ZipperGeo
Geoprofessional Consultants

October 12, 2020

Washington State Department of Ecology
Voluntary Cleanup Program
3190 160th Ave SE
Bellevue, Washington 98008

Attn: Mr. Grant Yang, P.E., Site Manager, Toxics Cleanup Program
Ms. Louise Bardy, Northwest Regional Office Voluntary Cleanup Program Unit Supervisor
Mr. Bob Warren, P.Hg., MBA, Northwest Regional Office Section Manager

RE: Work Plan for Ecology Review in Response to Ecology Opinion Letter dated October 17, 2019
Auburn TREK Apartments (Auburn Promenade Project)
12 and 16 South Division Street
Auburn, King County, Washington
Ecology Facility ID No. 11202
Ecology Cleanup Site ID No. 11979
Ecology VCP No. NW2696
ZGA Project 1684.20

Dear Mr. Yang, Ms. Bardy, and Mr. Warren:

Per your request, Zipper Geo Associates, LLC (ZGA) is pleased to present this Work Plan to complete additional environmental services at the Auburn TREK Apartments located at the address listed above. ZGA prepared and submitted to Ecology the following document: *Response to Ecology Opinion Letter dated October 17, 2019* (dated and transmitted August 21, 2020). The purpose of the letter was to discuss and clarify each comment from Ecology's October 17, 2019 Opinion Letter in our pursuit of a "No Further Action" (NFA) determination and Project Closure for the Auburn TREK Property under Chapter 70.105D RCW, and its implementing regulations, the Model Toxics Control Act (MTCA), Chapter 173-340 WAC. Following Ecology's review of ZGA's letter, a conference call occurred on September 1, 2020 with Grant Yang, Kaelin Newman (ZGA), and Sean Donnan (ZGA) participating.

The scope of services in this Work Plan is consistent with the detailed responses in ZGA's August 21, 2020 letter and as discussed during the September 1, 2020 conference call with Ecology. The scope of services includes:

Task 1 Monthly injections in wells MW-7A and MW-11;
Task 2 Overdrill and Deepen Five Existing Groundwater Monitoring Wells;
Task 3 Quarterly Groundwater Monitoring and Sampling;
Task 4 EIM Data Submittal; and,
Task 5 Monitoring Well Decommissioning.

Following successful implementation of Tasks 1 through 3 as described in detail below, and assuming groundwater monitoring and sampling results demonstrate four consecutive, MTCA Method A-compliant calendar quarterly events, ZGA will, when Ecology has communicated to Landmark Development Group that the agency is in a position to issue a determination of No Further Action (NFA) for the site or Property, proceed with Tasks 4 and 5.

As indicated during the September 1, 2020 conference call, we understand that this Work Plan will be reviewed by Ecology. To the extent the plan meets Ecology's expectations with the objective of obtaining an NFA for the site or Property, we understand Site Manager Mr. Grant Yang will communicate such with an email transmission followed by issuance of a formal Opinion Letter.

PROPOSED SCOPE OF SERVICES

Task 1. Monthly injections in MW-7A and MW-11

PetroFix™ is an activated carbon "trap and treat" compound manufactured by Regenesis™ applied as an aqueous solution. A weekly injection program of Petrofix was initiated on January 9, 2019 in wells MW-7A and MW-11. The program continued until September 26, 2019 and a single injection event was completed on December 13, 2019. ZGA will resume injections in MW-7A and MW-11 on a Monthly basis beginning in October 2020.

Since January 9, 2019, PetroFix injection events at each injection well location consist of a 15-gallon solution of potable water and PetroFix™ (1 to 2 micron-activated carbon) and inorganic electron acceptor blend (sulfate and nitrate combination blend) at a 30:1 ratio. The solution is injected utilizing a low pressure (56 psi) transfer pump at controlled depths within the screened interval of each well using an (expandable) well packer for vertical injectate control. The expandable well packer will be placed at variable depths within the upper, middle, and lower screened interval to control the injectate horizon. Water levels in MW-7A will be documented prior to each injection event. As recommended by Regenesis, each injection event includes a secondary injection of 5 to 10 gallons of potable water at the same depth intervals within the screen to ensure that residual injectate does not accumulate within the treatment well and to promote further distribution away from the injection well.

