North Maintenance Facility (SNMF)
City of Shoreline

Pre-Design Report

TCF Project No. 2015-016

August 9, 2016

TCF Architecture

ACKNOWLEDGEMENTS

OVERVIEW

TCF wishes to extend its gratitude to the many individuals who provided time and insight to the Predesign work.

Name	Title	Representing
Owner		
Randy Witt	Public Works Director	City of Shoreline
Lance Newkirk	Operations Manager	City of Shoreline
Noel Hupprich	Capital Project Manager	City of Shoreline
Kirk Petersen	Parks Sup.	City of Shoreline
David LaBelle	PW Maint. Sup.	City of Shoreline
Steven Smith	PW Maint. Lead	City of Shoreline
Eric Gilmore	Sr. Engineer Tech.	City of Shoreline
Uki Dele	SW Utility Manager	City of Shoreline
Tina Kendall	Env. Service Tech.	City of Shoreline
Quang Nguyen	Traffic Engineer II	City of Shoreline
Allan Unger	WW Maintenance	City of Shoreline
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Brian Straathof	Facilities	City of Shoreline
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Study Team		
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Greg Brower	Landscape Architect	Berger Partnership
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1 - EXECUTIVE SUMMARY REPORT

OVERVIEW AND PROJECT PURPOSE

The City of Shoreline purchased the former King County Maintenance yard off of Ballinger Way and 25th Ave adjacent to Brugger's Bog Park, to consolidate and expand the City's maintenance departments on one site. The site was renamed the North Maintenance Facility (NMF). The site presently contains existing structures including a one story wood framed building, a pre-engineered storage canopy and a covered fuel canopy with dispensers, and above ground fuel tanks. The site is currently used for fueling by City and police vehicles and storage of miscellaneous items and material.



The NMF site is bounded by Brugger's Park on the north, 25th Ave NE on the east, zoned multifamily residential R-24 on the south and Ballinger Way on the Western edge. The eastern edge of the NMF site, along 25 Ave NE, floods during high rainfall events. The City is actively looking to correct this issue with the "25th Ave NE Floor Reduction Project". The intent of this project is to correct the flooding issue on the NMF site and street, the design strategy is yet to be determined. High ground water table and possible fish passage requirements could add complexity to the site design. It is expected that the flood reduction project will be behind the NMF project schedule, strategies for the NMF project will need to be implemented to prevent flooding of the site and new structures until the flood reduction project is complete.

In 2015, The City of Shoreline retained TCF Architecture to provide full architectural and engineering services for the NMF project. The Scope of Services is structured to accommodate the phased nature of the project. The following provides a general description of the project phases. This report covers Phase 1 of this project.

Phase 1 - Master Planning and Preliminary Design:

Develop space requirements, preliminary site investigations, prepare conceptual layouts, prepare facility master plan, manage a public input process, complete a preliminary design and cost estimates for the NMF. In addition, the master planning and space requirement work will consider the City's existing Hamlin Maintenance Facility and how it could be used in combination with the proposed NMF.

Phase 2 - Final Design and Project Bidding:

Complete final architectural design and engineering, prepare project specifications, obtain all necessary permits, prepare any critical area mitigation plans, and perform project bidding using State of Washington and City of Shoreline public works procurement criteria.

Phase 3 - Construction and Commissioning:

Construction management, inspection and material testing, facility commissioning, system testing, facility O&M training, and warranty compliance.

PROJECT VISION AND VALUES

The following is a list of general goals to be integrated into the project set forth by the group for the North Maintenance Facility project based on the City of Shoreline and Public Works mission, vision and values:

- "Working together, protecting our resources, making a difference"
- Excellent customer service
- Fiscal responsibility
- Long term protection of public assets
- Responsible environmental stewardship
- Efficient and safe work methods
- Progressive use and deployment of technology
- Active and long term planning
- Team of professionals
- Communicate effectively
- Create a work environment that is innovative, supportive and enjoyable

COMMUNITY COMMENTS / CONCERNS

On February 1st, 2016 at a community meeting with the Ballinger Neighborhood Association, City of Shoreline staff provided a high level overview of the project and how the City is trying to meet its current and future operational needs. Comments from the community are summarized below.

Aesthetic:

- Desire to have the site developed and be seen as an asset in the neighborhood; i.e. attractive building facades, land and streetscaping, etc.

Environmental:

- Decant operations – Make sure to address odor control; especially if WW uses the decant site for its waste stream
- Lighting – Desire to have more information on the exterior lighting plan when available
- Noise – Audible vehicle backing alarms and after hour operations
- Vector control – Having a plan to address/prevent rodents from becoming a problem from the on-site spoils/waste products
- Vehicle idling – Emissions and noise
- Water quality

Site Development:

- Access – Consider providing vehicle access off of Ballinger Way to reduce vehicle traffic on 25th
- Parking – Make provision for electric vehicle charging station(s)and no on-street parking
- Fueling – Wanted more information on quantity of fuel to be stored on site and storage configuration (above or below ground)

Traffic:

- Pedestrian Safety – Ensure pedestrian, especially children, needs (sidewalks) are addressed
- Traffic volume – Desire to have more information on the number of vehicle trips expected in and out of the site on a daily basis

Other:

- Public meeting space – Desire expressed to provide public meeting space in admin building for community use
- Restrooms – Desire expressed to build public restrooms for use by Brugger's Bog park users
- Communications – Interested in having every six month or so check-in with the neighborhood as the project progresses

PROGRAMMING

The programming documents were developed during an initial two-day workshop held at the City of Shoreline in December of 2015, with representatives of the City's Streets, Surface Water Management, Waste Water, Police, and Environmental Services. Follow up sessions were also held, to review staff comments for incorporation into the final program document. The purpose of the programming workshops were to review all functions supporting City maintenance operations, and develop a program of current and projected space needs, tied to projections for anticipated City growth over a minimum 20 year planning horizon. This program is intended for use in establishing a recommended minimum facility size.


Work Shop Day 2

Space Design Criteria:

This document provides the functional requirements for all program areas (rooms and spaces) including essential adjacencies, equipment and furnishings.

Space Program:

This document provides a comprehensive list of spaces, for buildings and the site, their required square footages. The creation of this document is the initial step in listing out required spaces for the NMF.

Vehicle Parking Analysis:

This document provides a comprehensive list of current vehicle and rolling stock counts, their sizes, and parking requirements.

Preliminary Equipment List:

This document provides a comprehensive list of new and existing equipment, their sizes, and utility requirements for each space.

The table below is the Space Program Summary by type of space

Program Type	Gross Area (SF)	Description
Administrative	1,664	Offices, Conference rooms, Lobby
Crew	4,711	Crew rooms, Mud room, Locker rooms, etc.
Support	959	IT, Electrical rm, Toilet rooms, Custodial, etc.
Maintenance Shops	5,702	Carpentry, Fabrication, Facilities, Multiuse vehicle bays, etc.
Enclosed Equip. / Materials Stor.	4,055	Semi heated space for Hazmat & Tool storage, Working stock, etc.
Enclosed Vehicle Storage	1,008	Semi-Heated space for temperature sensitive vehicles
Covered Vehicle Storage	13,116	Covered storage for non-temperature sensitive vehicles
Covered Equip. / Material Stor.	5,174	Covered storage for non-temperature sensitive equipment
Covered Fueling/Wash	1,760	Fuel and Wash facilities
	38,150	**Total Minimum Program Area**

Personnel:

The table below shows total crew and staff required for the NMF with 20-year growth projections.

Current Staffing - 2015 (20 year projections)

	Crew	Sup.	Mgr.	Seasonal	**Totals**	Remarks
Streets	8 (10)	1 (1)	1 (1)	2 (4)	**12 (16)**	
Surface Water	3 (4)	1 (1)	-	2 (3)	**6 (8)**	
Waste Water	6 (6)	1 (1)	-		**7 (7)**	
Facilities	1 (2)	1 (1)	-	1 (1)	**3 (4)**	
Fleet	-	-	-	-	**0**	Possible future mobile mechanic
Traffic	-	-	-	-	**0**	Storage and shop space
Police	-	-	-	-	**0**	Storage of vehicles and pallets
Admin	-	-	-	-	**0 (1)**	
TOTALS	**18 (22)**	**4 (4)**	**1 (1)**	**5 (8)**	**28 (36)**	

Vehicles (All Rolling Stock including trailers and attachments):

Vehicles and rolling stock are categorized by Large, Medium, Small, X-Small and XX-Small. The City staff desire that all vehicles and rolling stock be canopy covered at a minimum, while vehicles with weather sensitivity be enclosed and heated. See below for an abbreviated list of vehicles that will be domiciled on the NMF site. In addition to the programmed parking for city-owned vehicles, 35-40 employee parking stalls plus 4 visitor stalls are included in the program. See detailed vehicle parking analysis document for a full break down of vehicles and rolling stock.

	Large	Medium	Small	X-Small	XX-Small	**Totals**	Remarks
Heated/Enclosed	1	1	-	-	-	**2**	
Covered	2	15	28*	9	21	**75**	*(2) Police impound, secured
Uncovered	-	-	10*	-	-	**10**	*Police vehicles
Totals	**3**	**16**	**38**	**9**	**21**	**87**	

(*) Note: Not shown on site layout alternatives. These could be accommodated at the Hamlin property after Public Works vacates the site.

SITE LAYOUT SELECTION AND DESIGN

8 total site alternative layouts were produced showing varying building and site configurations. The site layout selection process involved noting opportunities and constraints for the following criteria: Vehicle Circulation, People Circulation, Building Layout/Space Program, Economics and Environment, Regulation, and Community. All site alternative layouts have common considerations including significant grading, possible high retaining and stormwater management costs, clear efficient people circulation, and limited or no building expansion. Each achieves a successful design outcome accommodating the primary program, addressing neighborhood concerns and provides functional circulation for large vehicles.

Based on all the criteria, the Public Works staff and Study Team found that site layout alternative B.1 would provide the most opportunity to accommodate program needs for the 20-year planning horizon and beyond. City Council is also in

agreement that site layout alternative B.1 is best and should be explored further. Site alternative B.1 does require the acquisition of an adjacent parcel to the south. If the acquisition of this property is not feasible, site alternative B would move forward which allows for the future acquisition of the property. City staff are in the process of making contact with the property owner of the adjacent property to initiate conversations regarding a property sale. In the site layout analysis matrix, the added south parcel was included in B.1 only, however, the acquisition of the property and its opportunity and constraints could be applied to each site layout alternative.

Site layout B.1, shown below, consists of 4 buildings, summarized below:

Building A:

A two-story building providing office and crew facilities for Waste Water, Public Works, Surface Water Management with limited presence of Facilities, Traffic Engineering, Environmental Services employees, including locker rooms, mud room, wellness room, dispatch rooms, multipurpose/lunch room, lobby, supervisor offices and shop and multi-use bays.

Building B:

A one-story canopy with walls on three sides providing covered, unheated storage for vehicles and equipment including snow plows, spreaders and trailers with mounted equipment.

Building	Gross Area
Building A: Operations/Shops	15,500 SF
Building B: Vehicle/Equip Stor.	8,090 SF
Building C: Vehicle/Equip Stor.	17,660 SF
Building D: Vehicle/Equip Stor.	4,220 SF
Total Program Area	**45,470 SF**
Site Area	**140,930 SF**

Building C:

A one-story building providing both enclosed/heated and canopy covered vehicle and material storage as well as wash and fueling bays.

Building D:

A one-story canopy with walls on three sides providing covered, unheated storage for equipment and materials including salt and sweeper spoils, as well as a decant facility.



PROJECT ECONOMICS

Preliminary costs budgets for four site layout alternatives were prepared by the Design Team using recent cost history from similar projects. The broad cost categories are used to determine initial budgetary estimates for construction at this Predesign phase. Site costs are organized into a number of sub-categories allowing for a sufficient level of cost detail, while building costs are based on building types such as administrative/crew facilities, enclosed storage facilities, canopy covered storage and fuel and wash facilities. In addition to the "hard" construction cost estimates, budgets for "soft" costs such as sales tax, professional services fees, permit fees, special testing fees, along with budgets for furnishings, fixtures and equipment (FF&E), land costs and contingencies. The combination of hard and soft costs provides a total budget, including escalation with the current schedule.

