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June 12, 2025

Cascade Yard Owner, LLC
C/O Urban Renaissance Property Company, LLC
3245 146th Place Southeast, Suite 100
Bellevue, Washington 98007

Attn: Mr. Craig Glazier

And

Northwest Regional Office
Washington State Department of Ecology
15700 Dayton Ave North
Shoreline, Washington 98133

Attn: Ms. Jing Song

Re: Disproportionate Cost Analysis Memorandum
Cascade Yard (Lincoln Executive Center)
3380 146th Place Southeast
Bellevue, King County, Washington 98007
Terracon Project No. 81207056
CSID: 5531
FSID: 11731557
VCP Project No. NW3289

Dear Mr. Glazier and Ms. Song:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Disproportionate Cost Analysis (DCA) memorandum for the above referenced Property, as a supplement to our *Remedial Investigation (RI) Data Gap Assessment and Feasibility Study (FS) Report* dated December 10, 2020. This DCA is submitted for your review and opinion under Washington State Department of Ecology's (Ecology) Voluntary Cleanup Program (VCP) project number NW3289 under the Toxics Cleanup Program of Ecology.

This memorandum has been prepared to address Ecology's request for a DCA for the site using Ecology's *Draft Guidance for Determining if a Cleanup Action uses Permanent Solutions to the Maximum Extent Practicable using Disproportionate Cost Analysis*, dated February 2025, and is intended to be used in conjunction with Terracon's RI/FS and

Terracon's *Groundwater Monitoring Report*, dated March 12, 2025, both of which have been provided to Ecology for review.

During Terracon's recent groundwater sampling activities, as summarized in Terracon's Groundwater Monitoring Report, contaminants of concern (COCs) were detected in groundwater samples collected at the site above the Model Toxics Control Act (MTCA) Method A Cleanup Levels (CULs). Specifically, total petroleum hydrocarbons (TPH), petroleum-related volatile organic compounds (VOCs), and vinyl chloride (VC) were detected above MTCA CULs. The following DCA is based on the results of the recent groundwater monitoring conducted at the site and remaining soil-impacts identified in Terracon's RI/FS.

Terracon evaluated the following remedial alternatives as a part of the RI/FS to address the remaining petroleum- and VC-related impacts to soil and groundwater at the Property. This evaluation is based upon Terracon's past experience, best professional judgment, and the application of scientific principles to the known and available data. The remedial alternatives are based on the response actions and technologies screened in Terracon's RI/FS.

Three remedial alternatives were evaluated as part of this DCA and include the following:

- Alternative 1: In-Situ Chemical Treatment with Institutional Controls
- Alternative 2: Electric Resistance Heating and Vapor Extraction
- Alternative 3: Remedial Excavation with Remedial Amendment Application and Institutional Controls

Alternative 1 consists of implementing in-situ chemical treatment coupled with institutional controls (ICs) to limit exposures to remaining impacts. The selected in-situ chemical treatment technologies utilized at the Property have been demonstrated to be successful at significantly degrading contaminant mass. Although TPH and VC concentrations remain in on-site groundwater at concentrations exceeding groundwater impacts, Terracon has provided Ecology with our Groundwater Monitoring Report, which indicates that the petroleum- and VC-impacted groundwater plumes are stable and/or shrinking. Therefore, institutional controls would be implemented that consist of the recording of an Environmental Covenant (EC) that imposes a deed restriction on the area of residual impacts to soil and groundwater. The implementation of the EC will eliminate the exposure pathways and would provide for continued, long-term groundwater monitoring to verify that the on-site groundwater plumes remain in a stable or shrinking state. It should be noted that the EC would include contingency plans that would provide for responses should groundwater conditions change over time.

Alternative 2 consists of implementing Electric Resistance Heating (ERH) at the impacted areas identified at the Property, coupled with vapor extraction wells to remove volatilized contaminants of concern. The treatment system would operate for approximately two, 6-month treatment periods, with confirmation sampling conducted between treatment periods.

Alternative 3 consists of conducting a source area excavation followed by a remedial amendment backfill and installation of remedial injection wells for future injections. Assuming the current on-site structure would remain in place, impacted soil and groundwater would remain in-place in inaccessible areas of the Property. Therefore, this alternative includes the implementation of ICs and/or physical restrictions on land use to limit exposure potential.

Compliance groundwater monitoring is included as a component of each of these remedial options to assess the effectiveness of each of the three alternatives evaluated in the RI/FS.

The alternatives were evaluated relative to the criteria specified in Ecology's draft guidance, which includes the following:

- Protectiveness;
- Permanence;
- Long-term effectiveness;
- Implementation Risk Management; and,
- Implementability.

