STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000
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February 13, 2014

Mr. Louis Mosconi
Phillips 66 Company
3900 Kilroy Airport Way, Suite 210
Long Beach, CA 90806

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

- **Name:** Phillips 66 070644
- **Address:** 2800 Martin Luther King Jr. Way S., Seattle, WA
- **Facility/Site No.:** 42746846
- **VCP No.:** NW2612
- **Cleanup Site ID No.:** 6056

Dear Mr. Mosconi:

Thank you for submitting documents regarding your proposed remedial action for the **Phillips 66 070644** 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 release(s) at the Site:

- Total gasoline-range petroleum hydrocarbons (TPHg) and associated benzene, toluene, ethylbenzene, and xylenes (BTEX) in Soil and Groundwater;
- Total diesel-range petroleum hydrocarbons (TPHd) in Soil and Groundwater;
- Total oil-range petroleum hydrocarbons (TPHo) in Soil and Groundwater;
- Carcinogenic polynuclear aromatic hydrocarbons (cPAH) in Soil; and
- Tetrachloroethene (PCE) and related degradation product volatile organic compounds (VOCs) in Groundwater;
- Non-chlorinated VOCs in Groundwater including 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, and naphthalenes.

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 your proposed remedial action:

1. G-Logics, Inc., *Cleanup Action Report, Former Gas Station, 2800 Martin Luther King Way South, Seattle, WA 98144*, October 31, 2005.
2. G-Logics, Inc., *Summary Report Site Remediation and Groundwater Monitoring, Former Auto Service Station, 2800 Martin Luther King Way South, Seattle, WA 98144*, August 2, 2007.
3. G-Logics, Inc., *Cleanup Action Plan, Former Gas Station, 2800 Martin Luther King Way South, Seattle, WA 98144*, January 22, 2008.
4. Stantec Consulting Corporation (Stantec), *Soil and Groundwater Assessment Report, Former Tidewater Service Station, ConocoPhillips Site 5173, Chevron Site 301233, 2800 Martin Luther King Way South, Seattle, WA*, March 13, 2012.
5. Stantec, *Fourth Quarter 2011 Monitoring and Sampling Report, Former Tidewater Service Station, ConocoPhillips Site 5173, Chevron Site 301233, 2800 Martin Luther King Way South, Seattle, WA*, April 25, 2012.
6. Stantec, *First Quarter 2012 Monitoring and Sampling Report, Former Tidewater Service Station, ConocoPhillips Site 5173, Chevron Site 301233, 2800 Martin Luther King Way South, Seattle, WA*, April 27, 2012.
7. Conestoga-Rovers & Associates (CRA), *Second Quarter 2012, Groundwater Monitoring and Sampling Report, Former Tidewater Site, Phillips 66 Site 5173, Chevron Site 301233, 2800 Martin Luther King Junior Way South, Seattle, WA, DOE Case 42746846*, October 9, 2012.
8. CRA, *Third Quarter 2012 Groundwater Monitoring and Sampling Report, Former Tidewater Site, Phillips 66 Site 5173, Chevron Site 301233, 2800 Martin Luther King Junior Way South, Seattle, WA, DOE Case 42746846*, December 11, 2012.
9. CRA, *Fourth Quarter 2012 Groundwater Monitoring and Sampling Report, Former Tidewater Site, Phillips 66 Site 5173, Chevron Site 301233, 2800 Martin Luther King Junior Way South, Seattle, WA, DOE Case 42746846*, February 26, 2013.
10. CRA, *First Quarter 2013 Groundwater Monitoring and Sampling Report, Former Tidewater Site, Phillips 66 Site 5173, Chevron Site 301233, 2800 Martin Luther King Junior Way South, Seattle, WA, DOE Case 42746846*, July 23, 2013.

11. CRA, *Second Quarter 2013 Groundwater Monitoring and Sampling Report, Former Tidewater Site, Phillips 66 Site 5173, Chevron Site 301233, 2800 Martin Luther King Junior Way South, Seattle, WA, DOE Case 42746846*, November 7, 2013.
12. CRA, *Remedial Investigation and Feasibility Study Work Plan, Phillips 66/Former Tidewater Site, 2800 Mlk Jr Way S., Seattle, WA*, December 2, 2013.
13. Conestoga-Rovers & Associates (CRA), *Third Quarter 2013 Groundwater Monitoring and Sampling Report, Former Tidewater Site, Phillips 66 Site 5173, Chevron Site 301233, 2800 Martin Luther King Junior Way South, Seattle, WA, DOE Case 42746846*, December 18, 2013.

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:

- TPHg and associated BTEX in Soil and Groundwater;
- TPHd in Soil and Groundwater;
- TPHo in Soil and Groundwater;
- cPAH in Soil;
- PCE and related degradation product VOCs in Groundwater;
- Non-chlorinated VOCs in Groundwater including 1,2,4-TMB, 1,3,5-TMB, and naphthalenes.