Total budgetary costs range from $14 million to $18 million, summarized below, among the 4 site layout alternatives. For general comparative purposes, a 5% range, 2.5% above and below the preliminary budget number. Primary differences in cost between the site layout alternatives include varying building square footages, land acquisition cost of the adjacent parcel, and potential wetland mitigation. It is assumed that the site would be completely upgraded regardless of which site layout alternative is selected. Site cost numbers are consistent throughout, except for B.1 because of the additional site area. As noted in section 3 of this report, site layout alternative B.1 has been selected to be explored further. Costs for this alternative range between $17.1 - $18 million. Site layout alternative B.1 does require the acquisition of an adjacent parcel to the south. If the acquisition of this property is unsuccessful, site alternative B, with an estimated range of $15.9 - $16.7 million, would move forward. A more detailed estimate will be completed for site layout alternative B.1 in the upcoming Schematic Design phase.

Table 5A - Summary of Site Layout Alternatives Cost Models

	Site Alternative A	Site Alternative B	Site Alternative B.1	Site Alternative C
Preliminary Budget	$14,333,920	$16,273,117	$17,690,095	$16,851,253
5% +/- Range	$14.0 - 14.7 million	$15.9 - 16.7million	$17.1 - 18.0 million	$16.4 - 17.3 million

SCHEDULE

The City and the Design Team are reviewing the feasibility of preparing a separate early site development contract followed by a final site development and building package in order to compress overall construction schedule. The early site package could include demolition of existing structures, clearing and grubbing, rough grading, major utilities and storm water systems. The final site development and buildings packages will include remaining utilities, final site work and landscaping.

Preliminary Schedule	
Design	May 2016 - April 2017
Construction	Dec. 2016 - March 2018
Occupancy	April 2018

SUSTAINABILITY

The group discussed general sustainability goals for the project. The City has a sustainability goal of LEED Silver with the possibility of pursuing LEED Gold for the main building. Several strategies for obtaining certification include maximizing mechanical, water and electrical efficiencies, high recycled content material, daylighting, and low impart stormwater strategies. See Section 4 of this report for the LEED scorecard. Additional sustainability discussions will be held as part of the subsequent Schematic Design phase.

LAND USE AND PERMITTING

On March 15, 2016 TCF Architecture along with representatives from the City of Shoreline Public Works department met with the City of Shoreline's Planning and Community Development department for a Pre-Application meeting to review initial site and building concepts in relation to codes and regulations. A Special Use Permit (SUP) is required based on the NMF site zoning of R-24 and the proposed facility being categorized as a Government Public Agency Office and Yard Facility. SUP requires a public process involving a public meeting and a hearing examiners review who will make a determination on the proposal. Timeline is 4-6 months. Other required items include Building Permits, State Environmental Policy Act (SEPA) review, National Pollutant Discharge Elimination System (NPDES) Permit, contamination clean up, traffic impact analysis, and frontage improvements. All buildings will be fully accessible as required.

NEXT STEPS

The direction to proceed with site layout alternative B.1 permits the project to move forward into the second phase of the project. The project will transition into the Schematic Design phase in order obtain a more thorough cost estimate. Schematic level designs will include the development of floor plans, elevations, building sections, 3D massing, architectural character and engineering drawings.

2 - PROGRAMMATIC DESIGN CRITERIA

OVERVIEW

Section 2 is comprised of the following bound booklet entitle Programmatic Design Criteria which includes the space design criteria document, building program summary, space program, vehicle parking analysis and preliminary equipment list documents.

North Maintenance Facility (SNMF)
City of Shoreline

Programmatic Design Criteria

TCF Project No. 2015-016

August 9, 2016

TCF Architecture

SPACE DESIGN CRITERIA

OVERVIEW

This document provides the basic functional criteria for the rooms, spaces and functions programmed for the facility, including essential adjacencies, equipment and furnishings. The development of this preliminary program is the result of several workshops conducted by TCF Architecture with the City's program development team. (See acknowledgments for participants)

CITY OF SHORELINE

NORTH MAINTENANCE FACILITY

SPACE DESIGN CRITERIA

WORKSHOP 1/2 – SUMMARY NOTES

Meeting Date: December 1, 2 and 16 2015

Location: City of Shoreline City Hall

PROGRAMMING WORKSHOP ATTENDANCE

Name	Title	Representing
Randy Witt	Public Works Director	City of Shoreline - PW
Kirk Petersen	Parks Sup.	City of Shoreline - Parks
David LaBelle	PW Maint. Sup.	City of Shoreline - Streets
Steven Smith	PW Maint. Lead	City of Shoreline - Streets
Eric Gilmore	Sr. Engineer Tech.	City of Shoreline - SWM
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Noel Hupprich	Capitol Project Mgr.	City of Shoreline
Randy Cook	Principal / Project Manager	TCF Architecture, pllc
Mark Hurley	Project Architect / Co-Manager	TCF Architecture, pllc
Darrell Smith	Civil Engineer	Perteet, Inc.
Dustin Dekoekkoek	Civil Engineer	Perteet, Inc.
Frank Coleman	Industrial Engineer	Pinnacle Consulting Group

1 - Project Overview

Overview

The City of Shoreline purchased the former King County Maintenance yard located off of Ballinger Way and 25th Ave, adjacent to Bruggers Bog Park, to consolidate and expand the City's maintenance departments on one site. These departments include Public Works, Streets (ST) and Surface Water Management (SWM), Ronald Waste Water (WW) groups, with limited presence of Facilities, Traffic Engineering, and Environmental Services.

Project Vision and Values

The following is a list of general goals set forth by the group for the North Maintenance Facility project based on the City of Shoreline and Public Works mission, vision and values:

- "Working together, protecting our resources, making a difference"
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SUSTAINABILITY

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EXISTING SITE

The City of Shoreline purchased the former King County Maintenance yard off of Ballinger Way and 25th Ave adjacent to Brugger's Bog Park, to consolidate and expand the City's maintenance departments on one site. The site presently contains existing structures including a one story wood framed building, a pre-engineered storage canopy and a covered fuel canopy with dispensers, and above ground fuel tanks. The site is mainly used for fueling by City and police vehicles and storage of miscellaneous items and material.

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2 – Personnel, Vehicles and Equipment

Personnel

The North Maintenance Facility (NMF) will include Public Works, Streets and SWM, WW groups, and include Facilities, Traffic Engineering groups on a part time basis. For long term planning purposes the total will show current and future growth projections for a planning period of approximately 20 years.

CURRENT STAFFING - 2015 (20 YEAR PROJECTIONS)

	Crew	Sup.	Mgr.	Seasonal	**Totals**	Remarks
Streets	8 (10)	1 (1)	1 (1)	2 (4)	**12 (16)**	
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Traffic	-	-	-	-	**0**	Storage and shop space
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	Large	Medium	Small	X-Small	XX-Small	**Totals**	Remarks
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Uncovered	-	-	10*	-	-	**10**	*Police vehicles
TOTALS	**3**	**16**	**38**	**9**	**21**	**87**	

(*) Note: Not shown on site plan alternatives. These could be accommodated at the Hamlin property after Public Works vacates the site.

Equipment and Storage

A full equipment list will be provided as part of the final Predesign report

3 – Program – Admin and Crew Facilities

Lobby/Waiting Area

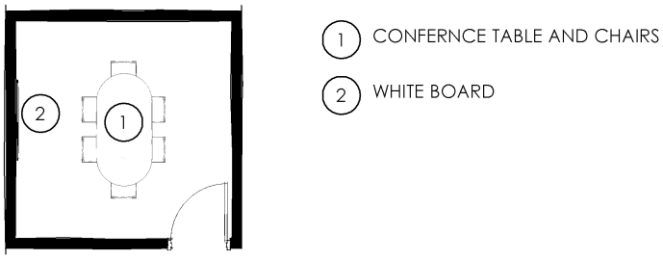
- Welcoming main entry for guests and "front door" control point for the building
- Assume the building will require occasional access by public visitors
- City staff from other departments may use the facility for meetings
- 2-3 chairs and a small table
- Posting area
- Exterior sign and/or bell to until the reception desk is staffed

Reception/Admin Asst.

- Built-in reception counter and workstation (no position at this time)
- Provide line of sight from reception desk to lobby, entry area, parking and crew yard if possible
- Direct access/adjacency to lobby

Small Conference Room

- Space for (4) people
- Table and chairs, white board
- Can function as a future office
- One adjacent to lobby



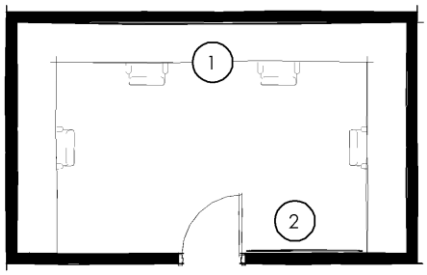
Enclosed Office

- For Operations and Utility Manager as well as Supervisors
- Workstation with 2 chairs, bookcase and white board



LEAD OFFICE

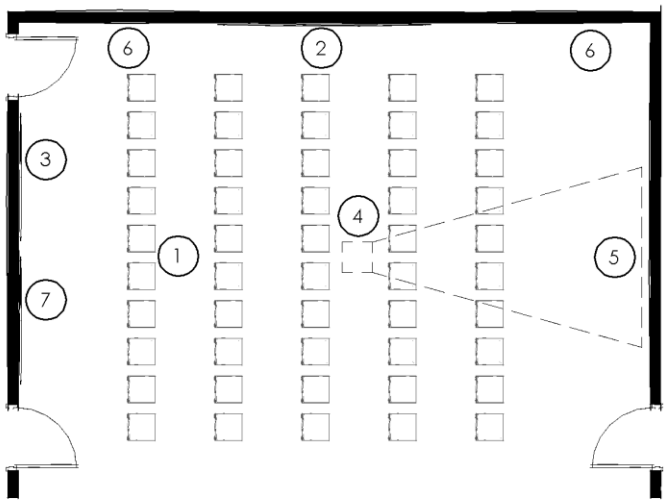
- Open office for Leads to share
- Modular or built-in wrap around counter
- 3-4 workstations
- White board



1 BUILT IN COUNTER (4) WORKSTATIONS
2 WHITE BOARD

MULTI-PURPOSE ROOM

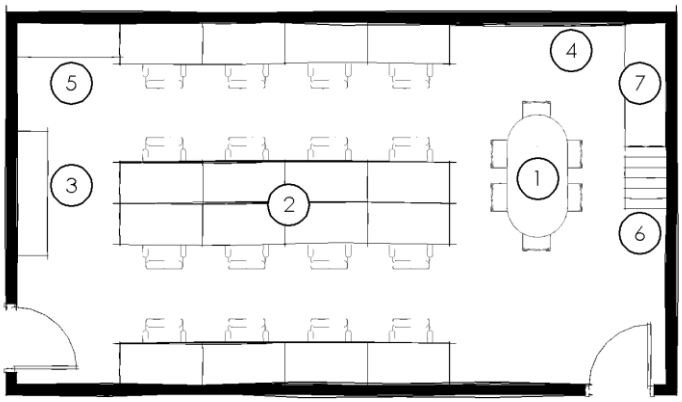
- Table seating for 40, (nesting tables for storage within the space)
- Chair seating for 50 people min
- To be used for dispatch, all hands meetings and training sessions, shared by all crew
- Available for use by other city departments
- Projector and projector screen (ceiling mounted), (2) flat screen TV's
- Minimum 10 lineal feet of white board
- Large city map, with additional maps in adjacent hallway
- Views to yard if feasible



1 (50) CHAIRS, (30-40) PEOPLE AT TABLES
2 WHITE BOARD
3 CITY MAPS
4 PROJECTOR
5 PROJECTOR SCREEN
6 FLATSCREEN TV
7 WALL PIN UP SPACE

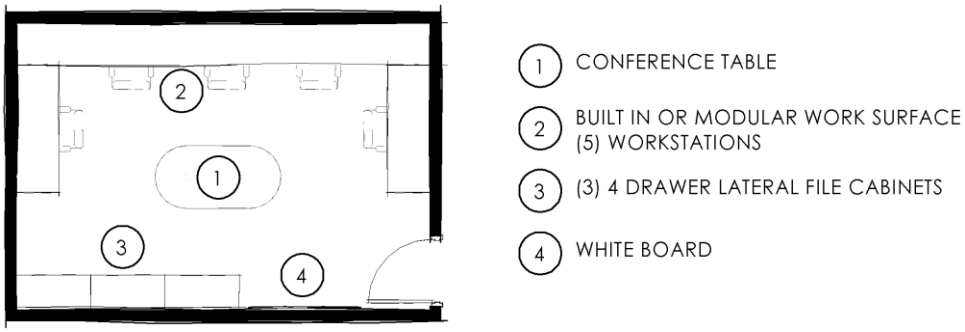
STREETS/WW CREW AND DISPATCH ROOM

- Shared space between Streets and WW for crew meetings and dispatching
- Adjacent to multi-purpose room
- (1) workstation per 2 people
- Stand up counter with stools
- Map/drawing storage with adjacent layout counter
- Conference table with chairs (6 people)
- Maximize white board space, add sliding white board if needed
- Radio charging location



