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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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October 6, 2015

Mr. Branislav Jurista
Farallon Consulting
975 5th Avenue NW
Issaquah, WA 98027

Re: Opinion on Proposed Cleanup of the following Site:

- **Site Name:** Woodworth & Co. Lakeview Plant
- **Site Address:** 2800 104th Street South, Tacoma
- **Facility/Site No.:** 1372
- **Cleanup Site No.:** 165
- **VCP Project No.:** SW1012

Dear Mr. Jurista:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your proposed independent cleanup of the Woodworth & Co. Lakeview Plant facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Upon completion of the proposed cleanup, will further remedial action likely be necessary to clean up contamination at the Site?

YES. Ecology has determined that, upon completion of your proposed cleanup, further remedial action will likely be necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following confirmed and suspected releases:

- Total petroleum hydrocarbons-diesel range (TPH-D) and total petroleum hydrocarbons-heavy oil-range (TPH-HO) into the soil.
- TPH-D, trichloroethylene (TCE) and associated halogenated volatile organic compounds (VOCs), arsenic, and lead into the groundwater

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Farallon Consulting (Farallon), *Remedial Investigation/Feasibility Study Report*, August 19, 2009.
2. Ecology, *Opinion on Proposed Cleanup of the following Site*, February 15, 2011.
3. Farallon, *Soil Excavation Cleanup Action Completion Report*, March 28, 2011.
4. Farallon, *Arsenic and Lead Characterization Lakeview Facility*, December 22, 2014.
5. Farallon, *Focused Feasibility and Disproportionate Cost Analysis Report*, April 14, 2015.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that, upon completion of your proposed cleanup, **further remedial action** will likely be necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.**

The Site has been defined through previous investigations conducted from 1983 to 2010 by Farallon Consulting (Farallon) and others as described in the Focused Feasibility Study and Disproportionate Cost Analysis (FFS/DCA) Report (Farallon, April 2015).

Investigations conducted at the Site have detected concentrations of TCE, TPH-D, TPH-HO, and metals (lead and arsenic) in groundwater or soil exceeding applicable MTCA cleanup levels (CULs). Recent (2008-2010) investigations by Farallon included the advancement of soil borings, installation of monitoring wells, and collection of soil, groundwater, and surface water samples (collected from the on-Site storm water detention ponds).

The Site (Figure 2) has been partitioned into five areas of concern (AOCs):

- AOC 1 - Equipment Storage Carport Area.
- AOC 2 - Equipment Parking Area.
- AOC 3 - Former Recycled Stockpile Area.
- AOC 4 - Asphalt-Testing Laboratory Area.
- AOC 5 - Atlas Foundry Waste Area.

AOC 1 is located on the southern portion of the Site, and includes a carport structure that is used to store various equipment used for truck fleet maintenance and operations. TPH-D and TPH-HO have been detected in shallow subsurface soil and groundwater exceeding MTCA Method A CULs.

AOC 2 is located directly north of the truck maintenance shop and is currently used for parking various trailer-mounted equipment and machinery. TPH-HO has been detected in soil exceeding the MTCA Method A CUL.

AOC 3 is located in the western portion of the Site in an area that formerly was used for stockpiling recycled asphaltic concrete. Concentrations of TPH-HO have been detected in shallow subsurface soils exceeding the MTCA Method A CUL.

Farallon conducted excavation of petroleum contaminated soils (PCS) from September to November 2010 in AOCs 1, 2, and 3. These excavations have resulted in the

removal of the source of contamination for groundwater at the Site in AOCs 1, 2, and 3. TPH-D and TPH-HO have not been detected in groundwater above the laboratory practical quantitation limits (PQLs) or MTCA Method A CULs for four consecutive quarters in AOC 1. Petroleum hydrocarbons in groundwater have not been detected above the laboratory PQL in AOC 2 and AOC 3.

AOC 4 is located near the central portion of the Site immediately west to northwest of the roofing shredder building in the reported vicinity of the former Washington State Department of Transportation (DOT) testing laboratory. Concentrations of TCE have been detected in groundwater exceeding the MTCA Method A CULs in both the deep and shallow groundwater-bearing zones as depicted in Enclosure A and in Figures 3 and 4. TCE was additionally detected below MTCA A CULs in the on Site industrial water supply well.

Further subsurface investigations in AOC 4 were conducted by Farallon between July 2012 and January 2013; including the advancement of seven soil borings, as well as five monitoring wells (MWs). According to Figure 6, the borings (B-2 to B-7 and B-9) advanced to characterize soil in AOC 4 were located generally to the south of the presumed former DOT testing laboratory, not within, immediately adjacent to, or surrounding the presumed DOT laboratory location. In addition, the April 2015 report indicates the soil sample data for AOC 4 is present in Table 3, however, the title of the aforementioned table references AOC 5, which is misleading. In the soil samples collected to the south of the presumed DOT laboratory location, TCE or its associated degradation constituents were not detected at concentrations at or exceeding the laboratory PQLs or MTCA Method A CULs in soil. TCE-impacted shallow and deep groundwater zones in AOC 4 are illustrated in Figures 3 and 4, respectively.

AOC 5 is in the area of reported land-filling of foundry waste material in the northeastern portion of the Site (Figure 2). Concentrations of total and dissolved arsenic and lead have been detected in the shallow groundwater-bearing zone exceeding MTCA Method A CULs. Arsenic soil sampling conducted in AOC 5 during previous investigations has exhibited arsenic and lead concentrations less than MTCA Method A CULs. Elevated pH and low oxidation-reduction potential (ORP) recorded at MW-12, (situated in the arsenic/lead shallow groundwater plume) have apparently contributed to the solubility and leaching of lead and arsenic to shallow groundwater. Normal pH and ORP have reportedly been measured at other MWs throughout the Site. The area of delineated lead and arsenic impacted groundwater is depicted in Figures 5 and 6.

Farallon conducted a Site-specific Tier I Vapor Intrusion assessment to evaluate the potential for TCE migration into future structures. TCE concentrations in groundwater

were input into the Johnson and Ettinger Vapor Intrusion Model. TCE concentrations in both shallow and deep groundwater in AOC 4 are protective of the vapor intrusion pathway for the commercial exposure scenario. However, the assumptions used include the emplacement of approximately 30 feet of inert fill material on the ground surface in AOC 4. This differs from existing conditions at the Site.

A cross-section illustrating the shallow, deep, and regional/water-bearing zones is included as Figure 10.

Farallon did a preliminary terrestrial ecological evaluation (TEE) for the Site. The TEE showed the Site does not have any complete ecological pathways. Therefore, the Site qualifies for an exclusion (Farallon, April 2015).

Based on a review of the available information, Ecology has the following comments on the FFS/DCA:

1. AOC 4 is not sufficiently characterized for remedy selection. Additional soil samples need to be collected in the area of the former DOT asphalt testing laboratory, since this is the presumed TCE source area (Farallon, April 2015). Remedy selection cannot begin until further investigation of the source area soils is completed. In particular, please collect soil samples from the upper portion and within the silt/silt and sandy gravels (as shown on Figure 7 in the Farallon April 2015 report), beneath and immediately adjacent to the former DOT laboratory.

In addition, it is likely additional MWs are necessary to further define the extent of contamination at various depths and within the various water bearing zones in AOC 4.

2. The current AOC 4 Alternative 1 (ICs) does not meet the substantive requirements of MTCA. This alternative relies on dilution and dispersion for cleanup. Ecology does not agree that sufficient source area characterization has been conducted or considered enough remedial alternatives to justify the choice of dilution and dispersion as a remedy.

AOC 4 Alternative 1 is also unacceptable because the Site will not meet groundwater CULs within a reasonable restoration timeframe. The Feasibility Study (FS) assumes that TCE concentrations will continue to decline along the trend observed during AS/SVE operation. This assumption is unrealistic and likely incorrect. Ecology expects concentrations to increase upon SVE shutdown unless source area TCE removal or reduction is part of the remedy. Additionally, MWs in AOC 4 have not been sampled since June 2013. We recommend resampling these wells to determine

a current TCE concentration baseline and subsequent quarterly sampling to establish a trend.