Task 2. Overdrill and Deepen Five Existing Groundwater Monitoring Wells

ZGA proposes to overdrill and deepen five existing monitoring wells (upgradient wells MW-6 and MW-8; and downgradient wells MW-17, MW-19, and MW-20) in an effort to obtain sufficient volumes of groundwater for the required analytical suite for monitored natural attenuation (MNA) parameters. Groundwater levels measured on September 9, 2020 disclosed that of the five monitoring wells to be monitored after overdrilling and deepening, only MW-6 had measurable quantities of water (1.37 feet of water column) while monitoring wells MW-8, MW-17, MW-19, and MW-20 were dry. Injection well MW-7A was the only other well to have measurable quantities of water (1.95 feet of water column) on September 9, 2020. All other wells on the property or in the Right-of-Way (ROW) including MW-1, MW-9, MW-10, MW-11, MW-12, and MW-18 were dry.

Downgradient monitoring wells MW-17, MW-19, and MW-20 are located inside the ground floor parking garages of the TREK Apartments building while upgradient monitoring wells MW-6 and MW-8 are located west of South Division Street in the ROW. As discussed in ZGA's August 21, 2020 letter, successful deepening of these three wells presents significant challenges and potential impediments including low overhead clearance (MW-17, 19, 20). Deepening of MW-17, 19, and 20 will require project specific (custom) modifications to the already height restriction-capable, limited access drilling equipment available to the industry. Utility conflicts below the building and in the City-owned ROW (MW-6, 8) are also a significant consideration.

Table 1 presents recorded water level measurements for the TREK Apartments/Auburn Promenade Project dating back to 2012. Figure 1 presents the location of all wells on the property and in the ROW including the two injection wells and the five monitoring wells to be monitored after overdrilling and deepening.

Deepening of the five monitoring wells as discussed above will include:

- Revise/renew the existing City of Auburn ROW Use Permit to reflect the overdrilling/deepening of monitoring wells MW-6 and MW-8, continued groundwater monitoring and sampling, and continued injections in wells MW-7A and MW-11;
- Mark the five boring locations for subsequent utility clearance;
- At least 72 hours prior to intrusive activities, ZGA will contact the utility locator service Underground Service Alert (1-800-424-5555) to arrange for underground utility clearance at the property;
- Obtain as-built plans of the property in an attempt to locate all subsurface utilities beneath the two parking garage structures;
- Complete a private utility locate after completion of the public utility locate in order to further attempt to mitigate encountering unmarked subsurface utilities on private property;
- Overdrill and deepen monitoring wells MW-6, MW-8, MW-17, MW-19, and MW-20 using a limited-access, modified low overhead clearance, direct-push drill rig to depths of 25 to 30 feet below existing ground surface;
- Borings will be advanced by a Washington State-licensed resource protection well driller under ZGA observation. Monitoring well construction will be in strict accordance with Chapter 173-160 WAC, *Minimum Standards for Construction and Maintenance of Wells*; and,
- All subsurface exploration efforts will use procedures intended to minimize the risk of cross contamination.

ZGA will utilize Anderson Environmental Contracting of Kelso, Washington a Washington State-recognized Water Well and Resource Protection Well drilling company to overdrill and deepen the wells as discussed above.

Task 3. Quarterly Groundwater Monitoring and Sampling

Monitoring wells MW-6 and MW-8 serve as upgradient wells while MW-17, MW-19, and MW-20 serve as downgradient compliance wells. Groundwater monitoring and sampling events will be conducted on a quarterly basis from these five wells. Groundwater sampling will include low-flow sampling procedures in accordance with EPA guidance No. EQASOP-GW4: *Low Stress (Low Flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells,* revised September 19, 2017. When all field parameters stabilize and at least three consecutive turbidity readings from a Horiba multi-meter connected to a flow-through-cell were within 10%, a groundwater sample will be collected into laboratory-provided glassware.