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 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 following release(s) at the Site, Ecology has determined:**

- The additional proposed sampling and data collection will provide valuable data for characterization of the Site, and assist in development of a conceptual site model for the Site.
- One upgradient well may not be sufficient to determine if there is an upgradient source of PCE for the Property, and Ecology recommends at least one more upgradient well be added to the proposed scope of work. These wells, and all others sampled for VOCs should be sampled using low flow sampling methods.
- The former service garage could be a source of PCE at the Site based on the common historical use of PCE as an automotive parts washer and the distribution of the PCE

groundwater data. All chlorinated solvents detected at the Site need to be presented in text, tables, and figures, regardless of source.

In addition to the proposed boring locations presented in the Work Plan, soil samples should be collected from borings sited to characterize the former hoists and sumps within the former service garage and analyzed for TPHg, TPHd, TPHo, VOCs, cPAHs, and PCBs in general accordance with Table 830-1 of the MTCA regulation for waste oil releases.

All potential contaminants of concern (COCs) in each media need to be discussed in remedial investigation (RI) documents, and appropriate cleanup levels developed and identified for comparison. This includes VOCs including PCE and its degradation products, naphthalenes and the trimethylbenzenes that have been detected in groundwater. Once the RI is complete and each potential COC is discussed, Ecology will comment on the final COCs for the Property and the Site.

- Based on the information presented, additional sampling is proposed to address many of the data gaps related to vertical and lateral extent of contamination in soil. Ecology suggests that an additional boring be located near boring P-4 to address the lack of vertical definition of soil impacts at borings B-7, P-1, and P-9. In addition, the extent of contamination west and north of B-6 and north of B-3 has not been defined. Additional borings are advisable to define the lateral extent of contamination in these areas.

- Reports have indicated that a waste oil tank was formerly located with the former gasoline tanks at the northwest portion of the Property. However, sampling is being proposed related to the "former and current waste oil and heating oil USTs" near what is labeled a heating oil tank on the figures (southeast of the garage). Please clarify the status and locations of all current or former waste oil and heating oil tanks at the Property.

- Because the Method B soil cleanup level calculated using the MTCATPH11.1 worksheet tool is for TPH across the TPH ranges, there will be one Method B cleanup level for the Site. This will correspond to the lowest concentration calculated from inputting the proposed EPH/VPH sampling data into the MTCATPH11.1 worksheet. This Method B cleanup level should then be compared to the sum of the TPHg, TPHd, and TPHo concentrations at any given sampling location and depth to determine compliance at the Site. If Method B is used for TPH in soil, Method B cleanup levels will also need to be used for TPH in groundwater.

- According to the Draft ***Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action,*** Ecology Publication No. 09-09-047, October 2009, Tier I soil vapor sample data is needed at all developable areas of the Site. This Tier I sampling is required before indoor air modeling can be done. Therefore, soil vapor data must be collected to establish that soil vapor is not an issue for potential future uses of the Site, including all areas with volatile COCs including TPH and chlorinated solvents in soil and groundwater at the Site.

- Groundwater samples collected at MW-7 and MW-10 have had detections of chlorinated VOCs at concentrations greater than MTCA Method A cleanup levels, and additional characterization will be required to define the extent of chlorinated VOCs in groundwater.

- For a non-potability determination to be made, the yield must be determined to comply with WAC 173-340-720 (2)(b)(i). Ecology recommends conducting a step drawdown test prior to the yield test to estimate the optimum pumping rate for the yield test. Water level measurements should also be collected once a minute during the first 5 to 15 minutes of testing at each proposed rate to ensure a more complete data set. The frequency of data collection and duration of the tests may need to be revised in the field based on actual pumping rates and corresponding drawdown in the pumping well.

  In addition, all of the requirements in WAC 173-340, especially WAC 173-340-720 (2) c (i through vii), need to be met. This includes demonstrating that there is a low likelihood of interconnection between the contaminated groundwater and groundwater that is a current or potential future source of drinking water. Therefore, a deep boring penetrating the aquitard below the perched aquifer will be necessary to show that the aquitard is thick enough to prevent migration of contaminants from the perched aquifer into a deeper aquifer. During drilling of a deep boring, ground water below the aquitard will need to be protected from potential cross contamination by using telescoping casing.

  The yield test should be conducted at a location at the Site with the highest potential yield. The proposed location of MW-12 should be evaluated to make sure that its location will meet this criterion. Ecology recommends performing slug tests in existing wells to decide where to site a new well for the yield test. Alternately, an existing well with the highest apparent hydraulic conductivity based on the slug tests could be used if it fully penetrates the perched aquifer.

  Until a non-potability determination can be made, it is premature to develop a conceptual site model and cleanup levels that are not protective of the drinking water pathway.

- Once the Site has been fully characterized and it is clear whether drinking water is an exposure pathway for the Site, a Remedial Investigation (RI) report that summarizes all previous investigations and shows the nature and extent of contamination in all media must be provided. The RI must provide summaries of the former Site uses that could have resulted in releases, including a history of the use and locations of tanks and service areas. Cross-sections and plan-view graphics are needed to show the relationship of the Site contamination to current and former Site features, parcel boundaries, Site geology, subsurface utilities, and points of compliance. Description and interpretation of geologic and hydrogeologic conditions for and in the vicinity of the Site is needed. Boring logs and test pit logs need to be included with the RI evaluation and appended to the RI.