Following the investigation and further characterization of the AOC 4 source area, please amend the FS to consider several possible cleanup alternatives for AOC 4.

3. Ecology does not agree with the results of the Tier I Vapor Intrusion (VI) Assessment because the assessment assumes that you will place 30 feet of clean fill at the Site. The FS did not include placement of fill/capping in the proposed alternatives. Therefore these conditions cannot be assumed for the assessment. The Tier I VI Assessment must reflect existing conditions at the Site. Also, Ecology does not recommend that a Tier I VI Assessment is completed until further source area soils characterization is performed. Soil gas samples may need to be collected as part of the Tier I VI Assessment.

Please note, we can only consider Modified Method B calculations that include adjustments to reasonable maximum exposure as remediation levels, not CULs (see WAC 173-340-750(3)(c)(d)). Please reference the allowable modifications to the default assumptions as outlined in WAC 173-340-740(3)(c)(ii).

4. Ecology recommends decommissioning the industrial water supply well because it is within the TCE plume and recent sampling detected TCE in this well. Installation and use of an industrial well at the Site has the potential to affect the distribution of the contaminated groundwater plume. Additionally, the industrial water supply well provides a potential conduit for contaminants to further migrate vertically into the deeper regional aquifer.

Therefore, upon proposal of a replacement industrial well, Ecology recommends the applicant provide additional information regarding Wellhead Protection Areas (WHPAs) for the proposed well location.

- A licensed professional engineer or hydrogeologist who is experienced in WHPA delineations needs to prepare this information. A WHPA is a capture zone surrounding a pumping well that will supply groundwater recharge to the well.
- Please prepare WHPA delineations using criteria and methods identified by the U.S. Environmental Protection Agency. For example, delineation of WHPAs using a numerical model simulation with the Wellhead Analytic Element Model (WhAEM2000). WhAEM2000 is a public domain groundwater flow model that calculates capture zones for wellhead protection area mapping (<http://www.epa.gov/athens/software/whaem/>).

5. Please define the full extent of the total arsenic and lead groundwater plume in AOC 5. In particular, the Site needs:
 - Additional wells north, west, and northwest of MW-31. Installation of these wells will also provide further control on shallow groundwater contours for the northern portion of the Site.
 - Depending on the extent of contamination at the property line, the Site may also need off-property wells to determine the extent of the plume.
 - The Site also needs additional total arsenic and lead concentration data from the existing wells.
6. As per WAC 173-340-720(9)(b), please perform analyses for compliance monitoring on unfiltered samples. Unfiltered groundwater data are not available for MW-9. Please ensure that you collect unfiltered samples for all future groundwater samples for metals analyses at the Site.
7. Please conduct further assessment of the interrelationship between the shallow, deep, and regional aquifers, specifically the presence of a vertical gradient to determine preferential flow paths between the aquifers. As referenced above, assess the potential influence from the industrial water extraction well on the deep and shallow aquifers.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site do not meet the substantive requirements of MTCA. The Site needs further characterization work before CULs and points of compliance are established.

Soil and Groundwater

MTCA Method A CULs for both soil and groundwater have been adopted for the majority of the Site, with the exception of petroleum contaminated soil (PCS) in AOC 2 and AOC 3, where a Site specific MTCA Method B CUL was established. Groundwater sampling did not detect petroleum hydrocarbons in AOC 2 or AOC 3.

AOC 2 and AOC 3

MTCA Method B Site specific CULs for PCS was adopted in AOC 2 and AOC 3 for TPH-D and TPH-HO. The Site specific CUL calculated for AOC 2 is 3,699 milligrams per kilograms (mg/Kg) and 3,739 mg/Kg for AOC 3. Ecology accepted these CULs (Ecology, February 2011).

Points of Compliance

The point of compliance for soil is established for the protection of groundwater, defined as soil throughout the Site. Contaminants of concern (COCs) in soil have been reportedly cleaned up in AOCs 1, 2, and 3 to concentrations below their respective MTCA Method A CULs (AOC 1) or their respective MTCA Method B site specific CULs (AOC 2 and 3) or were determined to be below laboratory PQLs.

The standard point of compliance for groundwater is defined as the uppermost level of the saturated zone extending vertically to the lowest depth that could potentially be affected by the Site. A conditional point of compliance is deemed acceptable where it is not practicable to meet the CULs throughout the Site within a reasonable time frame, and is to be as close as practicable to the source of COCs on the Site.

3. Selection of cleanup action.

Ecology has determined the cleanup action you proposed for the Site does not meet the substantive requirements of MTCA. Please refer to Section 1 for specific comments.

Cleanup actions conducted on the Site to date include the following:

- In September 2010, PCS was excavated from AOC 1 and transported off Site for disposal. Approximately 6,289 tons of PCS was removed. The depth of the excavation ranged between 8 to 13 feet below ground surface (bgs). A total of 31 confirmation soil samples were collected and analyzed from the excavation sidewalls and base/bottom, indicating that all PCS with a concentration greater than MTCA Method A CULs (2,000 mg/Kg) had been removed (Farallon, March 2011).
- In November 2010, PCS was excavated from AOC 2 and transported off Site for disposal. Approximately 118 tons of PCS was removed. The depth of the excavation ranged between 2 to 4 feet bgs. A total of 11 confirmation soil samples were collected and analyzed from the excavation sidewalls and base/bottom, indicating that all PCS with a concentration greater than MTCA Method A CULs (2,000 mg/Kg) had been removed. Ecology approved a MTCA B Site specific CUL of 3,699 mg/Kg for AOC 2; however, Farallon reportedly excavated PCS to MTCA Method A CULs for AOC 2 (Farallon, March 2011).
- From September to November 2010, PCS was excavated from AOC 3 and transported off Site for disposal. Approximately 1,578 tons of PCS was removed. The depth of the excavation ranged between 5.5 to 10 feet bgs. A

total of 32 confirmation soil samples were collected and analyzed from the excavation sidewalls and base/bottom, indicating that all PCS with a concentration greater than the Ecology approved, MTCA Method B Site specific CUL of 3,739 mg/Kg had been removed (Farallon, March 2011).

- An air sparge/soil vapor extraction (AS/SVE) system was installed in AOC 4. The system was constructed between September 2009 to April 2010, and included the installation of 10 AS wells in the deep groundwater-bearing zone and 12 AS wells in the vadose zones of the shallow and deep groundwater-bearing zones. The AS/SVE system was in operation from November 2010 through February 2013, with continued operation of the SVE component through September 2014. TCE decreases were noted in the five MWs used to monitor and characterize the TCE plumes (SVE-12, MW-2, MW-14, MW-20, and MW-22). Farallon concluded the continued operation of the system would provide minimal results in reducing TCE concentrations.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you proposed will be substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

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3. Opinion is limited to proposed cleanup.

This letter does not provide an opinion on whether further remedial action will actually be necessary at the Site upon completion of your proposed cleanup. To obtain such an opinion, you must submit a report to Ecology upon completion of your cleanup and request an opinion under the VCP.

4. State is immune from liability.

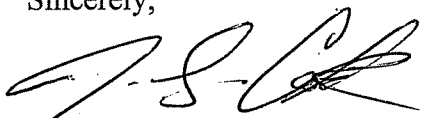
The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. See RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up your Property under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may resubmit your proposal for our review. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-6528 or e-mail at ASCO461@ecy.wa.gov.