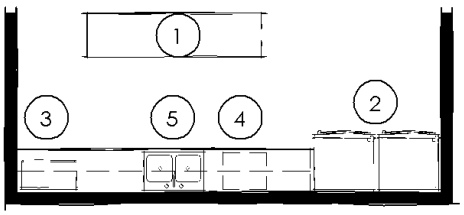
SWM CREW AND DISPATCH ROOM

- 5 workstations at built-in counter, desk height
- Conference table and chairs (4 people)
- (3) 4 drawer lateral file cabinets
- White board



KITCHENETTE

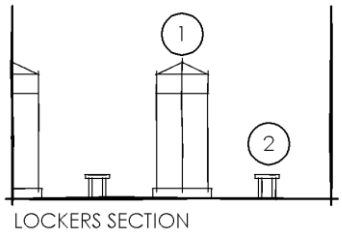
- Open to multi-purpose room
- Shared by all personnel
- (2) full size refrigerators, (2) microwaves, dishwasher, upper and lower cabinets, island dividing kitchen and multi-purpose if space allows
- Confirm if stovetop is required, additional ventilation will be required



1 ISLAND WITH BASE CABINETS
2 (2) REFRIGERATORS
3 (2) MICROWAVES STACKED
4 DISHWASHER
5 SINK WITH DISPOSAL

LOCKER ROOMS (MEN'S AND WOMEN'S)

- Sinks, toilets, urinals (min 2) to meet code minimum
- (30)-(35) 12" wide full height standard lockers in men's locker room away from toilets for personal belongings. Provide raised concrete base
- (6)-(10) 12" wide full height standard lockers in women's locker room away from toilets for personal belongings. Provide raised concrete base
- Benches
- Floor drains
- Tile floors and walls for durability



LOCKERS SECTION

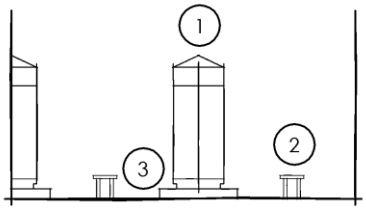
1 LOCKERS ON CURB
2 BENCH

SHOWER FACILITIES

- (2) Enclosed private ADA shower stalls with changing area
- Tile floors and walls for durability

MUD ROOM

- Unisex space for secure storage of field gear
- Provide up to 45 cage lockers, 24” wide by 18” deep
- Boot dryers integrated into mechanical system and concrete base
- Well ventilated space to prevent odor and allow gear drying
- Benches
- Floor drains



LOCKER SECTION

1 LOCKERS ON CURB

2 BENCH

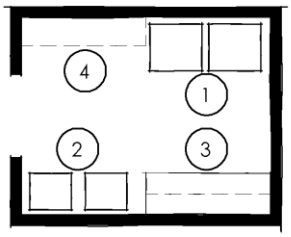
3 BOOT DRYER NOZZLES BELOW LOCKERS

BOOT WASH

- Canopy covered
- Adjacent to main crew entry to mud room from yard
- Hose bib, sump with grating, boot scrubber
- Direct access to mud room

UTILITY ROOM

- (2) sets of stacking washer and dryer units
- (2) deep sinks with goose neck faucets
- Clothes hanging rod
- 6’-8’ counter top with upper and lower cabinets
- Floor drain
- Integral with or direct access to mud room



1 (2) STACKED WASHER AND DRYER

2 (2) DEEK SINKS

3 COUNTER TOP, LOWER AND UPPER CABINETS

4 HANGING RODS

WELLNESS ROOM

- Space for exercise equipment shared by all facility personnel
- Can function as a future office

COPY/PRINT ALCOVE

- Copier/printer
- Upper and lower casework
- 6 - 8 linear feet of counter top
- Recycle and refuse bins
- Centrally located to offices

MAILBOX ALCOVE

- Centrally located to offices
- 1 mailbox for each crew member up to 40 slots

SERVER RM, ELECTRICAL RM, MECHANICAL RM

- Primary IT systems hub
- Location on mezzanine if space allows and building design

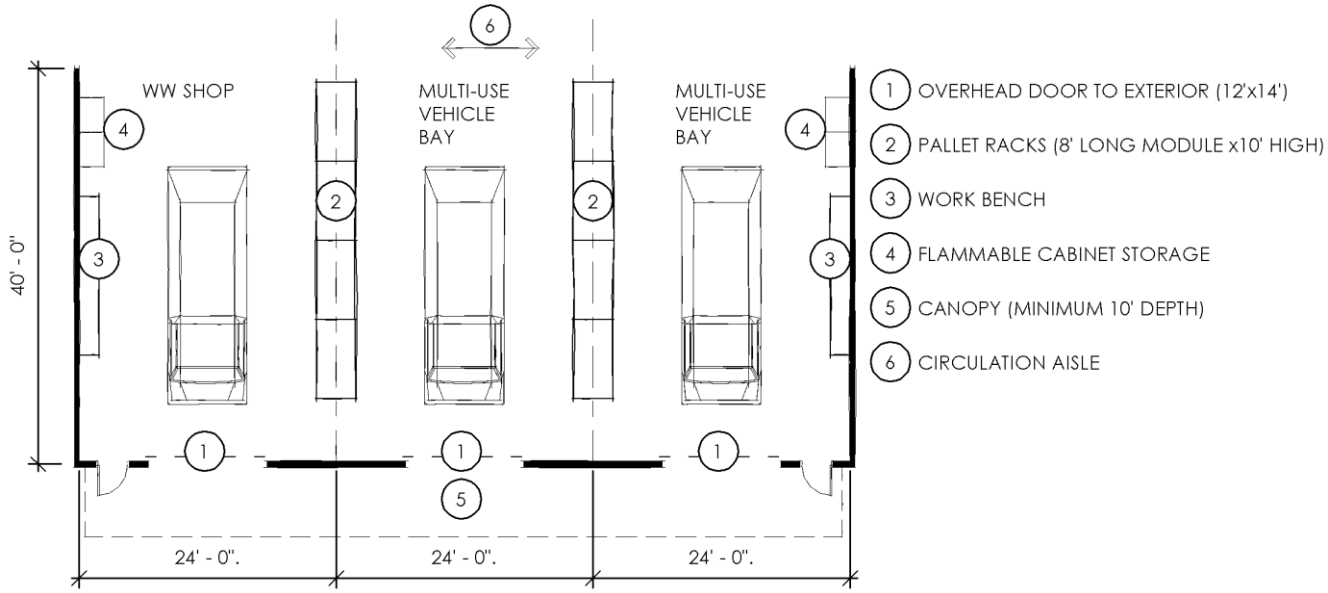
CUSTODIAL ROOM

- Mop sink /rack
- Storage space for janitorial items
- Centrally located, adjacent to mud and locker rooms

4 – Program – Shop and storage Facilities (Heated Enclosed)

Waste Water Shop

- Main shop for Waste Water crew
- Work bench, with small tool storage above and below
- 12'x14' overhead door with direct access to exterior
- Canopy at exterior above overhead doors
- Flammable cabinets

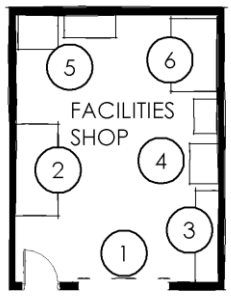


Multi-Use Vehicle Bays (see previous diagram)

- Vehicle parking and storage racks
- CRT events, City Hall temporary storage, mobile vehicle lifts
- Used by future city mobile mechanic while not in use by NMF crews
- Used by Police for light duty maintenance while not in use by NMF crews

Facilities Shop

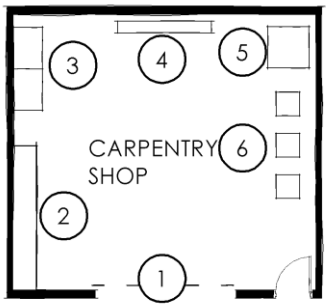
- Main shop for facilities staff
- Work bench, fuel reader station
- 8' x 8' overhead door with direct access to exterior if layout allows
- Flammable cabinets
- Include water quality lab with work bench and storage cabinet/rack
- 6'x4' cabinet testing and work bench and lap top for traffic engineer
- Variety of storage rack systems



1. OVERHEAD DOOR
2. PALLET RACK
3. WORK BENCH
4. FLAMMABLE CABINET STORAGE
5. WATER QUALITY LAB WITH BENCH
6. CABINET TESTING WITH BENCH

CARPENTRY SHOP

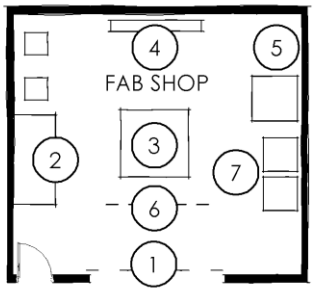
- Shared wood working shop
- Provide dust collection system, table saw, chop saw, sander, work bench and stock storage ½ sheets
- 10'x12' overhead door with direct access to exterior if layout allows, smaller overhead door if interior access only



1. OVERHEAD DOOR
2. WORK BENCH
3. FLAMMABLE CABINET STORAGE
4. STOCK STORAGE RACK
5. DUST COLLECTION SYSTEM
6. TABLE SAW, CHOP SAW, SANDER

FAB SHOP / COMMON WORK

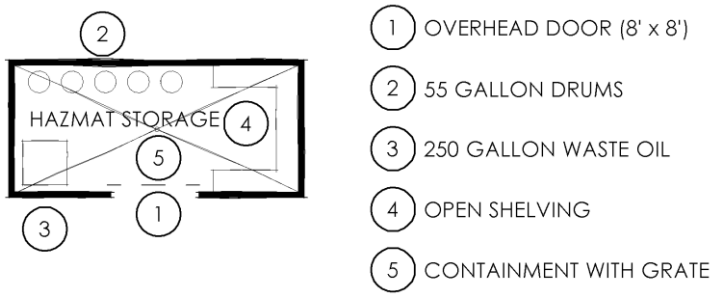
- Shared area for low volume steel fabrication and other general purpose work
- Welding table, welding / fab equipment, ventilation boom, welding curtain
- Work benches
- 10'x12' overhead door with direct access to exterior if layout allows, smaller overhead door if interior access only



1. OVERHEAD DOOR
2. PALLET RACK
3. WELDING TABLE
4. STOCK STORAGE RACK
5. VENTILATION BOOM
6. WELDING CURTAIN
7. WELDERS

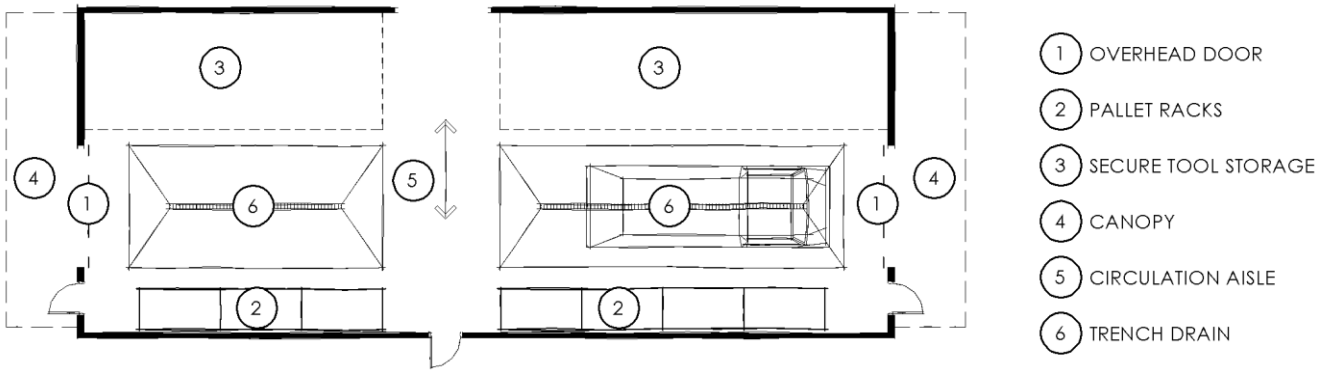
HAZMAT STORAGE

- Enclosed room for the storage of hazardous material
- Pesticides, (5) 55 Gal drums of release agent, 250 gal waste oil tank
- Provide containment system and ventilation
- 8’ x 8’ overhead door