The analytical laboratory testing suite will specifically include all requirements of MTCA Table 830-1 as well as monitored natural attenuation (MNA) parameters and consist of the following:

- Gasoline-range hydrocarbons (TPH-G) by NWPTH-Gx;
- Diesel- and oil-range hydrocarbons (TPH-D and TPH-O) by NWPTH-Dx extended;
- Volatile organic compounds (VOCs) by EPA Method 8260C;
- Ethylene dibromide (EDB) by EPA Method 8011 Modified;
- Total and dissolved Fe, Pb, and Mn by EPA Method 200.8;
- Nitrate, nitrite, and sulfate by EPA Method 300.0;
- Methane, ethane, and ethene by RSK-175; and,
- Alkalinity by SM 2320B.

As discussed during our September 1, 2020 conference call, we understand that analysis of EDB and lead can be discontinued following two additional quarters of analytical laboratory concentrations below the applicable MTCA Method A cleanup levels. As specifically indicated in ZGA's *Response to Ecology Opinion Letter dated October 17, 2019, g*roundwater samples collected during groundwater monitoring and sampling events will be subjected to analytical laboratory testing employing laboratory method reporting limits (MRLs) appropriate for comparison of the data to the additive MTCA Method A cleanup standard of 500 µg/L for TPH-D and TPH-O.

ZGA will utilize Friedman & Bruya, Inc. of Seattle, Washington and/or Apex Laboratories of Tigard, Oregon, both of which are Washington State-accredited analytical laboratories for the analyses discussed above.

Quarterly groundwater monitoring reports will include the following:

- A description of groundwater sampling completed for each event;
- Tabulated ground water levels and calculated ground water elevations;
- Groundwater elevation contour figures;
- Tabulated analytical laboratory data;
- Evaluation of results including MNA parameters relative to MTCA cleanup standards;
- Completed Groundwater Purge and Sample field forms; and,
- Analytical Laboratory Test Certificates.

Task 4. EIM Data Submittal

ZGA will review and input analytical data from all available reports (circa 2005 and beyond) into Ecology's Environmental Information Management (EIM) data retrieval system. This will take place following four consecutive quarters of groundwater concentrations below MTCA Method A cleanup levels and when Ecology has communicated to Landmark Development Group that the Agency is in a position to issue an NFA determination for the site or Property.

Task 5. Monitoring Well Decommissioning

ZGA will decommission all groundwater monitoring wells at the site following written acknowledgment from Ecology that four consecutive quarters of compliant groundwater results are achieved and an NFA determination is granted for the site or Property. Well decommissioning will be completed in accordance with Chapter 173-160 WAC, *Minimum Standards for Construction and Maintenance of Wells*, specifically Chapter 173-160-381 WAC, and Chapter 173-160-460 WAC.

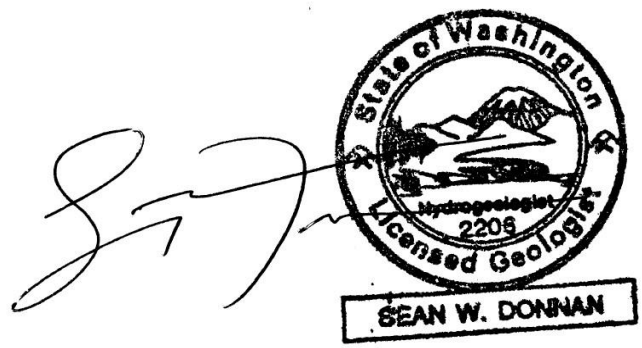
CLOSING

We appreciate the opportunity to present this Work Plan and look forward to your review and favorable response. If you have any questions or comments in the interim, please contact the undersigned at (425) 582-9928.