Sincerely,



JG Cook, LG
SWRO Toxics Cleanup Program

JGC: knf

Enclosures (1): A – Description and Diagrams of the Site

By certified mail: 9171082133393970388081

cc: Jeff Woodworth, Woodworth & Co., Inc.
Sharon Bell, Tacoma-Pierce County Health Department
Richelle Perez, Ecology
Steve Teel, Ecology
Dolores Mitchell, Ecology

Enclosure A

Description and Diagrams of the Site

Site Description

The Site is located north of Washington State Route 512, east of Interstate 5, and west of Sales Road South in Section 6, Township 19 North, Range 3 East in Lakewood, Pierce County, Washington (Figure 1). The Site consists of Pierce County Parcel Nos. 0319061135, 0319061136, 0319062075, and 0319062076, together totaling approximately 60 acres. All four parcels were formerly used by Woodworth Capital, Inc., (Woodworth) for the recycling of imported asphalt and concrete debris and for hot- and cold-mix asphalt production. The Site is currently owned by Miles Sand & Gravel, Inc.

The southern portion of the Site is almost entirely asphalt-paved. The Site is currently improved with a truck maintenance shop building, a covered carport used for equipment storage, a covered secondary containment structure, a large roofing shredder building, and several small sheds and modular structures used for storage, office space, and/or warehousing. The Site is additionally improved with a large 10,000 gallon above-ground storage tank (AST) containing asphalt tar, and two 12,000 gallon ASTs containing diesel fuel. An industrial water-supply well near the center portion of the Site provides water reportedly for dust control. The water-supply well head is located in a well house. The extraction well was advanced to a total depth of 187 feet bgs, and is reportedly screened from 107 to 129 feet bgs, below the deeper aquifer into the regional aquifer. Storm water is discharged into two on Site storm water detention ponds, located in the western and northern portions of the Site.

The northern portion of the Site is used as a storage area for miscellaneous inert debris and material.

The southern portion of the Site was formally occupied by a thermodesorption plant used for the treatment and recycling of PCS, and is currently used for parking.

The central portion of the Site is used for asphalt and concrete recycling and for stockpiling raw and crushed material. Crushing equipment, radial stackers, and various stockpiles of sorted debris are located on this portion of the Site.

The soil encountered at the Site is comprised of poorly-graded sands and gravels, separated into a shallow and a deep unit by a layer of silt and silty-gravel. The shallow sand and gravel unit is primarily composed of poorly-graded sands and gravels containing various amounts of silt from the ground surface to a depth of approximately 48 feet bgs. In some areas, the sand and gravel layer is replaced by fill material, which is largely reworked native material or imported material consisting of construction debris. Drilling and test pit explorations were used to identify and delineate the fill material. The silt and silty-gravel layers appear to be a confining layer at the base of the shallow water-bearing zone.

The deep sand and gravel layer consists of fine to coarse sand and gravel with very little fines. The deep sand and gravel unit is underlain by a silt and silty-gravel layer encountered at depths ranging from approximately 77 feet bgs to 127 feet bgs.

Two ground-water bearing zones have been recognized in this study. The shallow water bearing zone ranges in thickness from 8 to 20 feet, appears to be discontinuous and largely unconfined, and was encountered at depths ranging from 5 to 36 feet bgs. MWs in the shallow zone were advanced to depths from approximately 8 to 55 feet bgs. MWs are typically screened at 10 foot intervals from the bottom of casing. The groundwater flow direction in the shallow water-bearing zone was observed to be radially inward towards MW-9 (Figures 8 and 9). A deep water bearing zone encountered across the Site transitions from confined conditions in the east to unconfined conditions in the central portion of the Site and was encountered at depths ranging from 28 to 72 feet bgs. The deep water bearing zone ranges in thickness from 46 to 60 feet. The static groundwater levels in the MWs screened in the deep water bearing zone ranged from 17 to 69 feet bgs. The groundwater flow direction in the deep water bearing zone was observed to be generally north to north-northeast (Figure 10). MWs in the deep zone were advanced to depths from approximately 35 to 127 feet bgs. MWs are also typically screened at 10 foot intervals from the bottom of casing. The shallow water bearing zone is separated from the deep water bearing zone by a discontinuous layer of silt and silty-gravel.

Site History

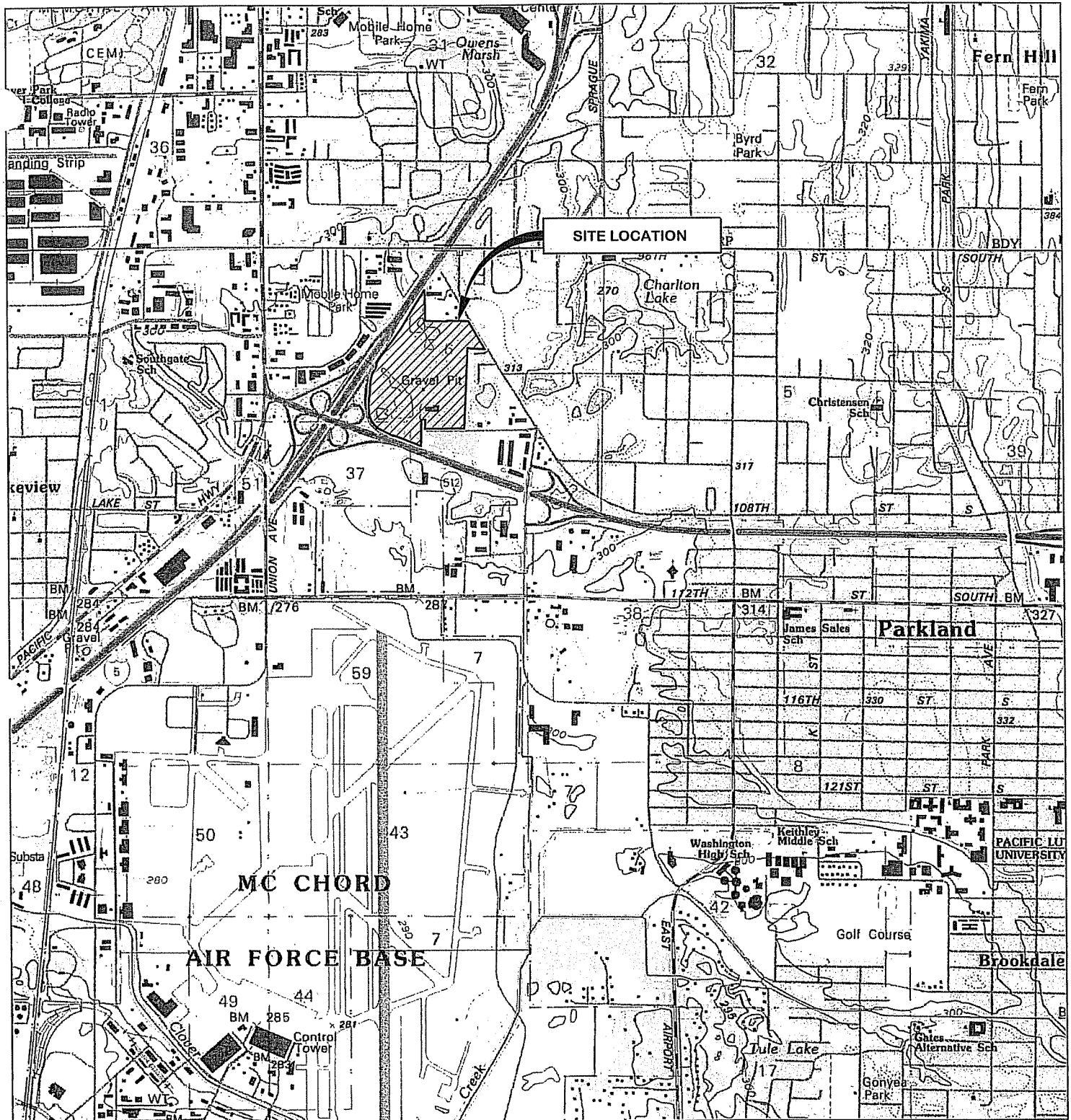
The Site was first developed between 1946 and 1969 for surface sand and gravel mining operations, and hot-mix asphalt production which reportedly commenced on the Site in 1971. Sand and gravel mining operations continued until the late 1980s, at which time the raw materials for asphalt production were imported from off Site locations.

