report**
☒ **Interim Action Work Plan**
☐ **Interim Action Report**
☐ **Cleanup Action Plan (CAP)**
☐ **Final Cleanup Report**
☐ **Other (Explain below):**

Provide description of the purpose of this Opinion Letter:
Provide opinion on pilot test of a proposed remedial action.

Project Activity Initiation Date: 12/11/2008

Due Date for Response to Applicant (90 days from Initiation Date): 3/11/08

Was technical assistance provided or currently being ?
☐ **No (received VCP application/cleanup report after cleanup completed)**
☒ **Yes (If yes, then check box(s) below that apply)**
☒ **before cleanup activities**
☐ **during cleanup activities**
☐ **after cleanup activities**

☐ Yes ☒ No **Is this a *regulated* UST/LUST site? (Please coordinate with UST/LUST staff)**
☐ Yes ☐ No **If so, has the LUST database manager been notified of this current activity?**

☐ Yes ☒ No **Is the site ranked? If yes, what is its rank: (1 2 3 4 5)?**
☐ **EEOS notified of pending delisting (only if site is ranked)?**
☐ **Public notice completed for delisting?**

☒ Yes ☐ No **Has Site Manager coordinated with Local Government/County Health Department?**

☐ Yes ☒ No **Is this site in the Tacoma Smelter Plume area?**
☐ Yes ☐ No **Has Site owner been notified of potential for arsenic/lead contamination?**

☐ Yes ☒ No **Policy 840 Compliance: EIM Data Submitted?**
Date Final EIM Data Received: _________

☒ Yes ☐ No **Site logs submitted to VCP data manager at the end of the pay period?**

Part II: Cleanup/Decision Summary

☐ Yes ☒ No **Does the cleanup meet substantive requirements of MTCA?** Example: Required reports (e.g., RI/FS, CAP, Sampling and Analysis plan, etc) need not be the same in title or format; however, the documents must still contain sufficient information to serve the same purpose. The scope and level of detail in these documents may vary from site to site depending on the site specific conditions and the complexity.

☐ Yes ☒ No **Has site (anywhere contamination has come to be located) been fully characterized (all media)?**

☒ Yes ☐ No ☐ Unknown **Does contamination remain on-site (definition of "site/facility")?**

☐ Yes ☐ No **Restrictive covenants/deed restrictions /institutional controls required?**
☐ Yes ☐ No **Has a filed restrictive covenant been received and entered into database?**
Unknown at this point

1. **Site Description (include site address [street, city, county], physical description, current and historical uses of site, etc):**

The site is located at 725 South 32nd Street in Washougal, Clark County, Washington. It is situated on 12 acres of industrial property located approximately one-eighth of a mile south of the Lewis and Clark Highway in the Camas/Washougal Industrial Park adjacent to the Steigerwald Lake National Wildlife Refuge. Pressure treated wood has been manufactured at the property since approximately 1984. The previous owner, Allweather, treated wood with chromated copper arsenate (CCA) in the original retort (retort one) since 1984. A second retort was added adjacent to the first in 1993. Both retorts used CCA exclusively until February 2002, when retort one was switched to alkaline copper quaternary (ACQ) formulation with boric acid. The process in retort two was switched to the same ACQ formulation in January 2004. Beginning in October 2004, both borates and the CCA formulation were used in retort one and have been used in this retort to the present day. Retort two was switched to a formulation of ACQ without boric acid in January 2006, and this formulation has been used since.

The site lies within the Williamette Lowland Aquifer system, approximately 0.3 miles from the Columbia River. Annual average precipitation in Clark County is 48.14 inches. Surface-water runoff from the property is ultimately discharged to Gibbons Creek, which flows to the Columbia River. Groundwater from the shallow aquifer under the property may ultimately discharge to Gibbons Creek or the Columbia River. Based on data from a site characterization as well as data from an adjacent site (Philip Services), there are three primary hydrogeologic units beneath the property: a shallow aquifer, an upper confining unit, and a deep aquifer. Geology within the shallow aquifer consists of dark yellowish-brown to dark grey, poorly-sorted, fine- to medium-grained sands, and the unit contains a saturated and unsaturated zone. This unit extends from the ground surface to a thickness of approximately 9 to 12 feet below ground surface (bgs). Geology within the upper confining layer consists of a relatively impermeable silt layer derived from marsh that was present at the property before it was filled with dredge sands. This layer consists of dark greenish-grey to black, well-sorted silt and clay, with some sand. This unit overlies and hydraulically confines the deep aquifer. Philip Services confirmed by ground penetrating radar that the upper confining unit was laterally continuous in the area of the adjacent site (to the north) and the property. The thickness of this silt layer is approximately 18 feet or more. Geology within the deeper aquifer consists of dark greenish-grey to olive brown, poorly sorted, fine to medium gravel intermixed with silt and sand, or yellowish-brown, moderately-sorted, fine to medium sand and silt. Shallow groundwater has been observed on the property and neighboring properties. Recent depth to groundwater measurements on the site indicate a shallow aquifer groundwater gradient of 0.0056 trending southeast. The gradient measured on the neighboring property to the north indicates a gradient of 0.003 to the east with a northerly component at times. This discrepancy may be due to the lack of recharge under the subject property because it is paved and covered with building structures. Much of the property to the north is permeable by comparison. Horizontal hydraulic conductivity testing in the shallow aquifer on the adjacent site yielded conductivities ranging from 1.7 x 10^{-3} to 3.2 x 10^{-2} centimeters per second (cm/s).

2. **Describe affected media (soil, groundwater, surface water, sediment, air):**

Groundwater sampling has shown elevated levels of arsenic in shallow groundwater in samples collected near the wood treating retorts. Allweather has indicated that there were occasional spills of treatment chemicals from the primary containment area resulting in diluted chemicals sitting in the channel area. From the 1990's to the early 2000's, the retort door sump experienced overflows due to operator error and equipment failures. Overflows occurred in the area where a crack was recently observed and repaired. These overflows are suspected as the source of the high levels of arsenic in groundwater. Background levels of arsenic in groundwater range from Non Detect to 5 micrograms per liter (ug/L), increase to approximately 30 ug/L in the downgradient direction. In the source area, concentrations were approximately 3,300 ug/L. Further downgradient of the source area, the concentrations of arsenic drop an order of magnitude to approximately 300 ug/L. **Arsenic levels in soil have not been completely investigated on the site.** Site characterization efforts have basically defined the source area of the arsenic in groundwater to be approximately 30 feet wide by 50 feet long by 15 feet deep and encompassed by wells MW-3, MW-8, MW-9, and MW-10. **Stormwater drainage channels may affect shallow groundwater flow preferentially diverting impacted groundwater off site. This requires further investigation.**

3. **Cleanup method used:**

- ☒ **Method A**
- ☐ **Method B**
- ☐ **Method C**

4. **Describe cleanup activities (for each media) and if contamination remains on site (including confirmational sampling/analysis, points of compliance, etc):**

No cleanup of the impacted areas has occurred. A work plan outlining a pilot study has been provided and describes the addition of Adventus EHC-M to reduce the dissolved metals (arsenic) in groundwater. This product is designed to immobilize the arsenic through precipitation. Possible side effects are noted as the increased mobility and toxicity of chromium. The proposed sampling program includes analysis of total/dissolved arsenic, iron, boron, chromium, manganese, hexavalent chromium, as well as sulfate, chloride, nitrate, and total organic carbon. There are two proposed monitoring events over a period of six months. Following the pilot test, the results will be analyzed and data will be used to design a full-scale in-situ remediation approach.

Two wells in the source area are proposed to be decommissioned with a new product called Holeblok +. **Currently Ecology does not have enough information on this product, thus we recommend standard well decommissioning procedures be utilized on the site at this time.**

5. **Describe restrictive covenant (e.g., contamination remains under structure, groundwater restrictions, 5-year review):**

N/A

[signature] 2/28/08

Site Manager **Date**

Peer Reviewer	**Date**
Scott Rose	*2/28/08*
Unit Manager	**Date**
Marian Abbett	*2/28/08*
Section Manager	**Date**

Draft

February 25, 2008

Mr. Alan Wade
TrueGuard, LLC
PO Box 227
Washougal, WA 98671

Re: Opinion pursuant to WAC 173-340-515(5) on Proposed Remedial Action for the following Hazardous Waste Site:

- Name: TrueGuard, LLC
- Address: 725 South 32nd Street, Washougal, Washington
- Facility/Site No.: 75455855
- VCP No.: SW0916

Dear Mr. Wade:

Thank you for submitting your independent remedial action report for the TruGuard Facility (Site) for review by the State of Washington Department of Ecology (Ecology) under the Voluntary Cleanup Program (VCP). Ecology appreciates your initiative in pursuing this administrative option for cleaning up hazardous waste sites under the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

This letter constitutes an advisory opinion regarding whether your proposed remedial action is likely to be sufficient to meet the specific substantive requirements of MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing the following release(s) at the Site:

- Arsenic, boron, copper, and chromium in Soil and Ground Water,

Ecology is providing this advisory opinion under the specific authority of RCW 70.105D.030(1)(i) and WAC 173-340-515(5).

This opinion does not resolve a person's liability to the state under MTCA or protect a person from contribution claims by third parties for matters addressed by the opinion. The state does not have the authority to settle with any person potentially liable under MTCA except in accordance with RCW 70.105D.040(4). The opinion is advisory only and not binding on Ecology.

Ecology's Toxics Cleanup Program has reviewed the following information regarding the Site:

1. Groundwater Remediation Plan: Pilot Test, TrueGuard LLC, Washougal, Washington, dated January 31, 2008 by Maul Foster Alongi Inc.

The document listed above will be kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. Appointments can be made by calling the SWRO resource contact at (360) 407-6365.

The Site is defined by the extent of contamination caused by the following release(s):

- Arsenic, boron, copper, and chromium in soil and groundwater.

The Site is more particularly described in Enclosure A to this letter, which includes a detailed Site diagram. The description of the Site is based solely on the information contained in the document listed above.

Based on a review of the independent remedial action report and supporting documentation listed above, **Ecology has determined that the independent remedial action(s) performed at the Site are not sufficient to meet the substantive requirements contained in MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing any of the contamination at the Site.** Therefore, pursuant to WAC 173-340-515(5), Ecology is issuing this opinion that **further remedial action is necessary** at the Site under MTCA.

Based on a review of the above listed document, Ecology has the following comments:

1. It appears from the information provided that the source of the arsenic in groundwater has been identified as originating from spillage and leakage of wood treatment chemicals in the retort area. There is limited information on shallow soil testing on the site. We recommend that arsenic, boron, copper, and chromium levels in soil across the site also be delineated to determine if these are also impacting the shallow aquifer.

2. Although no site drawings have been provided, it appears there is a shallow storm water drainage network on the site that collects storm water and drains towards the Wildlife Refuge to the east. This drainage network may preferentially divert shallow groundwater. Please provide Ecology with a map of the storm water network and all other buried utilities. We also recommend that a sample of the water within the drainage network, at the outfall located in the Wildlife Refuge, be collected and tested for the constituents of concern including arsenic, boron, copper, and chromium.

3. Two wells in the source area are proposed to be decommissioned with a new product called Holeblok +. Currently Ecology does not have enough information on this product, thus we recommend standard well decommissioning procedures be utilized on the site at this time.

4. Please furnish Ecology with details of the current independent remedial action system in place at the site (groundwater extraction). This includes at a minimum, system drawings, pumping rates, radius of influence of the pumping wells, details on treatment of extracted groundwater, and effects on shallow groundwater flow directions.

5. In accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated for Independent Remedial Actions shall be submitted simultaneously in both a written and electronic format. For additional information regarding electronic format requirements, see the website http://www.ecy.wa.gov/eim. Be advised that according to the policy, any reports containing sampling data that are submitted for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy. **Data must be submitted to Ecology in this format for Ecology to issue a No Further Action determination.** Be advised that Ecology requires up to two weeks to process the data once it is received.

6. Ecology is not opposed to the implementation of your pilot scale remedial action (the addition of Adventus EHC-M to treat heavy metals in groundwater) prior to addressing the above listed comments; however, these above-noted comments will require attention before implementation of the full scale system.

Please note that this opinion is based solely on the information contained in the documents listed above. Therefore, if any of the information contained in those documents is materially false or misleading, then this opinion will automatically be rendered null and void.

The state, Ecology, and its officers and employees make no guarantees or assurances by providing this opinion, and no cause of action against the state, Ecology, its officers or employees may arise from any act or omission in providing this opinion.

Again, Ecology appreciates your initiative in conducting independent remedial action and requesting technical consultation under the VCP. As the cleanup of the Site progresses, you may request additional consultative services under the VCP, including assistance in identifying applicable regulatory requirements and opinions regarding whether remedial actions proposed for or performed at the Site meet those requirements.

If you have any questions regarding this opinion, please contact me at (360) 407-7263.

Sincerely,

Tom Middleton L.HG.
Site Manager
SWRO Toxics Cleanup Program

TM: [SECRETARY INITIALS]

Enclosures:
Site Summary
Table 1 – Dissolved Metals in Groundwater from Monitoring Wells
Table 3 – Metals in Reconnaissance Groundwater
Table 4 – Metals in Soil
Figure 1 – Site Location
Figure 2 – Monitoring Wells Locations and December 2007 Groundwater Contours
Figure 3 – Well Locations and Groundwater Monitoring Results
Figure 5 – Reconnaissance Groundwater Results

Cc:
Ted Wall, Maul Foster Alongi Inc. 3121 SW Moody Ave., Suite 200, Portland, OR 97239
Bryan DeDoncker, Clark Co. Health, P.O. Box 9825, Vancouver, WA 98666-8825
Scott Rose – Ecology

Enclosure A

Site Summary

The site is located at 725 South 32nd Street in Washougal, Clark County, Washington. It is situated on 12 acres of industrial property located approximately one-eighth of a mile south of the Lewis and Clark Highway in the Camas/Washougal Industrial Park adjacent to the Steigerwald Lake National Wildlife Refuge. Pressure treated wood has been manufactured at the property since approximately 1984. The previous owner, Allweather, treated wood with chromated copper arsenate (CCA) in the original retort (retort one) since 1984. A second retort was added adjacent to the first in 1993. Both retorts used CCA exclusively until February 2002, when retort one was switched to alkaline copper quaternary (ACQ) formulation with boric acid. The process in retort two was switched to the same ACQ formulation in January 2004. Beginning in October 2004, both borates and the CCA formulation were used in retort one and have been used in this retort to the present day. Retort two was switched to a formulation of ACQ without boric acid in January 2006, and this formulation has been used since.

The site lies within the Williamette Lowland Aquifer system, approximately 0.3 miles from the Columbia River. Annual average precipitation in Clark County is 48.14 inches. Surface-water runoff from the property is ultimately discharged to Gibbons Creek, which flows to the Columbia River. Groundwater from the shallow aquifer under the property may ultimately discharge to Gibbons Creek or the Columbia River. Based on data from a site characterization as well as data from an adjacent site (Philip Services), there are three primary hydrogeologic units beneath the property: a shallow aquifer, an upper confining unit, and a deep aquifer. Geology within the shallow aquifer consists of dark yellowish-brown to dark grey, poorly-sorted, fine- to medium-grained sands, and the unit contains a saturated and unsaturated zone. This unit extends from the ground surface to a thickness of approximately 9 to 12 feet below ground surface (bgs). Geology within the upper confining layer consists of a relatively impermeable silt layer derived from marsh that was present at the property before it was filled with dredge sands. This layer consists of dark greenish-grey to black, well-sorted silt and clay, with some sand. This unit overlies and hydraulically confines the deep aquifer. Philip Services confirmed by ground penetrating radar that the upper confining unit was laterally continuous in the area of the adjacent site (to the north) and the property. The thickness of this silt layer is approximately 18 feet or more. Geology within the deeper aquifer consists of dark greenish-grey to olive brown, poorly sorted, fine to medium gravel intermixed with silt and sand, or yellowish-brown, moderately-sorted, fine to medium sand and silt. Shallow groundwater has been observed on the property and neighboring properties. Recent depth to groundwater measurements on the site indicate a shallow aquifer groundwater gradient of 0.0056 trending southeast. The gradient measured on the neighboring property to the north indicates a gradient of 0.003 to the east with a northerly component at times. This discrepancy may be due to the lack of recharge under the subject property because it is paved and covered with building structures. Much of the property to the north is permeable by comparison. Horizontal hydraulic conductivity testing in the shallow aquifer on the adjacent site yielded conductivities ranging from 1.7×10^{-3} to 3.2×10^{-2} centimeters per second (cm/s).

Groundwater sampling has shown elevated levels of arsenic in shallow groundwater in samples collected near the wood treating retorts. Allweather has indicated that there were occasional spills of treatment chemicals from the primary containment area resulting in diluted chemicals sitting in the channel area. From the 1990's to the early 2000's, the retort door sump experienced overflows due to operator error and equipment failures. Overflows occurred in the area where a crack was recently observed and repaired. These overflows are suspected as the source of the high levels of arsenic in groundwater. Background levels of arsenic in groundwater range from Non Detect to 5 micrograms per liter (ug/L), increase to approximately 30 ug/L in the downgradient direction. In the source area, concentrations were approximately 3,300 ug/L. Further downgradient of the source area, the concentrations of arsenic drop an order of magnitude to approximately 300 ug/L. Arsenic levels in soil have not been fully investigated on the site. Site characterization efforts have basically defined the source area of the arsenic in groundwater to be approximately 30 feet wide, by 50 feet long by 15 feet deep and encompassed by wells MW-3, MW-8, MW-9, and MW-10. Stormwater drainage channels may affect shallow groundwater flow preferentially diverting impacted groundwater offsite. This requires further investigation.

No cleanup of the impacted areas has occurred. A work plan outlining a pilot study has been provided and describes the addition of Adventus EHC-M to reduce the dissolved metals (arsenic) in groundwater. This product is designed to immobilize the arsenic through precipitation. Possible side effects are noted as the increased mobility and toxicity of chromium. The proposed sampling program includes analysis of total/dissolved arsenic, iron, boron, chromium, manganese, hexavalent chromium, as well as sulfate, chloride, nitrate, and total organic carbon. There are two proposed monitoring events over a period of six months. Following the pilot test, the results will be analyzed and data will be used to design a full-scale in-situ remediation approach. Two wells in the source area are proposed to be decommissioned with a new product called Holeblok +. Currently Ecology does not have enough information on this product, thus we recommend standard well decommissioning procedures be utilized on the site at this time.

WASHINGTON STATE DEPARTMENT OF ECOLOGY
TOXICS CLEANUP
VOLUNTARY CLEANUP PROGRAM SITE LOG

SITE NAME TruGuard - Washougal **MONTH** Feb **YEAR** 2008

NAME Thomas Middleton **PAYROLL** **1-15**

SIC J1C55 **VCP ID#:SW0916** **FS ID #75455855** **PERIOD** **16-31** X

DATE WORKED	HOURS	ACTIVITY DESCRIPTION
2-20-2008	1	Work on opinion letter.
2-21-2008	1	Finalize opinion letter.

EMPLOYEE'S SIGNATURE **Ecology Site Manager** **DATE** 3-4-07

DATA ON THIS FORM IS IN AGREEMENT WITH EMPLOYEE TIME SHEETS.

SUPERVISOR'S SIGNATURE **Ecology Supervisor** **DATE** 3/4/08

Development date: August 8, 2005

WASHING ON STATE DEPARTMENT O ECOLOGY
TOXICS CLEANUP
VOLUNTARY CLEANUP PROGRAM SITE LOG

SITE NAME TruGuard - Washougal **MONTH** Feb **YEAR** 2008
NAME Thomas Middleton **PAYROLL** 1-15 X
SIC J1C55 **VCP ID#:SW0916** **FS ID #75455855** **PERIOD** 16-31

DATE WORKED	HOURS	ACTIVITY DESCRIPTION
2-11-2008	2	Begin file review.
2-12-2008	3	Continue file review.
2-13-2008	3	Continue file review and research new bentonite holeplug. Spoke with Bill Lum (SWRO Water Resources Well Inspector) regarding the use of new holeplug sealing material. Start Opinion Letter.

EMPLOYEE'S SIGNATURE Ecology Site Manager **DATE** 2-20-08

DATA ON THIS FORM IS IN AGREEMENT WITH EMPLOYEE TIME SHEETS.

SUPERVISOR'S SIGNATURE Ecology Supervisor **DATE** 2/20/08

Development date: August 8, 2005

2007

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

December 11, 2007

Mr. Alan Wade
TrueGuard, LLC
PO Box 227
Washougal WA 98671

Dear Mr. Wade:

Your complete application for the Voluntary Cleanup Program (VCP) was accepted on December 11, 2007. The purpose of this letter is to acknowledge receipt of your application and to provide you with the name of the Site Manager assigned to your cleanup site.

Site Name: TrueGuard LLC
Site Manager: Tom Middleton
VCP Identification: SW0916

Our database has been updated to reflect your participation in the Voluntary Cleanup Program. I have enclosed a signed copy of the VCP agreement for this project for your record. If you have any questions, your Site Manager can be reached at 360-407-6263.

I need to advise you of our new Data Submittal Requirements defined in Policy 840 (enclosed). This policy mandates that all Environmental Monitoring Data generated during Contaminated Site Investigation and Cleanup activities shall be required to be submitted to Ecology in both written and electronic format. Policy Item #3 (attached) applies to the Voluntary Cleanup Program and reads: "*All reports on Independent Remedial Actions submitted after October 1, 2005, under Ecology's VCP program shall not be reviewed until the data have been submitted in compliance with this policy.*" Questions regarding this policy and how it affects your Voluntary Cleanup Program project can be discussed with your site manager.

Thank you for your commitment to the environment and the Voluntary Cleanup Program.

Sincerely,

Scott Rose

Scott Rose, L.G.
Acting VCP Unit Manager
Southwest Regional Office
Toxics Cleanup Program

SR/ksc:acceptance letter sw0916

Enclosures

cc: Ted Wall, Maul Foster Alongi
Tom Middleton, Ecology
Dolores Mitchell, Ecology
Kim Cross, Ecology

Voluntary Cleanup Program

RECEIVED
DEC 0 3 2007
Washington State
Department of Ecology

Washington State Department of Ecology
Toxics Cleanup Program

ECOLOGY

APPLICATION FORM

Under the Voluntary Cleanup Program (VCP), the Department of Ecology (Ecology) may provide informal site-specific technical consultations to persons conducting independent remedial actions at a hazardous waste site. Ecology may provide such consultations under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC.

To request technical consultations under the VCP, you must submit an application to Ecology. That application must include, at a minimum, the following documents:

- VCP Application Form (including required attachments); ← **THIS DOCUMENT**
- VCP Agreement.

For guidance on how to complete your VCP application, including this Application Form, please refer to the Application Instructions, which are available separately. All of these documents are available for downloading on the VCP web site: http://www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm.

Part 1 - ADMINISTRATION

Client Information. The "Client" is the person or entity seeking informal site-specific technical consultations from Ecology under the VCP. This person must sign the VCP Agreement and is responsible for payment of those costs incurred by Ecology in providing the requested consultative services. Please enter the required information below.

Name: **TrueGuard, LLC**		Title: **Property/Business Owner**
Organization: **TrueGuard, LLC**		
Mailing address: **P.O. Box 227, 725 South 32nd Street**		
City: Washougal	State: WA	Zip: 98671
Phone: 360-835-8547	Fax: 866-571-5362	E-mail: a.wade@allweatherwood.com

What is the Client's involvement at the Site? Please check all that apply.

- ☒ Property owner
- ☐ Past property owner
- ☐ Future property owner
- ☐ Property lessee
- ☐ Other – please specify: ____________________
- ☒ Business owner (operator)
- ☐ Mortgage holder
- ☐ Consultant
- ☐ Attorney

If not the current property owner, is the Client acting as the agent for the property owner?

☐ Yes ☐ No

If not the current property owner, is the Client authorized to grant access to the property?

☐ Yes ☐ No

SWRO, TCP ID# SW0916

F/S# 75455855

Property Owner Information (if different than Client). If the Client is not the current property owner, please enter the required information below.			
Name:			Title:
Organization:			
Mailing address:			
City:		State:	Zip:
Phone:	Fax:		E-mail:

What type of entity is the property owner? Please check only one.

- ☐ Private
- ☐ Tribal
- ☐ Federal
- ☐ State
- ☐ Other – please specify: ____________
- ☐ County
- ☐ Municipal
- ☐ Mixed
- ☐ Public School

Billing Contact Information (if different than Client). If the Client would like Ecology to mail billing statements to an address different than the Client's above, please enter the required information below. Please note that the Client will remain responsible for payment under the VCP Agreement.			
Name:			Title:
Organization:			
Mailing address:			
City:		State:	Zip:
Phone:	Fax:		E-mail:

What type of entity is the property owner? Please check only one.

- ☐ Private
- ☐ Tribal
- ☐ Federal
- ☐ State
- ☐ Other – please specify: ____________
- ☐ County
- ☐ Municipal
- ☐ Mixed
- ☐ Public School

Services Requested by Client.

What type of independent remedial action plan or report are you submitting to Ecology with your application for review under the VCP? Please check all that apply.

- ☐ Interim action plan
- ☐ Interim action report
- ☐ Cleanup action plan
- ☐ Cleanup action plan
- ☐ Remedial investigation plan
- ☐ Remedial investigation report
- ☐ Feasibility study report
- ☒ Other – please specify: Groundwater Remediation Plan; Pilot- and Bench-Testing

Do you want Ecology to provide you with a written opinion on the planned or completed independent remedial action?

☒ Yes ☐ No

Please note that Ecology's opinion will be limited to:

- Whether the planned or completed remedial actions at the site meet the substantive requirements of MTCA, and/or
- Whether further remedial action is necessary at the site under MTCA to characterize and address all of the contamination at the site.

Instructions for Data Submittal.

In accordance with WAC 173-340-840(5), when submitting any sampling data to Ecology, please submit the data in both a printed form and an electronic form capable of being transferred into Ecology's data management systems. The data must be submitted consistent with the procedures specified in Ecology's Toxic Cleanup Program Policy 840 (Data Submittal Requirements). Please note that any report submitted to Ecology for review under the VCP that does not comply with these data submittal requirements will be considered incomplete by Ecology.

Part 2 - DESCRIPTION OF THE SITE

Name of the Site. Please enter the name of the Site below.

Name: TrueGuard, Washougal Facility

Alternate Name TrueGuard, Washougal

Location of the Site.

Reference Point.

Do you know which property is the source of the release(s) of hazardous substances at the Site (i.e., source property)?

☒ Yes — *If you answered **"YES,"** then please refer to the **"source property"** when answering the following questions regarding the location of the Site, even if your independent remedial action does not address that property.*

☐ No — *If you answered **"NO,"** then please refer to the **"affected property"** addressed by your independent remedial action when answering the following questions regarding the location of the Site. An affected property is a property affected by the release(s) on the source property.*

Physical Address. Please enter the physical address of the property below.

Name:. TrueGuard LLC 725 South 32nd Street

City: Washougal	State: WA	Zip: 98671

Geographic Position – Latitude (Lat) and Longitude (Long). For additional guidance on how to complete this part of the application form, please refer to the application instructions.

COORDINATES	LATITUDE:	Degrees: 45	Minutes: 34	Seconds: 16
	LONGITUDE :	Degrees: -122	Minutes: 20	Seconds: 70
LOCATION ON PROPERTY: [e.g., point of release or center of parcel]		Eastern side of retort area		
COLLECTION METHOD: [e.g., GPS or address matching]		Address matching		
COLLECTION SOURCE: [i.e., map scale]		2007 Portland Metro Aerial Photograph		
HORIZONTAL DATUM: [i.e., base reference for coordinate system]		WGS 1984		

ACCURACY LEVEL: [i.e., +/- feet or meters]	+/- 3 meters			
Legal Descriptions.				
TRS DATA:	Township: 1N	Range: 4E	Section: 17	Quarter-Quarter:
TAX PARCEL #(S):	140279, 140282, 140285, 140290			

Extent of the Site.
What is the approximate areal extent of the Site? Please check only one. ☐ < 5,000 square feet ☐ > 5,000 square feet, but < 1 acre ☒ > 1 acre, but < 10 acres ☐ > 10 acres ☐ Unknown

Properties Affected by the Site.	
Do any of the releases on the source property affect any properties adjacent to the source property (affected properties)? ☒ Yes ☐ No ☐ Unknown If you answered "YES" above, then please identify each property that you know has been affected by the release(s) on the source property. If you need to identify additional properties, please attach additional pages.	
1.	Address: 765 South 32nd Street, Washougal, WA. Taxlot 140286. Note that this lot is owned by Alan Wade under the company name TOMAL. This lot is currently leased to TrueGuard.
	Tax Parcel(s):
2.	Address:
	Tax Parcel(s):
3.	Address:
	Tax Parcel(s):
4.	Address:
	Tax Parcel(s):
Do any of the releases affect any right-of-ways (e.g., streets) located on or adjacent to the source property? ☐ Yes ☐ No ☒ Unknown If you answered "YES" above, please specify:	
Is the source property affected by any release(s) on properties adjacent to the source property? ☐ Yes ☐ No ☒ Unknown If you answered "YES" above, please specify:	

Description of Release(s) at the Site.
Source of Release(s).
What are the source(s) of the release(s) at the Site? Please check all that apply. ☒ Point source (e.g., leaking tank) ☐ Non-point source (e.g., contaminated soil used as fill) ☐ Area-wide lead and arsenic soil contamination (see Question #4 below) ☐ Other – please specify: _____ ☐ Unknown
To the extent known, please describe the source(s) of the release(s): Wood treating chemicals released to soil and groundwater via a crack adjacent to the sump near the retort area.

Circumstances of Release(s). To the extent known, please describe below the circumstances of the release(s).

The crack was not visible due to its location in an inaccessible area. On several occassions, the area in which the crack was located was exposed to wood treating solutions.

Circumstances of Release Discovery. To the extent known, please describe below the circumstances of the discovery of the release(s).

The release was discovered via monitoring of a nearby monitoring well.

Area-Wide Soil Contamination. For guidance on how to complete this part of the application form, please refer to the application instructions and the area-wide soil contamination tool box located at the following Ecology web site: http://www.ecy.wa.gov/programs/tcp/area_wide/area_wide_hp.html.

Is the Site located within an area affected by smelter emissions, such as the Tacoma Smelter Plume area, or on a former apple or pear orchard in operation prior to 1947?

☐ Yes ☒ No ☐ Unknown

Does the Site contain area-wide arsenic and/or lead soil contamination?

☐ Yes ☒ No ☐ Unknown

Nature and Extent of Hazardous Substances Released at the Site.

Hazardous Substances and Affected Media. To the extent known, please identify in the following table the hazardous substances released at the Site and the media (e.g., soil) impacted by those substances using the codes at the bottom of the table.

HAZARDOUS SUBSTANCE	AFFECTED MEDIA				
	SOIL	GROUND WATER	SURFACE WATER	SEDIMENT	AIR
EXAMPLE: Benzene	C	S	N/A	N/A	B
Arsenic	**U**	**C**	**N/A**	**N/A**	**N/A**
Chromium	**U**	**C***	**N/A**	**N/A**	**N/A**

When identifying the affected media in the table above, please use one of the following codes:

- C = confirmed, above cleanup level
- B = confirmed, below cleanup level
- O = confirmed, not present
- S = suspected
- N/A = not suspected
- U = unknown

*MW-1 (2/21/06) and MW-3 (3/28/02) above MTCA Method A cleanup level.

Drinking Water.
Does any of the contamination at the Site pose a threat or potential threat to an existing drinking water source (ground water or surface water)? ☐ Yes ☒ No ☐ Unknown If you answered "YES" above, what type of drinking water system is threatened by the contamination? Please check all that apply. ☐ Single Family ☐ Community
Indoor Air.
Are contaminate odors present in any buildings, manholes, or other confined spaces? ☐ Yes ☒ No ☐ Unknown If you answered "YES" above, please specify:
Maps of the Site.
Please attach to this application map(s) that identify, to the extent known, the following: • The location of the site • The properties affected by the site • The source(s) of the release(s) at the site • The nature and extent of contamination at the site • Any human or ecological receptors impacted by the site (e.g., drinking water wells) • The physical characteristics of the site (e.g., property lines, building and road outlines, surface water bodies, water supply wells, ground water flow direction, and utility right-of-ways) • The properties adjacent to the site and the uses of those properties (e.g., gas station, dry cleaner, residential).

Part 3 – OPERATIONAL HISTORY OF THE SITE

Current Use of Source Property. *Note that the following questions refer only to the Source Property, not other properties affected by the Site. Please answer these questions to the best of your ability.*		
Current Property Owners. To the extent known, please identify below the current owner(s) of the source property.		
Name: TrueGuard LLC	Title: Property and Business Owner	
Organization: TrueGuard LLC		
Mailing address: P.O. Box 227, 725 South 32nd Street		
City: Washougal	State: WA	Zip code: 98671
Phone: 360-835-8547		
Current Business Owner (Operator). To the extent known, please identify below the current owner of the business located on the source property.		
Name: Alan Wade	Title: Vice President	
Organization: TrueGuard LLC		
Mailing address: P.O. Box 227 725 South 32nd Street		
City: Washougal	State: WA	Zip code: 98671
Phone: 360-835-8547		

Current Business Operations. To the extent known, please identify below the current operations of the business located on the source property.

What is the current land use of the source property? Please check all that apply.

- ☐ Residential
- ☐ Commercial
- ☒ Industrial
- ☐ Agricultural
- ☐ Other – please specify: _____
- ☐ School
- ☐ Childcare facility
- ☐ Park

Is there a currently operational commercial or industrial business located on the source property?

☒ Yes ☐ No ☐ Unknown

If you answered "YES" above, please identify in the following table the current business operations using the North American Industry Classification System (NAICS) codes and specifying the operations.

NAICS CODE	DESCRIPTION OF OPERATIONS
EX: 447110	Gasoline Stations with Convenience Stores
321114	**Pressure treated lumber made from purchased lumber**

Is there a solid waste handling facility located on the Source Property?

☐ Yes ☒ No ☐ Unknown

If you answered "YES" above, please identify:

Is there a dangerous waste treatment, storage, or disposal facility located on the Source Property?

☐ Yes ☒ No ☐ Unknown

If you answered "YES" above, please identify:

Regulation of Current Business Operations.

Does the business operate under any federal, state, or local permits related to the release of hazardous substances into the environment (e.g., NPDES permit)?

☒ Yes ☐ No ☐ Unknown

If you answered "YES" above, please specify the regulated operation, the name of the permit, and the date it was issued in the table below.

REGULATED OPERATION	PERMIT	DATE ISSUED
EX: Wastewater discharge	NPDES permit	02/02/02
Wastewater Discharge	**NPDES Permit No. WA 0040029**	**03/01/03**

Has a state or federal notice of enforcement action (e.g., notice of violation) ever been issued related to the release of hazardous substances at the business?

☒ Yes ☐ No ☐ Unknown

If you answered "yes" above, please specify (notice and year issued): **NPDES Notice: DE01WQSR-3178, August 28, 2001**

Have business operations resulted in any other spills or other unpermitted releases on the source property?

☐ Yes ☐ No ☒ Unknown

If you answered "YES" above, please specify in the table below.

RELEASE	DATE OF RELEASE	STATUS OF RELEASE

Storage Tank Information. In table below, please identify all above ground storage tanks (AST) and underground storage tanks (UST) that have been used for storing hazardous substances on the source property, irrespective of whether the tanks are still in use or in place. *If you are unable to provide answers to specific questions regarding a tank, please enter "U" for unknown.*

IDENTIFICATION				STATUS AND CLOSURE				RELEASES	
Hazardous Substance	Type (AST/UST)	Size (Gallons)	TANK ID	DATE INSTALL	IN USE (Y/N)	DATE CLOSED	CLOSURE METHOD (*)	PAST (Y/N)	CURRENT (Y/N)
EX: Diesel	UST	10,000	4	02/87	N	05/98	Removed	Y	N
SEE ATTACHED TABLE	SEE ATTACHED TABLE	SEE ATTACHED TABLE	SEE ATTACHED TABLE	SEE ATTACHED TABLE	SEE ATTACHED TABLE	SEE ATTACHED TABLE	SEE ATTACHED TABLE	SEE ATTACHED TABLE	SEE ATTACHED TABLE

(*) Options = Removed or Closed in Place

Past Use of Source Property. *Note that the following questions refer only to the Source Property, not other properties affected by the Site. Please answer these questions to the best of your ability.*

Past Property Owners. To the extent known, please identify below the past owner(s) of the source property.

Name: Alan Wade | Title: President

Organization: Evergreen Forest Products Inc.

Mailing address: P.O. Box 227 725 South 32nd Street

City: Washougal | State: WA | Zip code: 98671

Phone: 360-835-8547 | Fax: 866-571-5362 | E-mail: a.wade@allweatherwood.com

Past Business Owners (Operators). To the extent known, please identify below the past owner(s) of the source property.

Name: Alan Wade | Title: President

Organization: Evergreen Forest Products, Inc.

Mailing address: P.O. Box 227, 725 South 32nd Street

City: Washougal | State: WA | Zip code: 98671

Phone: 360-835-8547 | Fax: 866-571-5362 | E-mail: a.wade@allweatherwood.com

Identification of Past Business Operations. Please identify in the following table the past operations of businesses located on the source property using the North American Industry Classification System (NAICS) codes and/or specifying the operations.

NAICS CODE	DESCRIPTION OF OPERATIONS
EX: 447110	Gasoline Stations with Convenience Stores
321114	**Pressure treated lumber made from purchased lumber**

Future Use of Source and Affected Properties. The following questions refer to both source and affected properties. Please answer these questions to the best of your ability.

Will any ownership interest in the source or affected properties be conveyed prior to, or upon completion of, the cleanup?

☒ Yes ☐ No ☐ Unknown

If you answered "YES" above, please specify: **Allweather Wood Treater's assets were sold to TrueGuard LLC by Evergreen Forest Products in October, 2007.**

Will any of the source or affected properties, or portions of those properties, be redeveloped as part of the cleanup?

☐ Yes ☒ No ☐ Unknown

If you answered "YES" above, please specify the proposed land use below. Please check all that apply.

☐ Residential ☐ School
☐ Commercial ☐ Childcare facility
☐ Industrial ☐ Park
☐ Agricultural
☐ Other – please specify: _____

Please also specify the activities proposed for that land use:

Part 4 – ADMINISTRATIVE HISTORY OF THE SITE

Have you previously reported the release(s) of hazardous substances at the Site to Ecology?

☒ Yes – If so, when? August 2007 ☐ No ☐ Unknown

Has the cleanup of the Site, or any portion of the Site, ever been managed under the VCP?

☐ Yes – If so, please specify the VCP Project ID#:
☒ No
☐ Unknown

Has the cleanup of the Site, or any portion of the Site, ever been managed under a federal or state order or decree?

☐ Yes – If so, please specify the type and docket #:
☒ No
☐ Unknown

Part 5 – DESCRIPTION OF INDEPENDENT REMEDIAL ACTIONS AT THE SITE

Scope of Remedial Actions.

Do you plan to characterize and address all of the contamination at the Site, including any contamination located on affected adjacent properties, as part of the VCP project?

☐ Yes ☐ No ☒ Unknown

If you answered "NO" above, please describe below the scope of the VCP project, including the contamination (properties, portions of a property, media and/or hazardous substances) that you DO NOT plan on characterizing and/or addressing as part of the VCP project. Please include additional pages if necessary.

Status of Remedial Actions.

What is the current status of remedial actions at the site? Please check all that apply in the table below.

REMEDIAL ACTION	PLANNED	ONGOING	COMPLETED	NOT APPLICABLE
INITIAL RESPONSE (UST ONLY)				x
INTERIM ACTION		x (Groundwater extraction)	x (Crack repair)	
REMEDIAL INVESTIGATION		x		
FEASIBILITY STUDY	x			
CLEANUP ACTION	x			

Documentation of Remedial Actions.

Please list in the table below all known remedial action plans or reports produced for the site, including:

- The title of the plan or report,
- The author (e.g. consulting firm) of the plan or report,
- The date the plan or report was produced,
- Whether the plan or report has been submitted to Ecology,
- The date the plan or report was submitted to Ecology.

	TITLE	AUTHOR	DATE	SUBMITTED TO ECOLOGY	
				Y/N?	DATE
EX:	John Doe's Property: Remedial Investigation Work Plan	Mom's Consulting Firm	02/20/99	NO	N/A
1.	Groundwater Remediation Plan: Pilot and Bench Testing	Maul, Foster Alongi	11/21/07	Attached	Attached
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Part 6 – STATEMENT AND SIGNATURE

Statement and Signature. The undersigned affirms that the information contained in this application is true and accurate to the best of his or her knowledge. Please note that someone other than the Client may sign this Application Form.				
Name: Ted Wall Ted Wall			Title: Principal Engineer	
Organization: Maul, Foster, Alongi				
Mailing address: 3121 SW Moody Ave., Suite 200				
City: Portland			State: OR	Zip code: 97239
Phone: 971-544-2139	Fax: 971-544-2140		E-mail: twall@mfainc.org	

Affiliation.

What is the signatory's involvement at the Site? Please check all that apply.

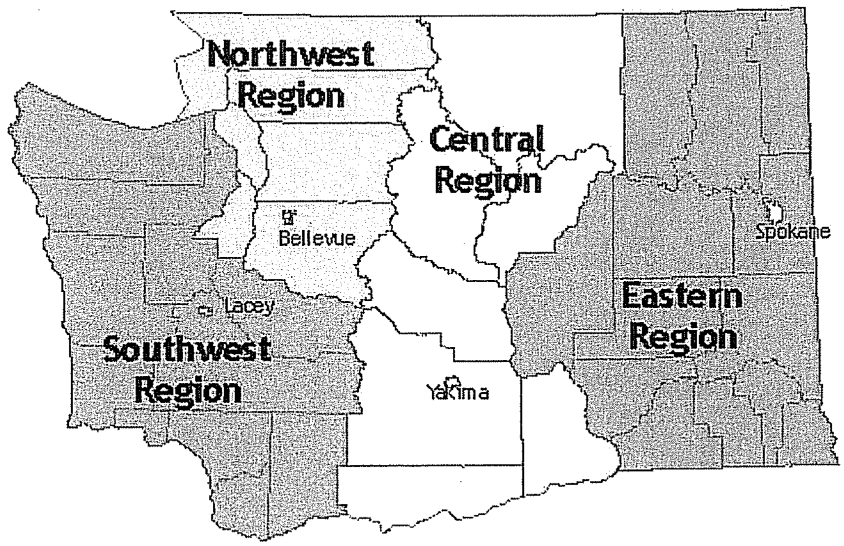
- ☐ Client
- ☐ Property Owner
- ☒ Consultant
- ☐ Attorney
- ☐ Other – please specify:

SUBMITTAL INSTRUCTIONS

To complete your application, please submit the following materials to the Ecology regional office for the County in which your Site is located:

1 - ☒ VCP Application Form (signed)
2 - ☒ VCP Agreement (signed by Client)
3 - ☒ Independent Remedial Action Plan(s) or Report(s) (see Part I.D of VCP Application Form)
4 - ☒ Map(s) of the Site (see Part II.G of VCP Application Form)
5 - ☒ Terrestrial Ecological Evaluation Exclusion Form (if applicable)

To identify the appropriate Ecology regional office, please refer to the following map:



Northwest Region: Attn: Dale Myers 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: Mark Dunbar 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
Southwest Region: Attn: Bob Warren P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: Patti Carter N. 4601 Monroe Spokane, WA 99205-1295

If you have any questions regarding the application process or how to complete the forms, please contact the appropriate regional office contact listed below:

Northwest Region: Mark Edens, Unit Supervisor (425) 649-7070 mede461@ecy.wa.gov	**Central Region:** Valerie Drew, Unit Supervisor (509) 454-7886 vdre461@ecy.wa.gov
Southwest Region: Bob Warren, Unit Supervisor (360) 407-6361 rwar461@ecy.wa.gov	**Eastern Region:** Sherman Spencer, Unit Supervisor (509) 329-3408 sspe461@ecy.wa.gov

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

ECY #020-74 (revised 6/06)

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION EXCLUSION FORM

Under the Model Toxics Control Act (MTCA), a Terrestrial Ecological Evaluation (TEE) is not required if the Site meets the criteria in WAC 173-340-7491 for an exclusion. If you determine that your Site does not require a TEE, please complete this form and submit it to the Department of Ecology (Ecology) at the appropriate time, either with your VCP application or with a subsequent request for a written opinion. Please note that exclusion from the TEE does not exclude the Site from an evaluation of aquatic or sediment ecological receptors.

If your Site does not meet the criteria for exclusion under WAC 173-340-7491, then you may have to conduct a simplified TEE in accordance with WAC 173-340-7492 or a site-specific TEE in accordance with WAC 173-340-7493. If you have questions about conducting a simplified or site-specific TEE, please contact the Ecology site manager assigned to your Site or the appropriate Ecology regional office.

Step 1: IDENTIFY HAZARDOUS WASTE SITE AND EVALUATOR

Please identify below the hazardous waste site for which you are documenting an exclusion from conducting a TEE and the name of the person who conducted the evaluation.

Facility/Site Name: TrueGuard	
Facility/Site Address: 725 South 32nd Street, Washougal, WA	
Facility/Site No:	VCP Project No.:
Name of Evaluator: Ted Wall, Principal Engineer, Maul Foster Alongi	

Step 2: DOCUMENT BASIS FOR EXCLUSION

The bases for excluding a site from a terrestrial ecological evaluation are set forth in WAC 173-340-7491(1). Please identify below the basis for excluding your Site from further evaluation. Please check all that apply.

POINT OF COMPLIANCE – WAC 173-340-7491(1)(A)

1-☐ No contamination present at site.

2-☐ All contamination is 15 feet below ground level prior to remedial activities.

3-☐ All contamination is six feet below ground level and an institutional control has been implemented as required by WAC 173-340-440.

4-☐ All contamination is below a site-specific point of compliance established in compliance with WAC 173-340-7490(4)(b) with an institutional control implemented as required by WAC 173-340-440. ***Please provide documentation that describes the rational for setting a site-specific point of compliance.***

BARRIERS TO EXPOSURE – WAC 173-340-7491(1)(b)

5-☒ All contaminated soil, is or will be, covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife and an institutional control has been implemented as required by WAC 173-340-440. *An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.*

Step 2: DOCUMENT BASIS FOR EXCLUSION – CONTINUED

UNDEVELOPED LAND – WAC 173-340-7491(1)(c)

"Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

"Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

6-☐ There is less than one-quarter acre of contiguous undeveloped land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

7-☐ For sites not containing any of the chemicals mentioned above, there is less than one-and-a-half acres of contiguous undeveloped land on or within 500 feet of any area of the Site.

BACKGROUND CONCENTRATIONS – WAC 173-340-7491(1)(d)

8-☐ Concentrations of hazardous substances in soil do not exceed background levels as described in WAC 173-340-709.

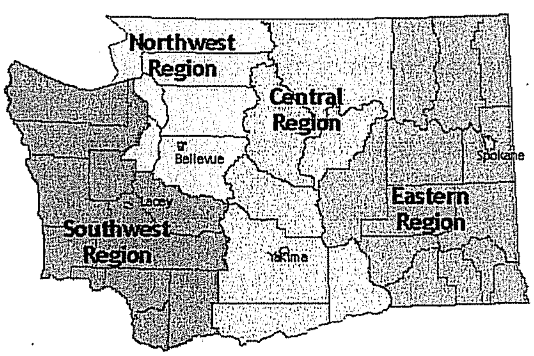
Step 3: PROVIDE EXPLANATION FOR EXCLUSION (IF NECESSARY)

All contaminated soil is covered with asphalt paving or building structures. The property is also completely surrounded by fencing.

Attach additional pages if necessary.

Step 4: SUBMITTAL

Please mail your completed form to Ecology at the appropriate time, either with your VCP application or with a subsequent request for a written opinion. If you complete the form after you enter the VCP, please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



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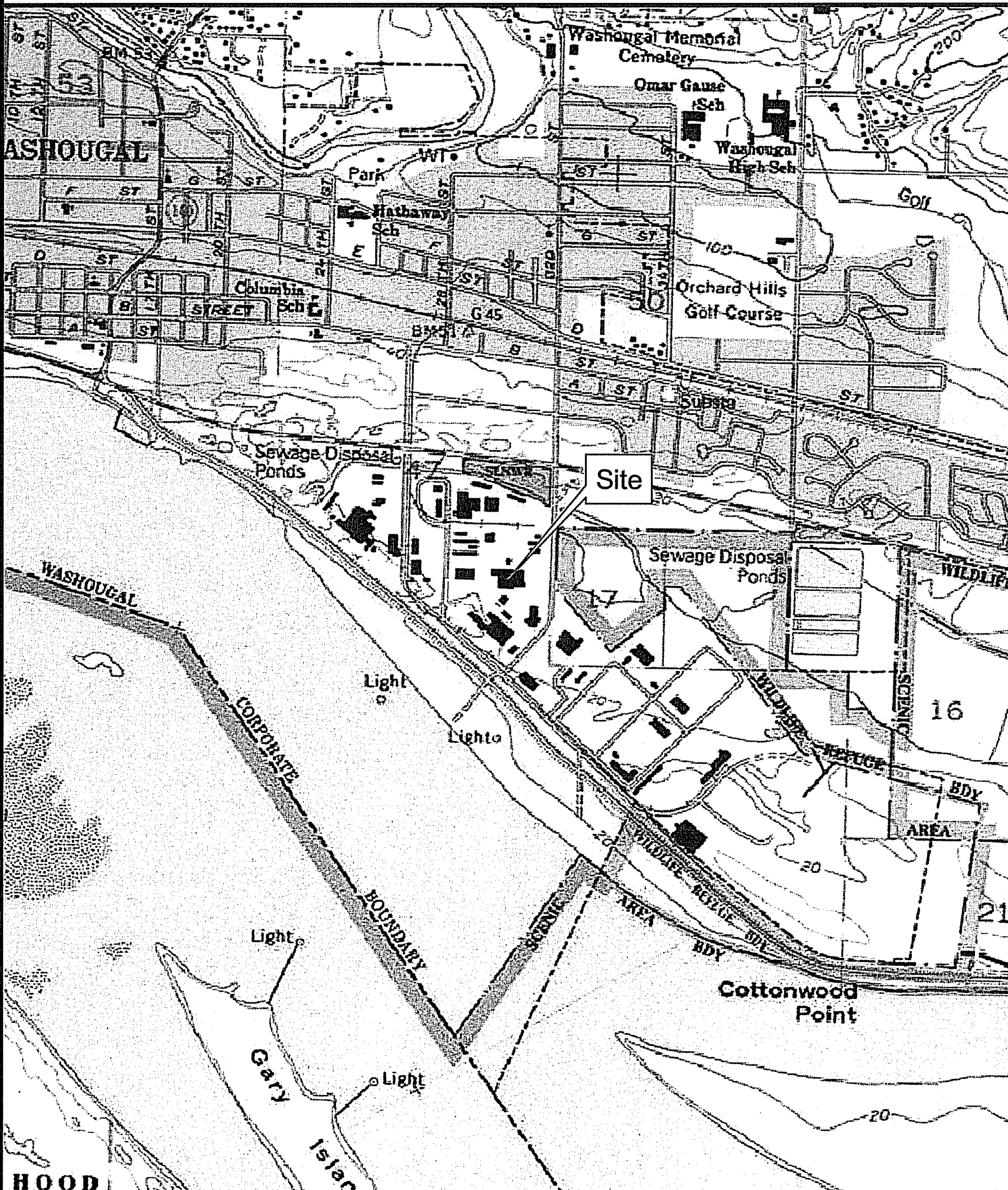
0 1,500 3,000
Feet

N

Figure 1
Site Location
TrueGuard LLC
Washougal, Washington

Site Address: 725 S. 32nd Street, Washougal, Washington
Source: USGS (1990) 7.5 Minute Topo Quad Washougal:
Section 17, Township 1 North, Range 4 East

Site Taxlot Boundaries



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Project: 9009.01 Produced By: R. Maronn Approved By: M. Hickey

Figure 2
Proposed New Monitoring Well Locations and 9/25/07 Groundwater Contours

TrueGuard LLC
Washougal, Washington

Legend

Boring Locations

- Boring Location (Sept. 6, 2007)
- Boring Location (July 30-31, 2007)
- Piezometer Location
- Proposed Monitoring Well Location
- Extraction Well Location
- Monitoring Well Location
- Abandoned Monitoring Well Location
- Groundwater Contours (9/25/07)
- Taxlot Boundaries
- TrueGuard Site Boundaries
- 140279 MH — Parcel ID Number; Zoning (MH = Heavy Industrial, Parks/OS = Parks & Open Space)

Source: Aerial Photograph (2005) and Taxlots (March 07) obtained from Clark County GIS Dept.

Notes:
All Well locations are approximate.
1. Boring locations GP-1 through GP-18 were installed on July 30-31, 2007. GP-19 through GP-27 were installed on September 6, 2007.
2. MH = Heavy Industrial zoning
3. POS = Parks and Open Space zoning

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Project: 9009.01.11 Produced By: R. Maronn Approved By: A. Hughes

Figure 4
Reconnaissance Groundwater Results

TrueGuard LLC
Washougal, Washington

Legend

Boring Locations

- Boring Location (Sept. 6, 2007)
- Boring Location (July 30-31, 2007)
- Piezometer Location
- Extraction Well Location
- Monitoring Well Location
- Abandoned Monitoring Well Location
- Taxlot Boundaries
- TrueGuard Site Boundaries

Source: Aerial Photograph (2005) and Taxlots (March 07) obtained from Clark County GIS Dept.

Notes:
1. All Well locations are approximate.
2. Boring locations GP-1 through GP-18 were installed on July 30-31, 2007. GP-19 through GP-27 were installed on September 6, 2007.
3. Piezometer PZ-1 was installed after the groundwater sample was taken.
4. All results are in micrograms per liter (µg/L).
5. ND = Not detected at or above the reporting limit.

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Feet

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Project: 9009.01.11 Produced By: B. Hines/R. Maronn Approved By: A. Hughes

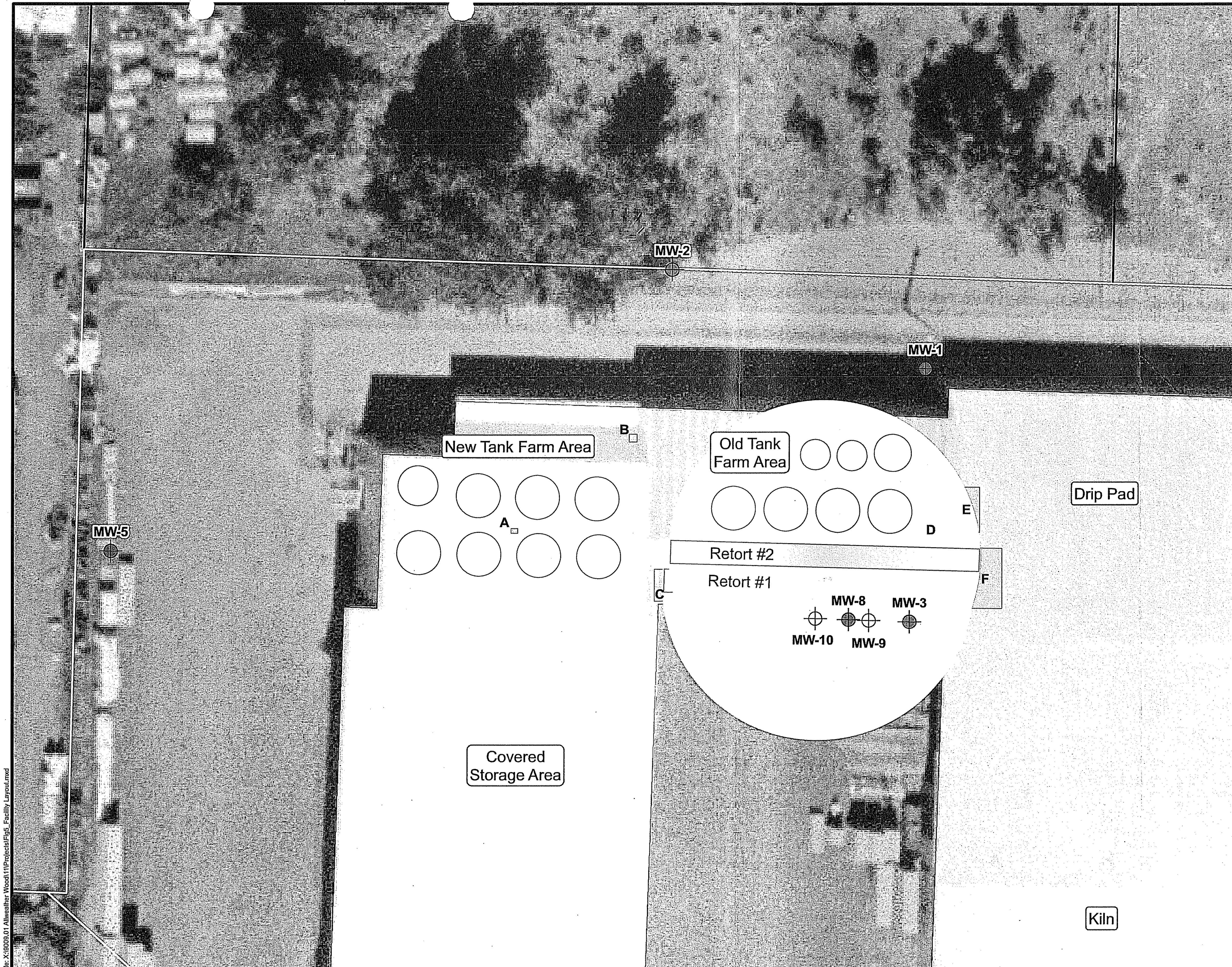

Figure 5
Facility Layout
TrueGuard LLC
Washougal, Washington

Legend

- Extraction Well Location
- Monitoring Well Location
- Storage Tank
- Retorts
- Sumps
- Taxlot Boundaries
- Building footprint
- TrueGuard Site Boundaries

Notes:
1) All well locations and facility features are approximate

Sources:
1) Aerial Photograph (2005) and Taxlots (March 07) obtained from Clark County GIS Department

N

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Feet

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File: X:\9009.01 Allweather Wood\11\Projects\Fig5_Facility Layout.mxd

Project: 9009.01.11 Produced By: T. Vick/R. Maronn Approved By: A. Hughes

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-1	04/25/86	0.033	<0.005	<0.002	--
	04/20/87	0.030	<0.005	<0.005	--
	01/27/88	0.055	<0.005	<0.010	--
	03/23/88	0.043	<0.005	<0.010	--
	05/11/88	0.047	<0.01	0.01	--
	10/14/88	0.082	<0.01	<0.01	--
	04/28/89	0.045	<0.005	<0.01	--
	10/24/89	0.072	<0.01	<0.01	--
	04/25/90	0.056	<0.005	<0.01	--
	09/19/90	0.072	<0.005	<0.01	--
	01/24/91	0.043	<0.005	<0.01	--
	06/18/92	0.064	<0.005	<0.010	--
	05/10/93	0.029	<0.005	<0.010	--
	04/22/94	0.029	<0.005	<0.010	--
	04/25/95	0.019	<0.005	<0.010	--
	04/18/96	0.023	<0.005	<0.010	--
	05/02/97	0.028	<0.005	<0.010	--
	04/09/98	0.024	<0.005	<0.010	--
	05/14/99	0.029	<0.005	<0.010	--
	06/23/00	0.038	<0.005	<0.010	--
	04/25/01	0.0337	<0.005	<0.010	--
	03/28/02	0.0235	<0.005	<0.010	--
	02/28/03	0.012	<0.005	0.03	--
	02/21/06	0.0108	0.0261	0.0347	--
	02/08/07	0.0189	<0.005	<0.010	--
	06/25/07	0.045	<0.005	<0.010	0.0234
MW-2	04/25/86	0.030	<0.005	<0.002	--
	04/20/87	0.044	<0.005	<0.005	--
	01/12/88	0.040	<0.005	<0.010	--
	02/16/88	0.031	<0.005	<0.010	--
	03/23/88	0.032	<0.005	<0.010	--
	05/11/88	0.039	<0.01	<0.01	--
	10/14/88	0.086	<0.01	<0.01	--
	04/28/89	0.034	<0.005	<0.01	--
	10/24/89	0.075	<0.01	<0.01	--
	04/25/90	0.034	<0.005	<0.01	--
	09/19/90	0.064	<0.005	<0.01	--
	01/24/91	0.042	<0.005	<0.01	--
	06/18/92	0.045	<0.005	<0.010	--
	05/10/93	0.032	<0.005	<0.010	--
	04/22/94	0.028	<0.005	<0.010	--
	04/25/95	0.019	<0.005	<0.010	--
	04/18/96	0.020	<0.005	<0.010	--

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-2 cont.	05/02/97	0.020	<0.005	<0.010	--
	04/09/98	0.019	<0.005	<0.010	--
	05/14/99	0.022	<0.005	<0.010	--
	06/23/00	0.025	<0.005	<0.010	--
	04/25/01	0.0266	<0.005	0.0183	--
	03/28/02	0.0206	<0.005	<0.010	--
	02/28/03	0.020	<0.005	0.0052	--
	02/21/06	0.0111	0.0292	0.0397	--
	02/08/07	0.0166	<0.005	<0.010	--
	06/25/07	0.033	<0.005	<0.010	0.0206
MW-3	04/25/86	0.023	<0.005	<0.002	--
	04/20/87	0.063	<0.005	<0.005	--
	01/12/88	0.060	<0.005	<0.010	--
	02/16/88	0.076	<0.005	<0.010	--
	03/23/88	0.049	<0.005	<0.010	--
	05/11/88	0.065	<0.01	<0.01	--
	10/14/88	0.076	<0.01	<0.01	--
	04/28/89	0.056	<0.005	<0.01	--
	10/24/89	0.134	<0.01	<0.01	--
	04/25/90	0.252	<0.005	<0.01	--
	09/19/90	0.477	<0.005	<0.01	--
	01/24/91	0.382	<0.005	<0.01	--
	04/19/91	0.063	<0.005	<0.01	--
	03/11/92	0.210	<0.005	<0.01	--
	06/18/92	0.287	<0.005	<0.010	--
	02/05/93	0.188	<0.005	<0.010	--
	05/10/93	0.150	<0.005	<0.010	--
	04/22/94	0.142	<0.005	<0.010	--
	04/25/95	0.094	<0.005	<0.010	--
	04/18/96	0.094	<0.005	<0.010	--
	05/02/97	0.076	<0.005	<0.010	--
	04/09/98	0.500	<0.005	<0.010	--
	05/14/99	0.654	0.041	<0.010	--
	06/23/00	0.895	0.008	<0.010	--
	04/25/01	1.490	<0.005	<0.010	--
	03/28/02	1.270	0.0542	<0.010	--
	02/21/06	0.0325	0.0195	0.0271	--
	02/08/07	0.639	<0.005	<0.010	--
	03/07/07	0.760	<0.005	<0.010	--
	06/25/07	0.600	<0.005	<0.010	0.746
	08/01/07	0.690	<0.005	<0.010	0.507

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-4	04/25/86	0.015	<0.005	<0.002	--
	04/20/87	0.009	<0.005	<0.005	--
	01/27/88	0.082	<0.005	<0.010	--
	03/23/88	0.027	<0.005	<0.010	--
	05/11/88	0.047	<0.01	<0.01	--
	10/14/88	0.095	<0.01	<0.01	--
	04/28/89	0.013	<0.005	<0.01	--
	10/24/89	0.086	<0.01	<0.01	--
	04/25/90	0.076	<0.005	<0.01	--
	09/19/90	0.092	<0.005	<0.01	--
	01/24/91	0.081	<0.005	<0.01	--
MW-5	01/12/88	0.003	<0.005	<0.010	--
	01/12/88	0.003	<0.005	<0.010	--
	03/23/88	0.005	<0.005	<0.010	--
	05/11/88	--	--	--	--
	10/14/88	0.055	<0.01	0.01	--
	04/28/89	<0.005	0.006	0.025	--
	10/24/89	--	--	--	--
	04/25/90	0.0640	<0.005	<0.01	--
	09/19/90	0.062	<0.005	<0.01	--
	01/24/91	0.019	<0.005	<0.01	--
	06/18/92	0.024	<0.005	<0.010	--
	05/10/93	0.013	<0.005	<0.010	--
	04/22/94	0.007	<0.005	<0.010	--
	04/25/95	0.006	<0.005	<0.010	--
	04/18/96	0.044	<0.005	<0.010	--
	05/02/97	0.005	0.006	<0.010	--
	04/09/98	--	<0.005	<0.010	--
	05/14/99	<0.005	<0.005	<0.010	--
	06/23/00	0.009	<0.005	<0.010	--
	04/25/01	0.013	<0.005	<0.010	--
	03/28/02	<0.0100	<0.005	<0.010	--
	02/28/03	0.045	0.023	0.063	--
	02/21/06	0.010	0.0372	0.057	--
	02/08/07	0.0074	<0.005	<0.010	--
	06/25/07	0.061	<0.005	<0.010	<0.010
MW-6	01/12/88	0.005	<0.005	<0.010	--
	03/23/88	--	<0.005	<0.010	--
	05/11/88	--	--	--	--
	10/14/88	0.009	<0.01	<0.01	--
	04/28/89	--	--	--	
	02/08/07	0.0053	<0.005	<0.010	--
	11/06/07	0.0015		<0.010	0.494

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-7	12/30/91	0.041	<0.005	<0.01	--
	06/18/92	0.047	<0.005	<0.010	--
	05/10/93	0.040	<0.005	<0.010	--
	04/22/94	0.027	<0.005	<0.010	--
	04/25/95	0.012	<0.005	<0.010	--
	04/18/96	0.022	<0.005	<0.010	--
	05/02/97	0.074	0.008	<0.010	--
	04/09/98	0.018	<0.005	<0.010	--
	05/14/99	0.020	<0.005	<0.010	--
	06/23/00	0.031	<0.005	<0.010	--
	04/25/01	0.0299	<0.005	0.0138	--
	03/28/02	0.0133	<0.005	<0.010	--
	02/28/03	0.063	<0.005	0.037	--
	02/21/06	<.010	0.0229	0.0281	--
MW-8	03/07/07	2.900	<0.005	<.010	--
	06/25/07	1.400	<0.005	<0.010	0.567
	08/01/07	3.300	<0.005	<0.010	0.627
	11/06/07	0.72		0.01 U	0.106
MW-9	06/25/07	2.900	<0.005	<0.010	1.13
	08/01/07	2.600	<0.005	<0.010	0.893
MW-10	06/25/07	4.800	0.0057	<0.010	0.529
	08/01/07	6.400	<0.005	<0.010	0.914

NOTES:
Data have not yet been independently verified by Maul Foster and Alongi, Inc.
-- = analysis not performed for analyte shown.
< = analyte not detected at or above the reported method reporting limit.
mg/L = milligrams per liter (or parts per million).

RECEIVED
DEC 1 1 2007
State
Department of Ecology

VCP AGREEMENT

- Facility/Site Name: TrueGuard LLC
- Facility/Site No.: 75455855
- VCP Project No: SW0946 *For Office Administrative Use Only*

This document constitutes an Agreement between the State of Washington Department of Ecology (Ecology) and TrueGuard LLC (Client) to provide informal site-specific technical consultations under the Voluntary Cleanup Program (VCP) for the Site identified above and associated with the following address: 725 South 32nd Street, Washougal, WA.

The purpose of this Agreement is to facilitate independent remedial action at the Site. Ecology is entering into this Agreement under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC. If a term in this Agreement is defined in MTCA or Chapter 173-340 WAC, then that definition shall govern.

Services Provided by Ecology

Upon request, Ecology agrees to provide the Client informal site-specific technical consultations on the independent remedial actions proposed for or performed at the Site consistent with WAC 173-340-515(5). Those consultations may include assistance in identifying applicable regulatory requirements and opinions on whether the remedial actions proposed for or conducted at the Site meet those requirements.

Ecology may use any appropriate resource to provide the Client with the requested consultative services. Those resources may include, but shall not be limited to, those of Ecology and the Office of the Attorney General. However, Ecology shall not use independent contractors unless the Client provides Ecology with prior written authorization.

In accordance with RCW 70.105D.030(1)(i), any opinions provided by Ecology under this Agreement are advisory only and not binding on Ecology. Ecology, the state, and officers and employees of the state are immune from all liability. Furthermore, no cause of action of any nature may arise from any act or omission in providing, or failing to provide, informal advice and assistance under the VCP.

Payment for Services by Client

The Client agrees to pay all costs incurred by Ecology in providing the informal site-specific technical consultations requested by the Client consistent with WAC 173-340-515(6) and 173-340-515(6). Those costs may include the costs incurred by attorneys or independent contractors used by Ecology to provide the requested consultative services. Ecology's hourly costs shall be determined based on the method in WAC 173-340-550(2).

Ecology shall mail the Client a monthly itemized statement of costs (invoice) by the tenth day of each month (invoice date) that there is a balance on the account. The invoice shall include a summary of the costs incurred, payments received, identity of staff involved, and amount of time staff spent on the project.

The Client shall pay the required amount by the due date, which shall be thirty (30) calendar days after the invoice date. If payment has not been received by the due date, then Ecology shall withhold any requested opinions and notify the Client by certified mail that the debt is past due. If payment has not been received within sixty (60) calendar days of the invoice date, then Ecology shall stop all work under the Agreement and may, as appropriate, assign the debt to a collection agency under Chapter 19.16 RCW. The Client agrees to pay the collection agency fee incurred by Ecology in the course of debt collection.

SW0946

Reservation of Rights / No Settlement

This Agreement does not constitute a settlement of liability to the state under MTCA. This Agreement also does not protect a liable person from contribution claims by third parties for matters addressed by the Agreement. The state does not have the authority to settle with any person potentially liable under MTCA except in accordance with RCW 70.105D.040(4). Ecology's signature on this Agreement in no way constitutes a covenant not to sue or a compromise of any Ecology rights or authority.

Ecology reserves all rights under MTCA, including the right to require additional or different remedial actions at the Site should it deem such actions necessary to protect human health and the environment, and to issue orders requiring such remedial actions. Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the release or threatened release of hazardous substances at the Site.

Effective Date, Modifications, and Severability

The effective date of this Agreement shall be the date on which this Agreement is signed by the Toxics Cleanup Program's Section Manager or delegated representative. This Agreement may be amended by mutual agreement of Ecology and the Client. Amendments shall be in writing and shall be effective when signed by the Toxics Cleanup Program's Section Manager or delegated representative. If any provision of this Agreement proves to be void, it shall in no way invalidate any other provision of this Agreement.

Termination of Agreement

Either party may terminate this Agreement without cause by sending written notice to the other party by certified mail, return receipt requested. The effective date of termination shall be the date Ecology sends notice to the Client or the date Ecology receives notice from the Client, whichever occurs first.

Under this Agreement, the Client is only responsible for costs incurred by Ecology before the effective date of termination. However, termination of this Agreement shall not affect any right Ecology may have to recover its costs under MTCA or any other provision of law.

Representations and Signatures

The undersigned representative of the Client hereby certifies that he or she is fully authorized to enter into this Agreement and to execute and legally bind the Client to comply with the Agreement.

RECEIVED
DEC 11 2007
Washington State
Department of Ecology

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY	TrueGuard LLC
	Name of Client
Rebecca Lawson	Alan Wade
Signature	*Signature of Client or Client Representative*
REBECCA LAWSON	Alan Wade.
Printed Name	*Printed Name of Signatory*
Section Manager, SWRO	Vice President, TrueGuard LLC
Toxics Cleanup Program *Section*	*Title of Signatory*
Date: 12/11/2007	Date: 12-3-07

Instructions: Please submit this Agreement to Ecology as part of the VCP application. Before submitting the Agreement, please provide the Client's name and the Site's address on the first page and complete the Client's portion of the signature block on the second page. If the application is accepted, Ecology will sign the Agreement and send the Client an acceptance letter that will include the completed Agreement as an enclosure.

VCP Application Process Sheet

Site Name: **TrueGuard LLC**

VCP #: SW0916

Ecology F/S No.: 75455855

Please assign the attached VCP application to:

- ☐ Chuck Cline
- ☐ Guy Barrett (TSP Sites only)
- ☐ Carol Johnston (LUST Sites only)
- ☐ Cris Matthews (Only after coordinating w/ Lisa Pearson)
- ☐ Scott Rose
- ☒ Tom Middleton
- ☐ Steve Teel (No New VCP Sites)
- ☐ Paul Turner (LUST Site only)

☐ Yes ☒ No **Is this VCP Site within the Tacoma Smelter Plume (TSP) area?**

☐ Yes ☒ No **Is this VCP Site a Puget Sound Initiative Site (PSI)?**

☒ Yes ☐ No **Has VCP agreement been signed by the applicant?**

☒ Yes ☐ No **Has VCP agreement been signed by Ecology?**

☒ Yes ☐ No **Were reports included with the application?**
If so, what reports where included?

See Page 11

TrueGuard™

Cover Memo

To: Scott Rose

From: Cheryl Moore

CC: Matthew Hickey

Steve Krommenacker

Date: 12/5/07

Re: VCP Agreement

Please use the attached VCP agreement for the application submitted under separate cover for TrueGuard, LLC, Washougal.

