TECHNICAL MEMORANDUM

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ENVIRONMENTAL | GEOTECHNICAL | NATURAL RESOURCES

TO: Mohsen Kourehdar, P.E., Washington State Department of Ecology

cc: Don Bache, Port of Olympia

FROM: Lawrence D. Beard, P.E., L.G., and Christine Kimmel, L.G. CBK

DATE: July 22, 2009

RE: SUPPLEMENTAL SOIL INVESTIGATION REPORT
HOLBROOK/KGY AREA
PORT OF OLYMPIA
OLYMPIA, WASHINGTON

This technical memorandum presents the results of the supplemental soil investigation at the Holbrook/KGY Area, which is located immediately west of the former Cascade Pole Company (CPC) site in Olympia, Washington. The Holbrook/KGY Area is adjacent to the northwest corner of the CPC site; this portion of the CPC site was historically used for log storage during CPC operation.

The purpose of this supplemental investigation is to further evaluate a portion of the Holbrook/KGY Area where elevated carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were observed during a previous investigation. In April 2007, a shallow soil investigation was conducted by collecting two soil samples from six locations and analyzing for cPAHs. The results of the investigation indicated all results were below the total cPAH screening level of 137 micrograms per kilogram (µg/kg). However, one sample from sampling location HK-1 reported a total cPAH concentration of 102 µg/kg (Landau Associates 2007). The sample locations and previous investigation results are shown on Figure 1. Ecology requested that the Port of Olympia (Port) collect a soil sample from the location of the highest cPAH concentration and test the sample for dioxins/furans to confirm that the Model Toxics Control Act (MTCA) Method B cleanup level for unrestricted use is not exceeded within the Holbrook/KGY Area.

SAMPLE LOCATION AND ANALYSIS

The supplemental investigation was conducted on May 7, 2009 and consisted of collecting two shallow soil samples from one location (HK-7) in the Holbrook/KGY Area. The sampling location was in the direct vicinity of the previous investigation sampling location HK-1 (in the northeast portion of the Holbrook/KGY Area), as shown on Figure 2. Two samples were collected, the upper sample represented the upper 1-ft interval and the second sample represented the 1- to 2-ft interval.

Sample collection activities were conducted in accordance with the procedures described in the Washington State Department of Ecology (Ecology)-approved work plan (Landau Associates 2009). The HK-7 location was hand-excavated to 2 ft BGS using a decontaminated shovel. Upon completing the hand exploration to 2 ft below ground surface (BGS), the hole was cleared of excavated soil. The first sample was collected by scraping the upper 1-ft interval side wall with a decontaminated stainless-steel spoon, and the soil was mixed resulting in a homogeneous sample. The same procedure was used for the second sample collected from the 1- to 2- ft interval. Upon completion of the sample collection, the location was backfilled with excavated soil and marked for a locational survey.

The two soil sample HK-7 (0-1) and HK-7(1-2) were stored in a cooler at 4°C and hand delivered to Analytical Resources Inc., located in Tukwila, Washington and subcontracted to SGS Laboratories. Based on the cPAH results of the previous investigation, the upper sample of this supplemental investigation was archived and the lower sample [HK-7(1-2)] was analyzed for dioxin and furans using U.S. Environmental Protection Agency (EPA) Method 8290. The work plan indicated that if the results from the second sample interval exceeded the dioxin Method B soil cleanup level for unrestricted use [11 nanograms per kilogram (ng/kg)], then the sample from the upper interval would be removed from archive and analyzed.

ANALYTICAL RESULTS

Analytical results for the HK-7(1-2) soil sample are presented in Table 1 and are shown on Figure 2. The laboratory report is provided in Attachment 1.

Soil analytical results were evaluated against the MTCA Method B cleanup level for unrestricted site use. To evaluate the analytical data for dioxins and furans, the toxicity equivalency quotients (TEQ) of individual dioxin/furans were calculated and summed for comparison to 2,3,7,8-TCDD congener. Analytical results for the second interval sample indicate a dioxin TEQ concentration of 8.71 ng/kg, which is below the dioxin Method B soil cleanup level of 11 ng/kg. Based on these results, the sample collected from the upper 1 ft was not analyzed.