Respectfully submitted,
Zipper Geo Associates, LLC

Kaelin R. Newman, G.I.T.
Staff Geologist

Charles C. Cacek, M.Sc., L.E.G.
Associate Geologist



Sean W. Donnan, P.G., L.E.G., L.Hg.
Principal

Attachments: Table 1 – Groundwater Elevations
Figure 1 – Site & Exploration Plan

Table 1. Groundwater Elevations
ZGA Project No. 1684.20
Auburn Trek Property

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Well ID	TOC in Feet[1]	Sample Date	Screen Interval (Feet Below TOC)	Depth to Groundwater (Feet Below TOC)[2]	Groundwater Elevation (Feet AMSL)
MW-1	85.98	07/31/12	5-15	13.32	72.66
		11/13/12		14.44	71.54
		12/14/12		13.94	72.04
		02/07/13		12.81	73.17
		10/23/13		dry	--
		08/26/15		13.01	72.97
		12/31/15		11.06	74.92
		06/20/18		13.34	72.64
		11/04/19		dry	--
		05/26/20		13.56	72.42
		06/11/20		13.65	72.33
		09/09/20		dry	--
MW-2	81.94	07/31/12	5-15	11.60	70.34
		11/12/12		dry	--
		12/14/12		6.55	75.39
		02/06/13		7.39	74.55
		10/23/13		11.40	70.54
	Decommissioned on 01/06/2014 prior to ground improvements				
MW-3	81.63	07/31/12	4.5-14.5	11.45	70.18
		11/12/12		dry	--
		10/23/13		10.61	71.02
	Decommissioned on 01/06/2014 prior to ground improvements				
MW-4	81.83	07/31/12	4.5-14.5	13.78	68.05
		11/13/12		10.53	71.3
		12/14/12		10.61	71.22
		02/06/13		9.06	72.77
		10/23/13		11.64	70.19
	Decommissioned on 01/06/2014 prior to ground improvements				
MW-5	81.84	07/31/12	4.5-14.5	12.45	69.39
		11/12/12		10.07	71.77
		12/14/12		9.20	72.64
		02/06/13		8.01	73.83
		10/23/13		12.94	68.9
	Decommissioned on 01/06/2014 prior to ground improvements				

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Well ID	TOC in Feet[1]	Sample Date	Screen Interval (Feet Below TOC)	Depth to Groundwater (Feet Below TOC)[2]	Groundwater Elevation (Feet AMSL)
MW-6	84.80	11/12/12	4.5-14.5	10.44	74.36
		12/14/12		9.23	75.57
		02/06/13		9.72	75.08
		10/23/13		10.43	74.37
		08/26/15		10.47	74.33
		12/31/15		9.10	75.70
		06/20/18		10.70	74.10
		11/04/19		10.83	73.97
		05/26/20		10.08	74.72
		06/11/20		10.12	74.68
		09/09/20		13.13	71.67
MW-7	85.75	11/12/12	4.5-14.5	11.80	73.95
		12/14/12		10.29	75.46
		02/07/13		10.65	75.10
		10/23/13		11.29	74.46
		08/26/15		dry	--
		12/31/15		9.35	76.40
		01/06/17		10.66	75.09
	Decommissioned on 02/22/2018 prior to MW-7A installation				
MW-7A[3]	Replaced MW-7 on 02/22/2018				
	85.82	04/16/18	10-20	12.57	73.25
		06/20/18		14.98	70.84
		07/11/18		16.28	69.54
		09/14/18		17.57	68.25
		10/03/18		18.78	67.04
		10/26/18		18.85	66.97
		12/19/18		12.49	73.33
		01/07/19		10.96	74.86
		01/09/19		10.93	74.89
		01/22/19		11.33	74.49
		02/24/19		9.89	75.93
		03/29/19		11.46	74.36
		04/25/19		11.14	74.68
		05/31/19		12.52	73.30
		07/12/19		13.53	72.29
		07/25/19		13.68	72.14
		08/23/19		13.56	72.26
		09/26/19		13.80	72.02
		10/11/19		13.97	71.85
		11/04/19		12.51	73.31
		12/18/19		13.16	72.66
		01/09/20		10.93	74.89
		03/24/20		12.75	73.07
		05/26/20		13.91	71.91
		06/11/20		14.59	71.23
		09/09/20		18.05	67.77