MENDOCINO
FOREST PRODUCTS CO., LLC
Cheryl Moore
Environmental Manager

6500 Durable Mill Rd. • P.O. Box 390 • Calpella, CA 95418
(707)485-6740 • Mobile (707) 272-5589 • Fax (707) 485-7918
e-mail: cherylmoore@mendoco.com

MAUL FOSTER ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS
3121 SW Moody Avenue, Suite 200, Portland, Oregon 97239
Phone 971.544.2139 | Fax 971.544.2140 | www.MFAinc.org

TRANSMITTAL

PROJECT/TASK NO.: 9009.01.11/02

DATE: November 30, 2007

TO: Scott Rose
Washington State Department of Ecology—Southwest Region
PO Box 47775
Olympia, Washington 98504-7775

RE: Voluntary Cleanup application forms and Groundwater Remediation Plan: Pilot and Bench Testing

ENCLOSED, PLEASE FIND THE FOLLOWING:

QUANTITY	DESCRIPTION
1	Voluntary Cleanup Program application form, including one table and five figures
1	VCP Agreement
1	Terrestrial Ecological Evaluation Exclusion Form
1	Groundwater Remediation Plan: Pilot and Bench Testing

FOR YOUR:
- X USE
- APPROVAL
- REVIEW/COMMENTS
- INFORMATION
- OTHER

SENT BY:
- X REGULAR MAIL
- FEDEX / AIRBORNE
- UPS
- COURIER
- OTHER

COMMENTS:

BY: Matthew Hickey

GROUNDWATER REMEDIATION PLAN: PILOT TEST

TRUEGUARD LLC
WASHOUGAL, WASHINGTON

Prepared for

TrueGuard LLC

January 31, 2008

Prepared by

Maul Foster & Alongi, Inc.
7223 NE Hazel Dell Avenue, Suite B
Vancouver, Washington 98665

Project No. 9009.01.12

This document replaces Groundwater Remediation Plan: Pilot and Bench Testing, dated November 27, 2007

Groundwater Remediation Plan: Pilot Test
TrueGuard LLC
Washougal, Washington

The material and data in this report were prepared under the supervision and direction of the undersigned.

Maul Foster & Alongi, Inc.

Ted Wall, PE
Principal Engineer

Matthew Hickey, EIT
Project Engineer

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CONTENTS (Continued)

TABLES AND ILLUSTRATIONS

Following Report:

Tables

Figures

ACRONYMS AND ABBREVIATIONS

ACQ	alkaline copper quaternary
Adventus	Adventus Americas, Inc.
Allweather	Allweather Wood Treaters
bgs	below ground surface
CCA	chromated copper arsenate
Ecology	Washington State Department of Ecology
FSDS	field sampling data sheet
mg/L	milligrams per liter
µg/L	micrograms per liter
ORP	oxidation/reduction potential
the property	725 South 32nd Street, Washougal, Washington
TrueGuard	TrueGuard LLC
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

This groundwater remediation plan has been prepared for the TrueGuard LLC (TrueGuard) wood treating facility located at 725 South 32nd Street in Washougal, Washington (the property) (see Figure 1). The groundwater remediation plan describes pilot-scale testing for determination of design parameters needed for an in-situ groundwater remediation approach. The groundwater-monitoring program for assessing the effectiveness of the in-situ remediation system is also described in this plan.

The TrueGuard facility is situated on approximately 12 acres of industrial property that is located approximately one-eighth of a mile south of the Lewis and Clark Highway in the Camas/Washougal Industrial Park adjacent to the Steigerwald Lake National Wildlife Refuge. Pressure-treated wood has been manufactured at the property since approximately 1984. 8.76 acres of the facility property was purchased by TrueGuard LLC on October 12, 2007. An additional 3.6 acres are currently leased by TrueGuard from an adjacent property owner. The work described in this plan is being undertaken by TrueGuard under the State of Washington Department of Ecology's Voluntary Cleanup Program.

A supplemental site characterization effort was undertaken to better define the nature and extent of groundwater contamination. Results of this additional characterization indicate that dissolved arsenic is above background levels and warrants active remediation in the area of MW-3.

An in-situ remediation system, consisting of injection of a product into the saturated zone, will be implemented at the property to reduce the source of heavy metals in shallow groundwater. The in-situ remediation will be designed to immobilize dissolved metals for the purpose of reducing concentrations to below the applicable cleanup levels and/or background concentrations.

An extraction system is currently being operated by TrueGuard as an independent remedial action. TrueGuard may continue to extract groundwater for use in the wood-treating process. The effectiveness of both of the remediation systems will be assessed through a groundwater-monitoring program, as described in this plan.

1.1 Regional and Local Geology and Hydrogeology

The property lies within the Willamette Lowland Aquifer system, approximately 0.3 mile from the Columbia River. Annual average precipitation in Clark County is 48.14 inches, with the highest measuring 61.20 inches. Surface-water runoff from the property is ultimately discharged to Gibbons Creek, which flows to the Columbia River. Groundwater from the shallow aquifer under the property may ultimately discharge to Gibbons Creek or the Columbia River.

Based on data from site-characterization work performed on the property, as well as data from an adjacent site (Philip Services, 2000), there are three primary hydrogeologic units beneath the property: a shallow aquifer, an upper confining unit, and a deep aquifer. Geology within the shallow aquifer consists of dark yellowish-brown to dark grey, poorly-sorted, fine- to medium-grained sands, and the unit contains a saturated and unsaturated zone. This unit extends from the ground surface to a thickness of approximately 9 to 12 feet below ground surface (bgs). Geology within the upper confining layer consists of a relatively impermeable silt layer derived from a marsh that was present at the property before it was filled with dredge sands. This layer consists of dark greenish-grey to black, well-sorted silt and clay, with some sand. This unit overlies and hydraulically confines the deep aquifer. Philip Services confirmed by ground-penetrating radar that the upper confining unit was laterally continuous in the area of the adjacent site (to the north) and the property. The thickness of this silt layer is approximately 18 feet or more. Geology within the deep aquifer consists of dark greenish-grey to olive brown, poorly-sorted, fine to medium gravel intermixed with silt and sand, or yellowish-brown, moderately-sorted, fine to medium sand and silt.

Shallow groundwater has been observed on the property and neighboring properties. Results of depth-to-water measurements made in the monitoring wells on December 6, 2007, indicate a shallow aquifer groundwater gradient of 0.0056 trending southeast (see Figure 2). These data differ slightly from the observed groundwater gradients on the neighboring Philip Services property, which was 0.003 to 0.004 to the east, with a slight northerly component at times (Philip Services, 2000). This discrepancy may be due to the lack of recharge under the subject property because it is mostly paved and covered with building structures. Much of the Philip Services property is permeable by comparison.

Philip Services conducted extensive hydraulic conductivity testing in the shallow groundwater aquifer. The tests found that the hydraulic conductivity measured in observation wells varied from 1.7 x 10-3 to 3.2 x 10-2 centimeters per second. Conductivities using only the recovery data (considered to be more reliable) in the same wells range from 5.9 x 10-4 to 3.1 x 10-3 centimeters per second (Philip Services, 2000). Given the proximity of the Philip Services property, these data are considered representative of conditions on the subject property.

1.2 Background

Groundwater sampling has shown elevated levels of arsenic in shallow groundwater samples collected from monitoring well MW-3. This monitoring well is located near the wood treating retorts (see Figures 3 and 4), and near the suspected arsenic source (see Section 1.7).

Based on the detected arsenic concentrations (see Section 1.4), two 4-inch extraction wells, MW-9 and MW-10, were installed near monitoring wells MW-3 and MW-8. The extraction wells were installed to approximately 15 feet bgs, using a hollow-stem auger drilling rig with 6.25-inch inside diameter (10.25-inch outside diameter). Figure 3 shows the locations of monitoring and extraction wells and the results of recent groundwater monitoring from these wells. Table 1 presents a summary of the groundwater monitoring results.

1.3 Historical Treatment Operations and Spills

As part of the assessment, historical operations and spills were researched to establish when different wood-treating products were used and where they were used and stored.

The previous owner, Allweather, treated wood with chromated copper arsenate (CCA) in the original retort (retort one) since 1984. A second retort was added adjacent to the first in 1993. Both retorts used CCA exclusively until February 2002, when retort one was switched to alkaline copper quaternary (ACQ) formulated with boric acid. The process in retort two was switched to the same ACQ formulation in January 2004. The chemical in retort one was switched back to CCA in January 2004. Beginning in October 2004, both borates and the CCA formulation were used in retort one and have been used in this retort to the present day. Retort two was switched to a formulation of ACQ without boric acid in January 2006, and this formulation has been used since. Table 2 summarizes the chemical usage history for the property.

Wood-treating chemicals have been stored at two indoor tank farm areas on the property. The newest of these areas is west of the original area and was built in 2004 with a synthetic liner under the secondary containment structure. The previous owner, Allweather, has indicated that spills of borate-containing wood preservative occurred in the new tank farm in April 2006 and April 2007. All of the preservative was captured within the secondary containment and no product was released to the environment. Allweather indicated that the chemicals did not reach the tank farm walls, but that the floor of the secondary containment was covered.

The oldest tank farm area was built in 1984, without a roof. The secondary containment area is sloped from north to south so that liquids drain south to the retort area where they drop to the retort floor (also part of the secondary containment). The retort floor is sloped south to north, and has a channel that allows liquids to flow east to sump D. Allweather has indicated that chemical product and rainwater could be found on the secondary containment floor of this area during routine operations between 1984 and 1991. The original tank farm and retort area were roofed and the floor was coated with a rubberized sealer in 1991. In 1993, a second retort was added along with sump C. In 1997, a water stop was installed in the channel leading to sump D because of observations that groundwater was entering the area in the vicinity of the retort footings.

Allweather has indicated that there were occasional minor spills of treatment chemicals from the primary containment area due to operator and equipment failures from 1991 to 2000, but that these spills only flooded the secondary containment structures of the original tank farm/retort area. This resulted in diluted chemicals sitting in the channel area for as many as two days at a time. Allweather also recorded four more significant spills of chemicals onto the retort floor (within the secondary containment structure) in March and June of 2003 and February and April of 2004.

During the same period from the late 1990s to the early 2000s, the retort door sump experienced overflows due to operator errors and equipment failures. These overflows occurred in the area where a crack was recently discovered and repaired, and the overflows are a suspected source of the groundwater contamination.

Analysis of the facility's chemical usage history indicates that the earliest date that a release of boron-containing compound could have occurred was 2002 which is when the material was first used on site. However, arsenic-containing chemicals were used at the site beginning in 1984. Table 2 provides a summary of recorded spills for the facility, as well as highlights the most likely time frames for releases contributing to the observed groundwater contamination.

1.4 Site Characterization

Arsenic concentrations in shallow groundwater typically range between 20 micrograms per liter (µg/L) and 80 µg/L in monitoring wells crossgradient or upgradient of MW-3 and MW-8. Investigators on the Philip site north of TrueGuard reported background concentrations of arsenic in groundwater to be as high as 57 µg/L (Philip Services, 2000).

To confirm arsenic concentrations in shallow groundwater, Allweather installed an additional monitoring well, MW-8, approximately 20 feet west of MW-3. Samples were collected from MW-8 on March 7, 2007, June 25, 2007, and August 1, 2007; arsenic was detected in these wells at concentrations of 2.9 milligrams per liter (mg/L), 1.4 mg/L, and 3.3 mg/L, respectively. Figure 3 shows these results. Table 1 also shows these results as well as historical groundwater monitoring data.

In order to further evaluate the nature and extent of arsenic in groundwater, site characterization was conducted on July 30 and 31, 2007, with the completion of 18 borings (see Figure 5). A supplemental site characterization was completed on September 6, 2007, with the completion of an additional nine borings (see Figure 5). The borings were advanced using direct-push drilling methods by Pacific Soil and Water, Inc., and shallow reconnaissance groundwater samples were collected from each location. Shallow reconnaissance groundwater sample results are included in Table 3 and are shown on Figure 5. Table 4 shows the results from two soil samples collected during the initial site characterization in July. Field measurements of dissolved oxygen and oxidation/reduction potential (ORP) indicate that groundwater under the property is under slightly reducing conditions. These conditions are likely related to the presence of elevated ferrous iron concentrations in the soil due to the volcanic origin of the fill soils present.

On October 2, 2007, Minister and Glaeser Surveying completed an elevation and location survey of the current monitoring-well network. On September 25, 2007, MFA completed a round of depth-to-water level measurements to confirm groundwater flow direction on the property. Results indicate that the depth to water was approximately 5 feet bgs on that date, and the groundwater gradient was approximately 0.0036 feet per foot toward the southeast. Dissolved arsenic was detected above natural background concentrations at the property. The results indicate that dissolved arsenic is likely being transported beneath the wood-treating building to the southeast. Groundwater concentrations of dissolved arsenic decrease with distance from the source area, indicating that natural geochemical attenuation is occurring. Detected concentrations of dissolved boron under the property indicate that boron is also being transported to the southeast. However, in general, the dissolved boron concentrations increase with distance from source area. This behavior is consistent with the expected geochemical behavior of boron, which is known to act like a conservative tracer and migrate with groundwater without significant attenuation. Peak concentrations would thus be expected to have moved downgradient without significant retardation, which is what has been observed at the property. The history of the use of boron in the wood-treating solutions at the property as well as the observed boron distribution suggest that some short-circuiting of contaminant migration in groundwater may be occurring due to the presence of preferential pathways. Short-circuiting could occur if high-permeability pathways are present, such as utility corridors and building foundation bedding materials. Short-circuiting has not been confirmed at this time. Boron levels are below Washington State cleanup standards.

1.5 Assessment of Treatment and Containment Areas

An inspection of the treatment and containment areas was conducted to identify potential release locations (i.e., source areas). The inspection included sumps, tanks, containment floor, drip pad, piping, etc. Figure 4 shows the approximate locations of the retorts, sumps, and aboveground storage tanks.

A separation between the retort door sump F wall and the concrete floor beneath the retort, northeast of MW-3, was observed during the inspection. It is unclear when the separation occurred; however, it provided a potential pathway for drip pad washwater to reach the shallow groundwater aquifer and has therefore been deemed a potential source of contamination.

1.6 Site Repairs

The separation in the concrete that was identified during the site inspection described in Section 1.5 was repaired according to the following procedures:

- Temporary measures were taken immediately to avoid exposure of the area to treating chemicals and to temporarily seal the space between the back of the retort door sump F and the concrete structure.
- For the permanent repair, the area was dried and loose material was vacuumed.
- Loose or spalling concrete and the temporary sealant were removed.
- The entire surface behind the retort door sump and in front of the wall separating the tank farm containment area was sandblasted until the concrete and metal were ready for an epoxy/sand coating.
- All sandblast materials were removed and cleaned with a high-pressure air line.
- An epoxy/sand mixture was prepared per the manufacturer's recommendations. All gaps and cracks in the concrete structure were grouted.
- The epoxy coating material was prepared per the manufacturer's recommendations and at least three coats were applied over the entire surface.

A letter certifying that the repairs have been made, signed by a registered professional engineer at MFA, was submitted under separate cover.

1.7 Source Area

Site characterization efforts to date, as summarized above, have allowed the delineation of the source area of groundwater contamination. The source area is believed to be located in the central portion of the building, adjacent to the separation between the retort door sump F wall and the concrete floor beneath the retort (see Figure 4). The source area is currently assumed to be approximately 30 feet wide, 50 feet long, and 15 feet deep, and encompasses MW-3, MW-8, MW-9, MW-10, and the adjacent area. A portion of the source area is assumed to be located beneath the lined drip pad. The size and exact location of the source area may be refined as new data become available.

2 INDEPENDENT REMEDIAL ACTION

TrueGuard will implement an in-situ remediation system in the source area to immobilize dissolved metals in the shallow groundwater aquifer, per Washington Administrative Code 173-340-400. The technology expected to be used at this site, Adventus EHC-M™, has been used to treat heavy-metal contamination in groundwater at wood-treating sites (see supplemental product literature attached as Appendix A), and is expected to reduce the dissolved-metals concentrations to below the applicable cleanup levels or background concentrations.

The Adventus EHC-M™ product will first be applied in a pilot-scale injection event. As described in the attached supplemental literature (Appendix A), EHC-M™ has been used at sites contaminated with arsenic and other metals and appears to be well suited for remediation of the arsenic-impacted groundwater at the TrueGuard site.

A groundwater-extraction system in the source area is currently being operated by TrueGuard as an independent remedial action. TrueGuard will cease operation of this extraction system during the pilot-scale injection.

Results of the pilot-scale injection will be used to design a full-scale remediation approach for the site, the effectiveness of which will be monitored through a groundwater-monitoring program, as described in Section 3.

2.1 Well Installation and Abandonment

As part of the independent remedial action, five additional monitoring wells (MW-11 through MW-15) were installed at the property (see Figure 2). The wells were installed using direct-push drilling methods and industry-standard techniques. Groundwater monitoring well MW-2 and piezometer PZ-1 were decommissioned by overdrilling and backfilling with bentonite chips hydrated with potable water, per State of Washington well-abandonment requirements.

After installation, the five new monitoring wells were developed to increase communication with the water-bearing zone and remove sediments caused by drilling. Once installed, the new and existing wells were surveyed by Minister Glaeser Surveying, Inc., a surveyor licensed in Washington State. Boring logs for the new wells, as well as the results of groundwater monitoring conducted on December 6, 2007, will be submitted with the full-scale groundwater remediation plan.

Just prior to the pilot-scale injection, one of the extraction wells (MW-9) and the one groundwater-monitoring well (MW-8) will be decommissioned in order to minimize potential interference with pilot-scale injection. The wells will be abandoned in place, consistent with State of Washington guidelines, using the AquaBlok® product HoleBlok+™ to provide additional treatment in the source area. A product test report for the HoleBlok+™ product has been included in Appendix A.

2.2 In-Situ Groundwater Remediation Using Adventus® EHC-M™

The EHC-M product planned for use in the in-situ remediation of the groundwater at the TrueGuard facility is described below.

The addition of a strong chemical reductant such as polysulfide and zero valent iron in the Adventus EHC-M product is expected to encourage a strongly reducing environment in the groundwater by the creation of an anaerobic, sulfide-rich condition. The result of this is expected to be the formation of the arsenic/iron sulfide mineral arsenopyrite. Arsenopyrite has a very low solubility and is extremely stable under reducing conditions. Arsenopyrite is subject to oxidation when exposed to oxidizing conditions, forming sulfuric acid and remobilizing arsenic; however, Adventus presents data (see Appendix A) that indicates that such oxidation does not occur under the test conditions. Existing conditions in the upper aquifer at the TrueGuard site have been consistently measured as mildly reducing. There is also a possibility that more strongly reduced conditions could lead to the reduction of manganese. In theory, this reduced manganese may in turn act as an electron donor for the oxidation of trivalent chromium and conversion to the hexavalent form under elevated pH conditions, which would lead to increased mobility and toxicity of the chromium. Adventus has provided references indicating that Mn^{2+} reduction is limited to acidic and oxic environments (Eary and Rai, 1987). EHC-M creates strongly reducing conditions and does not acidify aquifers. Adventus has confirmed the increase in chromium mobility and toxicity is implausible under normal aquifer conditions; the pilot-scale groundwater monitoring will confirm that this is the case for the use of EHC-M at the TrueGuard site.

2.2.1 In-Situ Pilot-Scale Remediation Methodology

As previously noted, wells MW-8 and MW-9 will be decommissioned in place prior to the pilot-scale injection, using the AquaBlok® HoleBlok+™ material. Decommissioning will be undertaken in order to allow for the maximum amount of EHC-M product to be injected into the subsurface. MW-3 will not be decommissioned before the pilot-scale injection because it is the furthest down-gradient well in the source area and TrueGuard would like to continue to use it if possible. MW-10 will not be decommissioned before the pilot-scale injection because arsenic concentrations in groundwater samples from this well have been the highest detected at the site. There is a chance that the pilot-scale injection may compromise one or both of these wells. During the pilot-scale groundwater-monitoring events, MFA will evaluate the ability of these wells to measure contaminant concentrations representative of the surrounding aquifer. If needed, these wells may be abandoned and replaced during the full-scale injection.

Pilot-scale injection will consist of injection of up to 5,150 pounds of EHC-M product into nine injection points (see Figure 6). Injection will be performed using a Geoprobe® rig and injection pump, and will be conducted under oversight of a professional engineer and a geologist, both registered by the State of Washington, as well as under supervision of an Adventus® staff member. The injection area consists of approximately 500 square feet in the paved area south of the retorts. This area represents the most accessible source area for the arsenic detected in groundwater at the site. The EHC-M™ product will be injected to a depth of approximately 15 feet bgs, and the installed borings will not penetrate the confining layer found at approximately this depth.

Pilot-scale injection of the EHC-M product will be implemented in the source area, with the primary objective being to evaluate product injection parameters (best injection techniques, injection rates and product radius of influence) and the secondary objective being to confirm that the EHC-M product will immobilize the arsenic and reduce its concentrations in shallow groundwater. Optimal injection parameters of the EHC-M product will be evaluated during the pilot-scale injection, and in-situ treatment effectiveness will be evaluated after two rounds of pilot-scale groundwater monitoring.

After pilot-scale in-situ treatment, groundwater will be monitored to confirm the extent to which the remedial design is effectively reducing the groundwater contamination. Two monitoring events will be conducted within a six-month period, with a limited subset of the groundwater-monitoring well network tested for the analytes necessary to assess the EHC-M performance. Groundwater samples from monitoring wells MW-3, MW-10, and MW-11 will be analyzed for dissolved and total arsenic, iron, boron, chromium, manganese and hexavalent chromium. In addition, the samples will be analyzed for sulfate, chloride, and nitrate, as well as total organic carbon.

Results of the pilot-scale injection and subsequent pilot groundwater monitoring will be used to design a full-scale in-situ remediation approach.

2.3 System Tracking and Decision Making

Results of pilot-scale injection will enable optimization of the full-scale remediation system. Optimization parameters include reagent dosage, injection locations, and injection grid spacing. Following the conclusion of the pilot-scale injection, MFA will produce and submit a full-scale in-situ remediation plan, as discussed in Section 4. The full-scale remediation plan will include the results of the pilot-scale injection and subsequent groundwater monitoring.

Based on experience at similar sites, the source-area contamination is expected to be immobilized within three to six months of reagent injection. However, accessibility to all locations in the source area is limited by the location of lined drip pads and other facility equipment. In spite of these obstacles, it is expected that arsenic concentrations following full-scale remedial injection will decline with time; however, there may be deviations from a steady-state decline due to the accessibility constraints and seasonal fluctuations in groundwater in contact with source-area soils. As groundwater spatial and temporal quality data are obtained through the monitoring program, aqueous arsenic and chromium concentration trend plots will be prepared yearly to determine the rate of change of these constituents in groundwater. Following the five-year monitoring period, the effectiveness of the full-scale remedial design will be evaluated.

3 GROUNDWATER MONITORING

3.1 Groundwater Monitoring

Groundwater from the monitoring and extraction wells will be monitored for five years. Nine events will be conducted in total, with quarterly monitoring for the first year (four events); semiannual monitoring for the second year (two events); and annual for the remaining three years (three events). The first quarterly event in this schedule will occur after the full scale injection. Monitoring will include collection of groundwater samples from MW-1, MW-3, MW-5, MW-6, MW-10, and MW-11 through MW-15. Groundwater samples from all of the wells will be analyzed for dissolved metals (arsenic, chrome, boron, iron and copper), using USEPA Methods 6010/6020. Analysis will be conducted for hexavalent chromium in any well by USEPA Method 7196 if chrome is detected above the Model Toxics Control Act Method B level of 48 µg/L. The Adventus EHC-M product will also necessitate the testing of sulfates in monitoring wells MW-3, MW-10 and MW-11, using USEPA Methods 300.1/9056, as the concentration of sulfates has an impact on the performance of the EHC-M™ remediation system.

3.2 Groundwater-Sample Collection Procedures

Groundwater-sampling methods are designed to obtain samples that are representative of in-situ groundwater quality.

3.2.1 Extraction-Well Sampling Procedure

Sample collection from extraction well MW-10 will be as follows:

- A minimum of 1 gallon of water will be removed from the sampling port and reused before collection of a groundwater sample.
- Before a sample is collected, field parameters will be measured (e.g., pH, specific conductance, turbidity, and temperature) using portable meters calibrated according to manufacturers' specifications.

- Each sample collected for dissolved-metals analyses will be filtered using a new, disposable, 0.45-micron, in-line filter. The filter will be attached directly to the sample port, using new polyethylene tubing. The filter and the polyethylene tubing will be used only once.

- Field parameters, conditions, and sampling data (e.g., well purging data, type of sample containers, methods of preservation) will be recorded on the field sampling data sheet (FSDS).

3.2.2 Monitoring-Well Sampling Procedures

Samples will be collected from the monitoring wells consistent with the following procedures:

- The depth to water will be measured with an electronic water-level indicator. The results will be recorded on an FSDS.

- Before sample collection, at least three casing volumes will be purged from the monitoring well, using a peristaltic pump.

- After each casing volume is removed, field parameters (e.g., pH, specific conductance, turbidity, and temperature) will be measured with portable meters calibrated according to manufacturers' specifications. Data will be recorded on an FSDS. The well will be purged until specific conductance and pH measurements stabilize to within 10 percent of previous measurements and the turbidity is below 10 nephelometric turbidity units.

- If a well is purged dry during casing-volume removal, the well will be allowed to recharge for no more than 24 hours before a sample is collected. At least one casing volume will be removed from each well before a sample is collected.

- Groundwater samples will be collected directly from the peristaltic pump discharge line for dissolved-metals analyses. The samples will be filtered using new, disposable, 0.45-micron, in-line filters. The filters will be attached directly to the peristaltic pump discharge line. Filters and peristaltic pump tubing will be used only once.

- Field activities and conditions, sampling data (e.g., well purging data, type of sample containers, methods of preservation) will be recorded on the FSDS. Any substantive deviations will be noted on the FSDS and will be brought to the attention of the project manager.

3.2.3 Sampling Handling and Laboratory Analysis

After samples are collected they will be labeled, stored in iced shipping containers with chain-of-custody procedures, and transported to the contract laboratory for analyses. Samples will be stored at 4 degrees Celsius from the time of sample collection until they arrive at the laboratory. All groundwater samples will be analyzed as described in Section 3.1.

3.3 Water-Level Monitoring

When monitoring wells are sampled, depth-to-water (groundwater elevation) will be measured using the procedures described in this section. The data will be used to estimate the horizontal and vertical groundwater flow direction under the property.

Measurements will be taken with an electronic water-level indicator. Levels will be measured to the nearest 0.01 foot from a pre-established reference point. The measurements will be converted to an elevation relative to the surveyed datum. Measurements, as well as the date, time, reference point, and initials of the sampler, will be recorded on a water-level form or FSDS. Measurements from each well will be collected as quickly as practicable during each monitoring event to reduce the potential for external factors (e.g., rainfall, barometric pressure) to affect water levels.

4 REPORTING

4.1 Groundwater Remediation Plan

Following the conclusion of the pilot-scale test, MFA will produce and submit a full-scale in-situ remediation plan in the form of a groundwater remediation plan. The plan will discuss the pilot-scale test results and optimal full-scale remediation system parameters, as well as injection procedures and any necessary changes to the groundwater monitoring proposed in Section 3.1. The purpose of this plan will be to outline a final strategy to reduce contaminant concentrations below applicable cleanup standards. The addendum may also include a discussion of potential exposure pathways and receptor risks.

4.2 Construction Completion Report

A construction completion report will be prepared and submitted to the Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program, summarizing historical site information, any additional site characterization results, the full-scale in-situ remediation system implementation, and the first-quarter groundwater-monitoring results (following full-scale injection). The report will be submitted no later than eight weeks following receipt of the laboratory analytical results. The report will also include:

- Laboratory analytical reports
- Boring and well logs
- Tables summarizing soil and groundwater analytical data compared to applicable screening criteria
- A data validation memorandum confirming that the analytical data meet project-specific data-quality objectives
- Figures showing boring and well locations and the location of the remediation/injection area

4.3 Groundwater-Monitoring Reporting

Following the construction completion report, annual letter reports will be prepared and submitted to Ecology summarizing the sampling event results, including analytical data. These will be issued in the first quarter of each calendar year.

LIMITATIONS

The services provided in the development of this plan were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This plan is solely for the use and information of our client unless otherwise noted. Any reliance on this plan by a third party is at such party's sole risk.

Opinions and recommendations contained in this plan apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. MFA does not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

REFERENCES

Philip Services. 2000. Remedial investigation report. 2 vols. Philip Services Corporation. September.

Eary, L. E., and D. Rai. 1987. Kinetics of chromium (III) oxidation to chromium (VI) by reaction with manganese dioxide. Environmental Science and Technology 21:1187-1193.

TABLES

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-1	04/25/86	0.033	<0.005	<0.002	--
	04/20/87	0.030	<0.005	<0.005	--
	01/27/88	0.055	<0.005	<0.010	--
	03/23/88	0.043	<0.005	<0.010	--
	05/11/88	0.047	<0.01	0.01	--
	10/14/88	0.082	<0.01	<0.01	--
	04/28/89	0.045	<0.005	<0.01	--
	10/24/89	0.072	<0.01	<0.01	--
	04/25/90	0.056	<0.005	<0.01	--
	09/19/90	0.072	<0.005	<0.01	--
	01/24/91	0.043	<0.005	<0.01	--
	06/18/92	0.064	<0.005	<0.010	--
	05/10/93	0.029	<0.005	<0.010	--
	04/22/94	0.029	<0.005	<0.010	--
	04/25/95	0.019	<0.005	<0.010	--
	04/18/96	0.023	<0.005	<0.010	--
	05/02/97	0.028	<0.005	<0.010	--
	04/09/98	0.024	<0.005	<0.010	--
	05/14/99	0.029	<0.005	<0.010	--
	06/23/00	0.038	<0.005	<0.010	--
	04/25/01	0.0337	<0.005	<0.010	--
	03/28/02	0.0235	<0.005	<0.010	--
	02/28/03	0.012	<0.005	0.03	--
	02/21/06	0.0108	0.0261	0.0347	--
	02/08/07	0.0189	<0.005	<0.010	--
	06/25/07	0.045	<0.005	<0.010	0.0234
MW-2	04/25/86	0.030	<0.005	<0.002	--
	04/20/87	0.044	<0.005	<0.005	--
	01/12/88	0.040	<0.005	<0.010	--
	02/16/88	0.031	<0.005	<0.010	--
	03/23/88	0.032	<0.005	<0.010	--
	05/11/88	0.039	<0.01	<0.01	--
	10/14/88	0.086	<0.01	<0.01	--
	04/28/89	0.034	<0.005	<0.01	--
	10/24/89	0.075	<0.01	<0.01	--
	04/25/90	0.034	<0.005	<0.01	--
	09/19/90	0.064	<0.005	<0.01	--
	01/24/91	0.042	<0.005	<0.01	--
	06/18/92	0.045	<0.005	<0.010	--
	05/10/93	0.032	<0.005	<0.010	--
	04/22/94	0.028	<0.005	<0.010	--
	04/25/95	0.019	<0.005	<0.010	--
	04/18/96	0.020	<0.005	<0.010	--

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-2 cont.	05/02/97	0.020	<0.005	<0.010	--
	04/09/98	0.019	<0.005	<0.010	--
	05/14/99	0.022	<0.005	<0.010	--
	06/23/00	0.025	<0.005	<0.010	--
	04/25/01	0.0266	<0.005	0.0183	--
	03/28/02	0.0206	<0.005	<0.010	--
	02/28/03	0.020	<0.005	0.0052	--
	02/21/06	0.0111	0.0292	0.0397	--
	02/08/07	0.0166	<0.005	<0.010	--
	06/25/07	0.033	<0.005	<0.010	0.0206
MW-3	04/25/86	0.023	<0.005	<0.002	--
	04/20/87	0.063	<0.005	<0.005	--
	01/12/88	0.060	<0.005	<0.010	--
	02/16/88	0.076	<0.005	<0.010	--
	03/23/88	0.049	<0.005	<0.010	--
	05/11/88	0.065	<0.01	<0.01	--
	10/14/88	0.076	<0.01	<0.01	--
	04/28/89	0.056	<0.005	<0.01	--
	10/24/89	0.134	<0.01	<0.01	--
	04/25/90	0.252	<0.005	<0.01	--
	09/19/90	0.477	<0.005	<0.01	--
	01/24/91	0.382	<0.005	<0.01	--
	04/19/91	0.063	<0.005	<0.01	--
	03/11/92	0.210	<0.005	<0.01	--
	06/18/92	0.287	<0.005	<0.010	--
	02/05/93	0.188	<0.005	<0.010	--
	05/10/93	0.150	<0.005	<0.010	--
	04/22/94	0.142	<0.005	<0.010	--
	04/25/95	0.094	<0.005	<0.010	--
	04/18/96	0.094	<0.005	<0.010	--
	05/02/97	0.076	<0.005	<0.010	--
	04/09/98	0.500	<0.005	<0.010	--
	05/14/99	0.654	0.041	<0.010	--
	06/23/00	0.895	0.008	<0.010	--
	04/25/01	1.490	<0.005	<0.010	--
	03/28/02	1.270	0.0542	<0.010	--
	02/21/06	0.0325	0.0195	0.0271	--
	02/08/07	0.639	<0.005	<0.010	--
	03/07/07	0.760	<0.005	<0.010	--
	06/25/07	0.600	<0.005	<0.010	0.746
	08/01/07	0.690	<0.005	<0.010	0.507

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-4	04/25/86	0.015	<0.005	<0.002	--
	04/20/87	0.009	<0.005	<0.005	--
	01/27/88	0.082	<0.005	<0.010	--
	03/23/88	0.027	<0.005	<0.010	--
	05/11/88	0.047	<0.01	<0.01	--
	10/14/88	0.095	<0.01	<0.01	--
	04/28/89	0.013	<0.005	<0.01	--
	10/24/89	0.086	<0.01	<0.01	--
	04/25/90	0.076	<0.005	<0.01	--
	09/19/90	0.092	<0.005	<0.01	--
	01/24/91	0.081	<0.005	<0.01	--
MW-5	01/12/88	0.003	<0.005	<0.010	--
	01/12/88	0.003	<0.005	<0.010	--
	03/23/88	0.005	<0.005	<0.010	--
	05/11/88	--	--	--	--
	10/14/88	0.055	<0.01	0.01	--
	04/28/89	<0.005	0.006	0.025	--
	10/24/89	--	--	--	--
	04/25/90	0.0640	<0.005	<0.01	--
	09/19/90	0.062	<0.005	<0.01	--
	01/24/91	0.019	<0.005	<0.01	--
	06/18/92	0.024	<0.005	<0.010	--
	05/10/93	0.013	<0.005	<0.010	--
	04/22/94	0.007	<0.005	<0.010	--
	04/25/95	0.006	<0.005	<0.010	--
	04/18/96	0.044	<0.005	<0.010	--
	05/02/97	0.005	0.006	<0.010	--
	04/09/98	--	<0.005	<0.010	--
	05/14/99	<0.005	<0.005	<0.010	--
	06/23/00	0.009	<0.005	<0.010	--
	04/25/01	0.013	<0.005	<0.010	--
	03/28/02	<0.0100	<0.005	<0.010	--
	02/28/03	0.045	0.023	0.063	--
	02/21/06	0.010	0.0372	0.057	--
	02/08/07	0.0074	<0.005	<0.010	--
	06/25/07	0.061	<0.005	<0.010	<0.010
MW-6	01/12/88	0.005	<0.005	<0.010	--
	03/23/88	--	<0.005	<0.010	--
	05/11/88	--	--	--	--
	10/14/88	0.009	<0.01	<0.01	--
	04/28/89	--	--	--	
	02/08/07	0.0053	<0.005	<0.010	--
	11/06/07	0.0015		<0.010	0.494

Table 1
Dissolved Metals in Groundwater from Monitoring Wells (mg/L)
TrueGuard
Washougal, Washington

Well	Date	Dissolved Metals			
		Arsenic	Chromium	Copper	Boron
MW-7	12/30/91	0.041	<0.005	<0.01	--
	06/18/92	0.047	<0.005	<0.010	--
	05/10/93	0.040	<0.005	<0.010	--
	04/22/94	0.027	<0.005	<0.010	--
	04/25/95	0.012	<0.005	<0.010	--
	04/18/96	0.022	<0.005	<0.010	--
	05/02/97	0.074	0.008	<0.010	--
	04/09/98	0.018	<0.005	<0.010	--
	05/14/99	0.020	<0.005	<0.010	--
	06/23/00	0.031	<0.005	<0.010	--
	04/25/01	0.0299	<0.005	0.0138	--
	03/28/02	0.0133	<0.005	<0.010	--
	02/28/03	0.063	<0.005	0.037	--
	02/21/06	<.010	0.0229	0.0281	--
MW-8	03/07/07	2.900	<0.005	<.010	--
	06/25/07	1.400	<0.005	<0.010	0.567
	08/01/07	3.300	<0.005	<0.010	0.627
	11/06/07	0.72		0.01 U	0.106
MW-9	06/25/07	2.900	<0.005	<0.010	1.13
	08/01/07	2.600	<0.005	<0.010	0.893
MW-10	06/25/07	4.800	0.0057	<0.010	0.529
	08/01/07	6.400	<0.005	<0.010	0.914

NOTES:

Data have not yet been independently verified by Maul Foster and Alongi, Inc.

-- = analysis not performed for analyte shown.

< = analyte not detected at or above the reported method reporting limit.

mg/L = milligrams per liter (or parts per million).

Table 2
Wood Treatment Chemical Use at TrueGuard Washougal Facility
Washougal, Washington

<table>
<tr><th>Year</th><th>Retort Tube #1</th><th>Retort Tube #2</th><th colspan="3">Spill and Other History</th></tr>
<tr><td>1984</td><td>CCA</td><td>-</td><td rowspan="8">Chemicals and rainwater periodically found in Sump D (retort area was uncovered).</td><td rowspan="7"></td><td rowspan="7"></td></tr>
<tr><td>1985</td><td>CCA</td><td>-</td></tr>
<tr><td>1986</td><td>CCA</td><td>-</td></tr>
<tr><td>1987</td><td>CCA</td><td>-</td></tr>
<tr><td>1988</td><td>CCA</td><td>-</td></tr>
<tr><td>1989</td><td>CCA</td><td>-</td></tr>
<tr><td>1990</td><td>CCA</td><td>-</td></tr>
<tr><td>1991</td><td>CCA</td><td>-</td><td rowspan="11">Periodic small spills in tank farm/retort area due to minor pipe leaks and equipment failure. Dilute chemicals in channel area while repairs being performed.</td><td rowspan="2">Retort floor area sealed.</td></tr>
<tr><td>1992</td><td>CCA</td><td>-</td><td rowspan="5"></td></tr>
<tr><td>1993</td><td>CCA</td><td>Added Tube #2. CCA</td><td rowspan="14"></td></tr>
<tr><td>1994</td><td>CCA</td><td>CCA</td></tr>
<tr><td>1995</td><td>CCA</td><td>CCA</td></tr>
<tr><td>1996</td><td>CCA</td><td>CCA</td></tr>
<tr><td>1997</td><td>CCA</td><td>CCA</td><td>Installed water-stop at building footings in retort channel flowing to Sump D.</td></tr>
<tr><td>1998</td><td>CCA</td><td>CCA</td><td rowspan="5"></td></tr>
<tr><td>1999</td><td>CCA</td><td>CCA</td></tr>
<tr><td>2000</td><td>CCA</td><td>CCA</td></tr>
<tr><td>2001</td><td>CCA</td><td>CCA</td></tr>
<tr><td>2002</td><td>ACQ with boric acid</td><td>CCA</td><td rowspan="5"></td></tr>
<tr><td>2003</td><td>ACQ with boric acid</td><td>CCA</td><td>March and June 2003: CCA overflows into Retort #2 area.</td></tr>
<tr><td>2004</td><td>CCA only Jan.–Sept. Added borates in October.</td><td>ACQ with boric acid</td><td>February and April 2004: ACQ with boron overflows to Retort #2 area.</td></tr>
<tr><td>2005</td><td>CCA with borates</td><td>ACQ with boric acid</td><td></td></tr>
<tr><td>2006</td><td>CCA with borates</td><td>ACQ without boric acid</td><td>April 2006: tank farm floor flooded; contained within secondary containment.</td></tr>
</table>

Table 2
Wood Treatment Chemical Use at TrueGuard Washougal Facility
Washougal, Washington

Year	Retort Tube #1	Retort Tube #2	Spill and Other History		
2007	CCA with borates	ACQ without boric acid	April 2007: tank farm floor flooded; contained within secondary containment.		

NOTES:
ACQ = alkaline copper quaternary.
CCA = chromate copper arsenate.

Table 3
Metals in Reconnaissance Groundwater (µg/L)
TrueGuard LLC
Washougal, Washington

Location	Sample Name	Date	Depth (feet bgs)	Arsenic	Boron	Chromium	Copper
GP-1	GP-1-W-8	07/30/2007	8	49	< 10	< 5	< 10
GP-2	GP-2-W-8	07/30/2007	8	51	< 10	< 5	< 10
GP-3	GP-3-W-8	07/30/2007	8	18	170	< 5	33.0
GP-4	GP-4-W-8	07/30/2007	8	75	203	< 5	< 10
GP-5	GP-5-W-8	07/30/2007	8	100	1550	< 5	< 10
GP-6	GP-6-W-8	07/30/2007	8	77	497	< 5	< 10
GP-7	GP-7-W-8	07/30/2007	8	41	32.7	< 5	< 10
GP-8	GP-8-W-8	07/30/2007	8	360	185	< 5	< 10
GP-9	GP-9-W-7	07/31/2007	7	48	< 10	< 5	< 10
GP-10	GP-10-W-7	07/31/2007	7	33	88.1	< 5	< 10
GP-11	GP-11-W-7	07/31/2007	7	55	< 10	< 5	< 10
GP-12B	GP-12B-W-7.5	07/31/2007	7.5	28	77.3	< 5	< 10
GP-13	GP-13-W-7	07/31/2007	7	15	20.1	< 5	< 10
GP-14	GP-14-W-7	07/31/2007	7	5.9	251	< 5	< 10
GP-15	GP-15-W-7	07/31/2007	7	5	22.2	< 5	< 10
GP-16	GP-16-W-7	07/31/2007	7	32	49.3	< 5	< 10
GP-17	GP-17-W-7	07/31/2007	7	24	13.9	< 5	< 10
GP-18	GP-18-W-7	07/31/2007	7	61	55.4	< 5	< 10
GP-19	GP19-8	09/06/2007	8	73	343	< 5	< 10
GP-20	GP20-10	09/06/2007	10	120	< 10	< 5	< 10
GP-21	GP21-11	09/06/2007	11	310	94.6	< 5	< 10
GP-22	GP22-8	09/06/2007	8	44	160	< 5	< 10
GP-23	GP23-11	09/06/2007	11	96	17.4	< 5	< 10
GP-24	GP24-11	09/06/2007	11	62	< 10	< 5	< 10
GP-25	GP25-8	09/06/2007	8	30	1170	< 5	< 10
GP-26	GP26-9.5	09/06/2007	9.5	62	1180	< 5	< 10
GP-27	GP27-7	09/06/2007	7	83	418	< 5	< 10

NOTES:
bgs = below ground surface.
< = analyte not detected at or above the reported method reporting limit.
µg/L= micrograms per liter.

Table 4
Metals in Soil (mg/kg)
TrueGuard LLC
Washougal, Washington

Location	Sample Name	Date	Depth (feet bgs)	Arsenic	Boron	Chromium	Copper
GP-15	GP-15-S-4	07/31/2007	4	1.94	< 1.01	7.60	4.75
GP-18	GP-18-S-4.5	07/31/2007	4.5	2.00	< 0.86	9.34	5.69

NOTES:
bgs = below ground surface.
< = analyte not detected at or above the reported method reporting limit.
mg/kg = milligrams per kilogram.

FIGURES

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0 1,500 3,000
Feet

N

Figure 1
Site Location
TrueGuard LLC
Washougal, Washington

Site Address: 725 S. 32nd Street, Washougal, Washington
Source: USGS (1990) 7.5 Minute Topo Quad Washougal:
Section 17, Township 1 North, Range 4 East

Site Taxlot Boundaries

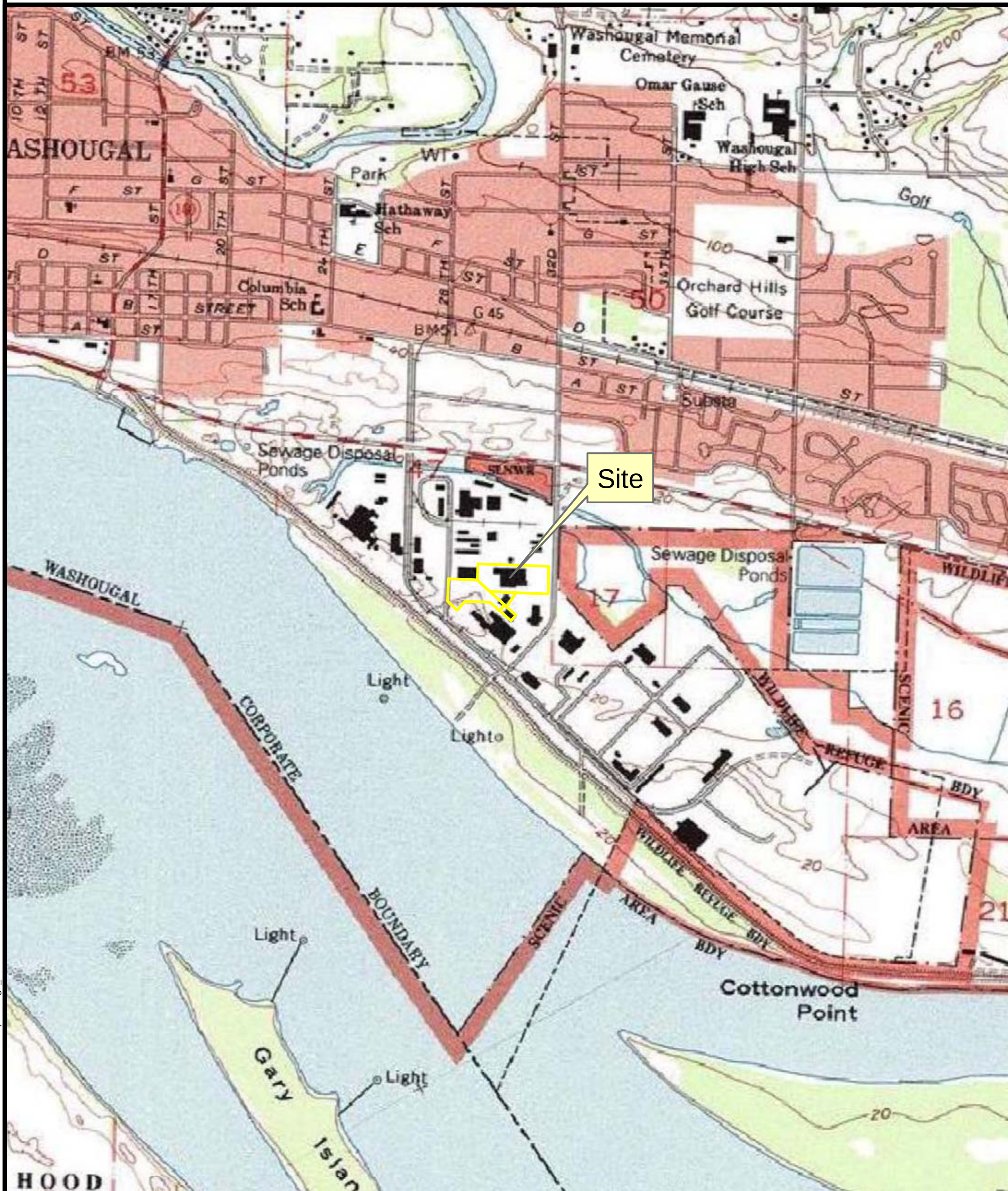

Figure 2
Monitoring Well Locations and December 6, 2007 Groundwater Contours

TrueGuard LLC
Washougal, Washington

Legend

MW-6 21.05 — Monitoring Well Location (with Water Level Value Feet NAVD88)

MW-9 — Extraction Well Location

15 — Contour 0.5-Foot Interval

TrueGuard Site Boundaries

Taxlots

Source: Aerial Photograph (2005) and Taxlots (March 07) obtained from Clark County GIS Dept.

Note:
1. NAVD88 = North American Vertical Datum of 1988.

2. Due to the close proximity of MW-10, MW-8, MW-9, and MW-3, only MW-3 was used in the generation of the Water Level Contours.

N

0 100 200
Feet

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Printing Date: January 25, 2008 File: X:\9009.01 Allweather Wood\12\Projects\Fig2_Monitoring Well Locations and December 6 2007 Ground Water Elevations.mxd

Project: 9009.01.12 Produced By: B. Hines Approved By: M. Hickey

Figure 3
Well Locations and Groundwater Monitoring Results

TrueGuard LLC
Washougal, Washington

MW-1

Analyte	June-07	August-07
Arsenic	45	--
Chromium	ND	--
Copper	ND	--
Boron	23.4	--

MW-2

Analyte	June-07	August-07
Arsenic	33	--
Chromium	ND	--
Copper	ND	--
Boron	20.6	--

MW-3

Analyte	June-07	August-07
Arsenic	600	690
Chromium	ND	ND
Copper	ND	ND
Boron	746	507

MW-5

Analyte	June-07	August-07
Arsenic	61	--
Chromium	ND	--
Copper	ND	--
Boron	ND	--

MW-6

Analyte	June-07	August-07
Arsenic	--	--
Chromium	--	--
Copper	--	--
Boron	--	--

MW-8

Analyte	June-07	August-07
Arsenic	1400	3300
Chromium	ND	ND
Copper	ND	ND
Boron	567	627

MW-9

Analyte	June-07	August-07
Arsenic	2900	2600
Chromium	ND	ND
Copper	ND	ND
Boron	1130	893

MW-10

Analyte	June-07	August-07
Arsenic	4800	6400
Chromium	5.7	ND
Copper	ND	ND
Boron	529	914

Legend

- Extraction Well Location
- Monitoring Well Location
- Abandoned Well Location
- Taxlot Boundaries
- TrueGuard Site Boundaries

Notes:
1) Results are reported in micrograms per liter
2) ND = Non Detect
3) All well locations are approximate

Sources:
1) Aerial Photograph (2005) and Taxlots (March 07) obtained from Clark County GIS Department

N

0 100 200
Feet

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File: X:\9009.01 Allweather Wood\12\Projects\Fig3_Well Locations and Groundwater Monitoring Results.mxd

Project: 9009.01.11 Produced By: T. Vick/R. Maronn Approved By: A. Hughes

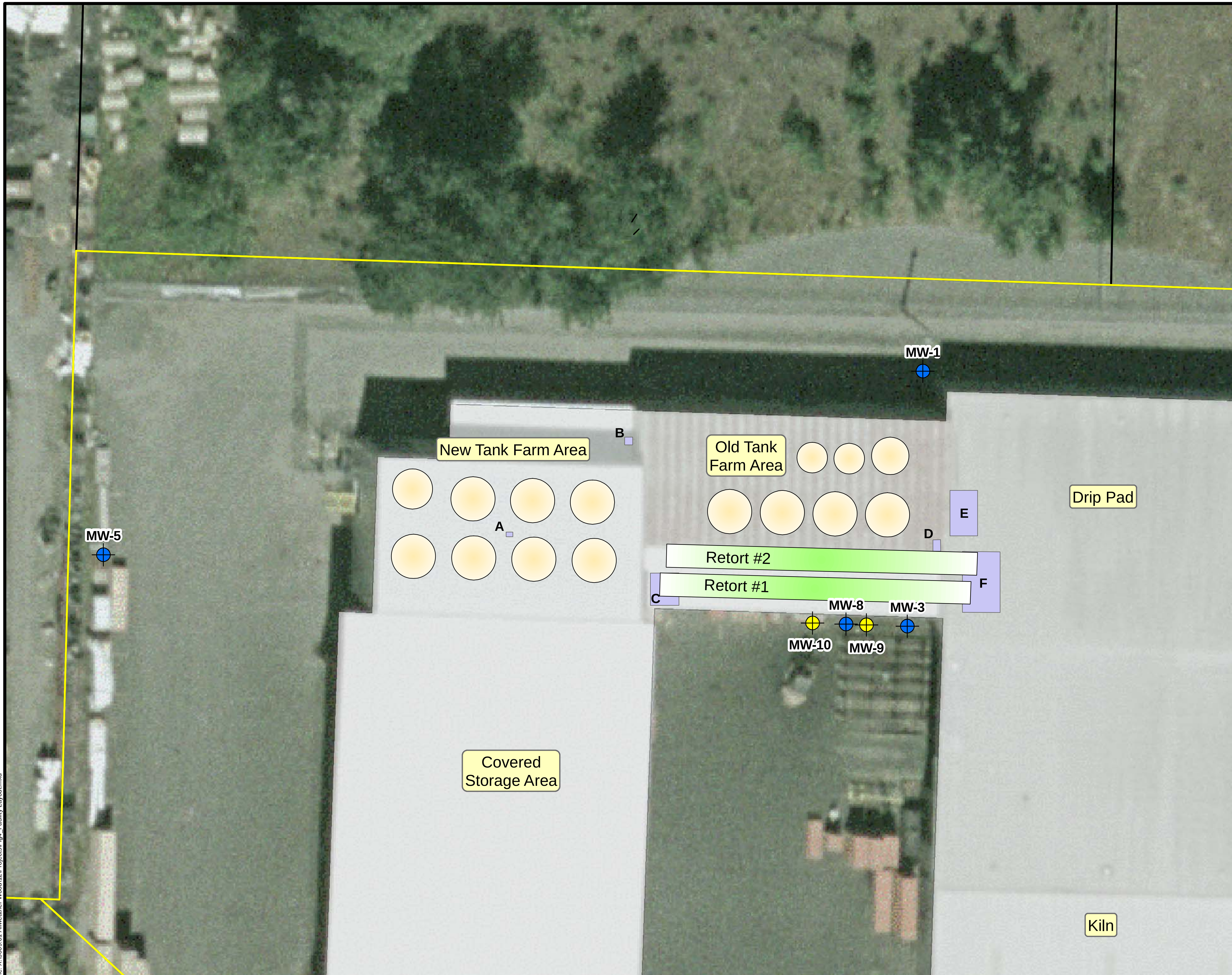

Figure 4
Facility Layout

TrueGuard LLC
Washougal, Washington

Legend

- Extraction Well Location
- Monitoring Well Location
- Storage Tank
- Retorts
- Sumps
- Taxlot Boundaries
- Building footprint
- TrueGuard Site Boundaries

Notes:
1) All well locations and facility features are approximate

Sources:
1) Aerial Photograph (2005) and Taxlots (March 07) obtained from Clark County GIS Department

N

0 25 50
Feet

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File: X:\9009.01 Allweather Wood\12\Projects\Fig4_Facility Layout.mxd

Project: 9009.01.11 Produced By: T. Vick/R. Maronn Approved By: A. Hughes

Figure 5
Reconnaissance Groundwater Results

TrueGuard LLC
Washougal, Washington

Legend

Boring Locations

- Boring Location (Sept. 6, 2007)
- Boring Location (July 30-31, 2007)
- Piezometer Location
- Extraction Well Location
- Monitoring Well Location
- Abandoned Monitoring Well Location
- Taxlot Boundaries
- TrueGuard Site Boundaries

Source: Aerial Photograph (2005) and Taxlots (March 07) obtained from Clark County GIS Dept.

Notes:
1. All Well locations are approximate.
2. Boring locations GP-1 through GP-18 were installed on July 30-31, 2007. GP-19 through GP-27 were installed on September 6, 2007.
3. Piezometer PZ-1 was installed after the groundwater sample was taken.
4. All results are in micrograms per liter (µg/L).
5. ND = Not detected at or above the reporting limit.

N

0 75 150
Feet

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File: X:\9009.01 Allweather Wood\12\Projects\Fig5_Reconnaissance Groundwater Results.mxd

Project: 9009.01.11 Produced By: B. Hines/R. Maronn Approved By: A. Hughes

Figure 6
Detail of Injection Area and Wells To Be Decommissioned

TrueGuard LLC
Washougal, Washington

Legend

- Extraction Well Location
- Extraction Well Location (To Be Decommissioned)
- Monitoring Well Location
- Monitoring Well Location (To Be Decommissioned)
- Proposed Injection Point Location

Note: Injection point locations are approximate.

Source: Aerial Photograph (2005) and Taxlots (March 07) obtained from Clark County GIS Dept.

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File: X:\9009.01 Allweather Wood\12\Projects\Fig6_Detail of Injection Area and Wells to be Decommissioned.mxd

Project: 9009.01.11 Produced By: R. Maronn Approved By: M. Hickey

APPENDIX A

SUPPLEMENTAL EHC-M™ AND HOLEBLOK+™ LITERATURE*

*Information and material in the appendix were not independently verified by MFA.

ADVENTUS

Proven Soil, Sediment, and Groundwater Remediation Technologies

Via Email: mhickey@mfainc.org

Matthew Hickey, EIT
Staff Engineer
Maul Foster & Alongi, Inc.
3121 SW Moody Avenue, Suite 200
Portland, OR 97239

January 7, 2008

Subject: Treatment of Arsenic using EHC-M™ ISCR Technology
TrueGuard, Washougal Arsenic Site
Adventus Proposal No. AAI8-003

Dear Mr. Hickey

Please find herewith a conceptual remedial design and cost estimate for employing EHC-M™ *in situ* chemical reduction (ISCR) technology to remove chlorinated volatile organic compounds (CVOCs) from groundwater and simultaneously immobilize heavy metals at the above referenced site (the Site). The cost estimate includes EHC amendments and delivery (estimated) and Adventus on-site field support for the initiation of the project.

TECHNOLOGY BACKGROUND

EHC™ is a patented combination of controlled-release carbon and zero valent iron (ZVI) particles used for stimulating *in situ* chemical reduction (ISCR) of otherwise persistent organic compounds in groundwater. Variations of these materials have been used to treat over 2,000,000 tons of soil/sediment impacted by recalcitrant compounds as part of the company's DARAMEND® bioremediation technology. Both EHC and DARAMEND are proven, established technologies that have been used at over 150 field sites to date throughout North America and accepted by many Federal, State, and regional regulatory authorities within the USA/Canada (**Figure 1a**) Europe (**Figure 1b**) and Asia.

EHC is available as a **solid or liquid** material that can be easily injected into the subsurface environment in a variety of ways based on site-specific designs. Application methods include direct mixing, hydraulic fracturing, pneumatic fracturing, and injection of slurries or liquids. Direct placement in trenches and excavations are also reliable application methods.

1435 Morris Ave, Floor 2 • Union, NJ 07083 • Tel: 908.688.8543 • Fax: 908.688.8563
www.AdventusGroup.com

Figure 1a: Adventus Field-Scale ISCR Projects in North America. September 2007

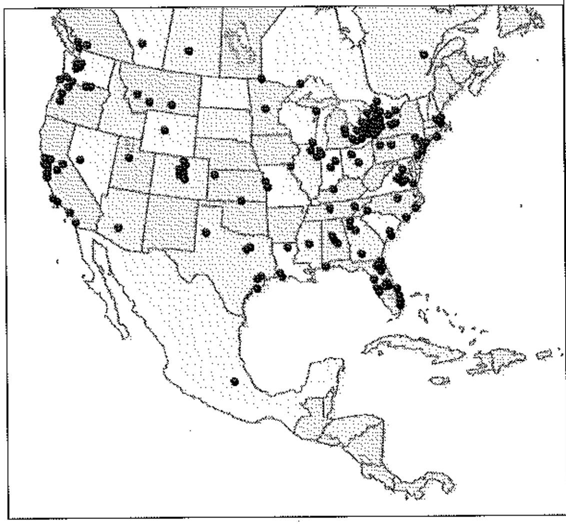
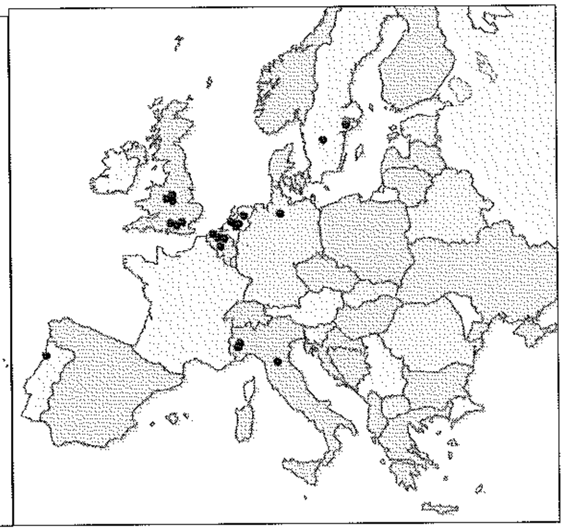


Figure 1b: Adventus Field-Scale Projects in Europe. September 2007



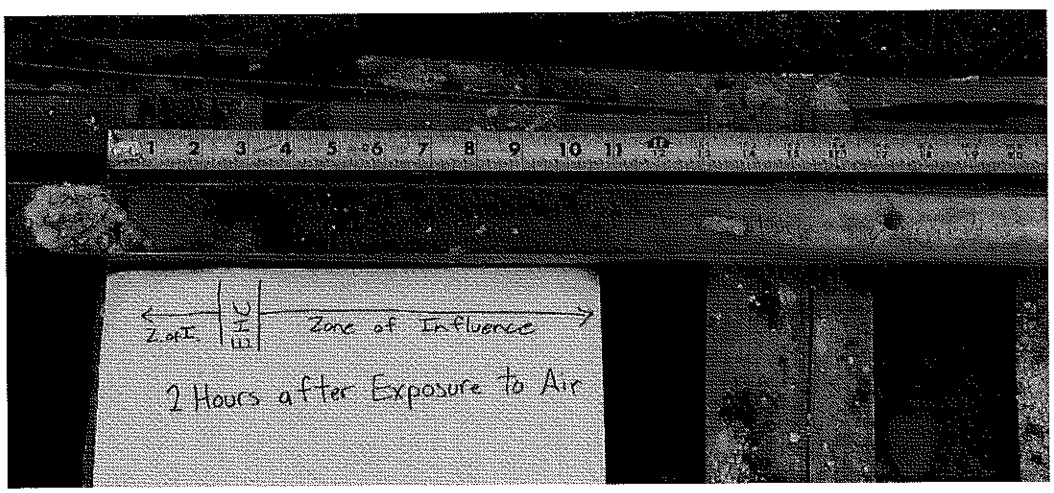
Following placement of EHC into the subsurface environment, a number of physical, chemical and microbiological processes combine to create very strong reducing conditions that stimulate rapid and complete dechlorination of organic solvents and other recalcitrant compounds. First, the organic component of EHC (fibrous organic material) is nutrient rich, **hydrophilic** and has high surface area; thus, it is an ideal support for growth of bacteria in the groundwater environment. As they grow on EHC particle surfaces, indigenous heterotrophic bacteria consume dissolved oxygen thereby reducing the redox potential in groundwater. In addition, as the bacteria grow on the organic particles, they ferment carbon and release a variety of volatile fatty acids (acetic, propionic, butyric) which diffuse from the site of fermentation into the groundwater plume and serve as electron donors for other bacteria, including dehalogenators and halorespiring species. Finally, the small ZVI particles (<5 to 45 μm) provide substantial reactive surface area that stimulates direct chemical dechlorination and an additional drop in the redox potential of the groundwater via chemical oxygen scavenging.

These physical, chemical and biological processes combine to create an extremely reduced environment that stimulates chemical and microbiological dechlorination of otherwise persistent compounds. Redox potentials as low as –550 mV are commonly observed in groundwater after EHC application. At these Eh levels, many organic constituents of interest (COI) are thermodynamically unstable and they will readily degrade via pathways more typical of physical destruction processes (minimum production and no accumulation of typically recognized biodegradation intermediates such as DCE for TCE). Hence, the ISCR technology is microbiologically based in that we rely on indigenous microbes to biodegrade the EHC carbon (refined plant materials), but we do not require the presence or activity of special or otherwise unique bacteria for complete and effective remediation.

The type of EHC used for a given site depends, in part, on the construction method employed to emplace the material into the subsurface. If a direct mixing or direct placement method is used, the standard slow release, solid EHC material would likely be utilized. If an injection method is used, however, a combination of fast and slow release EHC may be preferred. If the material is to be placed through an existing well network, then a water-soluble, aqueous formulation, EHC-A, may be utilized.

In either event, the fibrous organic carbon and ZVI or other reduced metal that comprises the slow release EHC will remain in the location where it is injected. It will not only treat COI that migrates into the treated area, but it will also have a 'halo' or 'zone of influence' of low redox conditions that will extend beyond its physical space, greatly increasing its effectiveness. **Figure 2** provides an example of how a small fracture of EHC creates a wide zone of influence outside of its immediate location. The native soil color is the yellow visible on the right hand side of the core. The orange discoloration is due to the low redox conditions created by the EHC, which became apparent after exposure to the air for 2 hours.

Figure 2. Photograph of a soil core, from 30 ft to 33 ft bgs, showing a 1-inch fracture.



EHC-M™ TECHNOLOGY BACKGROUND

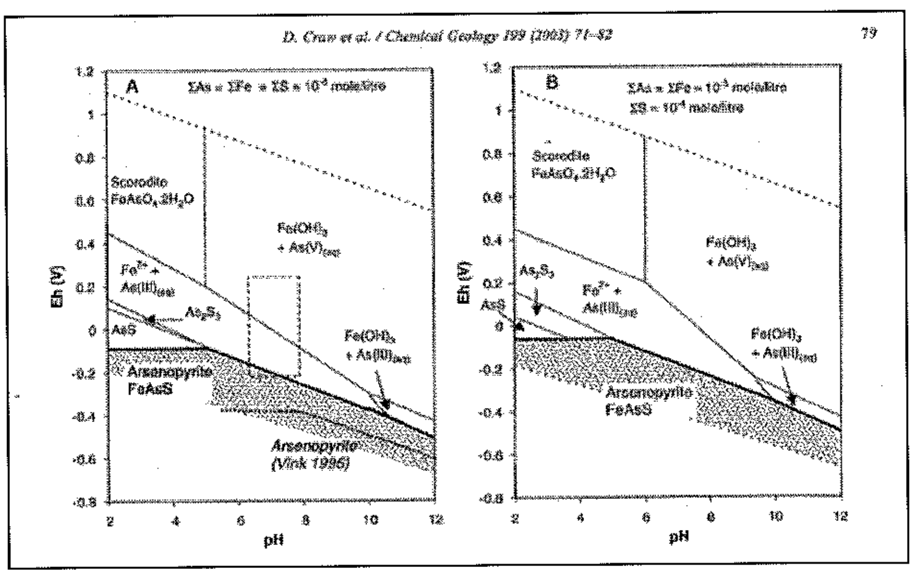
EHC-M™ is a patented combination of controlled-release carbon and zero valent iron (ZVI) particles used for stimulating reductive dechlorination of otherwise persistent organic compounds and stabilization of metals such as arsenic, chromium, lead, mercury and others. Variations of these materials have been used to treat over 1,000,000 tons of soil/sediment impacted by recalcitrant compounds as part of the company's DARAMEND® bioremediation technology. EHC and DARAMEND are proven, established technologies that have been used at over 65 field sites to date throughout North America and accepted by many Federal, State, and regional regulatory authorities within the USA, Canada, Europe and Asia.

HEAVY METAL IMMOBILIZATION USING EHC-M TECHNOLOGY

EHC-M™ is a specially formulated version of our controlled-release, integrated carbon and zero valent iron (ZVI) technology for in situ chemical reduction (http://www.adventus.us/ehc.htm). EHC-M encourages the precipitation and adsorption of arsenic and other dissolved metals (such as chromium, lead and mercury) to limit their movement downstream of a treatment zone. It can be applied to the subsurface environment in a number of ways to quickly reduce the concentration of metals in groundwater in a safe and timely manner. Following placement of EHC-M into the subsurface environment, a number of physical, chemical and microbiological processes combine to create very strong reducing conditions that stimulate stabilization of metals as well as rapid and complete dechlorination of organic solvents. The primary mechanism of removal entails physical precipitation of arsenic with iron and other inorganic compounds, especially those associated with the reduction of sulfate to form arsenopyrite (EPA, 2000; Craw *et al* 2003 as shown below). Given that the removal mechanisms are precipitation and adsorption, the arsenic is transferred from the aqueous phase to a solid phase.

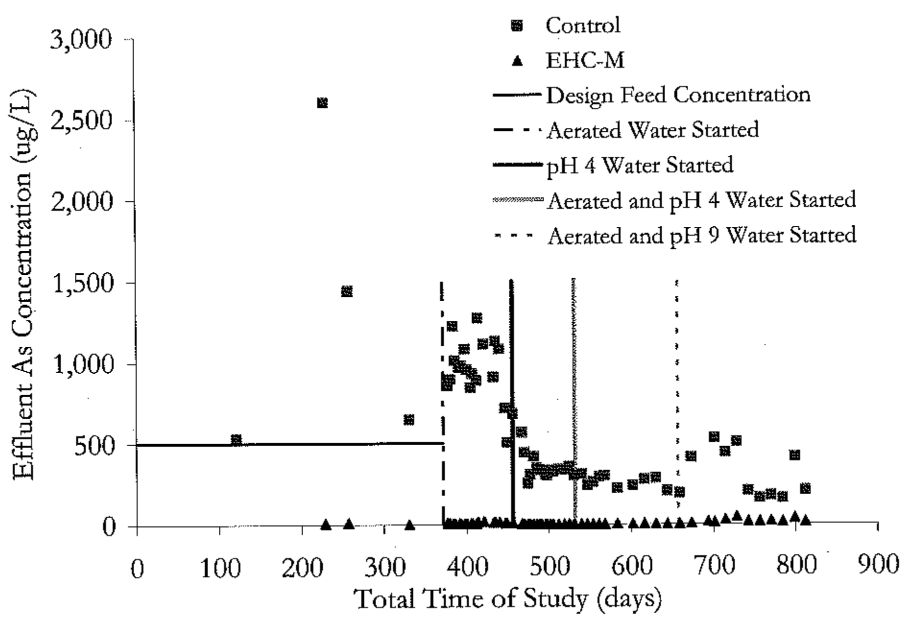
EHC-M is available as a **solid** material that can be easily injected into the subsurface environment in a variety of ways based on site-specific designs. Application methods include direct mixing, hydraulic fracturing, pneumatic fracturing, and injection of slurries. Direct placement in trenches and excavations are also reliable application methods.

Figure 1: Eh-pH diagram for the As-Fe-O-S system showing the stability field of arsenopyrite (Craw et al 2003).



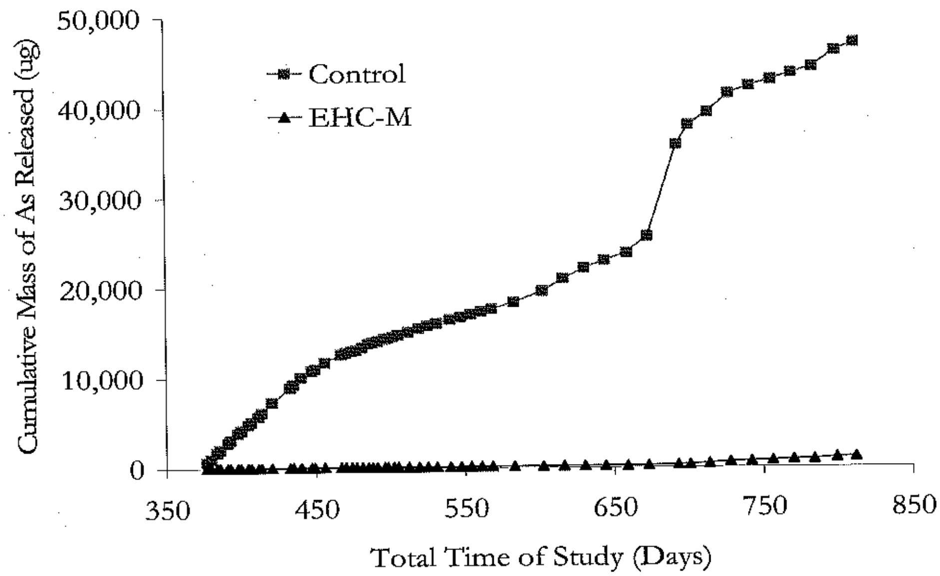
EHC-M has been shown to rapidly reduce the concentration of dissolved arsenic in groundwater from >1,000 to <10 ug/L. A continuous-flow laboratory study was performed to evaluate the removal and subsequent retention of arsenic in the column. Removal efficiencies exceeding 98% were demonstrated for the 1-year duration of feeding 500 µg/L of arsenic into the column. This was followed by more than a second year of introducing uncontaminated water of varying pH and dissolved oxygen conditions in an effort to demonstrate the ability of EHC-M to retain arsenic in the column. As shown in **Figure 2,** minimal arsenic was eluted from the column despite periods of intentionally high pH, low pH, and high dissolved oxygen. This suggests that arsenic removal using EHC-M technology is **NON REVERSIBLE** by change in Eh or pH; hence, **rebound should not be observed**. This supports the premise that arsenopyrite is the primary precipitation product (Craw et. al., 2003).