  Summary tables should include all compounds that have been detected in each media throughout the history of the Site, and the proposed cleanup level for each compound. It would be helpful to have remaining in-situ soil samples and treated soil samples representing re-used backfill on a separate table from over-excavated and stockpile samples. An annotated outline of an RI Report is presented in **Enclosure B** to provide an understanding of Ecology's expectations for conducting and documenting the RI.

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.

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) 649-7257 or at masa461@ecy.wa.gov.

Sincerely,

Maureen Sanchez
Site Manager
Toxics Cleanup Program

Enclosures: Enclosure A: Description and Diagrams of the Site
Enclosure B: Remedial Investigation Outline

cc: Sonia Fernandez, VCP Coordinator, Ecology
Edwin Turner, Conestoga-Rovers & Associates

Enclosure A

Description and Diagrams 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 by TPHg, TPHd, TPHo, and BTEX in soil and ground water, cPAHs in soil, and chlorinated and non-chlorinated VOCs in groundwater. The Site is located at 2800 Martin Luther King Way South in Seattle, WA (Property). The Site is located on King County tax parcel 003600055.

Area and Property Description: The Property occupies approximately 0.25 acres of the southeast corner of the intersection of Martin Luther King Way S and South McClellan Street. Residences and small businesses are located across South McClellan Street, north of the Property, including Mount Baker Cleaners located northeast of the Property. A Lowe's Home Improvement store occupies the northwest corner of the intersection and an operating gasoline service station occupies the southwest corner of the intersection. The Property is bounded on the east by a dental clinic and by a strip mall directly south of the Property, see **Figure 1.**

Site History and Current Use: The Property was used as a service station from 1955 to 1989. From the late 1980s to 2004, various auto repair businesses operated on the Property. The Property was reportedly undeveloped prior to 1955. One 4,000-gallon gasoline UST, one 5,000-gallon gasoline UST, and one 300-gallon waste oil UST formerly located at the northwest portion of the Property were removed in 1989, along with one pump island. In 2005, one 500-gallon heating oil UST, one remaining pump island, and two hydraulic hoists were removed from the Property. Some reports reference a waste oil tank near the former heating oil tank, as well. Locations of current and former Site features are shown on **Figure 2.** The Property is currently the location of an auto detailing business.

Sources of Contamination: The sources of contamination at the Site are the former USTs and associated product piping and dispensers that were removed in 1989 and 2005. The source of the chlorinated solvents detected in groundwater has not been established, but could include historic parts washing in the on-Property garage or the upgradient Mount Baker Cleaners property.

Physiographic Setting: The Property is at an elevation of approximately 65 feet above mean sea level and slopes gently down to the southwest corner of the Property.

Surface/Storm Water System: The nearest surface water body to the Site is Lake Washington located approximately ½-mile to the east. Stormwater from the Site and adjoining properties likely flows to municipal storm drains.

Ecological Setting: Surface cover on the Property is mainly grass, shrubs and a service garage building. There are no parks or other areas of natural habitat adjacent to or near the Site. The Site is paved with asphalt and concrete and is surrounded by roadways and commercial properties. There are less than 1.5 acres of contiguous, undeveloped land on or within 500 feet of any area of the Site.

Geology: According to boring logs, the Property is underlain by approximately 2 to 2 ½ feet of sandy fill material. This fill material is underlain by approximately 15 feet of fine to medium grained sand interbedded with silt and underlain by dense silt and clay to the maximum depth explored, which was 20 feet bgs.

Groundwater: Ground water has been encountered between approximately nine to 13 feet bgs at the Site. Depth to ground water fluctuates seasonally. Wet season depth to ground water averages about 9 to 13 feet bgs and dry season depth to ground water averages 11 to 13 feet bgs. Ground water flows to the southwest (**Figure 3**).

Release and Extent of Contamination: Soil sampled in the vicinity of the former dispenser islands has contained concentrations of TPHg and BTEX greater than MTCA Method A cleanup levels. Soil sampling in the vicinity of the former heating oil UST has contained concentrations of TPHg, TPHd, TPHo, and cPAHs greater than MTCA Method A cleanup levels. Additional soil sampling is needed to define the lateral and vertical extent of contamination in these areas. Additional soil sampling is also needed at the former service garage to determine if releases occurred related to generation and storage of waste oils or to potential parts washing that could contribute to the VOCs detected in Site groundwater.

TPHg, TPHd, naphthalenes, and chlorinated and non-chlorinated VOCs have been detected in groundwater at concentrations greater than MTCA Method A cleanup levels (**Figure 4**). Some of the compounds detected do not have current MTCA Method A cleanup levels and Method B cleanup levels have to be determined. These include 1,2,4-trimethylbenzene (TMB)and 1,3,5-TMB. The source of PCE and its degradation products has not been identified, but may be an on-Property source, or potentially the upgradient Mount Baker Cleaners Site. The extent of chlorinated VOCs has not been determined on the Site downgradient of MW-7 and MW-10.

An ozone treatment system was installed in 2005 to treat ground water contamination near the dispenser islands. In 2006, in-situ oxidation treatment using Fentons reagent was conducted at the Site. Remediation efforts were discontinued in 2007 without confirmation soil or ground water samples collected to determine the effectiveness of the remediation efforts.