Between the 1980s and early 1990s, the WSDOT established a mobile laboratory on the Site for testing of asphalt mix, which reportedly included use of TCE in the asphalt testing process.

The Site was used from approximately 1981 to 1992 to landfill various inert waste materials, such as clean dirt and rock, waste concrete and asphalt building materials.


Treatment of petroleum-contaminated soil was conducted on the Site from 1991 to 2005 under a Conditional Solid Waste Permit from Tacoma-Pierce County Health Department (TPCHD). In 1994, Woodworth sold the soil treatment facility to TPST Soil Recyclers of Washington (TPST), but remained an owner of the Site. Operations by TPST ended in approximately 2005, at which time the majority of the buildings and equipment used by TPST were demolished or decommissioned.

In August 2003, TPCHD conducted a Site Hazard Assessment of the Woodworth facility. The Site's hazard ranking, an estimation of the potential threat to human health and the environment relative to all other Washington State sites assessed at the time, was determined to be a "2". The ranking ranges from 1 to 5, with 1 representing the highest relative risk and 5 the lowest relative risk.



REFERENCE: 7.5 MINUTE USGS QUADRANGLE TACOMA SOUTH, WASHINGTON. DATED 1991





Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Bend

California
Oakland | Sacramento | Irvine

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FIGURE 1

SITE VICINITY MAP
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

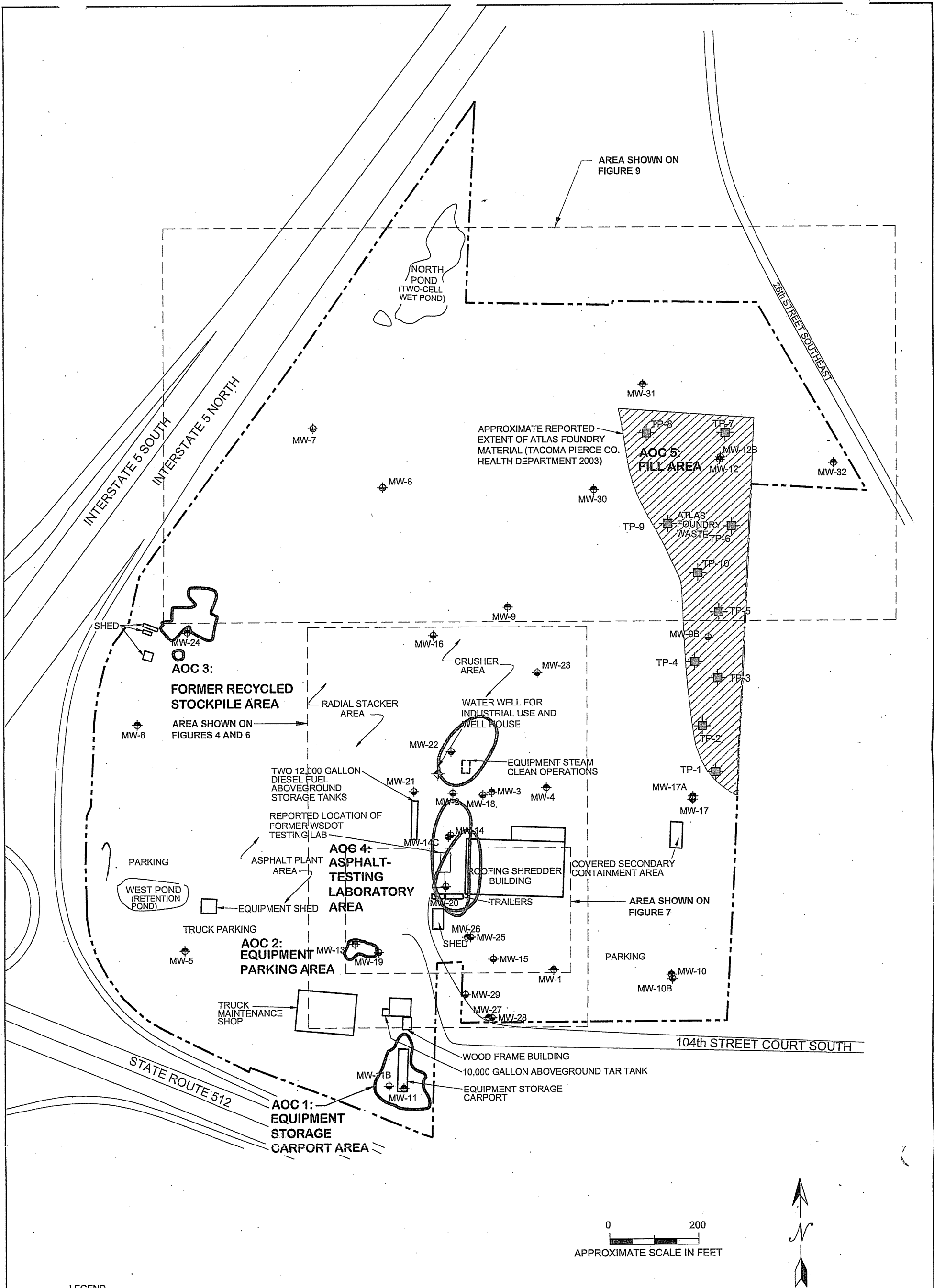
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Checked By: BJ

Date: 3/27/2015

Disk Reference: 188002b



Washington
Issaquah | Bellingham | Seattle

Oregon
Portland | Bend

California
Oakland | Sacramento | Irvine

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FIGURE 2

SITE PLAN

LAKEVIEW FACILITY

2800 104th STREET COURT SOUTH

LAKEWOOD, WASHINGTON

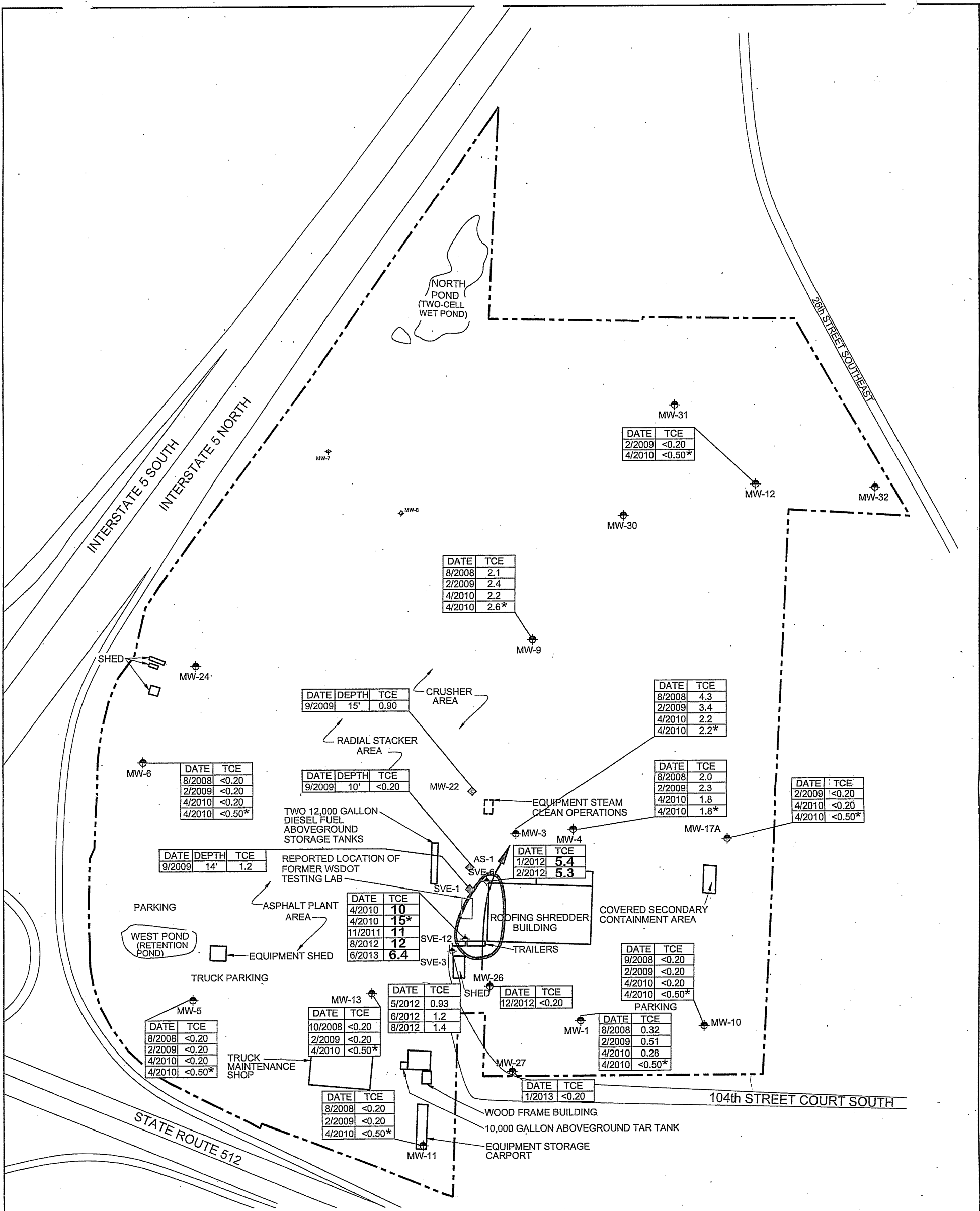
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Date: 3/31/2015