Figure 2: **Influence of EHC-M on arsenic concentrations in a column study.**



Only 2.4% of the mass of arsenic that was removed from the water by the EHC-M column was released during the subsequent phases of the study. These data illustrate that EHC-M is capable of creating and maintaining reducing conditions effective for the removal of arsenic from the water phase, despite significant change in physicochemical conditions that in theory could reverse the stabilized condition (**Figure 3**).

Figure 3: Cumulative mass of arsenic released from control and EHC-M columns in flow-through column study.



ISCR CASE STUDIES

EHC treatment has effectively mineralized these compounds before without generation of problematic daughter products. The following relevant case studies are included as **Appendix A**:

- EHC-M for treatment of hot-spot with TCE and Cr(VI), NW USA
- EHC for Source Area Mass Reduction (TCE, TCA and daughters), Cherry Point, North Carolina.
- EHC PRB for Plume Management (CT), Confidential site, Kansas
- EHC Plume Treatment (CF and TCE), Confidential site, SE USA
- EHC PRB for Plume Management (TCE and daughters), Former Unregulated SWMU, Ohio
- EHC PRB for Plume Management (PCE and daughters), Confidential site, Texas

MODE OF ACTION - HEAVY METAL IMMOBILIZATION

EHC-M™ combines controlled-release carbon, ZVI and a slow-release source of sulfide ion. Under ISCR conditions, precipitation and adsorption reactions unique to EHC-M will rapidly reduce the concentration of many dissolved heavy metals, including As, Cd, Co, Cr, Cu, Hg, Ni, Pb, Sb and Zn (**Appendix B**). A summary of observed removal efficiencies follows:

Compound	Influent (ppb)	Effluent (ppb)	% Removal
Antimony	24,500	35	>99
Arsenic	500	9	98
Cadmium	11	<1	>99
Chromium	200	<5	>99
Cobalt	210	<5	>99
Copper	86	<5	>99
Lead	64,000	600	>99
Mercury	1,020	29	97
Nickel	350	5	>99
Zinc	50,400	3,900	92

EHC-M can be easily applied to the subsurface environment in a number of ways to quickly reduce the concentration of dissolved metals in a safe and timely manner. Independent studies showing the effectiveness of EHC-M for immobilization of Cr are provided as **Appendices C – F.** Numerous organic substrates have been evaluated for establishment of reducing conditions, including molasses, acetate, lactate, emulsified vegetable oil (EVO), and a mixture of carbon source and zero valent iron (ZVI). As outlined above, EHC-M is unique and, in all studies, EHC-M performed better than any of the alternatives tested.

EHC has been accepted by the Florida Department of Environmental Protection (http://www.dep.state.fl.us/waste/categories/pcp/pages/bio.htm) and many other regulatory agencies. The product is supplied in 50 lb bags as a powder which can be mixed with soil or slurried in water. Installation techniques vary widely depending on the application. For example, the powder can be mixed with soil and placed at the bottom of an excavation where prior soil removal had been conducted. A slurry can be made and the mixture can be injected into the subsurface using techniques such as direct injection through GeoProbe rods or hydraulic fracturing.

POTENTIAL ADVANTAGES OF USING EHC ISCR TECHNOLOGY

The patented combination of controlled-release organic carbon plus ZVI uniquely yields ISCR conditions which give EHC powerful technical advantages over other materials that provide only carbon (*i.e.*, emulsified oils, molasses or lactate-based substrates) or only ZVI. These include:

- **Health and Safety**. Safe handling and easy application with no bulky or hazardous material disposal issues;
- **Minimal Methane Production**. The presence of ZVI and the complex, controlled-release carbon source help minimize production of potentially problematic fermentation end-products, such as methane;

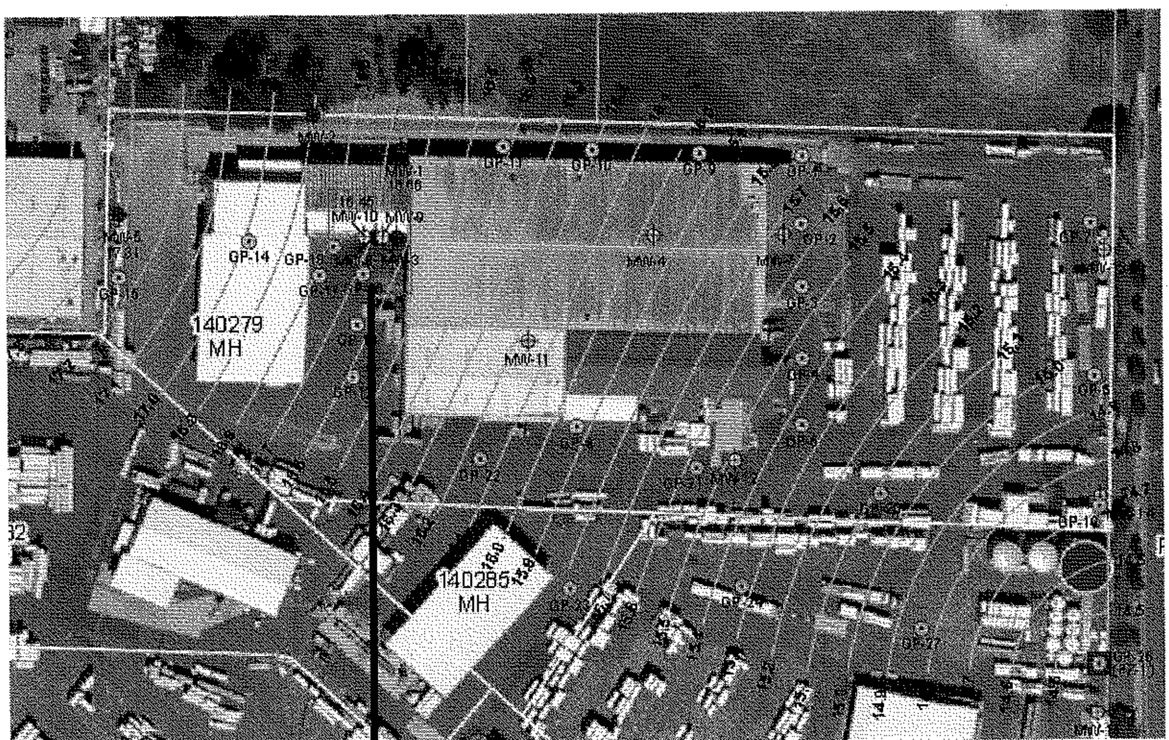
- **Predictable Performance**. EHC uniquely integrated chemical and microbiological degradation processes which allows treatment to proceed at a predictable rate;
- **Constructability**. EHC is easily and quickly injected using conventional construction technologies;
- **No Mobilization of Contaminants.** Optimal volume of EHC slurry is injected **without the need for extensive water flushing**, which avoids potential displacement and mobilization issues;
- **Accelerated Site Closure** due to the ability of the EHC system to rapidly remove COI mass via a combination of biogeochemical degradation processes **without relying on physical sorption / sequestration as a major "removal" mechanism (ala oils – See Appendix D);**
- **ISCR**. Combined chemical and biological oxygen scavenging facilitates rapid oxygen consumption and establishment of reduced Eh; Generation of significantly lowered reducing conditions usually eliminates any requirement for specialty microorganisms or inoculants;
- **No Dead-End Intermediates**. Rapid COI removal without accumulation of potentially problematic catabolites, such as *cis* DCE from TCE or chloroform (CF) from carbon tetrachloride (CT);
- **Applicability**. Demonstrated effective on a wide range of COI, including chlorinated solvents, Freons, pesticides, perchlorate and other energetic compounds (explosives);
- **Longevity with no Rebound.** EHC remains active in the environmental for 12 to 60 months hence COI rebound phenomena are not observed (rebound is common when using readily biodegradable, liquid substrates);
- **Complete Technology.** Provision of major, minor and micronutrients that are essential to the activity of fastidious anaerobic bacteria involved in recognized dechlorination reactions;
- **Buffering Capacity**. Provision of substantial pH buffering capacity (*i.e.*, different EHC products are designed to release alkalinity, acidity or to maintain a neutral pH). In contrast, the addition of conventional organic substrates (e.g., emulsified oils, molasses or lactate-based materials) to promote COI biodegradation can lead to aquifer acidification;
- **Facilitates Natural Attenuation Processes.** For all the reasons summarized above, EHC enhances the natural biological processes. Other technologies may offer short term COI reduction via sorption reactions, etc. but they can alter the environmental conditions such that natural attenuation mechanisms are adversely influenced; and

- **Simultaneous Immobilization of Heavy Metals.** EHC will not mobilize arsenic, and EHC-M will simultaneously immobilize many other heavy metals which may be present as other potential COIs.

SITE UNDERSTANDING AND CONCEPTUAL DESIGN

The TrueGuard facility is situated on approximately 12 acres of industrial property that is located approximately one-eighth of a mile south of the Lewis and Clark Highway in the Camas/Washougal Industrial Park adjacent to the Steigerwald Lake National Wildlife Refuge. Pressure-treated wood has been manufactured at the property since approximately 1984. 8.76 acres of the facility property was purchased by TrueGuard LLC on October 12, 2007. Groundwater sampling has shown elevated levels of arsenic in shallow groundwater samples collected from monitoring well MW-3. This monitoring well is located near the wood treating retorts near the suspected arsenic source (**Figure** 4). Based on the detected arsenic concentrations, two 4-inch extraction wells, MW-9 and MW-10, were installed near monitoring wells MW-3 and MW-8. The extraction wells were installed to approximately 15 feet bgs, using a hollow-stem auger drilling rig with 6.25-inch inside diameter (10.25-inch outside diameter).

Figure 4: Monitoring well Source area Locations



Source Area Location

There are three primary hydrogeologic units beneath the property: a shallow aquifer, an upper confining unit, and a deep aquifer. Geology within the shallow aquifer consists of dark yellowish-brown to dark grey, poorly-sorted, fine- to medium-grained sands, and the unit contains a saturated and unsaturated zone. This unit extends from the ground surface to a thickness of approximately 9 to 12 feet below ground surface (bgs). Geology within the upper confining layer consists of a relatively impermeable silt layer derived from a marsh that was present at the property before it was filled with dredge sands. This layer consists of dark greenish-grey to black, well-sorted silt and clay, with some sand. This unit overlies and hydraulically confines the deep aquifer.

CONCEPTUAL REMEDIAL DESIGN

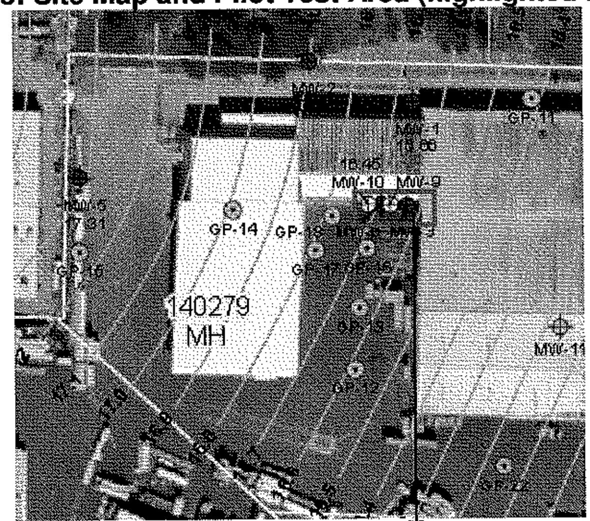
Adventus recommends an *in situ* remedial strategy consisting of injection EHC-M into the saturated zone, will be implemented at the property to reduce the source of Arsenic in shallow groundwater. The proposed technologies that have been used to treat heavy-metals contamination in groundwater at wood-treating sites are expected to reduce the dissolved-metals concentrations to below the applicable cleanup levels or background concentrations

The following assumptions have been made to design EHC-M requirement for both pilot and full scale treatment

Assumptions

- Soil Bulk Density = 110 lb /ft^3
- Porosity = 30%
- Since there is no data available on Dissolved oxygen concentrations (DO) and redox potential (ORP) at the area of concern, the application rates have been chosen assuming a DO of around 2 mg/L and ORP close to 100 mV.
- As impacts are limited to the upper confining layer which extends from 5 to 20 ft bgs
- Depth to groundwater is 5 to 8 ft bgs

Figure 5: Site Map and Pilot Test Area (highlighted in green)



FIELD PILOT TEST

In order to validate the *in situ* construction method (direct injection) and the ability of EHC-M to immobilize As at the Site a field-scale pilot-scale test will be implemented near the source area (**Figure 5).** The pilot test will measure approximately 25 ft wide x 25 ft loing x 15 ft deep (from 5 to 20 ft). The EHC-M will be injected in this area at an application rate of 0.5% by weight of soil targeted in the saturated zone in order to sustain ISCR conditions. EHC-M will be directly delivered into the subsurface using a direct push technology. **Table 1** shows the amount of EHC-M required for the pilot test and other relevant information. We will inject EHC on a grid of injection points spaced 10 ft on center to cover the impacted area. The EHC-M will be provided as a dry powder in 50 lb bags, and it will be mixed with water on site prior to injection.

Table 1: Injection Details for Pilot Test

	Value	Unit
Treatment Area Dimensions:		
Length of treatment zone	25	ft
Width of treatment zone	25	ft
Depth to top of treatment zone	0	ft
Depth to bottom of treatment zone	15	ft
Treatment zone thickness	15	ft
Treatment zone volume	9,375	ft3
Mass of soil in treatment zone	516	U.S. tons
Volume pore space	3,142	ft3
EHC mass calculations:		
Percentage EHC by soil mass	0.50%	

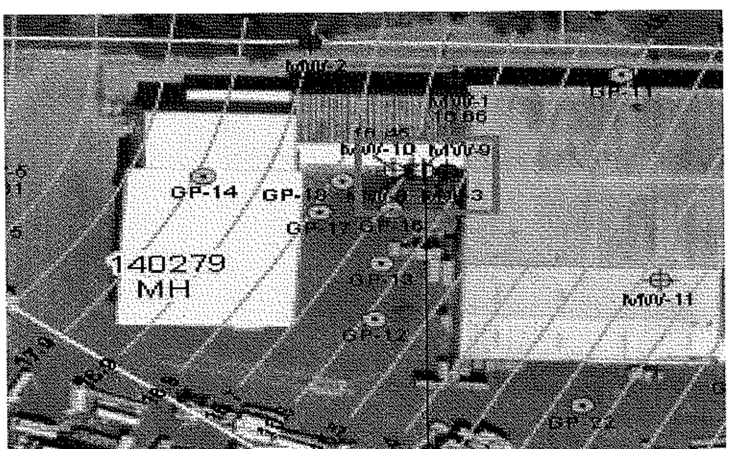
Mass of EHC required	5,156	lbs
Preparation of EHC Slurry:		
Percent solids in slurry (can be altered)	29%	
Volume water required	1,548	U.S. gallons
Slurry volume to inject	1,881	U.S. gallons
Injection details:		
Injection spacing	10	ft
Number of injection points	9	points
Mass EHC per point	573	lbs
Water volume per point	172	U.S. gallons
Slurry volume per point	209	U.S. gallons
Application rates for reference:		
Slurry volume to pore space volume	8.0%	
EHC concentration in groundwater	1.6	lbs/ft3

The efficacy of the pilot tests would be known within 3 to 6 months after EHC-M injections. Once the results are validated proving the effectiveness of the material at the targeted area, full scale treatment concentrated around the source area can be conducted as described below.

FULL SCALE TREATMENT – SOURCE AREA TREATMENT

Using information learned from the field pilot test, EHC-M will be injected in the source area (**Figure 6**) where arsenic concentrations in groundwater range from 0.6-7 mg/L. **Table 2** shows the amount of EHC-M required for treating the entire source area, along with other relevant information. For full scale implementation, we assumed an average EHC-M loading rate of 0.4% and grid of injection points spaced 12 ft apart to cover the impacted area.

Figure 6: Full Scale Treatment (highlighted in blue)



Full-Scale Treatment

Table 2: Full-Scale Injection Details

	Value	Unit
Treatment Area Dimensions:		
Length of treatment zone	50	ft
Width of treatment zone	50	ft
Depth to top of treatment zone	0	ft
Depth to bottom of treatment zone	15	ft
Treatment zone thickness	15	ft
Treatment zone volume	37,500	ft3
Mass of soil in treatment zone	2,063	U.S. tons
Volume pore space	12,566	ft3
EHC mass calculations:		
Percentage EHC by soil mass	0.40%	
Mass of EHC required	16,500	lbs
Preparation of EHC Slurry:		
Percent solids in slurry (can be altered)	29%	
Volume water required	4,953	U.S. gallons
Slurry volume to inject	6,018	U.S. gallons
Injection details:		
Injection spacing	12	ft
Number of injection points	16	points
Mass EHC per point	1031	lbs
Water volume per point	310	U.S. gallons
Slurry volume per point	376	U.S. gallons
Application rates for reference:		
Slurry volume to pore space volume	6.4%	
EHC concentration in groundwater	1.3	lbs/ft3

FULL SCALE TREATMENT – PERMEABLE REACTIVE BARRIER (PRB) OPTION

As an alternative to source area treatment, PRBs can be strategically located on Site. As the groundwater flows through the PRB, dissolved As will be precipitated within the reactive zone. Upon request, Adventus will prepare a conceptual design for this option

FIELD-SCALE DISTRIBUTION OF RESPONSIBILITIES

Adventus provides environmental biotechnology and design support. It is our intention and understanding that MFA will be responsible for remedial construction and EHC application. The distribution of responsibilities envisioned is as follows:

1. Upon request, Adventus will provide technical writing and remedial design support to MFA in preparation of the Remedial Action Plan and in procuring Agency approvals of the proposed remedial effort.
2. Adventus will provide and arrange delivery of all required EHC products to the Site.

3. MFA will be responsible for remedial contractors.
4. Upon request, Adventus personnel will be on site during the 15 days of the injection events to support MFA's field staff.
5. Adventus will provide result interpretation and technical reporting to MFA, as required.
6. Adventus will provide technical support to MFA, as required.
7. MFA will provide manpower for receiving shipments, transport on site, monitoring treatment performance and collecting samples.
8. MFA will maintain overall responsibility and control of the Site and serve as the Project Manager.
9. MFA will be responsible for all sampling and analytical costs along with all data management and reporting costs.

Introduction

EHC-M™ is a specially formulated version of our controlled-release, integrated carbon and zero valent iron (ZVI) technology for *in situ* chemical reduction (http://www.adventus.us/ehc.htm). EHC-M encourages the precipitation and adsorption of dissolved metals such as chromium, lead, arsenic, zinc and mercury, to limit their movement downstream of a treatment zone.

Removal Mechanism

Trace metals constitute a significant class of groundwater contaminants originating from mining effluents, industrial wastewater, landfill leachate, agricultural wastes and fertilizers, and fossil fuels (*1*). Based on the chemical properties of dissolved species, trace metals can be divided into two distinctive groups: reducible metals and metalloids, which are present in natural waters as anions and oxyanions (e.g.; Cr, As, Se, Mo, U), and metal cations, which occur in aqueous environment as divalent cations (e.g.; Cu, Zn, Cd, Pb, Hg, Ni). Depending on their aqueous form (Appendix 1), the mobility of trace metals in groundwater is affected by various chemical reactions, including dissolution-precipitation, oxidation-reduction, adsorption-desorption and complexation (*2*). Several different remediation technologies based on those reactions have been implemented for subsurface metal immobilization (e.g.; reactive zones containing zero valent iron (ZVI), organic carbon substrates, zeolite, limestone) (*3*).

EHC-M™ is a specially formulated integrated treatment material containing controlled-release organic carbon, ZVI, a source of sulfate, and other additives designed for treatment of dissolved trace metals. The two main reactive components of EHC-M, ZVI and organic carbon substrate, are well-established reactive materials used for in-situ reductive immobilization of different types of metals in groundwater. The treatment mechanisms using these materials are well understood (*4,5,6,8,10*). ZVI permeable reactive barriers (PRBs) have been applied for treatment of reducible metals (i.e.; Cr, As, U, Se, Mo) via reductive precipitation on ZVI surfaces and with iron oxyhydroxides that form on the ZVI surfaces. For example, the reaction sequence for Cr(VI) can be described as (*4*):

$$CrO_4^{2-}{}_{(aq)} + Fe^\circ + 8H^+_{(aq)} \rightarrow Fe^{3+} + Cr^{3+}_{(aq)} + 4H_2O$$

$$(x)Cr^{3+}_{(aq)} + (1\text{-}x)Fe^{3+}_{(aq)} + 2H_2O \rightarrow Cr_xFe_{(1-x)}OOH_{(s)} + 3H^+_{(aq)}$$

PRBs containing a wide range of solid-phase organic carbon (e.g.; compost, wood chips, saw dust, etc.) have been used for treatment of metal cations (i.e.; Cu, Zn, Hg, Pb, Cd, Ni). These cations precipitate as metal sulfides following microbial mediated reduction of sulfate present in the groundwater. The internal source of sulfate in EHC-M enables metal immobilization in groundwaters depleted in dissolved sulfate. The liable carbon stimulates sulfate-reducing bacteria. This process can be represented by the following reaction sequence (*4*):

$$2CH_2O_{(s)} + SO_4^{2-} + 2H^+_{(aq)} \rightarrow H_2S + 2CO_{2(aq)} + H_2O$$

$$Me^{2+}_{(aq)} + H_2S_{(aq)} \rightarrow MeS_{(s)} + 2H^+_{(aq)}$$

where: CH_2O represents organic carbon and Me^{2+} represents a divalent metal cation.

Another important mechanism of metal cation removal in the presence of corroding ZVI is adsorption onto iron corrosion products, like iron oxides and iron oxy-hydroxides (Appendix 2).

EHC-M™ Treatment Performance

Our long-term column tests with metal contaminated groundwaters have shown that an EHC-M in-situ zone will provide a rapid, persistent and irreversible immobilization of both reducible metals (As and Cr) and metal cations (Zn, Hg, and Pb). Based on these data, the cumulative effect of ZVI and carbon substrate in EHC-M is applicable for a wider range of environmental applications, and tests are ongoing to document EHC-M's ability to remove other trace metal contaminants. Table 1 provides a summary of metal-specific immobilization mechanisms, which may occur in an EHC-M zone, based on the known chemical and microbial processes in the presence of ZVI and organic substrates. A summary of observed treatment efficiencies using EHC-M is provided in Table 2. Upon request, we would be pleased to provide summaries of laboratory studies noted above, and the references quoted herein.

Table 1. Metal-specific immobilization mechanisms in groundwater for an EHC-M treatment zone. (Underlined symbols indicate metals immobilized in EHC-M column tests conducted by the Adventus Group).

Metal	Dissolved species	Immobilization Mechanism	Reference
As	As (III, V)	Reductive precipitation with oxidized iron minerals. Precipitation as As sulfide and mixed Fe-As sulfide.	*4,6,7*
Cr	Cr(VI)	Reduction to Cr(III) and precipitation with oxidized iron minerals and adsorption to iron oxides.	*4,8*
Mo, Se, U	Mo(VI), Se(IV,VI), U(VI)	Reductive precipitation with oxidized iron minerals.	*4*
Cu, **Zn**, **Pb**, Cd, Ni	Me^{2+}	Organic carbon source stimulates heterotrophic microbial sulfate reduction to sulfide. Subsequently, metal cations precipitate as sulfides. Strong adsorption to iron corrosion products (e.g.; iron oxides and oxyhydroxides).	*2,4,5,9,10*
Hg*	Hg^{2+}	If not complexed, indirect reductive precipitation as mercury sulfide. Strong adsorption to iron corrosion products (e.g.; iron oxides and oxyhydroxides).	*2,4,9*

* Mercury is commonly transferred by microorganisms to monomethyl mercury (CH_3Hg) and dimethyl mercury [$(CH_3)_2Hg$)]

Table 2. Summary of observed treatment efficiencies using EHC-M.

Compound	Influent (ppb)	Effluent (ppb)	Removal Efficiency
Arsenic	500	9	98%
Chromium	433	56	87%
Lead	64,000	600	99%
Mercury	1,020	29	97%
Zinc	50,400	3,900	92%

EHC-M Longevity of Performance

EHC-M has been shown to rapidly reduce the concentration of dissolved arsenic in groundwater from >1,000 to <10 ug/L. Under continuous-flow laboratory conditions, removal efficiencies exceeding 98% were achieved.

After a period of loading the column with arsenic, a series of influent groundwater conditions were introduced into the column to demonstrate the ability of EHC-M to retain the arsenic despite conditions that could in theory reverse the process.

Arsenic removal using EHC-M technology has been shown to be non-reversible by change in Eh or pH as shown in **Figure 1**. EHC-M is designed to create very low redox (Eh) conditions and neutral pH. Once stabilized, arsenic was not significantly liberated upon exposure to the following groundwater conditions:

- Aerated influent
- pH 4 influent
- Aerated and pH 4 influent
- Aerated and pH 9 influent

Less than 3% of the mass of arsenic that was removed from the water by the EHC-M column was released during all the subsequent phases of the study combined (**Figure 2**). These data illustrate that EHC-M is capable of creating and maintaining reducing conditions effective for the removal of arsenic from the water phase, despite these significant disruptions.

The total length of the study is 950 days, or 2.6 years, and counting. Given that the test is being operated at approximately 70 ^{o}F, which would reduce the longevity of EHC-M in comparison to cooler groundwater temperatures, the arsenic remains retained in the column. This demonstrates the high longevity of EHC-M.

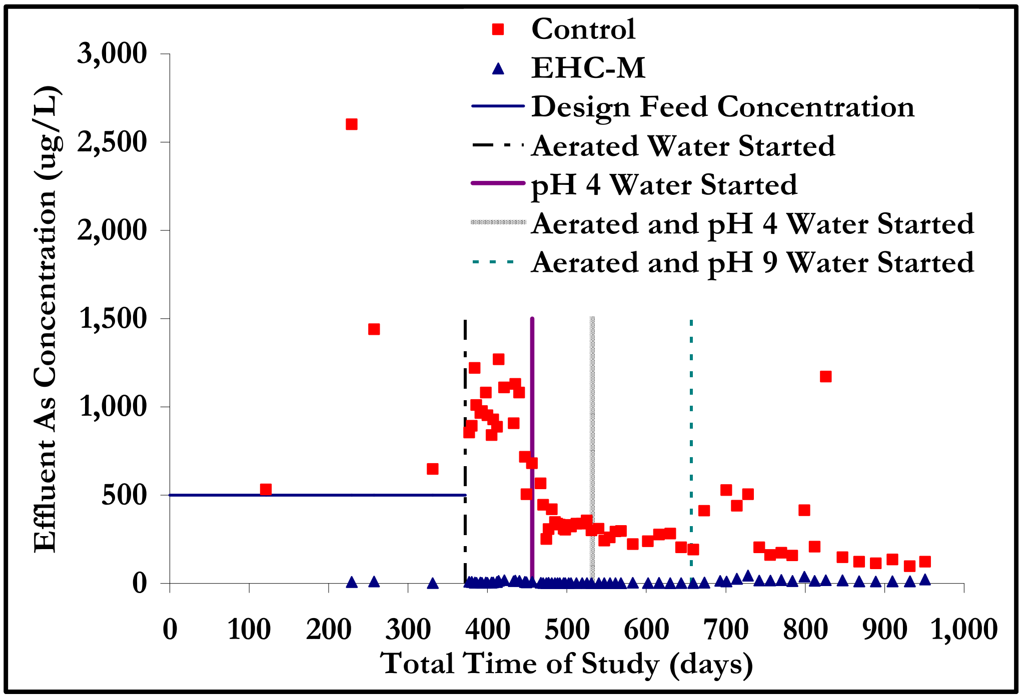


Figure 1. Influence of EHC-M and control on arsenic concentrations in groundwater in flow-through column study.

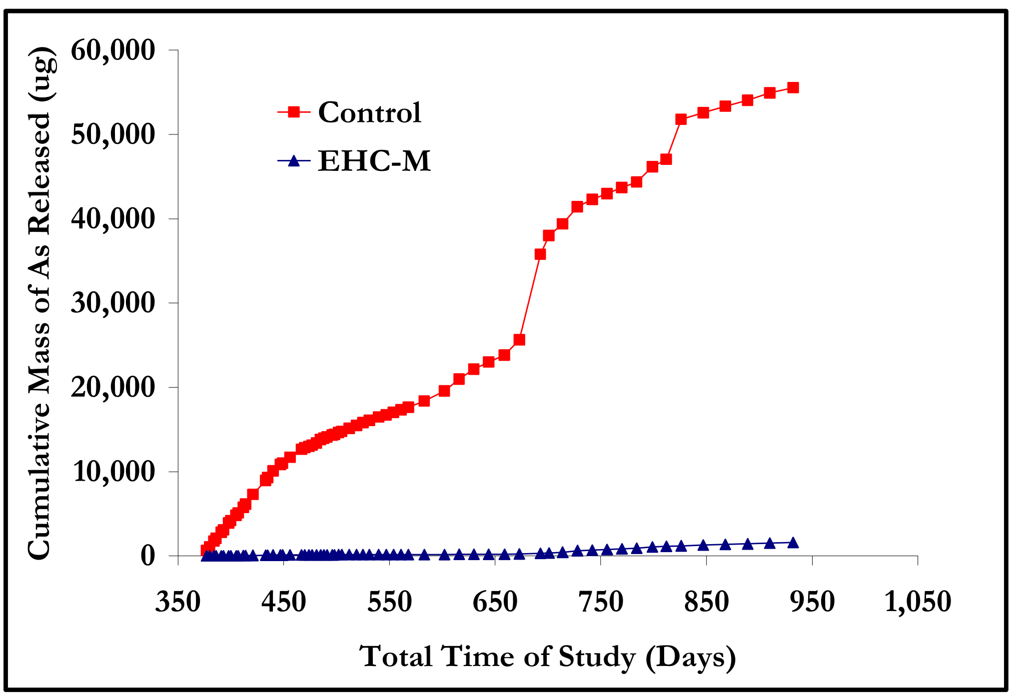


Figure 2. Cumulative mass of arsenic released from control and EHC-M columns in flow-through column study.

Cost

At $2/lb, EHC-M offers a very cost efficient means of in situ stabilization of dissolved metals. Volume discounts apply.

Installation

EHC-M can be used for plume cut-off, plume treatment, or source zone reduction. Installation methods include direct injection, hydraulic fracturing, pneumatic fracturing, soil mixing, and direct emplacement in trenches and excavations. For injection applications, the EHC-M is provided in 50-lb bags as a dry powder and mixed with water on site into a slurry. EHC-M has also been applied on top of sediments in combination with Bauxsol for removal of arsenic from surface water.

The technology has been implemented at numerous sites across the United States and Canada.

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Appendix 1. Aqueous Forms of Metals under Varying pH and Oxidation Reduction Potentials.

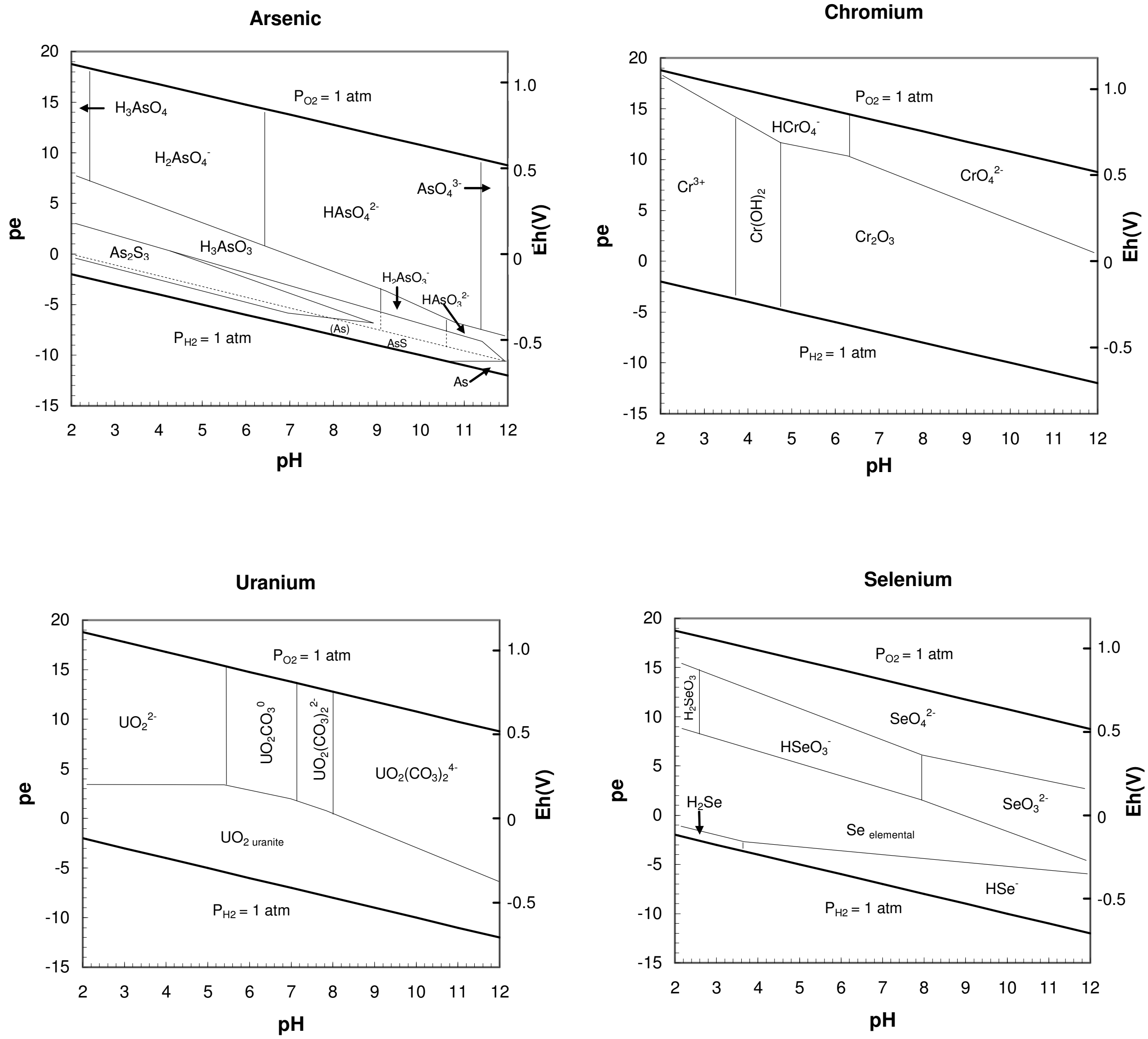


Figure 1a. Simplified pe-pH diagrams for common metals which occur in subsurface as anions and oxyanions. (Data from Ref. 2). Me-O-H_2O systems with a metal (Me) activity of 10^{-6}, at 25℃ and one atmosphere. For arsenic, total acitvity of sulfur species = 10^{-2}, light lines are boundaries for dissolved species only, dashed line is field of elemental arsenic in the absence of sulfur. For uranium, $P_{CO2} = 10^{-2}$ atm.

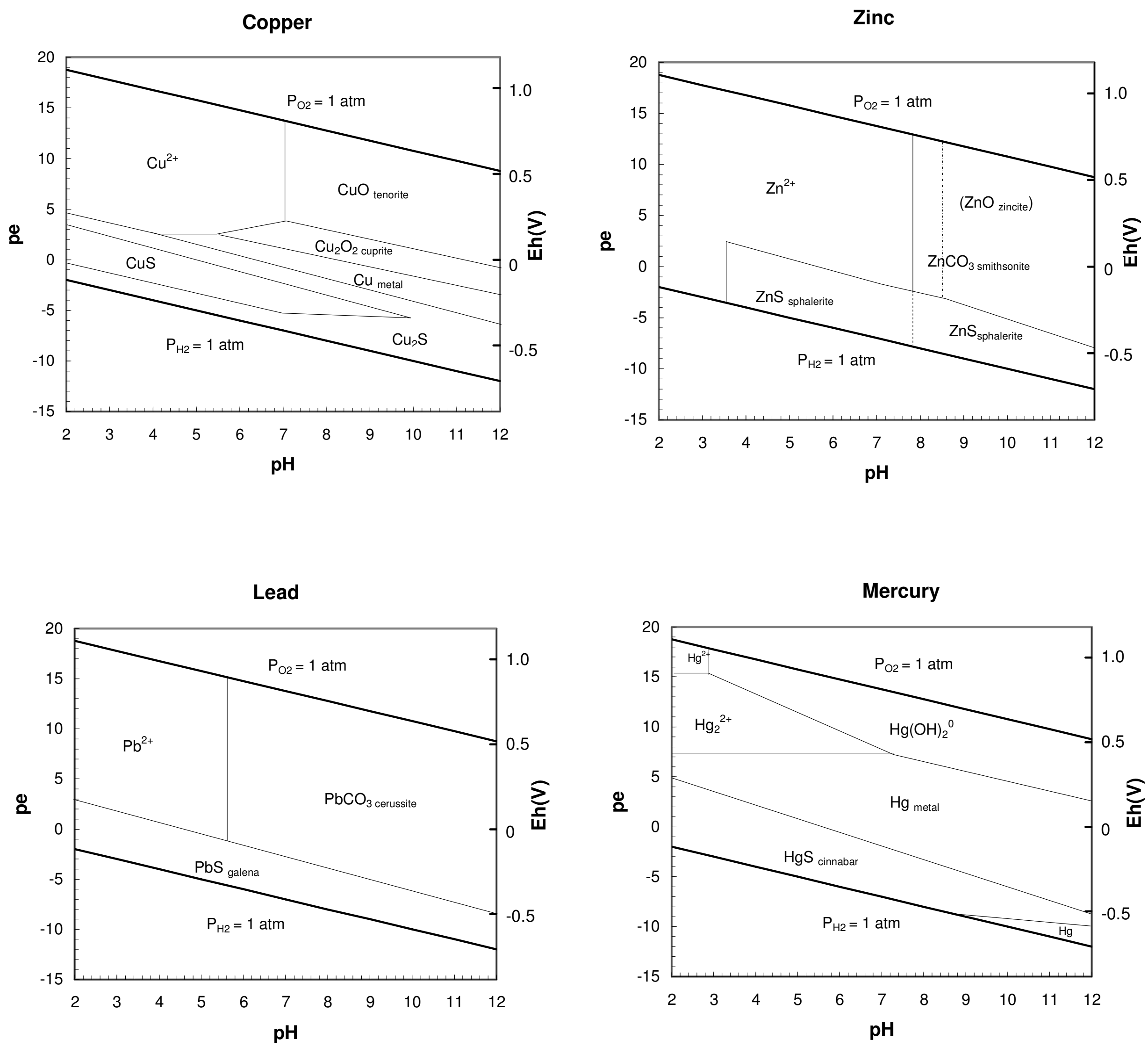


Figure 1b. Simplified pe-pH diagrams for common metals which occur in subsurface as divalent cations. (Data from Ref. 2). Me-S-O-H_2O systems with a metal (Me) activity of 10^{-6}, at 25°C and one atmosphere. Total acitvity of sulfur species = 10^{-2}. For zinc and lead, $P_{CO2} = 10^{-2}$ atm. Solid lines are solubilities in the presence of S species, and dashed lines are solubilities of carbonates in the absence of sulfur.

Appendix 2. Adsorption of Metals on Hydrous Ferric Oxide as a Function of pH.

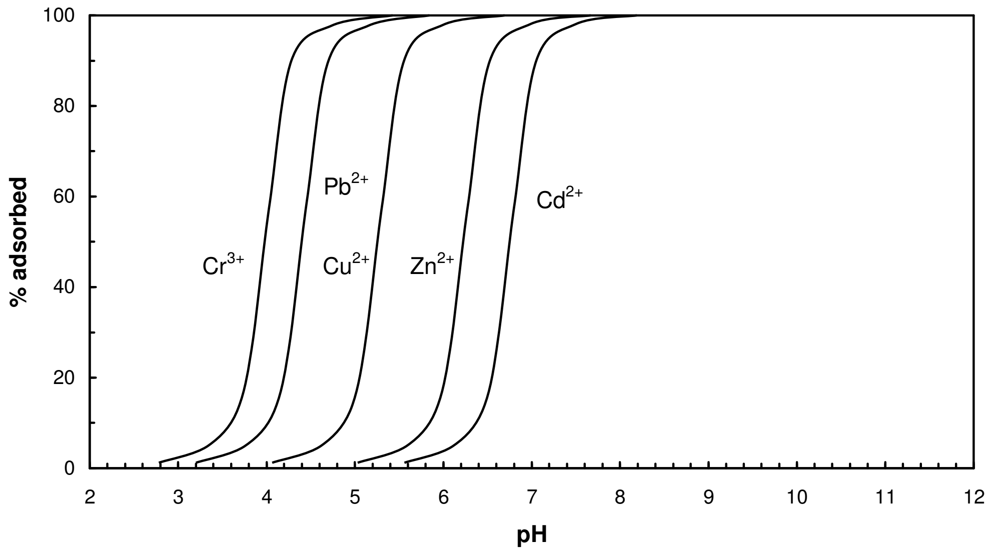


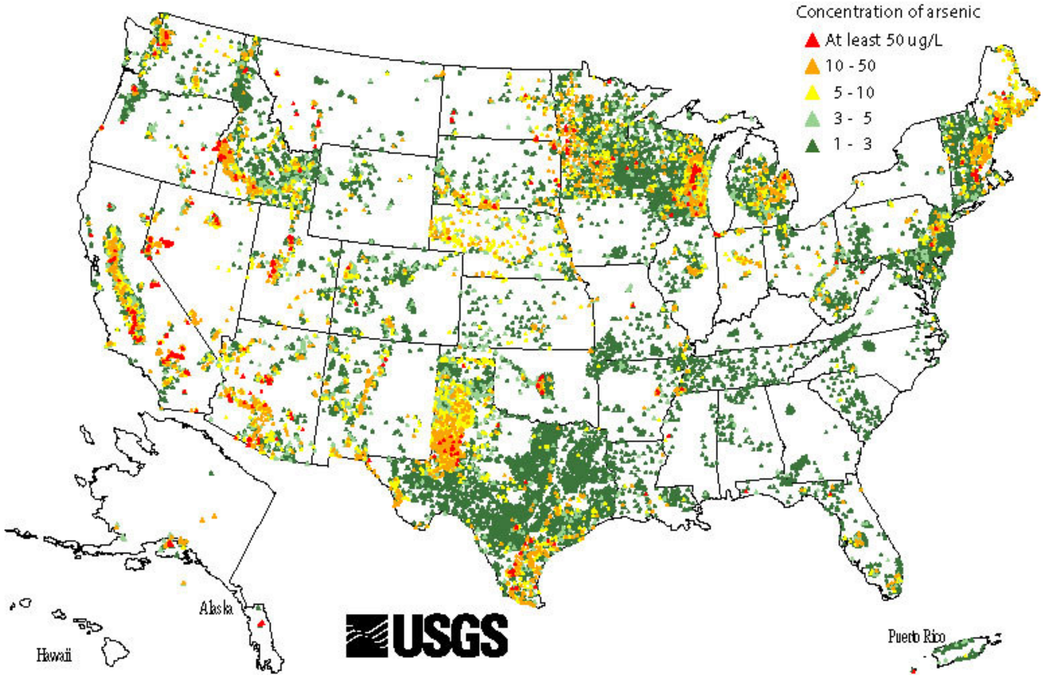
Figure 2. Adsorption of Cr^{3+}, Cu^{2+}, Cd^{2+}, Zn^{2+}, and Pb^{2+} on hydrous ferric oxide as a function of pH. Each metal shows adsorption "edge"; at pH values below the edge, the ion is not adsorbed. At pH values above the edge, the ion is strongly adsobred. High ratios of hydrouds ferric oxide to adsorbing ion and an ionic strength of 0.1 M were assumed. (Data from Ref. *9).*

Introduction

EHC-M™ is a specially formulated version of our controlled-release, integrated carbon and zero valent iron (ZVI) technology for *in situ* chemical reduction (http://www.adventus.us/ehc.htm). EHC-M encourages the precipitation and adsorption of arsenic and other dissolved metals (such as chromium, lead and mercury) to limit their movement downstream of a treatment zone. It can be applied to the subsurface environment in a number of ways to quickly reduce the concentration of arsenic in groundwater in a safe and timely manner.

The problem with Arsenic

Arsenic in ground water is largely the result of minerals dissolving from weathered rocks and soils (http://water.usgs.gov/nawqa/trace/arsenic). As summarized below, arsenic is naturally occurring in the environment and is present in groundwater at concentrations ranging from 1 to >50 micrograms per liter (ug/L).

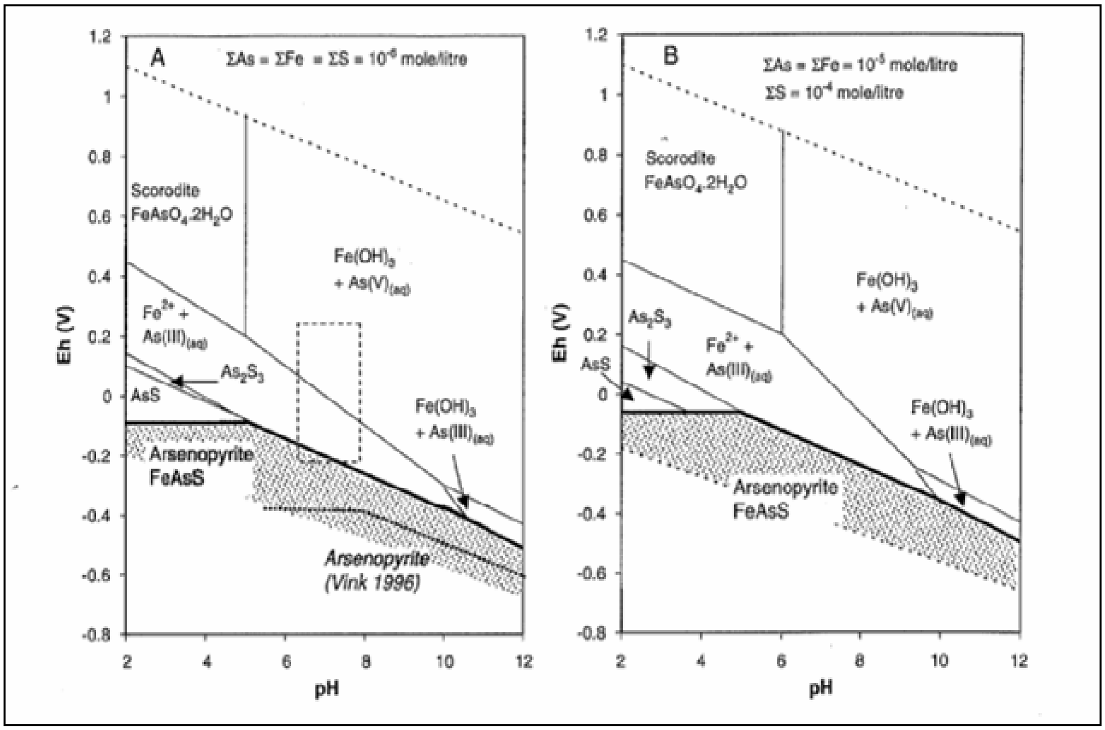


However, several types of cancer have been linked to arsenic in water. Therefore, in 2001 the US Environmental Protection Agency lowered the maximum level of arsenic permitted in drinking water from 50 to 10 ug/L. A number of sites exceed this value do to a combination of natural and/or anthropogenic arsenic sources. In turn, an effective, cost-efficient *in situ* remedial solution is required.

EHC-M^{TM} for Removal of Arsenic in Groundwater

The primary mechanism of removal entails physical precipitation of arsenic with iron and other inorganic compounds, especially those associated with the reduction of sulfate to form arsenopyrite (EPA, 2000; Craw *et al* 2003 as shown below). Given that the removal mechanisms are precipitation and adsorption, the arsenic is transferred from the aqueous phase to a solid phase.

Figure 1: Eh-pH diagram for the As-Fe-O-S system showing the stability field of arsenopyrite (Craw et al 2003).



EHC-M^{TM} Treatment Performance

EHC-M has been shown to rapidly reduce the concentration of dissolved arsenic in groundwater from >1,000 to <10 ug/L. Under continuous-flow laboratory conditions, removal efficiencies exceeding 98% have been maintained for over a year.

Arsenic removal using EHC-M technology is **NON REVERSIBLE** by change in Eh or pH (**Figure 2**) hence **rebound should not be observed**. EHC-M is designed to create very low redox (Eh) conditions and neutral pH. Once stabilized, arsenic is not liberated upon exposure to oxygenated water. This supports the premise that arsenopyrite is the primary precipitation product (Craw et. al., 2003). Likewise, acidification to pH 4 did not increase the concentration of arsenic in groundwater nor did exposure to simultaneous aerated and acidic water or simultaneous aerated and basic water.

Only 4% of the mass of arsenic that was eluted from the control column was eluted by the EHC-M column during the second (aerated), third (acidified pH 4), fourth (simultaneous aeration and acidification), and fifth (simultaneous aeration and basic pH 9) phases of the study. These data illustrate that EHC-M is capable of creating and maintaining reducing conditions effective for the removal of arsenic from the water phase, despite significant change in physiochemical conditions that in theory could reverse the stabilized condition (**Figure 3**). The high longevity of this process is demonstrated by the fact that the column has been operating for more than **three years** at room temperature. It is expected that EHC-M's longevity under field conditions will be longer than that in the laboratory due to lower average temperatures.

Figure 2: Influence of EHC-M and control on arsenic concentrations in groundwater in flow-through column study.

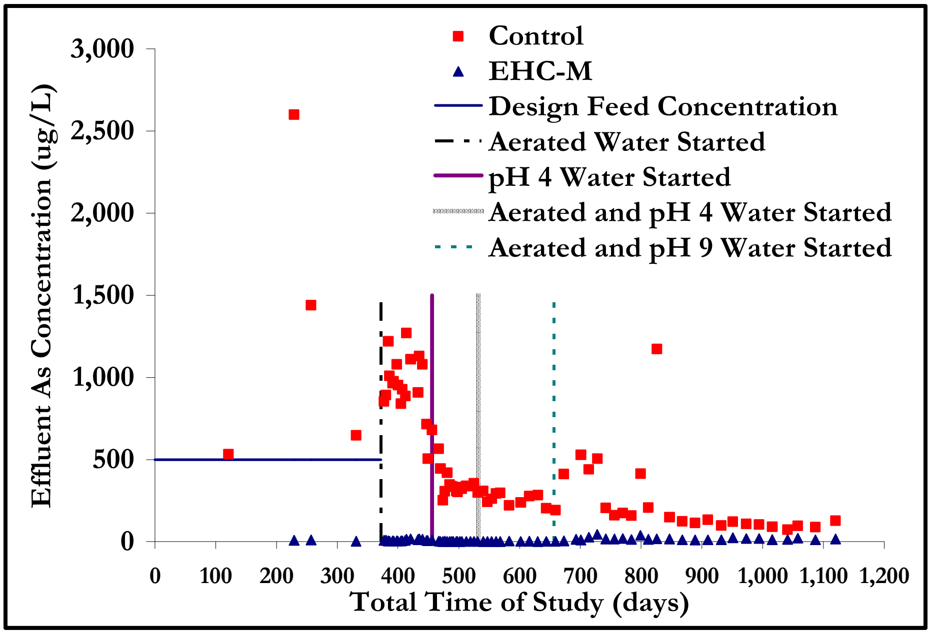
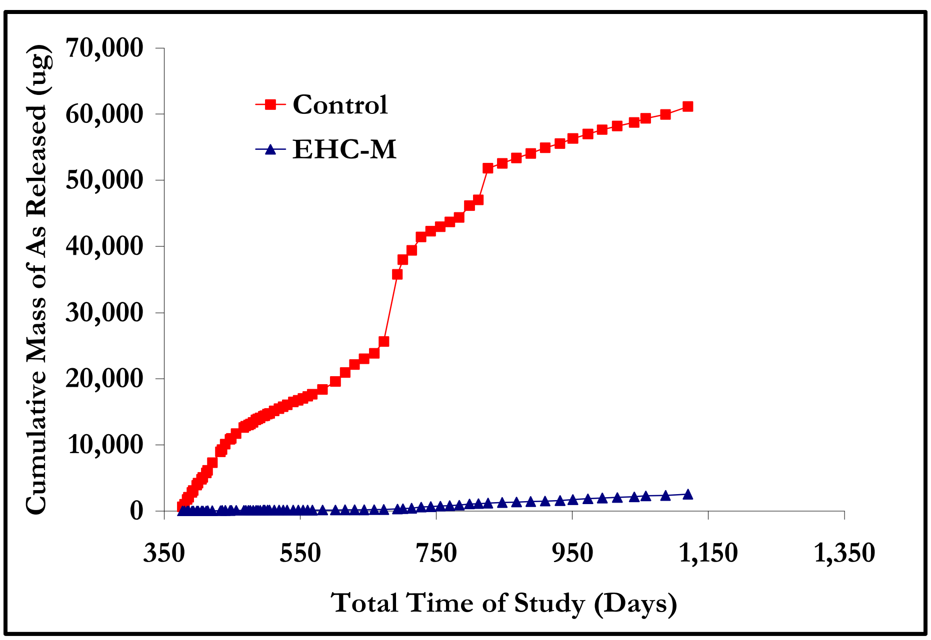


Figure 3: Cumulative mass of arsenic released from control and EHC-M columns in flow-through column study.



The Cost

At $2/lb, EHC-M offers a very cost efficient means of in situ stabilization of dissolved arsenic. Field application methods consist of various injection methods for plume cut-off, plume treatment, and source-zone reduction, or trench-type applications for plume cut-off.

Installation

The EHC-M is provided in 50-lb bags as a dry powder and mixed with water on site into a slurry. The EHC-M slurry can be injected into the subsurface in a variety of ways including direct injection and hydraulic fracturing or through direct soil mixing. EHC-M has also been applied on top of sediments in combination with Bauxsol for removal of Arsenic from surface water.

References

Craw D., Falconer D., and Youngson J.H. 2003. Environmental arsenopyrite stability and dissolution: theory, experiment, and field observations. Chemical Geology (199) p. 71-82.

EPA (United States Environmental Protection Agency). 2000. Technologies and Costs for Removal of Arsenic from Drinking Water. EPA 815-R-00-028. December 2000.

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TEST REPORT #2 HB HOLEBLOK+™ GROUT CHEMICAL REACTIVITY WITH GROUNDWATER IN MONITORING WELL

Technology Overview

AquaBlok® is a patented, composite-aggregate technology resembling small stones and typically comprised of a dense aggregate core, clay or clay sized materials, and polymers (Figure 1). For typical formulations, AquaBlok's clay (sealant) component consists largely of bentonite clay. However, other clay minerals can be incorporated to meet specific needs. Other technology parameters (particle size, relative clay content, etc.) can also be modified, as appropriate.

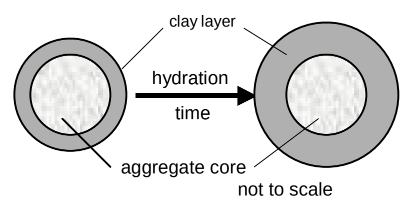


Figure 1. Configuration of Typical AquaBlok Particle.

AquaBlok particles expand when hydrated, with the degree of net vertical expansion determined largely by the formulation, application thickness, and the hardness and salinity of the hydrating water. When a mass of particles is hydrated, the mass coalesces into a continuous body of material. Once developed, the hydrated AquaBlok can act as an effective physical, hydraulic, and chemical barrier by virtue of its relatively cohesive and homogeneous character, and low permeability to water.

Problem Statement

In construction of an environmental monitoring well, a low-permeability, hydraulic seal is required to minimize the potential for vertical transfer of contaminated ground water or oil along the well's annular space. Often standard bentonite grout materials will absorb low levels of contaminants, only to release these constituents later. This can result in false positive readings causing significant added expense and time to monitoring programs. In addition, creating and maintaining a positive seal above the sand/screen interval is important to prevent transfer of contaminants such that pollutant migration does not contaminate adjacent aquifers.

Approach

Current practice for creating a hydraulic seal above a well's screened interval generally involves installation of a low-permeability grout material directly over a well screen sand pack or other granular material previously placed into the well's annular space, adjacent to the well screen (Figure 2). The seal is typically created by pouring an adequate quantity of pure, dry bentonite pellets or chips down the annular space and across the surface of the granular component.

Water present in the formation hydrates the pellets, thus affecting material expansion and sealing of the annular space. Finally, the bentonite chips or concrete/bentonite grout slurry (typically characterized by a low bearing capacity) is tremie-piped over the top of the semi-solid cap. Well construction is then typically completed through application of a surficial concrete cap.

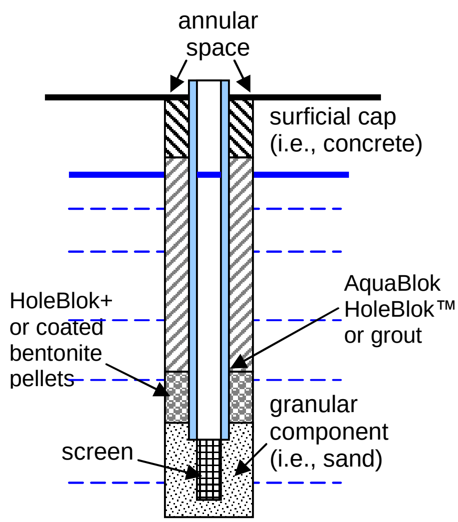


Figure 2. Schematic of common well construction.

Figure 3. Hole Size Application Rates.
D1 = Bore Hole Diameter (Inches)
V1 = Entire Bore Hole Volume (Cu.Ft.)
LF1 = Linear Feet per 50# of HoleBlok
D2 = Well Casing Diameter (Inches)
V2 = Annular Space Volume (Cu.Ft.)
LF2 = Linear Feet per 50# of HoleBlok

D_1	V_1	LF_1	D_2	V_2	LF_2
24	3.142	0.20	16	1.745	0.36
			12	2.356	0.27
18	1.767	0.35	8	1.418	0.44
			6	1.571	0.40
16	1.396	0.45	8	1.047	0.60
			6	1.200	0.52
			4	1.309	0.48
14	1.069	0.58	8	0.720	0.87
			6	0.873	0.72
			4	0.982	0.64
12	0.785	0.80	6	0.589	1.06
			4	0.698	0.90
10	0.545	1.15	4	0.458	1.36
			2	0.524	1.19
8	0.349	1.79	2	0.327	1.91
7	0.267	2.34	2	0.245	2.55
6	0.196	3.18	2	0.175	3.58
			1	0.191	3.27
4	0.087	7.16	2	0.065	9.55
			1	0.082	7.64
3	0.049	12.73	1 1/2	0.037	16.98
			1	0.044	14.32
2	0.022	28.65	1 1/2	0.010	65.48
			1	0.016	38.20
			3/4	0.019	33.34
1 3/4	0.017	37.42	1 1/4	0.008	76.39
1 1/2	0.012	50.93	1	0.007	91.67
1 1/4	0.009	73.34	1	0.003	203.72
1	0.005	114.59	3/4	0.002	261.92

Construction of an effective bentonite seal directly over the top of (and contiguous with) the underlying granular unit can be complicated by a phenomenon known as "bridging." Bridging generally involves a "clogging" of bentonite material within upper reaches of the annular space during its application and descent through the annular space, and can result in gaps.

Such a hydraulic gap could create pathways for release or the uncontrolled transfer of contaminated ground waters from one aquifer to another.

In addition, the potential for direct contact between the bentonite seal and contaminated groundwater below creates the need for both a very low hydraulic conductivity barrier and also a material that will not react or re-release contaminants once contact is made.

Why HoleBlok+ Is Better

Two important advantages are provided by the use of AquaBlok's unique HoleBlok+ product. First, the more dense, bentonite-bearing particle has both a greater mass and a delayed hydration time to minimize bridging during descent through the annular space, enabling more effective placement of the reactive bentonite component directly overtop the sand unit – thus resulting in formation of a continuous and effective well seal. The settling velocity of dry AquaBlok particles through a water column within the annular space equals that of coated bentonite pellets and is faster than that of pure chips (see Figure 6, page 2).

Second, the reactive material contained in the HoleBlok+ will both minimize the potential for contaminant rebound within an environmental monitoring well, but also provide some level of pollution prevention as described further below.

Figure 4. AquaBlok HoleBlok™ and HoleBlok+™ grout particles are easy to handle and place. No mixing or special equipment is required.

AquaBlok HoleBlok+ Reactive Sealant for Pollution Prevention

By adding reactive media or catalysts to AquaBlok, such as Zero Valent Iron, hydrated composite particles quickly form subsurface seals around targeted objects such as well casings, piping, or other structures and provide treatment of residual pollution. The reactive nature of the amended sealant is such that organic compounds that partition into the sealant can be destroyed. Inorganic compounds, which tend to migrate along the preferred path of the boreholes or engineered structures, will also be effectively sequestered, thereby minimizing extended or cross-contamination of sub-aqueous environments. AquaBlok HoleBlok+ helps minimize cross contamination of aquifers during site investigation, delineation and remedial actions. In addition, the potential for rebound of contaminants of concern, which may be attributed to the sorptive nature of conventional sealants, can be minimized (PATENTS PENDING).

Impact/Reactivity of HoleBlok+ with Groundwater

Independent lab tests were performed to access potential impact on groundwater chemistry from the use of HoleBlok+ or standard HoleBlok products. Leachability in a simulated well/annular environment was tested. Comparison was made to control, where no sealant was used. This study provides additional data beyond prior tests which were performed to compare AquaBlok to other currently commercially available well sealant products.

The below table presents a selected, partial summary of key analytical results:

Indicator, Major Ions, Metals	Drinking Water Stds	Control	Bentonite	HP+
Specific Conductance	--	2160	2480	2430
pH	6.5-8.5	7.28	7.22	7.29
Calcium	--	328000	315000	330000
Chloride	250	74	80	72
Iron	300	4910	1380	3750
Potassium	--	3810	7230	6720
Magnesium	--	147000	135000	145000
Sodium	--	57200	153000	113000
Sulfate	250	1240	1320	1280
Arsenic	10	<3.0	<3.0	<3.0
Copper	1300	<5.0	<5.0	<5.0
Lead	15	<1.0	1.54	1.7

HoleBlok+ did not materially affect analytical groundwater data. Also, previous studies indicate that non-reactive HoleBlok is an effective alternative to traditional annular sealant, which compares favorably from a chemical perspective. This additional data now indicates that HoleBlok+ performs as well as non-reactive HoleBlok and may offer additional protective measures to further assure the accuracy of ground water samples by minimizing the potential impact of organic pollutant rebound issues.

Permeability

Representative samples of freshwater AquaBlok (4060 FW) were used to determine saturated hydraulic conductivity in general conformance with ASTM Method D 5084.

AquaBlok HoleBlok Formulation	Hydraulic Conductivity Values (cm/sec)
4060 FW	3.94×10^{-9}

Settling Characteristics

To obtain a comparison of the rate of descent of AquaBlok to alternative products, two formulas of AquaBlok were used: a 4060 No. 9 AquaBlok HoleBlok, having an average particle size of ~1/4"; and a 4060 uniform No. 8 AquaBlok HoleBlok, having an average particle size of ~3/8". The two formulations of AquaBlok were compared to bentonite chips, 1/4" coated tablets, and 3/8" coated tablets. To perform the comparison, an 8.5'x11"x11" acrylic testing apparatus was used. The 8.5- foot column was filled to six-inches from the top of the column to obtain an eight-foot water column. A dropping apparatus was then utilized to consistently drop approximately 200 cm^3 of each product. The rate of descent was timed from the moment of opening the dropping apparatus until the majority of the product had reached the floor of the testing column. A total of ten repetitions were completed for each product. As shown on Figure 5, the average drop rates for the AquaBlok HoleBlok grout particles are equivalent to the coated bentonite pellets.

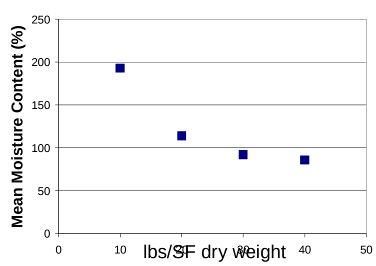
Figure 5. Comparative Drop Test Results.

TEST #	Bentonite Chips	1/4" Coated Bentonite Pellets	AquaBlok 4060 No.9's	3/8" Coated Bentonite Pellets	AquaBlok 4060 No. 8's
	Time (sec)	Time (sec)	Time (sec)	Time (sec)	Time (sec)
AVG	*11.46*	*10.44*	*10.46*	*8.22*	*8.31*

Additional Application Data

The following additional data is provided for better understanding of the physical and application characteristics of HoleBlok and HoleBlok+ products.

Figure 6. Mean Moisture Content



For more information, call AquaBlok, Ltd. at (800) 688-2649, fax us at (419) 385-2990, or email us at services@aquablokinfo.com.

The test reports are also available on our web site at: www.aquablokinfo.com.

Last Revised 12/19/07.

Figure 7. Mean Moisture Content

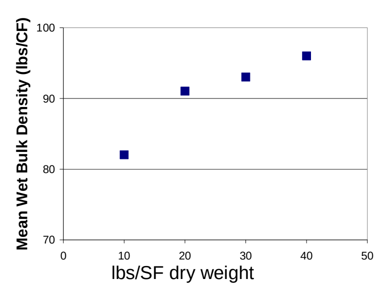


Figure 8. Typical Dry Bulk Density for AquaBlok HoleBlok+

Product Formulation	Aggregate Core	Dry Bulk Density, Typical Range (lbs/ft^3) 75 80 85
4060 FW	No. 8	

AquaBlok®

Composite Particle System

MAUL FOSTER ALONGI
3121 SW Moody Avenue, Suite 200 | Portland, OR 97239 | 971 544 2139 | www.maulfoster.com

October 2, 2009
Project No. 9009.01.12

Tom Middleton, LHG
Washington State Department of Ecology
SWRO Toxics Cleanup Program
PO Box 47775
Olympia, Washington 98504-7775

Re: TrueGuard, LLC—Washougal Facility SW0916, Voluntary Cleanup Program Status Report and Confirmation of Background Concentration for Arsenic in Groundwater

Dear Mr. Middleton:

On behalf of TrueGuard, LLC (TrueGuard), Maul Foster & Alongi, Inc. (MFA) is submitting this status update for site characterization and bench test work for the TrueGuard facility at 725 South 32nd Street, Washougal, Washington. This status update covers the period from May 13, 2009 (i.e., from the time of the previous status report [MFA, 2009]) to the present.

SITE CHARACTERIZATION

Groundwater and soil samples were collected in July and September 2007, using direct-push technologies (i.e., Geoprobe™). These data were summarized for the Washington State Department of Ecology (Ecology) in the January 2008 groundwater remediation plan pilot test (pilot test work plan) (MFA, 2008a). Groundwater samples were collected from selected monitoring wells in November and December 2007 and February 2008 to augment the baseline data set for use in the pilot test. These results were summarized in the November 2008 status report to Ecology (MFA, 2008c).

TrueGuard conducted limited soil sampling in and adjacent to the source area during previous pilot-scale activities in April 2008. Soil samples were analyzed for metals and arsenic speciation, as proposed in MFA's April 1, 2008, letter to Ecology (MFA, 2008b).

PREVIOUS PILOT TEST

In April 2008, approximately 5,250 pounds of Adventus EHC-M™ was injected into the uppermost aquifer at ten locations in two separate areas of the site. Ecology had approved this pilot test (Ecology, 2008), which was intended to assess the applicability of in situ stabilization (via chemical reduction) of dissolved arsenic concentrations in the uppermost aquifer. The test was implemented consistent with the pilot test work plan (MFA, 2008a).

Post-injection groundwater sampling was completed in July and October 2008 and in January and March 2009. The analytical data from the above mentioned events were presented in the May 13, 2009, status report (MFA, 2009).

The data show marginal improvement in arsenic groundwater quality—concentrations of arsenic decreased only slightly. Other water quality indicator parameters showed groundwater conditions amenable to arsenic reduction. Specifically, field measurements of dissolved oxygen and oxidation reduction potential, as well as analytical data for nitrate and sulfate, were trending in favorable directions for the reduction of arsenic. While the field data suggested that arsenic concentrations would be reduced, this outcome was not observed during the post-injection monitoring period.

BENCH TEST

Because the chemical reduction process resulted in marginal improvement in arsenic groundwater quality, TrueGuard elected to perform a bench test, in June and July 2009, of an alternative remediation technology that was previously unavailable. The alternative technology is designed to create an oxidizing environment in which arsenic removal via chemisorption can occur.

The alternative approach utilized an activated red mud (GeoBind™) manufactured by Geochem Remediation, LLC, and a persulfate oxidant (Klozur™) manufactured by FMC, Inc. A detailed approach to the bench test and an overview of arsenic geochemistry were described in a MWH Americas, Inc. (MWH) memorandum attached to the May 13, 2009 status report (MFA, 2009). The bench test included a natural oxidant demand determination and a determination of the GeoBind™ dose requirements sufficient to oxidize arsenic dissolved in groundwater and adsorb it onto the aquifer soils in the solid arsenate form.

TrueGuard used direct-push technologies to collect aquifer soils required for the bench test on May 5, 2009. Drilling was performed by a contractor licensed in the State of Washington. Borings were completed next to the monitoring wells with high concentrations of dissolved arsenic, specifically next to MW-3 (boring GP-29) and MW-11 (boring GP-28). The borings were also located near the April 2008 pilot scale injection locations to obtain aquifer solids that were considered to be anaerobic in nature with reducing conditions created by the Adventus EHC-M™. The bench test required oxidizing (aerobic) conditions favorable to precipitating arsenic. The aquifer solids were collected from the locations most likely to be anaerobic in nature to determine the level of oxidant needed to convert the aquifer from anaerobic to aerobic conditions.

In addition to the two borings described above, TrueGuard elected to install a new monitoring well (MW-16) for the purpose of anticipated pilot scale injection testing of the GeoBind™ and/or Klozur™ reagents as described in the previous status report (MFA, 2009). The location of monitoring well MW-16 is shown on the attached figure. This location may allow for a better orientation of injections to the well with respect to the groundwater flow direction along the axis of the plume. The boring logs (GP-28 and GP-29) and monitoring well log (MW-16) are included as an attachment.

Groundwater samples necessary for the bench test were collected on May 5, 2009, from monitoring wells MW-3 and MW-11 and from upgradient well MW-6. Additionally, quarterly groundwater monitoring was performed on May 4 and 5, 2009, and the results were consistent with prior monitoring events. The average concentration of dissolved arsenic in samples obtained from monitoring wells MW-3 and MW-11 on May 5, 2009 is 1,700 micrograms per liter (µg/L) and is considered representative of baseline conditions for the bench test.

The groundwater data from the May 2009 quarterly monitoring event and the bench test analysis are included in this submittal. Summary tables, field sampling data sheets, laboratory analytical reports, and data validation memoranda are attached. Water levels were measured during the May 2009 event; water level elevations and contours are depicted on the attached MFA figure.

The bench test process and results are summarized in the attached Laboratory-Scale Groundwater Arsenic Remediation Evaluation (MWH, 2009). The bench test data are summarized in this report and Table 6 (attached). These data show significant reductions in dissolved arsenic, relative to baseline conditions. Two sets of results are included in Table 6: results of arsenic stabilization with varying concentrations of GeoBind™, ferrous chloride, and Klozur™; and the results of leachability testing following stabilization. Concentrations of other redox-sensitive metals (e.g., chromium and manganese) are also included.

The data in Table 6 demonstrate that arsenic and manganese reductions in the treated slurry samples are sensitive to both pH and redox conditions created by addition of GeoBind™ and/or Klozur™, with varying effectiveness. Hexavalent chromium was effectively adsorbed independent of pH or redox conditions.

The post-treatment leachability samples demonstrated that regardless of the varying concentrations of GeoBind™, ferrous chloride, and Klozur™, arsenic and hexavalent chromium concentrations were stable. However, manganese was found to be more stable at pH conditions circa pH 6, with increased manganese concentrations at pH 5.

These results suggest that the alternative technology is valid for further evaluation by a field pilot, with the understanding that careful consideration of side effects related to pH management (i.e., increased manganese concentrations) is required and will be incorporated into the field pilot program.

BACKGROUND ARSENIC LEVEL

MFA reviewed documents pertaining to the Philip Services Company (PSC) waste management facility (625 South 32nd Street, Washougal, Washington) located adjacent to TrueGuard. Specifically, MFA evaluated the nature and extent of arsenic at the PSC site. As summarized below, the background arsenic data and related statistical analyses completed by PSC are applicable to the TrueGuard facility.

Numerous groundwater monitoring wells have been installed and soil borings have been advanced on the PSC property. Figure 7 (attached) from a March 2008 draft remedial investigation technical memorandum for the PSC facility presents a site map showing the locations of the wells and borings (Geomatrix Consultants, Inc. [Geomatrix], 2008).

