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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Southwest Region Office
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December 14, 2023

Sara Abdelrahman
Kite Realty Group/KRG Lakewood LLC
30 S. Meridian Street; Suite 1100
Indianapolis, IN 46204
sabdelrahmaniftner@kiterealty.com

Re: Technical Assistance on the Proposed Cleanup at a Site:

- **Site Name:** Lakewood Towne Center
- **Site Address:** 6020-6030 Main St SW, Lakewood, WA 98499
- **Facility/Site ID:** 7922231
- **Cleanup Site ID:** 421
- **VCP Project ID:** SW1801

Dear Sara Abdelrahman:

The Washington State Department of Ecology (Ecology) received your recent Workplan and request for an opinion on proposed continued investigation of the Lakewood Towne Center Property (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA),[1] chapter 70A.305 Revised Code of Washington (RCW).[2]

Issue Presented and Opinion

Ecology is responding to your request on the adequacy of the scope of work proposed in the current workplan[3]. The SOW is being proposed to further assess the nature and extent of

1. [1] https://fortress.wa.gov/ecy/publications/SummaryPages/9406.html
2. [2] https://app.leg.wa.gov/RCW/default.aspx?cite=70A.305
3. [3] Workplan; Additional Monitoring Well Installation and Groundwater Treatment-Lakewood Towne Center; Herrera Environmental Consultants, Inc.; October 16, 2023.

halogenated volatile organic compound (HVOC) contamination in soil and groundwater and to develop a preferred cleanup alternative more fully for the Property that meets MTCA requirements. Upon our review of the Workplan, Ecology has the following comments**.**

This opinion is based on an analysis of whether the existing and proposed work meets the substantive requirements of MTCA, Chapter 70A.305 RCW, and its implementing regulations, Washington Administrative Code (WAC) Chapter 173-340 (collectively "substantive requirements of MTCA"). The analysis is provided below.

Basis for the Opinion

This opinion is based on the information contained in the documents listed in Enclosure A.

These documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. Information on obtaining those records can be found on Ecology's public records requests web page.[4] Some site documents may be available on Ecology's Cleanup Site Search web page.[5]

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

Opinion

1. Characterization of the Site.

Site Investigation Summary

Previous site investigations and groundwater monitoring within the northwest portion of the Lakewood Towne Center (Site) indicate a dry cleaner solvent, perchloroethylene (PCE) and its breakdown products (aka daughter products) trichloroethylene (TCE), cis-1,2-dichloroethene (cDCE), and vinyl chloride (VC) and several related halogenated volatile organic compounds (HVOCs), were detected in groundwater across the Site.

The extent of HVOC in groundwater across the Mall property was initially evaluated during an August 2000 Hydropunch Investigation (HI) conducted by Impact Environmental. Thirty-four

4. [4] https://ecology.wa.gov/Footer/Public-records-requests
5. [5] https://apps.ecology.wa.gov/cleanupsearch/site/3420

hydropunch locations were drilled and the subsequent groundwater sample results indicated the presence of HVOC in groundwater across the northern portion of the Site. While the groundwater HVOC concentrations were generally below the respective MTCA CULs across the HI network, the results from sample P-12 indicated the presence of an HVOC hotspot where concentrations exceeded the CULs. This location is coincident with the location of the former Plaza Dry Cleaners.

During May-September 2000, a Phase II Environmental Site Assessment was conducted by Herrera Environmental Consultants, including two subsequent follow-up site investigations. A total of 34 direct-push borings were drilled with collection of both soil and groundwater samples and 7 groundwater monitoring wells were installed (Figure 1). Soil and groundwater samples collected from 4 of the direct-push borings (P18 through P21) identified a source area of dry-cleaning solvent in the septic and drain field system at the former Plaza Cleaners that operated from 1968-1987 and was situated south of the existing mall building at 5815 Lakewood Towne Center Boulevard.

The wells were installed at the following locations and are illustrated on Figure 2:

- MW-1S (shallow depth), MW-1M (medium depth), and MW-1D (deep) in the source area;
- MW-2D (deep) upgradient of the source area;
- MW-3 (shallow) at the northwest corner of the former mall complex, approximately 1,300 feet downgradient of the source area;
- MW-4 (shallow) immediately downgradient of the source area; and
- MW-5 (shallow) immediately downgradient of the source area.

