



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

November 25, 2015

Mr. Mark Chandler
TOC Holdings Co.
2737 West Commodore Way
Seattle, WA 98199

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

- **Name:** Time Oil Co Seattle Terminal
- **Address:** 2737 W. Commodore Way, Seattle, WA 98199
- **Facility/Site No.:** 75486194
- **VCP No.:** NW2948
- **Cleanup Site ID No.:** 7123

Dear Mr. Chandler:

Thank you for submitting documents regarding your proposed remedial action for the **Time Oil Co Seattle Terminal** facility (Site) for review by the Washington State 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 a review of submitted documents/reports pursuant to requirements of MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing the following releases at the Site:

- Total petroleum hydrocarbons in the gasoline, diesel and oil ranges (TPH-G, TPH-D and TPH-O), benzene, toluene, ethylbenzene, xylenes (BTEX), naphthalene, 1-methyl-naphthalene, 2-methyl-naphthalene, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), pentachlorophenol (PCP), dioxins, furans and lead into the Soil;
- TPH-G, TPH-D, TPH-O, BTEX, 1,2-dibromethane (EDB) 1,2-dichloroethane (EDC), naphthalene, PCP, arsenic and lead into the 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).



Mr. Mark Chandler
September 29, 2015
Page 2

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 your proposed remedial action:

1. SoundEarth Strategies, Inc., 2014. *Feasibility Study, Bulk Terminal Property, 2737 West Commodore Way, Seattle, Washington*. June 17.
2. SoundEarth Strategies, Inc., 2014. *Remedial Investigation Report, Bulk Terminal Property, 2737 West Commodore Way, Seattle, Washington*. June 13.

The reports listed above will be kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Appointments can be made by calling the NWRO resource contact at (425) 649-7235 or sending an email to: nwro_public_request@ecy.wa.gov.

The Site is defined by the extent of contamination caused by the following releases:

- TPH-G, TPH-D, TPH-O, BTEX, naphthalene, 1-methyl-naphthalene, 2-methyl-naphthalene, cPAHs, PCP and lead into the Soil;
- TPH-G, TPH-D, TPH-O, BTEX, 1,2-dibromethane (EDB) 1,2-dichloroethane (EDC), naphthalene, PCP, arsenic and lead into the Ground Water.

The Property is part of the Seattle Terminal Properties (STP) site. The STP includes: 1) Bulk Terminal Properties; 2) East Waterfront Property; 3) ASKO Hydraulic Property; 4) West Waterfront Property and 5) the Washington State Department of Natural Resources (DNR) Aquatic Lease Land Property.

The Site is more particularly described in **Enclosure A** to this letter. The description of the Site is based solely on the information contained in the documents listed above.

Based on a review of supporting documentation listed above, pursuant to **requirements contained in MTCA and its implementing regulations, Chapter 70.105D RCW and Chapter 173-340 WAC, for characterizing and addressing the releases at the Site, Ecology has determined:**

- The interim actions performed at the Property appear to have removed PCP-contaminated soil and soil containing dioxins and furans at the Site. Detections of PCP in Site ground water are primarily downgradient of the former PCP mixing area and/or near the associated interim action area. PCP concentrations in the shallow water-bearing zone on the Site are below the Method B cleanup level of 0.22 micrograms per liter ($\mu\text{g/L}$). However, the intermediate and deep water-bearing zones have not been investigated.
- TPH-G, TPH-D and TPH-O contamination remains in soil at concentrations exceeding Method A cleanup levels.
- TPH-G, TPH-D and TPH-O concentrations in ground water on the Site exceed Method A cleanup levels but have been delineated and do not appear to extend off the Property.
- The following four cleanup action alternatives for the Property were proposed in the FS:
 - Alternative 1 – Unsaturated zone excavation with off-Site land disposal; multi-phase extraction (MPE) for light non-aqueous phase liquids (LNAPL); biosparge and air sparge/soil vapor extraction (SVE) for TPH in ground water. The estimated remediation time frame is 10 years.
 - Alternative 2 – Unsaturated zone excavation with off-Site land disposal; MPE for LNAPL and TPH in ground water. The estimated remediation time frame is 10 years.
 - Alternative 3 – Unsaturated zone and LNAPL excavation with off-Site land disposal; monitored natural attenuation (MNA) for TPH in ground water. The estimated remediation time frame is 20 years.
 - Alternative 4 – In-situ remediation using MPE for the unsaturated zone, LNAPL and TPH in ground water. The estimated remediation time frame is 15 years.
- Alternative 4 was selected due to cost, fewer short term risks and the fact that it is more implementable. However, due to the uncertainty of the effectiveness of the remediation, there is a potential future need for an environmental covenant. Ecology prefers a more reliable and permanent solution with a shorter remediation time frame that does not require an environmental covenant.