Geomatrix initially calculated a background arsenic concentration of 57.19 μg/L using data from 12 groundwater samples obtained from direct-push borings. Geomatrix concluded that arsenic concentrations from the PSC wells were below the background level derived from the boring data. Ecology rejected this value because Ecology considered monitoring wells, not direct-push borings, suitable for determining background concentrations (Geomatrix, 2008).

In response, Geomatrix calculated background in shallow groundwater based on data from monitoring wells MC-12 and MC-107. The well locations are shown on the attached Figure 7. Geomatrix used 70 data points (2000–2007 data) for total arsenic and a statistical program provided by Ecology to calculate a background concentration of 25.48 μg/L in the shallow aquifer. In its memorandum, Geomatrix inferred that Ecology agreed with its choice of wells to use for background determination (Geomatrix, 2008).

Based on an evaluation of the PSC facility background determination, MFA concurs that the value of 25.48 μg/L is the appropriate background concentration to be used when assessing the effectiveness and applicability of the alternative technology during the bench test and proposed field pilot described below.

PLANNED NEXT STEPS

The following actions are planned:

1. **Confirm Arsenic Background Concentration:** TrueGuard requests that Ecology confirm the applicable background concentration for arsenic in the site vicinity as 25.48 μg/L for the shallow aquifer. Using this background arsenic concentration, the bench test results confirm that the GeoBind™ and Klozur™ approach demonstrated adequate arsenic reductions, and that further analysis is warranted.

2. **Pilot Test:** This status letter serves as TrueGuard's notice to Ecology of its intention to develop a pilot scale injection program. TrueGuard will provide a work plan for

this effort to Ecology prior to initiating the fieldwork. Should the test prove successful in reducing dissolved arsenic levels to near or below background concentrations, TrueGuard anticipates a full-scale remedial action using the GeoBind™ and or Klozur™ approach. Approval from Ecology of the pilot test results and planned full-scale approach will be requested before proceeding with full-scale efforts.

3. **Groundwater Monitoring:** At this point, TrueGuard plans to continue conducting groundwater monitoring on a quarterly basis. However, the monitoring schedule and analyte lists may be adjusted without notification to Ecology to meet the data collection objectives of the pilot test. The next groundwater monitoring event is anticipated to occur at or near the time of the pilot scale injections and will serve as a baseline for pre-injection conditions.

Please contact us at your convenience to discuss the arsenic background concentration issue and the pilot scale program.

Sincerely,

Maul Foster & Alongi, Inc.

State of Washington
2621
Licensed Geologist
Anthony Gomez Silva

Ted Wall

Ted Wall, PE
Director of Engineering

Tony Silva, RG
Project Geologist

Attachments: Limitations
References
Boring and Well Logs
Tables
Figures
Field Sampling Data Sheets
Analytical Reports
Data Validation Memoranda
MWH Memorandum

cc: Steve Krommenacker, TrueGuard, LLC
Cheryl Moore, TrueGuard, LLC

LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

REFERENCES

Ecology. 2008. Letter (re: opinion pursuant to WAC 173-340-515(5) on proposed remedial action for the following hazardous waste site) to A. Wade, TrueGuard LLC, Washougal, Washington, from T. Middleton, Washington State Department of Ecology, Olympia, Washington. February 28.

Geomatrix. 2008. Draft remedial investigation technical memorandum, PSC Washougal facility, Washougal, Washington. Geomatrix Consultants, Inc., Mountlake Terrace, Washington. March 21.

MFA. 2008a. Groundwater remediation plan: pilot test, TrueGuard LLC, Washougal, Washington. Prepared for TrueGuard LLC. Maul Foster & Alongi, Inc., Vancouver, Washington. January 31.

MFA. 2008b. Letter (re: response to Ecology February 28, 2008 opinion pursuant to WAC 173-340-515(5) on proposed remedial action, TrueGuard, LLC) to T. Middleton, Washington State Department of Ecology, Olympia, Washington, from M. Hickey and T. Wall, Maul Foster & Alongi, Inc., Portland, Oregon. April 1.

MFA. 2008c. Letter (re: TrueGuard, LLC—Washougal facility SW0916, Voluntary Cleanup Program status report) to T. Middleton, Washington State Department of Ecology, Olympia, Washington, from T. Silva and T. Wall, Maul Foster & Alongi, Inc., Portland, Oregon. November 25.

MFA. 2009. Letter (re: TrueGuard, LLC—Washougal facility SW0916, Voluntary Cleanup Program status report) to T. Middleton, Washington State Department of Ecology, Olympia, Washington, from T. Silva and T. Wall, Maul Foster & Alongi, Inc., Portland, Oregon. May 13.

MWH. 2009. TrueGuard, LLC, laboratory-scale groundwater arsenic remediation evaluation. Prepared for TrueGuard LLC. MWH Americas, Inc., Portland, Oregon. August 26.

BORING AND WELL LOGS

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number 9009.01.12	Well Number GP-28	Sheet 1 of 1

Project Name	**TrueGuard, LLC**	TOC Elevation (feet)	
Project Location	**725 South 32nd Street, Washougal, Washington 98671-2519**	Surface Elevation (feet)	**21.3**
Start/End Date	**05/05/09 to 05/05/09**	Northing	
Driller/Equipment	**Cascade Drilling, Inc./Geoprobe**	Easting	
Geologist/Engineer	**T. Silva**	Hole Depth	**12.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**4-inch**

Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0–0.5			100%	GP	1				0.0 to 0.5 feet: Concrete.
0.5–2.0									0.5 to 2.0 feet: SAND (SP); light brown; 100% sand, medium; moist.
2.0–7.5									2.0 to 7.5 feet: SAND (SP); gray; 100% sand, medium; micaceous; moist.
4			100%	GP	2				
5	∇								@ 5.0 feet: Wet.
7.5–8.0									7.5 to 8.0 feet: SILT (ML); gray; 100% fines, medium plasticity; organic debris; moist.
8.0–9.5			100%	GP	3				8.0 to 9.5 feet: SAND (SP); gray; wet. Sample is loose from saturation and drilling action. Possible sluff from sands above.
9.5–12.0									9.5 to 12.0 feet: SILT (ML); gray; 100% fines, medium plasticity; organic debris; moist.

Total Depth = 12.0 feet below ground surface.

Boring Completion Details
0.0 to 12.0 feet: 4-inch boring.
0.0 to 0.5 feet: concrete patch.
0.5 to 12.0 feet: bentonite chips hydrated with potable water.

NOTES: 1) The boring is centered between injection locations A-2 and A-3 and is 4.3 feet south of monitoring well MW-11. 2) GP = Geoprobe. 3) Collected soil material from approximately 2.5 to 10.5 feet below ground surface to composite into one soil sample.

∇ **Water level observed while drilling.**

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Maul Foster & Alongi, Inc.

Geologic Borehole Log/Well Construction

Project Number	Well Number	Sheet
9009.01.12	GP-29	1 of 1

Project Name	TrueGuard, LLC	TOC Elevation (feet)	
Project Location	725 South 32nd Street, Washougal, Washington 98671-2519	Surface Elevation (feet)	21.9
Start/End Date	05/05/09 to 05/05/09	Northing	
Driller/Equipment	Cascade Drilling, Inc./Geoprobe	Easting	
Geologist/Engineer	T. Silva	Hole Depth	20.0-feet
Sample Method	Geoprobe	Outer Hole Diam	4-inch

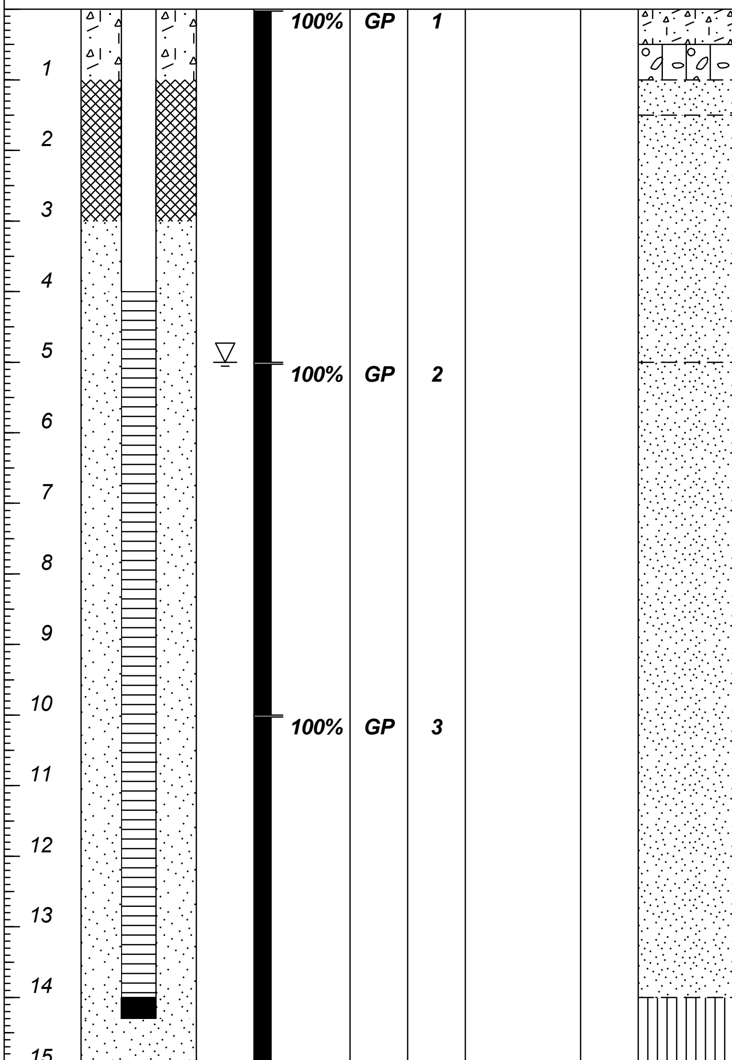
Depth (feet, BGS)	Well Details	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Lithologic Column	Soil Description
0			90%	GP	1				0.0 to 0.5 feet: ASPHALT.
1									0.5 to 1.5 feet: GRAVEL (GP); light brown; moist. (FILL)
2									1.5 to 5.5 feet: SAND (SP); light brown; 100% sand, medium, micaceous; moist.
4	▽		100%	GP	2				@ 4.0 feet: Wet.
6									5.5 to 18.0 feet: SAND (SP); gray grading to dark gray with depth; 100% sand, medium; micaceous; wet.
8			100%	GP	3				
12			100%	GP	4				
14									Boring Completion Details 0.0 to 20.0 feet: 4-inch boring. 0.0 to 0.5 feet: concrete patch. 0.5 to 20.0 feet: bentonite chips hydrated with potable water.
16			100%	GP	5				
18									18.0 to 20.0 feet: SILT (ML); gray; 100% fines, medium plasticity; trace organic debris; moist.
20									Total Depth = 20.0 feet below ground surface.

NOTES: 1) The boring is located between monitoring well MW-3 and injection location B-1. The boring is 3.7 feet west and 2.8 feet south of MW-3. 2) GP = Geoprobe. 3) Collected soil material from approximately 4.0 to 18.0 feet below ground surface to composite into one soil sample.

▽ **Water level observed while drilling.**

Maul Foster & Alongi, Inc.	Geologic Borehole Log/Well Construction		
	Project Number	Well Number	Sheet
	9009.01.12	**MW-16**	**1 of 1**

Project Name	**TrueGuard, LLC**	TOC Elevation (feet)	**21.331**
Project Location	**725 South 32nd Street, Washougal, Washington 98671-2519**	Surface Elevation (feet)	**21.6**
Start/End Date	**05/05/09 to 05/05/09**	Northing	**92119.4**
Driller/Equipment	**Cascade Drilling, Inc./Geoprobe**	Easting	**1169533.0**
Geologist/Engineer	**T. Silva**	Hole Depth	**15.0-feet**
Sample Method	**Geoprobe**	Outer Hole Diam	**4-inch**



Depth (feet, BGS)	Interval	Percent Recovery	Collection Method	Number	Name (Type)	Blows/6"	Soil Description
0		**100%**	**GP**	**1**			0.0 to 0.5 feet: CONCRETE.
0.5							0.5 to 1.0 foot: SILTY GRAVEL (GM); grayish brown. Hand dug by driller. (FILL)
1							1.0 to 1.5 feet: SAND (SP), brown. Hand dug by driller.
1.5							1.5 to 5.0 feet: SAND (SP); dark brown; 100% sand, medium; micaceous; moist.
5		**100%**	**GP**	**2**			5.0 to 14.0 feet: SAND (SP); gray; 100% sand, medium; micaceous, wet.
10		**100%**	**GP**	**3**			
14							14.0 to 15.0 feet: SILT (ML); gray; 100% fines, medium plasticity; micaceous; trace organic debris at the top of the silt; moist.

Total Depth = 15.0 feet below ground surface.

Boring Completion Details
0.0 to 15.0 feet: 4-inch boring.
0.0 to 1.0 feet: concrete.
1.0 to 3.0 feet: bentonite chips hydrated with potable water.
3.0 to 15.0 feet: 10X20 silica sand.

Monitoring Well Completion Details
Flush-mount-up completion.
0.2 to 4.0 feet: 2-inch, schedule 40, polyvinyl chloride, riser pipe.
4.0 to 14.0 feet: 2-inch, schedule 40, polyvinyl chloride, 0.010-inch, machine slot, prepacked, well screen.
4.4 to 14.7 feet: 2-inch, schedule 40, polyvinyl chloride pipe end cap.

NOTES: 1) GP = Geoprobe.

▽ **Water level observed while drilling.**

TABLES

Table 1
Water Level Elevations
TrueGuard, LLC
Washougal, Washington

Location	Date	Measuring Point Elevation[a] (ft NAVD)	Depth to Water (ft TOC)	Water Level Elevation (ft NAVD)
MW-1	02/08/07	23.65	4.21	19.44
	02/27/07	23.65	2.92	20.73
	03/07/07	23.65	NM	NM
	06/25/07	23.65	5.67	17.98
	09/25/07	23.65	7.08	16.57
	12/06/07	23.65	4.94	18.71
	02/26/08	23.65	4.10	19.55
	02/28/08	23.65	4.29	19.36
	07/14/08	24.00[b]	5.68	18.32
	10/14/08	23.65	6.75	16.90
	01/13/09	23.65	3.28	20.37
	05/04/09	23.65	3.71	19.94
MW-2	02/08/07	22.80	2.88	19.92
	02/27/07	22.80	1.38	21.42
	03/07/07	22.80	NM	NM
	06/25/07	22.80	4.45	18.35
	09/25/07	22.80	5.16[c]	Dry
	Decommissioned in November 2007			
MW-3	02/08/07	23.46	4.02	19.44
	02/27/07	23.46	2.82	20.64
	03/07/07	23.46	2.85	20.61
	06/25/07	23.46	5.91	17.55
	08/01/07	23.46	6.23	17.23
	09/25/07	23.46	6.95	16.51
	12/06/07	23.46	5.42	18.04
	02/26/08	23.92[b]	4.39	19.53
	02/28/08	23.92[b]	4.60	19.32
	07/14/08	23.92[b]	5.53	18.39
	10/14/08	23.46	8.55	14.91
	01/13/09	23.46	3.35	20.11
	05/04/09	23.46	3.51	19.95
MW-5	02/08/07	23.17	3.13	20.04
	02/27/07	23.17	1.92	21.25
	03/07/07	23.17	NM	NM
	06/25/07	23.17	4.36	18.81
	09/25/07	23.17	5.76	17.41
	12/06/07	23.17	3.43	19.74
	02/26/08	23.17	2.93	20.24
	02/28/08	23.17	3.03	20.14
	07/14/08	23.34[b]	4.40	18.94
	10/14/08	23.17	7.66	15.51
	01/13/09	23.17	2.26	20.91
	05/04/09	23.17	2.55	20.62

Table 1
Water Level Elevations
TrueGuard, LLC
Washougal, Washington

Location	Date	Measuring Point Elevation[a] (ft NAVD)	Depth to Water (ft TOC)	Water Level Elevation (ft NAVD)
MW-6	02/08/07	22.78	3.70	19.08
	02/27/07	22.78	2.68	20.10
	03/07/07	22.78	NM	NM
	06/25/07	22.78	NM	NM
	09/25/07	22.78	4.73	18.05
	12/06/07	22.78	1.73	21.05
	02/26/08	22.78	3.41	19.37
	02/28/08	22.78	3.45	19.33
	07/14/08	23.24[b]	4.72	18.52
	10/14/08	22.78	3.89	18.89
	01/13/09	22.78	2.35	20.43
	05/04/09	22.78	2.75	20.03
MW-8	03/07/07	21.55	0.92	20.63
	06/25/07	21.55	4.29	17.26
	08/01/07	21.55	3.88	17.67
	09/25/07	21.55	7.42	14.13
	12/06/07	21.55	3.42	18.13
	02/26/08	21.55	2.01	19.54
	Decommissioned in April 2008			
MW-9	08/01/07	23.82	6.18	17.64
	09/25/07	23.82	5.00	18.82
	12/06/07	23.82	NM	NM
	02/26/08	23.82	4.31	19.51
	Decommissioned in April 2008			
MW-10	08/01/07	23.78	6.09	17.69
	09/25/07	23.78	7.31	16.47
	12/06/07	23.78	NM	NM
	02/26/08	23.78	4.20	19.58
	02/28/08	23.78	4.43	19.35
	07/14/08	23.78	5.41	18.37
	10/14/08	23.78	8.79	14.99
	01/13/09	23.78	3.55	20.23
	05/04/09	23.78	3.77	20.01
MW-11	12/06/07	23.82	6.44	17.38
	02/26/08	23.82	4.70	19.12
	02/28/08	23.82	4.84	18.98
	07/14/08	24.16[b]	6.00	18.16
	10/14/08	23.82	7.06	16.76
	01/13/09	23.82	4.59	19.23
	05/04/09	23.82	4.38	19.44

Table 1
Water Level Elevations
TrueGuard, LLC
Washougal, Washington

Location	Date	Measuring Point Elevation[a] (ft NAVD)	Depth to Water (ft TOC)	Water Level Elevation (ft NAVD)
MW-12	12/06/07	21.19	4.50	16.69
	02/26/08	21.19	2.89	18.30
	02/28/08	21.19	2.95	18.24
	07/14/08	21.19	3.50	17.69
	10/14/08	21.19	4.93	16.26
	01/13/09	21.19	3.46	17.73
	05/04/09	21.19	2.63	18.56
MW-13	12/06/07	19.91	4.86	15.05
	02/26/08	19.91	4.52	15.39
	02/28/08	19.91	4.55	15.36
	07/14/08	19.91	5.14	14.77
	10/14/08	19.91	5.76	14.15
	01/13/09	19.91	4.45	15.46
	05/04/09	19.91	4.65	15.26
MW-14	12/06/07	20.10	5.25	14.85
	02/26/08	20.10	4.21	15.89
	02/28/08	20.10	4.25	15.85
	07/14/08	20.10	4.85	15.25
	10/14/08	20.10	6.20	13.90
	01/13/09	20.10	4.23	15.87
	05/04/09	20.10	3.65	16.45
MW-15	12/06/07	21.73	5.95	15.78
	02/26/08	21.73	4.63	17.10
	02/28/08	21.73	4.64	17.09
	07/14/08	21.73	4.98	16.75
	10/14/08	21.73	7.34	14.39
	01/13/09	21.73	5.05	16.68
	05/04/09	21.73	4.20	17.53
MW-16	05/07/09	21.33	2.08	19.25
PZ-1	09/25/07	21.40	7.02	14.38
	Decommissioned in November 2007			

NOTES:

ft NAVD = in feet North American Vertical Datum of 1988.

ft TOC = In feet below top of casing.

NM = not measured.

[a]Wells were surveyed in December 2007 and/or April 2008.

[b]Measurement taken from top of steel security casing.

[c]Well was dry and a blockage was encountered.

Table 2
Water Quality Field Parameters
TrueGuard, LLC
Washougal, Washington

Location	Sample	Date	Sample Depth	pH (standard units)	Temperature (degrees Celsius)	Conductivity (microSiemens per centimeter)
MW-1	GW-32	02/08/07	6	6.95	7.60	131.9
	GW-37	02/27/07	6	6.61	7.30	113.5
	GW-39	06/25/07	6.5	6.94	15.90	113.1
	MW1-120607	12/06/07	8	6.99	12.86	52
	MW-1	02/26/08	--	6.74	9.32	59
	MW1-W	07/14/08	8	6.47	16.18	207
	MW1	10/14/08	8	6.58	16.52	198
	MW-1	01/13/09	8	6.42	10.68	95.0
	MW1	05/04/09	8	6.89	12.50	74
MW-2	GW-33	02/08/07	5	6.54	6.90	151
	GW-38	02/27/07	5	6.39	6.70	164
	GW-40	06/25/07	5.5	6.64	14.00	346
MW-3	GW-34	02/08/07	6	6.78	14.70	185.5
	GW-37	03/07/07	6	7.15	14.70	175.1
	GW-42	06/25/07	7.5	6.76	17.80	289
	MW3-W	08/01/07	--	6.82	18.61	183
	MW3-120607	12/06/07	8	7.14	16.65	140
	MW-3	02/26/08	--	7.08	15.10	167
	MW3	07/15/08	8	6.63	18.52	487
	MW3	10/14/08	10	6.52	19.69	1,031
	MW-3	01/14/09	10	6.88	16.64	142
	MW3-030209	03/02/09	7	6.74	16.59	129
	MW3	05/05/09	10	8.28	16.67	132
MW-5	GW-35	02/08/07	5	6.50	8.50	97.9
	GW-41	06/25/07	5.5	6.89	16.00	454
	MW5-120607	12/06/07	7	7.06	11.14	115
	MW-5	02/26/08	--	6.83	8.59	64
	MW5-W	07/14/08	7	6.85	16.94	443
	MW5	10/14/08	7	--	--	--
	MW-5	01/13/09	3.5	5.92	7.83	38
	MW5	05/04/09	3.5	6.70	11.49	42
MW-6	GW-36	02/08/07	8	6.55	7.50	389
	MW-6	11/06/07	5	6.61	13.29	302
	MW6-120607	12/06/07	6	6.80	10.10	284
	MW-6	02/26/08	--	6.59	7.68	392
	MW6-W	07/14/08	6	5.82	14.10	414
	MW6	10/14/08	6	6.45	15.20	331
	MW-6	01/13/09	4	6.48	8.21	364
	MW6	05/05/09	4	7.09	9.80	282

Table 2
Water Quality Field Parameters
TrueGuard, LLC
Washougal, Washington

Location	Sample	Date	Sample Depth	pH (standard units)	Temperature (degrees Celsius)	Conductivity (microSiemens per centimeter)
MW-8	GW-38	03/07/07	3.5	6.99	15.00	185.3
	GW-43	06/25/07	5.5	6.70	19.60	180.7
	MW8-W	08/01/07	--	6.40	19.53	337
	MW-8	11/06/07	--	6.85	18.30	149
MW-9	GW-45	06/25/07	--	6.78	17.20	285
	MW9-W	08/01/07	--	6.50	19.67	279
MW-10	GW-44	06/25/07	--	6.75	18.10	315
	MW10-W	08/01/07	--	6.52	20.39	208
	MW10-120607	12/06/07	--	6.96	17.26	179
	MW-10	02/26/08	--	6.71	15.60	143
	MW10	07/15/08	--	6.47	19.61	359
	MW10	10/14/08	10	6.45	21.13	641
	MW-10	01/14/09	6	6.31	17.41	175
	MW10-030209	03/02/09	7	6.57	16.34	174
	MW10	05/05/09	6	7.27	17.10	210
MW-11	MW11-120607	12/06/07	10	6.79	14.98	470
	MW-11	02/26/08	--	6.66	14.03	363
	MW11	07/15/08	10	6.34	15.96	762
	MW11	07/15/08	10	6.34	15.96	762
	MW11	10/14/08	10	6.26	17.02	1235
	MW-11	01/14/09	7	6.42	13.54	396
	MW11-030209	03/02/09	7	6.27	13.17	517
	MW11	05/05/09	7	7.45	13.97	817
MW-12	MW12-120607	12/06/07	8	6.83	16.08	423
	MW-12	02/28/08	--	6.60	15.42	510
	MW12-W	07/15/08	8	6.68	17.30	562
	MW12	10/14/08	8	6.69	18.85	632
	MW-12	01/13/09	6	6.53	14.93	616
	MW12	05/04/09	6	7.14	14.72	608
MW-13	MW13-120707	12/07/07	8	6.78	14.46	149
	MW-13	02/28/08	--	6.59	11.52	171
	MW13-W	07/14/08	8	6.48	17.64	247
	MW13	10/14/08	8	6.40	18.31	283
	MW-13	01/13/09	6	6.48	11.92	235
	MW13	05/04/09	6	7.15	12.36	181

Table 2
Water Quality Field Parameters
TrueGuard, LLC
Washougal, Washington

Location	Sample	Date	Sample Depth	pH (standard units)	Temperature (degrees Celsius)	Conductivity (microSiemens per centimeter)
MW-14	MW14-120707	12/07/07	8	6.83	13.37	399
	MW-14	02/28/08	--	6.62	11.32	363
	MW14	07/15/08	8	6.68	15.37	322
	MW14	10/14/08	8	6.49	15.82	397
	MW-14	01/13/09	6	6.52	11.25	323
	MW14	05/04/09	6	7.02	11.66	384
MW-15	MW15-120707	12/07/07	8	6.71	15.34	459
	MW-15	02/28/08	--	6.67	12.77	370
	MW15	07/15/08	8	6.71	14.96	412
	MW15	10/14/08	9	6.55	18.37	538
	MW-15	01/13/09	7	6.56	13.33	436
	MW15	05/04/09	7	6.75	12.29	416
MW-16	MW16	05/07/09	5	7.66	13.30	589

Table 2
Water Quality Field Parameters
TrueGuard, LLC
Washougal, Washington

Location	Sample	Date	Sample Depth	Dissolved Oxygen (milligrams per liter)	Oxidation Reduction Potential (millivolts)	Turbidity (nephelometric turbidity units)
MW-1	GW-32	02/08/07	6	--	--	3.66
	GW-37	02/27/07	6	--	--	5.47
	GW-39	06/25/07	6.5	--	--	1.30
	MW1-120607	12/06/07	8	4.66 R	226.5	4.19
	MW-1	02/26/08	--	1.75 R	62.0	--
	MW1-W	07/14/08	8	0.36	-45.7	1.2
	MW1	10/14/08	8	0.36	-32.2	0.61
	MW-1	01/13/09	8	2.43	-16.8	5.5
	MW1	05/04/09	8	5.52	-19.6	2.89
MW-2	GW-33	02/08/07	5	--	--	2.15
	GW-38	02/27/07	5	--	--	0.98
	GW-40	06/25/07	5.5	--	--	0.29
MW-3	GW-34	02/08/07	6	--	--	3.27
	GW-37	03/07/07	6	--	--	1.01
	GW-42	06/25/07	7.5	--	--	0.79
	MW3-W	08/01/07	--	1.15	-115.7	2.38
	MW3-120607	12/06/07	8	6.86 R	112.6	1.49
	MW-3	02/26/08	--	0.01 R	-7.2	--
	MW3	07/15/08	8	0.26	-58.8	4.20
	MW3	10/14/08	10	0.29	-168.6	1.22
	MW-3	01/14/09	10	0.04	-96.9	2.66
	MW3-030209	03/02/09	7	0.46	-99.9	2.99
	MW3	05/05/09	10	0.38	-146.5	1.35
MW-5	GW-35	02/08/07	5	--	--	9.80
	GW-41	06/25/07	5.5	--	--	7.21
	MW5-120607	12/06/07	7	10.20 R	155.2	5.10
	MW-5	02/26/08	--	6.83 R	7.58	--
	MW5-W	07/14/08	7	0.39	-77.0	488
	MW5	10/14/08	7	--	--	--
	MW-5	01/13/09	3.5	2.81	-114.4	27.9
	MW5	05/04/09	3.5	3.14	3.6	27.45
MW-6	GW-36	02/08/07	8	--	--	6.76
	MW-6	11/06/07	5	0.19	-76.4	4.10
	MW6-120607	12/06/07	6	6.80 R	151.4	3.52
	MW-6	02/26/08	--	0.13 R	30.8	--
	MW6-W	07/14/08	6	0.18	-30.8	0.8
	MW6	10/14/08	6	0.40	19.6	3.19
	MW-6	01/13/09	4	0.07	-62.2	14.3
	MW6	05/05/09	4	0.34	-80.3	1.53

Table 2
Water Quality Field Parameters
TrueGuard, LLC
Washougal, Washington

Location	Sample	Date	Sample Depth	Dissolved Oxygen (milligrams per liter)	Oxidation Reduction Potential (millivolts)	Turbidity (nephelometric turbidity units)
MW-8	GW-38	03/07/07	3.5	--	--	0.59
	GW-43	06/25/07	5.5	--	--	1.74
	MW8-W	08/01/07	--	0.41	-82.7	1.22
	MW-8	11/06/07	--	0.10	-127.6	0.40
MW-9	GW-45	06/25/07	--	--	--	5.24
	MW9-W	08/01/07	--	0.58	-85.0	3.98
MW-10	GW-44	06/25/07	--	--	--	4.12
	MW10-W	08/01/07	--	0.48	-87.9	3.24
	MW10-120607	12/06/07	--	6.65 R	114.6	3.47
	MW-10	02/26/08	--	0.01 R	14.6	--
	MW10	07/15/08	--	0.19	-191.8	8.0
	MW10	10/14/08	10	0.13	-188.4	2.45
	MW-10	01/14/09	6	0.04	-65.2	1.37
	MW10-030209	03/02/09	7	0.28	-76.2	1.90
	MW10	05/05/09	6	0.42	-124.0	2.87
MW-11	MW11-120607	12/06/07	10	7.67 R	108.4	4.24
	MW-11	02/26/08	--	0.04 R	0.0	--
	MW11	07/15/08	10	0.44	-62.6	18
	MW11	07/15/08	10	0.44	-62.6	18
	MW11	10/14/08	10	0.12	-198.4	1.50
	MW-11	01/14/09	7	0.33	-72.5	1.02
	MW11-030209	03/02/09	7	0.92	-85.2	3.67
	MW11	05/05/09	7	0.64	-123.4	2.04
MW-12	MW12-120607	12/06/07	8	6.83 R	101.2	5.92
	MW-12	02/28/08	--	0.02 R	-134.6	--
	MW12-W	07/15/08	8	0.11	-85.5	6.2
	MW12	10/14/08	8	0.22	-172.5	1.65
	MW-12	01/13/09	6	0.09	-90.6	2.74
	MW12	05/04/09	6	0.65	-132.0	5.09
MW-13	MW13-120707	12/07/07	8	7.41 R	169.3	1.76
	MW-13	02/28/08	--	0.04 R	-102.5	--
	MW13-W	07/14/08	8	0.07	-49.3	4.5
	MW13	10/14/08	8	0.31	-15.6	0.85
	MW-13	01/13/09	6	0.06	-55.8	9.57
	MW13	05/04/09	6	0.39	-95.2	0.68

Table 2
Water Quality Field Parameters
TrueGuard, LLC
Washougal, Washington

Location	Sample	Date	Sample Depth	Dissolved Oxygen (milligrams per liter)	Oxidation Reduction Potential (millivolts)	Turbidity (nephelometric turbidity units)
MW-14	MW14-120707	12/07/07	8	8.21 R	113.6	0.53
	MW-14	02/28/08	--	0.09 R	-113.8	--
	MW14	07/15/08	8	0.16	-80.4	9.4
	MW14	10/14/08	8	0.40	-30.0	2.77
	MW-14	01/13/09	6	0.06	-91.1	9.27
	MW14	05/04/09	6	0.82	-88.3	4.74
MW-15	MW15-120707	12/07/07	8	6.70 R	106.8	0.59
	MW-15	02/28/08	--	0.08 R	-124.0	--
	MW15	07/15/08	8	0.08	-79.7	30.08
	MW15	10/14/08	9	0.48	-43.1	0.81
	MW-15	01/13/09	7	0.04	-90.2	3.13
	MW15	05/04/09	7	0.59	-87.3	1.24
MW-16	MW16	05/07/09	5	1.03	-90.2	2.46

NOTES:

-- = not measured.

R = qualified as rejected, based on equipment calibration.

Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

Date: 06/01/2009

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Arsenic (mg/l)	Dissolved Boron (mg/l)	Dissolved Chromium (mg/l)	Dissolved Hexavalent Chro mium (mg/l)	Dissolved Copper (mg/l)
MW-1	02/08/2007	Prim	GW-32	0.019		<0.0050		<0.010
MW-1	06/25/2007	Prim	GW-39	0.045	0.0234	<0.005		<0.01
MW-1	12/06/2007	Prim	MW1-120607	0.022	0.0366	<0.005		<0.01
MW-1	02/26/2008	Prim	MW-1	0.021		<0.005		<0.01
MW-1	07/14/2008	Prim	MW1-W	0.037	0.0100	<0.005		<0.01
MW-1	10/14/2008	Prim	MW1	0.050	<0.01	<0.005		<0.01
MW-1	01/13/2009	Prim	MW-1	0.015	0.0328	<0.005		<0.01
MW-1	05/04/2009	Prim	MW1	0.0097	0.0449	<0.005		<0.01
MW-10	06/25/2007	Prim	GW-44	4.8	0.529	0.00570		<0.01
MW-10	08/01/2007	Prim	MW10-W	6.4	0.914	<0.005		<0.01
MW-10	12/06/2007	Prim	MW10-120607	4.5	0.309	0.00620		<0.01
MW-10	02/26/2008	Prim	MW-10	2.8		<0.005		<0.01
MW-10	07/15/2008	Prim	MW10-W	3.8	0.159	0.00960	<0.005	<0.01
MW-10	10/14/2008	Prim	MW10	3.8	0.438	0.00600	<0.005J	<0.01
MW-10	01/14/2009	Prim	MW-10	2.8	0.127	<0.005	<0.005	<0.01
MW-10	03/02/2009	Prim	MW10-030209	4.5				
MW-10	05/05/2009	Prim	MW10	5.0	0.106	0.00670	<0.005	<0.01
MW-11	12/06/2007	Prim	MW11-120607	7.3	0.624	<0.005		<0.01
MW-11	02/26/2008	Prim	MW-11	7.1		<0.005		<0.01
MW-11	07/15/2008	Prim	MW11-W	3.7	4.52	<0.005	<0.005	<0.01

mg/l = milligrams per liter. J = estimated concentration.
< = not detected at or above the method reporting limit.

Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

Date: 06/01/2009

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Arsenic (mg/l)	Dissolved Boron (mg/l)	Dissolved Chromium (mg/l)	Dissolved Hexavalent Chromium (mg/l)	Dissolved Copper (mg/l)
MW-11	07/15/2008	Dup 1	MW11-WD	3.8	4.59	<0.005	<0.005	<0.01
MW-11	10/14/2008	Prim	MW11	3.4	1.90	<0.005	<0.005J	<0.01
MW-11	10/14/2008	Dup 1	MW11-D	3.5	1.85	<0.005	<0.005J	<0.01
MW-11	01/14/2009	Prim	MW-11	4.1	0.367	<0.005	<0.005	<0.01
MW-11	01/14/2009	Dup 1	MW-11D	4.1	0.370	<0.005	<0.005	<0.01
MW-11	03/02/2009	Prim	MW11-030209	3.9				
MW-11	05/05/2009	Prim	MW11	3.0	0.234	0.00520	<0.005	<0.01
MW-12	12/06/2007	Prim	MW12-120607	0.33	0.454	<0.005		<0.01
MW-12	02/28/2008	Prim	MW-12	0.37		<0.005		<0.01
MW-12	07/15/2008	Prim	MW12-W	0.50	1.58	<0.005		<0.01
MW-12	10/14/2008	Prim	MW12	1.5	1.45	<0.005		<0.01
MW-12	01/14/2009	Prim	MW-12	0.44	0.339	<0.005		<0.01
MW-12	05/04/2009	Prim	MW12	0.63	3.33	<0.005		<0.01
MW-13	12/07/2007	Prim	MW13-120707	0.040	<0.01	<0.005		<0.01
MW-13	02/28/2008	Prim	MW-13	0.037		<0.005		<0.01
MW-13	07/14/2008	Prim	MW13-W	0.043	0.0197	<0.005		<0.01
MW-13	10/14/2008	Prim	MW13	0.053	0.0612	<0.005		<0.01
MW-13	01/13/2009	Prim	MW-13	0.035	0.0619	<0.005		<0.01
MW-13	05/04/2009	Prim	MW13	0.035	0.879	<0.005		<0.01
MW-13	05/04/2009	Dup 1	MW13D	0.033	0.803	<0.005		<0.01

mg/l = milligrams per liter. J = estimated concentration.
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Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Arsenic (mg/l)	Dissolved Boron (mg/l)	Dissolved Chromium (mg/l)	Dissolved Hexavalent Chromium (mg/l)	Dissolved Copper (mg/l)
MW-14	12/07/2007	Prim	MW14-120707	0.075	0.0879	<0.005		<0.01
MW-14	02/28/2008	Prim	MW-14	0.072		<0.005		<0.01
MW-14	07/15/2008	Prim	MW14-W	0.075	1.32	<0.005		<0.01
MW-14	10/14/2008	Prim	MW14	0.084	0.743	<0.005		<0.01
MW-14	01/13/2009	Prim	MW-14	0.069	1.70	<0.005		<0.01
MW-14	05/04/2009	Prim	MW14	0.063	0.592	<0.005		<0.01
MW-15	12/07/2007	Prim	MW15-120707	0.043	0.692	<0.005		<0.01
MW-15	02/28/2008	Prim	MW-15	0.0048		<0.005		<0.01
MW-15	07/15/2008	Prim	MW15-W	0.044	3.12	<0.005		<0.01
MW-15	10/14/2008	Prim	MW15	0.050	1.72	<0.005		<0.01
MW-15	01/13/2009	Prim	MW-15	0.036	1.72	<0.005		<0.01
MW-15	05/04/2009	Prim	MW15	0.034	1.34	<0.005		<0.01
MW-16	05/07/2009	Prim	MW16	2.8	0.427	<0.005	<0.005	<0.01
MW-2	02/08/2007	Prim	GW-33	0.017		<0.0050		<0.010
MW-2	06/25/2007	Prim	GW-40	0.033	0.0206	<0.005		<0.01
MW-3	02/08/2007	Prim	GW-34	0.64		<0.0050		<0.010
MW-3	03/07/2007	Prim	GW-37	0.76		<0.005		<0.01
MW-3	06/25/2007	Prim	GW-42	0.60	0.746	<0.005		<0.01
MW-3	08/01/2007	Prim	MW3-W	0.69	0.507	<0.005		<0.01
MW-3	12/06/2007	Prim	MW3-120607	0.22	0.172	<0.005		<0.01

mg/l = milligrams per liter. J = estimated concentration.
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Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Arsenic (mg/l)	Dissolved Boron (mg/l)	Dissolved Chromium (mg/l)	Dissolved Hexavalent Chromium (mg/l)	Dissolved Copper (mg/l)
MW-3	02/26/2008	Prim	MW-3	0.082		<0.005		<0.01
MW-3	07/15/2008	Prim	MW3-W	0.27	0.447	0.00530	<0.005	<0.01
MW-3	10/14/2008	Prim	MW3	0.64	0.288	<0.005	<0.005J	<0.01
MW-3	01/14/2009	Prim	MW-3	0.24	0.254	<0.005	<0.005	<0.01
MW-3	03/02/2009	Prim	MW3-030209	0.31				
MW-3	05/05/2009	Prim	MW3	0.40	0.173	<0.005	<0.005	<0.01
MW-5	02/08/2007	Prim	GW-35	0.0074		<0.0050		<0.010
MW-5	06/25/2007	Prim	GW-41	0.061	<0.01	<0.005		<0.01
MW-5	12/06/2007	Prim	MW5-120607	0.017	0.0287	<0.005		0.0214
MW-5	02/26/2008	Prim	MW-5	0.010		<0.005		0.0160
MW-5	07/14/2008	Prim	MW5-W	0.062	<0.01	0.00500		<0.01
MW-5	01/13/2009	Prim	MW-5	0.0023	0.0684	<0.005		<0.01
MW-5	05/04/2009	Prim	MW5	0.0031	0.129	0.00710		<0.01
MW-6	02/08/2007	Prim	GW-36	0.0053		<0.0050		<0.010
MW-6	11/06/2007	Prim	MW-6	0.0015	0.494		<0.005J	<0.01
MW-6	12/06/2007	Prim	MW6-120607	0.0047	0.170	<0.005		<0.01
MW-6	02/26/2008	Prim	MW-6	0.0080		<0.005		<0.01
MW-6	07/14/2008	Prim	MW6-W	0.0084	0.0659	<0.005		<0.01
MW-6	10/14/2008	Prim	MW6	0.0035	0.585	0.00540		<0.01
MW-6	01/13/2009	Prim	MW-6	0.0061	0.0334	<0.005		<0.01

mg/l = milligrams per liter. J = estimated concentration.
< = not detected at or above the method reporting limit.

Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Arsenic (mg/l)	Dissolved Boron (mg/l)	Dissolved Chromium (mg/l)	Dissolved Hexavalent Chromium (mg/l)	Dissolved Copper (mg/l)
MW-6	05/05/2009	Prim	MW6	0.0042	0.128	0.00510	<0.005	<0.01
MW-8	03/07/2007	Prim	GW-38	2.9		<0.005		<0.01
MW-8	06/25/2007	Prim	GW-43	1.4	0.567	<0.005		<0.01
MW-8	08/01/2007	Prim	MW8-W	3.3	0.627	<0.005		<0.01
MW-8	11/06/2007	Prim	MW-8	0.72	0.106		<0.005J	<0.01
MW-9	06/25/2007	Prim	GW-45	2.9	1.13	<0.005		<0.01
MW-9	08/01/2007	Prim	MW9-W	2.6	0.893	<0.005		<0.01

mg/l = milligrams per liter. J = estimated concentration.
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Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Iron (mg/l)	Dissolved Manganese (mg/l)
MW-1	02/08/2007	Prim	GW-32		
MW-1	06/25/2007	Prim	GW-39		
MW-1	12/06/2007	Prim	MW1-120607	6.34	
MW-1	02/26/2008	Prim	MW-1		
MW-1	07/14/2008	Prim	MW1-W		
MW-1	10/14/2008	Prim	MW1	22.3	
MW-1	01/13/2009	Prim	MW-1	7.24	
MW-1	05/04/2009	Prim	MW1	5.05	0.494
MW-10	06/25/2007	Prim	GW-44		
MW-10	08/01/2007	Prim	MW10-W		
MW-10	12/06/2007	Prim	MW10-120607	9.63	
MW-10	02/26/2008	Prim	MW-10		
MW-10	07/15/2008	Prim	MW10-W	16.7	2.55
MW-10	10/14/2008	Prim	MW10	26.0	3.52
MW-10	01/14/2009	Prim	MW-10	11.9	0.830
MW-10	03/02/2009	Prim	MW10-030209		
MW-10	05/05/2009	Prim	MW10	14.4	1.18
MW-11	12/06/2007	Prim	MW11-120607	34.0	
MW-11	02/26/2008	Prim	MW-11		
MW-11	07/15/2008	Prim	MW11-W	44.6	6.30

mg/l = milligrams per liter. J = estimated concentration.
< = not detected at or above the method reporting limit.

Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Iron (mg/l)	Dissolved Manganese (mg/l)
MW-11	07/15/2008	Dup 1	MW11-WD	45.2	6.29
MW-11	10/14/2008	Prim	MW11	55.8	5.48
MW-11	10/14/2008	Dup 1	MW11-D	55.5	5.10
MW-11	01/14/2009	Prim	MW-11	25.4	2.45
MW-11	01/14/2009	Dup 1	MW-11D	25.2	2.43
MW-11	03/02/2009	Prim	MW11-030209		
MW-11	05/05/2009	Prim	MW11	52.1	6.25
MW-12	12/06/2007	Prim	MW12-120607	29.3	
MW-12	02/28/2008	Prim	MW-12		
MW-12	07/15/2008	Prim	MW12-W		
MW-12	10/14/2008	Prim	MW12	29.9	
MW-12	01/14/2009	Prim	MW-12	44.6	
MW-12	05/04/2009	Prim	MW12	40.2	2.12
MW-13	12/07/2007	Prim	MW13-120707	27.2	
MW-13	02/28/2008	Prim	MW-13		
MW-13	07/14/2008	Prim	MW13-W		
MW-13	10/14/2008	Prim	MW13	25.2	
MW-13	01/13/2009	Prim	MW-13	18.8	
MW-13	05/04/2009	Prim	MW13	17.1	1.39
MW-13	05/04/2009	Dup 1	MW13D	15.6	1.30

mg/l = milligrams per liter. J = estimated concentration.
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Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Iron (mg/l)	Dissolved Manganese (mg/l)
MW-14	12/07/2007	Prim	MW14-120707	31.1	
MW-14	02/28/2008	Prim	MW-14		
MW-14	07/15/2008	Prim	MW14-W		
MW-14	10/14/2008	Prim	MW14	35.6	
MW-14	01/13/2009	Prim	MW-14	26.7	
MW-14	05/04/2009	Prim	MW14	32.5	3.66
MW-15	12/07/2007	Prim	MW15-120707	38.0	
MW-15	02/28/2008	Prim	MW-15		
MW-15	07/15/2008	Prim	MW15-W		
MW-15	10/14/2008	Prim	MW15	37.4	
MW-15	01/13/2009	Prim	MW-15	28.3	
MW-15	05/04/2009	Prim	MW15	25.2	3.58
MW-16	05/07/2009	Prim	MW16	60.8	5.08
MW-2	02/08/2007	Prim	GW-33		
MW-2	06/25/2007	Prim	GW-40		
MW-3	02/08/2007	Prim	GW-34		
MW-3	03/07/2007	Prim	GW-37		
MW-3	06/25/2007	Prim	GW-42		
MW-3	08/01/2007	Prim	MW3-W		
MW-3	12/06/2007	Prim	MW3-120607	5.94	

mg/l = milligrams per liter. J = estimated concentration.
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Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Iron (mg/l)	Dissolved Manganese (mg/l)
MW-3	02/26/2008	Prim	MW-3		
MW-3	07/15/2008	Prim	MW3-W	26.2	4.89
MW-3	10/14/2008	Prim	MW3	40.3	6.74
MW-3	01/14/2009	Prim	MW-3	5.41	0.934
MW-3	03/02/2009	Prim	MW3-030209		
MW-3	05/05/2009	Prim	MW3	5.40	0.872
MW-5	02/08/2007	Prim	GW-35		
MW-5	06/25/2007	Prim	GW-41		
MW-5	12/06/2007	Prim	MW5-120607	5.78	
MW-5	02/26/2008	Prim	MW-5		
MW-5	07/14/2008	Prim	MW5-W		
MW-5	01/13/2009	Prim	MW-5	0.277	
MW-5	05/04/2009	Prim	MW5	0.620	0.197
MW-6	02/08/2007	Prim	GW-36		
MW-6	11/06/2007	Prim	MW-6	17.8	
MW-6	12/06/2007	Prim	MW6-120607	23.5	
MW-6	02/26/2008	Prim	MW-6		
MW-6	07/14/2008	Prim	MW6-W		
MW-6	10/14/2008	Prim	MW6	16.8	
MW-6	01/13/2009	Prim	MW-6	22.4	

mg/l = milligrams per liter. J = estimated concentration.
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Table 3
Dissolved Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Dissolved Iron (mg/l)	Dissolved Manganese (mg/l)
MW-6	05/05/2009	Prim	MW6	16.4	2.35
MW-8	03/07/2007	Prim	GW-38		
MW-8	06/25/2007	Prim	GW-43		
MW-8	08/01/2007	Prim	MW8-W		
MW-8	11/06/2007	Prim	MW-8	9.05	
MW-9	06/25/2007	Prim	GW-45		
MW-9	08/01/2007	Prim	MW9-W		

mg/l = milligrams per liter. J = estimated concentration.
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Table 4
Total Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Arsenic (mg/l)	Arsenates (%)	Arsenites (%)	Boron (mg/l)	Calcium (mg/l)
MW-10	03/02/2009	Prim	MW10-030209	4.6	95.0	5.01		
MW-10	05/05/2009	Prim	MW10	4.9			0.120	18.0
MW-11	03/02/2009	Prim	MW11-030209	4.2	50.6	49.4		
MW-11	05/05/2009	Prim	MW11	4.0			0.271	84.2
MW-16	05/07/2009	Prim	MW16	3.0			0.465	70.3
MW-3	03/02/2009	Prim	MW3-030209	0.39	100	0.0500		
MW-3	05/05/2009	Prim	MW3	0.42			0.166	16.0
MW-6	05/05/2009	Prim	MW6	0.0050			0.136	38.6

mg/l = milligrams per liter.
< = not detected at or above the method reporting limit.

Table 4
Total Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Chromium (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)
MW-10	03/02/2009	Prim	MW10-030209					
MW-10	05/05/2009	Prim	MW10	0.00720	<0.01	14.6	7.48	1.16
MW-11	03/02/2009	Prim	MW11-030209					
MW-11	05/05/2009	Prim	MW11	<0.005	<0.01	53.6	40.2	6.00
MW-16	05/07/2009	Prim	MW16	<0.005	<0.01	61.8	20.0	5.42
MW-3	03/02/2009	Prim	MW3-030209					
MW-3	05/05/2009	Prim	MW3	0.00920	<0.01	5.90	4.57	0.866
MW-6	05/05/2009	Prim	MW6	0.00540	<0.01	16.3	14.8	2.40

mg/l = milligrams per liter.
< = not detected at or above the method reporting limit.

Table 4
Total Metals in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Potassium (mg/l)	Sodium (mg/l)
MW-10	03/02/2009	Prim	MW10-030209		
MW-10	05/05/2009	Prim	MW10	5.18	4.66
MW-11	03/02/2009	Prim	MW11-030209		
MW-11	05/05/2009	Prim	MW11	16.2	10.9
MW-16	05/07/2009	Prim	MW16	4.95	8.74
MW-3	03/02/2009	Prim	MW3-030209		
MW-3	05/05/2009	Prim	MW3	2.20	4.16
MW-6	05/05/2009	Prim	MW6	2.19	7.86

mg/l = milligrams per liter.
< = not detected at or above the method reporting limit.

Table 5
Conventional Parameters in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Chloride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Total Organic Carbon (mg/l)	Alkalinity, Carbonate (mg/l)
MW-10	07/15/2008	Prim	MW10-W	5.09	<0.03	10.4	7.45	
MW-10	10/14/2008	Prim	MW10	3.33	0.0344	<0.5	1.99	
MW-10	01/14/2009	Prim	MW-10	2.48	<0.03	<0.5	2.02	
MW-10	05/05/2009	Prim	MW10	3.14	0.0404	0.510	2.36	<10
MW-11	12/06/2007	Prim	MW11-120607			<0.5		
MW-11	07/15/2008	Prim	MW11-W	14.8	0.176	6.28	35.8	
MW-11	07/15/2008	Dup 1	MW11-WD	14.6	0.186	6.78	37.6	
MW-11	10/14/2008	Prim	MW11	15.6	0.0534	0.870	5.49	
MW-11	10/14/2008	Dup 1	MW11-D	16.0	0.0544	0.860	5.74	
MW-11	01/14/2009	Prim	MW-11	4.40	<0.03	<0.5	5.15	
MW-11	01/14/2009	Dup 1	MW-11D		<0.03	<0.5	5.24	
MW-11	05/05/2009	Prim	MW11	9.89	0.0666	<0.5	6.88	<10
MW-16	05/07/2009	Prim	MW16	4.02	0.0614	<0.5	3.49	<10
MW-3	12/06/2007	Prim	MW3-120607			0.650		
MW-3	07/15/2008	Prim	MW3-W	7.08	0.0874	3.13	9.76	
MW-3	10/14/2008	Prim	MW3	4.18	0.0410	1.85	2.75	
MW-3	01/14/2009	Prim	MW-3	2.28	<0.03	1.02	3.73	
MW-3	05/05/2009	Prim	MW3	1.99	<0.03	<0.5	2.54	<10
MW-6	11/06/2007	Prim	MW-6			2.76		
MW-6	05/05/2009	Prim	MW6	2.77	0.0352	1.55	5.60	<10

mg/l = milligrams per liter.
< = not detected at or above the method reporting limit.

Table 5
Conventional Parameters in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Chloride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Total Organic Carbon (mg/l)	Alkalinity, Carbonate (mg/l)
MW-8	11/06/2007	Prim	MW-8			3.40		

mg/l = milligrams per liter.
< = not detected at or above the method reporting limit.

Table 5
Conventional Parameters in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Alkalinity, Bicarbonate (mg/l)
MW-10	07/15/2008	Prim	MW10-W	
MW-10	10/14/2008	Prim	MW10	
MW-10	01/14/2009	Prim	MW-10	
MW-10	05/05/2009	Prim	MW10	92.4
MW-11	12/06/2007	Prim	MW11-120607	
MW-11	07/15/2008	Prim	MW11-W	
MW-11	07/15/2008	Dup 1	MW11-WD	
MW-11	10/14/2008	Prim	MW11	
MW-11	10/14/2008	Dup 1	MW11-D	
MW-11	01/14/2009	Prim	MW-11	
MW-11	01/14/2009	Dup 1	MW-11D	
MW-11	05/05/2009	Prim	MW11	477
MW-16	05/07/2009	Prim	MW16	349
MW-3	12/06/2007	Prim	MW3-120607	
MW-3	07/15/2008	Prim	MW3-W	
MW-3	10/14/2008	Prim	MW3	
MW-3	01/14/2009	Prim	MW-3	
MW-3	05/05/2009	Prim	MW3	65.9
MW-6	11/06/2007	Prim	MW-6	
MW-6	05/05/2009	Prim	MW6	171

mg/l = milligrams per liter.
< = not detected at or above the method reporting limit.

Table 5
Conventional Parameters in Groundwater (mg/l)
TrueGuard, LLC
Washougal, Washington

PERIOD: From 01/31/2007 thru 05/07/2009 - Inclusive
SAMPLE TYPE: Water

SITE	DATE	RESULT TYPE	SAMPLE ID	Alkalinity, Bicarbonate (mg/l)
MW-8	11/06/2007	Prim	MW-8	

mg/l = milligrams per liter.
< = not detected at or above the method reporting limit.

Table 6
Summary of Bench Test Data
TrueGuard, LLC
Washougal, Washington

Event	Analyte	pH	Klozur™	ARM	Oxidation Reduction Potential	Boron	Arsenic	Chromium	Copper	Iron	Lead	Manganese	Hexavalent Chromium	Sulfate
	Method	standard	grams	grams	SM2580b	SW6010	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SM 3500-Cr D	SW9056
	Units	units			mV	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
ARM Determination[1]														
ARM0-FeCl5-Klosure0.375	0906124-01A	5	0.375	0	420	0.304	0.0016	0.0012	0.0093	<0.1	0.00018	3.7	<0.0050 J	177
ARM0-FeCl6-Klosure0.5	0906124-02A	6	0.500	0	360	0.305	0.0057	0.0011	0.0017	<0.1	<0.001	0.95	<0.0050 J	166
ARM0-FeCl7-Klosure0.6125	0906124-03A	7	0.6125	0	340	0.283	0.013	0.0028	0.0017	<0.1	<0.001	0.022	<0.0050 J	140
ARM0.01-FeCl5-Klosure0.375	0906124-04A	5	0.375	0.01	410	0.314	0.0013	0.001	0.0042	<0.1	<0.001	4.0	<0.0050 J	236
ARM0.01-FeCl6-Klosure0.5	0906124-05A	6	0.500	0.01	370	0.321	0.0067	0.0011	0.0041	<0.1	<0.001	3.9	<0.0050 J	193
ARM0.01-FeCl7-Klosure0.6125	0906124-06A	7	0.6125	0.01	350	0.314	0.016	0.002	0.0028	<0.1	<0.001	0.3	<0.0050 J	173
ARM0.05-FeCl5-Klosure0.375	0906124-07A	5	0.375	0.05	420	0.326	0.0018	<0.001	0.0088	<0.1	0.00015	4.5	<0.0050 J	242
ARM0.05-FeCl6-Klosure0.5	0906124-08A	6	0.500	0.05	390	0.316	0.0042	0.0012	0.0015	<0.1	<0.001	1.2	<0.0050 J	127
ARM0.05-FeCl7-Klosure0.6125	0906124-09A	7	0.6125	0.05	350	0.301	0.015	0.0028	0.0024	<0.1	<0.001	0.018	<0.0050 J	135
ARM0.1-FeCl5-Klosure0.375	0906124-10A	5	0.375	0.10	410	0.322	0.0013	<0.001	0.0036	<0.1	<0.001	2.9	<0.0050 J	193
ARM0.1-FeCl6-Klosure0.5	0906124-11A	6	0.500	0.10	390	0.316	0.0045	<0.001	0.0016	<0.1	<0.001	2.2	<0.0050 J	217
ARM0.1-FeCl7-Klosure0.6125	0906124-12A	7	0.6125	0.10	350	0.303	0.012	0.0024	0.0022	<0.1	<0.001	0.035	<0.0050 J	187
ARM0.5-FeCl5-Klosure0.375	0906124-13A	5	0.375	0.50	410	0.320	0.0012	<0.001	0.0027	<0.1	<0.001	3.6	<0.0050 J	164
ARM0.5-FeCl6-Klosure0.5	0906124-14A	6	0.500	0.50	370	0.324	0.0048	<0.001	0.0018	<0.1	<0.001	0.66	<0.0050 J	211
ARM0.5-FeCl7-Klosure0.6125	0906124-15A	7	0.6125	0.50	350	0.322	0.017	0.0022	0.0028	<0.1	<0.001	0.021	<0.0050 J	165
Leachability[1]														
ARM0-FeCl5-Klosure0.375	0907016-01	5	0.375	0	--	0.120	0.0018	0.0011	0.06	<0.1	<0.001	7.2	<0.0050	67.1
ARM0-FeCl6-Klosure0.5	0907016-02	6	0.500	0	--	0.129	0.0039	0.0011	0.028	<0.1	<0.001	0.00077	<0.0050	78.7
ARM0.05-FeCl5-Klosure0.375	0907016-03	5	0.375	0.05	--	0.130	0.0017	<0.001	0.093	<0.1	<0.001	0.12	<0.0050	104
ARM0.05-FeCl6-Klosure0.5	0907016-04	6	0.500	0.05	--	0.129	0.0034	<0.001	0.021	<0.1	<0.001	0.0029	<0.0050	66.0
ARM0.5-FeCl5-Klosure0.375	0907016-05	5	0.375	0.50	--	0.122	0.0022	<0.001	0.023	<0.1	<0.001	0.72	<0.0050	66.5
ARM0.5-FeCl6-Klosure0.5	0907016-06	6	0.500	0.50	--	0.116	0.0051	0.001	0.017	<0.1	0.0002	0.0029	<0.0050	89.1

NOTES:

-- = not analyzed.

< = not detected at or above the method reporting limit.

ARM = Activated Red Mud.

FeCl = Ferrous Chloride.

J = estimated concentration.

Klozur™ = Calcium Persulfate (also Klosure).

mg/L = milligrams per liter.

mV = millivolts.

pH = hydrogen ion potential in standard units.

[1] = Values are dissolved concentrations.

FIGURES

Figure
Water Level Contours from May 4, 2009
TrueGuard, LLC
Washougal, Washington

Legend

MW-6 20.03 — Monitoring Well Location (with Water Level Value in Feet NAVD88)

MW-10 — Extraction Well Location

14.0 — Contour (0.5-Foot Interval)

TrueGuard, LLC Site Boundary

Tax Lots

Flow Direction

Source: Aerial photograph (2005) and tax lots (March 2007) obtained from Clark County GIS Department

Notes:
1. NAVD88 = North American Vertical Datum of 1988
2. Water level contours were generated using the tension spline method within ArcGIS 9.3 Spatial Analyst extension.
3. NM = Not measured

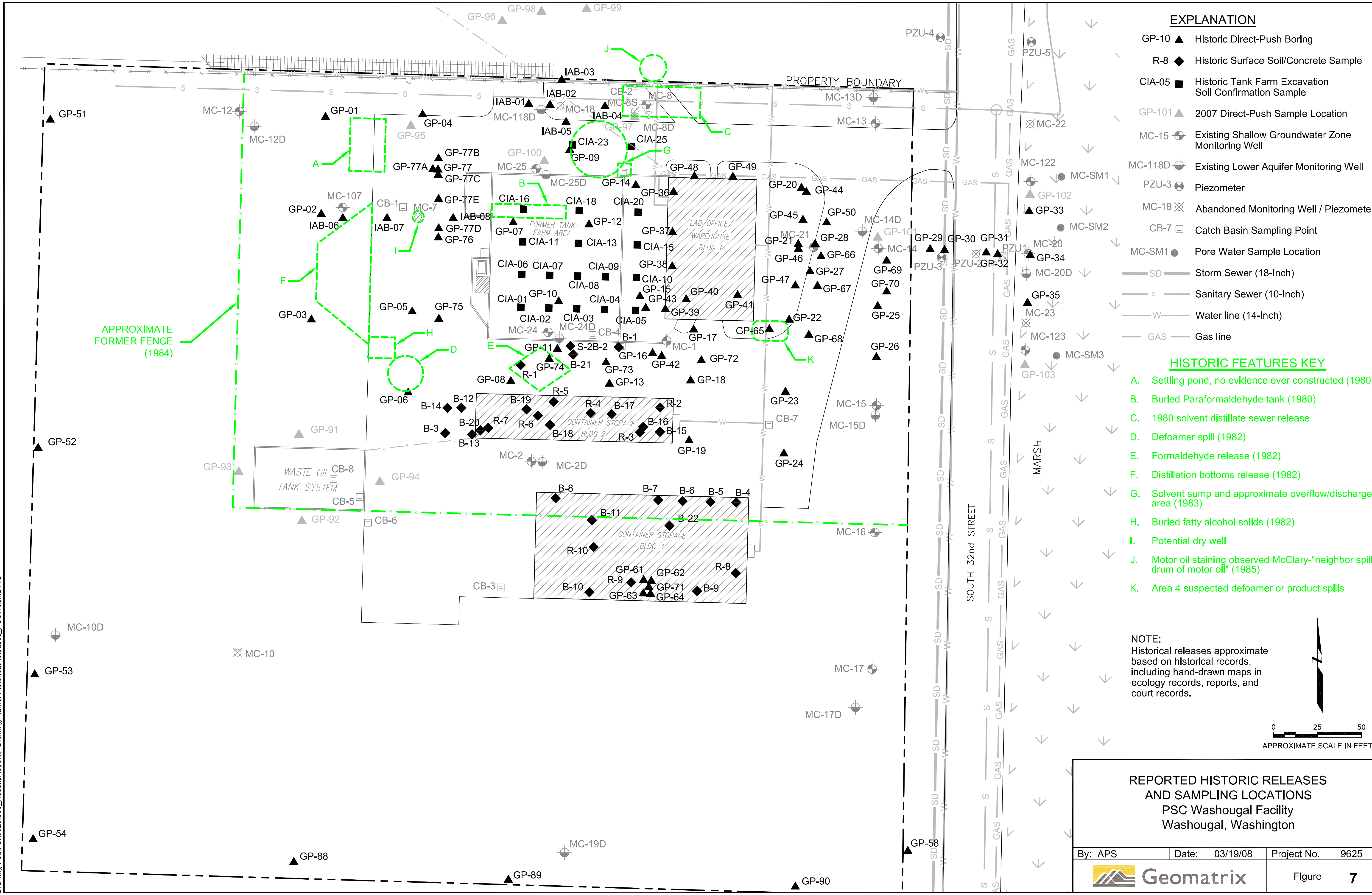
N

0 100 200
Feet

MAUL FOSTER ALONGI

File: X:\9009.01\Projects\12\04\Fig_Water Level Contours May 4, 2009.mxd

Project: 9009.01.12/04 Produced By: R. Maronn Approved By: T. Silva



Plot Date: 03/19/08 - 2:21pm, Plotted by: astenberg
Drawing Path: S:\9625\005_ResultsReport\, Drawing Name: HistoricalReleases_PSCWash.DWG

FIELD SAMPLING
DATA SHEETS

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-1
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/4/2009
Sampling Event	May 2009	**Sample Name**	MW1
Sub Area		**Sample Depth**	8
FSDS QA:	TJS 05/13/09	**Easting** / **Northing** / **TOC**	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness) DTP-DTW	(Water Column) DTB-DTW	(Gallons/ft x Water Column) Pore Volume
05/04/09	09:36	13.38	--	3.71	--	9.67	1.58

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	10:49	1.60	0.5	6.97	12.42	69	6.11	-10.7	6.03
	11:02	3.20	0.5	6.89	12.47	72	5.63	-18.4	2.61
Final Field Parameters	11:10	4.80	0.5	6.89	12.50	74	5.52	-19.6	2.89

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations:

Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	11:15:00 AM	VOA-Glass		
			Amber Glass		
			White Poly	1	No
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	3	

General Sampling Comments

Signature

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-3
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/5/2009
Sampling Event	May 2009	**Sample Name**	MW3
Sub Area		**Sample Depth**	10
FSDS QA:	TJS 05/13/09	**Easting**	
		Northing	
		TOC	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness) DTP-DTW	(Water Column) DTB-DTW	(Gallons/ft x Water Column) Pore Volume
05/04/09	09:39	13.95	--	3.51	--	10.44	1.70

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	08:05	1.75	0.6	8.08	16.75	131	1.14	-143.0	3.42
	08:17	3.50	0.6	8.30	16.77	129	0.59	-144.1	1.69
Final Field Parameters	08:29	5.25	0.6	8.28	16.67	132	0.38	-146.5	1.35

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	8:35:00 AM	VOA-Glass		
			Amber Glass	1	No
			White Poly	2	No/Yes
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	5	

General Sampling Comments: Also collected three 10-liter cubitainers for bench test analysis.

Signature

Maul Foster & Alongi, Inc.
7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-5
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/4/2009
Sampling Event	May 2009	**Sample Name**	MW5
Sub Area		**Sample Depth**	3.5
FSDS QA:	TJS 05/13/09	**Easting**	
		Northing	
		TOC	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness) DTP-DTW	(Water Column) DTB-DTW	(Gallons/ft x Water Column) Pore Volume
05/04/09	08:15	7.85	--	2.55	--	5.30	0.86

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	08:35	1.00	0.25	7.21	11.40	69	6.42	9.0	32.85
	08:50	2.00	0.25	6.86	11.38	53	4.02	9.4	18.17
	09:05	3.00	0.25	6.75	11.45	46	3.39	11.3	17.67
	09:25	4.00	0.25	6.55	11.78	35	3.73	30.6	20.73
Final Field Parameters	10:08	5.00	0.25	6.70	11.49	42	3.14	3.6	27.45

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	10:15:00 AM	VOA-Glass		
			Amber Glass		
			White Poly	1	No
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	3	

General Sampling Comments

Signature

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-6
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/5/2009
Sampling Event	May 2009	**Sample Name**	MW6
Sub Area		**Sample Depth**	4
FSDS QA:	TJS 05/13/09		

Easting		**Northing**		**TOC**	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW (Product Thickness)	DTB-DTW (Water Column)	Pore Volume (Gallons/ft x Water Column)
05/04/09	10:30	9.75	--	2.75	--	7.00	1.14

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	10:33	1.25	0.6	6.91	9.77	252	0.19	-68.4	2.43
	10:37	2.50	0.6	7.01	9.80	271	0.23	-75.7	2.47
Final Field Parameters	10:41	3.75	0.6	7.09	9.80	282	0.34	-80.3	1.53

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	10:45:00 AM	VOA-Glass		
			Amber Glass	1	No
			White Poly	2	No/Yes
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	5	

General Sampling Comments: Also collected one 10-liter cubitainer for bench test analysis.

Signature ______________________

Maul Foster & Alongi, Inc.

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Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-10
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/5/2009
Sampling Event	May 2009	**Sample Name**	MW10
Sub Area		**Sample Depth**	6
FSDS QA:	TJS 05/13/09	**Easting**	
		Northing	
		TOC	

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
05/04/09	09:38	16.62	--	3.77	--	12.85	8.39

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	09:00	8.50	1.5	7.48	17.06	209	0.32	-100.3	10.40
	09:20	17.00	1.5	7.58	17.07	208	0.32	-115.6	4.20
Final Field Parameters	09:41	25.50	1.5	7.27	17.10	210	0.42	-124.0	2.87

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	9:45:00 AM	VOA-Glass		
			Amber Glass	1	No
			White Poly	2	No/Yes
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	5	

General Sampling Comments: Production well pump not in use.

Signature ____________

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-11
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/5/2009
Sampling Event	May 2009	**Sample Name**	MW11
Sub Area		**Sample Depth**	7
FSDS QA:	TJS 05/13/09	**Easting**	
		Northing	
		TOC	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW (Product Thickness)	DTB-DTW (Water Column)	Pore Volume (Gallons/ft x Water Column)
05/04/09	09:42	17.40	--	4.38	--	13.02	2.12

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	12:04	2.20	0.6	7.39	13.99	867	2.34	-112.8	5.32
	12:18	4.40	0.6	7.46	13.97	846	0.85	-119.7	3.91
Final Field Parameters	12:32	6.60	0.6	7.45	13.97	817	0.64	-123.4	2.04

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	12:40:00 PM	VOA-Glass		
			Amber Glass	1	No
			White Poly	2	No/Yes
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	5	

General Sampling Comments: Also collected three 10-liter cubitainers for bench test analysis.

Signature ____________________

Maul Foster & Alongi, Inc.

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Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-12
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/4/2009
Sampling Event	May 2009	**Sample Name**	MW12
Sub Area		**Sample Depth**	6
FSDS QA:	TJS 05/13/09	**Easting**	
		Northing	
		TOC	

Hydrology/Level Measurements

					(Product Thickness)	(Water Column)	(Gallons/ft x Water Column)
Date	**Time**	**DT-Bottom**	**DT-Product**	**DT-Water**	**DTP-DTW**	**DTB-DTW**	**Pore Volume**
05/04/09	10:50	14.03	--	2.63	--	11.40	1.86

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	11:55	2.0	0.5	7.19	14.77	765	1.03	-140.9	20.52
	12:05	4.0	0.5	7.11	14.76	670	0.72	-140.2	8.01
Final Field Parameters	12:15	6.0	0.5	7.14	14.72	608	0.65	-132.0	5.09

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	12:25:00 PM	VOA-Glass		
			Amber Glass		
			White Poly	1	No
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	3	

General Sampling Comments

Signature

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-13
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/4/2009
Sampling Event	May 2009	**Sample Name**	MW13
Sub Area		**Sample Depth**	6
FSDS QA:	TJS 05/13/09	**Easting**	**Northing** **TOC**

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness) DTP-DTW	(Water Column) DTB-DTW	(Gallons/ft x Water Column) Pore Volume
05/04/09	10:35	14.05	--	4.65	--	9.40	1.53

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	12:51	1.60	0.5	7.04	12.34	178	0.26	-77.1	9.93
	13:01	3.20	0.5	7.11	12.36	180	0.38	-88.1	2.16
Final Field Parameters	13:11	4.80	0.5	7.15	12.36	181	0.39	-95.2	0.68

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	1:15:00 PM	VOA-Glass		
			Amber Glass		
			White Poly	1	No
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	3	

General Sampling Comments: Duplicate sample MW13D collected.

Signature

Maul Foster & Alongi, Inc.
7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-13
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/4/2009
Sampling Event	May 2009	**Sample Name**	MW13D
Sub Area		**Sample Depth**	6
FSDS QA:	TJS 05/13/09	**Easting** / **Northing** / **TOC**	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW (Product Thickness)	DTB-DTW (Water Column)	Pore Volume (Gallons/ft x Water Column)
05/04/09	10:35	14.05	--	4.65	--	9.40	1.53

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	12:51	1.60	0.5	7.04	12.34	178	0.26	-77.1	9.93
	13:01	3.20	0.5	7.11	12.36	180	0.38	-88.1	2.16
Final Field Parameters	13:11	4.80	0.5	7.15	12.36	181	0.39	-95.2	0.68

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	1:15:00 PM	VOA-Glass		
			Amber Glass		
			White Poly	1	No
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	3	

General Sampling Comments

Duplicate sample of MW13.