The groundwater sample results from these wells indicated PCE and its biodegradation by-products exceeded MTCA CULs in groundwater across a lateral area approximately 150 feet by 250 feet and appeared to be vertically limited to upper portion the water table. Further, PCE concentrations were detected in groundwater below the MTCA Method A CUL downgradient of the north-central portion at well MW-3 which was installed coincident with the location of a second former dry cleaner, Villa One-Hour Cleaners, which operated within Suite O of the existing Mall building at 6111 Lakewood Towne Center Boulevard from 1992 until late February 2003. However, based on additional soil and groundwater HVOC sample results below the MTCA Method A CULs that resulted from 2 subsequent limited site investigations within the former Villa Cleaners area conducted by Herrera in Spring 2002[6] and May 2003[7], it was concluded that HVOC

6. [6] Herrera Environmental Consultants, Inc., Limited Phase II Site Investigation and Ground Water Quarterly Status Report – Lakewood Towne Center; June 27, 2002.
7. [7] Herrera Environmental Consultants, Inc., Limited Phase II Site Investigation – Villa One-Hour Cleaners at Lakewood Towne Center; July 1, 2003.

detected in soil were restricted to the vadose zone well above the capillary fringe. Based on that conclusion and the HVOC results from groundwater samples between MW-3 (0.72 µg/L PCE) and the former direct-push groundwater samples P-16 (0.27 µg/L PCE), P-24 (0.24 µg/L PCE), P-25 (0.78 ug/L PCE), and P-27 (0.39 µg/L PCE), it was further theorized that HVOC groundwater impacts at and around well MW-3 potentially originated from upgradient at the original identified Plaza Cleaners source area near well MW-1S.

Since 2021, groundwater monitoring has shown a decreasing trend in contaminant concentrations at the six existing wells at the site. Concentrations of nearly all HVOC chemicals of concern (COCs) except VC have dropped below their respective Model Toxics Control Act (MTCA) cleanup levels (CULs).

During 2021 and 2022, the VC concentrations detected in groundwater in monitoring well MW-1S exceeded the MTCA Method A CUL. Although VC concentrations have been decreasing since 2004, Herrera's general conclusion is that a decreasing trend of PCE in all six wells indicates biodegradation is ongoing, and concentrations of nearly all HVOCs except vinyl chloride have dropped below the respective MTCA Method A or B CULs.

Herrera developed the current Workplan to i.) describe additional investigation activities planned to further characterize the nature and extent of residual HVOC in groundwater, and ii.) propose groundwater treatment via in-situ chemical oxidation (ISCO) in wells MW-1s, MW-1m, and MW-1d to reduce the HVOC concentrations in groundwater below the respective MTCA CULs. This remedial action would be followed by resampling of the on-site wells approximately 1 year after the ISCO treatment to assess whether HVOC concentrations are below the CULs. If so, this would be followed by three additional quarterly ground water monitoring events to provide a minimum of four consecutive quarters of monitoring data compliant with cleanup levels in order for Ecology to consider a No Further Action.

Site Topography/Hydrogeology

The Lakewood Mall property and vicinity has a poorly developed surface drainage system, due to high infiltration capacity of the gravelly soil and the level topography. Based on historical information, the mall was developed on a marsh that had occupied the east-central portion of

the property[8]. A layer of peat reportedly exists beneath the Site based on information gathered during the mall development.

Prior to development of the mall in 1957, the marsh drained into Ponce de Leon Creek to the west, which eventually drains into Lake Steilacoom located 0.5 miles west of the mall property. The marsh and creek were diverted and tightlined into a stormwater drainage system beneath the property during the development of Villa Plaza shopping center and later the Lakewood Mall II complex, which continues to discharge into Ponce de Leon Creek (Natansky 2000).

During the previous Phase II Site Investigations (SI) conducted by Herrera, groundwater appeared to seep into the stormwater drainage system, based on observations of running water in some of the drains and water levels measured in nearby probe borings. Groundwater also was observed seeping in an open-bottom storm drain/catch basin located in the far eastern portion of the site. No other continuously flowing streams or surface water channels in or out of the mall property and surrounding area were observed during Phase II investigations.

Area aquifers are recharged primarily by precipitation, with an average annual precipitation of approximately 38 inches. Further, the Site is also located within two wellhead protection areas.