Based upon Terracon's experience, best professional judgement, and the application of scientific principles, each alternative was assigned a score for each criterion ranging from 10 (best) to 1 (worst). Each score is based on the perceived benefit associated with the criterion and is included in the attachments of this memorandum. For the purposes of this DCA, each criterion has equal weight. The sum of the individual weighted scores for each alternative represents a value of the overall benefit of the alternative.

Order of magnitude remediation costs (\pm 30 percent) were estimated for each of the remedial alternatives based on the descriptions and associated assumptions, typical costs for Washington State, and the current knowledge of the Property, with engineering design and contractor bidding. These costs are summarized in the attachment and are for comparison purposes only, actual implementation costs will vary from those provided. Cost effectiveness was determined for each alternative by comparing cost per degree of benefit.

Based on the weighted degree of benefit for each alternative and cost evaluation, Alternative 1, in-situ chemical treatment with institutional controls, is considered the preferred Permanent Solution to the Maximum Extent Practicable (PMEP) alternative per Ecology's draft guidance. Combined with the environmental covenant that will comprise and restrict the use of soil and groundwater for the Property, should eliminate the exposure pathways, and any impacts present beneath the Property will no longer be considered a threat to human health or the environment. The existing wells at the Property will allow for future in-situ chemical treatment, if warranted.

Remedial performance and compliance groundwater quality monitoring will be implemented as a secondary component of this remedial action to monitor long-term stability of the impacted groundwater plumes at the Property.

This alternative is recommended because it is the most cost-effective remedy that provides a permanent solution to the maximum extent practicable for the contamination at the Property. Further, the estimated costs are not disproportionate to the environmental benefit obtained.

It should be noted that this alternative is selected under the assumption that each remedial alternative must have a reasonable restoration time frame (RTF) as a part of the PMEP evaluation. Terracon assumes that the Property will be redeveloped within the next 10 to 15 years. Under the assumption that groundwater concentrations will remain above MTCA CULs and degradation appears to have decreased to below a reasonable RTF, Alternative 3 should be implemented at the time of redevelopment to address remaining impacted soils and for application of remedial amendment in the backfill material to increase degradation of groundwater impacts to achieve a reasonable RTF. These conditions should be included as a part of the institutional controls and Environmental Covenant to ensure a reasonable RTF is achieved.

Remaining steps for Alternative 1 will include development of an Environmental Covenant for addressing residual soil and groundwater contamination, a groundwater monitoring program for addressing dissolved groundwater impacts, and contingency action plan to be incorporated as a component of the EC. Terracon will work with the Ecology to develop a groundwater monitoring program and contingency action plan acceptable to the agency and effective for evaluating both the efficacy of this alternative and groundwater quality throughout the Property.

In summary and based on the assumptions as noted herein and in Terracon's RI/FS, estimated costs to implement the recommended remedy—Alternative 1—(± 30 percent) are **\$210,000 to \$390,000**.

Terracon respectfully requests an opinion from Ecology regarding the feasibility of the selected remedial approach relative to the pursuit of a Conditional No Further Action (NFA) Determination.

If you have any questions or comments pertaining to the material presented herein, please contact either of the undersigned.

Sincerely,

Terracon Consultants, Inc.

A handwritten signature in black ink that reads 'Sydney K. Pazera'.

Sydney K. Pazera, E.I.T.
Staff Environmental Engineer

A handwritten signature in black ink that reads 'Kyle Bennett'.

Kyle Bennett, L.G.
Group Manager

A handwritten signature in black ink that reads 'Matt Wheaton'.

Matt Wheaton, L.G., P.E.
Senior Principal

Table 1: Input Data and Cost-Effectiveness Calculations										
Site Information		Alternative name and present value of total cost of each alternative								
Site Name:		Alternative Name	ALT 1	ALT 2	ALT 3	not used	not used	not used	not used	not used
Lincoln Executive Center		Cost (\$ in millions)	0.30	2.98	1.60					
CSID:	5531	Cost-Estimate Confidence Range	High (+)%	30%						
			Low (-)%	30%						
Benefit Inputs										
DCA Benefit Criteria	Weight (%)	Scores (relative degrees of benefit)								
Protectiveness	20%	6.0	7.0	8.0						
Permanence (no ties-see cell note)	20%	7.0	6.0	8.0						
Long-term effectiveness	20%	7.0	5.0	7.0						
Implementation Risk Management	20%	9.0	4.0	3.0						
Implementability	20%	9.0	3.0	2.0						
Total weighted degrees of benefit	100%	7.60	5.00	5.60	0.00	0.00	0.00	0.00	0.00	
Cost Effectiveness (million dollars per total weighted degrees of benefit)										
Cost Effectiveness (\$/B)		\$0.04	\$0.60	\$0.29						