Based on the information presented to date, the vertical and lateral extent of COCs and their relationship to the Site geology, former Site features, and the point of compliance is not clear. The additional proposed sampling and analysis should provide useful additional data for characterizing the Site.

The limits of the 1996 excavation, current site features, and 1996 through 2013 sample locations are shown on **Figure 2,** which is included in the Site Diagrams.

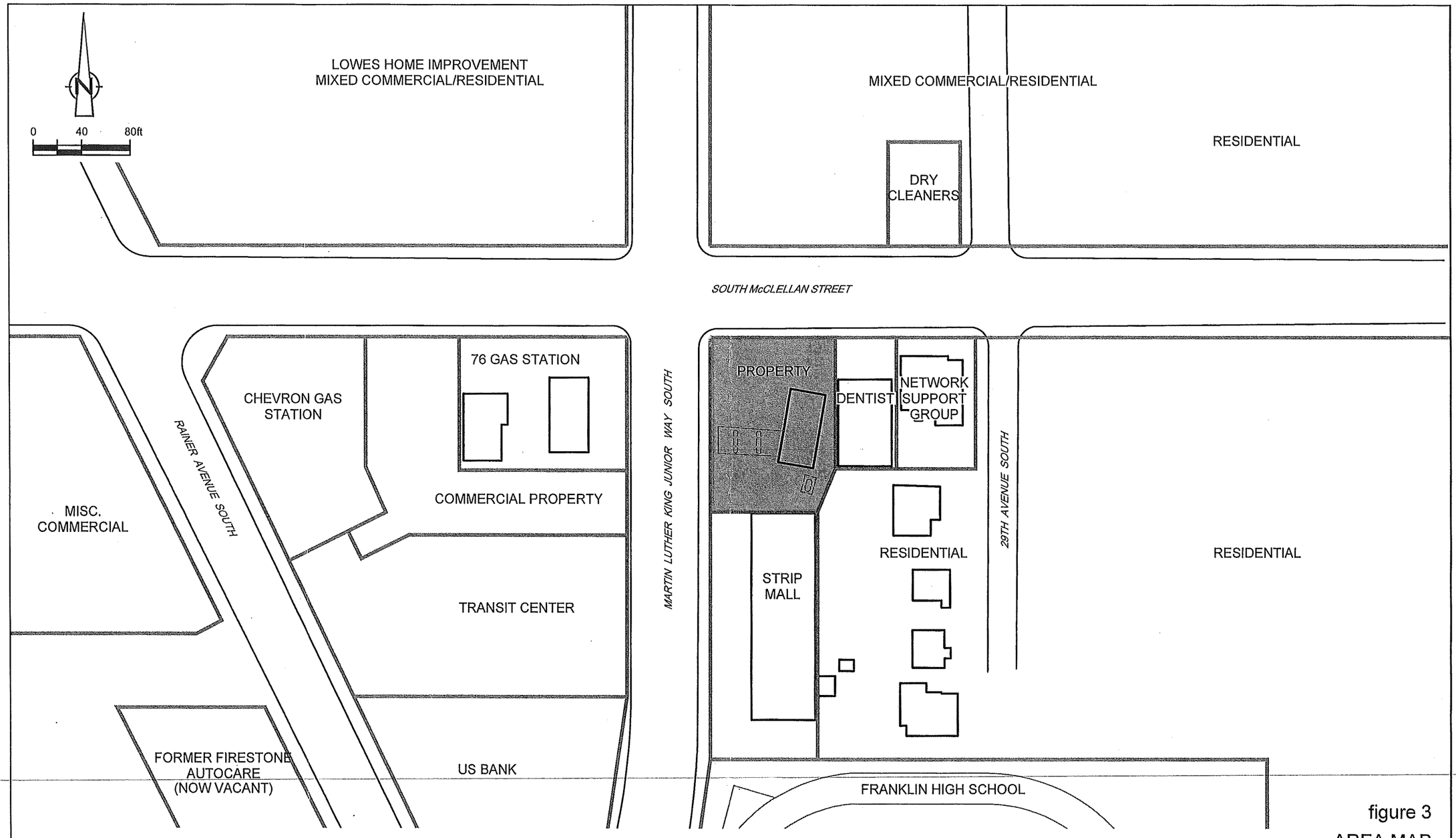
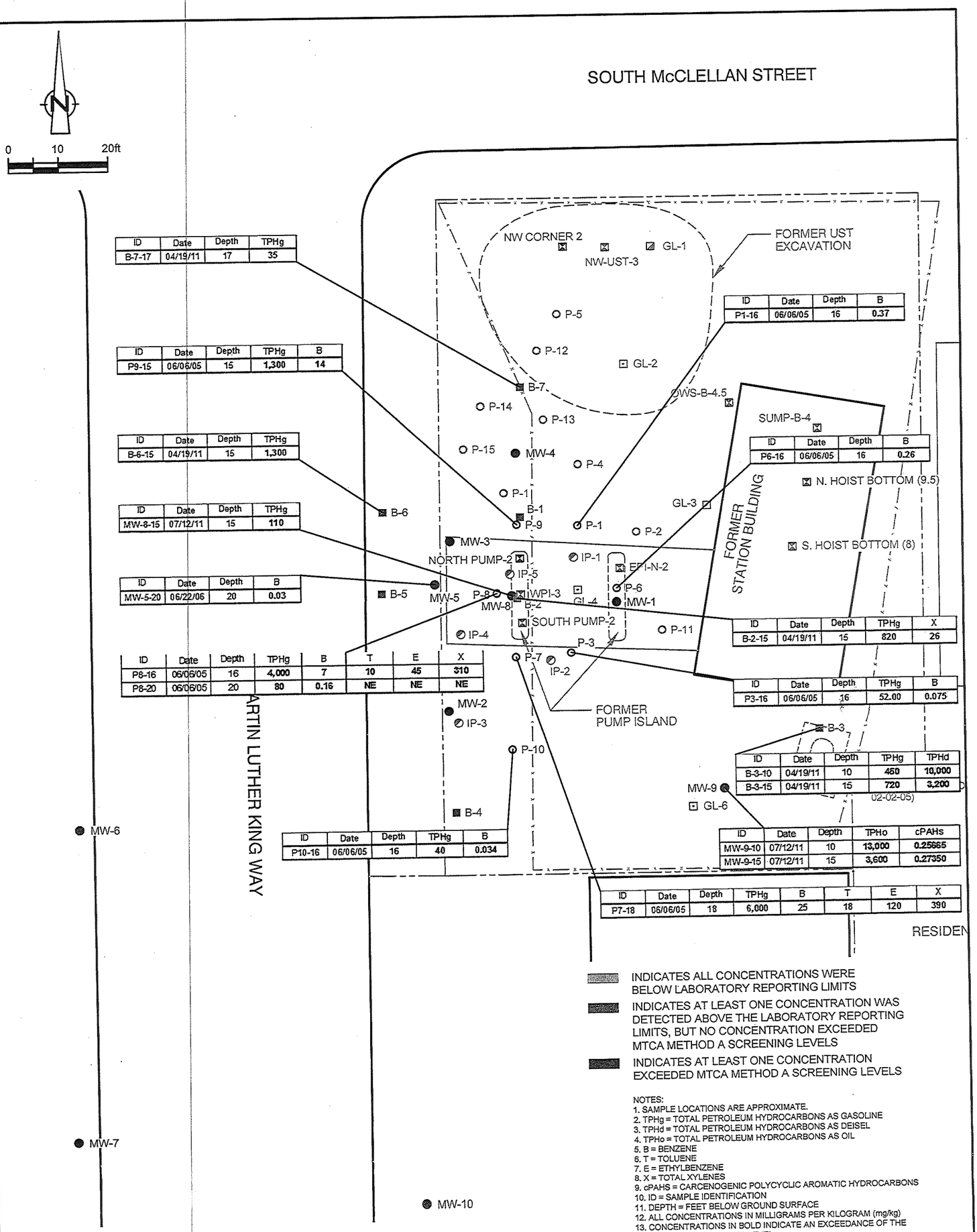