The water-bearing zone at the Site is located within the Steilacoom gravel unit, confined by the consolidated Vashon till layer beneath it. Monitoring wells across the northwest portion of the site have well screen that tap the upper (shallow), middle (medium), and deeper (deep) portions of the water- bearing zone. Shallow wells are screened in the top portion of the water bearing zone at approximately 2.5 feet bgs, medium wells are screened in the middle 7.5 to 12 feet of the water-bearing zone, and the deep wells are screened in the bottom 32 to 46 feet of the water-bearing zone.

Groundwater at the site is encountered from approximately 11.6 feet bgs at the eastern portion of the Site in MW-2M to 18.1 feet bgs at the western portion of the Site in MW-3. In general, groundwater flows to the west/west-northwest and west southwest across the northwestern portion of the site. The hydraulic gradient ranges from approximately 0.0011 to 0.0017 feet per feet across the site.

8. [8] Natansky, Tony (Operations/Property Manager for Lakewood Mall). In-person interview and site visit with Diana Phelan/Herrera; April 2000

2. Ecology Comments

General. At independent cleanup sites, interim actions can be implemented at any time consistent with WAC 173-340-430.

***a*. Proposed Monitoring Well Network Locations.** Per the technical assistance provided via my 4/14/23 email to George Iftner/Herrera and recommendations for additional wells, Ecology concurs with the proposed locations and depths of the additional monitoring wells in the workplan. Of note and in addition to the direct-push groundwater data from August 2000[9], Ecology also recommends that groundwater be assessed north and northeast of the former Plaza Cleaners building to assess further migration of dry-cleaning solvent through vadose zone soil to groundwater in those directions. This would be especially relevant with respect to the location of the adjacent building at 5815 Lakewood Towne Center Boulevard and potential Tier 1 and Tier 2 vapor intrusion concerns under Ecology's Soil Vapor Intrusion Guidance[10].

***b.* HVOC Degradation at the Site.** While dehydrohalogenation of HVOC may be occurring at the Site and is encouraging based on the presence of PCE daughter products, Ecology does not concur that abiotic (due to ISCO) and biotic (due to nutrients) degradation may be the sole cause of lessening HVOC concentrations. Decreases in HVOC groundwater concentrations may also be more likely due to dilution due to plume dispersion and downgradient migration. Further, claims of active HVOC degradation that would facilitate and support a monitored natural attenuation (MNA) remedy should be substantiated through analytical means. Typical parameters that should be monitored for MNA applications and/or to assess remedial action options include ammonia, total organic carbon (TOC), biological oxygen demand [BOD], total and dissolved iron and manganese, ferrous iron [Fe (III)], nitrate, nitrite, sulfate, and dissolved methane, ethane, ethene, and acetylene. Further, if MNA is to be considered as a selected remedy, please specify the subset of the well network that will be used to evaluate the remedy.

In addition, vapor intrusion may be a concern at the Site and as such, the MTCA Method A CUL for TCE may not be restrictive enough. Alternatively, the MTCA Method B CUL for TCE in groundwater that would be protective of vapor intrusion is 1.4 ug/L.

***c*. Villa One-Hour Cleaners/MW-3.** Based on the direct-push groundwater data that indicated PCE concentrations below the MTCA Method A CUL and within the same order of magnitude

9. [9] Independent Action Notification Regarding the Lakewood Mall; Impact Environmental, Inc.; August 25, 2000.
10. [10] Ecology; Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action; Revised April 2018.

across the northern portion of the Site, Ecology concurs that previously identified HVOC impacts to shallow soil are most likely not the cause of the low level HVOC impact to groundwater at the MW-3 location. However, given the difficulty of accessing sub-slab vadose zone soil within the former Villa Cleaners footprint and to further assess the presence of potential soil hotspots of HVOC, Ecology recommends that contemporaneous Tier 2 sub-slab and indoor air samples be collected within the former Villa Cleaners suite for the respective analytes under EPA Method TO-15.

d. Proposed In-Situ Chemical Oxidation (ISCO) Groundwater Remediation. Pending obtaining proper UIC permits, Ecology concurs that ISCO, and nutrients would represent a proven remedial technology to facilitate further interim abiotic/biotic remedial reduction of VC at the site. Of note, interim actions at independent cleanup sites can be implemented at any time consistent with WAC 173-340-430.