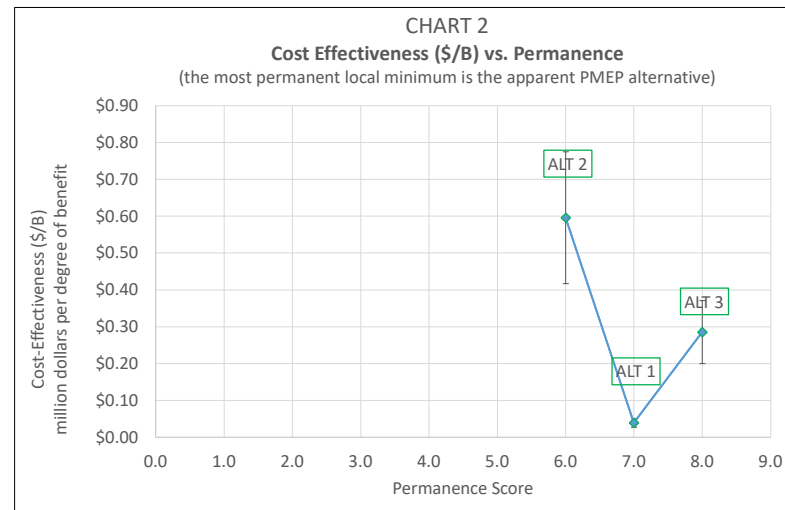
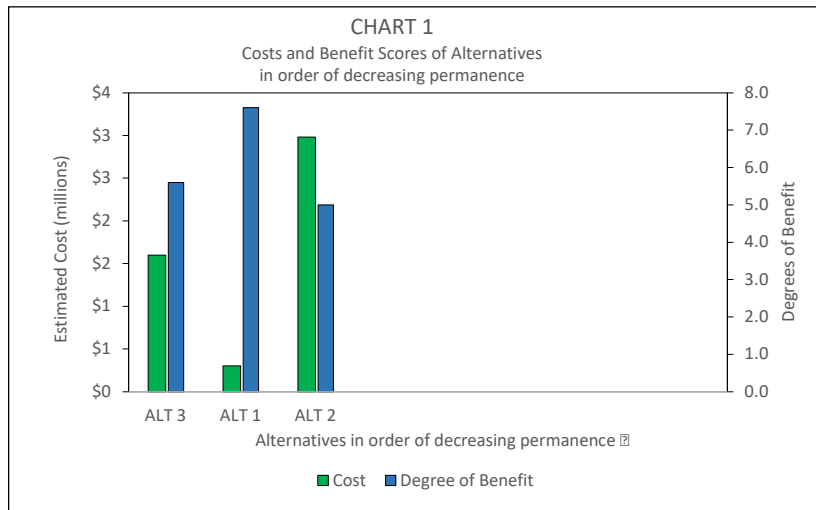


Table 2: DCA Calculations													
estimated costs and degrees of benefit	Alternative	Cost (\$ millions)	Degrees of Benefit	Permanence		↓ alternatives in order of decreasing permanence	DCA Order	Alternative	Permanence Score	Cost (\$ millions)	Degrees of Benefit	Cost Effectiveness (\$/B)	Apparent PMEP Alternative
				Score	Rank								
	ALT 1	\$0.30	7.6	7.0	2		1	ALT 3	8.0	\$1.60	5.6	\$0.29	NO
	ALT 2	\$2.98	5.0	6.0	3		2	ALT 1	7.0	\$0.30	7.6	\$0.04	PMEP
	ALT 3	\$1.60	5.6	8.0	1		3	ALT 2	6.0	\$2.98	5.0	\$0.60	NO
	not used						4		#N/A				
	not used						5		#N/A				
	not used						6		#N/A				
	not used						7		#N/A				
not used					8		#N/A						

Table 3: Chart Data & Error Bar Calculations								
Alternative	Permanence Score	Cost Effectiveness (\$/B)	Cost (\$ millions)	Degrees of Benefit	High Cost (\$/B)	Low Cost (\$/B)	Upper error range	Lower error range
ALT 3	8.0	\$0.29	\$1.60	5.6	\$0.37	\$0.20	\$0.09	\$0.09
ALT 1	7.0	\$0.04	\$0.30	7.6	\$0.05	\$0.03	\$0.01	\$0.01
ALT 2	6.0	\$0.60	\$2.98	5.0	\$0.77	\$0.42	\$0.18	\$0.18
	#N/A				#VALUE!	#VALUE!	#VALUE!	#VALUE!
	#N/A				#VALUE!	#VALUE!	#VALUE!	#VALUE!
	#N/A				#VALUE!	#VALUE!	#VALUE!	#VALUE!
	#N/A				#VALUE!	#VALUE!	#VALUE!	#VALUE!
	#N/A				#VALUE!	#VALUE!	#VALUE!	#VALUE!