- The disproportionate cost analysis graphically displayed in Chart 2 of the FS indicates that Alternative 3 achieves the most environmental benefit for the cost.
- Some of the remedial alternatives propose MNA which has not yet been demonstrated as occurring on the Site.

- The following two cleanup action alternatives for the West Commodore Right of Way (ROW) were proposed in the FS:
 - Alternative 1 – MPE for LNAPL and TPH in ground water. The estimated remediation time frame is 15 years.
 - Alternative 2 – LNAPL excavation for off-Site land disposal; MPE for residual LNAPL; MNA for TPH in ground water. The estimated remediation time frame is 10 years.

- Alternative 2 was selected due to cost and the fact that it is a permanent solution and it is more implementable. Ecology tentatively concurs with the choice of Alternative 2 for the West Commodore ROW cleanup.

- The Property does not qualify for an exclusion from conducting a Terrestrial Ecological Assessment (TEE). According to the RI, a Site-specific TEE will be conducted in accordance with WAC 173-340-7493. Information regarding conducting the Site-specific TEE can be found at the following link:
<http://www.ecy.wa.gov/programs/tcp/policies/terrestrial/site-specific.htm>

This opinion does not represent a determination by Ecology that a proposed remedial action will be sufficient to characterize and address the specified contamination at the Site or that no further remedial action will be required at the Site upon completion of the proposed remedial action. To obtain either of these opinions, you must submit appropriate documentation to Ecology and request such an opinion under the VCP. **This letter also does not provide an opinion regarding the sufficiency of any other remedial action proposed for or conducted at the Site.**

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.

Mr. Mark Chandler
November 25, 2015
Page 5

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 conducted at the Site meet those requirements.

If you have any questions regarding this opinion, please contact me at (425) 649-7064 or hvic461@ecy.wa.gov.

Sincerely,



Heather Vick
NWRO Toxics Cleanup Program

hv:tn

Enclosure: (1) A Site Description

cc: Timothy S. Brown, SoundEarth Strategies, Inc.
Sonia Fernandez, VCP Coordinator, Ecology

Enclosure A

Description of the Site

Site Description

This section provides Ecology's understanding and interpretation of Site conditions, and is the basis for the opinions expressed in the body of the letter.

Site: The Site is defined as total petroleum hydrocarbons in the gasoline, diesel and oil ranges (TPH-G, TPH-D and TPH-O), benzene, toluene, ethylbenzene and xylenes (BTEX naphthalene, 1-methyl-naphthalene, 2-methyl-naphthalene, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), pentachlorophenol (PCP), dioxins, furans and lead into the soil at 2727 West Commodore Way in Seattle, Washington (Property). The Site is also defined as TPH-G, TPH-D, TPH-O, BTEX, 1,2-dibromomethane (EDB) 1,2-dichloroethane (EDC), naphthalene, PCP, arsenic and lead into the ground water. The Site extends to the north of the Property into a portion of the West Commodore Way right-of-way (ROW). The Property is part of the Seattle Terminal Properties (STP). The STP include: 1) the Bulk Terminal Property; 2) East Waterfront Property; 3) ASKO Hydraulic Property; 4) West Waterfront Property and 5) Washington State Department of Natural Resources (DNR) Aquatic Lease Land Property. The King County tax parcel numbers and addresses corresponding to the STP are shown in the two tables below (the Property is shown in bold):