Signature

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-14
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/4/2009
Sampling Event	May 2009	**Sample Name**	MW14
Sub Area		**Sample Depth**	6
FSDS QA:	TJS 05/13/09	**Easting**	
		Northing	
		TOC	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness) DTP-DTW	(Water Column) DTB-DTW	(Gallons/ft x Water Column) Pore Volume
05/04/09	10:38	13.82	--	3.65	--	10.17	1.66

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	13:50	1.75	0.5	6.88	11.68	385	1.34	-79.7	7.29
	14:00	3.50	0.5	7.13	11.68	384	1.17	-87.3	5.59
Final Field Parameters	14:14	5.25	0.5	7.02	11.66	384	0.82	-88.3	4.74

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	2:20:00 PM	VOA-Glass		
			Amber Glass		
			White Poly	1	No
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	3	

General Sampling Comments

Signature

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-15
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/4/2009
Sampling Event	May 2009	**Sample Name**	MW15
Sub Area		**Sample Depth**	7
FSDS QA:	TJS 05/13/09	**Easting**	
		Northing	
		TOC	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness) DTP-DTW	(Water Column) DTB-DTW	(Gallons/ft x Water Column) Pore Volume
05/04/09	10:42	14.47	--	4.2	--	10.27	1.67

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	14:50	1.75	0.5	6.85	12.40	418	2.84	-90.8	9.18
	14:58	3.50	0.5	6.80	12.32	418	1.48	-89.2	5.61
Final Field Parameters	15:08	5.25	0.5	6.75	12.29	416	0.59	-87.3	1.24

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	3:20:00 PM	VOA-Glass		
			Amber Glass		
			White Poly	1	No
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	3	

General Sampling Comments

Signature

Maul Foster & Alongi, Inc.

7223 NE Hazel Dell Avenue, Suite B, Vancouver, WA 98665 (360) 694-2691 Fax. (360) 906-1958

Water Field Sampling Data Sheet

Client Name	TrueGuard, LLC	**Sample Location**	MW-16
Project #	9009.01.12	**Sampler**	RGA
Project Name	Washougal	**Sampling Date**	5/7/2009
Sampling Event	May 2009	**Sample Name**	MW16
Sub Area		**Sample Depth**	5
FSDS QA:	TJS 05/13/09	**Easting**	
		Northing	
		TOC	

Hydrology/Level Measurements

Date	Time	DT-Bottom	DT-Product	DT-Water	(Product Thickness) DTP-DTW	(Water Column) DTB-DTW	(Gallons/ft x Water Column) Pore Volume
05/07/09	07:48	13.83	--	2.08	--	11.75	1.92

(0.75" = 0.023 gal/ft) (1" = 0.041 gal/ft) (1.5" = 0.092 gal/ft) (2" = 0.163 gal/ft) (3" = 0.367 gal/ft) (4" = 0.653 gal/ft) (6" = 1.469 gal/ft) (8" = 2.611 gal/ft)

Water Quality Data

Purge Method	Time	Purge Vol (gal)	Flowrate l/min	pH	Temp (C)	E Cond (uS/cm)	DO (mg/L)	EH	Turbidity
(2) Peristaltic Pump	08:05	2.0	0.8	7.61	13.27	572	2.62	-18.4	3.13
	08:20	4.0	0.8	7.57	13.24	586	1.54	-73.8	1.09
Final Field Parameters	08:30	6.0	0.8	7.66	13.30	589	1.03	-90.2	2.46

Methods: (1) Submersible Pump (2) Peristaltic Pump (3) Disposable Bailer (4) Vacuum Pump (5) Dedicated Bailer (6) Inertia Pump (7) Other (specify)

Water Quality Observations: Clear and colorless.

Sample Information

Sampling Method	Sample Type	Sampling Time	Container Code/Preservative	#	Filtered
(2) Peristaltic Pump	Groundwater	8:35:00 AM	VOA-Glass		
			Amber Glass	1	No
			White Poly	2	No/Yes
			Yellow Poly		
			Green Poly		
			Red Total Poly	1	No
			Red Dissolved Poly	1	Yes
			Total Bottles	5	

General Sampling Comments

Signature

ANALYTICAL REPORTS

Specialty Analytical

11711 SE Capps Road
Clackamas, OR 97015
(503) 607-1331
Fax (503) 607-1336

May 15, 2009

Tony Silva
Maul, Foster & Alongi
7223 NE Hazel Dell Avenue
Suite B
Vancouver, WA 98665

TEL: (360) 694-2691
FAX (360) 906-1958

RE: TrueGuard / 9009.01.12

Dear Tony Silva: Order No.: 0905043

Specialty Analytical received 12 samples on 5/5/2009 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Cindy Hillyard
Cindy Hillyard
Project Manager

Technical Review

Specialty Analytical

Date: *15-May-09*

CLIENT: Maul, Foster & Alongi **Lab Order:** 0905043
Project: TrueGuard / 9009.01.12

Lab ID: 0905043-01 **Collection Date:** 5/4/2009 11:15:00 AM
Client Sample ID: MW1 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.0449	0.0100		mg/L	1	5/6/2009 4:32:48 PM
Chromium	ND	0.00500		mg/L	1	5/6/2009 4:32:48 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 4:32:48 PM
Iron	5.05	0.0100		mg/L	1	5/6/2009 4:32:48 PM
Manganese	0.494	0.00100		mg/L	1	5/6/2009 4:32:48 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	9.7	1.0		ug/L	1	5/6/2009 7:00:00 PM

Lab ID: 0905043-02 **Collection Date:** 5/4/2009 10:15:00 AM
Client Sample ID: MW5 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.129	0.0100		mg/L	1	5/6/2009 4:37:54 PM
Chromium	0.00710	0.00500		mg/L	1	5/6/2009 4:37:54 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 4:37:54 PM
Iron	0.620	0.0100		mg/L	1	5/6/2009 4:37:54 PM
Manganese	0.197	0.00100		mg/L	1	5/6/2009 4:37:54 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	3.1	1.0		ug/L	1	5/6/2009 7:07:00 PM

Lab ID: 0905043-03 **Collection Date:** 5/4/2009 12:25:00 PM
Client Sample ID: MW12 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	3.33	0.100		mg/L	10	5/8/2009 12:19:24 PM
Chromium	ND	0.00500		mg/L	1	5/6/2009 4:42:59 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 4:42:59 PM
Iron	40.2	0.0100		mg/L	1	5/6/2009 4:42:59 PM
Manganese	2.12	0.0100		mg/L	10	5/8/2009 12:19:24 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	630	20		ug/L	20	5/7/2009 4:54:00 PM

Specialty Analytical

Date: *15-May-09*

CLIENT: Maul, Foster & Alongi **Lab Order:** 0905043
Project: TrueGuard / 9009.01.12

Lab ID: 0905043-04 **Collection Date:** 5/4/2009 1:15:00 PM
Client Sample ID: MW13 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.879	0.0100		mg/L	1	5/6/2009 4:48:06 PM
Chromium	ND	0.00500		mg/L	1	5/6/2009 4:48:06 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 4:48:06 PM
Iron	17.1	0.0100		mg/L	1	5/6/2009 4:48:06 PM
Manganese	1.39	0.00100		mg/L	1	5/6/2009 4:48:06 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	35	1.0		ug/L	1	5/6/2009 7:21:00 PM

Lab ID: 0905043-05 **Collection Date:** 5/4/2009 1:15:00 PM
Client Sample ID: MW13D **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.803	0.0100		mg/L	1	5/6/2009 4:12:45 PM
Chromium	ND	0.00500		mg/L	1	5/6/2009 4:12:45 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 4:12:45 PM
Iron	15.6	0.0100		mg/L	1	5/6/2009 4:12:45 PM
Manganese	1.30	0.00100		mg/L	1	5/6/2009 4:12:45 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	33	1.0		ug/L	1	5/6/2009 7:28:00 PM

Lab ID: 0905043-06 **Collection Date:** 5/4/2009 2:20:00 PM
Client Sample ID: MW14 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.592	0.0100		mg/L	1	5/6/2009 4:53:14 PM
Chromium	ND	0.00500		mg/L	1	5/6/2009 4:53:14 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 4:53:14 PM
Iron	32.5	0.0100		mg/L	1	5/6/2009 4:53:14 PM
Manganese	3.66	0.0100		mg/L	10	5/8/2009 12:24:28 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	63	1.0		ug/L	1	5/6/2009 7:48:00 PM

Specialty Analytical

Date: *15-May-09*

CLIENT: Maul, Foster & Alongi **Lab Order:** 0905043
Project: TrueGuard / 9009.01.12

Lab ID: 0905043-07 **Collection Date:** 5/4/2009 3:20:00 PM
Client Sample ID: MW15 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	1.34	0.100		mg/L	10	5/8/2009 12:29:32 PM
Chromium	ND	0.00500		mg/L	1	5/6/2009 5:13:32 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 5:13:32 PM
Iron	25.2	0.0100		mg/L	1	5/6/2009 5:13:32 PM
Manganese	3.58	0.0100		mg/L	10	5/8/2009 12:29:32 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	34	1.0		ug/L	1	5/6/2009 7:55:00 PM

Specialty Analytical

Date: *15-May-09*

CLIENT: Maul, Foster & Alongi **Lab Order:** 0905043
Project: TrueGuard / 9009.01.12

Lab ID: 0905043-08 **Collection Date:** 5/5/2009 9:45:00 AM
Client Sample ID: MW10 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.120	0.0100		mg/L	1	5/7/2009 4:43:05 PM
Calcium	18.0	0.0500		mg/L	1	5/7/2009 4:43:05 PM
Chromium	0.00720	0.00500		mg/L	1	5/7/2009 4:43:05 PM
Copper	ND	0.0100		mg/L	1	5/7/2009 4:43:05 PM
Iron	14.6	0.0100		mg/L	1	5/7/2009 4:43:05 PM
Magnesium	7.48	0.100		mg/L	1	5/7/2009 4:43:05 PM
Manganese	1.16	0.00100		mg/L	1	5/7/2009 4:43:05 PM
Potassium	5.18	0.200		mg/L	1	5/7/2009 4:43:05 PM
Sodium	4.66	0.0500		mg/L	1	5/7/2009 4:43:05 PM
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.106	0.0100		mg/L	1	5/6/2009 5:18:35 PM
Chromium	0.00670	0.00500		mg/L	1	5/6/2009 5:18:35 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 5:18:35 PM
Iron	14.4	0.0100		mg/L	1	5/6/2009 5:18:35 PM
Manganese	1.18	0.00100		mg/L	1	5/6/2009 5:18:35 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	4900	100		µg/L	100	5/7/2009 4:27:00 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	5000	100		ug/L	100	5/7/2009 5:01:00 PM
DISSOLVED HEXAVALENT CHROMIUM		**SW7196A**				Analyst: **zau**
Chromium, Hexavalent	ND	0.00500		mg/L	1	5/6/2009
ALKALINITY		**SM2320B**				Analyst: **en**
Alkalinity, Bicarbonate (As CaCO3)	92.4	10.0		mg/L	1	5/7/2009
Alkalinity, Carbonate (As CaCO3)	ND	10.0		mg/L	1	5/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Chloride	3.14	0.500		mg/L	1	5/7/2009
Sulfate	0.510	0.500		mg/L	1	5/7/2009
NITRATE AS N		**E353.2**				Analyst: **en**
Nitrogen, Nitrate (As N)	0.0404	0.0300		mg/L	1	5/6/2009
ORGANIC CARBON, TOTAL		**E415.1**				Analyst: **jrp**
Organic Carbon, Total	2.36	1.00		mg/L	1	5/11/2009

Specialty Analytical

Date: *15-May-09*

CLIENT: Maul, Foster & Alongi
Project: TrueGuard / 9009.01.12
Lab Order: 0905043

Lab ID: 0905043-09
Client Sample ID: MW3
Collection Date: 5/5/2009 8:35:00 AM
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.166	0.0100		mg/L	1	5/7/2009 4:48:07 PM
Calcium	16.0	0.0500		mg/L	1	5/7/2009 4:48:07 PM
Chromium	0.00920	0.00500		mg/L	1	5/7/2009 4:48:07 PM
Copper	ND	0.0100		mg/L	1	5/7/2009 4:48:07 PM
Iron	5.90	0.0100		mg/L	1	5/7/2009 4:48:07 PM
Magnesium	4.57	0.100		mg/L	1	5/7/2009 4:48:07 PM
Manganese	0.866	0.00100		mg/L	1	5/7/2009 4:48:07 PM
Potassium	2.20	0.200		mg/L	1	5/7/2009 4:48:07 PM
Sodium	4.16	0.0500		mg/L	1	5/7/2009 4:48:07 PM
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.173	0.0100		mg/L	1	5/6/2009 5:23:39 PM
Chromium	ND	0.00500		mg/L	1	5/6/2009 5:23:39 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 5:23:39 PM
Iron	5.40	0.0100		mg/L	1	5/6/2009 5:23:39 PM
Manganese	0.872	0.00100		mg/L	1	5/6/2009 5:23:39 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	420	10		µg/L	10	5/14/2009 11:08:00 AM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	400	10		ug/L	10	5/7/2009 5:08:00 PM
DISSOLVED HEXAVALENT CHROMIUM		**SW7196A**				Analyst: **zau**
Chromium, Hexavalent	ND	0.00500		mg/L	1	5/6/2009
ALKALINITY		**SM2320B**				Analyst: **en**
Alkalinity, Bicarbonate (As CaCO3)	65.9	10.0		mg/L	1	5/7/2009
Alkalinity, Carbonate (As CaCO3)	ND	10.0		mg/L	1	5/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Chloride	1.99	0.500		mg/L	1	5/7/2009
Sulfate	ND	0.500		mg/L	1	5/7/2009
NITRATE AS N		**E353.2**				Analyst: **en**
Nitrogen, Nitrate (As N)	ND	0.0300		mg/L	1	5/6/2009
ORGANIC CARBON, TOTAL		**E415.1**				Analyst: **jrp**
Organic Carbon, Total	2.54	1.00		mg/L	1	5/11/2009

Specialty Analytical

Date: *15-May-09*

CLIENT: Maul, Foster & Alongi **Lab Order:** 0905043
Project: TrueGuard / 9009.01.12

Lab ID: 0905043-10 **Collection Date:** 5/5/2009 10:45:00 AM
Client Sample ID: MW6 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.136	0.0100		mg/L	1	5/7/2009 4:53:12 PM
Calcium	38.6	0.0500		mg/L	1	5/7/2009 4:53:12 PM
Chromium	0.00540	0.00500		mg/L	1	5/7/2009 4:53:12 PM
Copper	ND	0.0100		mg/L	1	5/7/2009 4:53:12 PM
Iron	16.3	0.0100		mg/L	1	5/7/2009 4:53:12 PM
Magnesium	14.8	0.100		mg/L	1	5/7/2009 4:53:12 PM
Manganese	2.40	0.0100		mg/L	10	5/8/2009 11:02:46 AM
Potassium	2.19	0.200		mg/L	1	5/7/2009 4:53:12 PM
Sodium	7.86	0.0500		mg/L	1	5/7/2009 4:53:12 PM
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.128	0.0100		mg/L	1	5/6/2009 5:28:44 PM
Chromium	0.00510	0.00500		mg/L	1	5/6/2009 5:28:44 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 5:28:44 PM
Iron	16.4	0.0100		mg/L	1	5/6/2009 5:28:44 PM
Manganese	2.35	0.0100		mg/L	10	5/8/2009 12:34:36 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	5.0	1.0		µg/L	1	5/6/2009 5:25:00 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	4.2	1.0		ug/L	1	5/6/2009 6:33:00 PM
DISSOLVED HEXAVALENT CHROMIUM		**SW7196A**				Analyst: **zau**
Chromium, Hexavalent	ND	0.00500		mg/L	1	5/6/2009
ALKALINITY		**SM2320B**				Analyst: **en**
Alkalinity, Bicarbonate (As CaCO3)	171	10.0		mg/L	1	5/7/2009
Alkalinity, Carbonate (As CaCO3)	ND	10.0		mg/L	1	5/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Chloride	2.77	0.500		mg/L	1	5/7/2009
Sulfate	1.55	0.500		mg/L	1	5/7/2009
NITRATE AS N		**E353.2**				Analyst: **en**
Nitrogen, Nitrate (As N)	0.0352	0.0300		mg/L	1	5/6/2009
ORGANIC CARBON, TOTAL		**E415.1**				Analyst: **jrp**
Organic Carbon, Total	5.60	1.00		mg/L	1	5/11/2009

Specialty Analytical

Date: *15-May-09*

CLIENT: Maul, Foster & Alongi **Lab Order:** 0905043
Project: TrueGuard / 9009.01.12

Lab ID: 0905043-11 **Collection Date:** 5/5/2009 12:40:00 PM
Client Sample ID: MW11 **Matrix:** GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.271	0.0100		mg/L	1	5/7/2009 4:58:15 PM
Calcium	84.2	0.0500		mg/L	1	5/7/2009 4:58:15 PM
Chromium	ND	0.00500		mg/L	1	5/7/2009 4:58:15 PM
Copper	ND	0.0100		mg/L	1	5/7/2009 4:58:15 PM
Iron	53.6	0.0100		mg/L	1	5/7/2009 4:58:15 PM
Magnesium	40.2	0.100		mg/L	1	5/7/2009 4:58:15 PM
Manganese	6.00	0.0100		mg/L	10	5/8/2009 11:07:49 AM
Potassium	16.2	0.200		mg/L	1	5/7/2009 4:58:15 PM
Sodium	10.9	0.0500		mg/L	1	5/7/2009 4:58:15 PM
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.234	0.0100		mg/L	1	5/6/2009 5:33:48 PM
Chromium	0.00520	0.00500		mg/L	1	5/6/2009 5:33:48 PM
Copper	ND	0.0100		mg/L	1	5/6/2009 5:33:48 PM
Iron	52.1	0.0100		mg/L	1	5/6/2009 5:33:48 PM
Manganese	6.25	0.0100		mg/L	10	5/8/2009 12:39:40 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	4000	100		µg/L	100	5/7/2009 4:41:00 PM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	3000	100		ug/L	100	5/7/2009 5:15:00 PM
DISSOLVED HEXAVALENT CHROMIUM		**SW7196A**				Analyst: **zau**
Chromium, Hexavalent	ND	0.00500		mg/L	1	5/6/2009
ALKALINITY		**SM2320B**				Analyst: **en**
Alkalinity, Bicarbonate (As CaCO3)	477	10.0		mg/L	1	5/7/2009
Alkalinity, Carbonate (As CaCO3)	ND	10.0		mg/L	1	5/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Chloride	9.89	0.500		mg/L	1	5/7/2009
Sulfate	ND	0.500		mg/L	1	5/7/2009
NITRATE AS N		**E353.2**				Analyst: **en**
Nitrogen, Nitrate (As N)	0.0666	0.0300		mg/L	1	5/6/2009
ORGANIC CARBON, TOTAL		**E415.1**				Analyst: **jrp**
Organic Carbon, Total	6.88	1.00		mg/L	1	5/11/2009

Specialty Analytical

Date: *15-May-09*

CLIENT: Maul, Foster & Alongi
Project: TrueGuard / 9009.01.12
Lab Order: 0905043

Lab ID: 0905043-12
Collection Date: 5/7/2009 8:35:00 AM
Client Sample ID: MW16
Matrix: GROUNDWATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.465	0.0100		mg/L	1	5/11/2009 5:16:47 PM
Calcium	70.3	0.0500		mg/L	1	5/11/2009 5:16:47 PM
Chromium	ND	0.00500		mg/L	1	5/11/2009 5:16:47 PM
Copper	ND	0.0100		mg/L	1	5/11/2009 5:16:47 PM
Iron	61.8	0.0100		mg/L	1	5/11/2009 5:16:47 PM
Magnesium	20.0	0.100		mg/L	1	5/11/2009 5:16:47 PM
Manganese	5.42	0.0100		mg/L	10	5/13/2009 3:21:51 PM
Potassium	4.95	0.200		mg/L	1	5/11/2009 5:16:47 PM
Sodium	8.74	0.0500		mg/L	1	5/11/2009 5:16:47 PM
DISSOLVED METALS BY ICP		**6010A**				Analyst: **zau**
Boron	0.427	0.0100		mg/L	1	5/8/2009 12:49:47 PM
Chromium	ND	0.00500		mg/L	1	5/8/2009 12:49:47 PM
Copper	ND	0.0100		mg/L	1	5/8/2009 12:49:47 PM
Iron	60.8	0.0100		mg/L	1	5/8/2009 12:49:47 PM
Manganese	5.08	0.0100		mg/L	10	5/8/2009 12:44:43 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	3000	100		µg/L	100	5/14/2009 10:41:00 AM
DISSOLVED METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	2800	100		ug/L	100	5/8/2009 1:28:00 PM
DISSOLVED HEXAVALENT CHROMIUM		**SW7196A**				Analyst: **zau**
Chromium, Hexavalent	ND	0.00500		mg/L	1	5/7/2009
ALKALINITY		**SM2320B**				Analyst: **en**
Alkalinity, Bicarbonate (As CaCO3)	349	10.0		mg/L	1	5/7/2009
Alkalinity, Carbonate (As CaCO3)	ND	10.0		mg/L	1	5/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Chloride	4.02	0.500		mg/L	1	5/12/2009
Sulfate	ND	0.500		mg/L	1	5/12/2009
NITRATE AS N		**E353.2**				Analyst: **en**
Nitrogen, Nitrate (As N)	0.0614	0.0300		mg/L	1	5/8/2009
ORGANIC CARBON, TOTAL		**E415.1**				Analyst: **jrp**
Organic Carbon, Total	3.49	1.00		mg/L	1	5/11/2009

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **MBLK-23176** SampType: **MBLK** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601507**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	0.0100									
Calcium	ND	0.0500									
Chromium	ND	0.00500									
Copper	ND	0.0100									
Iron	ND	0.0100									
Magnesium	0.0573	0.100									J
Manganese	ND	0.00100									
Potassium	ND	0.200									
Sodium	ND	0.0500									

Sample ID **MBLK-23176** SampType: **MBLK** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601620**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	0.0100									
Calcium	ND	0.0500									
Chromium	ND	0.00500									
Copper	ND	0.0100									
Iron	0.0038	0.0100									J
Magnesium	0.0547	0.100									J
Manganese	ND	0.00100									
Potassium	ND	0.200									
Sodium	0.0056	0.0500									J

Sample ID **MBLK-23196** SampType: **MBLK** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/11/2009** Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601891**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	0.0100									

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **MBLK-23196** SampType: **MBLK** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/11/2009** Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601891**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	0.0500									
Chromium	ND	0.00500									
Copper	ND	0.0100									
Iron	ND	0.0100									
Magnesium	0.0622	0.100									J
Manganese	ND	0.00100									
Potassium	ND	0.200									
Sodium	ND	0.0500									

Sample ID **LCS-23176** SampType: **LCS** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601510**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5216	0.0100	0.5	0	104	80	120	0	0		
Calcium	26.09	0.0500	25	0	104	88.6	114	0	0		
Chromium	0.2641	0.00500	0.25	0	106	93.9	113	0	0		
Copper	0.5117	0.0100	0.5	0	102	89.7	117	0	0		
Iron	0.5252	0.0100	0.5	0	105	86.2	117	0	0		
Magnesium	5.164	0.100	5	0.0573	102	87.7	117	0	0		
Manganese	0.052	0.00100	0.05	0	104	94.6	112	0	0		
Potassium	10.32	0.200	10	0	103	84.5	118	0	0		
Sodium	26.09	0.0500	25	0	104	83.8	121	0	0		

Sample ID **LCS-23176** SampType: **LCS** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601621**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4866	0.0100	0.5	0	97.3	80	120	0	0		
Calcium	25.54	0.0500	25	0	102	88.6	114	0	0		
Chromium	0.2541	0.00500	0.25	0	102	93.9	113	0	0		
Copper	0.4887	0.0100	0.5	0	97.7	89.7	117	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **LCS-23176**	SampType: **LCS**	TestCode: **6010_W**	Units: **mg/L**	Prep Date: **5/7/2009**	Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ**	Batch ID: **23176**	TestNo: **E6010A**		Analysis Date: **5/8/2009**	SeqNo: **601621**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	0.5034	0.0100	0.5	0.0038	99.9	86.2	117	0	0		
Magnesium	5.042	0.100	5	0.0547	99.7	87.7	117	0	0		
Manganese	0.0495	0.00100	0.05	0	99	94.6	112	0	0		
Potassium	9.885	0.200	10	0	98.8	84.5	118	0	0		
Sodium	24.57	0.0500	25	0.0056	98.3	83.8	121	0	0		

Sample ID **LCS-23196**	SampType: **LCS**	TestCode: **6010_W**	Units: **mg/L**	Prep Date: **5/11/2009**	Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ**	Batch ID: **23196**	TestNo: **E6010A**		Analysis Date: **5/11/2009**	SeqNo: **601892**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5373	0.0100	0.5	0	107	80	120	0	0		
Calcium	27.47	0.0500	25	0	110	88.6	114	0	0		
Chromium	0.2746	0.00500	0.25	0	110	93.9	113	0	0		
Copper	0.5317	0.0100	0.5	0	106	89.7	117	0	0		
Iron	0.5402	0.0100	0.5	0	108	86.2	117	0	0		
Magnesium	5.361	0.100	5	0	107	87.7	117	0	0		
Manganese	0.0527	0.00100	0.05	0	105	94.6	112	0	0		
Potassium	10.66	0.200	10	0	107	84.5	118	0	0		
Sodium	26.37	0.0500	25	0	105	83.8	121	0	0		

Sample ID **A0905039-03CMS**	SampType: **MS**	TestCode: **6010_W**	Units: **mg/L**	Prep Date: **5/7/2009**	Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ**	Batch ID: **23176**	TestNo: **E6010A**		Analysis Date: **5/7/2009**	SeqNo: **601513**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5258	0.0100	0.5	0.0019	105	88.2	118	0	0		
Calcium	26.4	0.0500	25	0.1029	105	78.9	125	0	0		
Chromium	0.2677	0.00500	0.25	0	107	93.4	112	0	0		
Copper	0.5154	0.0100	0.5	0.0054	102	92.7	114	0	0		
Iron	0.721	0.0100	0.5	0.1975	105	75	125	0	0		
Magnesium	5.249	0.100	5	0.0766	103	77.4	124	0	0		
Manganese	0.0584	0.00100	0.05	0.0058	105	83.9	118	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **A0905039-03CMS** SampType: **MS** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601513**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Potassium	10.5	0.200	10	0.127	104	75	125	0	0		
Sodium	26.37	0.0500	25	0.1785	105	87.5	121	0	0		

Sample ID **A0905039-03CMS** SampType: **MS** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601624**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4888	0.0100	0.5	0	97.8	88.2	118	0	0		
Calcium	26.06	0.0500	25	0.1314	104	78.9	125	0	0		
Chromium	0.2524	0.00500	0.25	0.0014	100	93.4	112	0	0		
Copper	0.4901	0.0100	0.5	0	98	92.7	114	0	0		
Iron	0.6891	0.0100	0.5	0.1864	101	75	125	0	0		
Magnesium	5.133	0.100	5	0.0755	101	77.4	124	0	0		
Manganese	0.0553	0.00100	0.05	0.006	98.6	83.9	118	0	0		
Potassium	10.16	0.200	10	0.1863	99.7	75	125	0	0		
Sodium	25.01	0.0500	25	0.1606	99.4	87.5	121	0	0		

Sample ID **A0905057-03CMS** SampType: **MS** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/11/2009** Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601896**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5461	0.0100	0.5	0	109	88.2	118	0	0		
Calcium	27.44	0.0500	25	0.4327	108	78.9	125	0	0		
Chromium	0.2726	0.00500	0.25	0.0022	108	93.4	112	0	0		
Copper	0.5436	0.0100	0.5	0	109	92.7	114	0	0		
Iron	1.208	0.0100	0.5	0.5817	125	75	125	0	0		S
Magnesium	5.582	0.100	5	0.1358	109	77.4	124	0	0		
Manganese	0.0681	0.00100	0.05	0.0159	104	83.9	118	0	0		
Potassium	11.96	0.200	10	0.9722	110	75	125	0	0		
Sodium	27.57	0.0500	25	0.4681	108	87.5	121	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Sample ID **A0905039-03CMSD** SampType: **MSD** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601514**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5337	0.0100	0.5	0.0019	106	88.2	118	0.5258	1.49	20	
Calcium	26.56	0.0500	25	0.1029	106	78.9	125	26.4	0.604	20	
Chromium	0.2749	0.00500	0.25	0	110	93.4	112	0.2677	2.65	20	
Copper	0.5294	0.0100	0.5	0.0054	105	92.7	114	0.5154	2.68	20	
Iron	0.7341	0.0100	0.5	0.1975	107	75	125	0.721	1.80	20	
Magnesium	5.387	0.100	5	0.0766	106	77.4	124	5.249	2.59	20	
Manganese	0.06	0.00100	0.05	0.0058	108	83.9	118	0.0584	2.70	20	
Potassium	10.48	0.200	10	0.127	104	75	125	10.5	0.191	20	
Sodium	26.46	0.0500	25	0.1785	105	87.5	121	26.37	0.341	20	

Sample ID **A0905039-03CMSD** SampType: **MSD** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601625**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5026	0.0100	0.5	0	101	88.2	118	0.4888	2.78	20	
Calcium	26.2	0.0500	25	0.1314	104	78.9	125	26.06	0.536	20	
Chromium	0.2581	0.00500	0.25	0.0014	103	93.4	112	0.2524	2.23	20	
Copper	0.5029	0.0100	0.5	0	101	92.7	114	0.4901	2.58	20	
Iron	0.704	0.0100	0.5	0.1864	104	75	125	0.6891	2.14	20	
Magnesium	5.205	0.100	5	0.0755	103	77.4	124	5.133	1.39	20	
Manganese	0.0567	0.00100	0.05	0.006	101	83.9	118	0.0553	2.50	20	
Potassium	10.44	0.200	10	0.1863	103	75	125	10.16	2.72	20	
Sodium	25.14	0.0500	25	0.1606	99.9	87.5	121	25.01	0.518	20	

Sample ID **A0905057-03CMSD** SampType: **MSD** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/11/2009** Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601897**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5415	0.0100	0.5	0	108	88.2	118	0.5461	0.846	20	
Calcium	27.59	0.0500	25	0.4327	109	78.9	125	27.44	0.545	20	
Chromium	0.2741	0.00500	0.25	0.0022	109	93.4	112	0.2726	0.549	20	

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **A0905057-03CMSD** SampType: **MSD** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/11/2009** Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601897**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	0.5432	0.0100	0.5	0	109	92.7	114	0.5436	0.0736	20	
Iron	1.215	0.0100	0.5	0.5817	127	75	125	1.208	0.578	20	S
Magnesium	5.636	0.100	5	0.1358	110	77.4	124	5.582	0.963	20	
Manganese	0.0683	0.00100	0.05	0.0159	105	83.9	118	0.0681	0.293	20	
Potassium	11.89	0.200	10	0.9722	109	75	125	11.96	0.587	20	
Sodium	27.5	0.0500	25	0.4681	108	87.5	121	27.57	0.254	20	

Sample ID **A0905039-03CDUP** SampType: **DUP** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601512**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	0.0100	0	0	0	0	0	0.0019	0	20	
Calcium	0.1032	0.0500	0	0	0	0	0	0.1029	0.291	20	
Chromium	ND	0.00500	0	0	0	0	0	0	0	20	
Copper	0.0044	0.0100	0	0	0	0	0	0.0054	0	20	J
Iron	0.1946	0.0100	0	0	0	0	0	0.1975	1.48	20	
Magnesium	0.0802	0.100	0	0	0	0	0	0.0766	0	20	J
Manganese	0.0059	0.00100	0	0	0	0	0	0.0058	1.71	20	
Potassium	0.1698	0.200	0	0	0	0	0	0.127	0	20	J
Sodium	0.1754	0.0500	0	0	0	0	0	0.1785	1.75	20	

Sample ID **A0905039-03CDUP** SampType: **DUP** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601623**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	0.0100	0	0	0	0	0	0	0	20	
Calcium	0.1421	0.0500	0	0	0	0	0	0.1314	7.82	20	
Chromium	ND	0.00500	0	0	0	0	0	0.0014	0	20	
Copper	0.002	0.0100	0	0	0	0	0	0	0	20	J
Iron	0.1846	0.0100	0	0	0	0	0	0.1864	0.970	20	
Magnesium	0.078	0.100	0	0	0	0	0	0.0755	0	20	J

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **A0905039-03CDUP** SampType: **DUP** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/7/2009** Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601623**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	0.0054	0.00100	0	0	0	0	0	0.006	10.5	20	
Potassium	0.2119	0.200	0	0	0	0	0	0.1863	12.9	20	
Sodium	0.1645	0.0500	0	0	0	0	0	0.1606	2.40	20	

Sample ID **A0905057-03CDUP** SampType: **DUP** TestCode: **6010_W** Units: **mg/L** Prep Date: **5/11/2009** Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601895**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	0.0100	0	0	0	0	0	0	0	20	
Calcium	0.4096	0.0500	0	0	0	0	0	0.4327	5.48	20	
Chromium	0.0008	0.00500	0	0	0	0	0	0.0022	0	20	J
Copper	ND	0.0100	0	0	0	0	0	0	0	20	
Iron	0.5203	0.0100	0	0	0	0	0	0.5817	11.1	20	
Magnesium	0.1292	0.100	0	0	0	0	0	0.1358	4.98	20	
Manganese	0.015	0.00100	0	0	0	0	0	0.0159	5.83	20	
Potassium	0.8824	0.200	0	0	0	0	0	0.9722	9.68	20	
Sodium	0.4469	0.0500	0	0	0	0	0	0.4681	4.63	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601506**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5207	0.0100	0.5	0	104	90	110	0	0		
Calcium	26.07	0.0500	25	0	104	90	110	0	0		
Chromium	0.2612	0.00500	0.25	0	104	90	110	0	0		
Copper	0.5102	0.0100	0.5	0	102	90	110	0	0		
Iron	0.5106	0.0100	0.5	0	102	90	110	0	0		
Magnesium	5.106	0.100	5	0	102	90	110	0	0		
Manganese	0.0517	0.00100	0.05	0	103	90	110	0	0		
Potassium	10.2	0.200	10	0	102	90	110	0	0		
Sodium	25.32	0.0500	25	0	101	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601509**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.529	0.0100	0.5	0	106	90	110	0	0		
Calcium	26.86	0.0500	25	0	107	90	110	0	0		
Chromium	0.2672	0.00500	0.25	0	107	90	110	0	0		
Copper	0.5158	0.0100	0.5	0	103	90	110	0	0		
Iron	0.5349	0.0100	0.5	0	107	90	110	0	0		
Magnesium	5.216	0.100	5	0	104	90	110	0	0		
Manganese	0.0528	0.00100	0.05	0	106	90	110	0	0		
Potassium	10.47	0.200	10	0	105	90	110	0	0		
Sodium	26.01	0.0500	25	0	104	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601517**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4991	0.0100	0.5	0	99.8	90	110	0	0		
Calcium	26.03	0.0500	25	0	104	90	110	0	0		
Chromium	0.2652	0.00500	0.25	0	106	90	110	0	0		
Copper	0.4907	0.0100	0.5	0	98.1	90	110	0	0		
Iron	0.5028	0.0100	0.5	0	101	90	110	0	0		
Magnesium	4.97	0.100	5	0	99.4	90	110	0	0		
Manganese	0.0516	0.00100	0.05	0	103	90	110	0	0		
Potassium	9.347	0.200	10	0	93.5	90	110	0	0		
Sodium	24.24	0.0500	25	0	97	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601522**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4985	0.0100	0.5	0	99.7	90	110	0	0		
Calcium	25.95	0.0500	25	0	104	90	110	0	0		
Chromium	0.2613	0.00500	0.25	0	105	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601522**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	0.4909	0.0100	0.5	0	98.2	90	110	0	0		
Iron	0.4967	0.0100	0.5	0	99.3	90	110	0	0		
Magnesium	4.978	0.100	5	0	99.6	90	110	0	0		
Manganese	0.0511	0.00100	0.05	0	102	90	110	0	0		
Potassium	9.416	0.200	10	0	94.2	90	110	0	0		
Sodium	23.82	0.0500	25	0	95.3	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601612**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	0.0496	0.00100	0.05	0	99.2	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601615**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	0.0499	0.00100	0.05	0	99.8	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601628**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4977	0.0100	0.5	0	99.5	90	110	0	0		
Calcium	26.12	0.0500	25	0	104	90	110	0	0		
Chromium	0.2533	0.00500	0.25	0	101	90	110	0	0		
Copper	0.4839	0.0100	0.5	0	96.8	90	110	0	0		
Iron	0.5014	0.0100	0.5	0	100	90	110	0	0		
Magnesium	5.001	0.100	5	0	100	90	110	0	0		
Manganese	0.0496	0.00100	0.05	0	99.2	90	110	0	0		
Potassium	9.878	0.200	10	0	98.8	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601628**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	24.14	0.0500	25	0	96.6	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601834**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	25.2	0.0500	25	0	101	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601890**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.525	0.0100	0.5	0	105	90	110	0	0		
Calcium	26.28	0.0500	25	0	105	90	110	0	0		
Chromium	0.2689	0.00500	0.25	0	108	90	110	0	0		
Copper	0.5176	0.0100	0.5	0	104	90	110	0	0		
Iron	0.5316	0.0100	0.5	0	106	90	110	0	0		
Magnesium	5.207	0.100	5	0	104	90	110	0	0		
Manganese	0.0515	0.00100	0.05	0	103	90	110	0	0		
Potassium	10.19	0.200	10	0	102	90	110	0	0		
Sodium	25.19	0.0500	25	0	101	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601901**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.518	0.0100	0.5	0	104	90	110	0	0		
Calcium	26.51	0.0500	25	0	106	90	110	0	0		
Chromium	0.2637	0.00500	0.25	0	105	90	110	0	0		
Copper	0.5054	0.0100	0.5	0	101	90	110	0	0		
Iron	0.5209	0.0100	0.5	0	104	90	110	0	0		

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601901**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Magnesium	5.099	0.100	5	0	102	90	110	0	0		
Manganese	0.0509	0.00100	0.05	0	102	90	110	0	0		
Potassium	10.15	0.200	10	0	102	90	110	0	0		
Sodium	24.77	0.0500	25	0	99.1	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601977**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5117	0.0100	0.5	0	102	90	110	0	0		
Calcium	26.43	0.0500	25	0	106	90	110	0	0		
Chromium	0.2602	0.00500	0.25	0	104	90	110	0	0		
Copper	0.5046	0.0100	0.5	0	101	90	110	0	0		
Iron	0.5107	0.0100	0.5	0	102	90	110	0	0		
Magnesium	5.096	0.100	5	0	102	90	110	0	0		
Potassium	10.03	0.200	10	0	100	90	110	0	0		
Sodium	24.21	0.0500	25	0	96.8	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601979**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5307	0.0100	0.5	0	106	90	110	0	0		
Calcium	26.48	0.0500	25	0	106	90	110	0	0		
Chromium	0.2661	0.00500	0.25	0	106	90	110	0	0		
Copper	0.5281	0.0100	0.5	0	106	90	110	0	0		
Iron	0.5276	0.0100	0.5	0	106	90	110	0	0		
Magnesium	5.311	0.100	5	0	106	90	110	0	0		
Potassium	10.43	0.200	10	0	104	90	110	0	0		
Sodium	25.35	0.0500	25	0	101	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/13/2009** SeqNo: **602220**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	0.0501	0.00100	0.05	0	100	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/7/2009** SeqNo: **601505**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5109	0.0100	0.5	0	102	90	110	0	0		
Calcium	25.51	0.0500	25	0	102	90	110	0	0		
Chromium	0.2619	0.00500	0.25	0	105	90	110	0	0		
Copper	0.5031	0.0100	0.5	0	101	90	110	0	0		
Iron	0.5058	0.0100	0.5	0	101	90	110	0	0		
Magnesium	5.041	0.100	5	0	101	90	110	0	0		
Manganese	0.0516	0.00100	0.05	0	103	90	110	0	0		
Potassium	9.737	0.200	10	0	97.4	90	110	0	0		
Sodium	24.7	0.0500	25	0	98.8	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090507D**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601604**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	0.0493	0.00100	0.05	0	98.6	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601619**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4998	0.0100	0.5	0	100	90	110	0	0		
Calcium	25.54	0.0500	25	0	102	90	110	0	0		
Chromium	0.2524	0.00500	0.25	0	101	90	110	0	0		
Copper	0.4867	0.0100	0.5	0	97.3	90	110	0	0		
Iron	0.5048	0.0100	0.5	0	101	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/8/2009** SeqNo: **601619**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Magnesium	5.037	0.100	5	0	101	90	110	0	0		
Manganese	0.0493	0.00100	0.05	0	98.6	90	110	0	0		
Potassium	10.12	0.200	10	0	101	90	110	0	0		
Sodium	24.98	0.0500	25	0	99.9	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090508A**
Client ID: **ZZZZZ** Batch ID: **23176** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601832**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	24.44	0.0500	25	0	97.8	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/11/2009** SeqNo: **601889**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5078	0.0100	0.5	0	102	90	110	0	0		
Calcium	25.04	0.0500	25	0	100	90	110	0	0		
Chromium	0.2568	0.00500	0.25	0	103	90	110	0	0		
Copper	0.4916	0.0100	0.5	0	98.3	90	110	0	0		
Iron	0.4957	0.0100	0.5	0	99.1	90	110	0	0		
Magnesium	4.957	0.100	5	0	99.1	90	110	0	0		
Manganese	0.0491	0.00100	0.05	0	98.2	90	110	0	0		
Potassium	9.865	0.200	10	0	98.6	90	110	0	0		
Sodium	24.44	0.0500	25	0	97.8	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090511B**
Client ID: **ZZZZZ** Batch ID: **23196** TestNo: **E6010A** Analysis Date: **5/13/2009** SeqNo: **602210**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	0.0502	0.00100	0.05	0	100	90	110	0	0		

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_WDIS

Sample ID **0905043-05CMS** SampType: **MS** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: **5/6/2009** Run ID: **TJA IRIS_090506C**
Client ID: **MW13D** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **600995**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	0.2606	0.00500	0.25	0.0029	103	93.4	112	0	0		
Copper	0.4894	0.0100	0.5	0	97.9	92.7	114	0	0		
Iron	15.02	0.0100	0.5	15.6	-116	75	125	0	0		S,MC
Manganese	1.266	0.00100	0.05	1.303	-74	83.9	118	0	0		S,MC

Sample ID **0905043-05CMS** SampType: **MS** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: **5/6/2009** Run ID: **TJA IRIS_090506C**
Client ID: **MW13D** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/8/2009** SeqNo: **601632**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	3.03	0.0500	2.5	0.8025	89.1	88.2	118	0	0		

Sample ID **0905043-05CMSD** SampType: **MSD** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: **5/6/2009** Run ID: **TJA IRIS_090506C**
Client ID: **MW13D** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **600996**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	0.2753	0.00500	0.25	0.0029	109	93.4	112	0.2606	5.49	20	
Copper	0.518	0.0100	0.5	0	104	92.7	114	0.4894	5.68	20	
Iron	15	0.0100	0.5	15.6	-120	75	125	15.02	0.133	20	S,MC
Manganese	1.267	0.00100	0.05	1.303	-72	83.9	118	1.266	0.0790	20	S,MC

Sample ID **0905043-05CMSD** SampType: **MSD** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: **5/6/2009** Run ID: **TJA IRIS_090506C**
Client ID: **MW13D** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/8/2009** SeqNo: **601633**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	3.072	0.0500	2.5	0.8025	90.8	88.2	118	3.03	1.38	20	

Sample ID **0905043-05CDUP** SampType: **DUP** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: **5/6/2009** Run ID: **TJA IRIS_090506C**
Client ID: **MW13D** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **600994**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_WDIS

Sample ID **0905043-05CDUP** SampType: **DUP** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: **5/6/2009** Run ID: **TJA IRIS_090506C**
Client ID: **MW13D** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **600994**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.7897	0.0100	0	0	0	0	0	0.8025	1.61	20	
Chromium	0.0027	0.00500	0	0	0	0	0	0.0029	0	20	J
Copper	ND	0.0100	0	0	0	0	0	0	0	20	
Iron	15.31	0.0100	0	0	0	0	0	15.6	1.88	20	
Manganese	1.282	0.00100	0	0	0	0	0	1.303	1.62	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **600991**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4998	0.0100	0.5	0	100	90	110	0	0		
Chromium	0.2592	0.00500	0.25	0	104	90	110	0	0		
Copper	0.4943	0.0100	0.5	0	98.9	90	110	0	0		
Iron	0.5024	0.0100	0.5	0	100	90	110	0	0		
Manganese	0.0514	0.00100	0.05	0	103	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **601002**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5011	0.0100	0.5	0	100	90	110	0	0		
Chromium	0.2519	0.00500	0.25	0	101	90	110	0	0		
Copper	0.4838	0.0100	0.5	0	96.8	90	110	0	0		
Iron	0.5148	0.0100	0.5	0	103	90	110	0	0		
Manganese	0.0513	0.00100	0.05	0	103	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **601008**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4862	0.0100	0.5	0	97.2	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_WDIS

Sample ID **CCV** SampType: **CCV** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **601008**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	0.2525	0.00500	0.25	0	101	90	110	0	0		
Copper	0.4747	0.0100	0.5	0	94.9	90	110	0	0		
Iron	0.4983	0.0100	0.5	0	99.7	90	110	0	0		
Manganese	0.0503	0.00100	0.05	0	101	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/8/2009** SeqNo: **601631**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4819	0.0100	0.5	0	96.4	90	110	0	0		
Chromium	0.2515	0.00500	0.25	0	101	90	110	0	0		
Copper	0.4777	0.0100	0.5	0	95.5	90	110	0	0		
Iron	0.5128	0.0100	0.5	0	103	90	110	0	0		
Manganese	0.0499	0.00100	0.05	0	99.8	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/8/2009** SeqNo: **601641**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4893	0.0100	0.5	0	97.9	90	110	0	0		
Chromium	0.25	0.00500	0.25	0	100	90	110	0	0		
Copper	0.4836	0.0100	0.5	0	96.7	90	110	0	0		
Iron	0.5065	0.0100	0.5	0	101	90	110	0	0		
Manganese	0.0499	0.00100	0.05	0	99.8	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_WDIS** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ** Batch ID: **23165** TestNo: **6010A** Analysis Date: **5/6/2009** SeqNo: **600988**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5062	0.0100	0.5	0	101	90	110	0	0		
Chromium	0.2585	0.00500	0.25	0	103	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_WDIS

Sample ID **ICV**	SampType: **ICV**	TestCode: **6010_WDIS**	Units: **mg/L**	Prep Date:	Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ**	Batch ID: **23165**	TestNo: **6010A**		Analysis Date: **5/6/2009**	SeqNo: **600988**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	0.5005	0.0100	0.5	0	100	90	110	0	0		
Iron	0.4993	0.0100	0.5	0	99.9	90	110	0	0		
Manganese	0.0509	0.00100	0.05	0	102	90	110	0	0		

Sample ID **ICV**	SampType: **ICV**	TestCode: **6010_WDIS**	Units: **mg/L**	Prep Date:	Run ID: **TJA IRIS_090506C**
Client ID: **ZZZZZ**	Batch ID: **23165**	TestNo: **6010A**		Analysis Date: **5/8/2009**	SeqNo: **601630**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4998	0.0100	0.5	0	100	90	110	0	0		
Chromium	0.2524	0.00500	0.25	0	101	90	110	0	0		
Copper	0.4867	0.0100	0.5	0	97.3	90	110	0	0		
Iron	0.5048	0.0100	0.5	0	101	90	110	0	0		
Manganese	0.0493	0.00100	0.05	0	98.6	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **MBLK-23163** SampType: **MBLK** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600942**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	1.0									

Sample ID **MBLK-23163** SampType: **MBLK** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602005**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	1.0									

Sample ID **MBLK-23202** SampType: **MBLK** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/12/2009** Run ID: **ICPMS_090514A**
Client ID: **ZZZZZ** Batch ID: **23202** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602388**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	1.0									

Sample ID **LCS-23163** SampType: **LCS** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600943**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	47.18	1.0	50	0	94.4	80	120	0	0		

Sample ID **LCS-23163** SampType: **LCS** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602006**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	47.18	1.0	50	0	94.4	80	120	0	0		

Sample ID **LCS-23202** SampType: **LCS** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/12/2009** Run ID: **ICPMS_090514A**
Client ID: **ZZZZZ** Batch ID: **23202** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602389**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **LCS-23202** SampType: **LCS** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/12/2009** Run ID: **ICPMS_090514A**
Client ID: **ZZZZZ** Batch ID: **23202** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602389**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	47.14	1.0	50	0	94.3	80	120	0	0		

Sample ID **A0905031-03CMS** SampType: **MS** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600946**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.8	1.0	50	1.653	96.3	70	130	0	0		

Sample ID **A0905031-03CMS** SampType: **MS** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602009**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.8	1.0	50	1.653	96.3	70	130	0	0		

Sample ID **0905043-12BMS** SampType: **MS** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/12/2009** Run ID: **ICPMS_090514A**
Client ID: **MW16** Batch ID: **23202** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602392**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	3094	100	50	2994	200	70	130	0	0		S,MC

Sample ID **A0905031-03CMSD** SampType: **MSD** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600947**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	48.96	1.0	50	1.653	94.6	70	130	49.8	1.70	20	

Sample ID **A0905031-03CMSD** SampType: **MSD** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **A0905031-03CMSD** SampType: **MSD** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602010**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	48.96	1.0	50	1.653	94.6	70	130	49.8	1.70	20	

Sample ID **0905043-12BMSD** SampType: **MSD** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/12/2009** Run ID: **ICPMS_090514A**
Client ID: **MW16** Batch ID: **23202** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602393**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	3060	100	50	2994	132	70	130	3094	1.10	20	S,MC

Sample ID **A0905031-03CDUP** SampType: **DUP** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600945**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	1.657	1.0	0	0	0	0	0	1.653	0.242	20	

Sample ID **A0905031-03CDUP** SampType: **DUP** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/6/2009** Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602008**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	1.657	1.0	0	0	0	0	0	1.653	0.242	20	

Sample ID **0905043-12BDUP** SampType: **DUP** TestCode: **6020_W** Units: **µg/L** Prep Date: **5/12/2009** Run ID: **ICPMS_090514A**
Client ID: **MW16** Batch ID: **23202** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602391**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	3084	100	0	0	0	0	0	2994	2.96	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600941**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600941**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.69	1.0	50	0	101	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600948**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.27	1.0	50	0	101	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600955**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.73	1.0	50	0	99.5	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600964**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.71	1.0	50	0	99.4	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/7/2009** SeqNo: **601296**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	52.61	1.0	50	0	105	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/7/2009** SeqNo: **601301**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/7/2009** SeqNo: **601301**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	51.99	1.0	50	0	104	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602004**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.69	1.0	50	0	101	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602011**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.27	1.0	50	0	101	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602012**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.73	1.0	50	0	99.5	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602014**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.71	1.0	50	0	99.4	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602386**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602386**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.88	1.0	50	0	102	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090514A**
Client ID: **ZZZZZ** Batch ID: **23202** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602395**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.88	1.0	50	0	102	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600940**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.79	1.0	50	0	99.6	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/7/2009** SeqNo: **601291**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	52.16	1.0	50	0	104	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506E**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **602003**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.79	1.0	50	0	99.6	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602378**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit S - Spike Recovery outside accepted recovery limits B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090506C**
Client ID: **ZZZZZ** Batch ID: **23163** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602378**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	51.44	1.0	50	0	103	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090514A**
Client ID: **ZZZZZ** Batch ID: **23202** TestNo: **SW6020** Analysis Date: **5/14/2009** SeqNo: **602387**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	51.44	1.0	50	0	103	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_WDISS

Sample ID **0905043-10CMS**	SampType: **MS**	TestCode: **6020_WDISS**	Units: **ug/L**	Prep Date: **5/6/2009**	Run ID: **ICPMS_090506A**
Client ID: **MW6**	Batch ID: **23164**	TestNo: **SW6020**		Analysis Date: **5/6/2009**	SeqNo: **600911**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	56.22	1.0	50	4.242	104	70	130	0	0		

Sample ID **0905043-10CMSD**	SampType: **MSD**	TestCode: **6020_WDISS**	Units: **ug/L**	Prep Date: **5/6/2009**	Run ID: **ICPMS_090506A**
Client ID: **MW6**	Batch ID: **23164**	TestNo: **SW6020**		Analysis Date: **5/6/2009**	SeqNo: **600912**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	56.54	1.0	50	4.242	105	70	130	56.22	0.568	20	

Sample ID **0905043-10CDUP**	SampType: **DUP**	TestCode: **6020_WDISS**	Units: **ug/L**	Prep Date: **5/6/2009**	Run ID: **ICPMS_090506A**
Client ID: **MW6**	Batch ID: **23164**	TestNo: **SW6020**		Analysis Date: **5/6/2009**	SeqNo: **600910**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	4.35	1.0	0	0	0	0	0	4.242	2.51	20	

Sample ID **CCV**	SampType: **CCV**	TestCode: **6020_WDISS**	Units: **ug/L**	Prep Date:	Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ**	Batch ID: **23164**	TestNo: **SW6020**		Analysis Date: **5/6/2009**	SeqNo: **600907**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.71	1.0	50	0	99.4	90	110	0	0		

Sample ID **CCV**	SampType: **CCV**	TestCode: **6020_WDISS**	Units: **ug/L**	Prep Date:	Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ**	Batch ID: **23164**	TestNo: **SW6020**		Analysis Date: **5/6/2009**	SeqNo: **600918**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.51	1.0	50	0	101	90	110	0	0		

Sample ID **CCV**	SampType: **CCV**	TestCode: **6020_WDISS**	Units: **ug/L**	Prep Date:	Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ**	Batch ID: **23164**	TestNo: **SW6020**		Analysis Date: **5/6/2009**	SeqNo: **600924**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_WDISS

Sample ID **CCV** SampType: **CCV** TestCode: **6020_WDISS** Units: **ug/L** Prep Date: Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ** Batch ID: **23164** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600924**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	54.34	1.0	50	0	109	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_WDISS** Units: **ug/L** Prep Date: Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ** Batch ID: **23164** TestNo: **SW6020** Analysis Date: **5/7/2009** SeqNo: **601315**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	52.61	1.0	50	0	105	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_WDISS** Units: **ug/L** Prep Date: Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ** Batch ID: **23164** TestNo: **SW6020** Analysis Date: **5/7/2009** SeqNo: **601320**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	51.99	1.0	50	0	104	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_WDISS** Units: **ug/L** Prep Date: Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ** Batch ID: **23164** TestNo: **SW6020** Analysis Date: **5/8/2009** SeqNo: **601664**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	52.65	1.0	50	0	105	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_WDISS** Units: **ug/L** Prep Date: Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ** Batch ID: **23164** TestNo: **SW6020** Analysis Date: **5/6/2009** SeqNo: **600906**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.79	1.0	50	0	99.6	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_WDISS** Units: **ug/L** Prep Date: Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ** Batch ID: **23164** TestNo: **SW6020** Analysis Date: **5/7/2009** SeqNo: **601314**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_WDISS

Sample ID **ICV** SampType: **ICV** TestCode: **6020_WDISS** Units: **ug/L** Prep Date: Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ** Batch ID: **23164** TestNo: **SW6020** Analysis Date: **5/7/2009** SeqNo: **601314**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	52.16	1.0	50	0	104	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_WDISS** Units: **ug/L** Prep Date: Run ID: **ICPMS_090506A**
Client ID: **ZZZZZ** Batch ID: **23164** TestNo: **SW6020** Analysis Date: **5/8/2009** SeqNo: **601662**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	53.05	1.0	50	0	106	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
S - Spike Recovery outside accepted recovery limits
B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits
R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: ALK_CWA

Sample ID: **MB-R55800** SampType: **MBLK** TestCode: **ALK_CWA** Units: **mg/L** Prep Date: Run ID: **MANTECH_090507A**
Client ID: **ZZZZZ** Batch ID: **R55800** TestNo: **SM2320B** Analysis Date: **5/7/2009** SeqNo: **601264**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Bicarbonate (As CaCO3)	1.81	10.0									J
Alkalinity, Carbonate (As CaCO3)	ND	10.0									
Alkalinity, Total (As CaCO3)	1.81	10.0									J

Sample ID: **LCS-R55800** SampType: **LCS** TestCode: **ALK_CWA** Units: **mg/L** Prep Date: Run ID: **MANTECH_090507A**
Client ID: **ZZZZZ** Batch ID: **R55800** TestNo: **SM2320B** Analysis Date: **5/7/2009** SeqNo: **601263**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	292.2	10.0	300	1.81	96.8	87.5	111	0	0		

Sample ID: **0905043-08AMS** SampType: **MS** TestCode: **ALK_CWA** Units: **mg/L** Prep Date: Run ID: **MANTECH_090507A**
Client ID: **MW10** Batch ID: **R55800** TestNo: **SM2320B** Analysis Date: **5/7/2009** SeqNo: **601256**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	175.1	10.0	100	92.38	82.7	80	100	0	0		

Sample ID: **0905043-08AMSD** SampType: **MSD** TestCode: **ALK_CWA** Units: **mg/L** Prep Date: Run ID: **MANTECH_090507A**
Client ID: **MW10** Batch ID: **R55800** TestNo: **SM2320B** Analysis Date: **5/7/2009** SeqNo: **601257**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	177.5	10.0	100	92.38	85.1	80	120	175.1	1.37	20	

Sample ID: **CCV** SampType: **CCV** TestCode: **ALK_CWA** Units: **mg/L** Prep Date: Run ID: **MANTECH_090507A**
Client ID: **ZZZZZ** Batch ID: **R55800** TestNo: **SM2320B** Analysis Date: **5/7/2009** SeqNo: **601262**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	235.7	10.0	250	0	94.3	80	120	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: CR6_WDISS

Sample ID **MBLK** SampType: **MBLK** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090506A**
Client ID: **ZZZZZ** Batch ID: **R55755** TestNo: **SW7196A** Analysis Date: **5/6/2009** SeqNo: **600673**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.00500									

Sample ID **MBLK** SampType: **MBLK** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090507A**
Client ID: **ZZZZZ** Batch ID: **R55782** TestNo: **SW7196A** Analysis Date: **5/7/2009** SeqNo: **601085**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.00500									

Sample ID **LCS** SampType: **LCS** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090506A**
Client ID: **ZZZZZ** Batch ID: **R55755** TestNo: **SW7196A** Analysis Date: **5/6/2009** SeqNo: **600674**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.04717	0.00500	0.05	0	94.3	80	120	0	0		

Sample ID **LCS** SampType: **LCS** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090507A**
Client ID: **ZZZZZ** Batch ID: **R55782** TestNo: **SW7196A** Analysis Date: **5/7/2009** SeqNo: **601086**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.04635	0.00500	0.05	0	92.7	80	120	0	0		

Sample ID **0905043-09DMS** SampType: **MS** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090506A**
Client ID: **MW3** Batch ID: **R55755** TestNo: **SW7196A** Analysis Date: **5/6/2009** SeqNo: **600677**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.03977	0.00500	0.05	0	79.5	75	125	0	0		

Sample ID **0905043-12DMS** SampType: **MS** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090507A**
Client ID: **MW16** Batch ID: **R55782** TestNo: **SW7196A** Analysis Date: **5/7/2009** SeqNo: **601091**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: CR6_WDISS

Sample ID **0905043-12DMS** SampType: **MS** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090507A**
Client ID: **MW16** Batch ID: **R55782** TestNo: **SW7196A** Analysis Date: **5/7/2009** SeqNo: **601091**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.05292	0.00500	0.05	0	106	75	125	0	0		CN

Sample ID **0905043-09DMSD** SampType: **MSD** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090506A**
Client ID: **MW3** Batch ID: **R55755** TestNo: **SW7196A** Analysis Date: **5/6/2009** SeqNo: **600678**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.03895	0.00500	0.05	0	77.9	75	125	0.03977	2.08	20	

Sample ID **0905043-09DDUP** SampType: **DUP** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090506A**
Client ID: **MW3** Batch ID: **R55755** TestNo: **SW7196A** Analysis Date: **5/6/2009** SeqNo: **600676**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.00500	0	0	0	0	0	0	0	20	

Sample ID **0905043-12DDUP** SampType: **DUP** TestCode: **CR6_WDISS** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090507A**
Client ID: **MW16** Batch ID: **R55782** TestNo: **SW7196A** Analysis Date: **5/7/2009** SeqNo: **601088**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.00500	0	0	0	0	0	0	0	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: IC_GW

Sample ID **MB-R55793** SampType: **MBLK** TestCode: **IC_GW** Units: **mg/L** Prep Date: Run ID: **IC_090507B**
Client ID: **ZZZZZ** Batch ID: **R55793** TestNo: **SW9056** Analysis Date: **5/7/2009** SeqNo: **601202**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.15	0.500									J
Sulfate	0.11	0.500									J

Sample ID **MB-R55859** SampType: **MBLK** TestCode: **IC_GW** Units: **mg/L** Prep Date: **5/12/2009** Run ID: **IC_090512A**
Client ID: **ZZZZZ** Batch ID: **R55859** TestNo: **SW9056** Analysis Date: **5/12/2009** SeqNo: **602107**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.14	0.500									J
Sulfate	0.13	0.500									J

Sample ID **LCS-R55793** SampType: **LCS** TestCode: **IC_GW** Units: **mg/L** Prep Date: Run ID: **IC_090507B**
Client ID: **ZZZZZ** Batch ID: **R55793** TestNo: **SW9056** Analysis Date: **5/7/2009** SeqNo: **601201**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	11.51	0.500	12.5	0.15	90.9	85.6	117	0	0		
Sulfate	11.93	0.500	12.5	0.11	94.6	89.6	112	0	0		

Sample ID **LCS-R55859** SampType: **LCS** TestCode: **IC_GW** Units: **mg/L** Prep Date: **5/12/2009** Run ID: **IC_090512A**
Client ID: **ZZZZZ** Batch ID: **R55859** TestNo: **SW9056** Analysis Date: **5/12/2009** SeqNo: **602106**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	11.34	0.500	12.5	0.14	89.6	85.6	117	0	0		
Sulfate	11.77	0.500	12.5	0.13	93.1	89.6	112	0	0		

Sample ID **A0904168-04AMS** SampType: **MS** TestCode: **IC_GW** Units: **mg/L** Prep Date: Run ID: **IC_090507B**
Client ID: **ZZZZZ** Batch ID: **R55793** TestNo: **SW9056** Analysis Date: **5/7/2009** SeqNo: **601198**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	45.6	5.00	50	5	81.2	67.5	129	0	0		
Sulfate	202.9	5.00	50	158.3	89.2	69.1	122	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: IC_GW

Sample ID **0905043-12AMS** SampType: **MS** TestCode: **IC_GW** Units: **mg/L** Prep Date: **5/12/2009** Run ID: **IC_090512A**
Client ID: **MW16** Batch ID: **R55859** TestNo: **SW9056** Analysis Date: **5/12/2009** SeqNo: **602103**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	7.49	0.500	5	4.02	69.4	67.5	129	0	0		
Sulfate	5.37	0.500	5	0.18	104	69.1	122	0	0		

Sample ID **A0904168-04AMSD** SampType: **MSD** TestCode: **IC_GW** Units: **mg/L** Prep Date: Run ID: **IC_090507B**
Client ID: **ZZZZZ** Batch ID: **R55793** TestNo: **SW9056** Analysis Date: **5/7/2009** SeqNo: **601199**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	47.9	5.00	50	5	85.8	67.5	129	45.6	4.92	20	
Sulfate	205.7	5.00	50	158.3	94.8	69.1	122	202.9	1.37	20	

Sample ID **0905043-12AMSD** SampType: **MSD** TestCode: **IC_GW** Units: **mg/L** Prep Date: **5/12/2009** Run ID: **IC_090512A**
Client ID: **MW16** Batch ID: **R55859** TestNo: **SW9056** Analysis Date: **5/12/2009** SeqNo: **602104**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	7.4	0.500	5	4.02	67.6	67.5	129	7.49	1.21	20	
Sulfate	5.28	0.500	5	0.18	102	69.1	122	5.37	1.69	20	

Sample ID **CCV** SampType: **CCV** TestCode: **IC_GW** Units: **mg/L** Prep Date: Run ID: **IC_090507B**
Client ID: **ZZZZZ** Batch ID: **R55793** TestNo: **SW9056** Analysis Date: **5/7/2009** SeqNo: **601200**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	9.05	0.500	10	0	90.5	90	110	0	0		
Sulfate	9.49	0.500	10	0	94.9	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **IC_GW** Units: **mg/L** Prep Date: **5/12/2009** Run ID: **IC_090512A**
Client ID: **ZZZZZ** Batch ID: **R55859** TestNo: **SW9056** Analysis Date: **5/12/2009** SeqNo: **602105**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	9.32	0.500	10	0	93.2	90	110	0	0		
Sulfate	9.58	0.500	10	0	95.8	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: NO3_W

Sample ID **MB-R55790** SampType: **MBLK** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090506E**
Client ID: **ZZZZZ** Batch ID: **R55790** TestNo: **E353.2** Analysis Date: **5/6/2009** SeqNo: **601176**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	ND	0.0300									

Sample ID **MB-R55820** SampType: **MBLK** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090508A**
Client ID: **ZZZZZ** Batch ID: **R55820** TestNo: **E353.2** Analysis Date: **5/8/2009** SeqNo: **601707**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	ND	0.0300									

Sample ID **LCS-R55790** SampType: **LCS** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090506E**
Client ID: **ZZZZZ** Batch ID: **R55790** TestNo: **E353.2** Analysis Date: **5/6/2009** SeqNo: **601175**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	1.485	0.0300	1.5	0	99	84.7	115	0	0		

Sample ID **LCS-R55820** SampType: **LCS** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090508A**
Client ID: **ZZZZZ** Batch ID: **R55820** TestNo: **E353.2** Analysis Date: **5/8/2009** SeqNo: **601706**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	1.538	0.0300	1.5	0	103	84.7	115	0	0		

Sample ID **0905043-08AMS** SampType: **MS** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090506E**
Client ID: **MW10** Batch ID: **R55790** TestNo: **E353.2** Analysis Date: **5/6/2009** SeqNo: **601165**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	0.5089	0.0300	0.5	0.0404	93.7	73.1	125	0	0		

Sample ID **0905043-12AMS** SampType: **MS** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090508A**
Client ID: **MW16** Batch ID: **R55820** TestNo: **E353.2** Analysis Date: **5/8/2009** SeqNo: **601704**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: NO3_W

Sample ID **0905043-12AMS** SampType: **MS** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090508A**
Client ID: **MW16** Batch ID: **R55820** TestNo: **E353.2** Analysis Date: **5/8/2009** SeqNo: **601704**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	0.4434	0.0300	0.5	0.0614	76.4	73.1	125	0	0		

Sample ID **0905043-08AMSD** SampType: **MSD** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090506E**
Client ID: **MW10** Batch ID: **R55790** TestNo: **E353.2** Analysis Date: **5/6/2009** SeqNo: **601166**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	0.5182	0.0300	0.5	0.0404	95.6	73.1	125	0.5089	1.81	20	

Sample ID **0905043-12AMSD** SampType: **MSD** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090508A**
Client ID: **MW16** Batch ID: **R55820** TestNo: **E353.2** Analysis Date: **5/8/2009** SeqNo: **601705**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	0.476	0.0300	0.5	0.0614	82.9	73.1	125	0.4434	7.09	20	

Sample ID **CCV** SampType: **CCV** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090506E**
Client ID: **ZZZZZ** Batch ID: **R55790** TestNo: **E353.2** Analysis Date: **5/6/2009** SeqNo: **601174**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	1.053	0.0300	1	0	105	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **NO3_W** Units: **mg/L** Prep Date: Run ID: **LACHAT_090508A**
Client ID: **ZZZZZ** Batch ID: **R55820** TestNo: **E353.2** Analysis Date: **5/8/2009** SeqNo: **601708**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate (As N)	1.6	0.0300	1.5	0	107	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: Maul, Foster & Alongi
Work Order: 0905043
Project: TrueGuard / 9009.01.12

ANALYTICAL QC SUMMARY REPORT

TestCode: TOC_W

Sample ID **MBLK** SampType: **MBLK** TestCode: **TOC_W** Units: **mg/L** Prep Date: Run ID: **TOC-APOLLO_090511A**
Client ID: **ZZZZZ** Batch ID: **R55854** TestNo: **E415.1** Analysis Date: **5/11/2009** SeqNo: **602040**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Total	0.24	1.00									J

Sample ID **LCS** SampType: **LCS** TestCode: **TOC_W** Units: **mg/L** Prep Date: Run ID: **TOC-APOLLO_090511A**
Client ID: **ZZZZZ** Batch ID: **R55854** TestNo: **E415.1** Analysis Date: **5/11/2009** SeqNo: **602039**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Total	10.43	1.00	10	0	104	84.1	109	0	0		

Sample ID **0905043-12EMS** SampType: **MS** TestCode: **TOC_W** Units: **mg/L** Prep Date: Run ID: **TOC-APOLLO_090511A**
Client ID: **MW16** Batch ID: **R55854** TestNo: **E415.1** Analysis Date: **5/11/2009** SeqNo: **602046**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Total	9.12	1.00	5	3.49	113	74.7	121	0	0		

Sample ID **0905043-12EMSD** SampType: **MSD** TestCode: **TOC_W** Units: **mg/L** Prep Date: Run ID: **TOC-APOLLO_090511A**
Client ID: **MW16** Batch ID: **R55854** TestNo: **E415.1** Analysis Date: **5/11/2009** SeqNo: **602047**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Total	9.13	1.00	5	3.49	113	74.7	121	9.12	0.110	20	

Sample ID **CCV** SampType: **CCV** TestCode: **TOC_W** Units: **mg/L** Prep Date: Run ID: **TOC-APOLLO_090511A**
Client ID: **ZZZZZ** Batch ID: **R55854** TestNo: **E415.1** Analysis Date: **5/11/2009** SeqNo: **602048**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Total	10.86	1.00	10	0	109	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

KEY TO FLAGS

A This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1 This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

A2 This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.

A3 The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

B The blank exhibited a positive result greater than the reporting limit for this compound.

CN See Case Narrative.

D Result is based from a dilution.

E Result exceeds the calibration range for this compound. The result should be considered as estimate.

F The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

H Sample was analyzed outside recommended hold time.

HT At clients request, sample was analyzed outside recommended hold time.

J The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.

K Diesel result is biased high due to amount of Oil contained in the sample.

L Diesel result is biased high due to amount of Gasoline contained in the sample.

M Oil result is biased high due to amount of Diesel contained in the sample.

N Gasoline result is biased high due to amount of Diesel contained in the sample.

MC Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.

MI Result is outside control limits due to matrix interference.

MSA Value determined by Method of Standard Addition.

O Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.

P Detection levels of Methylene Chloride may be laboratory contamination, due to previous analysis or background levels.

Q Detection levels elevated due to sample matrix.

R RPD control limits were exceeded.

RF Duplicate failed due to result being at or near the method-reporting limit.

RP Matrix spike values exceed established QC limits, post digestion spike is in control.

S Recovery is outside control limits.

SC Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.

* The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

CHAIN OF CUSTODY RECORD

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Project No. 9009.01.12 Project Name: TrueGuard
Project Site Location OR ____ WA X Other ____
Invoice To: TrueGuard, LLC P.O. No. 9009.01.12
Quarterly / Bench Test

Collected By:
Signature: [signature], MFA, Inc.
Printed: Tony Silva, MFA Inc.

Signature:
Printed:

Turn Around Time
☒ Normal 5-7 Business Days
☐ Rush ____
Specify

Rush Analyses Must Be Scheduled With The Lab In Advance

For Laboratory Use
Lab Job No. 0905043
Shipped Via: Specialty
Air Bill No.
Temperature On Receipt: 3 °C
Specialty Analytical Containers? Y / N
Specialty Analytical Trip Blanks? Y / N

Analyses:

Date	Time	Sample I.D.	Matrix	No. of Containers	Dissolved Arsenic 6020	Dissolved metals 6010 copper, boron, iron, chromium, Mn	Dissolved Manganese 6010	Dissolved Hex chrome 7196A	Sulfate and chloride 9056	Nitrate as Nitrogen 353.2	Carbonate (CO_3) Bicarbonate (HCO_3)	Total organic carbon 415.1	Total metals - Arsenic 6020	Total metals (see list below) 6010	Comments	Lab I.D.
05-04-09	11:15	MW1	Water	3	X	X										
05-04-09	10:15	MW5	Water	3	X	X										
05-04-09	12:25	MW12	Water	3	X	X										
05-04-09	13:15	MW13	Water	3	X	X										
05-04-09	13:15	MW13D	Water	3	X	X										
05-04-09	14:20	MW14	Water	3	X	X										
05-04-09	15:20	MW15	Water	3	X	X										
05-05-09	09:45	MW10	Water	5	X	X	X	X	X	X	X	X	X	X		
05-05-09	08:35	MW3	Water	8	X	X	X	X	X	X	X	X	X	X	Bench Test * More Soil	
05-05-09	10:45	MW6	Water	7	X	X	X	X	X	X	X	X	X	X	Bench Test - up gradient	
05-05-09	12:40	MW11	Water	8	X	X	X	X	X	X	X	X	X	X	Bench Test	

Relinquished By: [signature]	Date	Time	Received By: Nikki Nelton	Relinquished By:	Date	Time
Company: MFA, Inc.	05-05-09	14:15	Company: Specialty	~~Company:~~		
Unless Reclaimed, Samples Will Be Disposed of 60 Days After Receipt. Samples held beyond 60 days subject to storage fee(s)				Received For Lab By: Nikki Nelton	5/5/09	1625

Copies: White-Original Yellow-Project File Pink-Customer Copy

Total metals include = copper, boron, iron, chromium, manganese, calcium, magnesium, sodium, and potassium

Specialty Analytical

11711 SE Capps Road
Clackamas, OR 97015
(503) 607-1331
Fax (503) 607-1336

July 15, 2009

Steve Krommenacker
TrueGuard, LLC
725 S 32nd Street
PO BOX 227
Washougal, WA 98671

TEL: (360) 835-8547
FAX (360) 835-0147

RE: Bench Testing- ARM determination

Dear Steve Krommenacker: Order No.: 0906124

Specialty Analytical received 15 samples on 6/22/2009 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Cindy Hillyard
Cindy Hillyard
Project Manager

Technical Review

CLIENT:	TrueGuard, LLC
Project:	Bench Testing- ARM determination
Lab Order:	0906124

CASE NARRATIVE

The metals values labeled "Total Metals" per either EPA 6010 or 6020 were determined after filtering through a 0.45 um filter per the MWH protocol. The samples were digested after filtration using EPA method 3010 to solubilize any solids passing through the filter.