Disk Reference: 188002b



- MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
 SVE-12 SOIL VAPOR EXTRACTION WELL SCREENED IN SHALLOW WATER-BEARING ZONE
 RECONNAISSANCE GROUNDWATER SAMPLE COLLECTED IN SHALLOW WATER-BEARING ZONE

WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

NOTES:

- < DENOTES ANALYTE NOT DETECTED AT OR ABOVE THE REPORTING LIMIT LISTED.
- RESULTS IN **BOLD** DENOTE CONCENTRATIONS ABOVE APPLICABLE CLEANUP LEVEL.
- TCE CONCENTRATIONS FOLLOWED BY " * " ARE THE RESULTS PROVIDED BY GEOENGINEERS, INC. FOR THE APRIL 2010 GROUNDWATER SAMPLING EVENT.
- ALL RESULTS IN MICROGRAMS PER LITER.
- DEPTHS ARE INDICATED ARE IN FEET BELOW GROUND SURFACE.
- RESULTS IN **BLUE** DENOTE RECONNAISSANCE GROUNDWATER SAMPLES

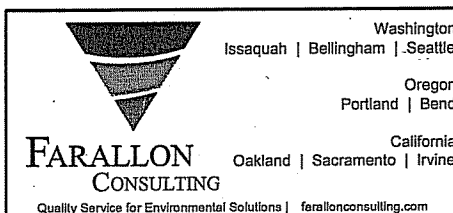


FIGURE 3

TCE DISTRIBUTION IN
 SHALLOW WATER-BEARING ZONE
 LAKEVIEW FACILITY
 2800 104th ST CT S, LAKEWOOD, WA

FARALLON PN: 188-002

Drawn By: DEW

Checked By: BJ

Date: 3/31/2015

Disk Reference: 188002b

MW-11	☼	MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
MW-15	☼	MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
SVE-12	☼	SOIL VAPOR EXTRACTION WELL IN SHALLOW WATER-BEARING ZONE
SVE-2	☼	SOIL VAPOR EXTRACTION WELL IN DEEP WATER-BEARING ZONE
AS-1	☉	AIR SPARGE WELL
AS/SVE	☼	AIR SPARGE AND SOIL VAPOR EXTRACTION WELL PAIR

APPROXIMATE AREA WHERE TRICHLOROETHENE (TCE)
CONCENTRATIONS IN DEEP WATER-BEARING ZONE
GROUNDWATER EXCEEDED THE WASHINGTON STATE MODEL
TOXIC CONTROL ACT (MTCA) METHOD A CLEANUP LEVEL IN 2010

■ APPROXIMATE AREA WHERE TCE CONCENTRATIONS IN DEEP WATER-BEARING ZONE GROUNDWATER EXCEEDED THE MTCA METHOD A CLEANUP LEVEL IN 2013

WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

NOTES:

1. < DENOTES ANALYTE NOT DETECTED AT OR ABOVE THE REPORTING LIMIT LISTED.
2. RESULTS IN **BOLD** DENOTE CONCENTRATIONS EXCEEDING APPLICABLE CLEANUP LEVEL.
3. TCE CONCENTRATIONS FOLLOWED BY " * " ARE THE RESULTS PROVIDED BY GEOENGINEERS, INC. FOR THE APRIL 2010 GROUNDWATER SAMPLING EVENT.
4. ALL RESULTS IN MICROGRAMS PER LITER.