Further, when injection of groundwater amendments/reagent is needed to remediate a source zone that covers multiple properties and rights-of-way (ROW), said injection should be coordinated with any UIC conditional rule authorization relative to said amendments/reagents. Depending on any conditions imposed by the UIC registration, though important to meet the groundwater non endangerment standards, it should be allowable at this Site to permit reagent exceeding the property boundaries. This is not necessarily true for all cleanup sites but given the remedial location of the injections and remedial goals for this Site, the reagents will have to be able to enter the right-of-way in order to remediate contaminated groundwater. The UIC registration may impose a time limit on when the injections can occur, so we encourage completion of the interim action as soon as possible after UIC registration.

With respect to the injection solutions, please clarify what source of water will be used (if not pre-mixed) and how will the reagents be mixed? Ecology also requests information on the injection pressure (if any)? In addition, how will daylighting and upwelling be monitored for and/or controlled? Also, how was the 6-month monitoring period selected for assessing the potential for concentration rebounding and what criteria will additional contingency injections be based upon?

Limitations of the Technical Assistance

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 70A.305.040(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 a party performs is substantially equivalent. Courts make that determination. *See* RCW 70A.305.080 and WAC 173-340-545.

3. **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 70A.305.170(6).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. 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 Voluntary Cleanup Program web site.[11] If you have any questions about this opinion, please contact me at (360) 489-5347 or joe.hunt@ecy.wa.gov.

Sincerely,

Joseph B. Hunt, LHG
Toxics Cleanup Program
Southwest Regional Office

JH:at

Enclosures (2): A – Documents

cc: George Iftner, Herrera Environmental Consultants, Inc. giftner@herrerainc.com
Jerome Lambiotte, Ecology, jerome.lambiotte@ecy.wa.gov
Ecology Site File

11. [11] https://www.ecy.wa.gov/vcp

Enclosure A

Documents

1. Workplan; Additional Monitoring Well Installation and Groundwater Treatment-Lakewood Towne Center; Herrera Environmental Consultants, Inc.; October 16, 2023.

2. Scope of Work – Lakewood Towne Center 2023-2024 Ground Water Treatment and Monitoring, Herrera Environmental Consultants Inc., November 29, 2022.

3. August 2021 Ground Water Quality Status Report – Lakewood Towne Center, Herrera Environmental Consultants, Inc., August 19, 2021.

4. Phase I Environmental Site Assessment Report – Lakewood Towne Center South; Partner Engineering and Science, Inc.; June 6, 2019.

5. Transformer Mineral Oil Spill Letter – 5811 Main Street SE, Lakewood, WA; Tacoma Power; September 11, 2013.

6. Phase I Environmental Site Assessment – Lakewood Towne Center; SLA; October 2, 2006.

7. Notification of Pending Inactive Determination Status Dated 4/07/06; MBK Northwest LLC; April 20, 2006.

8. Quarterly Groundwater Monitoring Update – Lakewood Towne Center; Brown and Caldwell; July 14, 2004.

9. Quarterly Groundwater Monitoring Update – Lakewood Towne Center; Brown and Caldwell; April 19, 2004.

10. Fourth Quarter 2002 Groundwater Monitoring Update – Lakewood Towne Center; Herrera Environmental Consultants, Inc.; January 22, 2004.

11. Ground Water Quarterly Status Report – Lakewood Towne Center; Herrera Environmental Consultants, Inc.; September 23, 2003.

12. Limited Phase II Site Investigation – Villa One-Hour Cleaners at Lakewood Towne Center; Herrera Environmental Consultants, Inc.; July 1, 2003.

13. Ground Water Quarterly Status Report – Lakewood Towne Center; Herrera Environmental Consultants, Inc.; April 4, 2003.

14. Ground Water Annual Summary Report – Lakewood Towne Center; Herrera Environmental Consultants, Inc.; January 23, 2003.

15. Ground Water Monitoring Annual Summary Report – Lakewood Mall; Herrera Environmental Consultants, Inc.; January 3, 2002.

16. Letter to Ecology regarding August 25, 2000, Independent Action Notification Regarding the Lakewood Mall; Perkins Coie LLP; July 2, 2001.

17. Ground Water Quarterly Status Report – Lakewood Mall I & II; Herrera Environmental Consultants, Inc.; June 26, 2001.

(a) Independent Action Notification Regarding the Lakewood Mall; Impact Environmental, Inc.; August 25, 2000.