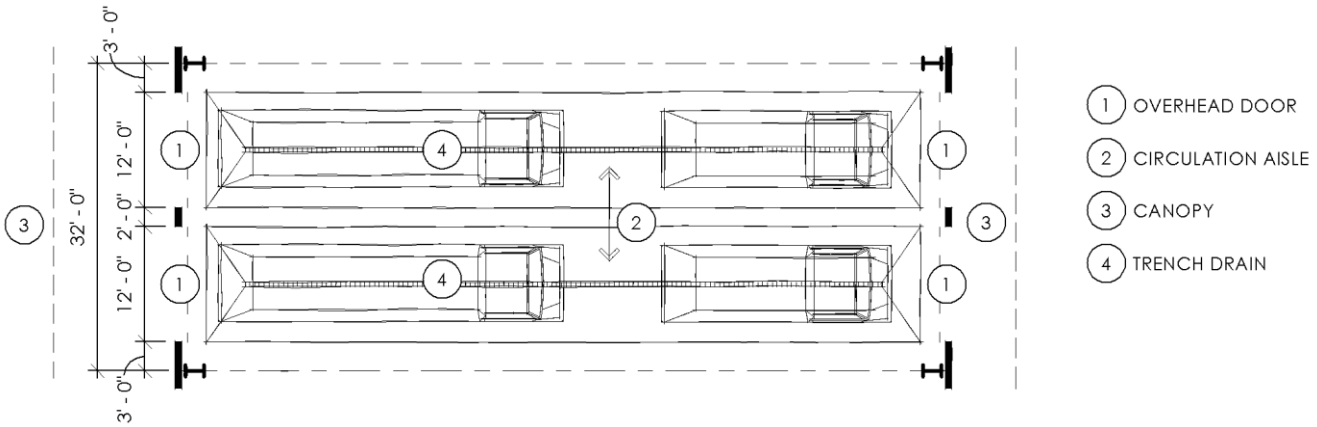
WORKING STOCK BAY

- Drive through bay
- Perimeter rack shelving for daily used items including pumps, man hole lids, concrete, other materials
- Locate police storage here, 2-3 pallets
- 12’w x 14’h overhead doors
- Storage for power tools, pressure washers and specialty tools, fenced areas
- Street sign storage, 24 lineal feet, some double stacked with sign rack system, on pallet racks
- Trench drains



ENCLOSED VEHICLE PARKING (SEE FULL VEHICLE AND EQUIPMENT INVENTORY)

- Large and medium vehicle sizes
- Temperature will be kept above freezing
- Trench drains, 1/8" slope per foot
- 12'w x 14'h overhead doors
- Trench drains



WASH BAY EQUIPMENT ROOM

- Wash bay water reclaim equipment
- Adjacent to wash bay

UNISEX TOILET ROOM

- Single toilet stall and sink
- For convenient access while in shop and vehicle storage areas
- Provide two rooms

CUSTODIAL ROOM

- Mop sink /rack
- Storage space for janitorial items
- Centrally located

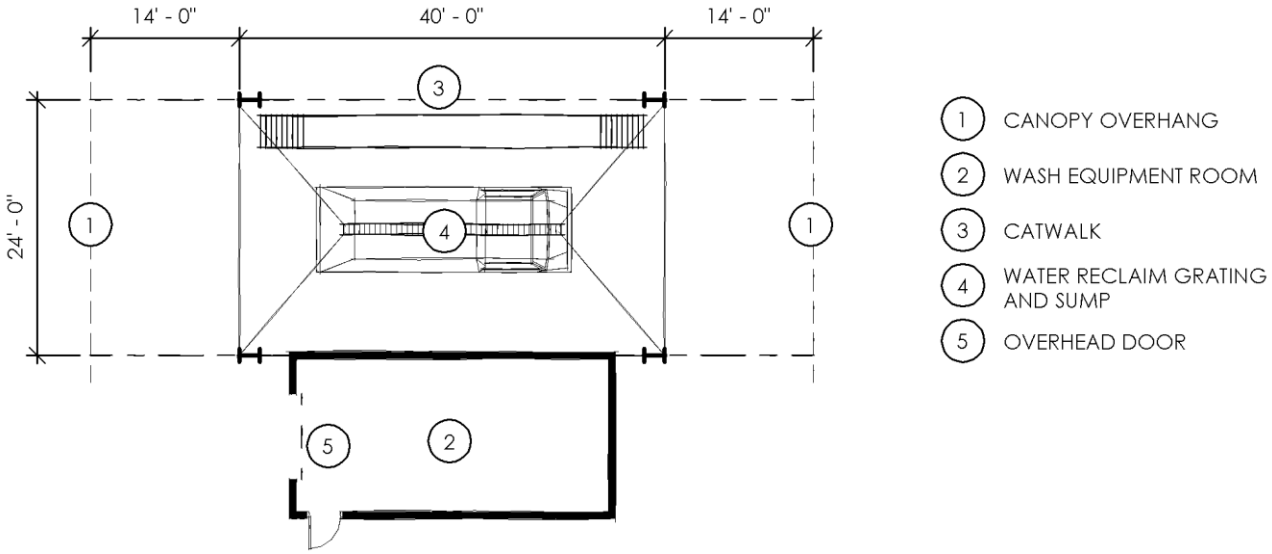
MEZZANINE

- Mechanical room, Electrical room, IT room, if layout allows

5 – PROGRAM –STORAGE FACILITIES (CANOPY COVERED)

WASH BAY

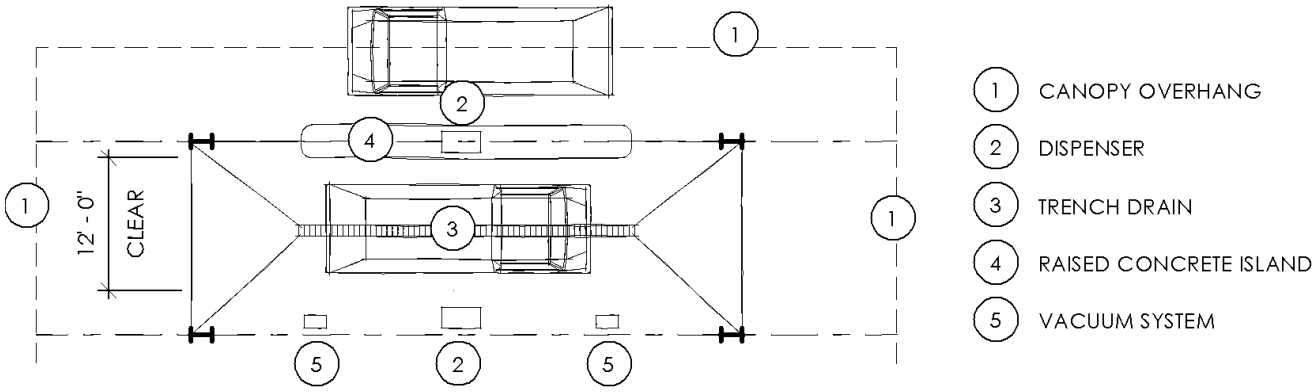
- Wash down of all vehicles and equipment with manual spray wand, heated water
- 1 1\2" hose connection, trench drain to water reclaim system
- Pressure washer with ¾" hose connection
- Convenient access, end of a structure
- Catwalks on one side (two if space allows)
- Flexibility to wash large and small vehicles, with trailers
- Water reclaim system with sump and grating



FUEL ISLAND

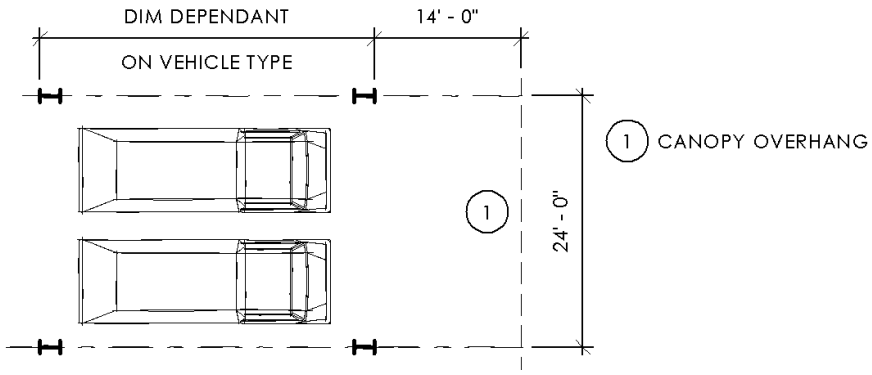
- (2) fueling positions for diesel, (2) for unleaded
- Provide access by all vehicles sizes including trailered equipment
- Convenient access, end of a building towards the front of the site
- Gas (10,000 gallons) and Diesel (5,000 gallons) tanks, above or underground tanks. Quantity to be determined
- Fuel management system accommodating all city vehicles
- The fuel lane should be 20 feet wide by 55 feet long
- Some vehicles fuel on the right and some on the left
- Provide duplicate dispensers on the fuel lane to provide back-up
- Provide a central vacuum system with a 10 foot hose (2 inch diameter) at the front and rear door locations.

- Typically fuel is delivered by double tanker, provide access
- Trench drain, route to dead end sump



VEHICLE STORAGE (SEE FULL VEHICLE AND EQUIPMENT INVENTORY)

- Police vehicle impound, fenced with privacy slats at minimum
- Several sizes, large, medium, and small
- 1-4 surplus vehicles of varying sizes, can be uncovered
- Trench drains at double loaded canopy, 1/8" slope per foot. At single loaded canopy slope away from back wall



MATERIALS AND EQUIPMENT STORAGE (SEE FULL VEHICLE AND EQUIPMENT INVENTORY)

- Barricades, cones, candle sticks, traffic control signs, steel sign parts (10'-12' lengths), etc. (Streets)
- Snow plows and other vehicle attachments
- Spill response kits, erosion control, car wash kits (SWM)
- 2 radar trailers (Size of dolly) need outlet for charging and space for back up battery, sign boards, 1 spare 6'x4' cabinet (Traffic)
- Misc. valves, pipe and clean outs (WW) 2 racks
- Shared by all groups
- Use floor area as well as pallet racks
- Provide canopy and walls at back and sides (open at front)

SANDER BOX STORAGE

- Hung from structure or ground mounted frame

PLOW BLADE STORAGE

- At back wall of storage canopy

VACTOR DECANT CANOPY

- Manhole for wastewater decanting
- 2" water filler
- Consider use of hay bales for drain protection from solids
- Concrete or ecology block back wall
- Slope concrete to manhole

SWEEPER SPOILS CANOPY

- Space to empty sweeper debris and allow to drain liquids
- Concrete or ecology block back wall
- Slope concrete to drain

MATERIALS STORAGE CANOPY

- Salt is delivered off of truck by conveyor belt
- Convenient if salt and deicer are adjacent to each other but not required
- Push wall at back and sides
- Salt storage to have a screen on all 4 sides to protect from weather
- Concrete or ecology block back and side walls

6 – PROGRAM –SITE STORAGE

DEICER TANK

- Approximate size of 8400 gallons
- Electric pumping system with canopy
- Double walled so secondary containment is not required
- Near salt storage if space allows

BULK MATERIALS BUNKERS

- Use ecology blocks to separate material types
- 5/8" minus - 5-10 yards
- 1 ¼" minus - 5-10 yards
- Asphalt waste - 5-10 yards
- Concrete waste - 5-10 yards
- Brush - 5-10 yards
- 20 yard dumpsters (Garbage, metal recycling, street sweeper collection), provide raised vehicle access if site area allows, provide for convenient vendor delivery and collection
- Pole storage - laydown area for minimal quantities of poles and pipes

GENERATOR

- Concrete pad
- Confirm generator size, to power full site

SPACE PROGRAM

OVERVIEW

This document provides a comprehensive list of spaces, for buildings and the site, with their minimum required square footages.

CITY OF SHORELINE

North Maintenance Facility

BUILDING PROGRAM SUMMARY

Program Type	Gross Area (SF)	Description
Administrative	1,664	Offices, Conference rooms, Lobby
Crew	4,711	Crew rooms, Mud room, Locker rooms, etc.
Support	959	IT, Electrical rm, Toilet rooms, Custodial, etc.
Maintenance Shops	5,702	Carpentry, Fabrication, Facilities, Multiuse vehicle bays, etc.
Enclosed Equipment/ Materials Storage	4,055	Semi heated space for Hazmat storage, Tool storage, Working stock, etc.
Enclosed Vehicle Storage	1,008	Semi-Heated space for temperature sensitive vehicles
Covered Vehicle Storage	13,116	Covered storage for non-temperature sensitive vehicles
Covered Equipment/Material Storage	5,174	Covered storage for non-temperature sensitive equipment
Covered Fueling/Wash	1,760	Fuel and Wash facilities
	38,150	**TOTAL MINIMUM PROGRAM AREA**

This space program was developed during an initial two day workshop held at the City of Shoreline on December 1 and 2, 2015, with representatives of the City's Streets, Surface Water Management, Waste Water, Police, and Environmental Services. Follow up sessions were also held, to review staff comments for incorporation into the final program document. The purpose of the programming workshops were to review all functions supporting City maintenance operations, and develop a program of current and projected space needs, tied to projections for anticipated City growth over a minimum 20 year planning horizon. This program is intended for use in establishing a recommended minimum facility size.