CONCLUSIONS

The Holbrook/KGY Area does not have dioxin concentrations indicative of impacts by historical activities on the CPC site. Although a low-level concentration of dioxins/furans was observed, the soil sample did not exhibit dioxin/furan concentrations exceeding the MTCA Method B cleanup level for unrestricted site use.

It should be noted that the analytical method used for dioxin/furan testing achieves extremely low reporting limits, and dioxins/furans are typically detected at low concentrations in most soil samples collected from urban areas. In our opinion, the dioxin/furan concentration detected in the soil sample collected from the Holbrook/KGY area is consistent with anthropogenic background concentrations in urban areas and is not consistent with a historic release from the CPC site or other specific sources.

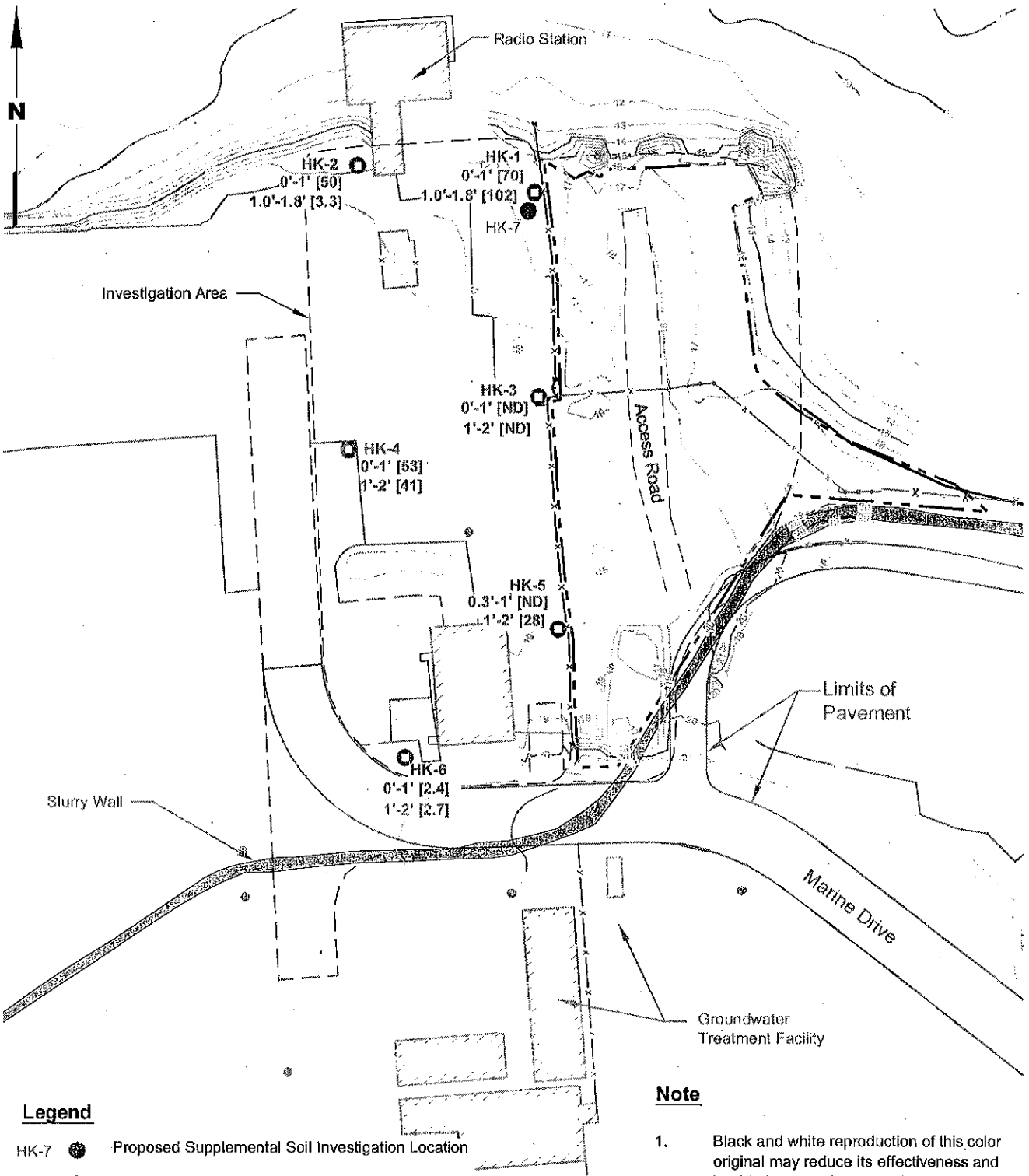
USE OF REPORT