figure 3

AREA MAP
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

61992-2012(004)GN-WA003 OCT 28/2013

Enclosure A Figure 1



ID	Date	Depth	TPHg
B-7-17	04/19/11	17	35

ID	Date	Depth	TPHg	B
P9-15	06/06/05	15	1,300	14

ID	Date	Depth	TPHg
B-6-15	04/19/11	15	1,300

ID	Date	Depth	TPHg
MW-8-15	07/12/11	15	110

ID	Date	Depth	B
MW-5-20	06/22/06	20	0.03

ID	Date	Depth	TPHg	B	T	E	X
P8-16	06/06/05	16	4,000	7	10	45	310
P8-20	06/06/05	20	80	0.16	NE	NE	NE

ID	Date	Depth	TPHg	B
P10-16	06/06/05	16	40	0.034

ID	Date	Depth	B
P1-16	06/06/05	16	0.37

ID	Date	Depth	B
P6-16	06/06/05	16	0.26

ID	Date	Depth	TPHg	X
B-2-15	04/19/11	15	820	26

ID	Date	Depth	TPHg	B
P3-16	06/06/05	16	52.00	0.075

ID	Date	Depth	TPHg	TPHd
B-3-10	04/19/11	10	450	10,000
B-3-15	04/19/11	15	720	3,200

ID	Date	Depth	TPHo	cPAHs
MW-9-10	07/12/11	10	13,000	0.25565
MW-9-15	07/12/11	15	3,600	0.27350

ID	Date	Depth	TPHg	B	T	E	X
P7-18	06/06/05	18	6,000	25	18	120	390

INDICATES ALL CONCENTRATIONS WERE BELOW LABORATORY REPORTING LIMITS

INDICATES AT LEAST ONE CONCENTRATION WAS DETECTED ABOVE THE LABORATORY REPORTING LIMITS, BUT NO CONCENTRATION EXCEEDED MTCA METHOD A SCREENING LEVELS