<i>VCP Site Name</i>	<i>VCP No.</i>	<i>STP Property Name</i>	<i>Address</i>
TOC Seattle Terminal	NW2948	Bulk Terminal Property	2737 W. Commodore Way
TOC 2754 Commodore Way	NW2949	East Waterfront Property	2754 W. Commodore Way
TOC ASKO Property	NW2950	ASKO Hydraulic Property	2805 W. Commodore Way
NA	NA	West Waterfront Property	2800 W. Commodore Way
NA	NA	WA DNR Aquatic Lease Land	DNR Moorage Lease

NA = Not applicable

<i>Property Name</i>	<i>King County Parcel Number</i>	<i>Size</i>
Bulk Terminal Property	1125039050	4.10 acres
East Waterfront Property	1125039120	3.17 acres
ASKO Hydraulic Property	4237900405	1.57 acres
West Waterfront Property	1125039081	1.58 acres
WA DNR Aquatic Lease Land	1125039113	0.56 acres

The Property is within the Ballard Interbay North Manufacturing Industrial Center. The Property is zoned as industrial.

Total petroleum hydrocarbons are the primary suspected sources on the Site based on the historical land use as a petroleum bulk storage facility. A second primary source is PCP which was encountered in a localized area on the Property where historical production of wood preservative was conducted. Additional contamination sources on the Site are additives or by-products of petroleum hydrocarbons including BTEX, lead, cPAHs, naphthalene, 1-methyl-naphthalene and 2-methyl-naphthalene.

Area and Property Description: The Property is located on the south shore of Salmon Bay on the Lake Washington Ship Canal (see Site Diagram). The Property is bordered to the north by the West Commodore Way Right of Way (ROW). Located further north are the East Waterfront Property to the northwest and a Port of Seattle parcel to the northeast. The eastern portion of the Property is

bordered by 27th Avenue West and a warehouse building. The southern portion of the Property is bordered by the BNSF railroad parcel. The western portion of the Property is bordered by the ASKO Hydraulic Property (VCP NW2950).

The western half of the Property is occupied by a warehouse that extends to the west on the ASKO Hydraulic Property (NW2950). The eastern half of the Property is currently vacant and covered with up to 6 inches of 2- to 4-inch diameter gravel.

The elevation of the Property ranges from approximately 45 to 60 feet above mean sea level; the Property slopes to the north towards Salmon Bay. The Property is currently zoned as industrial.

Property History and Current Use: The Property was originally occupied by three residences as early as 1905. In the 1920s and 1930s, the Property was the location of Salmon Bay Manufacturing Company and Rattan Furniture Manufacturing Company. The Property was owned by Jobbers Petroleum between 1939 and 1941. Time Oil Co. (TOC) acquired the Property in 1941 and operated a bulk fuel storage facility between 1941 and 2001.

Buildings on the Property are listed in the table below:

Date Built	Building Type	Historical Uses	Size	Current Use
1939	Office	Offices	13,662 SF	TOC offices
1946	Shop Building	Foamite shed	660 SF	Unknown
Unknown	Shop Building	Boiler Room	528 SF	Unknown
Unknown	Shop Building	Pump Shed	892 SF	Unknown

SF = square feet

Fourteen bulk above-ground storage tanks (ASTs) were constructed on the east side of the Property, six on the northeast side (Lower Tank Yard) in 1941 and eight on the southeast side (Upper Tank Yard) in 1944. The AST volumes ranged from 219,450 to 966,000 gallons with the Upper Tank Yard ASTs being larger than the Lower Tank Yard ASTs. The 14 ASTs were connected by pipe to the manifold shed.

An additional 10,000-gallon AST (#15) was installed on the Property prior to 1950 to be used for PCP mixing. At least five underground storage tanks (USTs) were also in use on the Property which are listed in the table below:

UST No.	Install Date	Contents	Capacity (gallons)	Removal Date
UST #1	Unknown	Unleaded gasoline	4,000	1991
UST #2	1980	Leaded gasoline/diesel ¹	1,500/2,500	1991
UST #3	1991	Unleaded gasoline/diesel ¹	1,000/3,000	2006
UST #5	Unknown	Heating fuel?	550	Unknown
UST #6	Unknown	Heating fuel?	300	2010

¹USTs #2 and #3 were baffled into two compartments.