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0906124
Project: Bench Testing- ARM determination

Lab ID: 0906124-01 **Collection Date:** 6/19/2009
Client Sample ID: ARM0-FeCl5-Klosure0.375 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.304	0.0100		mg/L	1	7/9/2009 4:23:47 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	1.6	1.0		µg/L	1	6/24/2009 2:34:00 PM
Chromium	1.2	1.0		µg/L	1	6/24/2009 2:34:00 PM
Copper	9.3	0.50		µg/L	1	6/24/2009 2:34:00 PM
Iron	ND	100		µg/L	1	6/24/2009 2:34:00 PM
Lead	0.18	0.10		µg/L	1	6/24/2009 2:34:00 PM
Manganese	3700	50		µg/L	100	6/24/2009 5:05:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	177	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	420			Eh	1	6/25/2009

CLIENT: TrueGuard, LLC **Lab Order:** 0906124
Project: Bench Testing- ARM determination

Lab ID: 0906124-02 **Collection Date:** 6/19/2009
Client Sample ID: ARM0-FeCl6-Klosure0.5 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.305	0.0100		mg/L	1	7/9/2009 4:28:48 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	5.7	1.0		µg/L	1	6/24/2009 3:02:00 PM
Chromium	1.1	1.0		µg/L	1	6/24/2009 3:02:00 PM
Copper	1.7	0.50		µg/L	1	6/24/2009 3:02:00 PM
Iron	ND	100		µg/L	1	6/24/2009 3:02:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 3:02:00 PM
Manganese	950	5.0		µg/L	10	6/24/2009 5:32:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	166	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	360			Eh	1	6/25/2009

Lab ID: 0906124-03 **Collection Date:** 6/19/2009
Client Sample ID: ARM0-FeCl7-Klosure0.6125 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.283	0.0100		mg/L	1	7/9/2009 4:33:51 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	13	1.0		µg/L	1	6/24/2009 3:09:00 PM
Chromium	2.8	1.0		µg/L	1	6/24/2009 3:09:00 PM
Copper	1.7	0.50		µg/L	1	6/24/2009 3:09:00 PM
Iron	ND	100		µg/L	1	6/24/2009 3:09:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 3:09:00 PM
Manganese	22	0.50		µg/L	1	6/24/2009 3:09:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	140	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	340			Eh	1	6/25/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0906124
Project: Bench Testing- ARM determination

Lab ID: 0906124-04 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.01-FeCl5-Klosure0.375 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.314	0.0100		mg/L	1	7/9/2009 4:38:55 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	1.3	1.0		µg/L	1	6/24/2009 3:29:00 PM
Chromium	1.0	1.0		µg/L	1	6/24/2009 3:29:00 PM
Copper	4.2	0.50		µg/L	1	6/24/2009 3:29:00 PM
Iron	ND	100		µg/L	1	6/24/2009 3:29:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 3:29:00 PM
Manganese	4000	50		µg/L	100	7/6/2009 4:46:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	236	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	410			Eh	1	6/25/2009

CLIENT: TrueGuard, LLC **Lab Order:** 0906124
Project: Bench Testing- ARM determination

Lab ID: 0906124-05 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.01-FeCl6-Klosure0.5 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.321	0.0100		mg/L	1	7/9/2009 4:43:58 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	6.7	1.0		µg/L	1	6/24/2009 3:36:00 PM
Chromium	1.1	1.0		µg/L	1	6/24/2009 3:36:00 PM
Copper	4.1	0.50		µg/L	1	6/24/2009 3:36:00 PM
Iron	ND	100		µg/L	1	6/24/2009 3:36:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 3:36:00 PM
Manganese	3900	25		µg/L	50	7/6/2009 4:53:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	193	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	370			Eh	1	6/25/2009

Lab ID: 0906124-06 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.01-FeCl7-Klosure0.6125 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.314	0.0100		mg/L	1	7/9/2009 5:04:12 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	16	1.0		µg/L	1	6/24/2009 3:43:00 PM
Chromium	2.0	1.0		µg/L	1	6/24/2009 3:43:00 PM
Copper	2.8	0.50		µg/L	1	6/24/2009 3:43:00 PM
Iron	ND	100		µg/L	1	6/24/2009 3:43:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 3:43:00 PM
Manganese	300	5.0		µg/L	10	7/6/2009 4:59:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	173	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	350			Eh	1	6/25/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT:	TrueGuard, LLC	**Lab Order:**	0906124
Project:	Bench Testing- ARM determination		

Lab ID:	0906124-07	**Collection Date:**	6/19/2009
Client Sample ID:	ARM0.05-FeCl5-Klosure0.375	**Matrix:**	AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.326	0.0100		mg/L	1	7/9/2009 5:09:15 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	1.8	1.0		µg/L	1	6/24/2009 3:50:00 PM
Chromium	ND	1.0		µg/L	1	6/24/2009 3:50:00 PM
Copper	8.8	0.50		µg/L	1	6/24/2009 3:50:00 PM
Iron	ND	100		µg/L	1	6/24/2009 3:50:00 PM
Lead	0.15	0.10		µg/L	1	6/24/2009 3:50:00 PM
Manganese	4500	50		µg/L	100	7/6/2009 5:06:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	242	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	420			Eh	1	6/25/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0906124
Project: Bench Testing- ARM determination

Lab ID: 0906124-08 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.05-FeCl6-Klosure0.5 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.316	0.0100		mg/L	1	7/9/2009 5:14:17 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	4.2	1.0		µg/L	1	6/24/2009 3:57:00 PM
Chromium	1.2	1.0		µg/L	1	6/24/2009 3:57:00 PM
Copper	1.5	0.50		µg/L	1	6/24/2009 3:57:00 PM
Iron	ND	100		µg/L	1	6/24/2009 3:57:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 3:57:00 PM
Manganese	1200	10		µg/L	20	7/6/2009 5:13:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	127	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	390			Eh	1	6/25/2009

Lab ID: 0906124-09 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.05-FeCl7-Klosure0.6125 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.301	0.0100		mg/L	1	7/9/2009 5:19:21 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	15	1.0		µg/L	1	6/24/2009 4:03:00 PM
Chromium	2.8	1.0		µg/L	1	6/24/2009 4:03:00 PM
Copper	2.4	0.50		µg/L	1	6/24/2009 4:03:00 PM
Iron	ND	100		µg/L	1	6/24/2009 4:03:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 4:03:00 PM
Manganese	18	0.50		µg/L	1	6/24/2009 4:03:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	135	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	350			Eh	1	6/25/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0906124
Project: Bench Testing- ARM determination

Lab ID: 0906124-10 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.1-FeCl5-Klosure0.375 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.322	0.0100		mg/L	1	7/9/2009 5:24:24 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	1.3	1.0		µg/L	1	6/24/2009 4:10:00 PM
Chromium	ND	1.0		µg/L	1	6/24/2009 4:10:00 PM
Copper	3.6	0.50		µg/L	1	6/24/2009 4:10:00 PM
Iron	ND	100		µg/L	1	6/24/2009 4:10:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 4:10:00 PM
Manganese	2900	50		µg/L	100	7/6/2009 5:20:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	193	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	410			Eh	1	6/25/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0906124
Project: Bench Testing- ARM determination

Lab ID: 0906124-11 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.1-FeCl6-Klosure0.5 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.316	0.0100		mg/L	1	7/9/2009 5:29:27 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	4.5	1.0		µg/L	1	6/24/2009 4:17:00 PM
Chromium	ND	1.0		µg/L	1	6/24/2009 4:17:00 PM
Copper	1.6	0.50		µg/L	1	6/24/2009 4:17:00 PM
Iron	ND	100		µg/L	1	6/24/2009 4:17:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 4:17:00 PM
Manganese	2200	50		µg/L	100	7/6/2009 5:26:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	217	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	390			Eh	1	6/25/2009

Lab ID: 0906124-12 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.1-FeCl7-Klosure0.6125 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.303	0.0100		mg/L	1	7/9/2009 5:34:30 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	12	1.0		µg/L	1	6/24/2009 4:24:00 PM
Chromium	2.4	1.0		µg/L	1	6/24/2009 4:24:00 PM
Copper	2.2	0.50		µg/L	1	6/24/2009 4:24:00 PM
Iron	ND	100		µg/L	1	6/24/2009 4:24:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 4:24:00 PM
Manganese	35	0.50		µg/L	1	6/24/2009 4:24:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	187	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	350			Eh	1	6/25/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT:	TrueGuard, LLC	**Lab Order:**	0906124
Project:	Bench Testing- ARM determination		

Lab ID:	0906124-13	**Collection Date:**	6/19/2009
Client Sample ID:	ARM0.5-FeCl5-Klosure0.375	**Matrix:**	AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.320	0.0100		mg/L	1	7/9/2009 5:39:34 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	1.2	1.0		µg/L	1	6/24/2009 4:31:00 PM
Chromium	ND	1.0		µg/L	1	6/24/2009 4:31:00 PM
Copper	2.7	0.50		µg/L	1	6/24/2009 4:31:00 PM
Iron	ND	100		µg/L	1	6/24/2009 4:31:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 4:31:00 PM
Manganese	3600	50		µg/L	100	7/6/2009 5:33:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	164	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	410			Eh	1	6/25/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0906124
Project: Bench Testing- ARM determination

Lab ID: 0906124-14 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.5-FeCl6-Klosure0.5 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.324	0.0100		mg/L	1	7/9/2009 5:44:37 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	4.8	1.0		µg/L	1	6/24/2009 4:51:00 PM
Chromium	ND	1.0		µg/L	1	6/24/2009 4:51:00 PM
Copper	1.8	0.50		µg/L	1	6/24/2009 4:51:00 PM
Iron	ND	100		µg/L	1	6/24/2009 4:51:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 4:51:00 PM
Manganese	660	5.0		µg/L	10	7/6/2009 5:40:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	211	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	370			Eh	1	6/25/2009

Lab ID: 0906124-15 **Collection Date:** 6/19/2009
Client Sample ID: ARM0.5-FeCl7-Klosure0.6125 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.322	0.0100		mg/L	1	7/9/2009 5:49:41 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	17	1.0		µg/L	1	6/24/2009 4:58:00 PM
Chromium	2.2	1.0		µg/L	1	6/24/2009 4:58:00 PM
Copper	2.8	0.50		µg/L	1	6/24/2009 4:58:00 PM
Iron	ND	100		µg/L	1	6/24/2009 4:58:00 PM
Lead	ND	0.10		µg/L	1	6/24/2009 4:58:00 PM
Manganese	21	0.50		µg/L	1	6/24/2009 4:58:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	6/22/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	165	5.00		mg/L	10	6/24/2009
REDOX POTENTIAL		**SM2580B**				Analyst: **en**
Oxidation-Reduction Potential	350			Eh	1	6/25/2009

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **MBLK-23606**	SampType: **MBLK**	TestCode: **6010_W**	Units: **mg/L**	Prep Date: **7/8/2009**	Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ**	Batch ID: **23606**	TestNo: **E6010A**		Analysis Date: **7/9/2009**	SeqNo: **615145**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	0.0100									

Sample ID **LCS-23606**	SampType: **LCS**	TestCode: **6010_W**	Units: **mg/L**	Prep Date: **7/8/2009**	Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ**	Batch ID: **23606**	TestNo: **E6010A**		Analysis Date: **7/9/2009**	SeqNo: **615146**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5242	0.0100	0.5	0	105	80	120	0	0		

Sample ID **LCSD-23606**	SampType: **LCSD**	TestCode: **6010_W**	Units: **mg/L**	Prep Date: **7/8/2009**	Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ**	Batch ID: **23606**	TestNo: **E6010A**		Analysis Date: **7/13/2009**	SeqNo: **615506**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4767	0.0100	0.5	0	95.3	80	120	0.5242	9.49	20	

Sample ID **CCV**	SampType: **CCV**	TestCode: **6010_W**	Units: **mg/L**	Prep Date:	Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ**	Batch ID: **23606**	TestNo: **E6010A**		Analysis Date: **7/9/2009**	SeqNo: **615144**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5162	0.0100	0.5	0	103	90	110	0	0		

Sample ID **CCV**	SampType: **CCV**	TestCode: **6010_W**	Units: **mg/L**	Prep Date:	Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ**	Batch ID: **23606**	TestNo: **E6010A**		Analysis Date: **7/9/2009**	SeqNo: **615152**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5189	0.0100	0.5	0	104	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ** Batch ID: **23606** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615163**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.522	0.0100	0.5	0	104	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ** Batch ID: **23606** TestNo: **E6010A** Analysis Date: **7/13/2009** SeqNo: **615507**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4785	0.0100	0.5	0	95.7	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ** Batch ID: **23606** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615143**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4972	0.0100	0.5	0	99.4	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090709E**
Client ID: **ZZZZZ** Batch ID: **23606** TestNo: **E6010A** Analysis Date: **7/13/2009** SeqNo: **615505**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4872	0.0100	0.5	0	97.4	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **MBLK-23507** SampType: **MBLK** TestCode: **6020_W** Units: **µg/L** Prep Date: **6/23/2009** Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611765**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	1.0									
Chromium	ND	1.0									
Copper	0.1352	0.50									J
Iron	ND	100									
Lead	ND	0.10									
Manganese	ND	0.50									

Sample ID **LCS-23507** SampType: **LCS** TestCode: **6020_W** Units: **µg/L** Prep Date: **6/23/2009** Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611766**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	51.77	1.0	50	0	104	80	120	0	0		
Chromium	47.19	1.0	50	0	94.4	80	120	0	0		
Copper	51.43	0.50	50	0	103	80	120	0	0		
Iron	5020	100	5000	0	100	80	120	0	0		
Lead	51.66	0.10	50	0	103	80	120	0	0		
Manganese	51.09	0.50	50	0	102	80	120	0	0		

Sample ID **0906124-01AMS** SampType: **MS** TestCode: **6020_W** Units: **µg/L** Prep Date: **6/23/2009** Run ID: **ICPMS_090624A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611769**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.5	1.0	50	1.557	97.9	70	130	0	0		
Chromium	47.71	1.0	50	1.192	93	70	130	0	0		
Copper	55.86	0.50	50	9.294	93.1	70	130	0	0		
Iron	4403	100	5000	5.554	87.9	70	130	0	0		
Lead	50.85	0.10	50	0.1805	101	70	130	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **0906124-01AMS** SampType: **MS** TestCode: **6020_W** Units: **µg/L** Prep Date: **6/23/2009** Run ID: **ICPMS_090624A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611789**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	3652	50	50	3688	-72	70	130	0	0		S,MC

Sample ID **0906124-01AMSD** SampType: **MSD** TestCode: **6020_W** Units: **µg/L** Prep Date: **6/23/2009** Run ID: **ICPMS_090624A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611770**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	54.55	1.0	50	1.557	106	70	130	50.5	7.71	20	
Chromium	49.7	1.0	50	1.192	97	70	130	47.71	4.09	20	
Copper	59.61	0.50	50	9.294	101	70	130	55.86	6.50	20	
Iron	4717	100	5000	5.554	94.2	70	130	4403	6.89	20	
Lead	53.33	0.10	50	0.1805	106	70	130	50.85	4.76	20	

Sample ID **0906124-01AMSD** SampType: **MSD** TestCode: **6020_W** Units: **µg/L** Prep Date: **6/23/2009** Run ID: **ICPMS_090624A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611790**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	3514	50	50	3688	-348	70	130	3652	3.85	20	S,MC

Sample ID **0906124-01ADUP** SampType: **DUP** TestCode: **6020_W** Units: **µg/L** Prep Date: **6/23/2009** Run ID: **ICPMS_090624A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611768**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	1.572	1.0	0	0	0	0	0	1.557	0.959	20	
Chromium	1.248	1.0	0	0	0	0	0	1.192	4.59	20	
Copper	9.188	0.50	0	0	0	0	0	9.294	1.15	20	
Iron	9.379	100	0	0	0	0	0	5.554	0	20	J
Lead	0.1468	0.10	0	0	0	0	0	0.1805	20.6	20	RF

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **0906124-01ADUP** SampType: **DUP** TestCode: **6020_W** Units: **µg/L** Prep Date: **6/23/2009** Run ID: **ICPMS_090624A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611788**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	3614	50	0	0	0	0	0	3688	2.03	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611773**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	52.78	1.0	50	0	106	90	110	0	0		
Chromium	52.2	1.0	50	0	104	90	110	0	0		
Copper	53.18	0.50	50	0	106	90	110	0	0		
Iron	5387	100	5000	0	108	90	110	0	0		
Lead	52.58	0.10	50	0	105	90	110	0	0		
Manganese	53.67	0.50	50	0	107	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611784**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	53.06	1.0	50	0	106	90	110	0	0		
Chromium	52.7	1.0	50	0	105	90	110	0	0		
Copper	53.37	0.50	50	0	107	90	110	0	0		
Iron	5143	100	5000	0	103	90	110	0	0		
Lead	52.62	0.10	50	0	105	90	110	0	0		
Manganese	54.23	0.50	50	0	108	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **6/24/2009** SeqNo: **611792**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	53.31	1.0	50	0	107	90	110	0	0		
Chromium	51.14	1.0	50	0	102	90	110	0	0		
Copper	52.69	0.50	50	0	105	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **CCV** | SampType: **CCV** | TestCode: **6020_W** | Units: **µg/L** | Prep Date: | Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** | Batch ID: **23507** | TestNo: **SW6020** | Analysis Date: **6/24/2009** | SeqNo: **611792**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	5381	100	5000	0	108	90	110	0	0		
Lead	52.82	0.10	50	0	106	90	110	0	0		
Manganese	54.78	0.50	50	0	110	90	110	0	0		

Sample ID **CCV** | SampType: **CCV** | TestCode: **6020_W** | Units: **µg/L** | Prep Date: | Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** | Batch ID: **23507** | TestNo: **SW6020** | Analysis Date: **7/6/2009** | SeqNo: **614266**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	50.18	0.50	50	0	100	90	110	0	0		

Sample ID **CCV** | SampType: **CCV** | TestCode: **6020_W** | Units: **µg/L** | Prep Date: | Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** | Batch ID: **23507** | TestNo: **SW6020** | Analysis Date: **7/6/2009** | SeqNo: **614276**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	49.82	0.50	50	0	99.6	90	110	0	0		

Sample ID **ICV** | SampType: **ICV** | TestCode: **6020_W** | Units: **µg/L** | Prep Date: | Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** | Batch ID: **23507** | TestNo: **SW6020** | Analysis Date: **6/24/2009** | SeqNo: **611764**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	52.37	1.0	50	0	105	90	110	0	0		
Chromium	51.57	1.0	50	0	103	90	110	0	0		
Copper	52.18	0.50	50	0	104	90	110	0	0		
Iron	5359	100	5000	0	107	90	110	0	0		
Lead	51.77	0.10	50	0	104	90	110	0	0		
Manganese	53.35	0.50	50	0	107	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090624A**
Client ID: **ZZZZZ** Batch ID: **23507** TestNo: **SW6020** Analysis Date: **7/6/2009** SeqNo: **614265**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	48.85	0.50	50	0	97.7	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: CR6-CWA

Sample ID **MBLK** SampType: **MBLK** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090622A**
Client ID: **ZZZZZ** Batch ID: **R56433** TestNo: **SM 3500-Cr D** Analysis Date: **6/22/2009** SeqNo: **611205**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.0050									

Sample ID **LCS** SampType: **LCS** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090622A**
Client ID: **ZZZZZ** Batch ID: **R56433** TestNo: **SM 3500-Cr D** Analysis Date: **6/22/2009** SeqNo: **611206**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.04799	0.0050	0.05	0	96	80	120	0	0		

Sample ID **0906124-06AMS** SampType: **MS** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090622A**
Client ID: **ARM0.01-FeCl7-Klo** Batch ID: **R56433** TestNo: **SM 3500-Cr D** Analysis Date: **6/22/2009** SeqNo: **611210**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.01102	0.0050	0.05	0.003626	14.8	75	125	0	0		S,MI

Sample ID **0906124-06AMSD** SampType: **MSD** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090622A**
Client ID: **ARM0.01-FeCl7-Klo** Batch ID: **R56433** TestNo: **SM 3500-Cr D** Analysis Date: **6/22/2009** SeqNo: **611211**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.01266	0.0050	0.05	0.003626	18.1	75	125	0.01102	13.9	20	S,MI

Sample ID **0906124-06ADUP** SampType: **DUP** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090622A**
Client ID: **ARM0.01-FeCl7-Klo** Batch ID: **R56433** TestNo: **SM 3500-Cr D** Analysis Date: **6/22/2009** SeqNo: **611209**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.0050	0	0	0	0	0	0.003626	0	20	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT:	TrueGuard, LLC		
Work Order:	0906124		
Project:	Bench Testing- ARM determination		

ANALYTICAL QC SUMMARY REPORT

TestCode: IC_GW

Sample ID **MB-R56484** SampType: **MBLK** TestCode: **IC_GW** Units: **mg/L** Prep Date: **6/24/2009** Run ID: **IC_090624A**
Client ID: **ZZZZZ** Batch ID: **R56484** TestNo: **SW9056** Analysis Date: **6/24/2009** SeqNo: **612047**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	0.09	0.500									J

Sample ID **LCS-R56484** SampType: **LCS** TestCode: **IC_GW** Units: **mg/L** Prep Date: **6/24/2009** Run ID: **IC_090624A**
Client ID: **ZZZZZ** Batch ID: **R56484** TestNo: **SW9056** Analysis Date: **6/24/2009** SeqNo: **612046**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	9.4	0.500	10	0.09	93.1	89.6	112	0	0		

Sample ID **0906124-01AMS** SampType: **MS** TestCode: **IC_GW** Units: **mg/L** Prep Date: **6/24/2009** Run ID: **IC_090624A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **R56484** TestNo: **SW9056** Analysis Date: **6/24/2009** SeqNo: **612027**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	226.8	5.00	50	177.2	99.2	69.1	122	0	0		

Sample ID **0906124-02AMS** SampType: **MS** TestCode: **IC_GW** Units: **mg/L** Prep Date: **6/24/2009** Run ID: **IC_090624A**
Client ID: **ARM0-FeCl6-Klosur** Batch ID: **R56484** TestNo: **SW9056** Analysis Date: **6/24/2009** SeqNo: **612030**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	218	5.00	50	166.3	103	69.1	122	0	0		

Sample ID **0906124-01AMSD** SampType: **MSD** TestCode: **IC_GW** Units: **mg/L** Prep Date: **6/24/2009** Run ID: **IC_090624A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **R56484** TestNo: **SW9056** Analysis Date: **6/24/2009** SeqNo: **612028**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	227.6	5.00	50	177.2	101	69.1	122	226.8	0.352	20	

Sample ID **0906124-02AMSD** SampType: **MSD** TestCode: **IC_GW** Units: **mg/L** Prep Date: **6/24/2009** Run ID: **IC_090624A**
Client ID: **ARM0-FeCl6-Klosur** Batch ID: **R56484** TestNo: **SW9056** Analysis Date: **6/24/2009** SeqNo: **612031**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0906124
Project: Bench Testing- ARM determination

ANALYTICAL QC SUMMARY REPORT

TestCode: IC_GW

Sample ID **0906124-02AMSD** SampType: **MSD** TestCode: **IC_GW** Units: **mg/L** Prep Date: **6/24/2009** Run ID: **IC_090624A**
Client ID: **ARM0-FeCl6-Klosur** Batch ID: **R56484** TestNo: **SW9056** Analysis Date: **6/24/2009** SeqNo: **612031**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	220	5.00	50	166.3	107	69.1	122	218	0.913	20	

Sample ID **CCV** SampType: **CCV** TestCode: **IC_GW** Units: **mg/L** Prep Date: **6/24/2009** Run ID: **IC_090624A**
Client ID: **ZZZZZ** Batch ID: **R56484** TestNo: **SW9056** Analysis Date: **6/24/2009** SeqNo: **612045**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	11.55	0.500	12.5	0	92.4	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

KEY TO FLAGS

A This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.

A1 This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.

A2 This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.

A3 The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.

B The blank exhibited a positive result greater than the reporting limit for this compound.

CN See Case Narrative.

D Result is based from a dilution.

E Result exceeds the calibration range for this compound. The result should be considered as estimate.

F The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.

H Sample was analyzed outside recommended hold time.

HT At clients request, sample was analyzed outside recommended hold time.

J The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.

K Diesel result is biased high due to amount of Oil contained in the sample.

L Diesel result is biased high due to amount of Gasoline contained in the sample.

M Oil result is biased high due to amount of Diesel contained in the sample.

N Gasoline result is biased high due to amount of Diesel contained in the sample.

MC Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.

MI Result is outside control limits due to matrix interference.

MSA Value determined by Method of Standard Addition.

O Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.

P Detection levels of Methylene Chloride may be laboratory contamination, due to previous analysis or background levels.

Q Detection levels elevated due to sample matrix.

R RPD control limits were exceeded.

RF Duplicate failed due to result being at or near the method-reporting limit.

RP Matrix spike values exceed established QC limits, post digestion spike is in control.

S Recovery is outside control limits.

SC Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.

* The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

Specialty Analytical

11711 SE Capps Road
Clackamas, OR 97015
(503) 607-1331
Fax (503) 607-1336

July 15, 2009

Steve Krommenacker
TrueGuard, LLC
725 S 32nd Street
PO BOX 227
Washougal, WA 98671

TEL: (360) 835-8547
FAX (360) 835-0147

RE: Bench Testing- Leachate Testing

Dear Steve Krommenacker: Order No.: 0907016

Specialty Analytical received 6 samples on 7/7/2009 for the analyses presented in the following report.

There were no problems with the analysis and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative, or as qualified with flags. Results apply only to the samples analyzed. Without approval of the laboratory, the reproduction of this report is only permitted in its entirety.

If you have any questions regarding these tests, please feel free to call.

Sincerely,

Cindy Hillyard
Cindy Hillyard
Project Manager

Technical Review

CLIENT: TrueGuard, LLC
Project: Bench Testing- Leachate Testing
Lab Order: 0907016

CASE NARRATIVE

The metals values labeled "Total Metals" per either EPA 6010 or 6020 were determined after filtering through a 0.45 um filter per the MWH protocol. The samples were digested after filtration using EPA method 3010 to solubilize any solids passing through the filter.

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0907016
Project: Bench Testing- Leachate Testing

Lab ID: 0907016-01 **Collection Date:** 7/7/2009
Client Sample ID: ARM0-FeCl5-Klosure0.375 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.120	0.0100		mg/L	1	7/9/2009 3:17:58 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	1.8	1.0		µg/L	1	7/9/2009 3:24:00 PM
Chromium	1.1	1.0		µg/L	1	7/9/2009 3:24:00 PM
Copper	60	0.50		µg/L	1	7/9/2009 3:24:00 PM
Iron	ND	100		µg/L	1	7/9/2009 3:24:00 PM
Lead	ND	0.10		µg/L	1	7/9/2009 3:24:00 PM
Manganese	7200	50		µg/L	100	7/9/2009 4:54:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	7/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	67.1	5.00		mg/L	10	7/8/2009

Lab ID: 0907016-02 **Collection Date:** 7/7/2009
Client Sample ID: ARM0-FeCl6-Klosure0.5 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.129	0.0100		mg/L	1	7/9/2009 3:23:01 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	3.9	1.0		µg/L	1	7/9/2009 3:31:00 PM
Chromium	1.1	1.0		µg/L	1	7/9/2009 3:31:00 PM
Copper	28	0.50		µg/L	1	7/9/2009 3:31:00 PM
Iron	ND	100		µg/L	1	7/9/2009 3:31:00 PM
Lead	ND	0.10		µg/L	1	7/9/2009 3:31:00 PM
Manganese	0.77	0.50		µg/L	1	7/9/2009 3:31:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	7/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	78.7	5.00		mg/L	10	7/8/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0907016
Project: Bench Testing- Leachate Testing

Lab ID: 0907016-03 **Collection Date:** 7/7/2009
Client Sample ID: ARM0.05-FeCl5-Klosure0.375 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.130	0.0100		mg/L	1	7/9/2009 3:28:04 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	1.7	1.0		µg/L	1	7/9/2009 3:38:00 PM
Chromium	ND	1.0		µg/L	1	7/9/2009 3:38:00 PM
Copper	93	0.50		µg/L	1	7/9/2009 3:38:00 PM
Iron	ND	100		µg/L	1	7/9/2009 3:38:00 PM
Lead	ND	0.10		µg/L	1	7/9/2009 3:38:00 PM
Manganese	120	5.0		µg/L	10	7/9/2009 5:01:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	7/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	104	5.00		mg/L	10	7/8/2009

Lab ID: 0907016-04 **Collection Date:** 7/7/2009
Client Sample ID: ARM0.05-FeCl6-Klosure0.5 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.129	0.0100		mg/L	1	7/9/2009 3:33:07 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	3.4	1.0		µg/L	1	7/9/2009 4:13:00 PM
Chromium	ND	1.0		µg/L	1	7/9/2009 4:13:00 PM
Copper	21	0.50		µg/L	1	7/9/2009 4:13:00 PM
Iron	ND	100		µg/L	1	7/9/2009 4:13:00 PM
Lead	ND	0.10		µg/L	1	7/9/2009 4:13:00 PM
Manganese	2.9	0.50		µg/L	1	7/9/2009 4:13:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	7/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	66.0	5.00		mg/L	10	7/8/2009

Specialty Analytical

Date: *15-Jul-09*

CLIENT: TrueGuard, LLC **Lab Order:** 0907016
Project: Bench Testing- Leachate Testing

Lab ID: 0907016-05 **Collection Date:** 7/7/2009
Client Sample ID: ARM0.5-FeCl5-Klosure0.375 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.122	0.0100		mg/L	1	7/9/2009 3:58:30 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	2.2	1.0		µg/L	1	7/9/2009 4:20:00 PM
Chromium	ND	1.0		µg/L	1	7/9/2009 4:20:00 PM
Copper	23	0.50		µg/L	1	7/9/2009 4:20:00 PM
Iron	ND	100		µg/L	1	7/9/2009 4:20:00 PM
Lead	ND	0.10		µg/L	1	7/9/2009 4:20:00 PM
Manganese	720	5.0		µg/L	10	7/10/2009 11:13:00 AM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	7/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	66.5	5.00		mg/L	10	7/8/2009

Lab ID: 0907016-06 **Collection Date:** 7/7/2009
Client Sample ID: ARM0.5-FeCl6-Klosure0.5 **Matrix:** AQUEOUS

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP		**E6010A**				Analyst: **zau**
Boron	0.116	0.0100		mg/L	1	7/9/2009 4:03:32 PM
TOTAL METALS BY ICP/MS		**SW6020**				Analyst: **zau**
Arsenic	5.1	1.0		µg/L	1	7/9/2009 4:27:00 PM
Chromium	1.0	1.0		µg/L	1	7/9/2009 4:27:00 PM
Copper	17	0.50		µg/L	1	7/9/2009 4:27:00 PM
Iron	ND	100		µg/L	1	7/9/2009 4:27:00 PM
Lead	0.20	0.10		µg/L	1	7/9/2009 4:27:00 PM
Manganese	2.9	0.50		µg/L	1	7/9/2009 4:27:00 PM
HEXAVALENT CHROMIUM		**SM 3500-CR D**				Analyst: **zau**
Chromium, Hexavalent	ND	0.0050		mg/L	1	7/7/2009
ANIONS BY ION CHROMATOGRAPHY		**SW9056**				Analyst: **en**
Sulfate	89.1	5.00		mg/L	10	7/8/2009

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **MBLK-23608** SampType: **MBLK** TestCode: **6010_W** Units: **mg/L** Prep Date: **7/8/2009** Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615127**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	ND	0.0100									

Sample ID **LCS-23608** SampType: **LCS** TestCode: **6010_W** Units: **mg/L** Prep Date: **7/8/2009** Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615128**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5233	0.0100	0.5	0	105	80	120	0	0		

Sample ID **A0906135-01BMS** SampType: **MS** TestCode: **6010_W** Units: **mg/L** Prep Date: **7/8/2009** Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615131**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.6107	0.0100	0.5	0.101	102	88.2	118	0	0		

Sample ID **A0906135-01BMSD** SampType: **MSD** TestCode: **6010_W** Units: **mg/L** Prep Date: **7/8/2009** Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615132**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.618	0.0100	0.5	0.101	103	88.2	118	0.6107	1.19	20	

Sample ID **A0906135-01BDUP** SampType: **DUP** TestCode: **6010_W** Units: **mg/L** Prep Date: **7/8/2009** Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615130**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.0904	0.0100	0	0	0	0	0	0.101	11.1	20	

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615126**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5141	0.0100	0.5	0	103	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615137**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5162	0.0100	0.5	0	103	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615140**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.5189	0.0100	0.5	0	104	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6010_W** Units: **mg/L** Prep Date: Run ID: **TJA IRIS_090709D**
Client ID: **ZZZZZ** Batch ID: **23608** TestNo: **E6010A** Analysis Date: **7/9/2009** SeqNo: **615125**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Boron	0.4972	0.0100	0.5	0	99.4	90	110	0	0		

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **MBLK-23609**	SampType: **MBLK**	TestCode: **6020_W**	Units: **µg/L**	Prep Date: **7/8/2009**	Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ**	Batch ID: **23609**	TestNo: **SW6020**		Analysis Date: **7/9/2009**	SeqNo: **615077**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	1.0									
Chromium	ND	1.0									
Copper	0.1136	0.50									J
Iron	ND	100									
Lead	0.05389	0.10									J
Manganese	ND	0.50									

Sample ID **LCS-23609**	SampType: **LCS**	TestCode: **6020_W**	Units: **µg/L**	Prep Date: **7/8/2009**	Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ**	Batch ID: **23609**	TestNo: **SW6020**		Analysis Date: **7/9/2009**	SeqNo: **615078**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	47.81	1.0	50	0	95.6	80	120	0	0		
Chromium	46.17	1.0	50	0	92.3	80	120	0	0		
Copper	48.34	0.50	50	0	96.7	80	120	0	0		
Iron	4943	100	5000	0	98.9	80	120	0	0		
Lead	50.61	0.10	50	0	101	80	120	0	0		
Manganese	51.77	0.50	50	0	104	80	120	0	0		

Sample ID **0907016-05AMS**	SampType: **MS**	TestCode: **6020_W**	Units: **µg/L**	Prep Date: **7/8/2009**	Run ID: **ICPMS_090709A**
Client ID: **ARM0.5-FeCl5-Klos**	Batch ID: **23609**	TestNo: **SW6020**		Analysis Date: **7/9/2009**	SeqNo: **615087**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	53.1	1.0	50	2.156	102	70	130	0	0		
Chromium	50.46	1.0	50	0.5568	99.8	70	130	0	0		
Copper	71.88	0.50	50	23.11	97.5	70	130	0	0		
Iron	4957	100	5000	0	99.1	70	130	0	0		
Lead	54.21	0.10	50	0.05083	108	70	130	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **0907016-05AMS** SampType: **MS** TestCode: **6020_W** Units: **µg/L** Prep Date: **7/8/2009** Run ID: **ICPMS_090709A**
Client ID: **ARM0.5-FeCl5-Klos** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/10/2009** SeqNo: **615248**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	829.3	5.0	50	723.1	212	70	130	0	0		S

Sample ID **0907016-05AMSD** SampType: **MSD** TestCode: **6020_W** Units: **µg/L** Prep Date: **7/8/2009** Run ID: **ICPMS_090709A**
Client ID: **ARM0.5-FeCl5-Klos** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/9/2009** SeqNo: **615088**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	53.93	1.0	50	2.156	104	70	130	53.1	1.55	20	
Chromium	50.23	1.0	50	0.5568	99.3	70	130	50.46	0.457	20	
Copper	73.53	0.50	50	23.11	101	70	130	71.88	2.27	20	
Iron	4848	100	5000	0	97	70	130	4957	2.22	20	
Lead	54.08	0.10	50	0.05083	108	70	130	54.21	0.240	20	

Sample ID **0907016-05AMSD** SampType: **MSD** TestCode: **6020_W** Units: **µg/L** Prep Date: **7/8/2009** Run ID: **ICPMS_090709A**
Client ID: **ARM0.5-FeCl5-Klos** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/10/2009** SeqNo: **615249**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	793.2	5.0	50	723.1	140	70	130	829.3	4.45	20	S

Sample ID **0907016-05ADUP** SampType: **DUP** TestCode: **6020_W** Units: **µg/L** Prep Date: **7/8/2009** Run ID: **ICPMS_090709A**
Client ID: **ARM0.5-FeCl5-Klos** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/9/2009** SeqNo: **615086**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	2.122	1.0	0	0	0	0	0	2.156	1.59	20	
Chromium	0.5589	1.0	0	0	0	0	0	0.5568	0	20	J
Copper	23.3	0.50	0	0	0	0	0	23.11	0.819	20	
Iron	ND	100	0	0	0	0	0	0	0	20	
Lead	0.04936	0.10	0	0	0	0	0	0.05083	0	20	J

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **0907016-05ADUP** SampType: **DUP** TestCode: **6020_W** Units: **µg/L** Prep Date: **7/8/2009** Run ID: **ICPMS_090709A**
Client ID: **ARM0.5-FeCl5-Klos** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/10/2009** SeqNo: **615247**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	748.5	5.0	0	0	0	0	0	723.1	3.45	20	

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/9/2009** SeqNo: **615076**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.58	1.0	50	0	99.2	90	110	0	0		
Chromium	48.23	1.0	50	0	96.5	90	110	0	0		
Copper	48.94	0.50	50	0	97.9	90	110	0	0		
Iron	4960	100	5000	0	99.2	90	110	0	0		
Lead	50.85	0.10	50	0	102	90	110	0	0		
Manganese	50.45	0.50	50	0	101	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/9/2009** SeqNo: **615082**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.02	1.0	50	0	100	90	110	0	0		
Chromium	49.78	1.0	50	0	99.6	90	110	0	0		
Copper	48.7	0.50	50	0	97.4	90	110	0	0		
Iron	5326	100	5000	0	107	90	110	0	0		
Lead	47.57	0.10	50	0	95.1	90	110	0	0		
Manganese	53.12	0.50	50	0	106	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/9/2009** SeqNo: **615091**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	50.32	1.0	50	0	101	90	110	0	0		
Chromium	52.01	1.0	50	0	104	90	110	0	0		
Copper	49.51	0.50	50	0	99	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/9/2009** SeqNo: **615091**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Iron	5094	100	5000	0	102	90	110	0	0		
Lead	50.02	0.10	50	0	100	90	110	0	0		
Manganese	53.7	0.50	50	0	107	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/10/2009** SeqNo: **615245**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	51.49	0.50	50	0	103	90	110	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/10/2009** SeqNo: **615250**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	51.99	0.50	50	0	104	90	110	0	0		

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090709A**
Client ID: **ZZZZZ** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/9/2009** SeqNo: **615075**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	48.57	1.0	50	0	97.1	90	110	0	0		
Chromium	49.88	1.0	50	0	99.8	90	110	0	0		
Copper	48.7	0.50	50	0	97.4	90	110	0	0		
Iron	5056	100	5000	0	101	90	110	0	0		
Lead	46.37	0.10	50	0	92.7	90	110	0	0		
Manganese	51.76	0.50	50	0	104	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit | S - Spike Recovery outside accepted recovery limits | B - Analyte detected in the associated Method Blank
J - Analyte detected below quantitation limits | R - RPD outside accepted recovery limits

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: 6020_W

Sample ID **ICV** SampType: **ICV** TestCode: **6020_W** Units: **µg/L** Prep Date: Run ID: **ICPMS_090709A**

Client ID: **ZZZZZ** Batch ID: **23609** TestNo: **SW6020** Analysis Date: **7/10/2009** SeqNo: **615244**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Manganese	51.68	0.50	50	0	103	90	110	0	0		

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: CR6-CWA

Sample ID **MBLK** SampType: **MBLK** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090707A**
Client ID: **ZZZZZ** Batch ID: **R56636** TestNo: **SM 3500-Cr D** Analysis Date: **7/7/2009** SeqNo: **614463**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	ND	0.0050									

Sample ID **LCS** SampType: **LCS** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090707A**
Client ID: **ZZZZZ** Batch ID: **R56636** TestNo: **SM 3500-Cr D** Analysis Date: **7/7/2009** SeqNo: **614464**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.04963	0.0050	0.05	0	99.3	80	120	0	0		

Sample ID **0907016-01AMS** SampType: **MS** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090707A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **R56636** TestNo: **SM 3500-Cr D** Analysis Date: **7/7/2009** SeqNo: **614467**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.04306	0.0050	0.05	0.0028	80.5	75	125	0	0		

Sample ID **0907016-01AMSD** SampType: **MSD** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090707A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **R56636** TestNo: **SM 3500-Cr D** Analysis Date: **7/7/2009** SeqNo: **614468**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.04224	0.0050	0.05	0.0028	78.9	75	125	0.04306	1.92	20	

Sample ID **0907016-01ADUP** SampType: **DUP** TestCode: **CR6-CWA** Units: **mg/L** Prep Date: Run ID: **GENESIS-1_090707A**
Client ID: **ARM0-FeCl5-Klosur** Batch ID: **R56636** TestNo: **SM 3500-Cr D** Analysis Date: **7/7/2009** SeqNo: **614466**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium, Hexavalent	0.00198	0.0050	0	0	0	0	0	0.0028	0	20	J

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

CLIENT: TrueGuard, LLC
Work Order: 0907016
Project: Bench Testing- Leachate Testing

ANALYTICAL QC SUMMARY REPORT

TestCode: IC_GW

Sample ID **MB-R56666** SampType: **MBLK** TestCode: **IC_GW** Units: **mg/L** Prep Date: Run ID: **IC_090708A**
Client ID: **ZZZZZ** Batch ID: **R56666** TestNo: **SW9056** Analysis Date: **7/8/2009** SeqNo: **614818**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	ND	0.500									

Sample ID **LCS-R56666** SampType: **LCS** TestCode: **IC_GW** Units: **mg/L** Prep Date: Run ID: **IC_090708A**
Client ID: **ZZZZZ** Batch ID: **R56666** TestNo: **SW9056** Analysis Date: **7/8/2009** SeqNo: **614817**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	10.37	0.500	10	0	104	89.6	112	0	0		

Sample ID **CCV** SampType: **CCV** TestCode: **IC_GW** Units: **mg/L** Prep Date: Run ID: **IC_090708A**
Client ID: **ZZZZZ** Batch ID: **R56666** TestNo: **SW9056** Analysis Date: **7/8/2009** SeqNo: **614816**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfate	10.58	0.500	10	0	106	90	110	0	0		

Qualifiers: ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

KEY TO FLAGS

A	This sample contains a Gasoline Range Organic not identified as a specific hydrocarbon product. The result was quantified against gasoline calibration standards.
A1	This sample contains a Diesel Range Organic not identified as a specific hydrocarbon product. The result was quantified against diesel calibration standards.
A2	This sample contains a Lube Oil Range Organic not identified as a specific hydrocarbon product. The result was quantified against a lube oil calibration standard.
A3	The result was determined to be Non-Detect based on hydrocarbon pattern recognition. The product was carry-over from another hydrocarbon type.
B	The blank exhibited a positive result greater than the reporting limit for this compound.
CN	See Case Narrative.
D	Result is based from a dilution.
E	Result exceeds the calibration range for this compound. The result should be considered as estimate.
F	The positive result for this hydrocarbon is due to single component contamination. The product does not match any hydrocarbon in the fuels library.
H	Sample was analyzed outside recommended hold time.
HT	At clients request, sample was analyzed outside recommended hold time.
J	The result for this analyte is between the MDL and the PQL and should be considered as estimated concentration.
K	Diesel result is biased high due to amount of Oil contained in the sample.
L	Diesel result is biased high due to amount of Gasoline contained in the sample.
M	Oil result is biased high due to amount of Diesel contained in the sample.
N	Gasoline result is biased high due to amount of Diesel contained in the sample.
MC	Sample concentration is greater than 4x the spiked value, the spiked value is considered insignificant.
MI	Result is outside control limits due to matrix interference.
MSA	Value determined by Method of Standard Addition.
O	Laboratory Control Standard (LCS) exceeded laboratory control limits, but meets CCV criteria. Data meets EPA requirements.
P	Detection levels of Methylene Chloride may be laboratory contamination, due to previous analysis or background levels.
Q	Detection levels elevated due to sample matrix.
R	RPD control limits were exceeded.
RF	Duplicate failed due to result being at or near the method-reporting limit.
RP	Matrix spike values exceed established QC limits, post digestion spike is in control.
S	Recovery is outside control limits.
SC	Closing CCV or LCS exceeded high recovery control limits, but associated samples are non-detect. Data meets EPA requirements.
*	The result for this parameter was greater that the maximum contaminant level of the TCLP regulatory limit.

DATA VALIDATION MEMORANDA

DATA QUALITY ASSURANCE/QUALITY CONTROL REVIEW

PROJECT NO. 9009.01.12 | MAY 29, 2009 | TRUEGUARD, LLC
REPORT NUMBER 0905043

This report reviews the analytical results for groundwater samples collected by the Maul Foster & Alongi, Inc. (MFA) project team on the TrueGuard, LLC, facility at 725 South 32nd Street in Washougal, Washington. The samples were collected in May 2009.

Specialty Analytical (SA), in Clackamas, Oregon, performed the analyses. SA report number 0905043 was reviewed. The analyses performed are listed below.

Analysis	Reference
Total and dissolved metals	USEPA 6010A/6020/7196A
Anions	USEPA 9056
Nitrate	USEPA 353.2
Alkalinity	SM2320B
Total organic carbon	USEPA 415.1

SM = Standard Methods for the Examination of Water and Wastewater (APHA and WEF, 1992).
USEPA = U.S. Environmental Protection Agency.

DATA QUALIFICATIONS

Analytical results were evaluated according to applicable sections of USEPA procedures (USEPA, 1994), and appropriate laboratory and method-specific guidelines (APHA and WEF, 1992; SA, 2008; USEPA, 1986).

The data are considered acceptable for their intended use, with the appropriate data qualifiers assigned.

HOLDING TIMES, PRESERVATION, AND SAMPLE STORAGE

Holding Times

Extractions and analyses were performed within the recommended holding time criteria.

Preservation and Sample Storage

The samples were preserved and stored appropriately.

BLANKS

Method Blanks

Laboratory method blank analyses were performed at the required frequencies. No target analytes were detected above the SA reporting limits (RLs).

Trip Blanks

Trip blanks were not submitted for these sampling events.

Equipment Rinsate Blanks

Equipment rinsate blanks were not required for this sampling event, as all samples were collected using dedicated, single-use equipment.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

MS/MSD results are used to evaluate laboratory precision and accuracy. All MS/MSD samples were extracted and analyzed at the required frequency. All recoveries were within acceptance limits for percent recovery and relative percent differences (RPDs).

LABORATORY DUPLICATE RESULTS

Duplicate results are used to evaluate laboratory precision. All duplicate samples were extracted and analyzed at the required frequency. All RPDs were within acceptance limits.

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RESULTS

An LCS/LCSD is spiked with target analytes to provide information on laboratory precision and accuracy. The LCS/LCSD samples were extracted and analyzed at the required frequency. All LCS/LCSD analytes were within acceptance limits for percent recovery.

FIELD DUPLICATE RESULTS

Field duplicate samples measure both field and laboratory precision. One field duplicate pair was submitted for analysis (MW13/MW13D). MFA uses acceptance criteria of 100 percent RPD for results that are less than five times the RL, or 50 percent RPD for results that are greater than five times the RL. Non-detect data are not used in the evaluation of field duplicate results. All analytes were within the acceptance criteria.

REPORTING LIMITS

SA used routine method RLs for non-detect results.

DATA PACKAGE

The data package was reviewed for transcription errors, omissions, and anomalies. None were found.

APHA and WEF. 1992. American Water Works Association and Water Environment Federation. Standard Methods for the examination of water and wastewater. 18th ed.

SA. 2008. Quality assurance manual. Specialty Analytical, Clackamas, Oregon.

USEPA. 1986. Test methods for evaluating solid waste: physical/chemical methods. EPA-530/SW-846. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. September (update 1, July 1992; update 2a, August 1993; update 2, September 1994; update 2b, January 1995).

USEPA. 1994. USEPA contract laboratory program, national functional guidelines for inorganics data review. EPA 540/R-94/013. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. February.

DATA QUALITY ASSURANCE/QUALITY CONTROL REVIEW

PROJECT NO. 9009.01.12 | AUGUST 5, 2009 | TRUEGUARD, LLC
REPORT NUMBERS 0906124 AND 0907016

This report reviews the analytical results for bench test samples treated with remediation reagents, including an activated red mud (GeoBind™) manufactured by Geochem Remediation, LLC, and a persulfate oxidant (Klozur™) manufactured by FMC, Inc. The samples were prepared in June and July 2009.

Specialty Analytical (SA), in Clackamas, Oregon, performed the analyses. SA report numbers 0906124 and 0907016 were reviewed. The analyses performed are listed below.

Analysis	Reference
Total metals	USEPA 6010A/6020/7196A
Anions	USEPA 9056
Hexavalent chromium	SM3500
Redox potential	SM2580B

SM = Standard Methods for the Examination of Water and Wastewater (American Public Health Association [APHA] and Water Environmetal Federation [WEF], 1992).
USEPA = U.S. Environmental Protection Agency.

DATA QUALIFICATIONS

Analytical results were evaluated according to applicable sections of USEPA procedures (USEPA, 1994), and appropriate laboratory and method-specific guidelines (APHA and WEF, 1992; SA, 2008; USEPA, 1986).

The data are considered acceptable for their intended use, with the appropriate data qualifiers assigned.

HOLDING TIMES, PRESERVATION, AND SAMPLE STORAGE

Holding Times

Extractions and analyses were performed within the recommended holding time criteria.

Preservation and Sample Storage

The samples were preserved and stored appropriately.

BLANKS

Method Blanks

Laboratory method blank analyses were performed at the required frequencies. No target analytes were detected above the SA reporting limits (RLs).

Trip Blanks

Trip blanks were not submitted for this sampling event.

Equipment Rinsate Blanks

Equipment rinsate blanks were not required for this sampling event, as all samples were collected using dedicated, single-use equipment.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RESULTS

MS/MSD results are used to evaluate laboratory precision and accuracy. All MS/MSD samples were extracted and analyzed at the required frequency. Except for hexavalent chromium, all recoveries were within acceptance limits for percent recovery and relative percent differences (RPDs). Because of low percent recoveries for hexavalent chromium in the MS/MSD for report number 0906124 (14.8 percent and 18.1 percent, respectively), the reviewer qualified all hexavalent chromium results as estimated (J or UJ) in report number 0906124.

LABORATORY DUPLICATE RESULTS

Duplicate results are used to evaluate laboratory precision. All duplicate samples were extracted and analyzed at the required frequency. All RPDs were within acceptance limits.

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RESULTS

An LCS/LCSD is spiked with target analytes to provide information on laboratory precision and accuracy. The LCS/LCSD samples were extracted and analyzed at the required frequency. All LCS/LCSD analytes were within acceptance limits for percent recovery.

REPORTING LIMITS

SA used routine method RLs for non-detect results.

DATA PACKAGE

The data package was reviewed for transcription errors, omissions, and anomalies. None were found.

APHA and WEF. 1992. American Water Works Association and Water Environment Federation. Standard Methods for the examination of water and wastewater. 18th ed.

SA. 2008. Quality assurance manual. Specialty Analytical, Clackamas, Oregon.

USEPA. 1986. Test methods for evaluating solid waste: physical/chemical methods. EPA-530/SW-846. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. September (update 1, July 1992; update 2a, August 1993; update 2, September 1994; update 2b, January 1995).

USEPA. 1994. USEPA contract laboratory program, national functional guidelines for inorganics data review. EPA 540/R-94/013. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. February.

MWH MEMORANDUM

TrueGuard, LLC
Laboratory-Scale Groundwater Arsenic Remediation Evaluation

Washougal Facility

August 26, 2009

f*or*

TrueGuard, LLC

725 South 32nd Street

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by

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Project No. 1006652.020101

\\Uspor1s02\NRII\Projects\TrueGuard\5.0 Reports\3.0 Bench-Scale Test Results Report

EXECUTIVE SUMMARY

MWH Americas, Inc. (MWH) has prepared this report to document laboratory-scale testing conducted for evaluating in-situ remedial alternatives for arsenic impacted groundwater beneath the TrueGuard, LLC (TrueGuard) Washougal facility located at 725 South 32nd Street in Washougal, Washington (Facility). This report describes the methods and findings of the laboratory-scale activities. The purpose of this report is to provide background information on the project, a description of the methods used during the laboratory-scale testing process, analytical laboratory results, and observations/recommendations based on those results. Key points of the laboratory-scale activities are summarized below and are discussed in detail in the report sections that follow.

Background

TrueGuard operates a timber preservation facility in Washougal, Washington. The Facility occupies approximately 15 acres, located approximately ¼-mile north of the Columbia River. Historical investigations at the Facility have identified the existence of arsenic impacted groundwater. In response, TrueGuard initiated a groundwater recovery system and notified the Washington Department of Ecology (DOE), and subsequently entered into the DOE Voluntary Cleanup Program.

MWH was contracted by TrueGuard to design and implement a laboratory-scale test program to evaluate the potential use of a chemical oxidant (calcium persulfate {Klozur™}) and proprietary Activated Red Mud (ARM) technology (Geobind™) to remediate the arsenic impacts at the Facility. Maul Foster and Alongi Inc. (MFA) conducted field sample collection and Specialty Analytical Inc. provided analytical laboratory services.

Summary of Results

- Klozur™ was capable of generating an oxidizing environment and converting arsenite ions to arsenate ions with or without the addition of ferrous ions (ferrous chloride) for activation, although based on similar studies, the addition of ferrous ions enhances the effect.
- The combination of Klozur™, ferrous chloride, and GeoBind™ was capable of immobilizing arsenic without mobilizing hexavalent chromium.

- Treatability samples with lower pH conditions (pH 5) resulted in lower arsenic concentrations; however, manganese concentrations at pH 5 were approximately equal to pre-treatment concentrations (3.56 µg/L). Samples with pH 6 conditions also resulted in low arsenic conditions, but with manganese concentrations lower than pre-treatment concentrations.
- The immobilized arsenic in treated samples did not significantly remobilize under the influx of upgradient groundwater obtained from MW-6.
- The addition of the ARM in GeoBind™ generally reduced manganese and copper mobilization during leachability testing. Additionally, MWH experience at other *in-situ* remediation sites indicates that ARM also results in greater long-term resistance to leaching by enhanced crystallization of the arsenic onto ARM particles.

Recommendations

There are two equally important elements to consider for the successful *in-situ* remediation of soil and groundwater contamination (Blessing et al, 2002):

1. Selection of the appropriate remediation reagents, considering the site-specific geochemical conditions; and,
2. Selection of the appropriate reagent delivery system, considering the site-specific geohydrological conditions.

The laboratory-scale testing program demonstrated that a mixture of Klosure™ persulfate chemical oxidant, ferrous chloride for pH modification, and a small dose of GeoBind™ ARM for stability of the 'fixed' arsenic and other metals are capable of immobilizing dissolved arsenic in the groundwater at the Facility without mobilizing hexavalent chromium or other metals. As such, the remediation reagents evaluated during the laboratory scale tests satisfy the first required element listed above for successful *in-situ* remediation (i.e., selection of the appropriate remedial reagents).

In order to evaluate the second element required for successful remediation, MWH recommends design and implementation of a pilot-scale study to evaluate reagent delivery systems. Reagent delivery systems are dependent on site-specific conditions, and at least two reagent delivery systems appear to hold promise for delivery of the remediation reagents at the Facility. MWH proposes that a program of pilot-scale testing be initiated to verify the delivery system efficacy and to develop design details for the future full-scale application of one or both delivery systems. The concepts for the two reagent delivery systems include:

- Slurry introduction through existing or new wells; and
- Slurry introduction on a grid or barrier basis using trenches or direct-push hydrofracturing drilling technology.

Specific details of the proposed pilot-scale testing, such as reagent handling, concentrations and doses, delivery methods and locations, monitoring, and reporting, will be provided in a separate pilot-scale test protocol.

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1.0 INTRODUCTION

MWH Americas, Inc. (MWH) has prepared this report to document laboratory-scale testing conducted to evaluate *in-situ* remedial alternatives for arsenic impacted groundwater at the TrueGuard, LLC (TrueGuard) Washougal facility located at 725 South 32nd Street in Washougal, Washington (Facility).

1.1 PROJECT OBJECTIVE

In summary, the objective of the laboratory-scale testing was to assess the capability of select remediation reagents to fixate arsenic onto aquifer solids and to determine the approximate dosage of reagents to complete the fixation process.

1.2 SCOPE OF WORK

The laboratory-scale testing was performed in general accordance with the *Bench-Scale Testing Laboratory Protocol for In-Situ Arsenic Groundwater Remediation Memorandum* (MWH, 2009) and consisted of the following activities.

- Treatability testing including:
  - Determination of the Natural Oxidant Demand (NOD) of a slurry of aquifer solids and groundwater collected from the source and down-gradient areas of the site; and,
  - Determination of appropriate oxidant and Activated Red Mud (ARM) dose rates for average source-area and down-gradient conditions.
- Leachability testing of treated aquifer solids to assess potential remobilization of chemisorbed arsenic from the solids into clean groundwater.

1.3 REPORT ORGANIZATION

This report is organized into the following sections:

Section 1 Presents the introduction, project objective, scope of work, and organization of the report.

Section 2 Presents background information regarding site-specific hydrogeology and geochemistry.

Section 3 Presents a narrative description of the treatability testing and results.

Section 4 Presents a narrative description of the leachability testing and results.

Section 5 Presents a summary of the conclusions derived from the laboratory-scale testing.

Section 6 Provides the limitations of the work conducted and the information presented in this report.

2.0 BACKGROUND

2.1 SITE SUMMARY

TrueGuard operates a timber preservation facility in Washougal, Washington. The Facility occupies approximately 15 acres and is located approximately ¼ mile north of the Columbia River (**Figure 1**). Historical investigations at the Facility have identified the existence of arsenic impacted groundwater under the Facility. As a response, TrueGuard initiated a groundwater recovery system and notified the Washington Department of Ecology (DOE), and subsequently entered into the DOE Voluntary Cleanup Program. In August 2007, Maul Foster and Alongi, Inc. (MFA) prepared a Groundwater Remediation Plan for the Facility. MFA subsequently conducted a test injection of EHC-M™, a metals remedial reagent for *in-situ* immobilization of soluble metals manufactured by Adventus Americas, Inc. in April 2008. MWH understands that this test program did not produce satisfactory results for remediation of the arsenic impacted groundwater.

MWH was contracted by TrueGuard to design and implement a laboratory-scale test program to evaluate the potential use of a chemical oxidant (calcium persulfate {Klozur™, manufactured by FMC Environmental Solutions}) and ARM (GeoBind™, manufactured by GEOCHEM Remediation LLC) to remediate the arsenic impacted groundwater at the Facility. MFA conducted field sample collection for the laboratory-scale testing, and Specialty Analytical, Inc. provided analytical laboratory services.

2.2 HYDROGEOLOGIC AND GEOCHEMICAL CONDITIONS

Groundwater beneath the Facility occurs in alluvial deposits, with apparent groundwater flow across the site predominantly from the west to east (**Figure 2**). In addition to arsenic, boron has also been detected in groundwater. A comparison of the arsenic and boron concentrations in groundwater indicates that the arsenic is somewhat naturally attenuated relative to the velocity of groundwater movement and boron groundwater concentrations.

Limited speciation data from historical groundwater investigations indicates that the arsenic is present predominantly as the oxidized arsenate anion near the source (MW-3), and as the reduced arsenite anion downgradient from the source (MW-11). The reduced arsenite ion tends to be more mobile than does the oxidized arsenate anion. Hexavalent chromium appears to be reduced to the immobile trivalent form by natural reducing conditions in the subsurface. The potential for conversion of the trivalent chromium to the more mobile hexavalent form must be considered in potential remediation plans for the site.

3.0 TREATABILITY TESTING

The first phase of the laboratory-scale testing involved determination of the NOD of the subsurface material, and subsequent treatability testing using a chemical oxidant (Klozur™) to convert the subsurface materials to a more highly oxidized state. Additionally, ferrous chloride was used to lower the pH of the subsurface material and to provide additional ferrous ions for formation of low-solubility ferric arsenate/ferric hydroxide. ARM (GeoBind™) was used to further stabilize the resultant solid-phase arsenic. The conduct of these tests is described in the following sections.

3.1 FIELD SAMPLE COLLECTION

During May 2009, MFA conducted routine groundwater-quality sampling of the site monitoring wells. Analytical results from the sampling event are presented in **Table 1**. In addition, MFA collected bulk groundwater samples from monitoring wells (MW-3 and MW-11) located within the arsenic plume, and from MW-6, an upgradient well (control well), for use in the treatability testing (**Figure 2**). The sampling was reportedly conducted in a manner to minimize the aeration and subsequent oxidation of the groundwater samples. Geochemical field parameter data (**Table 1**) indicates that the groundwater is low in dissolved oxygen with a negative ORP, typical of reduced groundwater conditions. MFA also collected aquifer solids from the saturated zone near wells MW-3 and MW-11 for the treatability testing. These samples were transported to Specialty Analytical, Inc. for the laboratory-scale testing.

3.2 EXPERIMENTAL DESIGN

The treatability testing involved two separate sequential tests. The first of these tests was determining the ability to generate oxidizing conditions (NOD) in slurries comprised of groundwater and aquifer solids collected from MW-3 and MW-11. Subsamples of the slurries were placed into 250-milliliter (ml) flasks and dosed with varying amounts of Klozur™. The flasks were sealed and placed on a shaker. Readings of ORP were collected after sample shake times of 1, 5, and 24 hours.

The second test involved monitoring the reaction of contaminated groundwater and aquifer solids slurries dosed with Klozur™ persulfate oxidant, ferrous chloride (for pH reduction and as a source of ferrous ions), and GeoBind™ ARM to serve as nucleation (fixation) sites. In this test, slurries of groundwater and aquifer solids collected from MW-3 and MW-11 were mixed in equal portions. This mixture was considered to represent an average representation of the conditions within the contaminant plume, including both the slightly oxidized and the reduced portions of the plume.

Fifteen subsamples of the slurry were formed by mixing 100 grams (g) of the composited aquifer solids and 500 ml of composited groundwater in a 1–liter (L) wide-mouth plastic sample bottle. The subsamples were dosed with 0.375 g, 0.5 g, or 0.6125 g of Klozur™. The pH of the slurries was adjusted to 5, 6, or 7 units by means of a ferrous chloride solution. The slurries were then dosed with powdered GeoBind™ at doses of 0.0 g (control), 0.01 g, 0.05 g, 0.1 g, or 0.5 g. The varying Klozur™ and ferrous choride dosages resulted in 15 slurry permutations, three at each of the five GeoBind™ dosage rates. The sample bottles were sealed and gently shaken for one week, at which time the ORP was determined. The samples were then filtered through a 0.45-micron filter. The filtrates from the samples were analyzed for a suite of parameters, including boron, arsenic, chromium, copper, iron, lead, manganese, hexavalent chromium, and sulfate. The solids were retained for subsequent leachability testing.

3.3 GEOCHEMICAL AND ANALYTICAL RESULTS

Results of the NOD testing are presented in **Figure 3**. While the groundwater had a negative ORP at the time of sample collection, the preparation of the slurry samples and reaction with headspace in the bottles was sufficient to result in positive ORP in the samples not dosed with Klozur™. The data show that dosing either of the MW-3 or MW-11 slurries with 0.5 grams of Klozur™ was sufficient to raise the ORP to values in the 300 to 400 millivolt (mV) range. These conditions are sufficient to oxidize arsenic to the arsenate form.

For Klozur™ to be effective as an oxidant, it needs to be 'activated' by pH increase, heat, or iron. Since the groundwater already contains elevated naturally occurring iron concentrations in MW-11 (>50,000 µg/L), it was anticipated that this would be sufficient to activate the Klozur™. Results of the testing appear to indicate that there was also sufficient iron available from the aquifer solids at MW-3 to activate the Klozur™. It was concluded that a Klozur™ dose of 0.5 g/L would be used as the optimal dose in the subsequent treatability testing, with dosing also at slightly lesser (0.375 g/L) and greater (0.6125 g/L) concentrations.

Table 2 presents results of the laboratory analyses of the liquid portion of the 15 treatability slurry samples. It should be noted that the ORP is highest for each of the series of samples where Klozur™ dosing is lower than optimal and lowest when Klozur™ dosing was greater than optimal. This is because, at higher Klozur™ doses, more of the ferrous chloride is oxidized, consuming oxidant. It should also be noted that the arsenic concentration is less in the samples with the lowest pH, since the solubility of ferric arsenate is lowest at approximately 4.5 to 5.5 (Cherry et al, 1986). **Figure 4** illustrates the concentration of arsenic from treatability samples in each ARM dosage group versus ORP. All treated samples were below the pre-treatment arsenic concentration (1,700 µg/L; average concentration from MW-3 and MW-11) by up to three orders of magnitude. Concentrations of manganese, copper and lead were highest in each of the samples at initial pH values of 5, since these metals are more soluble at lower pH values. Hexavalent chromium was not detected in any of the samples. Boron was present in the groundwater that was used in preparation of the slurries and was not attenuated due to its 'conservative' nature.

Manganese is worthy of special discussion. As noted above, manganese is soluble at low pH values. It is also soluble under reducing conditions at neutral pH, comparable to groundwater conditions at the Facility. Up-gradient monitoring well MW-6 had a manganese concentration of 2.35 milligrams per liter (mg/L) during the May 2009 sampling event. The combined sample from MW-3 and MW-11, used to form the slurries, has approximately the same manganese concentration as detected in the pH 5 slurries (**Table 2**), indicating there was essentially no mobilization of manganese during the treatment. The slurries at pH 6 contained significantly less manganese than was present in the groundwater used to form the slurries, which appears to indicate removal of manganese during the treatment. As shown by the test data, as the pH of the oxidized slurry liquid increases to neutral, the manganese concentration decreases, with concentrations significantly less than the source water concentrations.

4.0 LEACHABILITY TESTING

Upon the conclusion of the treatability studies described above, the efforts shifted to the determination of the potential for the precipitated arsenic to be mobilized by the subsequent influx of non-impacted groundwater. This was accomplished by taking the solids from six of the treatability test bottles and leaching them with groundwater collected from upgradient monitoring well MW-6. These tests are described below.

4.1 EXPERIMENTAL DESIGN

The six solids samples used in the preparation of the slurries for the leachability testing were comprised of solids material remaining from six of the treatability slurries that had been dosed with ferrous chloride to achieve pH values of either 5 or 6 and from groundwater collected from upgradient monitoring well MW-6. Two of the samples had previously received no GeoBind™, while the others received either 0.05 g or 0.5 g doses of GeoBind™. Slurries for the leachability testing had a higher percentage of solids (25% solids and 75% groundwater from MW-6) than the treatability slurries. The higher percentage of solids would thus be more prone to higher concentrations of metals in the liquid at the conclusion of the test.

As was the case with the treatability tests, the samples were gently shaken for one week, filtered through a 0.45-micron filter, and the liquid fraction analyzed for the same suite of parameters as the treatability samples.

4.2 ANALYTICAL RESULTS

Table 2 contains results of laboratory analyses on the liquid from the six leachability slurries. As with the treatability slurries, none of the samples contained detectable concentrations of iron or hexavalent chromium. Boron concentrations were lower than those concentrations from the treatability testing as the groundwater used for the leachability testing was derived from a monitoring well (MW-6) with lower boron concentrations (0.128 mg/L). Total chromium was only detected in the samples not dosed with GeoBind™, with the exception of one sample dosed at 0.5 g of GeoBind™ having a concentration equal to its reporting limit (1 ug/L). This illustrates the known ability of GeoBind™ to bind trivalent chromium into a non-leachable state onto the solids. In addition, generally higher doses of GeoBind™ resulted in lower concentrations of total copper in the leachate. An elevated concentration of manganese (7.2 mg/L) was observed in the sample not treated with GeoBind™ with the lowest pH. Manganese is detected in groundwater at the facility and is also a common constituent of ferrous chloride reagents. The analytical results illustrate the common mobility of manganese at a low pH, when GeoBind™ treatment is absent.

5.0 CONCLUSIONS

The following is a summary of the conclusions from the laboratory-scale testing activities:

- Klozur™ was capable of generating an oxidizing environment and converting arsenite ions to arsenate ions with or without the addition of ferrous ions (ferrous chloride) for activation, although based on similar studies, the addition of ferrous ions enhances the effect.
- The combination of Klozur™, ferrous chloride, and GeoBind™ was capable of immobilizing arsenic without mobilizing hexavalent chromium.
- Treatability samples with lower pH conditions (pH 5) resulted in lower arsenic concentrations; however, manganese concentrations at pH 5 were approximately equal to pre-treatment concentrations (3.56 µg/L). Samples with pH 6 conditions also resulted in low arsenic conditions, but with manganese concentrations lower than pre-treatment concentrations.
- The immobilized arsenic in treated samples did not significantly remobilize under the influx of upgradient groundwater obtained from MW-6.
- The addition of the ARM in GeoBind™ generally reduced manganese and copper mobilization during leachability testing. Additionally, MWH experience at other *in-situ* remediation sites indicates that ARM also results in greater long-term resistance to leaching by enhanced crystallization of the arsenic onto ARM particles.

6.0 RECOMMENDATIONS

There are two equally important elements to consider for the successful *in-situ* remediation of soil and groundwater contamination (Blessing et al, 2002):

1. Selection of the appropriate remediation reagents, considering the site-specific geochemical conditions; and,
2. Selection of the appropriate reagent delivery system, considering the site-specific geohydrological conditions.

The laboratory-scale testing program described in previous sections has demonstrated that a mixture of Klosure™ persulfate chemical oxidant, ferrous chloride for pH modification, and a small dose of GeoBind™ ARM for stability of the 'fixed' arsenic and other metals are capable of immobilizing dissolved arsenic in the groundwater at the Facility without mobilizing hexavalent chromium or other metals. As such, the remediation reagents evaluated during the laboratory scale tests satisfy the first required element listed above for successful *in-situ* remediation (i.e., selection of the appropriate remedial reagents).

In order to evaluate the second element required for successful remediation, MWH recommends design and implementation of a pilot-scale study to evaluate reagent delivery systems. Reagent delivery systems are dependent on site-specific conditions, and at least two reagent delivery systems appear to hold promise for delivery of the remediation reagents at the Facility. MWH proposes that a program of pilot-scale testing be initiated to verify the delivery system efficacy and to develop design details for the future full-scale application of one or both delivery systems. The concepts for the two reagent delivery systems include:

- Slurry introduction through existing or new wells; and
- Slurry introduction on a grid or barrier basis using trenches or direct-push hydrofracturing drilling technology.

Specific details of the proposed pilot-scale testing, such as reagent handling, concentrations and doses, delivery methods and locations, monitoring, and reporting, will be provided in a separate pilot-scale test protocol.

7.0 LIMITATIONS

This report was prepared exclusively for TrueGuard, LLC (TrueGuard) by MWH Americas, Inc. (MWH). The quality of information, conclusions, and recommendations contained herein is consistent with the level of effort involved in MWH services and based on: i) a specific scope agreed to between MWH and TrueGuard; ii) information available at the time of preparation, iii) data supplied by outside sources, and iv) the assumptions, conditions, and qualifications set forth in this report. Therefore, this report may have limitations, assumptions and/or rely on information/data that are not obvious on the face of it. Reliance, therefore, should not be made upon this report without further consultation with MWH.

This Laboratory-Scale Groundwater Arsenic Remediation Evaluation is intended to be used by TrueGuard for the Washougal, Washington Facility only, subject to the terms and conditions of its contract with MWH. Any interpretations and recommendations given in this report represent the opinions of MWH in accordance with a specific brief and as such do not necessarily address all aspects that may surround the subject area. In the event that changes in the nature, usage, or layout of the property or nearby properties are made, the conclusions and recommendations contained in this report may not be valid. If additional information becomes available, it should be provided to MWH so the original conclusions and recommendations can be modified as necessary.

MWH's liability under this report is limited to its agreement with TrueGuard. No liability or duty of care is accepted by MWH with respect to use of this report by any other person. Any reliance placed upon any matters upon which MWH has reported by any person other than TrueGuard, is done so entirely at their own risk and without recourse to MWH or any of its employees or agents for any loss, damage, or expense of whatsoever, in any nature which may be caused by any use of this report.