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Well ID	TOC in Feet[1]	Sample Date	Screen Interval (Feet Below TOC)	Depth to Groundwater (Feet Below TOC)[2]	Groundwater Elevation (Feet AMSL)
MW-8	85.03	11/12/12	4.5-14.5	11.05	73.98
		12/14/12		10.16	74.87
		02/07/13		10.45	74.58
		10/23/13		11.10	73.93
		08/26/15		dry	--
		12/31/15		8.19	76.84
		06/20/18		11.25	73.78
		11/04/19		11.25	73.78
		05/26/20		10.94	74.09
		06/11/20		11.03	74.00
		09/09/20		dry	--
MW-9	85.52	11/12/12	5-15	13.95	71.57
		12/14/12		11.64	73.88
		02/07/13		11.25	74.27
		10/23/13		12.72	72.80
		08/26/15		11.70	73.82
		12/31/15		10.20	75.32
		06/20/18		12.29	73.23
		11/04/19		dry	--
		05/26/20		12.49	73.03
		06/11/20		12.79	72.73
		09/09/20		dry	--
MW-10	85.63	11/12/12	4.5-14.5	dry	--
		12/14/12		13.28	72.35
		02/07/13		12.37	73.26
		10/23/13		11.64	73.99
		08/26/15		11.94	73.69
		12/31/15		11.22	74.41
		06/20/18		12.68	72.95
		11/04/19		dry	--
		05/26/20		13.07	72.56
		06/11/20		13.71	71.92
		09/09/20		dry	--
MW-11	85.42	11/12/12	3.5-13.5	11.67	73.75
		12/14/12		10.68	74.74
		02/07/13		10.99	74.43
		10/23/13		11.64	73.78
		08/26/15		11.80	73.62
		12/31/15		10.05	75.37
		01/06/17		dry	--
		06/20/18		dry	--
		09/14/18		dry	--
		10/26/18		dry	--
		12/19/18		dry	--
		01/07/19		dry	--
		01/22/19		dry	--
		04/25/19		dry	--
		11/04/19		dry	--
		12/18/19		dry	--
		05/26/20		dry	--
		06/11/20		dry	--
		09/09/20		dry	--

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Auburn Trek Property

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Well ID	TOC in Feet[1]	Sample Date	Screen Interval (Feet Below TOC)	Depth to Groundwater (Feet Below TOC)[2]	Groundwater Elevation (Feet AMSL)
MW-12	86.23	11/12/12	3.5-13.5	dry	--
		12/14/12		13.35	72.88
		02/06/13		12.88	73.35
		08/26/15		dry	--
		10/23/13		dry	--
		12/31/15		11.67	74.56
		06/20/18		dry	--
		11/04/19		dry	--
		05/26/20		dry	--
		06/11/20		dry	--
		09/09/20		dry	--
MW-13	85.02	11/12/12	4.5-14.5	dry	--
		12/14/12		10.39	74.63
		02/06/13		10.37	74.65
		10/23/13		12.57	72.45
	Decommissioned on 01/06/2014 prior to ground improvements				
MW-14	85.18	11/13/12	4.5-14.5	13.96	71.22
		12/14/12		11.89	73.29
		02/06/13		10.96	74.22
		10/23/13		dry	--
	Decommissioned on 01/06/2014 prior to ground improvements				
MW-15	85.19	11/13/12	4.5-14.5	12.46	72.73
		12/14/12		10.90	74.29
		02/07/13		10.56	74.63
		10/23/13		11.89	73.30
	Decommissioned on 01/06/2014 prior to ground improvements				
MW-16	NS	02/07/13	9.5-19.5	NS	NS
		10/23/13		18.98	NS
	Decommissioned on 05/15/2015 due to final floor construction of new building				
MW-17	85.98	10/23/13	9.5-19.5	13.61	72.37
		8/26/15		12.79	73.19
		12/31/15		11.37	74.61
		06/20/18		13.22	72.76
		07/11/18		10.70	75.28
		10/26/18		14.61	71.37
		01/09/19		14.10	71.88
		01/22/19		13.90	72.08
		04/25/19		13.49	72.49
		07/25/19		13.66	72.32
		11/04/19		15.45	70.53
		12/18/19		16.80	69.18
		05/26/20		13.54	72.44
		06/11/20		13.62	72.36
		09/09/20		dry	--