The TOC bulk fuel storage facility was operated on the Property from 1941 to 2001. Operations included the storage and distribution of retail petroleum products, including gasoline, diesel, kerosene and mineral spirits between transport ships, railroad tank cars and trucks. Petroleum products were delivered to the Property via BNSF rail cars, barges and tankers to be stored in the 14 fuel ASTs. The Lower Tank Yard consisted of smaller ASTs #1 through #6; the Upper Tank Yard consisted of larger ASTs #7 through #14. The petroleum products were transported using drums and distribution pipelines. The piping ran from the fuel ASTs to several barreling sheds where 5-gallon containers and 55 gallon drums were filled with petroleum products which were then transported beneath the West Commodore Way ROW to the East Waterfront Property docks using inclined gravity conveyors (Former West and East Barrel Inclines).

In 1967, wood preservative was made for a period of four months in the PCP mixing AST (#15) to fulfill a military contract. AST #15 was located near the west wall of the Lower Tank Yard. PCP crystals were mixed into heated diesel fuel and then transferred through underground pipelines to the New Barrel Shed on the ASKO Hydraulic Property. The mixture was then put into 5-gallon containers and 55-gallon drums and loaded onto railcars for shipment overseas including Vietnam.

The 14 fuel ASTs, the PCP mixing AST (#15) and UST #3 were removed in 2006. West Commodore Way was completed in 1912. The current use of the Property is a mix of industrial and commercial land uses.

Sources of Contamination: Sources of petroleum and cPAH contamination on the Site include former bulk fuel ASTs, USTs #1 through #3, the former pump island, the former loading racks, former open trench area, former manifold pit and the former barreling sheds and barreling inclines. Measurable light non-aqueous phase liquids (LNAPL) consisting of TPH and/or BTEX have been observed in monitoring wells on the Site up to 5.27 feet thick.

The source of PCP on the Site is the former PCP mixing AST area. The source of dioxins and furans on the Site is the PCP. Sources of lead on the Site are the former underground distribution pipelines and the former pump shed area.

Physiographic Setting: The Site is located within the Puget Sound Lowland Physiographic Province. This north-south trending structural and topographic depression is bordered on its west side by the Olympic Mountains, and to the east by the Cascade Mountain foothills. The Puget Lowland is underlain by Tertiary volcanic and sedimentary bedrock, and has been filled to the present day land surface with Pleistocene glacial and nonglacial sediments. The Site is located at the northern end of the Magnolia Drift Upland subprovince of metropolitan Seattle.

Surface/Storm Water System: Salmon Bay is the closest surface water body to the Site located approximately 110 feet north of the Property. Salmon Bay was originally a saltwater bay but was

inundated with fresh water in 1914 when the Hiram M. Chittenden Locks (Locks) were constructed to the west. Salmon Bay is now partially saline due to operation of the Locks which allows mixing of fresh water and salt water due to tides in Puget Sound. Storm water runoff on and in the vicinity of the Property disperses via sheet flow to catch basins connected to the City of Seattle storm water system.

Ecological Setting: The majority of the Property is unpaved; the ground surface is covered with a thick layer of gravel. Undeveloped portions of the Property are covered by buildings or gravel that are unlikely to attract wildlife. The Property is surrounded by commercial and industrial land uses with buildings and pavement covering most surfaces.

Geology: The Property is underlain by fill materials ranging in thickness from 5 to 20 feet. Underlying the fill are coarse and fine Vashon ice-contact deposits and advance outwash deposits underlain by pre-Fraser age glacial deposits, with the uppermost layer consisting of dense to hard, interbedded sand, gravel and silt.