This technical memorandum was prepared for the exclusive use of the Port of Olympia for specific application to the Holbrook/KGY Area at the Cascade Pole Site. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of the Port and Landau Associates. The reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

REFERENCES

Landau Associates. 2009. Technical Memorandum re: *Supplemental Soil Investigation Work Plan, Holbrook/KGY Area, Port of Olympia, Olympia, Washington.* May 5.

Landau Associates. 2007. Technical Memorandum to Mohen Kourehdar, Washington State Department of Ecology, re: *Supplemental Soil Investigation Report, North Point/Phase IV Capping Area, Cascade Pole Site, Olympia, Washington.* February 5.



Legend

HK-7 — Proposed Supplemental Soil Investigation Location

HK-1 — Former Holbrook/KGY Investigation Location

[23.8] — Former Investigation Soil Results CPAH Concentration In µg/kg

— — — Approximate Limits of Subject Property

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 80 160

Scale in Feet

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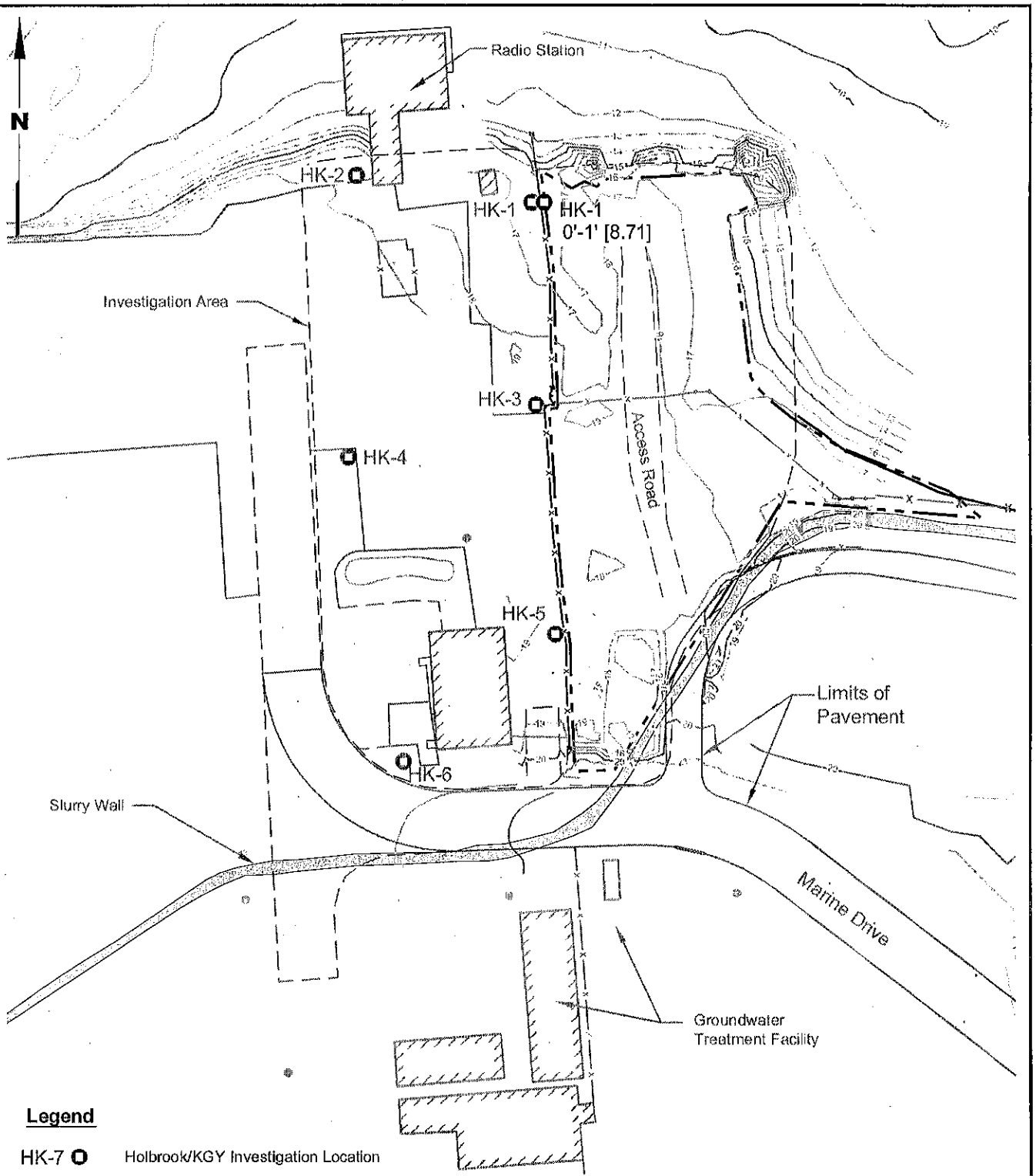
Holbrook/KGY Site Olympia, Washington	**Sampling Location Map**	Figure 1