SUMMARY OF PROGRAMMING

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WORKSHOP PARTICIPANTS

The following City staff participated in the workshop with TCF:

* Randy Witt, Public Works Director
* Kirk Peterson, Parks Sup.
* David LaBelle, PW Maint. Sup
* Eric Gilmore, SWM Sr. Eng. Tech
* Tina Kendall, Env. Serv. Asst
* Quang Nguyen, Traffic Eng. II
* Allan Unger, WW Maint.
* George Dicks, WW Maint Mgr.
* Cheryl Ooka, ASD Mgr
* Brian Straathof, Facilities
* Noel Hupprich, Cap Pjt. Mgr

TCF DESIGN TEAM

* Randy Cook, Principal, TCF Architecture
* Mark Hurley, Project Architect, TCF Architecture
* Darrell Smith, Civil Engineer, Perteet, Inc
* Frank Coleman, Industrial Engineer, Pinnacle Consulting

PROGRAM AREA SUMMARY

The summary below provides the total building and site program areas (square footage) derived from the breakdown of all programmed spaces included in this document.

	SF	
Building Program Area		
Enclosed / Heated Building Area	18,099	Administrative / Crew / Maintenance Shops / Vehicle Storage
Unheated / Covered Area	20,051	Vehicles and Equipment Storage / Materials Storage / Wash and Fueling / Decant
Total Building Program Area	**38,150**	
Site Program Area		
Bulk Materials / Miscellaneous Site	3,100	Open Bin Storage / Dumpster / Generator / Deicer
Total Site Program Area	**3,100**	

SUMMARY OF OPERATIONS STAFFING AND FUTURE GROWTH

The workshop participants discussed the current staffing levels and developed the following assessment and projections for the 20 year planning horizon. The program is based on a facility supporting 28 staff and crew with projected growth to 36. See the space design criteria document for a full break down of staffing.

SUMMARY OF VEHICLES AND ROLLING STOCK EQUIPMENT

Vehicles and Rolling stock are categorized by several differennt sizes totaling 87 pieces. All items are expected to be canopy covered at a minimum, vehicles and equipment with weather sensitivity will be enclosed and heated. In addition to the programmed parking for city-owned maintenance vehicles, plan for 35-40 employee parking stalls plus 4 visitor stalls. See detailed vehicle parking analysis document for a full break down of vehicles and equipment.

Space Description	No.	Proposed Space Standard	20 Year Program			General Space Purpose and Design Criteria	Adjacencies	Clear Height	Other Criteria / Equip. / Furnishing Needs
			Area (SF)	Qty.	Total Area				
ENCLOSED / HEATED FACILITIES									
ADMINISTRATION / PUBLIC / CREW									
Lobby / Waiting Room	A1	10 x 12	120	1	120	Assume the building will require occasional access by public visitors, as well as internal staff from other departments	Visitor and crew parking	9'	2-3 guest chairs and small table
Reception / Admin Asst.	A2	8 x 10	80	1	80	Provide line of sight from reception desk to lobby and to entry area, parking, and crew yard if possible	Lobby	9'	Built-in reception counter / workstation
Small Conference Room	A3	12 x 12	144	2	288	Provides space to meet with vendors up to 4 people. Future office space	1 adjacent to lobby	9'	Table with chairs, white board
Utility & Operations Manager Office	A4	12 x 12	144	1	144	Private office for manager	Near lobby	9'	work station, bookshelves, white board
Supervisor Office	A5	12 x 12	144	3	432	Private office for supervisors, Streets, WW and SWM	Adjacent to crew areas	9'	work station bookshelves, white board
Lead Office	A6	12 x 18	216	1	216	3-4 leads share open office area	Adjacent to crew rooms	9'	Work surface
Multi Purpose Rm	A7	24 x 32	768	1	768	Seating for 30-40 at chairs and tables, 50 people at chairs only. All hands meetings and training sessions	Kitchenette, convenient access to locker rooms, offices, direct access to Streets and WW crew room, near mailbox alcove	12'	Tables & chairs / (2) flat screens, city maps, posting space, 10' of white board. Projector and projector screen, additional maps in adjacent hallway
Streets and WW Crew & Dispatch Room	A8	18 x 32	576	1	576	Shared work room / map room for use by Streets and WW crew	Direct access to Multi purpose room and corridor. Adjacent to supervisor and lead offices	9'	Stand up height countertop with stool seating, shared computers, 1 per 2 crew. Sliding white board, radio charging station
SWM Crew/Dispatch Rm	A9	14 x 20	280	1	280	Crew and dispatch room for SWM		9'	5 workstations, conf table, (3) 4 drawer lateral files
Kitchenette	A10	6 x 14	84	1	84	Kitchen area shared by all staff and crew	Adjacent to, or contained within the multi purpose rm	9'	(2) full size refrigerators, (2) microwaves, dishwasher, lower and upper cabinets

Space Description	No.	Proposed Space Standard	20 Year Program			General Space Purpose and Design Criteria	Adjacencies	Clear Height	Other Criteria / Equip. / Furnishing Needs
			Area (SF)	Qty.	Total Area				
Men's Locker Room	A11	18 x 32	576	1	576	Private men's locker and toilet room. Toilets, sinks per plumbing code, (minimum 2 urinals)	Adjacent to mud room, wellness room	9' +	Provide space for up to (30-35), 12" wide full height standard lockers, benches. floor drains
Women's Locker Room	A12	14 x 18	252	1	252	Private women's locker and toilet room. Toilets, sinks per plumbing code	Adjacent to mud room, wellness room	9' +	Provide space for up to (6-10), 12" wide full height standard lockers, benches, floor drains
Shower	A13	5 x 8	40	2	80	Unisex private shower stall, ADA accessible	Adjacent to Toilet Rms	9'	Tile, shower accessories,floor drain
Mud Room	A14	18 x 32	576	1	576	Unisex space for storage and drying of wet gear / bulky gear	Adjacent to men's and women's locker rooms and utility room, exterior access, boot wash	9' +	Provide up to 45 cage lockers (24"W x 18"D). Boot dryers integrated into base of lockers, bench, floor drains
Boot Wash	A15	4 x 4	16	1	16	Cleaning of boots before entering the building, exterior space with canopy	Mud room, near exterior door		Hose bib, sump, grating, boot scrubber
Utility Room	A16	12 x 16	192	1	192	Cleaning of work clothing items	Mud room, near exterior door	9'	Provide 2 sets of stacking washer/dryer units / deep sink with goose neck faucets. Hanging rod and working counter. Floor drains
Wellness Room	A17	14 x 16	224	1	224	Open space for exercise equipment shared by all facility personnel. Use as future office	Near to locker rooms	9'	Exercise equipment such as staionary bike, weights, treadmill, to be provided by crew.
Copy/Print alcove	A18	6 x 8	48	1	48	Small area for printer/ copier	Near Sups offices	9'	Copier, shelves for paper storage, counter 6'-8' linear feet, Recycle bins
Mailbox Alcove	A19	4 x 6	24	1	24	Mailbox for each crew, up to 40 slots	Multi Purpose room	9'	
IT Room	A20	10 x 10	100	1	100	Primary hub for communications and data systems	Central to building	9'	
Custodial Room	A21	6 x 8	48	1	48	Mop sink/rack	Centrally located	9'	
Electrical Room	A22	10 x 10	100	1	100		Could be part of a mezzanine space	9'	
Mechanical Room	A23	10 x 17	170	1	170		Could be part of a mezzanine space	9'	
SUBTOTAL AREA					5,394				
Circulation / Walls / Misc			30%		1,618				
TOTAL ADMIN / CREW					**7,012**				

Space Description	No.	Proposed Space Standard	20 Year Program			General Space Purpose and Design Criteria	Adjacencies	Clear Height	Other Criteria / Equip. / Furnishing Needs
			Area (SF)	Qty.	Total Area				
MAINTENANCE / SHOPS / VEHICLES & EQUIPMENT									
Facilities Shop	M1	18 x 24	432	1	432	Main shop space for facilities crew / materials, tools. Water Quality lab and 1 cabinet testing space for Traffic	Adjacent to carpentry and fabrication shop	12'	Can be open to structure. 8 lineal feet of rack storage. Gas reading station. Can move to Hamlin site
Carpentry Shop	M2	24 x 30	720	1	720	Enclosed shop for wood working	Adjacent to other shops/storage	12'	Can be open to structure. Provide dust collection system. Table saw, chop saw, sander, work bench, stock storage, 1/2 sheets. Can move to Hamlin site
Fab Shop / Common Work Area	M3	24 x 30	720	1	720	Shared area for miscellaneous, low volume steel fabrication activities	Locate adjacent to carpentry and facilities shop	12'	Welding table, welding / fab equipment. Ventilation boom. Welding curtain
Hazmat Storage	M4	12 x 25	300	1	300	Pesticides, (5) 55 Gal drums of release agent, 250 gal waste oil, provide sump containment and ventilation per code		12'	Can be open to structure. 8x8 overhead door.
Sign Storage	M5	6 x 24	144	1	144	Provide 24 lineal feet of stacked (double row) sign storage racks	Adjacent to other shops/storage. Possibly combined with working stock bay Provide interior access and direct access to exterior	12'	Can be open to structure. Overhead door to exterior. Signage bay with sign storage if space allows
Tool Storage	M6	12 x 40	480	2	960	Secure tool storage for power tools, specialty tools	Adjacent to other shops/storage. Provide interior access and direct access to exterior, adjacent to drive through bay	12'	Fencing to divide space among departments for organization purposes
Working Stock Bay	M7	20 x 40	800	2	1,600	Drive through bay with perimeter sheving for variety of daily used items	Adjacent to other shops/storage. Provide interior access and direct access to exterior	16'	Can be open to structure. 2-3 pallets of police storage for flares, etc.

Space Description	No.	Proposed Space Standard	20 Year Program			General Space Purpose and Design Criteria	Adjacencies	Clear Height	Other Criteria / Equip. / Furnishing Needs
			Area (SF)	Qty.	Total Area				
Waste Water Shop	M8	24 x 40	960	1	960	Main shop space WW and vehicle storage	Adjacent to other shops/storage. Provide interior access and direct access to exterior	16'	Can be open to structure. Overhead door to exterior. Work bench and tool storage
Multi-Use Vehicle Bays	M9	24 x 40	960	2	1,920	Miscellaneous shop working space and vehicle storage		16'	Community Response Team (CRT) storage, could also be under canopy storage, 4 portable lifts
Large Vehicle Parking	M10	12 x 40	480	1	480	See complete vehicle analysis document		16'	
Medium Vehicle Parking	M11	12 x 30	360	1	360	See complete vehicle analysis document		16'	
Wash Bay Equipment Room	M12	15 x 25	375	1	375	Space for water reclaim equipment room	Wash Bay	12'	Can be open to structure. 8x8 overhead door
Unisex Toilet Room	M13	8 x 8	64	2	128	Single unisex restroom serving shop area	Convenient access within vehicle storage and shops	9'	
IT Room	M14	10 x 10	100	1	100	IT equipment	Centrally located, could be located on mezzanine	9'	
Custodial Room	M15	5 x 8	40	1	40	Mop sink/rack	Centrally located	9'	
Mezzanine	M16	x	-	1	-	Mechanical area, electrical rm, IT rm and bulk storage to optimum foot print		12'	SF determined during design
SUBTOTAL AREA					**9,239**				
Circulation / Walls / Misc			20%		1,848				
MAINTENANCE / SHOPS / VEHICLES & EQUIPMENT					**11,087**				
TOTAL ENCLOSED / HEATED FACILITIES					**18,099**				