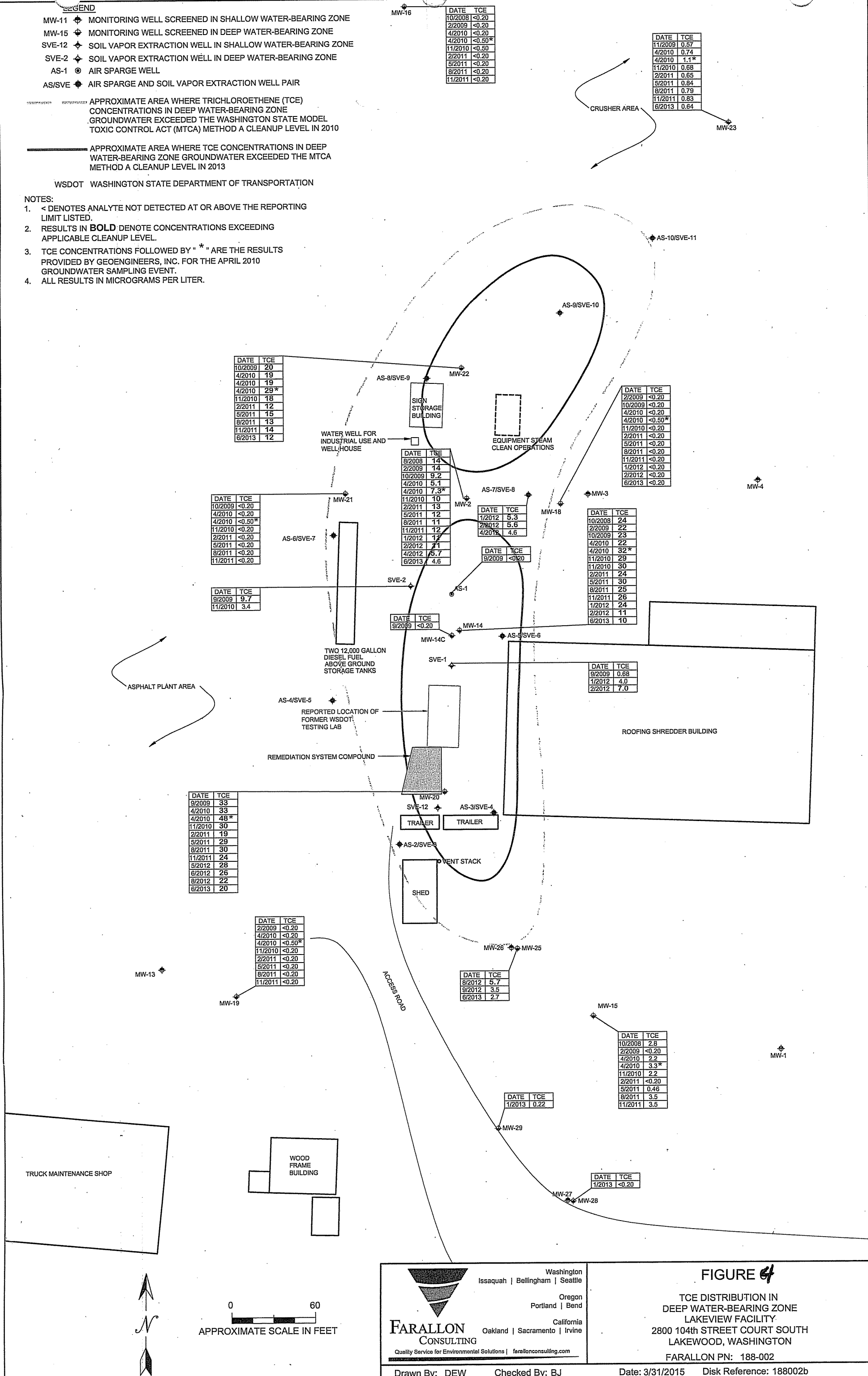


FIGURE 4

TCE DISTRIBUTION IN
DEEP WATER-BEARING ZONE
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

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CONSULTING

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Oregon
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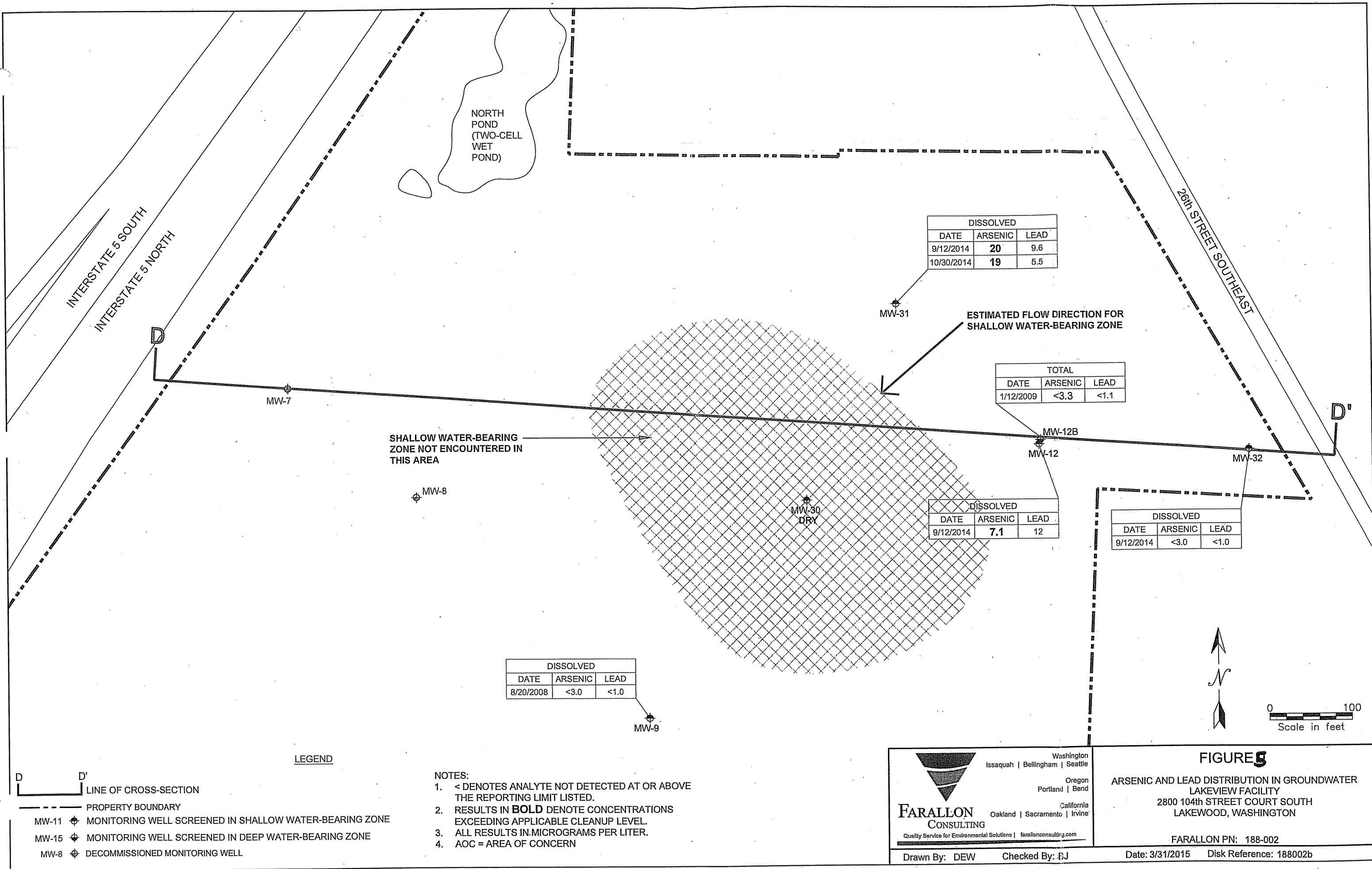
California
Oakland | Sacramento | Irvine

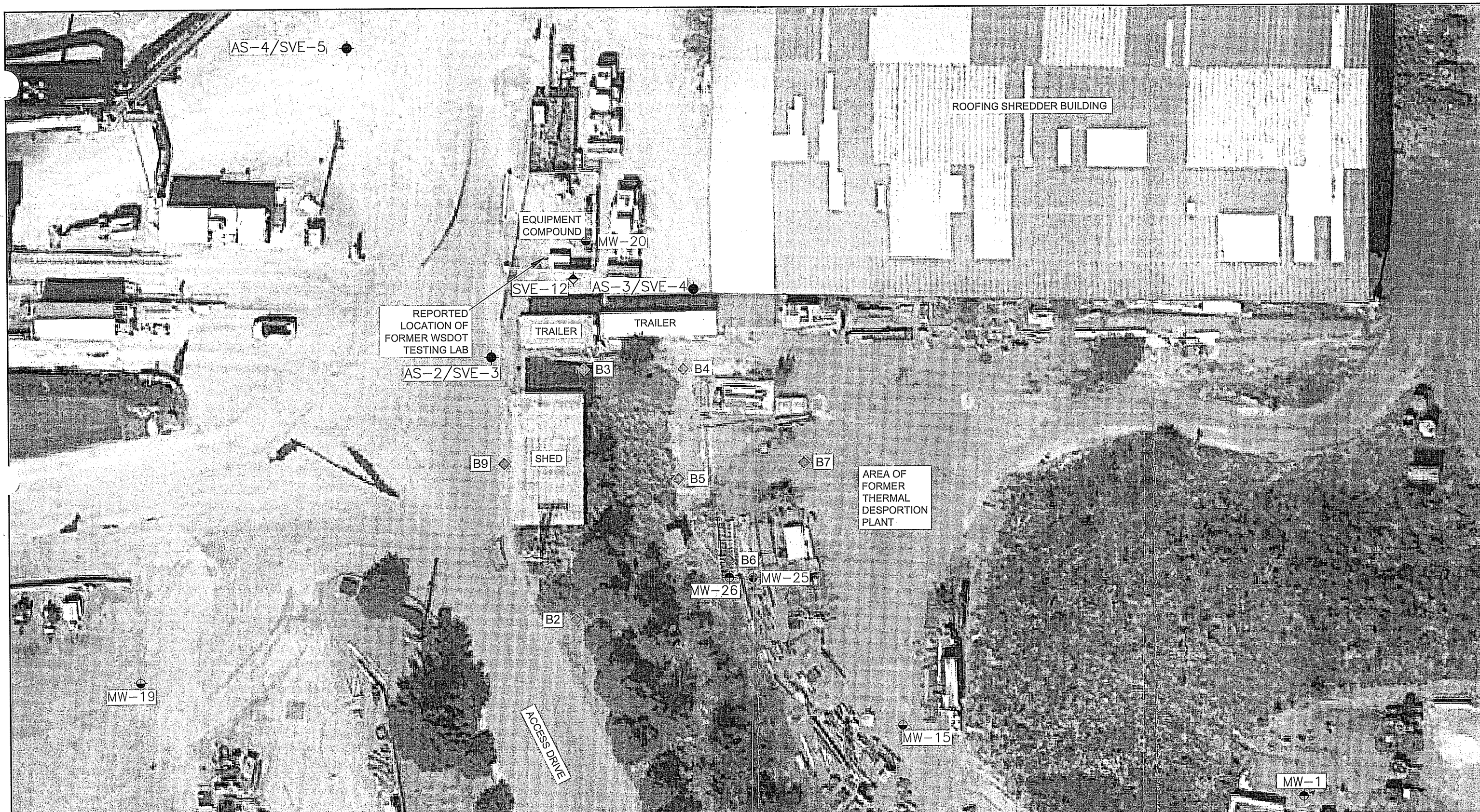
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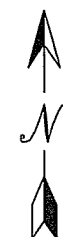