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Well ID	TOC in Feet[1]	Sample Date	Screen Interval (Feet Below TOC)	Depth to Groundwater (Feet Below TOC)[2]	Groundwater Elevation (Feet AMSL)
MW-18	85.19	10/23/13	9.5-19.5	15.46	69.73
		08/26/15		dry	--
		12/31/15		8.02	77.17
		06/20/18		13.08	72.11
		11/04/19		dry	--
		05/26/20		12.26	72.93
		06/11/20		13.05	72.14
		09/09/20		dry	--
MW-19	Installed on 08/25/2014 as a replacement well for MW-14				
	85.92	08/26/15	5-15	12.80	73.12
		12/31/15		11.04	74.88
		06/20/18		12.83	73.09
		07/11/18		dry	--
		10/26/18		14.48	71.44
		01/09/19		13.65	72.27
		01/22/19		13.32	72.60
		04/25/19		13.28	72.64
		07/25/19		13.71	72.21
		11/04/19		dry	--
		12/18/19		dry	--
		05/26/20		13.45	72.47
		06/11/20		13.55	72.37
		09/09/20		dry	--
MW-20	Installed on 08/25/2014 as a replacement well for MW-15				
	85.60	08/26/15	5-15	12.62	72.98
		12/31/15		10.70	74.90
		06/20/18		12.15	73.45
		07/11/18		13.10	72.50
		10/26/18		13.72	71.88
		01/09/19		13.64	71.96
		01/22/19		13.35	72.25
		04/25/19		13.17	72.43
		07/25/19		13.70	71.90
		11/04/19		dry	--
		12/18/19		dry	--
		05/26/20		13.15	72.45
		06/11/20		13.30	72.30
		09/09/20		dry	--

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Well ID	TOC in Feet[1]	Sample Date	Screen Interval (Feet Below TOC)	Depth to Groundwater (Feet Below TOC)[2]	Groundwater Elevation (Feet AMSL)

NOTES

[1]TOCs from MW-1 through MW-15 were surveyed to a horizontal datum (NAD 83/91) and a vertical datum (NAVD 88 Per City of Auburn published information) by Prizm Surveying, Inc. of Tacoma, Washington in 2013. TOCs from MW- 17 through MW-20 were surveyed by FILCO (2016) and ZGA (2019) using an arbitrary datum of 85.00 feet above mean sea level using a differential leveling technique.

[2]As measured in feet below a fixed spot on the north side of the well casing rim.

[3]MW-7A replaced MW-7 on February 22, 2018.

AMSL = above mean sea level

NS = not surveyed

TOC = top of casing

-- = not applicable

LEGEND

MW-1	Existing monitoring well.
MW-7	Injection well.
MW-6	Monitoring wells proposed for sampling per ZGA's *Work Plan in Response to Ecology Opinion Letter* dated October 12, 2020.

N

40 0 20 40

SCALE IN FEET

AUBURN PROMENADE PROJECT
12 & 16 Division St. S. R-O-W
Auburn, Washington

SITE AND EXPLORATION PLAN

DATE: SEPTEMBER 2020 Job No. 1684.20

Zipper Geo Associates, LLC
19019 36th Ave. W., Suite E
Lynnwood, WA

FIGURE 1
SHT. 1 of 1

REFERENCE: (1) *Remedial Investigation, Former Ace Hardware Store, Auburn, WA,* prepared by Terracon, dated April 2, 2013. (2) *Groundwater Monitoring Report, August 26, 2015 and December 31, 2015 Sampling Events, Former Ace Hardware, 12 and 16 South Division Street, Auburn, King County, Washington,* prepared by Filco, dated February 15, 2016.