INDICATES AT LEAST ONE CONCENTRATION EXCEEDED MTCA METHOD A SCREENING LEVELS

NOTES:
1. SAMPLE LOCATIONS ARE APPROXIMATE.
2. TPHg = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
3. TPHd = TOTAL PETROLEUM HYDROCARBONS AS DEISEL
4. TPHo = TOTAL PETROLEUM HYDROCARBONS AS OIL
5. B = BENZENE
6. T = TOLUENE
7. E = ETHYLBENZENE
8. X = TOTAL XYLENES
9. cPAHS = CARCENOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
10. ID = SAMPLE IDENTIFICATION
11. DEPTH = FEET BELOW GROUND SURFACE
12. ALL CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM (mg/kg)
13. CONCENTRATIONS IN BOLD INDICATE AN EXCEEDANCE OF THE MTCA METHOD A CLEANUP LEVEL
14. NE = NO EXCEEDENCES

LEGEND

- MW-1 GROUNDWATER MONITORING WELL
- P-1 PREVIOUS GEOPROBE BORING
- B-4 SOIL BORING
- GL-2 AUGER BORING LOCATION WITH GROUNDWATER SAMPLE
- GL-1 AUGER BORING LOCATION
- IP-1 FORMER INJECTION WELL LOCATION
- B-4 SOIL SAMPLE LOCATION

figure 4

SOIL INVESTIGATION DATA MAP
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