Ground Water: Ground water on the Site occurs as perched, shallow, intermediate and deep water-bearing zones. A seasonal shallow perched water bearing zone occurs in fill materials at approximately 5 to 8 feet below the ground surface (bgs). A shallow water bearing zone occurs from approximately 8 to 23 feet bgs and flows to the north-northwest. Underlying the shallow water-bearing zone are two semi-confined to confined water-bearing zones. The intermediate water-bearing zone occurs at depths of 26 to 40 feet bgs. A deep water-bearing zone was identified west of the Property on the ASKO Hydraulic Property where it occurs at depths of approximately 52 to 62 feet bgs. The intermediate and deep water-bearing zones have not been investigated on the Property. A total of 40 monitoring wells are installed in the shallow water-bearing zone on the Property and are listed in the following table:

Monitoring Wells	Water-Bearing Zone	Maximum Screen Depth
01MW01, 01MW04 through 01MW06; 01MW08; 01MW12 through 01MW14; 01MW17 through 01MW29; 01MW37 through 01MW43; 01MW59; 01MW66 through 01MW69; 01MW72 through 01MW75; 01MW90 through 01MW91	Shallow	30 feet bgs

Based on aquifer testing conducted at the Site, the hydraulic conductivity of the shallow water bearing zone ranges from 0.12 to 0.43 feet per day.

Water Supply: Water to the Property is supplied by Seattle Public Utilities from surface water sources including the Cedar and Tolt River watersheds. Three water supply wells were located within a mile of the Property, two north of Salmon Bay and a third 0.85 mile to the southeast. The wells were used for industrial or commercial uses and may have been abandoned.

Release and Extent of Soil and Ground Water Contamination: A 1999 subsurface investigation consisted of:

- Nine hollow stem auger (HSA) borings (01SB01 through 01SB09) advanced to a maximum depth of 25 feet bgs. The borings were sited in the vicinity of former USTs #1 through #3, in the southern end of the Pipeline Utilidor. Soil and ground water samples were analyzed.
- Five borings completed as monitoring wells 01MW01 through 01MW05.

A 2000 Phase I Environmental Site Assessment report describes the Property as having been used as a petroleum storage facility since the late 1930s. The report stated that petroleum-contaminated ground water was present beneath the Property. The report recommended soil borings near the rail spur in the Upper Tank Yard, the rail spur on the south side of the Warehouse building, the former ASTs north of the warehouse building, Former Barreling Sheds #2 and #3, the Lower Tank Yard and the former USTs near the northeast corner of the Headquarters Office Building. The report recommended that soil samples collected from the borings be analyzed for petroleum hydrocarbons, PCP and lead.

A 2000 subsurface investigation combined with the ASKO Hydraulic Property was performed to assess conditions in the vicinity of the Former PCP Mixing AST, Former Barreling Sheds #2 and #3 and the Former Railroad Spurs. The investigation consisted of advancing five hand auger borings and six hollow stem auger borings, one of which was converted to monitoring well 01MW06. A soil removal action was also performed which is discussed below under the heading of 'Interim Actions'.

A 2001 subsurface investigation included the advancement of eight soil borings, three of which were converted to monitoring wells 01MW14, 01MW16 and 01MW17.

In 2003, ground-penetrating radar (GPR) and electromagnetic surveys were performed to locate subsurface anomalies such as unknown USTs or piping which may have been sources of LNAPLs as TPH measured in monitoring well 01MW05. The geophysical surveys identified an anomalous area measuring approximately 60 feet by 40 feet near 01MW05. The GPR survey also identified a suspected buried pipe about 6 feet south of 01MW05. The depth of the pipe was estimated to be about 2 feet bgs; it was oriented east-west and extended approximately 66 feet west of 01MW05 until it ran to the southwest toward Former Barreling Shed #3. However, the presence and location of the pipe were not confirmed by excavation.

