Dixon Environmental Services LLC
4010 N 7th Street, Tacoma, WA 98406
Tel 253.380.4303
www.DixonES.com

March 27, 2025

Fulcrum Development Inc.
2100 N 30th Street
Tacoma, WA 98403

ARCADIA MONTESSORI REMEDIATION WORKPLAN

Dixon Environmental Services (Dixon ES) has prepared this Remediation Workplan for Pierce County Parcel #s 0221263043 and 5945620280, addressed at 5312 North 30th Street in Tacoma, Washington (the Property).

The purpose of the workplan is to provide conceptual information regarding the planned environmental remediation at the Property, for the purposes of project planning, permitting, and contractor coordination.

Property Description and Background

The Property is currently improved with a single-story, 2,086 square foot day care center, generally positioned on the south-east portion of Parcel #0221263043. The Property is also improved with a small playground and two inactive swimming pools.

Based on a review of aerial photographs, County Assessor records, and interviews with the current owner, it appears the Property was vacant and undeveloped prior to construction of the existing building and associated features in 1968.

The building was reportedly utilized as a community center for homeowners in the immediate vicinity, followed by a pre-school, then a day care/Montessori.

The current Property address listed by the County (5312 N 30th Street) does not appear in any city directory listings; however, the address of 6312 N 30th Street, which would appear to better correspond to the Property location, indicates the presence of Tacoma Chirstian School in 1988, followed by the Arcadia Montessori through at least 2010.

Previous Environmental Assessments

For almost 100 years, Asarco operated a copper smelter on the shores of Commencement Bay in Tacoma, Washington. Air pollution from the smelter, consisting of heavy metals such as arsenic and lead, settled on the surface soil of more than 1,000 square miles of the Puget Sound basin (Ecology 2021).

According to the Washington State Department of Ecology (Ecology) Tacoma Smelter Plume Map, the Property lies within an area where predicted arsenic concentrations exceed 100 milligrams per kilogram (mg/kg).

Based on these conditions, a surface and near surface soil assessment was requested by the City of Tacoma to evaluate the environmental quality of the Property prior to development.

On December 3, 2024, Dixon ES collected soil and duff samples on the Property to evaluate the potential for environmental impacts associated with the Tacoma Asarco Smelter Plume (TASP). The means and methods of the assessment were performed in general accordance with Ecology's TASP Guidance Document, dated July 2019.

According to this guidance, characterization sampling requirements are based on decision units. These units are determined by both historical use and future use.

Dixon ES identified two decision units for the Property; Decision Unit 1 wis comprised of approximately 1.99 acres and is characterized by the developed and historically trafficked areas on the Property. Decision Unit 2 is comprised of approximately 0.21 acres and is characterized by the vegetated undisturbed area on the southwest corner of the Property.

Dixon ES collected 33 soil samples in these decision units at the approximate locations shown on Figure 2. Samples were collected from 0-6 inches bgs at 26 locations (S1 through S26), and samples were collected from 6-12 inches bgs at 6 locations (S4, S8, S14, S17, S20, and S24).

A six-way composite duff sample was also collected from the forested areas on the Property.

Samples were collected using stainless steel sampling equipment (post-hole digger, shovel, and/or spade) properly decontaminated between uses.

Samples were transferred directly into clean laboratory provided 4oz jars, then placed in a cooler and kept on ice until delivered to an Ecology Accredited Laboratory, Friedman and Bruya, Inc. (F&BI) of Seattle, Washington under standard chain of custody protocols. Samples were analyzed for the presence of arsenic and lead by EPA Method 6020B.

Below is a summary of the data evaluation for each decision unit.

Decision Unit 1

- Eight soil samples, collected from the 0-6-inch depth interval, contained arsenic concentrations in excess, but less than double, the MTCA Method A Cleanup Level.
- One soil sample, collected from the 6-12-inch depth interval, contained an arsenic concentration in excess, but less than double, the MTCA Method A Cleanup Level.
- No other samples contained concentrations of arsenic or lead above their respective MTCA Method A Cleanup Levels.
- The average arsenic concentrations in both the 0-6 and 6-12-inch intervals were below the MTCA Method A Cleanup Level.
- The average lead concentrations in both the 0-6 and 6-12-inch intervals were below the MTCA Method A Cleanup Level.