Cascade Pole/North Point/Phase IV Compliance Monitoring | V:\021\035\010\011\Results of Investigation 07-02-09\Fig1.dwg (A) "Figure 1" 7/7/2009



Cascade Pole/North Point/Phase IV Compliance Monitoring | V:\021\035\010\011\Results of Investigation 07-02-09\Fig2 results.dwg (A) "Figure 2" 7/7/2009

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Cascade Pole Site Olympia, Washington	**Results of Investigations**	Figure 2

TABLE 1
SOIL ANALYTICAL RESULTS
PORT OF OLYMPIA

	MTCA Method B (a)	HK-7 (1-2) G1040-8-1B 5/7/2009
DIOXINS/FURANS (pg/g)		
Method 8290		
2,3,7,8-TCDD		**0.488**
1,2,3,7,8-PeCDD		1.37 U
1,2,3,4,7,8-HxCDD		**5.80**
1,2,3,6,7,8-HxCDD		**8.00**
1,2,3,7,8,9-HxCDD		**5.30**
1,2,3,4,6,7,8-HpCDD		**386**
OCDD		**3860**
2,3,7,8-TCDF		**1.62**
1,2,3,7,8-PeCDF		0.774 U
2,3,4,7,8-PeCDF		1.23 U
1,2,3,4,7,8-HxCDF		**1.45**
1,2,3,6,7,8-HxCDF		0.737 U
2,3,4,6,7,8-HxCDF		1.11 U
1,2,3,7,8,9-HxCDF		0.83 U
1,2,3,4,6,7,8-HpCDF		**24.1**
1,2,3,4,7,8,9-HpCDF		**1.70**
OCDF		**163**
Total TCDDs		**5.99**
Total PeCDDs		**8.72**
Total HxCDDs		**79.8**
Total HpCDDs		**1110**
Total TCDFs		**8.79**
Total PeCDFs		**5.77**
Total HxCDFs		**18.8**
Total HpCDFs		**119**
TEQ - DIOXINS/FURANS (b)	11	**8.71**

U = Compound not detected above method reporting limit

(a) Model Toxics Control Act (MTCA) regulations (WAC 173-340) Method B.
(b) Total equivalency quotient (TEQ) of individual dioxin and furran congeners calculated and compared to 2,3,7,8-TCDD.