LEGEND

- ◆ BORING LOCATIONS
- MW-11 ◆ MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- MW-15 ◆ MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- SVE-12 ◆ SOIL VAPOR EXTRACTION WELL IN SHALLOW WATER-BEARING ZONE
- SVE-2 ◆ SOIL VAPOR EXTRACTION WELL IN DEEP WATER-BEARING ZONE
- AS/SVE ◆ AIR SPARGE AND SOIL VAPOR EXTRACTION WELL PAIR

0 30
Scale in feet





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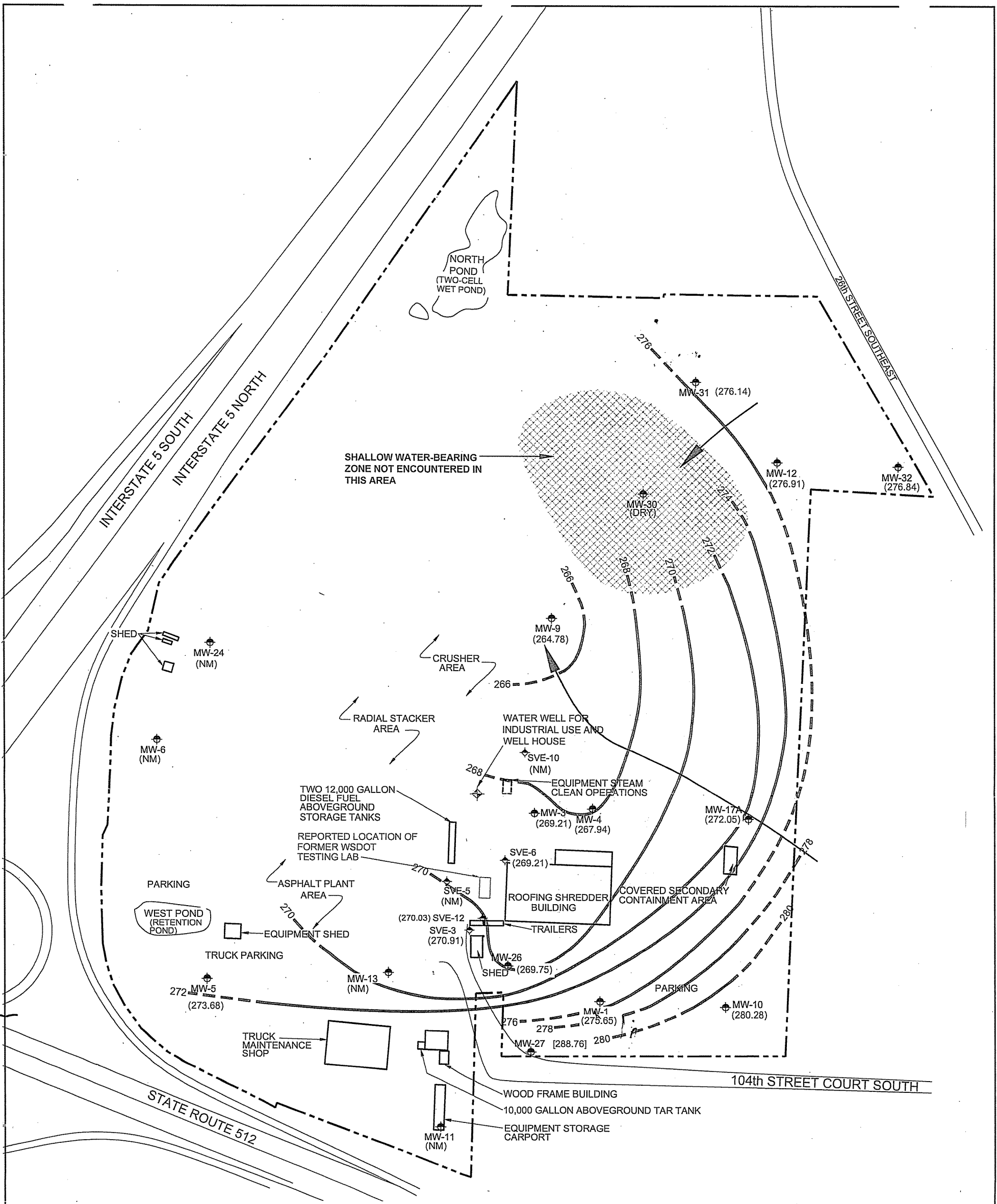
Drawn By: DEW Checked By: BJ

FIGURE 7

BORING LOCATIONS
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Date: 3/27/2015 Disk Reference: 188002b




LEGEND

- PROPERTY BOUNDARY
- MW-6 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
(269.88) GROUNDWATER ELEVATION AT WELL SCREENED IN SHALLOW WATER-BEARING ZONE (OCTOBER 2014)
- [269.37] GROUNDWATER ELEVATION NOT USED IN CONTOURING
- (NM) NOT MEASURED
- 270 - - - - - GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
- ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE.

0 200
APPROXIMATE SCALE IN FEET





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FIGURE 8

GROUNDWATER ELEVATION CONTOURS FOR
SHALLOW WATER-BEARING ZONE
(OCTOBER 2014)