Space Description	No.	Proposed Space Standard	20 Year Program			General Space Purpose and Design Criteria	Adjacencies	Clear Height	Other Criteria / Equip. / Furnishing Needs
			Area (SF)	Qty.	Total Area				
COVERED / UNHEATED FACILITIES									
CANOPY-COVERED									
Wash Bay	C1	20 x 40	800	1	800	Washdown of all vehicles. Provide 1-1/2" hose connection, trench drain and manhole/catchbasin. Water reclaim system	Located as an end bay adjacent to vehicle storage bays.	20'	Manual pressure system with heated water, catwalk
Fuel Island	C2	20 x 40	800	1	800	Canopy covered bay for fueling of all vehicles	Located near main entry of site to allow for easy access		Above ground or underground tanks are acceptible. Gas and deisel. 5,000 gallons deisel, 10,000 gallons gas
Police Vehicle Impound	C3	10 x 20	200	2	400	Over flow parking for vehicles waiting for search warrants	Easy access at end of canopy		If space allows, possibly enclose with privacy fencing, can move to Hamlin
Large Vehicle Parking	C4	12 x 40	480	2	960	See complete vehicle analysis document		16'	
Medium Vehicle Parking	C5	10 x 30	300	15	4,500	See complete vehicle analysis document		16'	
Small Vehicle Parking	C6	10 x 20	200	26	5,200	See complete vehicle analysis document		12'	
X-Small Vehicle Parking	C7	8 x 12	96	9	864	See complete vehicle analysis document		12'	
XX-Small Equipment Parking	C8	8 x 8	64	21	1,344	See complete vehicle analysis document		12'	
Materials and Equipment Storage	C9	12 x 40	480	2	960	Drive-through bay with rack and floor storage	Adjacent to vehicle storage	16'	Barricades. Cones, miscellaneous items
Sweeper Spoils	C10	20 x 30	600	1	600	Dump sweeper spoils	Adjacent to vactor decant	20'	2" water fill
Vactor Decant	C11	20 x 30	600	1	600	Decanting vactor trucks		20'	Manhole for WW, 2" water fill
Salt	C12	20 x 30	600	2	1,200	200 yrds		20'	Delivered off of truck by conveyor belt
SUBTOTAL AREA					**18,228**				
Circulation / Walls / Misc			10%		1,823				
TOTAL COVERED / UNHEATED					**20,051**				
TOTAL BUILDING AREA					**38,150**				

Space Description	No.	Proposed Space Standard	20 Year Program			General Space Purpose and Design Criteria	Adjacencies	Clear Height	Other Criteria / Equip. / Furnishing Needs
			Area (SF)	Qty.	Total Area				
SITE FACILITIES									
Parking									
Employee Parking	S1	10 x 20	200	30	6,000				30 stalls min up to 35 for future. ADA stalls as required, fenced if feasible. (1) electric charging spot
Police Parking	S2	10 x 20	200	10	2,000	Squad Cars	In crew parking area		If space allows, fenced in area
Visitor Parking	S3	10 x 20	200	4	800		Near main entry		In unfenced area
Bicycle Parking	S4	4 x 8	32	6	192		Near main entry		Near main entry
					8,992				
Circulation			100%		8,992				
Total Parking					**17,984**				
Bulk Materials / Miscellaneous Site Items									
Deicer tank	S5	9 x 9	81	1	81	Storage and pumping system for deicer			Approximate 8400 gallon tank, electric pumping system under canopy. Specify so a second containment system is not required
5/8" minus	S6	18 x 20	360	1	360	5-10 yards			Ecology Block separators
1 1/4" minus	S7	18 x 20	360	1	360	5-10 yards			Ecology Block separators
Dumpsters	S10	8 x 20	160	3	480	5 -10 yards			Garbage, metal recycling, organics, asphalt waste, concrete waste
Pole Storage	S11	5 x 40	200	1	200	Laydown area			Poles and pipes
Generator	S12	10 x 15	150	1	150	Conc Pad			
Subtotal					1,550				
Circlulation			100%		1,550				
Total Bulk Materials					**3,100**				
TOTAL PROGRAMMED SITE AREA					**21,084**	**Not including Structures, drive yard, land scaping, stormwater facilities, setbacks, etc.**			

VEHICLE PARKING ANALYSIS

OVERVIEW

This document provides a comprehensive list of current vehicle and rolling stock counts, their sizes, and parking requirements.

VEHICLE PARKING ANALYSIS

L = 12' x 40'
M = 10' x 30'
S = 10' x 20'
XS = 8' x 12'
XXS = 8' x 8'

Vehicle No	Description	Qty.	Size	Heated				Covered					Remarks
			(L,M,S,XS)	L	M	S	XS	L	M	S	XS	XXS	
	Public Works (Streets and SWM)												
	Vehicles												
169	Ford 4WD Pick up	1	M	0	0	0	0	0	1	0	0	0	
114	Facilities Chevrolet 2500 Van	1	M	0	0	0	0	0	1	0	0	0	
119	Ford 1 ton pickup	1	M	0	0	0	0	0	1	0	0	0	Approx. 23' long
121	Facilities Chev 1/2 ton pickup	1	S	0	0	0	0	0	0	1	0	0	Added facilities Pickup
122	Chev 1/2 ton pickup	1	S	0	0	0	0	0	0	1	0	0	
125	Intl 5 yd dump truck	1	M	0	0	0	0	0	1	0	0	0	Approx. 22' long
177	Ford F150 4WD Pick Up	1	S	0	0	0	0	0	0	1	0	0	Added S.W. Pickup
134	Chevy silverado pickup	1	M	0	0	0	0	0	1	0	0	0	Approx 24' long
173	Elgin Crosswind Street sweeper	1	M	0	1	0	0	0	0	0	0	0	New, Replaced street sweeper #149
158	Ford F550 super crew 4x4	1	M	0	0	0	0	0	1	0	0	0	Approx. 25' long
159	F550 suber cab 4x4	1	M	0	0	0	0	0	1	0	0	0	Approx. 26' long
165	Surface Water Dodge 1/2 ton pickup	1	S	0	0	0	0	0		1	0	0	Added S.W. Pickup
166	Navistar Intl 7000 sfa	1	L	0	0	0	0	1	0	0	0	0	Approx. 29' long
287	Caterpillar Backhoe	1	M	0	0	0	0	0	1	0	0	0	Approx. 26' long
214	asphalt hot roller												On Trailer 263, see below
227	2002 - Genie TMZ boom	1	M	0	0	0	0	0	1	0	0	0	
233	road shoulder maintenance	1	L	0	0	0	0	1	0	0	0	0	26' long
266	Bobcat A770 Skid steer	1	S	0	0	0	0	0	0	1	0	0	
170	Ford 1 Ton Dually pickup (Sign Truck)	1	M	0	0	0	0	0	1	0	0	0	Will be new to replace truck #116
	PW Vehicles Total	**18**		**0**	**1**	**0**	**0**	**2**	**10**	**5**	**0**	**0**	
	Trailers & Mobile Equipment												
116a	Snow plow	1	XS	0	0	0	0	0	0	0	1	0	8'6"x4'2"
119B	Western hitch mounted spreader for Truck #119	1	XS	0	0	0	0	0	0	0	0	1	5'x2'
119C	Meyer 8.5 Snow Plow	1	XS	0	0	0	0	0	0	0	1	0	8'6"x4'2"
125a	2000 - snow plow	1	XS	0	0	0	0	0	0	0	1	0	10'x4'7"
125b	2000 - sander/spreader	1	S	0	0	0	0	0	0	1	0	0	12'9"x8'
158A	Buyers Plow for Truck #158	1	XS	0	0	0	0	0	0	0	1	0	8'6"x5'6"
158B	Buyer Spreader for Truck #158	1	S	0	0	0	0	0	0	0	1	0	12'x7'7"
159A	Buyers Plow for Truck #159	1	XS	0	0	0	0	0	0	0	1	0	8'6"x5'6"
159B	Buyer Spreader for Truck #159	1	S	0	0	0	0	0	0	0	1	0	12'x7'7"
159C	Chipper Box for Truck #159	1	S	0	0	0	0	0	0	1	0	0	Approx. 11' long
166A	American Plow for Truck #166	1	XS	0	0	0	0	0	0	0	1	0	10'6"x6'
166B	Monroe Spreader for Truck #166 *Hook Skid mounted	1	S	0	0	0	0	0	0	1	0	0	18'x7'
166C	Liquid Anti-Icing tank/Sprayer for Truck #166 *Hook Skid mounted	1	S	0	0	0	0	0	0	1	0	0	Approx 14' long

VEHICLE PARKING ANALYSIS

L = 12' x 40'
M = 10' x 30'
S = 10' x 20'
XS = 8' x 12'
XXS = 8' x 8'

Vehicle No	Description	Qty.	Size	Heated				Covered					Remarks
			(L,M,S,XS)	L	M	S	XS	L	M	S	XS	XXS	
209	trailer - tilt deck	1	S	0	0	0	0	0	0	1	0	0	
217	air compressor trailer	1	XS	0	0	0	0	0	0	0	0	1	
218	concrete saw	1	XS	0	0	0	0	0	0	0	0	1	
235	Chipper	1	S	0	0	0	0	0	0	1	0	0	Approx 15' long
233A	Attachment: General Purpose "Standard" Bucket for Grader #233	1	XS	0	0	0	0	0	0	0	0	1	
233B	Attachment: Angle Sweeper Broom for Grader #233	1	XS	0	0	0	0	0	0	0	0	1	
236	Kubota Tractor												On trailer 237, see below
236B	Auger for Kubota Tractor #236	1	XS	0	0	0	0	0	0	0	0	1	
250	J&D Emergency Trailer	1	XS	0	0	0	0	0	0	0	0	1	
256	Cummings generator	1	S	0	0	0	0	0	0	1	0	0	Longer than 8' with Trailer Tongue (12' Long)
263	Olympic Paving Trailer (#214 Asphalt Roller on Trailer)	1	M	0	0	0	0	0	1	0	0	0	
266	Bobcat A770 Skid Steer												On trailer 269, aee below
266A	Attachment: 24" Asphalt Planer/grinder attachment for Skid Steer #266	1	XS	0	0	0	0	0	0	0	0	1	
266B	Attachment: 72" Sweeper attachment for Skid Steer #266	1	XS	0	0	0	0	0	0	0	0	1	
266C	Attachment: Pallet Fork attachment for Skid Steer #266	1	XS	0	0	0	0	0	0	0	0	1	
266D	Attachment: 24" Roadrunner paving box for Skid Steer #266	1	XS	0	0	0	0	0	0	0	0	1	
266E	Attachment: 48" Roadrunner Paving box for Skid Steer #266	1	XS	0	0	0	0	0	0	0	0	1	
266F	Attachment: Multi-Purpose "Clam" Bucket for Skid Steer #266	1	XS	0	0	0	0	0	0	0	0	1	
266G	Attachment: General Purpose "Standard" Bucket for Skid Steer #266	1	XS	0	0	0	0	0	0	0	0	1	
266H	Attachment: Tilt Tach attachment for Skid Steer #266	1	XS	0	0	0	0	0	0	0	0	1	
269	PJ tilt deck Equipment Trailer	1	M	0	0	0	0	0	1	0	0	0	Approx 28' long
271	Interstate Cargo Trailer	1	S	0	0	0	0	0	0	1	0	0	Approx 19' long
286	Stepp Mfg. Hotbox	1	S	0	0	0	0	0	0	1	0	0	
288	Crack Sealer	1	S	0	0	0	0	0	0	1	0	0	
287A	Attachment: General Purpose "Standard" Bucket for Backhoe #287	1	XS	0	0	0	0	0	0	0	0	1	
287B	Attachment: Multi-Purpose "Clam" Bucket for Backhoe #287	1	XS	0	0	0	0	0	0	0	0	1	
287C	Attachment: 12" Backhoe Trenching Bucket for Backhoe #287	1	XS	0	0	0	0	0	0	0	0	1	
287D	Attachment: 20.5" Standard Backhoe digging Bucket for Backhoe #287	1	XS	0	0	0	0	0	0	0	0	1	
287E	Attachment: 48" Ditching Bucket for Backhoe #287	1	XS	0	0	0	0	0	0	0	0	1	
237	Paros Tilt Deck Equipment Trailer (#236 kabuto tractor on trailer)	1	M	0	0	0	0	0	1	0	0	0	
	PW Rolling Stock Total	**41**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**10**	**8**	**20**	
	Total Public Works Vehicles and Rolling Stock	**59**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**13**	**15**	**8**	**20**

VEHICLE PARKING ANALYSIS

L = 12' x 40'
M = 10' x 30'
S = 10' x 20'
XS = 8' x 12'
XXS = 8' x 8'

Vehicle No	Description	Qty.	Size	Heated				Covered					Remarks
			(L,M,S,XS)	L	M	S	XS	L	M	S	XS	XXS	
	WASTE WATER												
	Vehicles												
122	2015 Ford 1-Ton Dump Truck	1	M	0	0	0	0	0	1	0	0	0	
150	2005 Ford 450 w/RST CCTV	1	S	0	0	0	0	0	0	1	0	0	
155	2015 Ford F-250 Pick up Truck	1	S	0	0	0	0	0	0	1	0	0	
157	Ford Explorer	1	S	0	0	0	0	0	0	1	0	0	
160	2008 Ford F-250 Pickup Truck 4X4	1	S	0	0	0	0	0	0	1	0	0	
186	Ford Ranger	1	S	0	0	0	0	0	0	1	0	0	
190	Chevrolet Malibu			0	0	0	0	0	0	0	0	0	Not at NMF
249	1995 Ford F350/Grumman Hi-Cube Van	1	M	0	0	0	0	0	1	0	0	0	
277	Ford F-150 Pickup Truck	1	S	0	0	0	0	0	0	1	0	0	
392	Peterbuilt Vactor	1	L	1	0	0	0	0	0	0	0	0	
	WW Vehicles Total	**9**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**6**		**0**
	Trailers & Mobile Equipment												
101	Electric Eel Sewer Rodder (Trailer)	1	S	0	0	0	0	0	0	1		0	
103	Meyers Snow Plow	1	XS	0	0	0	0	0	0	0	1	0	Blade for Truck #122 *Wider than 8'
111	Gorman-Rupp Trash Pump	1	XS	0	0	0	0	0	0	0	0	1	
135	Cummings Generator	1	S	0	0	0	0	0	0	1	0	0	
156	Katolight Generator	1	S	0	0	0	0	0	0	1	0	0	
280	Ingersoll Rand Air Compressor	1	S	0	0	0	0	0	0	1	0	0	
395	Trailer Mount Diesel Rodder	1	S	0	0	0	0	0	0	1	0	0	
	WW Rolling Stock Total	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**1**	**1**	
	WW Vehicle and Rolling Stock Total	**16**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**11**	**1**	**1**	
	NMF Total	**75**	**0**	**0**	**1**	**1**	**0**	**0**	**2**	**15**	**26**	**9**	**21**

Note: Vehicle Count and Program type is translated to building program areas in the Space Program

PRELIMINARY EQUIPMENT LIST

OVERVIEW

This document provides a comprehensive list of new and existing, primarily fixed, equipment and storage devices, their sizes, and utility requirements for each space.