61992-2012(004)GN-WA004 OCT 28/2013

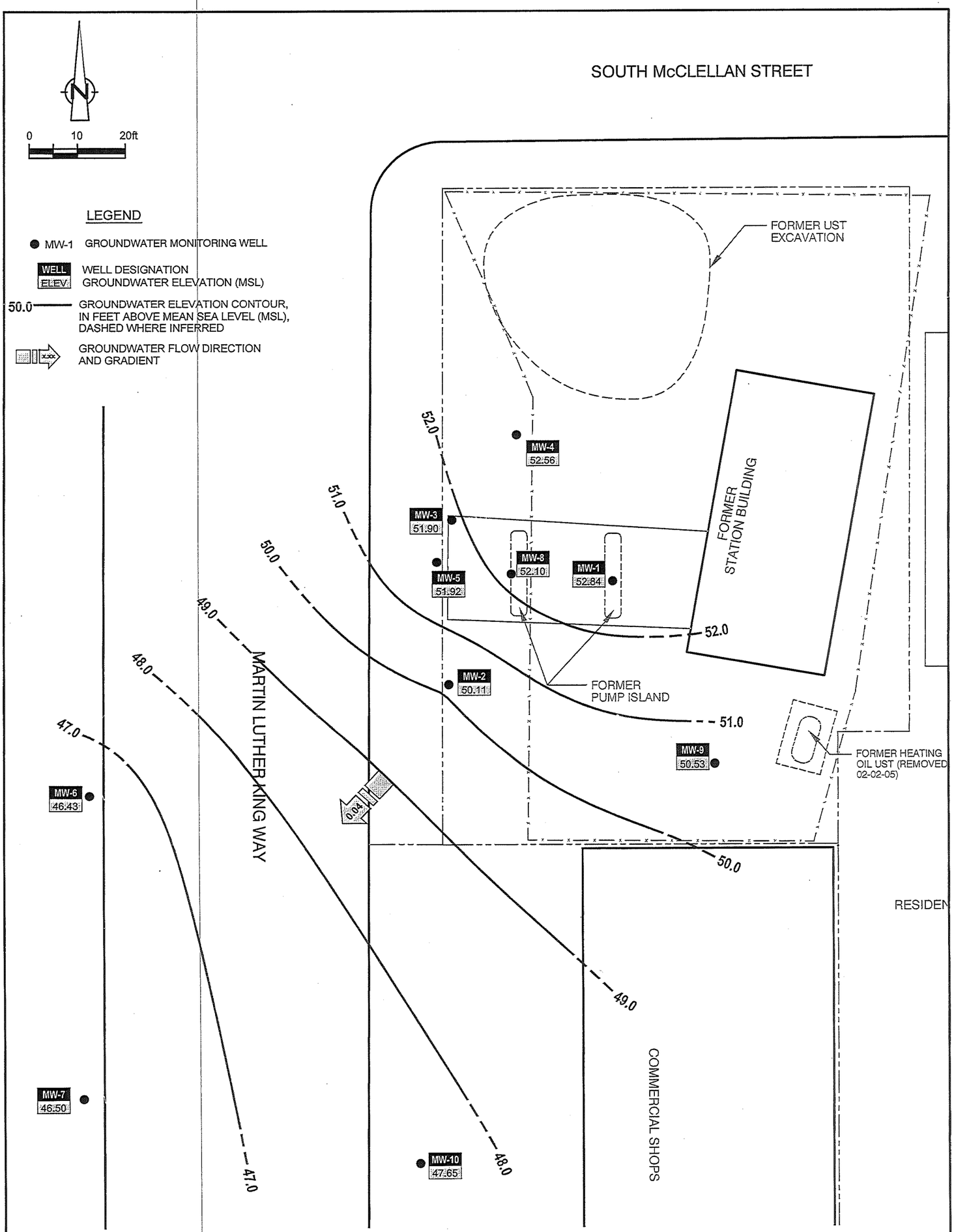


figure 5

GROUNDWATER ELEVATION CONTOUR MAP - NOVEMBER 2012
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

61992-2012(004)GN-WA006 OCT 28/2013

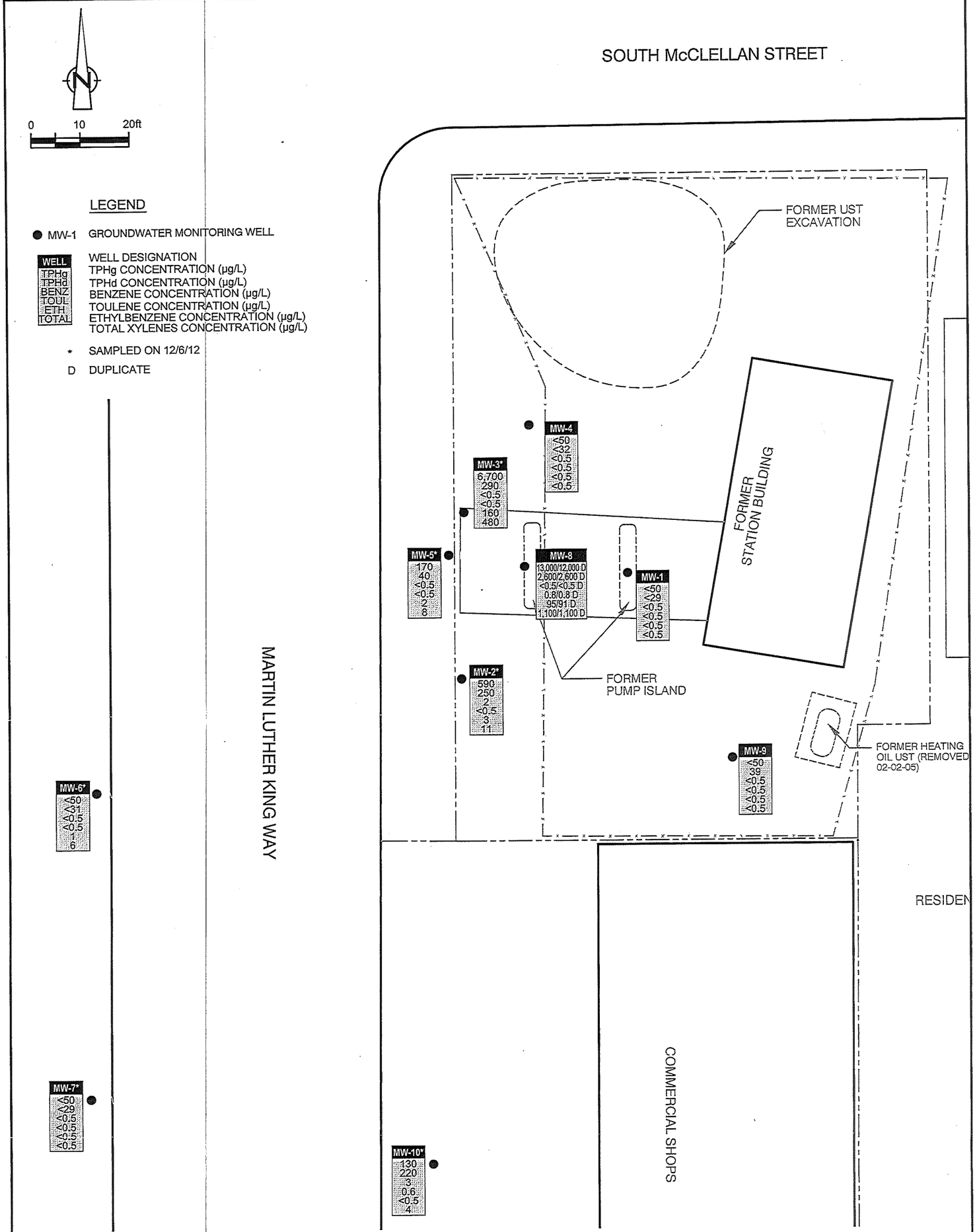


figure 6

GROUNDWATER CONCENTRATION MAP - NOVEMBER 2012
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

61992-2012(004)GN-WA007 OCT 28/2013

Enclosure B

Remedial Investigation Outline

Outline for Remedial Investigation Report
For Discussion Purposes

The following annotated outline is a suggested schematic for elements to be included in a Remedial Investigation report. It is not intended to replace MTCA's specific requirements as presented in 173-340-350(7) WAC.

The main purpose of the outline is to facilitate the preparation of a document that is clear, comprehensive, and to the point. A secondary, but important, purpose for this project is to make document preparation and review more efficient.