REFERENCES

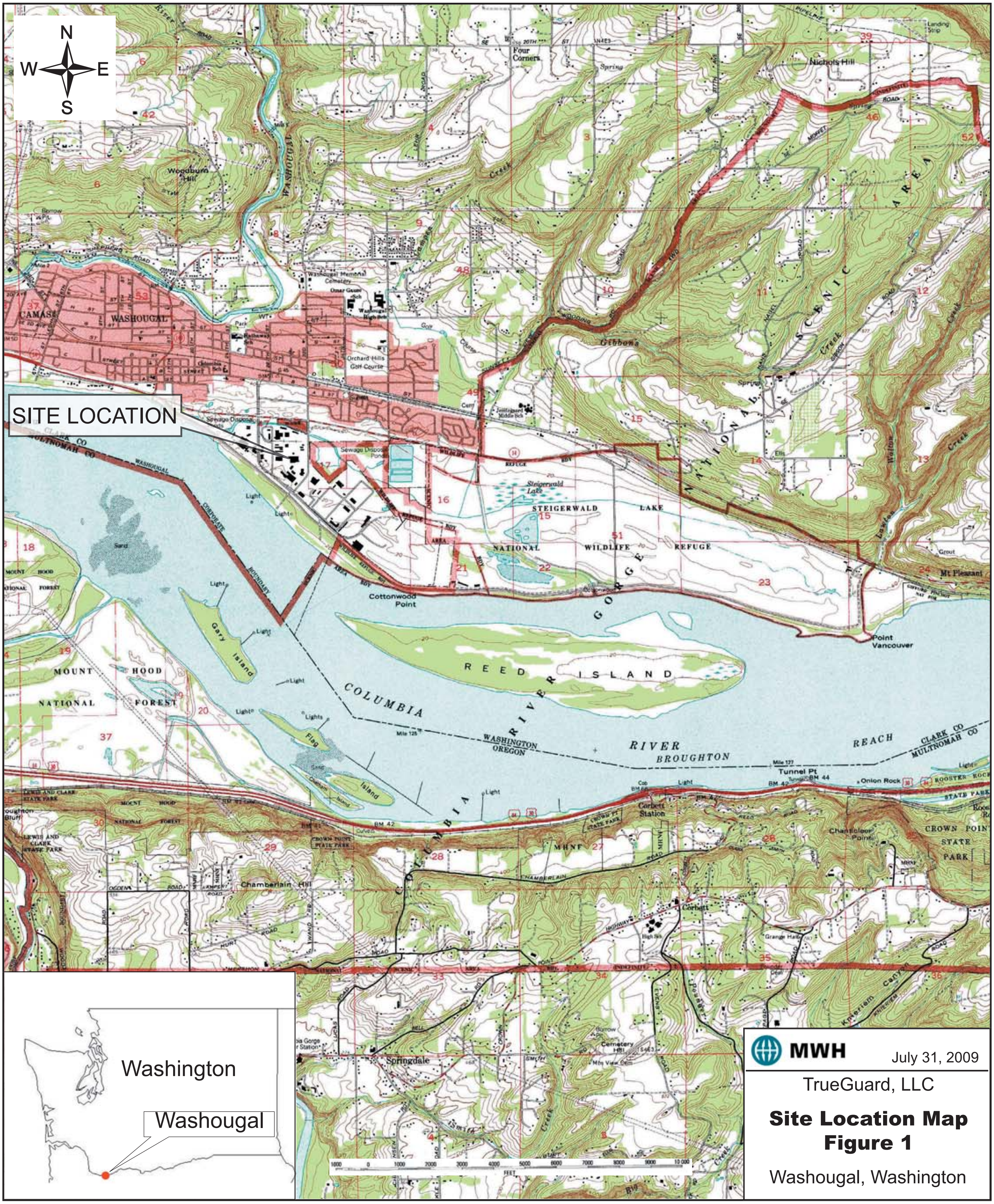
Cherry, J.A., F.M.M. Morel, J.V. Rouse, J.L. Schnoor, and M.G. Wolman, 1986, "Hydrogeochemistry of sulfide and arsenic-rich tailings and alluvium along Whitewood Creek, South Dakota" Colorado School of Mines, Mineral & Energy Resources.

MWH, 2009. Bench-Scale Testing Laboratory Protocol for *In-Situ* Arsenic Groundwater Remediation Memorandum, April 14, 2009.

DOE, 2007. Washington Department of Ecology, Model Toxics Control Act Statute and Regulations, November 2007.

Blessing, Todd C. and Rouse, Jim V, 2002. "Keys to Successful *In-Situ* Remediation of Hexavalent Chromium in Soil and Groundwater", Proceedings, American Wood preserver's Association, volume 97.

FIGURES



N
W
E
S
SITE LOCATION
CAMAS
WASHOUGAL
Woodburn Hill
Four Corners
Nichols Hill
Washougal Memorial Cemetery
Orchard Hills Golf Course
Sewage Disposal Ponds
Steigerwald Lake
STEIGERWALD LAKE NATIONAL WILDLIFE REFUGE
COLUMBIA RIVER GORGE NATIONAL SCENIC AREA
Gibbons Creek
Cottonwood Point
Point Vancouver
Mt Pleasant
REED ISLAND
Gary Island
Flag Island
COLUMBIA RIVER
BROUGHTON REACH
WASHINGTON
OREGON
CLARK CO
MULTNOMAH CO
MOUNT HOOD NATIONAL FOREST
Tunnel Pt
Onion Rock
Corbett Station
Corbett
Chanticleer Point
CROWN POINT STATE PARK
LEWIS AND CLARK STATE PARK
Chamberlain Hill
Springdale
Washington
Washougal
MWH
July 31, 2009
TrueGuard, LLC
Site Location Map
Figure 1
Washougal, Washington

Legend

MW-6 20.03 — Monitoring Well Location (with Water Level Value in Feet NAVD88)

MW-10 — Extraction Well Location

14.0 — Contour (0.5-Foot Interval)

TrueGuard, LLC Site Boundary

Tax Lots

Flow Direction

Notes

Source: Maul Foster Alongi Figure Water Level Contours from May 4, 2009.

N W E S

MWH July 31, 2009

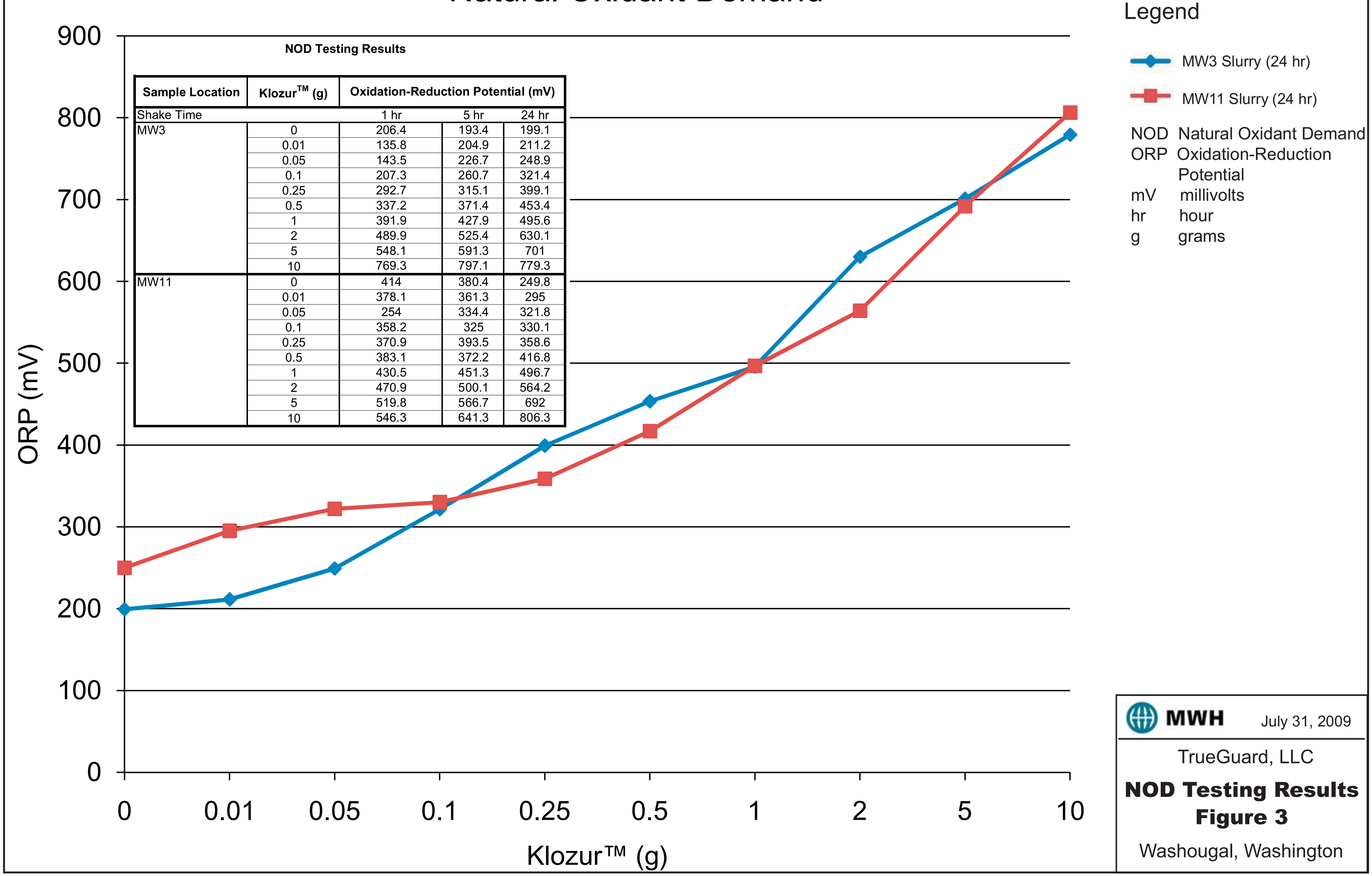
TrueGuard, LLC

Water Level Contours May 4, 2009

Figure 2

Washougal, Washington

Natural Oxidant Demand



NOD Testing Results

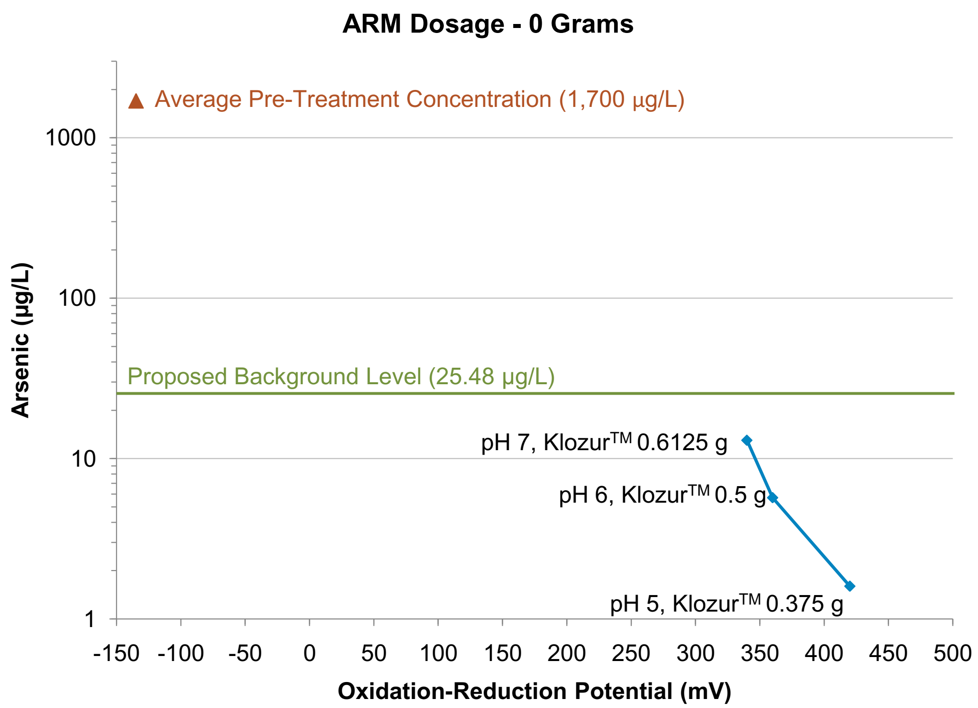
Sample Location	Klozur™ (g)	Oxidation-Reduction Potential (mV)		
Shake Time		1 hr	5 hr	24 hr
MW3	0	206.4	193.4	199.1
	0.01	135.8	204.9	211.2
	0.05	143.5	226.7	248.9
	0.1	207.3	260.7	321.4
	0.25	292.7	315.1	399.1
	0.5	337.2	371.4	453.4
	1	391.9	427.9	495.6
	2	489.9	525.4	630.1
	5	548.1	591.3	701
	10	769.3	797.1	779.3
MW11	0	414	380.4	249.8
	0.01	378.1	361.3	295
	0.05	254	334.4	321.8
	0.1	358.2	325	330.1
	0.25	370.9	393.5	358.6
	0.5	383.1	372.2	416.8
	1	430.5	451.3	496.7
	2	470.9	500.1	564.2
	5	519.8	566.7	692
	10	546.3	641.3	806.3

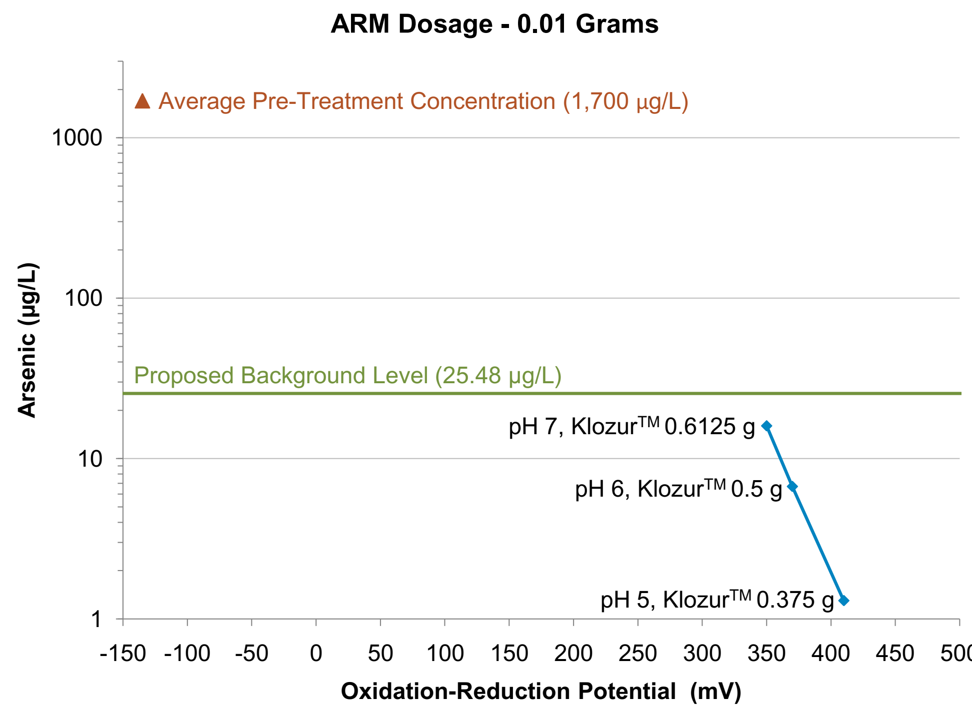
MWH July 31, 2009

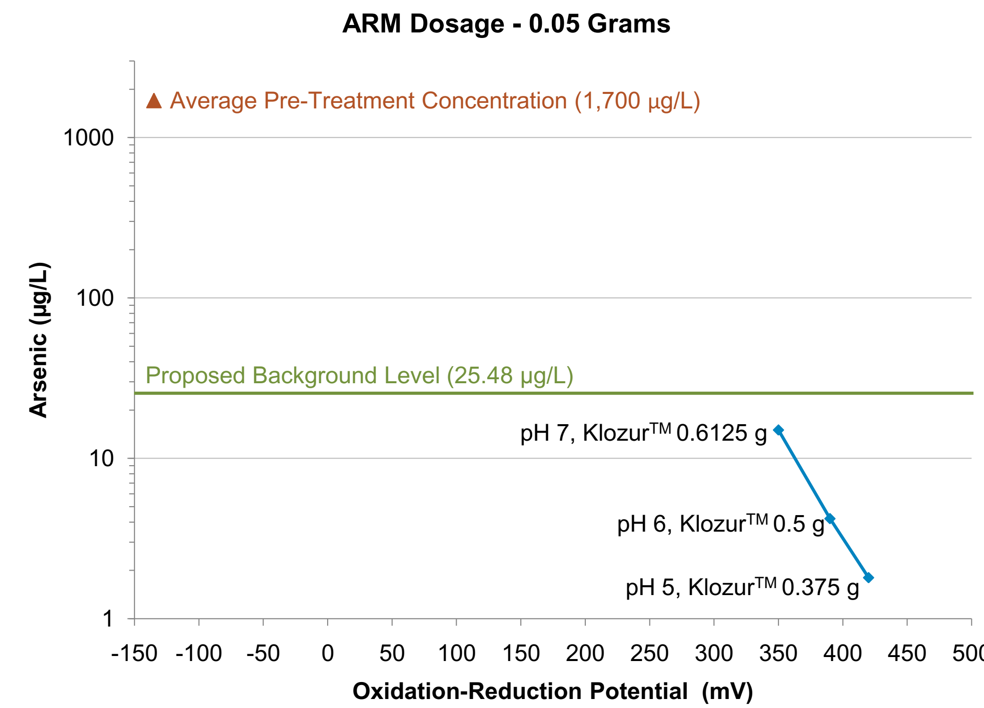
TrueGuard, LLC

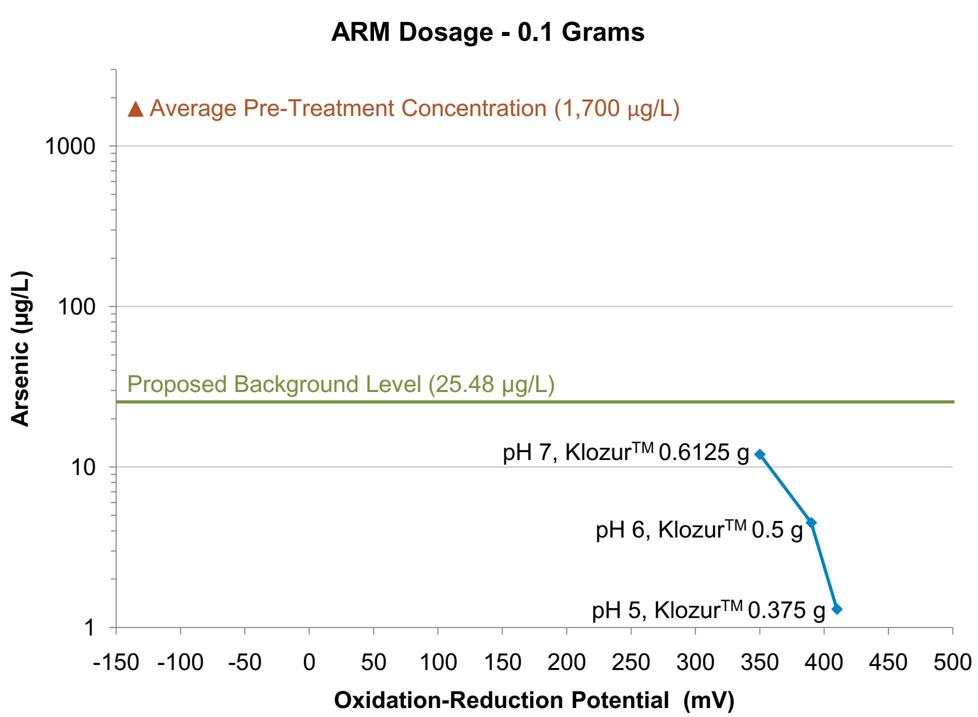
NOD Testing Results
Figure 3

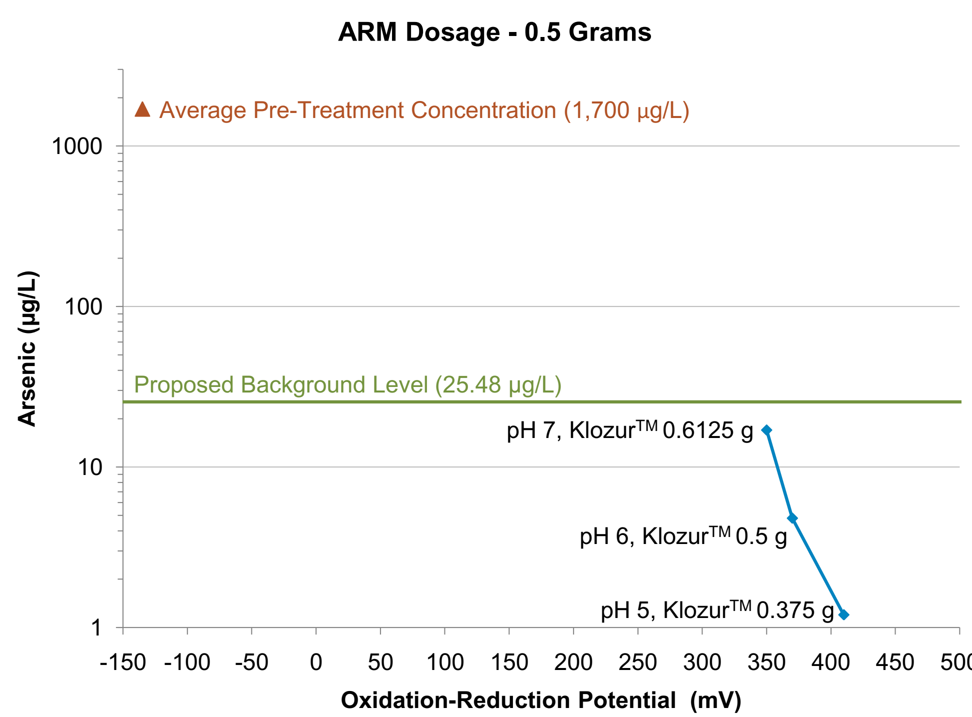
Washougal, Washington











Legend

g	grams
µg/L	micrograms per liter
mV	millivolts
ARM	Activated Red Mud

MWH July 31, 2009

TrueGuard, LLC

Treatability Testing Results

Figure 4

Washougal, Washington

TABLES

Table 1
Results - Groundwater Sampling May 2009
TrueGuard, LLC
Washougal, Washington

Monitoring Well ID			**MW-1**	**MW-3**	**MW-5**	**MW-6**	**MW-10**	**MW-11**	**MW-12**	**MW-13**	**MW-13Dup**	**MW-14**	**MW-15**	**MW-16**
Field Parameter Results														
pH		-	6.89	8.28	6.70	7.09	7.27	7.45	7.14	7.15	7.15	7.02	6.75	7.66
Conductivity		(mS)	74	132	42	282	210	817	608	181	181	384	416	589
ORP		(mV)	-19.6	-146.5	3.6	-80.3	-124.0	-123.4	-132.0	-95.2	-95.2	-88.3	-87.3	-90.2
Analyte Results														
Arsenic	Total	(mg/L)	-	0.42	-	0.005	4.9	4	-	-	-	-	-	3
Arsenic	Dissolved	(mg/L)	0.0097	0.4	0.0031	0.0042	5	3	0.63	0.035	0.033	0.063	0.034	2.8
Bicarbonate (as $CaCO^{3}$)	Total	(mg/L)	-	65.9	-	171	92.4	477	-	-	-	-	-	349
Boron	Total	(mg/L)	-	0.166	-	0.136	0.12	0.271	-	-	-	-	-	0.465
Boron	Dissolved	(mg/L)	0.0449	0.173	0.129	0.128	0.106	0.234	3.33	0.879	0.803	0.592	1.34	0.427
Calcium	Total	(mg/L)	-	16	-	38.6	18	84.2	-	-	-	-	-	70.3
Carbonate (as $CaCO^{3}$)	Total	(mg/L)	-	<10	-	<10	<10	<10	-	-	-	-	-	<10
Chloride	Total	(mg/L)	-	1.99	-	2.77	3.14	9.89	-	-	-	-	-	4.02
Chromium	Total	(mg/L)	-	0.0092	-	0.0054	0.0072	<0.005	-	-	-	-	-	<0.005
Chromium	Dissolved	(mg/L)	<0.005	<0.005	0.0071	0.0051	0.0067	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Hex Chrome	Dissolved	(mg/L)	-	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-	-	<0.005
Copper	Total	(mg/L)	-	<0.01	-	<0.01	<0.01	<0.01	-	-	-	-	-	<0.01
Copper	Dissolved	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	Total	(mg/L)	-	5.9	-	16.3	14.6	53.6	-	-	-	-	-	61.8
Iron	Dissolved	(mg/L)	5.05	5.4	0.62	16.4	14.4	52.1	40.2	17.1	15.6	32.5	25.2	60.8
Magnesium	Total	(mg/L)	-	4.57	-	14.8	7.48	40.2	-	-	-	-	-	20
Manganese	Total	(mg/L)	-	0.866	-	2.4	1.16	6	-	-	-	-	-	5.42
Manganese	Dissolved	(mg/L)	0.494	0.872	0.197	2.35	1.18	6.25	2.12	1.39	1.3	3.66	3.58	5.08
Nitrate	Total	(mg/L)	-	<0.03	-	0.0352	0.0404	0.0666	-	-	-	-	-	0.0614
Potassium	Total	(mg/L)	-	2.2	-	2.19	5.18	16.2	-	-	-	-	-	4.95
Sodium	Total	(mg/L)	-	4.16	-	7.86	4.66	10.9	-	-	-	-	-	8.74
Sulfate	Total	(mg/L)	-	<0.5	-	1.55	0.51	<0.5	-	-	-	-	-	<0.5
TOC	Total	(mg/L)	-	2.54	-	5.6	2.36	6.88	-	-	-	-	-	3.49

Notes:

ORP - Oxidation-Reduction Potential
$CaCO^{3}$ - Calcium Carbonate
TOC - Total Organic Compound
< - Not detected at reporting limit
mg/L - milligrams per liter
mV - millivolt
mS - microSiemens

Table 2
Laboratory-Scale Testing Results
TrueGuard, LLC
Washougal, Washington

Analyte	pH	Klozur™	ARM	ORP	Boron	Arsenic	Chromium	Copper	Iron	Lead	Manganese	Hex Chrome	Sulfate
EPA Method				SM2580b	SW6010	SW6020	SW6020	SW6020	SW6020	SW6020	SW6020	SM 3500-Cr D	SW9056
Units	-	(g)	(g)	(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
May 2009 Sampling Event													
MW-3	8.28	-	-	-146.5	0.173	0.4	<0.005	<0.01	5.4	NA	0.872	<0.005	<0.5
MW-11	7.45	-	-	-123.4	0.234	3.0	0.0052	<0.01	52.1	NA	6.25	<0.005	<0.5
MW-6	7.09	-	-	-80.3	0.128	0.0042	0.0051	<0.01	16.4	NA	2.35	<0.005	1.55
Average of MW-3 and MW-11	7.87	-	-	-134.9	0.2	1.7	0.00385 [1]	<0.01	28.8	NA	3.56	<0.005	<0.5
Treatability Testing [2]													
ARM0-FeCl5-Klosure0.375	5	0.375	0	420	0.304	0.0016	0.0012	0.0093	<0.1	0.00018	3.7	<0.005	177
ARM0-FeCl6-Klosure0.5	6	0.5	0	360	0.305	0.00057	0.0011	0.0017	<0.1	<0.0001	0.95	<0.005	166
ARM0-FeCl7-Klosure0.6125	7	0.6125	0	340	0.283	0.013	0.0028	0.0017	<0.1	<0.0001	0.022	<0.005	140
ARM0.01-FeCl5-Klosure0.375	5	0.375	0.01	410	0.314	0.0013	0.001	0.0042	<0.1	<0.0001	4.0	<0.005	236
ARM0.01-FeCl6-Klosure0.5	6	0.5	0.01	370	0.321	0.0067	0.0011	0.0041	<0.1	<0.0001	3.9	<0.005	193
ARM0.01-FeCl7-Klosure0.6125	7	0.6125	0.01	350	0.314	0.016	0.002	0.0028	<0.1	<0.0001	0.3	<0.005	173
ARM0.05-FeCl5-Klosure0.375	5	0.375	0.05	420	0.326	0.0018	<1.0	0.0088	<0.1	0.00015	4.5	<0.005	242
ARM0.05-FeCl6-Klosure0.5	6	0.5	0.05	390	0.316	0.0042	1.2	0.0015	<0.1	<0.0001	1.2	<0.005	127
ARM0.05-FeCl7-Klosure0.6125	7	0.6125	0.05	350	0.301	0.015	2.8	0.0024	<0.1	<0.0001	0.018	<0.005	135
ARM0.1-FeCl5-Klosure0.375	5	0.375	0.1	410	0.322	0.0013	<0.001	0.0036	<0.1	<0.0001	2.9	<0.005	193
ARM0.1-FeCl6-Klosure0.5	6	0.5	0.1	390	0.316	0.0045	<0.001	0.0016	<0.1	<0.0001	2.2	<0.005	217
ARM0.1-FeCl7-Klosure0.6125	7	0.6125	0.1	350	0.303	0.012	0.0024	0.0022	<0.1	<0.0001	0.035	<0.005	187
ARM0.5-FeCl5-Klosure0.375	5	0.375	0.5	410	0.320	0.0012	<0.001	0.0027	<0.1	<0.0001	3.6	<0.005	164
ARM0.5-FeCl6-Klosure0.5	6	0.5	0.5	370	0.324	0.0048	<0.001	0.0018	<0.1	<0.0001	0.66	<0.005	211
ARM0.5-FeCl7-Klosure0.6125	7	0.6125	0.5	350	0.322	0.017	0.0022	0.0028	<0.1	<0.0001	0.021	<0.005	165
Leachability Testing [2]													
ARM0-FeCl5-Klosure0.375	5	0.375	0	-	0.120	0.0018	0.0011	0.06	<0.1	<0.0001	7.2	<0.005	67.1
ARM0-FeCl6-Klosure0.5	6	0.5	0	-	0.129	0.0039	0.0011	0.028	<0.1	<0.0001	0.00077	<0.005	78.7
ARM0.05-FeCl5-Klosure0.375	5	0.375	0.05	-	0.130	0.0017	<0.001	0.093	<0.1	<0.0001	0.12	<0.005	104
ARM0.05-FeCl6-Klosure0.5	6	0.5	0.05	-	0.129	0.0034	<0.001	0.021	<0.1	<0.0001	0.0029	<0.005	66.0
ARM0.5-FeCl5-Klosure0.375	5	0.375	0.5	-	0.122	0.0022	<0.001	0.023	<0.1	<0.0001	0.72	<0.005	66.5
ARM0.5-FeCl6-Klosure0.5	6	0.5	0.5	-	0.116	0.0051	0.001	0.017	<0.1	0.0002	0.0029	<0.005	89.1

Notes:

Values are dissolved concentrations

Klozur™ - Calcium Persulfate

ARM - Activated Red Mud

ORP - Oxidation-Reduction Potential

FeCl - Ferrous Chloride

< - Not detected at reporting limit

g - grams

mg/L - milligrams per liter

µg/L - micrograms per liter

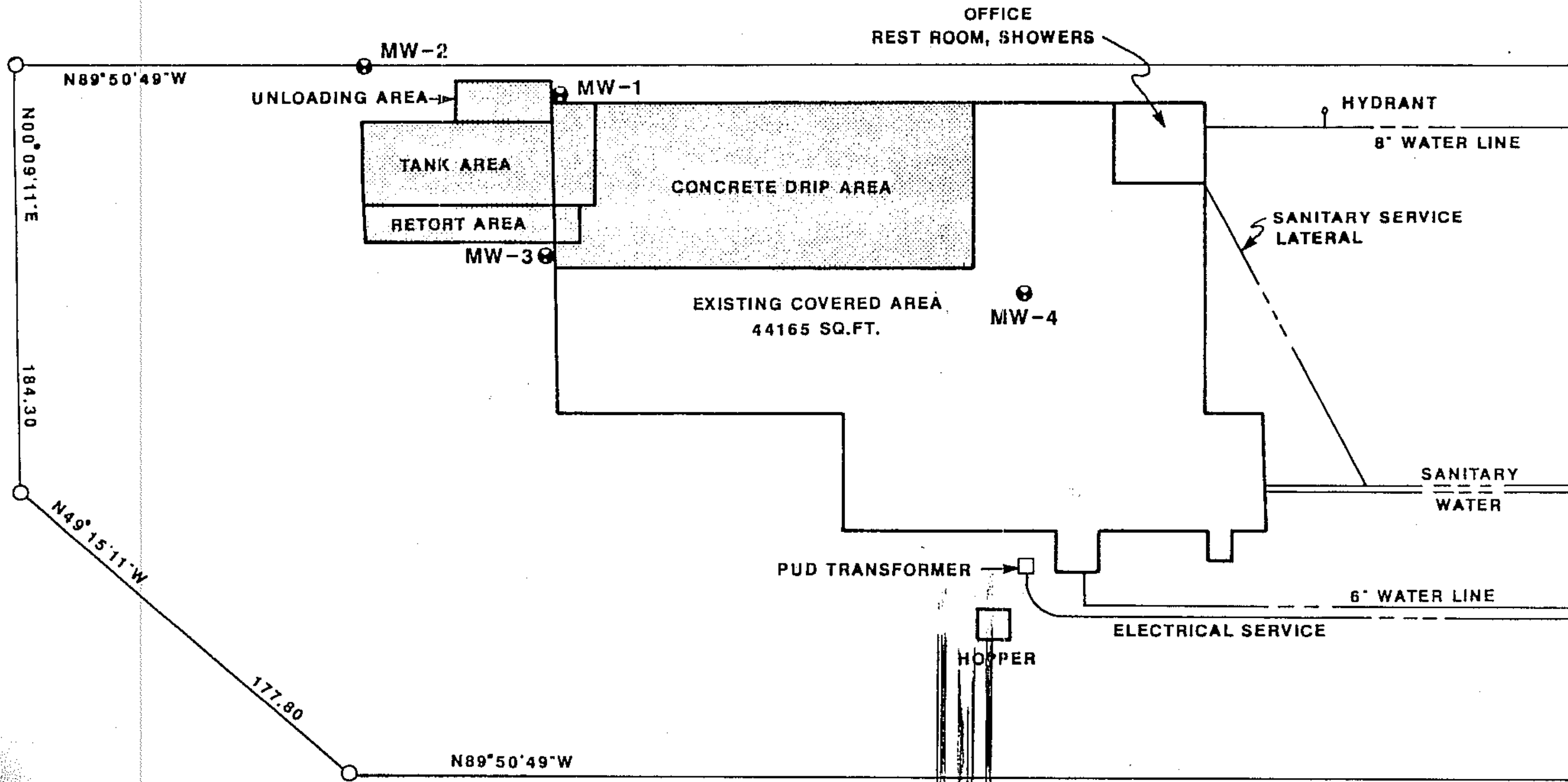
mV - millivolt

NA - Not applicable

NV - No value

[1] Average chromium concentration derived from MW-11 and 1/2 the method reporting limit for MW-3

[2] Sample nomenclature - ARM (g of ARM) - FeCl (pH) - Klosure (g of Klozur™)



NOTE:

ALL UTILITIES SHOWN ARE APPROXIMATE LOCATIONS

INDICATES NEW CONSTRUCTION

MW-2 MONITORING WELL LOCATION

ALL WEATHER WOOD

MONITORING WELL LOCATION MAP

Sweet, Edwards & Associates

	INITIALS	DATE
DRAWN BY	JLG	5-2-86
CHECKED BY		
REVISED		

Edwards & Associates, Inc.

BORING LOG

PROJECT All Weather Wood Treaters

Page 1 **of** 1

Location See Location Map

Boring No. MW-1

Surface Elevation

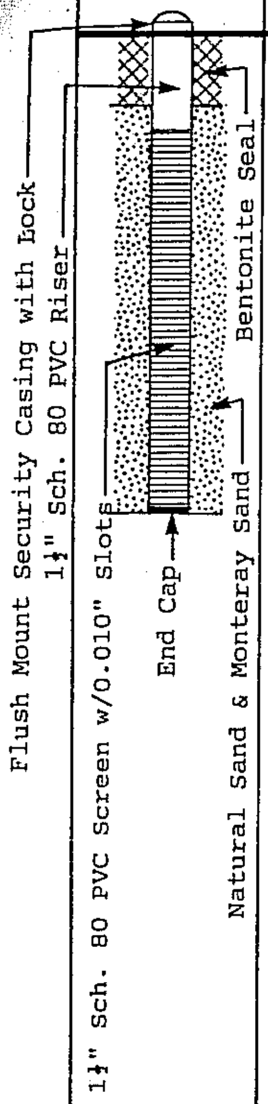
Drilling Method Hollow Stem Auger

Total Depth 12.5 Feet

Drilled By Sweet, Edwards & Assoc., Inc.

Date Completed 4/2/86

Logged By SRH/CEW



WELL DETAILS	PENE-TRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		0					0-1.0' Asphalt, base rock.	
			1	SS			3.5-5.0' Sand, gray to brown, medium grained, poorly graded, hard to push sample, 50% recovery, "Dredge Spoils", saturated.	▽
		5						
			2	SS			8.5-10.0' Sand, as above, 10% recovery, 1 foot of heave.	
		10						
		15	3	SS			15.0-16.5' Silt, gray, some mottling, abundant organic debris, moderately plastic, silt contact at 12.0'.	
		20						
		25						
		30						
		35					NOTE: SS=Split Spoon	

SEA-300-02a

Edwards & Associates, Inc.

BORING LOG

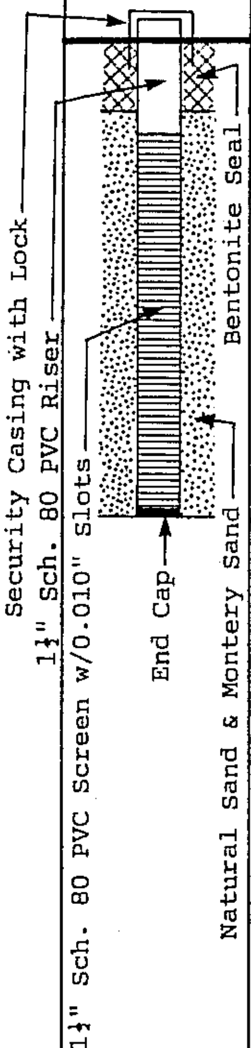
PROJECT All Weather Wood Treaters **Page** 1 **of** 1

Location See Location Map **Boring No.** MW-2

Surface Elevation ______ **Drilling Method** Hollow Stem Auger

Total Depth 12.0 Feet **Drilled By** Sweet, Edwards & Assoc., Inc.

Date Completed 4/3/86 **Logged By** SRH/CEW



WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		0						
			1	SS			3.5-5.0' Sand, gray to light brown, medium grained, poorly graded, "Dredge Spoils", saturated.	
		5						
			2	SS			8.5-9.5' Sand, as above.	
		10	3	SS			10.0-11.0' Silt contact, gray, abundant organic debris, moderately plastic, some mottling.	
		15						
		20						
		25						
		30						
		35					NOTE: SS=Split Spoon	

SEA-300-02a

Edwards & Associates, Inc.

BORING LOG

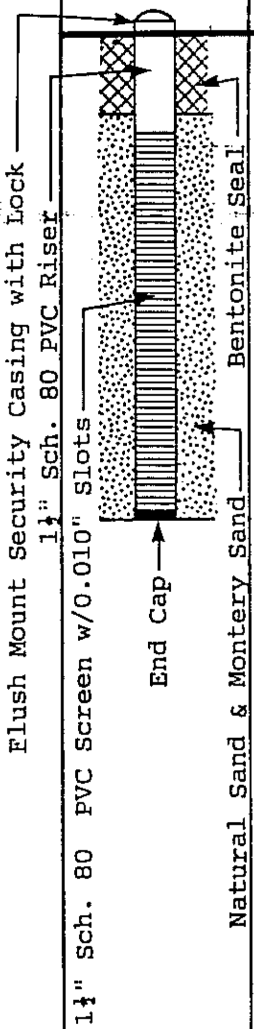
PROJECT All Weather Wood Treaters **Page** 1 **of** 1

Location See Location Map **Boring No.** MW-3

Surface Elevation ______ **Drilling Method** Hollow Stem Auger

Total Depth 12.5 Feet **Drilled By** Sweet, Edwards & Assoc., Inc.

Date Completed 4/3/86 **Logged By** SRH/CEW



WELL DETAILS	PENE-TRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERME-ABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		0					0-1.0' Asphalt, base rock.	
			1	SS			3.5-5.0' Sand, gray to brown, medium grained, poorly graded, "Dredge Spoils", saturated.	
		5						
			2	SS			8.5-9.5' Sand, as above, 2' heave.	
		10						
			3	From Auger Bit			12.5' Silt contact, gray, abundant organic debris, moderately plastic, heave prohibited split spoon sample.	
		15						
		20						
		25						
		30						
		35					NOTE: SS=Split Spoon	

SEA-300-02a

Edwards & Associates, Inc.

BORING LOG

PROJECT All Weather Wood Treaters

Page 1 **of** 1

Location See Location Map

Boring No. MW-4

Surface Elevation

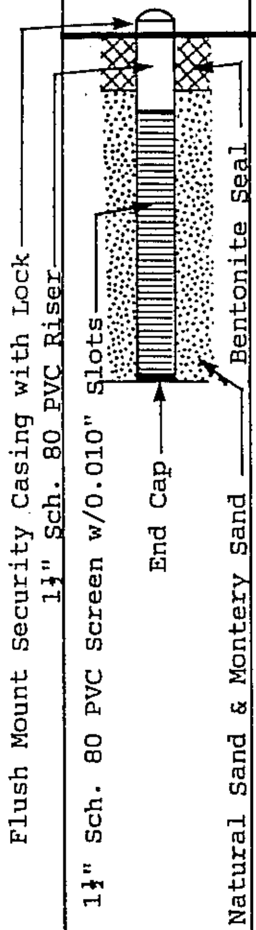
Drilling Method Hollow Stem Auger

Total Depth 9.0 Feet

Drilled By Sweet, Edwards & Assoc., Inc.

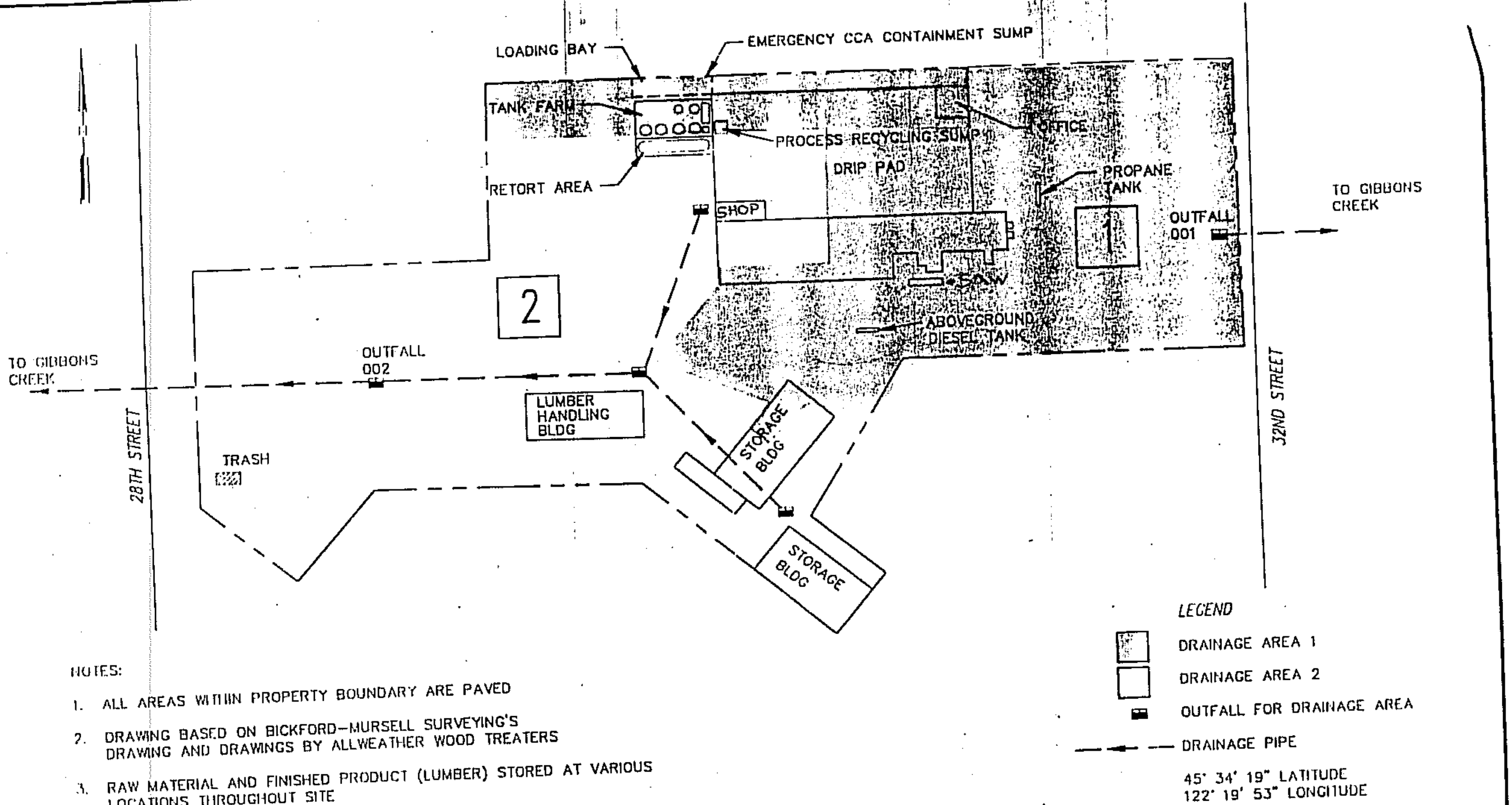
Date Completed 4/3/86

Logged By SRH/CEW



WELL DETAILS	PENETRATION TIME/RATE	DEPTH (FEET)	SAMPLE NO.	SAMPLE TYPE	PERMEABILITY TESTING	SYMBOL	LITHOLOGIC DESCRIPTION	WATER QUALITY
		0					0-1.0' Asphalt, base rock.	▽
		5	1	SS			~~3.5-~~5.0' Sand, ~~gray to brown, medium grained,~~ poorly graded "Dredge Spoils", saturated.	
		10	2	SS			8.5-10.0' Silt, contact at 9.0 feet, gray, abundant organic debris, moderately plastic, some thin sand stringers and mottling.	
		15	3	SS			13.5-15.0' Silt, as above.	
		20						
		25						
		30						
		35					NOTE: SS=Split Spoon	

SEA-300-02a



NOTES:

1. ALL AREAS WITHIN PROPERTY BOUNDARY ARE PAVED
2. DRAWING BASED ON BICKFORD–MURSELL SURVEYING'S DRAWING AND DRAWINGS BY ALLWEATHER WOOD TREATERS
3. RAW MATERIAL AND FINISHED PRODUCT (LUMBER) STORED AT VARIOUS LOCATIONS THROUGHOUT SITE

0 100 200
SCALE IN FEET

EMCON Northwest, Inc.

DATE 3/92
DWN. JIB
APPR.
REVIS.
PROJECT NO.
S5701.12

Figure 2
ALLWEATHER WOOD TREATERS
WASHOUGAL, WASHINGTON

DRAINAGE MAP

Washington Department of Ecology
Hazardous Waste & Toxics Reduction Program
Compliance Report

Site:	**Allweather Wood, Inc.**	**EPA ID # WAD 009 028 879**
Inspection Date:	08/20/07	
Site Contacts:	Alan Wade, President	
Phone:	503-221-1477	
Site Location:	725 South 32nd Street, PO Box 227 Washougal, WA 98671	
Generator/Site Status:	Reported MQG 2006	

Ecology
Lead Contact: Dee Williams Phone: (360) 407-6348
Other Representatives:
Report By: Dee Williams ___DeannRWll___ (Signed) ___9-5-07___ (Date)

This inspection was pre-arranged, and was focused on a release to groundwater. On August 15, 2007, Allweather Wood notified Ecology that they had identified high arsenic concentrations in groundwater. The company had identified the probable source of contamination and wanted Ecology's feedback on remediation. I agreed to meet at the facility to further discuss the problem.

Inspection Summary
I arrived on-site at 10:45am and was introduced to Alan Wade (President), Steve Krommenacker (Production Supervisor/Environmental Manager), and Kirk Dusenberry (Plant Manager). We discussed Allweather's findings. They provided me with a diagram (Figure 1, attached), showing contaminant concentrations in monitoring wells.

As illustrated in Figure 1, there are monitoring wells located close to the facility perimeter, and then at the center of the facility near the retorts. All of the wells were sampled, except Monitoring Wells 4 and 7 which are located east of the retorts. The arsenic concentrations along the north perimeter (measured in Monitoring Well 2) were 33ppb in June 2007. They were 61ppb along the west perimeter (measured in Monitoring Well 5).

The arsenic concentrations were most elevated in the center wells (MW 3, 8, 9 and 10). In these wells, the arsenic concentrations ranged from 600ppb to 4800ppb in June 2007. The concentrations ranged from 690ppb to 6400 in August.

Mr. Wade explained that this data helped them evaluate possible sources. They had narrowed their search to three possible areas: 1.) the door pit and floor seam, near the Borate/CCA retorts; 2.) the floor seam at the back-end of these retorts; and 3.) a shallow depression near the old CCA tank farm. They suspected that the door pit/floor seam was the primary problem.

We then toured key areas of the facility and discussed the following:

- Monitoring Wells 3, 8, 9 and 10 are located with close proximity to the borate/CCA retorts and tank farms. All Weather routinely withdraws water from the monitoring wells and uses it to reformulate product. See Photo #1.

- I inspected the door pit/floor seam adjacent to the borate/CCA retorts (see Photos 2, 3, 4, 5 and 7). Mr. Wade explained that a gap was found at the seam. He estimated that it was up to 3/8-inch in width. He said an employee had noticed the gap during a routine clean-out, when the retorts were changed-out from CCA to borate. The employee noticed that washwater was draining through the gap. Allweather believes this is source of groundwater contamination. Borate concentrations in groundwater seem to support this determination.

- Allweather worked with a contractor to find an appropriate caulk for the gap. This serves as a temporary repair, and the company is working with a contractor to define a more permanent fix.

- I inspected the floor seam at the back of the retorts (see Photo 6) and in the tank farm (see Photo 8). The cracking in these defined areas was very small (smaller than 0.01-inch).

We concluded our site tour. I offered to talk with Ecology's Toxics Cleanup Program about groundwater contamination. I said I'd look into managing the situation under the Dangerous Waste Regulations instead of the Voluntary Cleanup Program (VCP). I suggested that the VCP would provide more engineering support if that was needed, and the process could take more time than working through the WAC 173-303-145 Spill regulations. I offered to check it out and get back to Mr. Wade.

I thanked Allweather for their time, and left the site at 11:30.

<u>Post Inspection</u>
I contacted Ecology's Toxics Clean-up Program (TCP), and it was recommended that Allweather should enter the VCP. They indicated that the arsenic concentrations in groundwater needed to be mitigated, and the VCP would be the best venue for getting that work done in a timely manner.

I also spoke with Hugh O'Neill about the situation. He offered to provide technical assistance to the company as they explore preventative measures.

Requirements And Recommendations

No violations were observed through the inspection. However, Allweather should carefully examine the following issues, and should take action as needed:

- <u>Spills and Releases</u> – Allweather met the conditions of WAC 173-303-145(2) when it notified Ecology. The conditions of WAC 173-303-145(3) were partially addressed when Allweather caulked the gap at the door pit and evaluated other possible sources. WAC 173-303-145(3) will be fully addressed when Allweather completes the following actions:

  - The gap near the door pit / floor is more permanently repaired;
  - The floors and seams at the back of the Borate/CCA retorts and "low area" of the tank farm are further evaluated and repaired (if needed);
  - The site is remediated as directed by Ecology's Toxics Cleanup Program (TCP). Please contact Chuck Cline of Ecology's TCP at (360) 407-6300 for more information about the Voluntary Cleanup Program. At this time it appears that Allweather's groundwater is contaminated with arsenic above the "action level" defined by the Model Toxics Control Act (WAC 173-340).

  It is my understanding that Allweather is already planning to take the above actions. There is no prescribed timeline for completing the above work, and Allweather is not required to coordinate this work with Ecology's Hazardous Waste and Toxics Reduction (HWTR) Program. However, records of repairs, process evaluations and up-grades should be maintained and made available to Ecology upon request.

- Generator Status – At the time of the inspection, I understood Allweather to be a Medium Quantity Generator (MQG) based on the 2006 Generator Report. I recognize that the company may be able to report as a Small Quantity Generator (SQG) for 2007.

  It is possible that Allweather's generator status could change due to site remediation. Contaminated groundwater and soil will carry an F035-listing as dangerous waste. Wastes that are disposed off-site or treated on-site must be managed as regulated dangerous waste, and must be 'counted' in determining your generator status.

  Contaminated groundwater that is beneficially reused to formulate CCA product is excluded from regulation, as long as Allweather meets the recycling criteria defined in WAC 173-303-017.

- General Facility Inspections – Medium and Large Quantity Generators are required to conduct general facility inspections, as defined WAC 173-303-200(1)(e)(ii) and -320 by reference. Those inspections must be sufficient to prevent releases to the environment, and should highlight those facility processes/areas that carry the highest risk. I strongly recommend that you re-examine how the facility is routinely evaluated for risks. As you may know, this type of systematic evaluation could significantly reduce future liabilities. Please contact Hugh O'Neill of Ecology's Toxics Reduction Unit at (360) 407-6354 for more information about how this type of action could be tied into your Pollution Prevention Plan. Other facilities have successfully implemented "Environmental Management Systems" that include risk analysis.

State of Oregon
Department of Environmental Quality — Memorandum

RECEIVED

Date: December 2, 1997

To: Allweather Wood Treaters (AWT) Hazardous Waste File (ORD987187929)

From: Raimond Peterson, WR-Medford

Subject: Hazardous Waste Compliance Inspection

INSPECTION DATE: November 19, 1997

FACILITY NAME: Evergreen Forest Products, Inc.
dba Allweather Wood Treaters (AWT)

ADDRESS/LOCATION: 7893 Pacific Avenue
White City, Oregon 97503

MAILING ADDRESS: Allweather Wood Treaters
7893 Pacific Avenue
P.O. Box 2678
White City, Oregon 97503

TELEPHONE NUMBER: 541 826-1582

FAX NUMBER: 541 826-2268

EPA/DEQ ID NUMBER: ORD987187929

FACILITY REPRESENTATIVES:

Mr. Ted Greb, Operations Supervisor & Emergency Coordinator

Mr. Gerry Glem, Vice President for Production & Environmental Manager (Home Office -Washougal, Washington) by phone 11/18/97 & 11/24/97.

Mr. Tom Arnold, Shop Maintenance Electrician

Mr. Bert Young, Treatment Supervisor

ODEQ REPRESENTATIVES: Raimond Peterson lift are cleaned, and the wastewater has been allowed to either evaporate or run down the asphalt to the storm water retention pond (Attachment 2, Photos 1-3). Up to the time of the inspection, AWT did not have a wash water permit from the Department for such steam cleaning and had not conducted a hazardous waste determination on the wastewater.

AWT was advised to immediately stop such steam cleaning activity and to reevaluate their washing procedures in coordination with the Department's Water Quality (WQ) Program since the facility currently is in the process of developing a storm water management plan and permit which also will include the wastewater management requirements from their former WPCF permit. Information regarding the pressure washing activities discussed above has been referred to the Department's WQ staff (Jon Gasik) in the Medford Office for follow-up. This has also been addressed in the NON resulting from the recent inspection (Attachment 1).

<u>8.) Lab wastewater</u> - A small amount of wastewater is generated in the lab associated with the drip pad. All lab work involves the testing of treating solutions involving chemicals related to the treatment process. This wastewater is recycled into making new treatment solutions.

<u>9.) Storm water run-off</u> - Approximately 90% of the outside storage is non-roofed and does include the storage of CCA treated wood. Much of the treated wood is stored on asphalt although some wrapped, treated wood is stored on the rock/gravel portion of the outside storage area. Some of the rain water hitting the asphalt covered portion of the facility is currently directed as storm water run-off toward the SW corner of the facility where it is drained through a concrete spill-way into a retention pond (Attachment 2, Photos 1-3). The retention pond is actually just an unlined low wetland area leading to other drainage ditches in the area. There apparently is a culvert at the north end of the retention pond that can be plugged if need be to prevent further drainage from the retention pond to subsequent drainage ditches in the event of a spill or other problems with the storm water.

This storm water run-off is currently tested four times a year by AWT as a requirement of the facility's WPCF permit issued to AWT by the Department's WQ Program in August, 1990. The WPCF Permit expired on December 31, 1995, and AWT has been operating under the conditions of the former permit until such conditions are incorporated into a new NPDES Storm Water Permit to be drafted by the Department's WQ Program.

In the past, such testing has shown that arsenic, chromium and copper have been detected in the storm water run-off at concentrations of usually less than 1 mg/l. Test results from February 1, 1996, did find concentrations of 1.03 mg/l for arsenic and 1.52 mg/l for total chromium (See AWT WQ File #105365 in Medford Office). These values are below the TCLP concentration standards of 5.0 mg/l for both arsenic and chromium; and therefore, such storm water run-off would not be considered a hazardous waste as long as AWT is in compliance with the regulations for properly managing all treated wood on the drip pad until

WASHINGTON STATE DEPARTMENT OF ECOLOGY

INSPECTION REPORT

FACILITY: Allweather Wood Treaters (Allweather)
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671

INSPECTOR: Jacek Anuszewski, P.E.

DATE OF VISIT: July 21, 2006

PERMIT TYPE: National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit

PERMIT NUMBER: WA-0040029
Issuance Date: March 1, 2003
Effective Date: March 1, 2003
Expiration Date: March 1, 2008

Purpose of the Inspection

The visit purpose was to review improvements to Allweather's stormwater collection and treatment system.

Findings

Allweather constructed a gravel parking lot for employees. The parking lot does not discharge to the stormwater collection and treatment system, Outfall 001 or Outfall 002.

Seven tanks were installed to capture stormwater from the processing/office building roof. Allweather plans to use all captured stormwater in the wood preserving process as make-up water.

Allweather installed a French drain to prevent stormwater runoff from a neighboring facility into the stormwater collection and treatment system. The French drain discharges directly to a stormwater sewer.

An open lumber storage area in a southeast portion of the facility, previously connected to Outfall 001, was additionally connected to Outfall 002. This gives Allweather an option to store treated or untreated lumber in this area. When treated lumber is stored the stormwater from the area is discharged to the stormwater collection and treatment system and than to Outfall 001; when untreated lumber is stored the stormwater from the area is discharged without treatment to Outfall 002.

Allweather installed additional stormwater storage tanks so it can store and treat more contaminated stormwater. Alan Wade hopes that all contaminated stormwater will be captured and treated by the stormwater collection and treatment system before being discharged to Outfall 001.

Stormwater runoff from a building roof in a southeast portion of the facility is being redirected away from the stormwater collection and treatment system and Outfall 001. Ecology hopes that the runoff is redirected to Outfall 002 and no additional outfall is created.

Pictures

Pictures were taken during the visit. They are available for a review.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

INSPECTION REPORT

FACILITY:	Allweather Wood Treaters (Allweather) 725 South 32nd Street P.O. Box 227 Washougal, WA 98671
INSPECTOR:	Jacek Anuszewski, P.E.
DATE OF VISIT:	January 30, 2006
PERMIT TYPE:	National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit
PERMIT NUMBER:	WA-0040029 Issuance Date: March 1, 2003 Effective Date: March 1, 2003 Expiration Date: March 1, 2008

<u>Purpose of the Inspection</u>

The purpose of the inspection was to review storage areas of treated and untreated wood. This was an unannounced visit.

<u>Findings</u>

Untreated and stained lumber is stored in area that discharges untreated stormwater to Gibbons Creek via Outfall 002. Stained wood is tagged before treatment. According to Kirk Dusenberry, Allweather General Manager, the facility is one of few facilities in the USA that tag lumber before treatment. The untreated and stained lumber area is shown on Figure 1.

Treated lumber is stored in area that discharges treated stormwater to Gibbons Creek via Outfall 001. Periodically the stormwater treatment system is bypassed and untreated stormwater is discharged to Gibbons Creek. Allweather is planning to increase stormwater storage capacity to minimize bypass occurrences. The treated lumber area is shown on Figure 2. The stormwater storage and treatment facility is shown on Figure 3.

MAUL
FOSTER
ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS
7223 NE Hazel Dell Avenue, Suite B | Vancouver, Washington 98665 | Phone 360.694.2691 | Fax 360.906.1958 | www.MFAinc.org

February 28, 2005
Project 9009.01.01

Permit Coordinator
Southwest Regional Office
Washington Department of Ecology
P. O. Box 47775
Olympia, Washington 98504-7775

Re: Allweather Wood, Washougal, NPDES Permit No. 0040029 – Acute Toxicity Report

Dear Permit Coordinator:

We have attached the Acute Toxicity Testing results for the April and November 2004 events as required by Section S7A. of the permit. Allweather Wood has two outfalls, 001 and 002. Outfall 001 runoff is stored and treated with an electrocoagulation unit, with the sample collected after the treatment system. Outfall 002 collects runoff from the untreated lumber storage area and has limited exposure to treating chemicals.

The April 2004 results show that Outfall 001 had no appreciable toxicity with either species used in the testing (Fathead minnow and *Daphnia magna*). Outfall 002 results showed no appreciable toxicity for the Fathead minnow; however, the toxicity for *Daphnia magna* was 0% survival at 100% effluent concentration. The results are summarized in the table below.

The November 2004 results showed both Outfalls 001 and 002 as having below the required survival rates for both species. The results were far poorer than the April 2004 tests and prompted a closer look at water quality and treatment system performance. The results are summarized in the table below.

The Allweather Wood site is currently under interim limits for copper until October 31, 2005. These limits were established in 2004 as a result of an industry-wide U.S. Environmental Protection Agency (EPA) forced conversion to alternative treatment formulations and away from Copper Chrome Arsenic-based formulas (CCA). In April 2004, the site yard was still transitioning to product treated with the new formulation. By November 2004, the transition was complete and the Outfall 001 treatment system could not meet even the interim copper limits on a regular basis. Outfall 002 copper levels were also elevated, possibly due to truck traffic moving through the site. Total Suspended

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Issuance Date: March 1, 2003
Effective Date: March 1, 2003
Expiration Date: March 1, 2008
Modification Date: September 1, 2004
2nd Modification Date:

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT NO. WA0040029

State of Washington
DEPARTMENT OF ECOLOGY
Olympia, Washington 98504-7775

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1251 et seq.

Allweather Wood Treaters, Inc.
P.O. Box 227
Washougal, WA 98671

Facility Location:	Receiving Water:
725 South 32nd Street Washougal, WA 98671	Gibbons Creek, Outfalls 001 & 002
Water Body I.D. No.:	Discharge Location:
WA-28-3010, Outfalls 001 & 002	Outfall 001: Latitude: 45° 34' 16" N Longitude: 122° 20' 07" W
Industry Type:	Outfall 002: Latitude: 45° 34' 15" N Longitude: 122° 20' 23" W
Wood Preserving	

is authorized to discharge in accordance with the special and general conditions that follow.

Kelly Susewind, P.E.
Southwest Region Manager
Water Quality Program
Washington State Department of Ecology

	INTERIM EFFLUENT LIMITATIONS: OUTFALL 002	
Parameter	**Average Monthly[a]**	**Maximum Daily[b]**
pH (standard units)	between 6.0 and 9.0	
Oil and Grease (mg/L)	N/A	10
TSS (mg/L)	N/A	80
Arsenic (µg/L)	N/A	340
Chromium (µg/L)	N/A	460
Copper (µg/L)	N/A	240

2. FINAL EFFLUENT LIMITATIONS

Beginning 6 months after the effective date of this permit and lasting until this permit is renewed, the Permittee is authorized to discharge storm water from the treated and untreated (white wood) storage areas at the permitted location subject to meeting the following limitations:

	FINAL EFFLUENT LIMITATIONS: OUTFALL 001	
Parameter	**Average Monthly[a]**	**Maximum Daily[b]**
pH (standard units)	between 6.0 and 9.0	
Oil and Grease (mg/L)	N/A	10
TSS (mg/L)	N/A	80
Arsenic (µg/L)	N/A	340
Chromium (µg/L)	N/A	770
Copper (µg/L)	N/A	160 Interim Limit
Chromium ((hexavalent)	N/A	48

	FINAL EFFLUENT LIMITATIONS: OUTFALL 002	
Parameter	**Average Monthly[a]**	**Maximum Daily[b]**
pH (standard units)	between 6.0 and 9.0	
Oil and Grease (mg/L)	N/A	10
TSS (mg/L)	N/A	80
Arsenic (µg/L)	N/A	340

Chromium (μg/L)	N/A	460
Copper (μg/L)	N/A	160 Interim Limit
Chromium (hexavalent)	N/A	72
[a] The average monthly effluent limitation is defined as the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.		
[b] The maximum daily effluent limitation is defined as the highest allowable daily discharge. The daily discharge means the discharge of a pollutant measured during a calendar day. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day.		

C. Mixing Zone Description

1. Outfall 001

The Permittee is allowed a dilution factor of 3 for hexavalent chromium and 2 for copper in the City of Washougal storm sewer prior to discharge to the Gibbons Creek.

2. Outfall 002

The Permittee is allowed a dilution factor of 4.5 for hexavalent chromium and copper in the City of Washougal storm sewer prior to discharge to the Gibbons Creek.

Department of its status periodically. The Department received the current status of the action plan with a request for this modification.

The Department's Tentative Determination

Outfall 001

Allweather has not been able to comply with the final water-quality-based copper limit of 36 µg/L since the permit was issued on March 1, 2003, Figure 1, Figure 2, and Figure 3. Since September 2004, Allweather violated the interim copper limit of 160 µg/L twice. Since March 2003, an average copper removal efficiency has been steady at 84 percent, or 80 percent when negative removal efficiency of -4 percent for October 2003, is used in calculation of the average removal efficiency, Table 2.

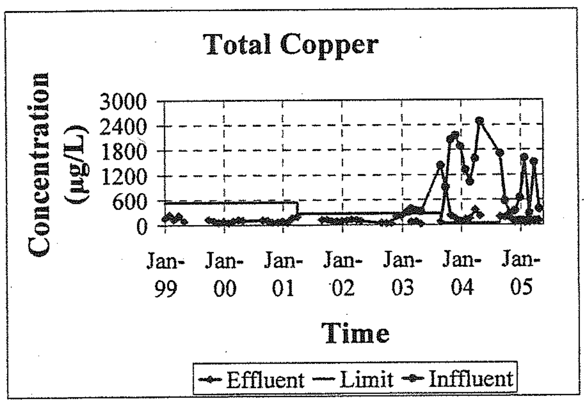


Figure 1 Effluent concentration, Jan. 1999-May 2005; influent concentration, Mar. 2003- May 2005; both at Outfall 001

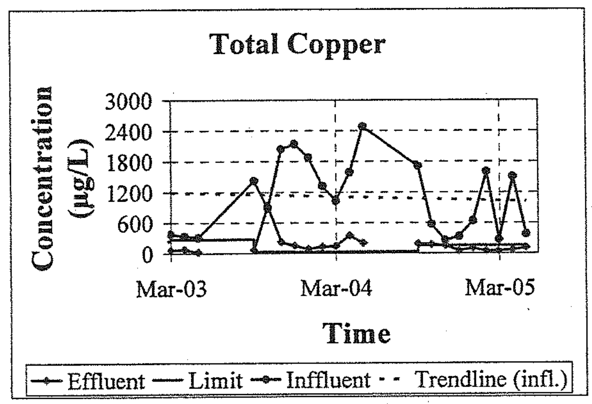


Figure 2 Influent and effluent concentration at Outfall 001, Mar. 2003- May 2005

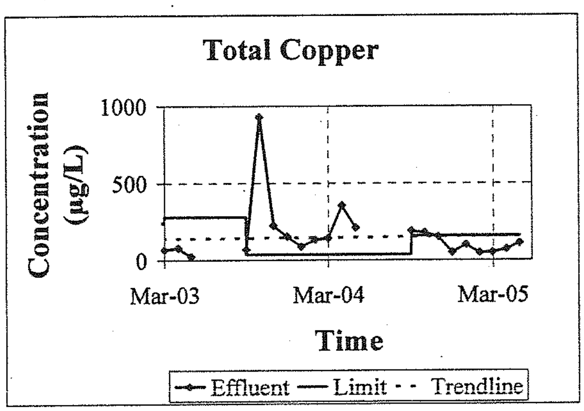


Figure 3 Effluent concentration at Outfall 001, Mar. 2003- May 2005

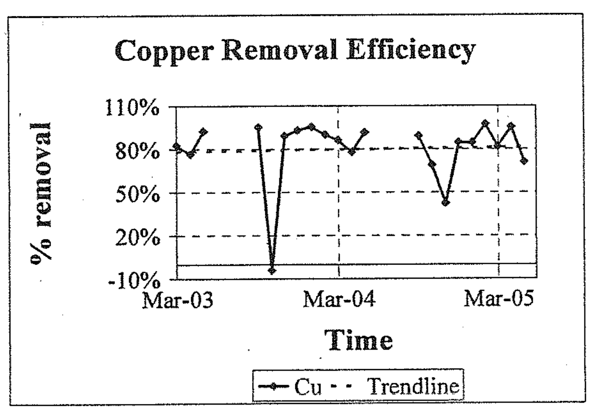


Figure 4 Copper removal efficiency at Outfall 001, Mar. 2003- May 2005

Table 2 Copper removal efficiency

Date	Total Copper (µg/L)			Removal Efficiency
	Influent	Effluent	Limit	
Mar-03	381	66	280	83 percent
Apr-03	341	80	280	77 percent
May-03	315	24	280	92 percent
Aug-03			280	
Sep-03	1,420	70	36	95 percent
Oct-03	891	928	36	-4 percent
Nov-03	2,040	224	36	89 percent
Dec-03	2,140	153	36	93 percent
Jan-04	1,880	87	36	95 percent
Feb-04	1,320	132	36	90 percent
Mar-04	1,030	143	36	86 percent
Apr-04	1,590	353	36	78 percent
May-04	2480	210	36	92 percent
Sep-04	1710	188	160	89 percent
Oct-04	573	178	160	69 percent
Nov-04	260	150	160	42 percent
Dec-04	330	51	160	85 percent
Jan-05	640	100	160	84 percent
Feb-05	1600	48	160	97 percent
Mar-05	270	50	160	81 percent
Apr-05	1500	72	160	95 percent
May-05	380	110	160	71 percent
Averages:	**1,100**	**163**		**84 percent**
				(with -4%) 80%

1. The levels of arsenic, chromium, and hexavalent chromium have continued to drop and are well below the permit limits for Outfall 001 since beginning of the 2004; Figure 5, Figure 6, and Figure 7.

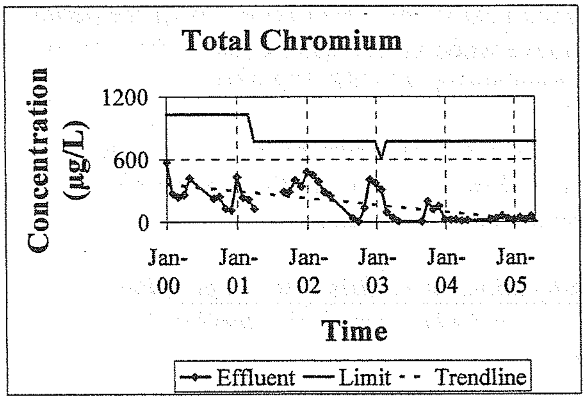


Figure 5 Effluent concentration at Outfall 001, Jan. 2000-May 2005

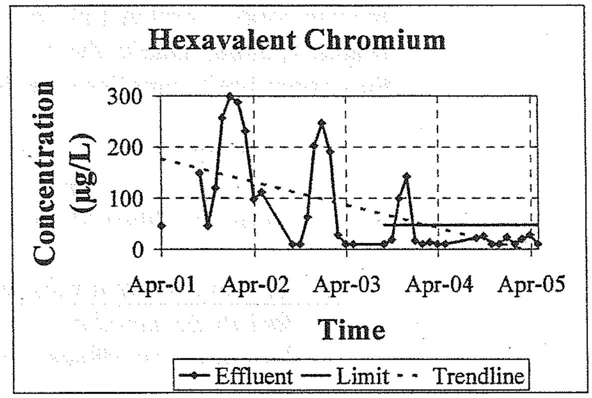


Figure 6 Effluent concentration at Outfall 001, Apr. 2001-May 2005

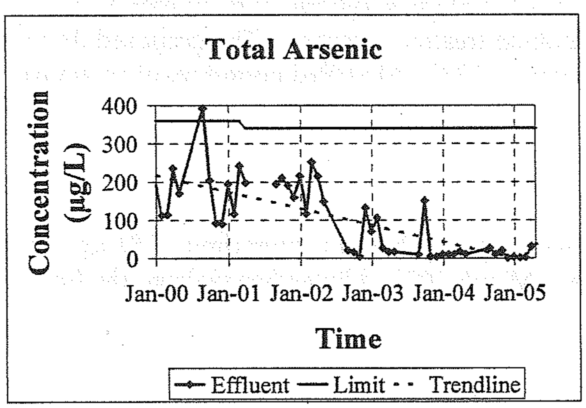


Figure 7 Effluent concentration at Outfall 001, Jan. 2000-May 2005

2. Allweather requested an extension of the interim maximum daily copper limit of 160 µg/L. The limit is lower that the previous interim copper limit of 280 µg/L. If the limit was calculated based on performance, for the last 12 months, November 2004-October 2005, the maximum daily effluent limit would be 260 µg/L and the average monthly effluent limit would be 180 µg/L. Said limits were calculated with the assumption that one sample is taken during the month. However, the limit is higher that the final water-quality-based copper limit of 36 µg/L, triggered on November 1, 2005.