Shoreline NMF

Equipment List

Preliminary Submittal

Equipment												Equipment Power						Compressed Air		Cost							
#	ID #	Equipment Status	Description	Qty	Length (inches)	Width (inches)	Height (inches)	F / I	Make	Model	Comment	Volt	PH	Freq. (Hz.)	HP	Amp	Comment	Air Drop Y/N	Comment	Lead Time	Equipment Cost (ea)	Accessories Cost	Shipping Cost (ea) @5%	Install Cost @ 1%	Total Cost (ea)	Extended Cost	Comment
Note: Mechanical, Electrical, and Plumbing (MEP) contractors shall verify all utility requirements and equipment connections types prior to start of work or design.																											
Fabrication Shop and Common Work Area - Building A																											
1	FSCW-01	New	Gas cylinder Cabinet	1	31	30	65	CF/CI	Grainger	5CHL1	8 cylinders										$467		$23	$5	$494	$494	
2	FSCW-02	New	Rack, arm, single face, 6' wide	1	68	22	84	CF/CI	Grainger	7J800											$1,063		$53	$12	$1,128	$1,128	
3	FSCW-03	New	Rack, pallet, high bay	1	96	48	120	CF/CI	Lyon	DD67545SP	10,000 lbs. capacity										$979		$49	$11	$1,039	$1,039	
4	FSCW-04	New	Table, welding	1	78	46	30	CF/CI	Build Pro	TMQA57846								Y			$5,939		$297	$65	$6,301	$6,301	
5	FSCW-05	New	Screen, welding	2	1	96	72	CF/CI	Steiner	5KNL9											$216		$11	$2	$229	$458.35	
6	FSCW-06	New	Welder, MIG	1	19	40	30	CF/CI	Millermatic Manufacturing	252 Plus w/Spool		208	1	60		48					$4,872		$244	$54	$5,169	$5,169	
7	FSCW-07	New	Portable Cutting and Welder	1	28	13	43	CF/CI	Victor Equipment	0384-0939	Oxygen-Acetylene										$954		$48	$10	$1,012	$1,012	
8	FSCW-08	New	Extractor, fume, welding, portable	1	39	19	92	CF/CI	Dayton	2HNT3		120	1	60		12					$3,476		$174	$38	$3,688	$3,688	
9	FSCW-09	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
																										$21,015	
Carpentry Shop - Building A																											
1	CS-01	New	Work Bench	1	72	36	35	CF/CI	Jamco	8DZ15								Y			$516		$26	$6	$547	$547	
2	CS-02	New	Buffer/Grinder, 6 inches, pedestal	1	18	9	12	CF/CI	Dayton	2LKR5		120	1	60		3					$128		$6	$1	$135	$135	
3	CS-03	New	Grinder Pedestal	1	12	9	30	CF/CI	Linishall	BGSTAND											$170		$8	$2			
4	CS-04	New	Drill Press, 15 inches	1	14	16	64	CF/CI	Dayton	49G985		230	1	60	2						$4,586		$229	$50	$4,866	$4,866	
5	CS-05	New	Chop Saw	1	18	9	12	CF/CI	Dewalt	DW872		120	1	60		15					$645		$32	$7	$684	$684	
6	CS-06	New	Stand, Material Support, Horizontal	4	17	17	29	CF/CI	Jet	414121											$152		$8	$2	$161	$643	
7	CS-07	New	Vise	2	20	9	10	CF/CI	Westward	39M994											$681		$34	$7	$722	$1,444	
8	CS-08	New	Table Saw 12"	1	79	30	30	CF/CI	Dayton	49G997											$3,302		$165	$36	$3,503	$3,503	
9	CS-09	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
10	CS-10	New	Dust Collector	1	46	23	45	CF/CI	Powermatic	1792072K		230	1	60	3	15					$2,060		$103	$23	$2,186	$2,186	
																										$15,734	
Facilities Shop - Building A																											
1	FS-01	New	Work Bench	1	72	36	35	CF/CI	Jamco	8DZ15								Y			$516		$26	$6	$547	$547	
2	FS-09	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
3	FS-10	New	Rack, pallet, high bay	1	96	48	120	CF/CI	Lyon	DD67545SP	10,000 lbs. capacity										$979		$49	$11	$1,039	$1,039	
4	FS-11	New	Shelving Units	1	36	96	72	CF/CI	Lyon	DD67513SP	Storage for Light Bulbs & Ballasts										$645		$32	$7	$684	$684	
5	FS-12	New	Shelving Units	4	36	96	72	CF/CI	Lyon	DD67513SP	10,000 lbs. capacity										$645		$32	$7	$684	$2,737	
6	FS-13	New	Cabinets (Nuts& Bolts)	2	28	30	37	CF/CI	Stanley Vidmar	4KC87											$1,812		$91	$20	$1,923	$3,845	
7	FS-14	New	Misc. Hand tools storage	4	28	30	31	CF/CI	Stanley Vidmar	4GE47											$571		$29	$6	$605	$2,421	
8	FS-15	New	2 Desks, 2 Chairs	2				CF/CI																	$0	$0	
9	FS-16	New	Storage space for chairs	1				CF/CI																	$0	$0	
10	FS-17	Existing	Gas Reading Station	1				OF/CI			Confirm Dimension and Utilities												$0	$0	$0	$0	
11	FS-18	Existing	Water Quality Lab (Surface Water)	1				OF/CI			Confirm Dimension and Utilities												$0	$0	$0	$0	
12	FS-19	Existing	Tester Cabinet (Traffic)	1				OF/CI			Confirm Dimension and Utilities												$0	$0	$0	$0	
																										$12,999	
Multi Use Bay 1 and 2 - Building A																											
1	MUB-01	New	Rack, pallet, high bay	4	96	48	120	CF/CI	Lyon	DD67545SP	10,000 lbs. capacity										$979		$49	$11	$1,039	$4,155	
2	MUB-02	New	Work Bench	2	72	36	35	CF/CI	Jamco	8DZ15								Y			$516		$26	$6	$547	$1,095	
3	MUB-03	New	Vehicle Exhaust System	1					Mechanical Contractor		Install Cost										$5,000		$250	$55	$5,305	$5,305	
			Hose Reals and Hose	4				CF/CI	Fume-A-Vent	HRS-3-0420											$1,187		$59	$13	$1,259	$5,038	
			Hose Reel Fan	4				CF/CI	Fume-A-Vent	HRF-05-1											$859		$43	$9	$911	$3,646	
			Ducting Kit	4				CF/CI	Fume-A-Vent	FAV-NF-HRNL											$231		$12	$3	$245	$980	
4	MUB-04	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
																										$21,944	

#	ID #	Equipment Status	Description	Qty	Length (inches)	Width (inches)	Height (inches)	F / I	Make	Model	Comment	Volt	PH	Freq. (Hz.)	HP	Amp	Comment	Air Drop Y/N	Comment	Lead Time	Equipment Cost (ea)	Accessories Cost	Shipping Cost (ea) @5%	Install Cost @ 1%	Total Cost (ea)	Extended Cost	Comment
	Waste Water Shop - Building A																										
1	WWS-01	New	Rack, pallet, high bay	4	96	48	120	CF/CI	Lyon	DD67545SP	10,000 lbs. capacity										$979		$49	$11	$1,039	$4,155	
2	WWS-02	New	Work Bench	2	60	36	30	CF/CI	Jamco	9EWE4								Y			$495		$25	$5	$525	$1,051	
3	WWS-03	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
4	WWS-13	Existing	Air Compressor	1				OF/OI	Cambell Hausefeld	wl650001aj													$0	$0	$0	$0	
																										$6,931	
	Fuel Island																										
1	FI-01	New	Gas Tanks	1				CF/CI	Under Ground	10,000 gallon	BCE to price and specify												$0	$0	$0	$0	
2	FI-02	New	Diesel tanks	1				CF/CI	Under Ground	5,000 gallon	BCE to price and specify												$0	$0	$0	$0	
3	FI-03	New	Fuel Tank monitoring	1				CF/CI			BCE to price and specify												$0	$0	$0	$0	
4	FI-04	New	Dispensers - Diesel	1				CF/CI		2 hose dispenser	BCE to price and specify												$0	$0	$0	$0	
5	FI-05	New	Dispensers - Gas	1				CF/CI		2 hose dispenser	BCE to price and specify												$0	$0	$0	$0	
6	FI-06	New	Industrial Vacuums	2				CF/CI	IVS PowerVac	VAI100002	w/ 10' hoses							Y	TBD		$990		$50	$11	$1,050	$2,101	
																										$2,101	
	Working Stock Bay - Building C																										
1	WSB-01	New	Rack, pallet, high bay	8	96	48	120	CF/CI	Lyon	DD67545SP	10,000 lbs. capacity										$979		$49	$11	$1,039	$8,310	
2	WSB-02	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
																										$10,035	
	HazMat Area - Building C																										
1	HMA-01	New	Rack, pallet, high bay	1	96	48	120	CF/CI	Lyon	DD67545SP	10,000 lbs. capacity										$979		$49	$11	$1,039	$1,039	
2	HMA-02	New	Shelving Units	2	36	96	72	CF/CI	Lyon	DD67513SP	10,000 lbs. capacity										$645		$32	$7	$684	$1,369	
3	HMA-03	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
																										$4,133	
	Tool Storage - Building C																										
1	TS-01	New	Shelving Units	2	36	96	72	CF/CI	Lyon	DD67513SP	10,000 lbs. capacity										$645	$500	$32	$7	$1,184	$2,369	
2	TS-02	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
																										$4,094	
	Compressor Room																										
1	CR-01	New	Compressor, air, receiver mounted, 5 HP duplex	1	68	29	50	CF/CI	Champion	HR5D-8													$0	$0	$0	$0	
2	CR-02	New	Dryer, air, refrigerated, 25 CFM	1	19	21	26	CF/CI	Champion	CRN25													$0	$0	$0	$0	
																										$0	
	Wash Bay																										
1	WB-01	New	Manual Wash Water Reclaim System	1				CF/CI	Hydroblaster	(HE/7000)-(CMAFU-2)-(5/3000EHGV)											$59,889		$2,994	$659	$63,542	$63,542	
2																							$0	$0	$0	$0	
																										$63,542	
	De-Icer Tank Area																										
1	DIT-01	New	Flammable Cabinet	1	43	18	65	CF/CI	Eagle	4510											$1,626		$81	$18	$1,725	$1,725	
2	DIT-02	New	Deicing System	1						8400 gallon with pump	BCE to price and specify												$0	$0	$0	$0	
																										$1,725	
																										$164,253	

3 - SITE LAYOUT ALTERNATIVES

OVERVIEW

The City of Shoreline purchased the former King County Maintenance yard with the intent of bringing the Public Works and Waste Water divisions together. The renamed North Maintenance Facility (NMF) site is bounded by Brugger's Park on the north, 25th Ave NE on the east, multifamily residential properties to the south and Ballinger Way on the western edge. The eastern edge of the NMF site, along 25 Ave NE, floods during heavy rainfall events. The City is actively looking to correct this issue with the "25th Ave NE Floor Reduction Project". Flooding issues, high ground water table, possible fish passage requirements, an irregular shaped site, and the stream/wetland buffer on the northeastern edge, add complexity to the site layout and design. Included in this section are several site layout alternatives, a site layout analysis, and preliminary civil and landscape drawings.