INTRODUCTION
(*concise, bulleted if possible*)

- Site name,VCP number, Name, address, and phone number of project consultant, Current owner/operator
- Purpose of document *(very brief restatement of what an RI is for, reference the WAC)*

SITE IDENTIFICATION AND DESCRIPTION
(*focus on defining the site in the context of its' location*)

- Site discovery and regulatory status (*describe how the site was identified and where it is in the MTCA process)*
- Site and property location/definition (*define actual MTCA site location relative to property or study area*)
- Neighborhood setting
- Physiographic setting/topography

Figure – Vicinity Map (*preferably with topography*)
Figure – Property/Site Map (*preferably with topography*)
Appendix – Legal description of property, present owner and operator, chronological listing of past owners and operators

PROPERTY DEVELOPMENT AND HISTORY
(*this section focuses on the built environment, both current and historical, and presents the sources of contamination and release mechanisms*)

- Past site uses and facilities
- Current site use and facilities
- Proposed or potential future site uses
- Zoning (*if appropriate)*
- Transportation/roads
- Utilities, water supply

- Potential sources of site contamination
- Potential sources of contamination from neighboring properties (*discuss nearby sources if known)*

Figure – Historical site features (*may be combined with Figure 2*)
Figure – Potential contaminant sources
Figure – Utilities (*may be combined with Figure 2*)
Table – Potential Contaminants

ENVIRONMENTAL INVESTIGATION/INTERIM ACTION SUMMARY

(Concise summary presentation of the investigations that have been done at the site, along with prior remedial actions. Focused mostly on figures and tables. Details of and methods used in former investigations and remediation in appendices)

- Constituents of Concern (*brief discussion about which specific compounds were chosen for analysis and why)*
- Soil
- Surface water
- Ground water
- Sediment
- Air/soil vapor
- Natural resources/wildlife
- Cultural history/archeology
- Interim actions (*brief intro to prior remediation activities*)

Figure – Soil investigation data points (*show potential source areas*)
Figure – Surface water/groundwater investigation data points (*show potential source areas*)
Figure – Air investigation data points (*show potential source areas*)
Figure – Prior remediation activities

Table – Exploration Summary
Table – Analytical Schedule per media (*include analytical methods and reporting limits, as possible)*

Appendix – Previous Investigations (*detailed discussion goes here)*
Appendix - Exploration and sampling methodology (*may combine with Previous Investigations)*
Appendix – Boring/ Well logs
Appendix - Prior Interim Actions

NATURAL CONDITIONS

- Geology
  (*focus on interpretation*)

  - Regional Setting (*brief*)
  - Property Geologic Conditions (*synthesis, not regurgitation of boring logs*)
  - Physical Properties (*unlikely to need this section, but in some cases may be useful to present data on soil adsorptive capacity, organic content, strength, etc.)*

  Figure – Plan view of geologic unit distribution (*if helpful*)
  Figure - Cross section A-A' (*show borings, wells, screened intervals, water levels*)
  Figure – Cross section B-B' (*if necessary*)

- Surface Water
  (*brief description of the surface water system*)

  - Property drainage
  - Area surface water/floodplain issues
  - Regulatory classifications, if any (*e.g surface water classification)*

  Figure – Surface water Conditions (*only if information not already in a prior figure*)

- Ground Water
  (*focus on interpretation, show on cross-sections*)

  - Occurrence (*aquifers, water levels, confinement, geometry, continuity, physical properties*)
  - Movement (*directions, gradient if important, seasonal fluctuations, tidal influence*)
  - Discharge
  - Recharge (*if significant for site*)
  - Regulatory classifications, if any (*e.g. sole source aquifer*)

  Figure – Cross section with ground water information (*if not already included above*)
  Figure – Water table/potentiometric surface maps (*for various seasons or tidal conditions, show surface water*)

  Appendix – Ground water elevation data (*a table)*

- Natural Resources and Ecological Receptors
  (*preparatory to a TEE*)

  - Greenbelts and other natural habitat
  - Wildlife
  - Other Information required to conduct evaluations under -7491, -7492, or if necessary -

7493

Figure – showing natural areas, as appropriate

CONTAMINANT OCCURRENCE AND MOVEMENT

(*brief text, mostly figures and tables, main point is to provide easy-to-understand figures showing the depth and breadth of contamination*)

- Waste Material (*sludges, fluids, stockpiles)*
- Soil
- Surface Water
- Ground Water
- Sediment
- Air/Soil Vapor

Figures – Cross sections showing soil contamination with depth
Figures – Plan views showing soil contamination across site (*relative to releases if known*)
Figures – Cross section showing ground water contamination with depth (*if appropriate*)
Figures – Plan views showing ground water contamination in each aquifer (*relative to soil contamination and P-head map*)
Figures – XY plots of specific contaminants with time (*as appropriate*)
Figures – Others as appropriate to show the distribution of surface water, ground water, or air data

Tables – All of the analytical data against final cleanup levels (*exceedances highlighted, no need to develop screening levels*)
Tables – Summary of exceedances (*if helpful*)

Appendix – QA report
Appendix – Analytical lab reports

CONCEPTUAL MODEL

(*putting the whole story together, graphic illustrations are best*)

- Contaminant release/fate and transport/potential or actual receptors
- Data gaps (*is anything missing)*

CLEANUP STANDARDS

(*developing appropriate cleanup standards based on receptors and pathways*)

- Soil
  - Reasonable maximum exposure
  - Cleanup levels protective of contact, ground water, inhalation, terrestrial species, surface water, sediment
  - Points of compliance