3. The Department has tentatively determined, based on the above information and analyses, that the requested interim copper limit would allow additional time to develop and implement further modifications of or expansions to the existing treatment system with lower probability for the permit violations. The Department proposes to set the

interim copper limit at 160 µg/L (maximum daily) until expiration day of the permit, March 1, 2008. Due to the described above wood preservative change, the increase of the copper limit complies with federal regulations, 40 CFR 122.44(l):

> *(i) Exceptions—A permit with respect to which paragraph (l)(2) of this section applies may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant, if—*
>
> *(A) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation;*

Compliance with the final limit of 36 µg/L will be effective in the future permit on July 1, 2009.

4. The Department has tentatively determined to allow additional time to prepare an engineering report for the electrocoagulation treatment system. The proposed deadline will be set in the future permit for January 1, 2009. Modified permit requires annual progress report, 40 CFR 122.47.

Outfall 002

Allweather has not been able to comply with the final water-quality-based copper limit of 81 µg/L since the permit was issued on March 1, 2003, Figure 8. Since March 2003, Allweather violated the final water-quality-based copper limit of 81 µg/L six times.

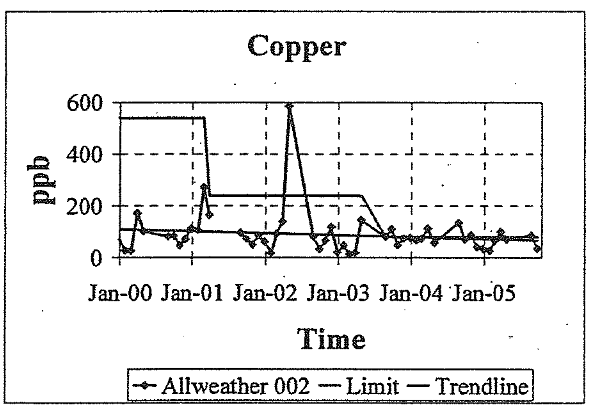


Figure 8 Effluent concentration at Outfall 002, Jan. 2000-October 2005

1. Allweather requested setting an interim maximum daily copper limit at 160 µg/L. The limit is lower than the previous interim copper limit of 240 µg/L that was in effect before

the current permit was issued. If the limit was calculated based on performance, for the last 12 months, November 2004-October 2005, the maximum daily effluent limit would be 170 µg/L and the average monthly effluent limit would be 120 µg/L. Said limits were calculated with the assumption that one sample is taken during the month. Compliance with the final limit of 81 µg/L will be effective in the future permit on July 1, 2009.

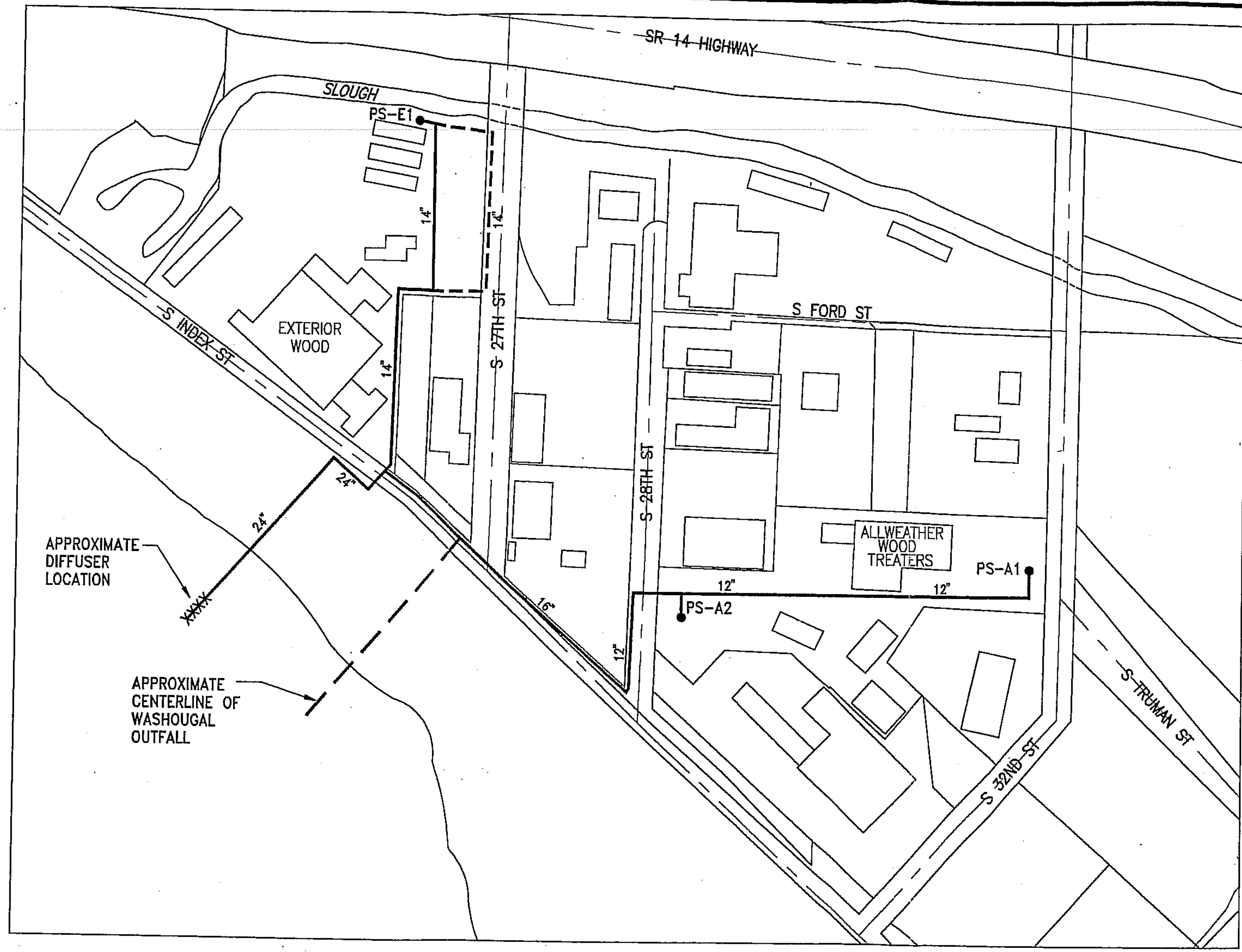
2. The Department has tentatively determined, based on the above information and analyses that the requested interim copper limit would allow additional time to comply with the final water-quality-based copper limit of 81 µg/L. The Department proposes to set the interim copper limit at 160 µg/L (maximum daily) until expiration day of the permit, March 1, 2008. Due to the described above wood preservative change, the increase of the copper limit complies with federal regulations, 40 CFR 122.44(l), quoted above.

Outfall 001 & 002

Allweather characterized effluent for acute toxicity. The results of the characterization triggered an effluent limit for acute toxicity. The Department has tentatively determined to remove the limit from the permit. This determination complies with federal regulations, 40 CFR 122.44, because of the described above wood preservative change. Further, the Department has tentatively determined to delay any future effluent characterization for acute toxicity until Allweather can achieve compliance with the water quality-based effluent limit for copper. The Department's tentative determination is in accordance with state regulations, WAC 173-205-030(4):

> *The department may delay effluent characterization for whole effluent toxicity for existing facilities that are under a compliance schedule in a permit, administrative order, or other legally enforceable mechanism to implement technology-based controls or to achieve compliance with water quality-based effluent limits.*

The existing effluent characterization was based on testing of samples without hardness adjustment. The toxicity of copper would be exaggerated in WET tests relative to its toxicity in receiving water due to hardness differences between the sample and ambient water. The latest version of Ecology publication WQ-R-95-80 (Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria) added a procedure to adjusting the hardness of low hardness samples to match that of the receiving water. This procedure will be used in all subsequent effluent characterization in order to better predict toxicity in excess of state water quality standards.



EXPLANATION

● APPROXIMATE PUMP STATION LOCATION

——— APPROXIMATE PIPE LOCATION WITH PIPE SIZE

– – – APPROXIMATE LOCATION OF ALTERNATIVE PIPE ROUTE FOR EXTERIOR WOOD

N

0 300 600

SCALE IN FEET

Maul Foster & Alongi, Inc.

DATE 12/96
DWN. JLG
APPR.
REVIS.
PROJECT NO.
9009-001.002

Figure 5.1
ALLWEATHER WOOD TREATERS
AND EXTERIOR WOOD
WASHOUGAL, WASHINGTON

PIPING AND PUMP STATION LOCATIONS

CAD|C:\MFA\ALLWOOD\002-01

PLOT AT 1 = 1

WASHINGTON STATE DEPARTMENT OF ECOLOGY

INSPECTION REPORT

FACILITY: Allweather Wood Treaters (Allweather)
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671

INSPECTOR: Jacek Anuszewski, P.E.

DATE OF VISIT: July 21, 2006

PERMIT TYPE: National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit

PERMIT NUMBER: WA-0040029
Issuance Date: March 1, 2003
Effective Date: March 1, 2003
Expiration Date: March 1, 2008

Purpose of the Inspection

The visit purpose was to review improvements to Allweather's stormwater collection and treatment system.

Findings

Allweather constructed a gravel parking lot for employees. The parking lot does not discharge to the stormwater collection and treatment system, Outfall 001 or Outfall 002.

Seven tanks were installed to capture stormwater from the processing/office building roof. Allweather plans to use all captured stormwater in the wood preserving process as make-up water.

Allweather installed a French drain to prevent stormwater runoff from a neighboring facility into the stormwater collection and treatment system. The French drain discharges directly to a stormwater sewer.

An open lumber storage area in a southeast portion of the facility, previously connected to Outfall 001, was additionally connected to Outfall 002. This gives Allweather an option to store treated or untreated lumber in this area. When treated lumber is stored the stormwater from the area is discharged to the stormwater collection and treatment system and than to Outfall 001; when untreated lumber is stored the stormwater from the area is discharged without treatment to Outfall 002.

Allweather installed additional stormwater storage tanks so it can store and treat more contaminated stormwater. Alan Wade hopes that all contaminated stormwater will be captured and treated by the stormwater collection and treatment system before being discharged to Outfall 001.

Stormwater runoff from a building roof in a southeast portion of the facility is being redirected away from the stormwater collection and treatment system and Outfall 001. Ecology hopes that the runoff is redirected to Outfall 002 and no additional outfall is created.

Pictures

Pictures were taken during the visit. They are available for a review.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

INSPECTION REPORT

FACILITY: Allweather Wood Treaters (Allweather)
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671

INSPECTOR: Jacek Anuszewski, P.E.

DATE OF VISIT: January 30, 2006

PERMIT TYPE: National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit

PERMIT NUMBER: WA-0040029
Issuance Date: March 1, 2003
Effective Date: March 1, 2003
Expiration Date: March 1, 2008

Purpose of the Inspection

The purpose of the inspection was to review storage areas of treated and untreated wood. This was an unannounced visit.

Findings

Untreated and stained lumber is stored in area that discharges untreated stormwater to Gibbons Creek via Outfall 002. Stained wood is tagged before treatment. According to Kirk Dusenberry, Allweather General Manager, the facility is one of few facilities in the USA that tag lumber before treatment. The untreated and stained lumber area is shown on Figure 1.

Treated lumber is stored in area that discharges treated stormwater to Gibbons Creek via Outfall 001. Periodically the stormwater treatment system is bypassed and untreated stormwater is discharged to Gibbons Creek. Allweather is planning to increase stormwater storage capacity to minimize bypass occurrences. The treated lumber area is shown on Figure 2. The stormwater storage and treatment facility is shown on Figure 3.

MAUL
FOSTER
ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS
7223 NE Hazel Dell Avenue, Suite B | Vancouver, Washington 98665 | Phone 360.694.2691 | Fax 360.906.1958 | www.MFAinc.org

February 28, 2005
Project 9009.01.01

Permit Coordinator
Southwest Regional Office
Washington Department of Ecology
P. O. Box 47775
Olympia, Washington 98504-7775

Re: Allweather Wood, Washougal, NPDES Permit No. 0040029 – Acute Toxicity Report

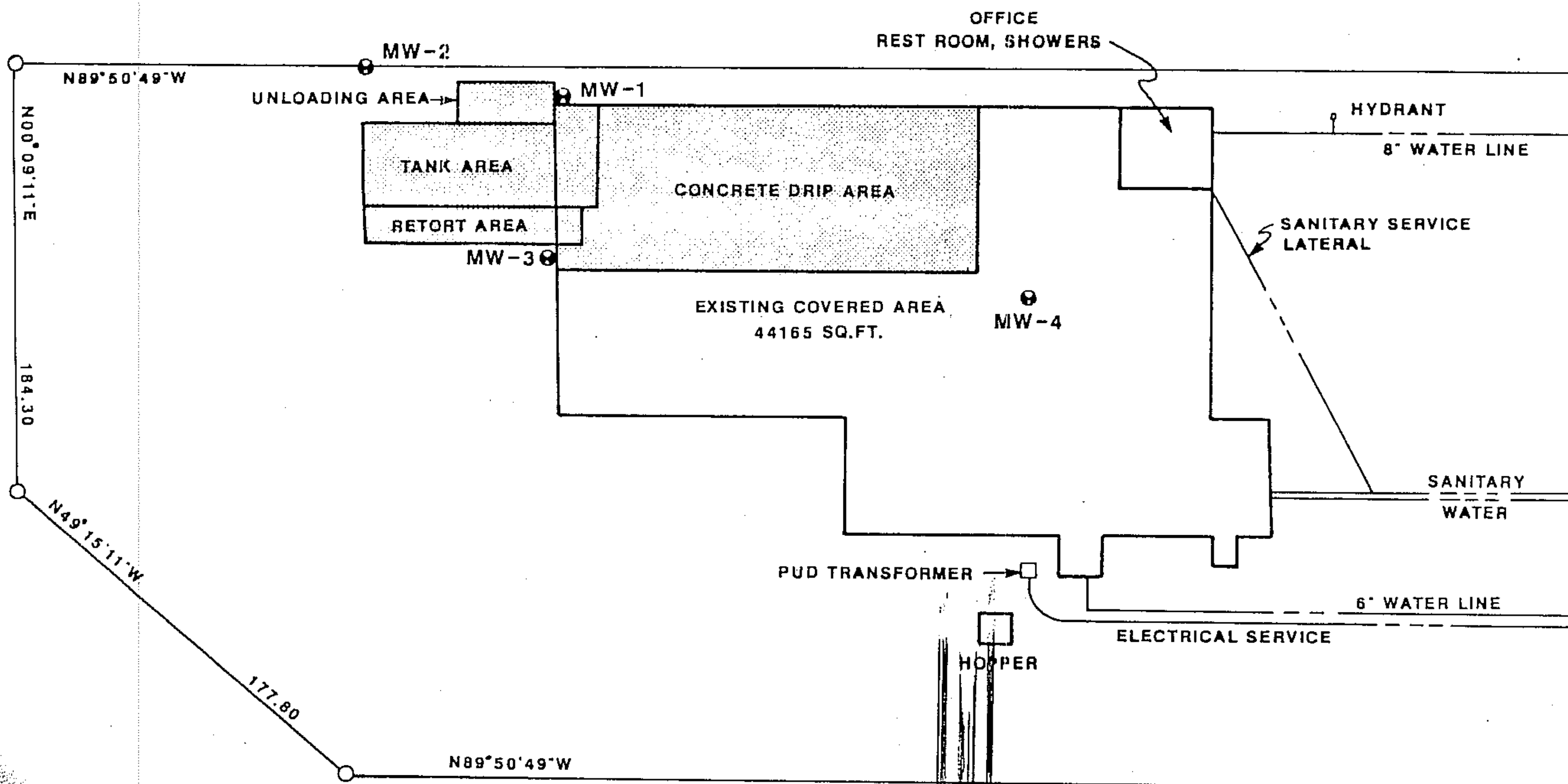
Dear Permit Coordinator:

We have attached the Acute Toxicity Testing results for the April and November 2004 events as required by Section S7A. of the permit. Allweather Wood has two outfalls, 001 and 002. Outfall 001 runoff is stored and treated with an electrocoagulation unit, with the sample collected after the treatment system. Outfall 002 collects runoff from the untreated lumber storage area and has limited exposure to treating chemicals.

The April 2004 results show that Outfall 001 had no appreciable toxicity with either species used in the testing (Fathead minnow and *Daphnia magna*). Outfall 002 results showed no appreciable toxicity for the Fathead minnow; however, the toxicity for *Daphnia magna* was 0% survival at 100% effluent concentration. The results are summarized in the table below.

The November 2004 results showed both Outfalls 001 and 002 as having below the required survival rates for both species. The results were far poorer than the April 2004 tests and prompted a closer look at water quality and treatment system performance. The results are summarized in the table below.

The Allweather Wood site is currently under interim limits for copper until October 31, 2005. These limits were established in 2004 as a result of an industry-wide U.S. Environmental Protection Agency (EPA) forced conversion to alternative treatment formulations and away from Copper Chrome Arsenic-based formulas (CCA). In April 2004, the site yard was still transitioning to product treated with the new formulation. By November 2004, the transition was complete and the Outfall 001 treatment system could not meet even the interim copper limits on a regular basis. Outfall 002 copper levels were also elevated, possibly due to truck traffic moving through the site. Total Suspended



NOTE:

ALL UTILITIES SHOWN ARE APPROXIMATE LOCATIONS

INDICATES NEW CONSTRUCTION

MW-2 MONITORING WELL LOCATION

ALL WEATHER WOOD

MONITORING WELL LOCATION MAP

Sweet, Edwards & Associates

	INITIALS	DATE
DRAWN BY	JLG	5-2-86
CHECKED BY		
REVISED		

Washington Department of Ecology
Hazardous Waste & Toxics Reduction Program
Compliance Report

Site:	**Allweather Wood, Inc.**	**EPA ID # WAD 009 028 879**
Inspection Date:	08/20/07	
Site Contacts:	Alan Wade, President	
Phone:	503-221-1477	
Site Location:	725 South 32nd Street, PO Box 227 Washougal, WA 98671	
Generator/Site Status:	Reported MQG 2006	

Ecology
Lead Contact: Dee Williams Phone: (360) 407-6348
Other Representatives:
Report By: Dee Williams DeannRWill 9-5-07
(Signed) (Date)

This inspection was pre-arranged, and was focused on a release to groundwater. On August 15, 2007, Allweather Wood notified Ecology that they had identified high arsenic concentrations in groundwater. The company had identified the probable source of contamination and wanted Ecology's feedback on remediation. I agreed to meet at the facility to further discuss the problem.

Inspection Summary
I arrived on-site at 10:45am and was introduced to Alan Wade (President), Steve Krommenacker (Production Supervisor/Environmental Manager), and Kirk Dusenberry (Plant Manager). We discussed Allweather's findings. They provided me with a diagram (Figure 1, attached), showing contaminant concentrations in monitoring wells.

As illustrated in Figure 1, there are monitoring wells located close to the facility perimeter, and then at the center of the facility near the retorts. All of the wells were sampled, except Monitoring Wells 4 and 7 which are located east of the retorts. The arsenic concentrations along the north perimeter (measured in Monitoring Well 2) were 33ppb in June 2007. They were 61ppb along the west perimeter (measured in Monitoring Well 5).

The arsenic concentrations were most elevated in the center wells (MW 3, 8, 9 and 10). In these wells, the arsenic concentrations ranged from 600ppb to 4800ppb in June 2007. The concentrations ranged from 690ppb to 6400 in August.

Mr. Wade explained that this data helped them evaluate possible sources. They had narrowed their search to three possible areas: 1.) the door pit and floor seam, near the Borate/CCA retorts; 2.) the floor seam at the back-end of these retorts; and 3.) a shallow depression near the old CCA tank farm. They suspected that the door pit/floor seam was the primary problem.

We then toured key areas of the facility and discussed the following:

- Monitoring Wells 3, 8, 9 and 10 are located with close proximity to the borate/CCA retorts and tank farms. All Weather routinely withdraws water from the monitoring wells and uses it to reformulate product. See Photo #1.

- I inspected the door pit/floor seam adjacent to the borate/CCA retorts (see Photos 2, 3, 4, 5 and 7). Mr. Wade explained that a gap was found at the seam. He estimated that it was up to 3/8-inch in width. He said an employee had noticed the gap during a routine clean-out, when the retorts were changed-out from CCA to borate. The employee noticed that washwater was draining through the gap. Allweather believes this is source of groundwater contamination. Borate concentrations in groundwater seem to support this determination.

- Allweather worked with a contractor to find an appropriate caulk for the gap. This serves as a temporary repair, and the company is working with a contractor to define a more permanent fix.

- I inspected the floor seam at the back of the retorts (see Photo 6) and in the tank farm (see Photo 8). The cracking in these defined areas was very small (smaller than 0.01-inch).

We concluded our site tour. I offered to talk with Ecology's Toxics Cleanup Program about groundwater contamination. I said I'd look into managing the situation under the Dangerous Waste Regulations instead of the Voluntary Cleanup Program (VCP). I suggested that the VCP would provide more engineering support if that was needed, and the process could take more time than working through the WAC 173-303-145 Spill regulations. I offered to check it out and get back to Mr. Wade.

I thanked Allweather for their time, and left the site at 11:30.

<u>Post Inspection</u>
I contacted Ecology's Toxics Clean-up Program (TCP), and it was recommended that Allweather should enter the VCP. They indicated that the arsenic concentrations in groundwater needed to be mitigated, and the VCP would be the best venue for getting that work done in a timely manner.

I also spoke with Hugh O'Neill about the situation. He offered to provide technical assistance to the company as they explore preventative measures.

Requirements And Recommendations

No violations were observed through the inspection. However, Allweather should carefully examine the following issues, and should take action as needed:

- <u>Spills and Releases</u> -- Allweather met the conditions of WAC 173-303-145(2) when it notified Ecology. The conditions of WAC 173-303-145(3) were partially addressed when Allweather caulked the gap at the door pit and evaluated other possible sources. WAC 173-303-145(3) will be fully addressed when Allweather completes the following actions:

  - The gap near the door pit / floor is more permanently repaired;
  - The floors and seams at the back of the Borate/CCA retorts and "low area" of the tank farm are further evaluated and repaired (if needed);
  - The site is remediated as directed by Ecology's Toxics Cleanup Program (TCP). Please contact Chuck Cline of Ecology's TCP at (360) 407-6300 for more information about the Voluntary Cleanup Program. At this time it appears that Allweather's groundwater is contaminated with arsenic above the "action level" defined by the Model Toxics Control Act (WAC 173-340).

  It is my understanding that Allweather is already planning to take the above actions. There is no prescribed timeline for completing the above work, and Allweather is not required to coordinate this work with Ecology's Hazardous Waste and Toxics Reduction (HWTR) Program. However, records of repairs, process evaluations and up-grades should be maintained and made available to Ecology upon request.

- Generator Status – At the time of the inspection, I understood Allweather to be a Medium Quantity Generator (MQG) based on the 2006 Generator Report. I recognize that the company may be able to report as a Small Quantity Generator (SQG) for 2007.

  It is possible that Allweather's generator status could change due to site remediation. Contaminated groundwater and soil will carry an F035-listing as dangerous waste. Wastes that are disposed off-site or treated on-site must be managed as regulated dangerous waste, and must be 'counted' in determining your generator status.

  Contaminated groundwater that is beneficially reused to formulate CCA product is excluded from regulation, as long as Allweather meets the recycling criteria defined in WAC 173-303-017.

- General Facility Inspections – Medium and Large Quantity Generators are required to conduct general facility inspections, as defined WAC 173-303-200(1)(e)(ii) and -320 by reference. Those inspections must be sufficient to prevent releases to the environment, and should highlight those facility processes/areas that carry the highest risk. I strongly recommend that you re-examine how the facility is routinely evaluated for risks. As you may know, this type of systematic evaluation could significantly reduce future liabilities. Please contact Hugh O'Neill of Ecology's Toxics Reduction Unit at (360) 407-6354 for more information about how this type of action could be tied into your Pollution Prevention Plan. Other facilities have successfully implemented "Environmental Management Systems" that include risk analysis.

State of Oregon
Department of Environmental Quality — Memorandum

RECEIVED

Date: December 2, 1997

To: Allweather Wood Treaters (AWT) Hazardous Waste File (ORD987187929)

From: Raimond Peterson, WR-Medford

Subject: Hazardous Waste Compliance Inspection

INSPECTION DATE: November 19, 1997

FACILITY NAME: Evergreen Forest Products, Inc.
dba Allweather Wood Treaters (AWT)

ADDRESS/LOCATION: 7893 Pacific Avenue
White City, Oregon 97503

MAILING ADDRESS: Allweather Wood Treaters
7893 Pacific Avenue
P.O. Box 2678
White City, Oregon 97503

TELEPHONE NUMBER: 541 826-1582

FAX NUMBER: 541 826-2268

EPA/DEQ ID NUMBER: ORD987187929

FACILITY REPRESENTATIVES:

Mr. Ted Greb, Operations Supervisor & Emergency Coordinator

Mr. Gerry Glem, Vice President for Production & Environmental Manager (Home Office -Washougal, Washington) by phone 11/18/97 & 11/24/97.

Mr. Tom Arnold, Shop Maintenance Electrician

Mr. Bert Young, Treatment Supervisor

ODEQ REPRESENTATIVES: Raimond Peterson lift are cleaned, and the wastewater has been allowed to either evaporate or run down the asphalt to the storm water retention pond (Attachment 2, Photos 1-3). Up to the time of the inspection, AWT did not have a wash water permit from the Department for such steam cleaning and had not conducted a hazardous waste determination on the wastewater.

AWT was advised to immediately stop such steam cleaning activity and to reevaluate their washing procedures in coordination with the Department's Water Quality (WQ) Program since the facility currently is in the process of developing a storm water management plan and permit which also will include the wastewater management requirements from their former WPCF permit. Information regarding the pressure washing activities discussed above has been referred to the Department's WQ staff (Jon Gasik) in the Medford Office for follow-up. This has also been addressed in the NON resulting from the recent inspection (Attachment 1).

8.) Lab wastewater - A small amount of wastewater is generated in the lab associated with the drip pad. All lab work involves the testing of treating solutions involving chemicals related to the treatment process. This wastewater is recycled into making new treatment solutions.

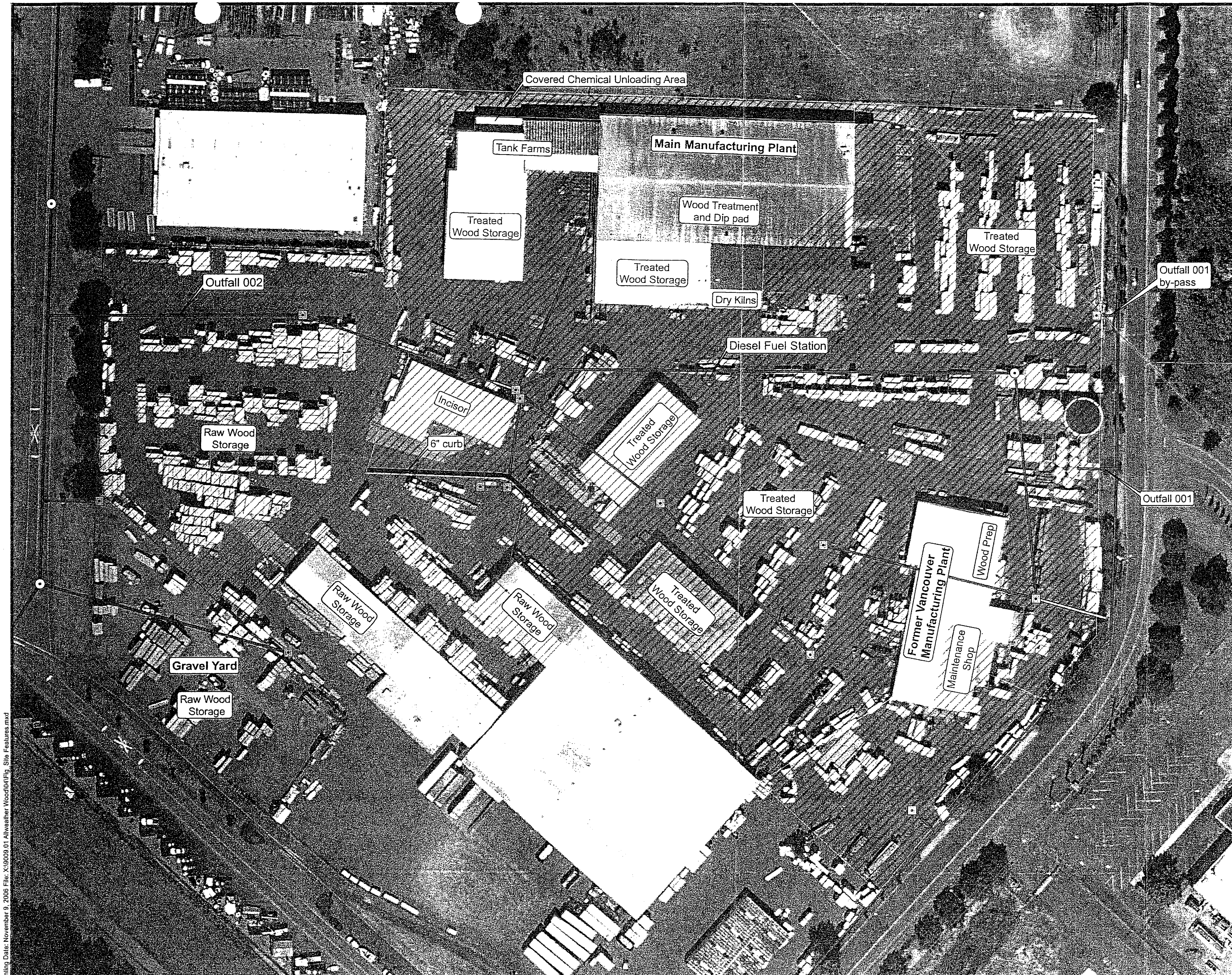
9.) Storm water run-off - Approximately 90% of the outside storage is non-roofed and does include the storage of CCA treated wood. Much of the treated wood is stored on asphalt although some wrapped, treated wood is stored on the rock/gravel portion of the outside storage area. Some of the rain water hitting the asphalt covered portion of the facility is currently directed as storm water run-off toward the SW corner of the facility where it is drained through a concrete spill-way into a retention pond (Attachment 2, Photos 1-3). The retention pond is actually just an unlined low wetland area leading to other drainage ditches in the area. There apparently is a culvert at the north end of the retention pond that can be plugged if need be to prevent further drainage from the retention pond to subsequent drainage ditches in the event of a spill or other problems with the storm water.

This storm water run-off is currently tested four times a year by AWT as a requirement of the facility's WPCF permit issued to AWT by the Department's WQ Program in August, 1990. The WPCF Permit expired on December 31, 1995, and AWT has been operating under the conditions of the former permit until such conditions are incorporated into a new NPDES Storm Water Permit to be drafted by the Department's WQ Program.

In the past, such testing has shown that arsenic, chromium and copper have been detected in the storm water run-off at concentrations of usually less than 1 mg/l. Test results from February 1, 1996, did find concentrations of 1.03 mg/l for arsenic and 1.52 mg/l for total chromium (See AWT WQ File #105365 in Medford Office). These values are below the TCLP concentration standards of 5.0 mg/l for both arsenic and chromium; and therefore, such storm water run-off would not be considered a hazardous waste as long as AWT is in compliance with the regulations for properly managing all treated wood on the drip pad until

Figure 2
Site Features

Allweather Wood Treaters
Washougal, Washington



Legend

- Manhole
- Catch Basin
- Storm Sewer Pipe
- Trench Drain
- Abandoned Storm Sewer Pipe
- Curb

Drainage Area

- Outfall 002
- Outfall 001

Note:
Outfall 001 Drainage Area 8.98 Acres
Outfall 002 Drainage Area 3.05 Acres

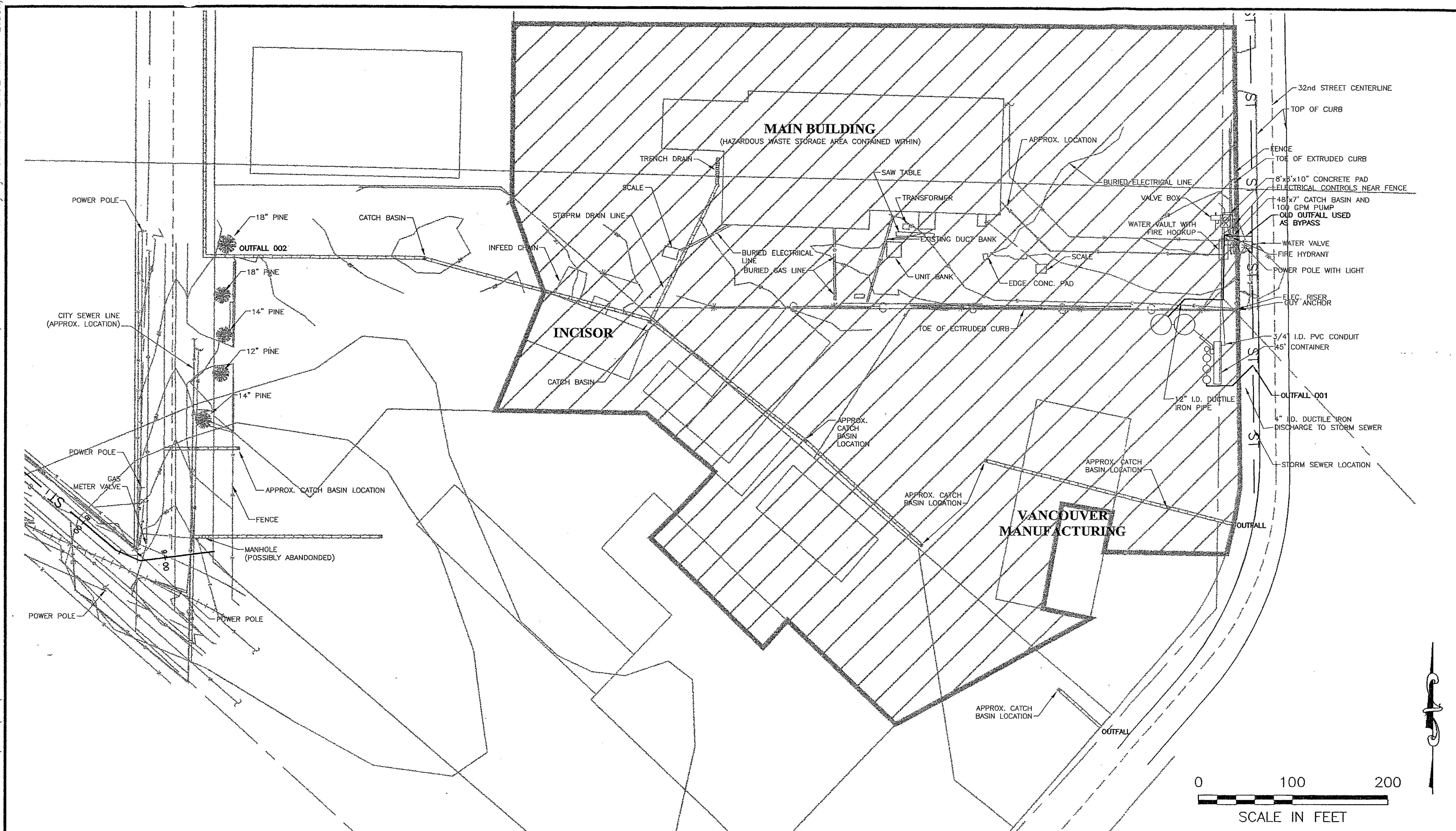
N

0 100 200
Feet

MAUL FOSTER ALONGI INC.
ENVIRONMENTAL & ENGINEERING CONSULTANTS
Vancouver, WA | Portland, OR | www.MFAinc.org

Printing Date: November 9, 2006 File: X:\9009.01 Allweather Wood\04\Fig. Site Features.mxd

Project: 9009.01.04 Produced By: T. Vick Approved By: M. Erickson



LEGEND:

WOOD TREATING AREA AND STORAGE AREAS FOR TREATED WOOD

Suite B
7223 NE Hazel Dell Ave.
Vancouver, WA 98665

P 360.694.2691
F 360.906.1958

MAUL FOSTER ALONGI

DATE	07/10/02
DWN.	AJY
APPR.	
REVIS.	
PROJECT NO.	9009.01.01

Figure 3
ALLWEATHER WOOD TREATERS
WASHOUGAL, WASHINGTON

SEGREGATED TREATED WOOD STORAGE AREAS

LAYOUT: 2

TrueGuard®

RECEIVED
JAN 20 2009
Washington State
Department of Ecology

January 13, 2009

Industrial Unit Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Re: Permit No WA0040029

Dear Sir or Madam,

This letter is a follow up of the written report that was sent on January 6, 2009. The following are the results of samples that were taken during the overflow prior to treatment works.
This written submission is to satisfy our NPDES requirements under section S3 of our NPDES permit:

Description of noncompliance: Overflow prior to treatment works.
Date: January 1, 2009
Start time of overflow: 11:00 a.m.
Duration of overflow: 18 hours
Quantity of untreated overflow: 535,000 gallons
Lab results:

	Result
Arsenic	27.2 ug/l
Chromium	35.5 ug/l
Copper	1500 ug/l
Chromium Hex	<5 ug/l
PH	6.4
Oil & Grease	<5 mg/l
Ammonia	.74 mg/l
TSS	5 mg/l

Cause of noncompliance: Excessive snow and rainfall that was above the designed capacity of the treating and storage system. The total effective perception that occurred was 6.3 inches in a 24 hour period which is more than a 25-year 24-hour storm (4.2 inches)

All reasonable methods were taken to avoid and reduce the overflow including holding water within the existing paved yard so that the maximum volume of water was treated and the minimum volume of water was bypassed.

If you have any questions or additional information is needed please contact me at 360-835-8547

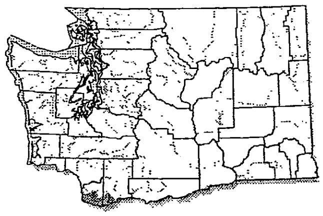
Thank you,

Steve Krommenacker
TrueGuard, LLC

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 5, 2009

Steve Krommenacker
TrueGuard, LLC
725 South 32nd Street
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your December 2008, Discharge Monitoring Report (DMR). The DMR indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following violation was reported:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
002	Copper	204 µg/L	160 µg/L

Your comment and explanation in your DMR, stated the drainage area did not have any treated wood in it. All BMPs were being applied. The only thing that had occurred prior to the sampling event was the addition of the new wet well/sampling station, is acknowledged.

Any failure to comply with permit limits and/or monitoring requirements is treated as a violation. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at 360-407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at 360-407-6288 or by e-mail at janu461@ecy.wa.gov.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:sg

cc: Jacek Anuszewski, Ecology
Sherri Greenup, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

April 1, 2008

Mr. Steve Krommenacker
TrueGuard, LLC
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your January 2008, Discharge Monitoring Report (DMR). The DMR indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following violation was reported:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Hexavalent Chromium	55 µg/L	48 µg/L

Any failure to comply with permit limits and/or monitoring requirements is treated as a violation. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at 360-407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

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Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:sg

cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 13, 2008

Mr. Steve Krommenacker
TrueGuard LLC
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your December 2007, Discharge Monitoring Report (DMR). The DMR indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following violation was reported:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Total Copper	1540 µg/L	160 µg/L

Your comment and explanation in your DMR, stated copper results do not correlate with field readings, is acknowledged.

Any failure to comply with permit limits and/or monitoring requirements is treated as a violation. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at 360-407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

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Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

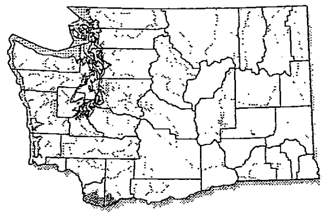
MP:sg

cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

May 24, 2007

Mr. Steve Krommenacker
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your March 2007, Discharge Monitoring Report (DMR). The DMR indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following violations were reported:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Hexavalent Chromium (Daily Max)	58.8 µg/L	48 µg/L
002	Total Suspended Solids (Daily Max)	160 mg/L	80 mg/L

Your comment and explanation in your DMR, stated additional samples were taken for Hexavalent Chromium and Total Suspended Solids and they were below permit requirement, is acknowledged.

Any failure to comply with permit limits and/or monitoring requirements is treated as a violation. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6288 or by e-mail at janu461@ecy.wa.gov.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

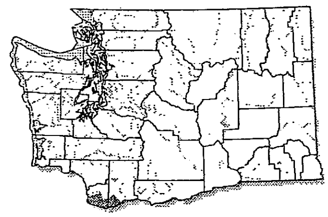
MP:sg

cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

January 18, 2007

Mr. Steve Krommenacker
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your September 2006, Discharge Monitoring Report (DMR). The DMR indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following violation was reported:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Total Copper (Maximum)	200 µg/L	160 µg/L

Your comment and explanation in your DMR, stated adjustments were made to the effluent settling tanks on the electrocoagalation system, is acknowledged.

Any failure to comply with permit limits and/or monitoring requirements is treated as a violation. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6288 or by e-mail at janu461@ecy.wa.gov.

Sincerely,

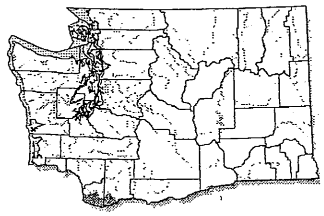
Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:sg

cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

April 13, 2006



Your address is in the **Salmon-Washougal** watershed

Mr. Steve Krommenacker
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your February 2006, Discharge Monitoring Report (DMR). The DMR indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following violations were reported:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	360 µg/L	160 µg/L

Your comment and explanation in your DMR, stated the rise in Copper was due to the influent inlet pipe dropping lower than where it should have been, is acknowledged.

Any failure to comply with permit limits and/or monitoring requirements is treated as a violation. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

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Sincerely,

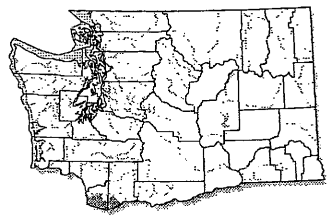
Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:sg

cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 27, 2006



Your address is in the **Salmon-Washougal** watershed

Mr. Steve Krommenacker
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your January 2006, Discharge Monitoring Report (DMR). The DMR indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following violation was reported:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	70 µg/L	36 µg/L

Your comment and explanation in your DMR, stated verbal notification was give for three bypasses, is acknowledged.

Any failure to comply with permit limits and/or monitoring requirements is treated as a violation. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

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Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:sg

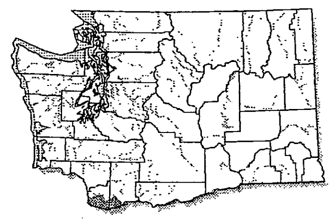
cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

January 3, 2006



Your address is in the **Salmon-Washougal** watershed

Mr. Steve Krommenacker
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your September 2005, Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
002	Min. pH	5.94 S.U.	6.0 S.U.
002	Copper	87 µg/L	81 µg/L

Your comment and explanation that this followed a long dry spell, and that you were in compliance during October is acknowledged.

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:cc

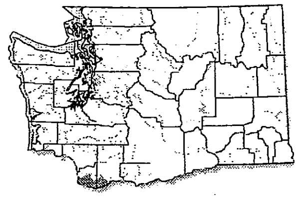
cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

June 28, 2005



Your address is in the **Salmon-Washougal** watershed

Mr. Steve Krommenacker
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029 noncompliance notification

Our office has completed review of your March 2005 (bypass), and April 2005, Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

March 2005:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001 (bypass)	Hexavalent Chromium	80.6 µg/l	48 µg/l

Your comment and explanation that your calculations show that this discharge did not exceed water quality standards is acknowledged.

April 2005:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
002	Total Copper	100 µg/l	81 µg/l
002	Oil & Grease	11.8 mg/l	10 mg/l
002	Total Suspended Solids	140 mg/l	80 mg/l

Your comment and explanation that you have purchased a yard sweeper to control the discharge of these pollutants is acknowledged.

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

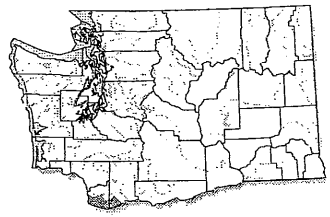
STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

January 21, 2005

Mr. Steve Krommenacker
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your November 2004 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
002	Copper	88 µg/l	81 µg/l

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

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Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

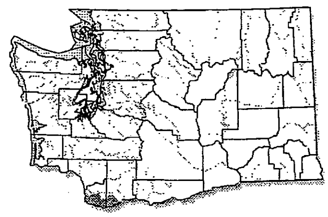
MP:le(15/wq)

cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

December 28, 2004

Mr. Steve Krommenacker
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your September 2004, and October 2004, Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

September 2004:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	188 μg/l	160 μg/l
002	Copper	135 μg/l	81 μg/l

October 2004:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	178 μg/l	160 μg/l
002	Total Suspended Solids	83 mg/l	80 mg/l

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le(082/wq)

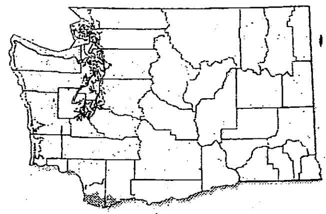
cc: Jacek Anuszewski, Ecology

File

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

June 28, 2004

Mr. Steve Krommenacker
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your May 2004, Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

May 2004:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	210 μg/l	36 μg/l

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

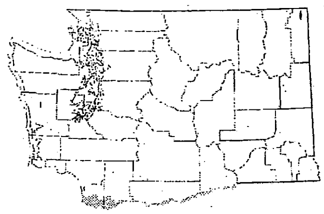
MP:le(063/wq)
cc: Jacek Anuszewski, Ecology

File

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

May 27, 2004

Mr. Steve Krommenacker
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671



Your address is in the Salmon-Washougal watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your March 2004 and April 2004 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

March 2004:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	143 µg/l	36 µg/l
001	Total Suspended Solids	90 mg/l	80 mg/l

April 2004:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	353 µg/l	36 µg/l
002	Copper	113 µg/l	81 µg/l

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le(112/wq)

cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

IN THE MATTER OF PENALTY ASSESSMENT AGAINST Allweather Wood Treaters, Inc.	)))	NOTICE OF DISPOSITION UPON APPLICATION FOR RELIEF FROM PENALTY NO. DE 04WQSR-6023

To: Steve Krommenacker
Corporate Environmental Manager
Allweather Wood Treaters, Inc.
P.O. Box 227
Washougal, WA 98671

For the site located at 725 South 32nd Street, Washougal, Washington, notice of Penalty Incurred and Due No. DE 04WQSR-6023 in the amount of $6,000.00 was sent to Allweather Wood Treaters, Inc. on March 15, 2004, to address violations of Chapter 90.48 of the Revised Code of Washington (RCW).

The penalty assessment was based on the following violations:

Exceeding the discharge limitations for hexavalent chromium established in National Pollutant Discharge Elimination System permit WA0040029, as reported on the November and December 2003 Discharge Monitoring Reports.

On March 26, 2004, Allweather Wood Treaters, Inc. filed an Application for Relief From Penalty No. DE 04WQSR-6023 (AFR). The following is a summary of what was stated by Steve Krommenacker in the AFR:

November violation: Caused by a program error in the new 65 GPM portion of the treatment system installed in August. A system error or power problem should stop the flow of water, this did not happen. Allweather Wood Treaters had not experienced this problem with the original 65 GPM system during the previous year and a half and was not aware this could happen. The discharge consisted of fully and partially treated stormwater.

December Violation: The cells in each electrocoagulation treatment bank had been configured with two iron cells (for hexavalent chromium removal), and six aluminum cells (for copper removal). High copper levels, the change from CCA to ACQ, and a reduced amount of CCA treated lumber on site prompted a decision to change the configuration to one iron cell, and seven aluminum cells. This change reduced copper levels, and the hexavalent chromium levels increased.

Penalty Calculation: Allweather Wood Treaters requested, and obtained a copy of the Recommendation for Enforcement (RFE) for Penalty DE 04WQSR-6023. Their review of the RFE led them to conclude that the gravity ratings for "Willful or Knowing Violation" and "Unresponsive in Correcting Violation were rated as probably when they should have been rated "No" for the following reasons:

November violation: For "Willful or Knowing Violation" Allweather Wood Treaters could not have known about the program error which caused the temporary shut down of half the treatment cells. Extensive testing in September 2003 did not reveal the error therefore it is not reasonable to say Allweather Wood Treaters "should have known" about the problem. The rating should be "No" because they did not know the problem existed.

For "Unresponsive in Correcting Violation" Allweather Wood Treaters corrected the problem as soon as the monitoring results detected it. The rating should have been "no" the violation was corrected as soon as the responsible person learned of it.

December violation: For "Willful or Knowing Violation" exceeding the hexavalent chromium discharge limitation was a result of Allweather Wood Treaters trying to improve the treatment system's performance with the new treating chemicals. Allweather Wood Treaters considers the treatment system to be in a new developmental period due to the chemical transitions, and needs to test different configurations under actual conditions. Allweather Wood Treaters was not in a position to "have known" that a violation would result. The second December violation falls into the same category as the first "the violator obviously did not know that the action "would result in a violation, the rating should be "No" for both December violations.

For "Unresponsive in Correcting Violation" Allweather Wood Treaters was responsive in correcting the problem resulting in compliance with the hexavalent chromium discharge limitation in January. The rating should be "No" as the problem was corrected as soon as possible after the testing results were available.

Fairness: Allweather Wood Treaters feels they have always been responsive in correcting problems as soon as they have been identified. Since December two additional settling tanks and a dewatering tank have been installed in an attempt to reduce effluent concentrations. The storage tank outlet is being re-configured, this along with studies on use of pH, sludge removal, and additional lab tests have cost over thirty thousand dollars.

Difficulties caused by EPA's required transition from CCA to other treating chemicals were discussed with Ecology staff during a February 12, 2004 site visit. The December exceedance occurred as a direct result of trying to adjust the treatment system to accommodate the chemical transition.

Allweather Wood Treaters does not feel it is fair to assess a monetary penalty to a company that has invested over $750,000.00 to develop new technology that will expand AKART and result in a huge reduction in the levels of pollutants discharged in stormwater from the wood treating industry. A reasonable period to perfect the technology should be provided, Allweather Wood Treaters feels this is January 1, 2007, the date the current permit expires, and the date that the treatment system engineering report is due.

Prudence: Allweather Wood Treaters feels it is not prudent to fine a company investing in new pollutant control technology until that technology has been proven effective, or determined to be ineffective. Results indicate substantial effectiveness, a plan has been identified that encourages success in achieving target limits. A penalty assessment will discourage others from investing in new technology reducing Ecology's effectiveness for Washington's citizens. Ecology should encourage the development of new technology, not discourage it.

> **Economics:** It is unwise economic policy for a government agency to fine a tax paying, family wage job providing company for this violation of its NPDES permit. Fining companies for stormwater violations , when the standards applied exceed federal standards will discourage industries from locating in Washington and encourage an exodus to Oregon. Ecology needs to identify all of its standards that exceed federal standards and determine if the benefits exceed the costs associated with meeting tougher standards. The Boeing Company's transfer of some of its production out of Washington State is a good example of what can happen when state government agencies loose sight of economics.
>
> **Conclusion:** Another option would be for Allweather Wood Treaters to pump its stormwater directly to the Columbia River to take advantage of higher dilution factors. Allweather Wood Treaters finds this undesirable and bad for the environment compared to using its treatment system, Ecology should also recognize this. It is unfair, imprudent and bad economic policy for Ecology to assess a $6,000.00 fine against Allweather Wood Treaters for its November and December 2003 NPDES permit violations. This penalty, and any for future violations during the remaining term of the permit should be reduced to $200.00. Choosing $200.00 is within Ecology's prerogative and insures Ecology is properly performing its monetary role. Assessing a fine larger than $200.00 is unnecessary, unfair, bad economic policy and does not put a favorable light to Ecology's Performance of its responsibility.

The Department of Ecology (Department) has reviewed the Application for Relief From Penalty. The Department agrees with Allweather Wood Treaters' request for reconsideration of the November 2003 violation as they were not aware that there was a program error that did not shut down the flow of water when the new portion of the treating system lost power or had a system error. The Department also agrees that Allweather Wood Treaters corrected the problem as soon as they became aware of it. For the December violations, Allweather Wood Treaters was aware that the iron cells were necessary for removal of hexavalent chromium and therefore if the number of iron cells were reduced the hexavalent chromium levels might rise. The Department does agree that Allweather Wood Treaters did correct the problem as soon as they became aware of it.

Regarding the other information presented by Allweather Wood Treaters in the AFR, the Department provided the opportunity to appeal the NPDES permit if Allweather Wood Treaters had sufficient cause to believe it was overly stringent when compared to federal requirements. By accepting the permit Allweather Wood Treaters agrees to abide by its discharge limitations, terms, and conditions and accepts the economic responsibility for doing so. The AFR is not the process for contesting the NPDES permit.

The NPDES program as it is run by the state of Oregon has generated concern regarding its effectiveness. The program is currently undergoing an EPA audit for permitting, compliance, and enforcement. A Legislative Blue Ribbon Committee has also been formed to review the Oregon NPDES program. Any relief realized by relocating to Oregon would be temporary at best, and would likely fail to offset the expense of relocating (Chris Cora, USEPA, personal communication).

The Department's guidance does not allow for penalty assessments as low as $200.00, additionally there is no basis for this amount. All penalty amounts must be based on the Penalty Calculation matrix for purposes of consistency, and to provide the rational for the penalty amount. A penalty assessment as low as $200.00 would do little to encourage compliance with the state's environmental laws and regulations.

Based on the presence of facts and information not known when the penalty was originally issued, it is ordered that Penalty No. DE 04WQSR-6023 is reduced to $2,500.00.

The penalty is due and payable thirty (30) days from your receipt of this Notice of Disposition. Please send the penalty payment to: Department of Ecology, Cashiering Section, P.O. Box 5128, Lacey, Washington 98509-5128.

If you wish to contest this penalty, you must file an appeal within thirty (30) days of your receipt of this Notice of Disposition with the Pollution Control Hearings Board, P.O. Box 40903, Olympia, Washington 98504-0903. At the same time, a copy of your appeal must be served on: Department of Ecology, Fiscal Office, P.O. Box 47615, Olympia, Washington 98504-7615. In addition, please send a copy of your appeal to Marc Pacifico, Department of Ecology, Southwest Regional Office, P.O. Box 47775, Olympia, Washington 98504-7775. These procedures are consistent with Chapter 43.21B RCW. The notice of appeal shall contain a copy of the order or decision appealed from, and if the order or decision followed an application, a copy of the application.

DATED this 4th day of May, 2004, at Olympia, Washington.

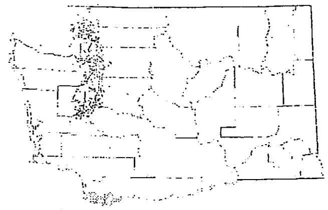
Kelly Susewind, P.E., P.G.
Southwest Region Manager
Water Quality Program

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

March 19, 2004



Your address is in the Salmon-Washougal watershed

Mr. Steve Krommenacker
Corporate Environmental Manager
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your January 204, and February 2004 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

January 2004:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	87 μg/l	36 μg/l

February 2004:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	132 μg/l	36 μg/l

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

Mr. Steve Krommenacker
Page 2

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le(021/wq)

cc: Jacek Anuszewski, Ecology

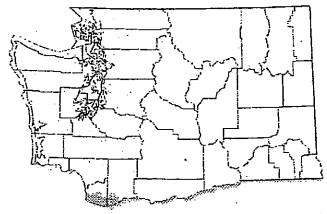
STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

November 20, 2003

Mr. Steve Krommenacker
Corporate Environmental Manager
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your October 2003 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	928 µg/l	48 µg/l
002	Minimum pH	5.65 S.U.	6.0 S.U.
002	Total Suspended Solids	104 mg/l	80 mg/l
002	Copper	110 µg/l	81 µg/l

Your comment and explanation that the power to the electrocoagulation cells had accidentally been cut off and that the sweeper was crossing between the treated and untreated wood storage areas is acknowledged is acknowledged. Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

Mr. Steve Krommenacker
Page 2

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le(018/wq)

cc: Jacek Anuszewski, Ecology

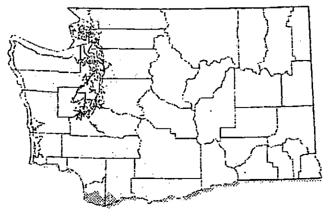
File

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 27, 2003



Your address is in the **Salmon-Washougal** watershed

Mr. Steve Krommenacker
Corporate Environmental Manager
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your September 2003 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	70 µg/l	48 µg/l

Your comment and explanation that this was the first significant rainfall of the season, that new chemical formulations contributed to high copper concentrations, and that the electrocoagulation cells are being modified to accommodate higher copper levels is acknowledged. Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le(080/wq)

cc: Jacek Anuszewski, Ecology

Files

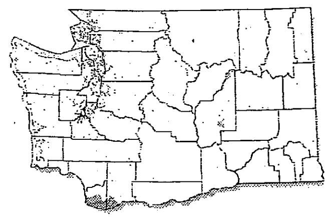
STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

May 16, 2003

Mr. Steve Krommenacker
Corporate Environmental Manager
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: Retraction of National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029 Noncompliance Notification Dated April 16, 2003

This letter officially retracts the following noncompliance notification:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	307 μg/l	280 μg/l

The analytical result cited in the noncompliance notification letter was in error as this was for a water sample collected prior to treatment that was not discharged before being treated. Corrections have been made to the database so this will not appear as a violation on compliance reports.

If you have questions or comments regarding this letter, please contact Marc Pacifico at (360) 407-6282.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6288.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le(07/wq)

cc: Jacek Anuszewski, Ecology

File

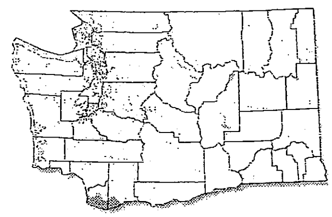
STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

April 16, 2003

Mr. Steve Krommenacker
Corporate Environmental Manager
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your February 2003 Discharge Monitoring Report (DMR). The DMR indicates your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Copper	307 µg/l	280 µg/l

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le(68/wq)

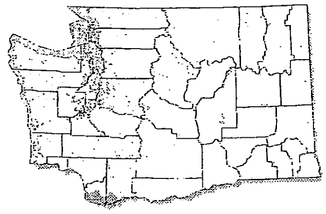
cc: Jacek Anuszewski, Ecology

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 2, 2002



Your address is in the **Salmon-Washougal** watershed

Mr. Steve Krommenacker, Corporate Environmental
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029 noncompliance notification

Our office has completed review of your May 2002 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
002	Copper	585 ug/l	240 ug/l

Your comment and explanation that a trial test of a new treating chemical with a high copper concentration was the likely cause of the noncompliance is acknowledged. Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le

cc: Jacek Anuszewski, Ecology

File

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

December 9, 1999

Mr. Gerry Glem
Vice President
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671

Dear Mr. Glem:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA-004002-9
Noncompliance Notification

Our office has completed review of your October 1999 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
002	Arsenic	392 ug/l	360 ug/l

Your comment and explanation that the high arsenic concentration was due to the first rain event of the season combined with large treated wood inventory is acknowledged. Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. Additionally, under law, discharge monitoring reports are public information. Please be advised that in the future your facility's variance from permit limits will be published in a discharge limit violation report. Your facility should be aware of its potential liability to be named in a third party suit filed under the Clean Water Act for its permit violations. Periodically our files are reviewed by persons representing organizations which file third party suits against permittees who report effluent limit violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Ecology) places on complete and accurate DMRs and the legal implications they have for your facility. Non-compliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by Ecology.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Carl Tonge at (360) 407-6288.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:le(3/wq)

cc: Carl Tonge, Ecology

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

December 29, 1998

Mr. Gerry Glem, Vice President
Allweather Wood Treaters
P.O. Box 227
Washougal, WA 98671

Dear Mr. Glem:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA0040029
Noncompliance Notification

Our office has completed review of your October 1998, Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Arsenic	704 ug/l	360 ug/l

Your comment and explanation that you reviewed your production logs and can not find a reason that the limit was exceeded, is acknowledged. Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. Additionally, under law, DMRs are public information. Please be advised that in the future your facility's variance from permit limits will be published in a discharge limit violation report. Your facility should be aware of its potential liability to be named in a third party suit filed under the Clean Water Act for its permit violations. Periodically our files are reviewed by persons representing organizations which file third party suits against permittees who report effluent limit violations. If this letter is incorrect or you have questions or comments, please contact me at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Ecology) places on complete and accurate DMRs and the legal implications they have for your facility. Non-compliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by Ecology.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Carl Tonge at (360) 407-6288.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Industrial Unit
Water Quality Program
Southwest Regional Office

MP:mf(2/wq)

cc: Carl Tonge, Ecology

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (206) 407-6300

March 17, 1995

Mr. Gerry Glem, Vice President
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671-0227

Dear Mr. Glem:

Re: National Pollutant Discharge Eliminations System (NPDES) Permit No. WA-004002-9

Our office has completed review of your November 1994 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your NPDES permit. The following were reported:

November 1994:

Outfall Number	**Monitoring Parameter**	**Sample Measurement**	**Permit Requirement**
001	Minimum pH	5.79 S.U.	6.0 S.U.
002	Daily Maximum Arsenic	499 ug/l	360 ug/l
002	Daily Maximum Copper	840 ug/l	540 ug/l
002	Minimum pH	5.81 S.U.	6.0 S.U.

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico at (360) 407-6282. Your comment and explanation of violations being caused by pH being analyzed beyond the recommended holding time and excessive chemical leaching from a custom treatment as well as your plans to increase drip pad residence time and wrap the finished product to prevent reoccurrence are acknowledged.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Ecology) places on complete and accurate DMRs <u>and</u> the legal implications they have for your facility. Non-compliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by Ecology.

If you need technical assistance with your facility, please contact Steve Eberl at (360) 407-6293.

Sincerely,

Marc Pacifico
Enforcement Specialist
Industrial Unit, Department of Ecology
Southwest Regional Office

MP:cg(1\wq)

cc: Steve Eberl

Table 1
Results - Groundwater Sampling May 2009
TrueGuard, LLC
Washougal, Washington

Monitoring Well ID			**MW-1**	**MW-3**	**MW-5**	**MW-6**	**MW-10**	**MW-11**	**MW-12**	**MW-13**	**MW-13Dup**	**MW-14**	**MW-15**	**MW-16**
Field Parameter Results														
pH		-	6.89	8.28	6.70	7.09	7.27	7.45	7.14	7.15	7.15	7.02	6.75	7.66
Conductivity		(mS)	74	132	42	282	210	817	608	181	181	384	416	589
ORP		(mV)	-19.6	-146.5	3.6	-80.3	-124.0	-123.4	-132.0	-95.2	-95.2	-88.3	-87.3	-90.2
Analyte Results														
Arsenic	Total	(mg/L)	-	0.42	-	0.005	4.9	4	-	-	-	-	-	3
Arsenic	Dissolved	(mg/L)	0.0097	0.4	0.0031	0.0042	5	3	0.63	0.035	0.033	0.063	0.034	2.8
Bicarbonate (as $CaCO^3$)	Total	(mg/L)	-	65.9	-	171	92.4	477	-	-	-	-	-	349
Boron	Total	(mg/L)	-	0.166	-	0.136	0.12	0.271	-	-	-	-	-	0.465
Boron	Dissolved	(mg/L)	0.0449	0.173	0.129	0.128	0.106	0.234	3.33	0.879	0.803	0.592	1.34	0.427
Calcium	Total	(mg/L)	-	16	-	38.6	18	84.2	-	-	-	-	-	70.3
Carbonate (as $CaCO^3$)	Total	(mg/L)	-	<10	-	<10	<10	<10	-	-	-	-	-	<10
Chloride	Total	(mg/L)	-	1.99	-	2.77	3.14	9.89	-	-	-	-	-	4.02
Chromium	Total	(mg/L)	-	0.0092	-	0.0054	0.0072	<0.005	-	-	-	-	-	<0.005
Chromium	Dissolved	(mg/L)	<0.005	<0.005	0.0071	0.0051	0.0067	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Hex Chrome	Dissolved	(mg/L)	-	<0.005	-	<0.005	<0.005	<0.005	-	-	-	-	-	<0.005
Copper	Total	(mg/L)	-	<0.01	-	<0.01	<0.01	<0.01	-	-	-	-	-	<0.01
Copper	Dissolved	(mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	Total	(mg/L)	-	5.9	-	16.3	14.6	53.6	-	-	-	-	-	61.8
Iron	Dissolved	(mg/L)	5.05	5.4	0.62	16.4	14.4	52.1	40.2	17.1	15.6	32.5	25.2	60.8
Magnesium	Total	(mg/L)	-	4.57	-	14.8	7.48	40.2	-	-	-	-	-	20
Manganese	Total	(mg/L)	-	0.866	-	2.4	1.16	6	-	-	-	-	-	5.42
Manganese	Dissolved	(mg/L)	0.494	0.872	0.197	2.35	1.18	6.25	2.12	1.39	1.3	3.66	3.58	5.08
Nitrate	Total	(mg/L)	-	<0.03	-	0.0352	0.0404	0.0666	-	-	-	-	-	0.0614
Potassium	Total	(mg/L)	-	2.2	-	2.19	5.18	16.2	-	-	-	-	-	4.95
Sodium	Total	(mg/L)	-	4.16	-	7.86	4.66	10.9	-	-	-	-	-	8.74
Sulfate	Total	(mg/L)	-	<0.5	-	1.55	0.51	<0.5	-	-	-	-	-	<0.5
TOC	Total	(mg/L)	-	2.54	-	5.6	2.36	6.88	-	-	-	-	-	3.49

Notes:

ORP - Oxidation-Reduction Potential
$CaCO^3$ - Calcium Carbonate
TOC - Total Organic Compound
< - Not detected at reporting limit
mg/L - milligrams per liter
mV - millivolt
mS - microSiemens

360 293 9006
360 708 4991

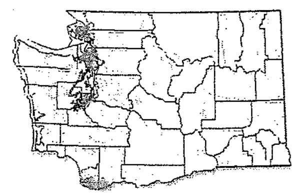
STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

October 23, 2001

Mr. Steve Krommenacker
Corporate Environmental
Allweather Wood Treaters
725 South 32nd Street
P.O. Box 227
Washougal, WA 98671



Your address is in the **Salmon-Washougal** watershed

Dear Mr. Krommenacker:

Re: National Pollutant Discharge Elimination System (NPDES) Permit No. WA00400029 noncompliance notification

Our office has completed review of your March 2001 Discharge Monitoring Reports (DMRs). The DMRs indicate your discharge did not comply with the effluent limitations and/or monitoring requirements established in your permit. The following was not in compliance:

Outfall Number	Monitoring Parameter	Sample Measurement	Permit Requirement
001	Arsenic	384 ug/l	360 ug/l

Your comment and explanation that a treatment system is being constructed to treat the discharge is acknowledged.

Reports which do not comply with permit limits and/or monitoring requirements are treated as violations. If this letter is incorrect or you have questions or comments, please contact Marc Pacifico, at (360) 407-6282.

The effluent limits established in your permit were derived considering the treatment technology employed at your facility, receiving water quality, the environmental impacts of your discharge, and statistical reliability associated with sampling and laboratory procedures.

Compliance Assurance is the goal of the Clean Water Act's self-monitoring program. The DMR is the principle tool used to enforce the self-monitoring program. Be aware of the importance the Department of Ecology (Department) places on complete and accurate DMRs and the legal implications they have for your facility. Noncompliance with the limits, monitoring requirements, terms and/or conditions established in your permit may result in formal enforcement action by the Department.

If you have any questions about your permit or need technical assistance with your facility or for completing your monitoring reports, please contact Jacek Anuszewski at (360) 407-6291.

Sincerely,

Marc Pacifico
Industrial Permit Compliance Specialist
Water Quality Programs, Industrial Unit
Southwest Regional Office

MP:lmc(34/wq)

cc: Jacek Anuszewski, Ecology

Revised March 2000

ERTS # 540666

Department of Ecology - Environmental Report Tracking System

Initial Report

External Reference #

Caller Information

	First	Last
Name	LOREN	EVY

Busines Name
Street Address 21 HUDSON ROAD
Other Address
City WASHOUGAL State WA Zip
E-mail Confidential_FL ☐

Phone	Ext	Type
(360) 835-9734		Home
(360) 909-3213		Mobile

Where did it happen

Berth Anchorage
Location Name WASHINGTON FOREST PRODUCTS
Street Address 520 SOUTH 28TH STREET
Other Address
City/Place WASHOUGAL (CLA State WA Zip
County - Region CLARK SWRO FS ID
WIRA #
Waterway Type
Latitude Longitude
Topo Quad 1:24:000 WASHOUGAL

Direction/Landmark (mile post, cross roads, township/range)

What happened

Spills Program Oil Spill? N

Incident Date 5/10/2004 Received Date 5/10/2004 0:00
Medium SURFACE WATER-FRESH
Material CHEMICAL
Quantity Unit

Source COMMERCIAL
Cause IMPROPER PROCEDURE
Incident Type
Activity ROUTINE/NORMAL OPERATIONS
Impact WATER POLLUTION
Vessel Name
Hull Number

Primary Potentially Responsible Party Information

	First	Last
Name		

Business Name WASHINGTON FOREST PRODUCT
Street Address 520 SOUTH 28TH STREET
Other Address
City WASHOUGAL State WA Zip
Phone Ext Type
E-mail

Additional Contact Information

Name	Phone	Ext	Type

More Information

COMPANY IS WILLING AND KNOWINGLY POLLUTING THE ENVIRONMENT. THEY ARE POLLUTING AIR, WATER AND SOIL. FOREMAN IS NOT ENVIRONMENTALLY SAVVY.

THE BAG HOUSE DOES NOT HAVE MONOCULAR VACUUM READING. THERE IS HOLES IN THE BOTTOM SIDE OF THE BAG HOUSE. THE HORIZONAL SECTION IS THE ONLY PART OF THE TOWER IS THE ONLY THING THAT DOESN'T HAVE HOLES. THEY DO NOT PLAN TO FIX IT UNTIL IT FALLS DOWN. PAUL ANDERSON CAME DOWN AND LOOKED AT IT BUT SAID THAT IT WASN'T GOING TO. FIX.

PURE CONDENSATE IS LEAKING OUT OF THE PIPE. THE PIPE HAS LOTS OF HOLES IN IT. THE CONDENSATE TANKS ARE LOCATED BETWEEN KILN 1 AND KILN2. THE TANK OVERFILLS INTO THE RAVINE TO A HOLE AND INTO A STORM WATER SYSTEM THAT OUTFALLS TO THE SLOUGH. THE BOILER IS OVERFLOWING THE TRI KILN FLUMES THAT CAUSING THE TANK TO OVERFLOW. CALLER STATES THAT HE WAS A BOILER OPERATOR. HE WAS ASKED TO LEAVE BECAUSE HE COMPLAINED ABOUT THE ENVIRONMENTAL ISSUES TO THE COMPANY. THE GROUNDWATER FROM THE TANK IS PUMPING 3 GALLONS A SECOND. THE WATER IS CONTAMINATED AND HEATED TO 240 GALLONS. THE MANHOLE THAT THE RUN OFF IS GOING TO IS ON THE GREEN SIDE BETWEEN KILN 3 AND 4. IT HEATS THE CREEK TO THE POINT OF STEAMING. CALLER STATES THAT HE HAS NOT WORKED THERE FOR ABOUT 2 MONTHS BUT A BUDDY TOLD HIM THAT THE TANK WAS OVERFLOWING ON FRIDAY. THEY REMOVED A PUMP TO TRY TO STOP IT BUT IT DIDN'T WORK. CALLER STATES THAT THE WATER IS PROBABLY LEAKING STILL TODAY.

CALLER STATES THAT THE FORKLIFTS ARE LEAKING ALL OVER THE PLACE. OIL AND HYDRAULIC FLUID STAINING CAN BE