Decision Unit 2

- Two soil samples, collected from the 0-6-inch depth interval, contained arsenic concentrations in excess, but less than double, the MTCA Method A Cleanup Level.
- Two soil samples, collected from the 0-6-inch depth interval, contained arsenic concentrations in excess of double the MTCA Method A Cleanup Level.
- Two soil samples, collected from the 6-12-inch depth interval, contained arsenic concentrations in excess, but less than double, the MTCA Method A Cleanup Level.
- One soil sample, collected from the 6-12-inch depth interval, contained an arsenic concentration in excess of double the MTCA Method A Cleanup Level.
- No other samples contained concentrations of arsenic or lead above their respective MTCA Method A Cleanup Levels.
- The average arsenic concentrations in both the 0-6 and 6-12-inch intervals were above the MTCA Method A Cleanup Level.
- The average lead concentrations in both the 0-6 and 6-12-inch intervals were below the MTCA Method A Cleanup Level.

Duff

- The concentrations of arsenic and lead in the composite duff sample were well below their respective MTCA Method A Cleanup Levels.

Sample analytical results are summarized on Table 1.

The results summarized above indicate that the majority of the Property does not require remediation due to fallout from the former smelter. The concentrations of arsenic and lead detected in DU1, which is comprised of 1.99 acres of the Property, do not meet Ecology's definition of elevated levels.

A relatively small areas on the southwestern portion of the Property (DU2) does appear to require remediation, as concentrations of arsenic in both the 0-6 and 6-12-inch intervals meet Ecology's definition of elevated levels.

To further evaluate the vertical extent of contamination, Dixon ES returned to the Property to collect two samples from 12-18 inches bgs at sample locations S23 and S24. This is where the highest concentrations of arsenic were detected in the 6–12-inch interval. Neither sample contained concentrations of arsenic in excess of its MTCA Method A Cleanup Level and generally appeared consistent with natural background conditions.

Contaminants of Concern

Based on the findings of the assessment discussed above, the primary contaminant of concern (COC) for the Property is arsenic. Lead was not present at concentrations warranting remedial action.

Chemical (or class)	Routes of Exposure	Exposure Symptoms
Arsenic	Ingestion and Inhalation.	Nausea, vomiting, diarrhea (potentially bloody), abdominal pain, and in severe cases, organ damage, seizures, coma, and death.

Distribution of Contamination

The lateral extent of arsenic impacts appears limited to DU2, which is characterized by a small undisturbed area on the southwest portion of the Property.

The vertical extent appears limited to the upper 0-12 inches of soil.

The approximate extent of known soil impacts is depicted on Figure 2.

Conceptual Cleanup Plan

Roles and Responsibilities

The Property developer (Fulcrum Development Inc.) will be responsible for conducting remedial actions through Ecology's Voluntary Cleanup Program (VCP). The Property is currently not covered by an Ecology Administrative Action; therefore, any state or local permits that are required to complete the remediation will be obtained.

Once the cleanup of the Property is complete and the final report is produced Ecology will evaluate the overall success of the cleanup and may issue a "No Further Action" (NFA) determination at their discretion.

Goals and Objectives

The specific cleanup goals and objectives for the Property include the following:

- Remediation of arsenic contaminated soil exceeding Ecology's definition of elevated levels; Ecology's guidance defines elevated levels of arsenic as:
    - Average arsenic concentrations greater than 20 mg/kg;
    - Or maximum (any one sample) arsenic concentration greater than 40 mg/kg.
- Protection of human health and the environment, including protection against direct contact with contaminated soil, while allowing for the most beneficial use of the Property.

Remedial Options

As discussed in Ecology's TASP Guidance Document and as shown below, two permanent remediation remedies are recommended for sites with elevated levels of arsenic or lead. These remedy options are: 1) Excavation & Removal, and 2) Soil Mixing.

Table 2. Model Remedy options

	Model Remedy	Action	Considerations
Permanent	**Excavate & Remove (Ch. 3)**	Excavate contaminated soils and properly dispose of them.	⇒ The top 6" of soil must have <20 ppm average arsenic and <250 ppm average lead after excavation. Take samples at depth to make sure you remove all contamination. ⇒ Performance monitoring required.
	Mix (Ch. 4)	Mix the top 6-12" of contaminated soils with imported soils or deeper, clean soil.	⇒ Not for soils >40 ppm average arsenic. ⇒ Performance monitoring required.

As shown above, the soil mixing option is appropriate for sites with average arsenic concentration of less than 40 mg/kg. The characterization sampling conducted by Dixon ES showed an average arsenic concentration in DU2, in the 0–12-inch range, of 37 mg/kg.

As such, remedial option 2 was selected for this Property.

Soil Mixing

Soil mixing will be completed on the Property using conventional earthwork equipment, including excavators, backhoe loaders, and/or bulldozers.

The process will involve scrapping/removing the upper 0-24 inches of soil in distinct rows within DU2, each measuring approximately 8-10 feet in width. In sequence, beginning on the southern boundary of the Property, the soil will be temporarily stockpiled adjacent to the north of each row, which will then be redistributed back into the excavated void space, resulting in a uniformly mixed backfill. The process will then be repeated in the subsequent row to the north.