LAKEVIEW FACILITY
2800 104th ST CT S, LAKEWOOD, WA

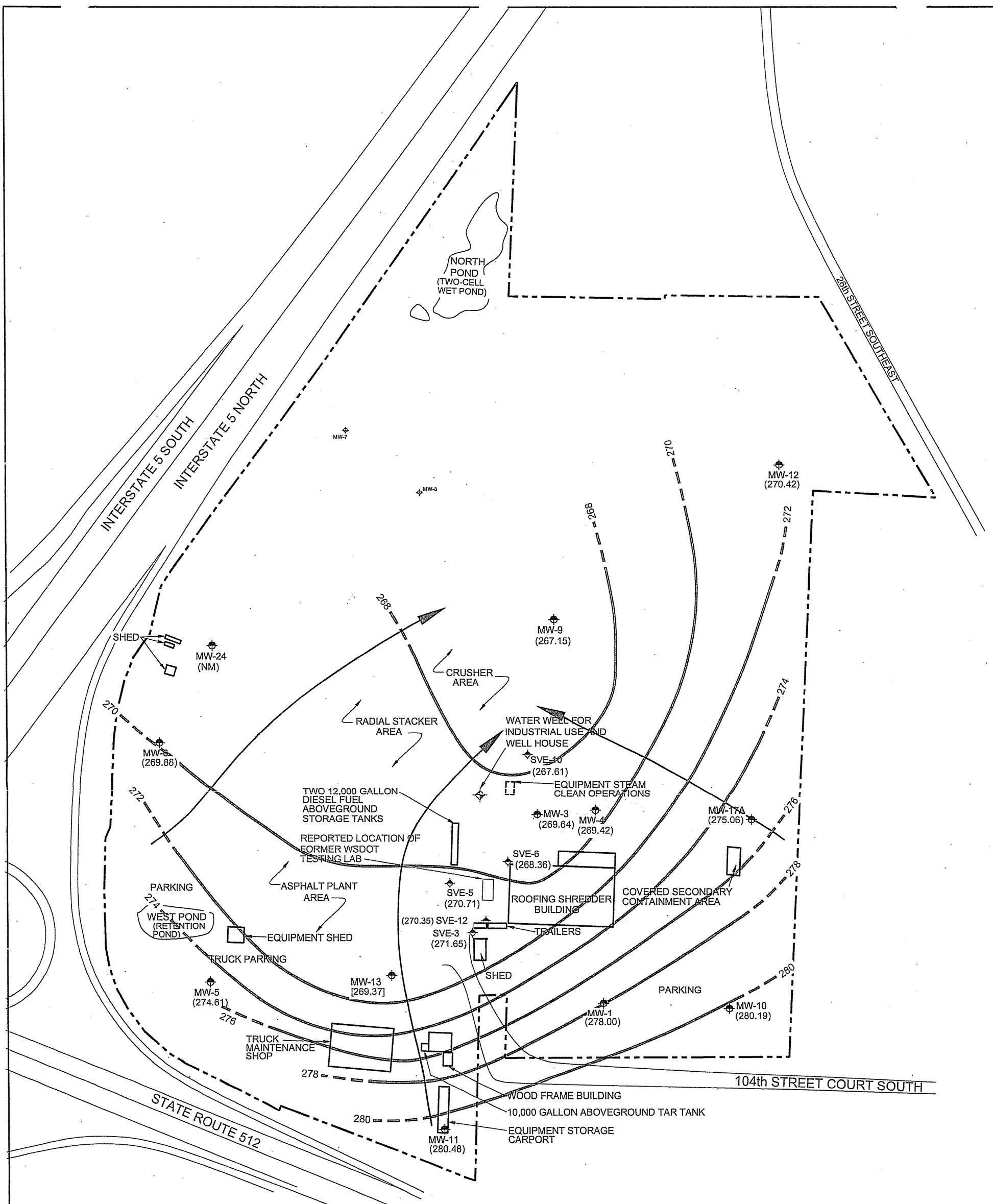
FARALLON PN: 188-002

Drawn By: DEW

Checked By: BJ

Date: 3/31/2015

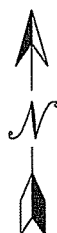
Disk Reference: 188002b



LEGEND

- PROPERTY BOUNDARY
- MW-6 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- EXTRACTION WELL
- (269.88) GROUNDWATER ELEVATION AT WELL SCREENED IN SHALLOW WATER-BEARING ZONE (APRIL 2010)
- [269.37] GROUNDWATER ELEVATION NOT USED IN CONTOURING
- (NM) NOT MEASURED
- 270 - - - GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
- ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE.

0 200
APPROXIMATE SCALE IN FEET



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FIGURE 3

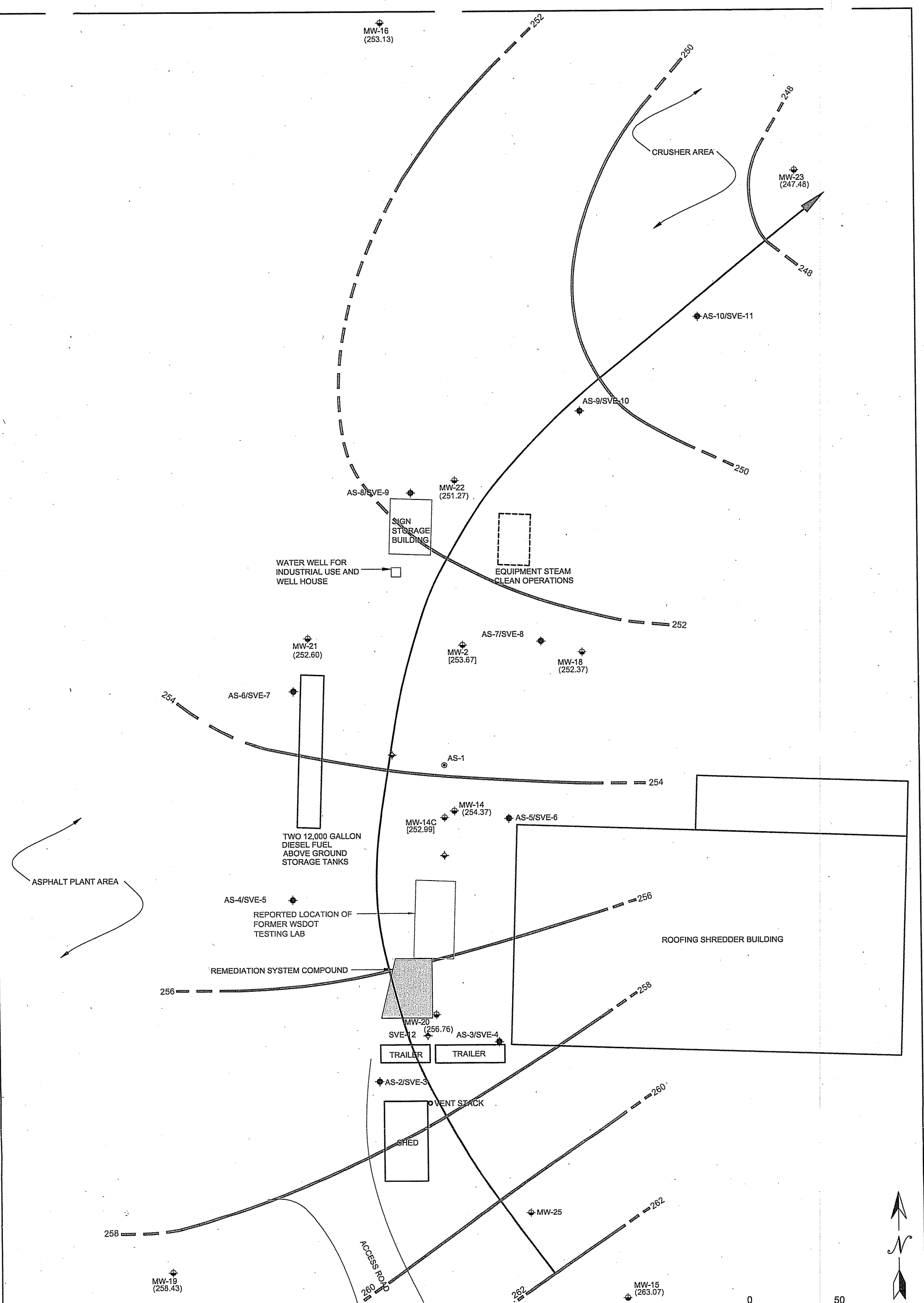
GROUNDWATER ELEVATION CONTOURS FOR
SHALLOW WATER-BEARING ZONE
(APRIL 2010)
LAKEVIEW FACILITY
2800 104th ST CT S, LAKEWOOD, WA
FARALLON PN: 188-002

Drawn By: DEW

Checked By: BJ

Date: 3/31/2015

Disk Reference: 188002b



LEGEND

- MW-14 MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- SVE-1 SOIL VAPOR EXTRACTION WELL
- AS-1 AIR SPARGE WELL
- AS/SVE AIR SPARGE AND SOIL VAPOR EXTRACTION WELL PAIR
- (254.37) GROUNDWATER ELEVATION AT WELL SCREENED NEAR THE MIDDLE OF THE DEEP WATER-BEARING ZONE (APRIL 2010)
- [252.99] GROUNDWATER ELEVATION NOT USED IN CONTOURING
- 250 GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

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FIGURE 4

GROUNDWATER ELEVATION CONTOURS FOR
DEEP WATER-BEARING ZONE
(APRIL 2010)

LAKEVIEW FACILITY
2800 104th ST CT S, LAKEWOOD, WA

FARALLON PN: 188-002

0 50

APPROXIMATE SCALE IN FEET