A total of 19 ground water monitoring events were conducted in Site monitoring wells between 1999 and 2005. The ground water samples collected during this period were analyzed for TPH-G, TPH-D, TPH-O, BTEX, methyl tertiary-butyl ether (MTBE); PCP; total and dissolved lead and cPAHs. Concentrations of TPHs, BTEX, PCP and total lead were detected in one or more ground water samples collected during the 19 monitoring events. Light non-a

Remedial Actions: Two USTs (UST #1 and #2) and two fuel dispensers were removed in 1991 as part of a facility upgrade. The two USTs were located north of the northeast corner of the Headquarters Office Building. Soil within the excavation appeared to be impacted; the tanks were observed to be slightly rusted and pitted. Approximately 140 cubic yards of petroleum-contaminated soil were removed from the excavation which measured approximately 25 feet by 20 to 25 feet. The final depth of the excavation is unknown but was at least 18 feet bgs which is where ground water was encountered. The excavation was discontinued due to proximity to the Headquarters Office Building. Eight soil samples were collected from the sidewalls and bottom of the excavation beneath the former fuel dispensers.

In 2002, a hydraulic fluid release occurred from a truck on the western edge of the parking lot. A total of 13 cubic yards of petroleum-contaminated soil were excavated and removed.

In 2003, a dual-phase extraction (DPE) pilot test was conducted which included the installation of three monitoring wells (01MW18 through 01MW20) in the vicinity of 01MW05. The pilot test consisted of performing a baildown and recovery test on well 01MW05, conducting baseline monitoring and conducting two DPE step tests. Based on TPH extracted during the two pilot tests, the average TPH recovery rate was 0.31 pounds per hour.

In 2002, a soil removal was conducted at the Former PCP/Diesel Mixing Area in an excavation that measured 28 feet by 65 feet and 6 to 18 inches deep. Two areas within the excavation were dug deeper to depths of 5 to 7 feet bgs. Nine confirmation soil samples analyzed for PCP contained non-detectable concentrations or were below the Method B PCP cleanup level of 2.5 mg/kg.

In 2006, two fuel dispensers, UST #3 and UST #4 were removed from the Site. Soil samples collected from the excavations indicate that soil exceeding MTCA cleanup levels was left in place.

In 2010, UST #6 was removed from the Property. Confirmation soil samples collected from the sidewalls and base of the excavation did not contain TPH-D, TPH-O or BTEX but LNAPL was observed from 1 to 2 feet bgs.

Remedial Investigation: A Remedial Investigation (RI) conducted between 2006 and 2013 addressed the following data gaps:

- 1) The lateral and vertical extent of TPH in soil and ground water at the Property and West Commodore Way ROW were not fully delineated.
- 2) The lateral and vertical extent of PCP in soil at the Property was not fully delineated.
- 3) The lateral extent of elevated concentrations of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (dioxins and furans) in soil associated with releases of PCP at the Property.

The RI consisted of:

- A 2009 ground penetrating radar survey to locate potential USTs. Two USTs (UST #5 and UST #6) were identified east of the Headquarters Office Building as a result of the survey.
- Soil and reconnaissance ground water sampling from selected direct push borings at various locations and depths.
- Installation of 28 new monitoring wells followed by ground water sampling.

Interim Actions:

In 2010 and 2011, an interim action was conducted to remediate the PCP plume in ground water located within the designated PCP treatment area. An injection well network consisting of 144 wells was installed on approximate 10-foot centers within an area measuring 120 feet by 170 feet. Injections of a sodium persulfate solution totaling 302,500 gallons were conducted for about 45 days. Quarterly ground water monitoring events in select wells conducted after the injections until 2012 indicated an 85% reduction in PCP concentrations in ground water. However, only the shallow water-bearing zone is being monitored on the Site.

In 2011, a hot spot soil removal was conducted to accelerate the time frame to remediate soil in two areas with concentrations of PCP, dioxins and furans that exceeded MTCA Method C cleanup levels.

In 2012, a full-scale soil removal action was conducted to remove soil containing PCP and 2,3,7,8-TCDD at concentrations exceeding their respective Method B cleanup levels. A total of approximately 4,491 tons of contaminated soil were removed and 74 performance and confirmation soil samples were collected. All soil containing PCP at concentrations exceeding the Method B cleanup level was removed. Two confirmation soil samples on the east side of the excavation containing 2,3,7,8-TCDD exceeded the Method B cleanup level; all other confirmation soil samples were below Method B. A statistical analysis using MTCASat97 confirmed that cleanup standards for dioxins and furans were met.