Compliance Sampling

Following soil mixing operations, compliance soil samples will be collected from the mixed soil to a total depth of 24 inches. Each discrete sample will be analyzed for total arsenic using EPA Method 6020B. In accordance with the table below, Dixon ES anticipates 8 sample locations. One sample will be collected from 12-inches bgs, and one sample will be collected from 24-inches bgs to verify thorough mixing had occurred.

Table 4. Minimum number of compliance sample locations per decision unit

Sampling area size (acres)	Samples needed Mapped arsenic >100 ppm	Samples needed Mapped arsenic <100 ppm
0.25*	10	8
1	20	16
5	40	32
10	60	48
20	80	64
100	120	90
>100	120 + 1 per 5 acres	90 + 1 per 10 acres

*0.25 acres ~11,000 square feet

Reporting

Upon completion of the cleanup action and compliance sampling, a Remedial Action Completion Report will be prepared for submittal to Ecology. The report will document the cleanup process and summarize the sample analytical results. If the confirmation sampling results adequately demonstrate that mixing has successfully remediated soil to below the applicable cleanup levels, the report will include or be accompanied by a request for an NFA determination.

DIXON
ENVIRONMENTAL SERVICES

LEGEND

★ SUBJECT PROPERTY

TOPOGRAPHIC MAP

PROJECT ADDRESS:

5312 N 30TH STREET
TACOMA, WA 98407

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DIXON
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▲ Soil Sample

Site Plan

Project Address:

5312 N 30th Street
Tacoma, WA 98407

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Table 1
Summary of Soil Analytical Results
Arsenic and Lead

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Decision Unit	Soil Sample ID	Sample Depth (Inches)	Date Sampled	Priority Pollutant Metals (mg/kg)			
				Arsenic	Average Concentration	Lead	Average Concentration
DU1	S1-6	0-6	12/3/2024	**35**	17.04	38	24.05
	S2-6	0-6	12/3/2024	**23**		15	
	S3-6	0-6	12/3/2024	14		14	
	S4-6	0-6	12/3/2024	**32**		30	
	S5-6	0-6	12/3/2024	**35**		66	
	S6-6	0-6	12/3/2024	**24**		23	
	S7-6	0-6	12/3/2024	4.0		13	
	S8-6	0-6	12/3/2024	3.9		11	
	S9-6	0-6	12/3/2024	4.9		13	
	S10-6	0-6	12/3/2024	14		19	
	S11-6	0-6	12/3/2024	7.6		7.9	
	S13-6	0-6	12/3/2024	**30**		8.5	
	S14-6	0-6	12/3/2024	**27**		82	
	S15-6	0-6	12/3/2024	15		30	
	S16-6	0-6	12/3/2024	17		21	
	S18-6	0-6	12/3/2024	16		14	
	S19-6	0-6	12/3/2024	3.4		5.6	
	S20-6	0-6	12/3/2024	15		22	
	S21-6	0-6	12/3/2024	11		21	
	S22-6	0-6	12/3/2024	**23**		47	
	S25-6	0-6	12/3/2024	12		16	
	S26-6	0-6	12/3/2024	8.1		12	
	S4-12	6-12	12/3/2024	**25**	16.50	25	17.25
	S8-12	6-12	12/3/2024	11		14	
	S14-12	6-12	12/3/2024	17		16	
	S20-12	6-12	12/3/2024	13		14	
DU2	S12-6	0-6	12/3/2024	**51**	**33.60**	59	34.00
	S17-6	0-6	12/3/2024	**21**		25	
	S18-6	0-6	12/3/2024	16		14	
	S23-6	0-6	12/3/2024	**37**		24	
	S24-6	0-6	12/3/2024	**43**		48	
	S17-12	6-12	12/3/2024	**20**	**43.00**	24	46.67
	S23-12	6-12	12/3/2024	**39**		53	
	S24-12	6-12	12/3/2024	**70**		63	
	S23-18	12-18	3/18/2025	2.3	2.80	53	
	S24-18	12-18	3/18/2025	3.3		63	
Duff	Duff	Surface	12/3/2024	8.5	4.25	15	7.45
Reference Concentrations (mg/kg)				40[1]	20[2]	500[1]	250[2]

Notes:
mg/kg = Milligrams per kilogram
MTCA = Model Toxics Control Act
[1] Double the MTCA Method A Cleanup Level
[2] MTCA Method A Cleanup Level
Bold indicates a detected concentration that is above Ecology MTCA Method A Cleanup Level
Bold Red indicates the detected concentration is double Ecology MTCA Method A Cleanup Level