SITE LAYOUT EVALUATION AND SELECTION

Eight total site alternative layouts were produced showing varying building and site configurations. The site layout selection process involved noting opportunities and constraints for the following criteria: Vehicle Circulation, People Circulation, Building Layout/Space Program, Economics and Environment / Regulation / Community. All site alternative layouts have common considerations including significant grading, possible high retaining and stormwater management costs, clear efficient people circulation, no building expansion, achieve successful design outcomes to address neighborhood concerns and have functional circulation for large vehicles.

Based on all the criteria the Public Works staff and Study Team found that site layout alternative B.1 would provide the most opportunity to accommodate program needs for the 20 year planning horizon and beyond. City Council is also in agreement that site layout alternative B.1 is best and should be explored further. Site alternative B.1 does require the acquisition of an adjacent parcel to the south. If the acquisition of this property is not feasible, site alternative B would move forward which allows for the future acquisition of the property. City staff are in the process of making contact with the property owner of the adjacent property to initiate conversations regarding a property sale in the site layout analysis matrix, the added south parcel was included in B.1 only, however, the acquisition of the property and its opportunity and constraints could be applied to each site layout alternative.

CITY OF SHORELINE

North Maintenance Facility

Criteria	Site Alternative A One Story Main Building No Added Parcel	Site Alternative B Two Story Main Building No Added Parcel	Site Alternative B.1 Two Story Main Building Acquisition of South Parcel	Site Alternative C Wetland Encroachment/Mitigation No Added Parcel
Vehicle Circulation	**Opportunities:** - Personal vehicles are separated from city owned vehicles - One primary site access, secondary access available - Clear drive aisle between Buildings A and C, increased flexibility	**Opportunities:** - Personal vehicles are separated from city owned vehicles - One primary site access, secondary access available - Clear drive aisle between Buildings A and C, increased flexibility	**Opportunities:** - Personal vehicles are separated from city owned vehicles - One primary site access, secondary access available - Clear drive aisle between Buildings A and C, increased flexibility - Increased yard between Buildings B and C	**Constraints:** - No clear drive aisle between Buildings A and C, only access is through fuel bay - Personal vehicles must use southern entrance - Personal vehicle traffic will mix with city owned vehicles
People Circulation	**Opportunities:** - All structures are one story, with the exception of storage mezzanines	**Constraints:** - The mud room and locker rooms are on different floor levels - High floor to floor height at building A to accommodate shop bay spaces	**Constraints:** - The mud room and locker rooms are on different floor levels - High floor to floor height at building A to accommodate shop bay spaces	**Constraints:** - The mud room and locker rooms are on different floor levels - High floor to floor height at building A to accommodate shop bay spaces
Building Layout / Program Space	**Opportunities:** - Optimized shop and storage arrangement - All shops have interior and exterior access - Approx. Building Area: 39,000SF **Constraints:** - Reduced flexibility in shop bays due to double use as vehicle parking - (3) extra small equipment not covered - (15) small city owned vehicles not covered - Wetland buffer impedes full use of the site	**Opportunities:** - Increase enclosed heated vehicle storage by (8) stalls from site Alternative A (no double function for vehicle storage in shop space) - Approx. Building Area: 45,000SF **Constraints:** - Shops have interior access only - Shops are separated from material and equipment storage - (3) extra small equipment not covered - (8) small city owned vehicles not covered - Wetland buffer impedes full use of the site	**Opportunities:** - Increase enclosed heated vehicle storage by (8) stalls from site Alternative A (no double function for vehicle storage in shop space) - All programmed equipment covered - Approx. Building Area: 48,000SF **Constraints:** - Shops have interior access only - Shops are separated from material and equipment storage - (4) small city owned vehicles not covered - Wetland buffer impedes full use of the site	**Opportunities:** - Increase enclosed heated vehicle storage by (8) stalls from site Alternative A (no double function for vehicle storage in shop space) - All programmed vehicles and equipment are covered - Most building area potential (uses portion of wetland buffer) - Approx. Building Area: 49,000SF **Constraints:** - Shops have interior access only - Shops are separated from material and equipment storage - (4) small city owned vehicles not covered - Future crew parking is not accounted for
Economics	**Cost Estimate Range:** $14.0 - $14.7 Million - Least building square footage (Baseline)	**Cost Estimate Range:** $15.9 - $16.7 Million **Additional Cost for:** - Added building square footage	**Cost Estimate Range:** $17.1 - 18.0 Million **Additional Cost for:** - Added building square footage - Acquisition cost for adjacent property	**Cost Estimate Range:** $16.4 - 17.3 Million **Additional Cost for:** - Added building square footage - Wetland mitigation
Environmental / Regulatory / Community	**Opportunities:** - No buildings within wetland buffer zone	**Opportunities:** - No buildings within wetland buffer zone	**Opportunities:** - No buildings within wetland buffer zone **Constraints:** - Facility proximity to existing apartment building	**Constraints:** - Buildings within wetland buffer zone

General Considerations for Each Site Alternative

- All site alternatives involve significant grading, retaining, and stormwater management costs
- All site alternatives have clear, efficient people circulation in building A and C and between buildings
- All site alternatives require a variance for the secondary site access due to its adjacency to the existing driveway
- All site alternatives have no building expansion capabilities
- All site alternatives can achieve successful design outcomes to address neighborhood concerns
- All site alternatives achieve functional circulation for large vehicles



ADMIN/CREW

BUILDING CIRCULATION

ENCLOSED/HEATED SHOPS &VEHICLE STORAGE

CANOPY COVER

EXISTING STRUCTURES ON ADJACENT PROPERTIES

SITE

127,530 SF

BUILDINGS

BUILDING A
7,000 SF - ADMIN/CREW TOTAL

BUILDING B
5,180 SF - CANOPY TOTAL

BUILDING C
11,300 SF - HEATED/ENCLOSED
6,400 SF - CANOPY STORAGE
1,500 SF - CANOPY WASH BAY
1,320 SF - CANOPY FUEL BAY
20,520 SF - TOTAL

BUILDING D
4,220 SF - CANOPY TOTAL

36,920 SF TOTAL PROGRAM AREA

PARKING

4 - VISITOR
32 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)
MEDIUM 10' x 30' (16)
SMALL 10' x 20' (26)
X-SMALL 8' x 12' (9)
XX-SMALL 8' x 8' (21)

BULK MATERIALS

18' x 20' 5/8" MINUS
18' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 8 MARCH 2016 PRE DESIGN PHASE

SITE AND BUILDING DEVELOPMENT - ALTERNATIVE A

NORTH

NOTE: DRAWING MAY BE REDUCED

0 15' 30' 60'

CITY OF SHORELINE

TCF Architecture



SITE

127,530 SF
13,400 SF ADJACENT PARCEL
140,930 SF TOTAL

BUILDINGS

BUILDING A
7,000 SF - ADMIN/CREW

BUILDING B
8,090 SF - CANOPY TOTAL

BUILDING C
11,300 SF - HEATED/ENCLOSED
6,400 SF - CANOPY STORAGE
1,500 SF - CANOPY WASH BAY
1,320 SF - CANOPY FUEL BAY
20,520 SF - TOTAL

BUILDING D
4,220 SF - CANOPY TOTAL

39,830 SF TOTAL PROGRAM AREA

PARKING

4 - VISITOR
40 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)

MEDIUM 10' x 30' (16)

SMALL 10' x 20' (26)

X-SMALL 8' x 12' (9)

XX-SMALL 8' x 8' (21)

BULK MATERIALS

18' x 20' 5/8" MINUS
18' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 8 MARCH 2016 PRE DESIGN PHASE

SITE AND BUILDING DEVELOPMENT - ALTERNATIVE A.1

CITY OF SHORELINE

TCF Architecture



SITE

127,530 SF
5,330 SF PARK LAND
132,860 SF TOTAL

BUILDINGS

BUILDING A
7,000 SF - ADMIN/CREW

BUILDING B
5,180 SF - CANOPY TOTAL

BUILDING C
11,300 SF - HEATED/ENCLOSED
6,400 SF - CANOPY STORAGE
1,500 SF - CANOPY WASH BAY
1,320 SF - CANOPY FUEL BAY
20,520 SF - TOTAL

BUILDING D
5,420 SF - CANOPY TOTAL

38,120 SF TOTAL PROGRAM AREA

PARKING

4 - VISITOR
32 - PERSONNEL

CITY-OWNER (SHADED)
LARGE 12' x 40' (3)

MEDIUM 10' x 30' (16)

SMALL 10' x 20' (26)

X-SMALL 8' x 12' (9)

XX-SMALL 8' x 8' (21)

BULK MATERIALS

18' x 20' 5/8" MINUS
18' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

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SITE AND BUILDING DEVELOPMENT - ALTERNATIVE A.2

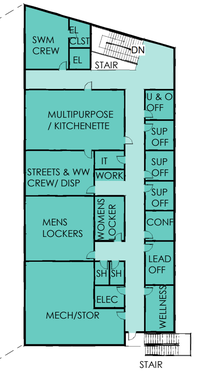
NORTH

NOTE: DRAWING MAY BE REDUCED
0 15' 30' 60'

CITY OF SHORELINE

TCF Architecture





BUILDING A - LEVEL 2

ADMIN/CREW

BUILDING CIRCULATION

ENCLOSED/HEATED SHOPS &VEHICLE STORAGE

CANOPY COVER

EXISTING STRUCTURES ON ADJACENT PROPERTIES

SITE

127,530 SF

BUILDINGS

BUILDING A
7,000 SF - LEVEL 1 CREW/SHOPS
8,500 SF - LEVEL 2 ADMIN/CREW
15,500 SF - TOTAL

BUILDING B
5,180 SF - CANOPY TOTAL

BUILDING C
10,660 SF - HEATED/ENCLOSED
5,000 SF - CANOPY STORAGE
1,000 SF - CANOPY WASH BAY
1,000 SF - CANOPY FUEL BAY
17,660 SF - TOTAL

BUILDING D
4,220 SF - CANOPY TOTAL

42,560 SF TOTAL PROGRAM AREA

PARKING

4 - VISITOR
38 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)

MEDIUM 10' x 30' (16)

SMALL 10' x 20' (26)

X-SMALL 8' x 12' (9)

XX-SMALL 8' x 8' (21)

BULK MATERIALS

18' x 20' 5/8" MINUS
18' x 20' 1 1/4"' MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 8 MARCH 2016 PRE DESIGN PHASE

SITE AND BUILDING DEVELOPMENT - ALTERNATIVE B

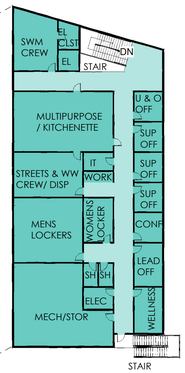
NORTH

NOTE: DRAWING MAY BE REDUCED
0 15' 30' 60'

CITY OF SHORELINE

TCF Architecture





BUILDING A - LEVEL 2

- ADMIN/CREW
- BUILDING CIRCULATION
- ENCLOSED/HEATED SHOPS &VEHICLE STORAGE
- CANOPY COVER
- EXISTING STRUCTURES ON ADJACENT PROPERTIES

SITE

127,530 SF
13,400 SF ADJACENT PARCEL
140,930 SF TOTAL

BUILDINGS

BUILDING A
7,000 SF - LEVEL 1 CREW/SHOPS
8,500 SF - LEVEL 2 ADMIN/CREW
15,500 SF - TOTAL

BUILDING B
8,090 SF - CANOPY TOTAL

BUILDING C
10,660 SF - HEATED/ENCLOSED
5,000 SF - CANOPY STORAGE
1,000 SF - CANOPY WASH BAY
1,000 SF - CANOPY FUEL BAY
17,660 SF - TOTAL

BUILDING D
4,220 SF - CANOPY TOTAL

45,470 SF TOTAL PROGRAM AREA

PARKING

4 - VISITOR
40 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)
MEDIUM 10' x 30' (16)
SMALL 10' x 20' (26)
X-SMALL 8' x 12' (9)
XX-SMALL 8' x 8' (21)

BULK MATERIALS

18' x 20' 5/8" MINUS
18' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 8 MARCH 2016 PRE DESIGN PHASE

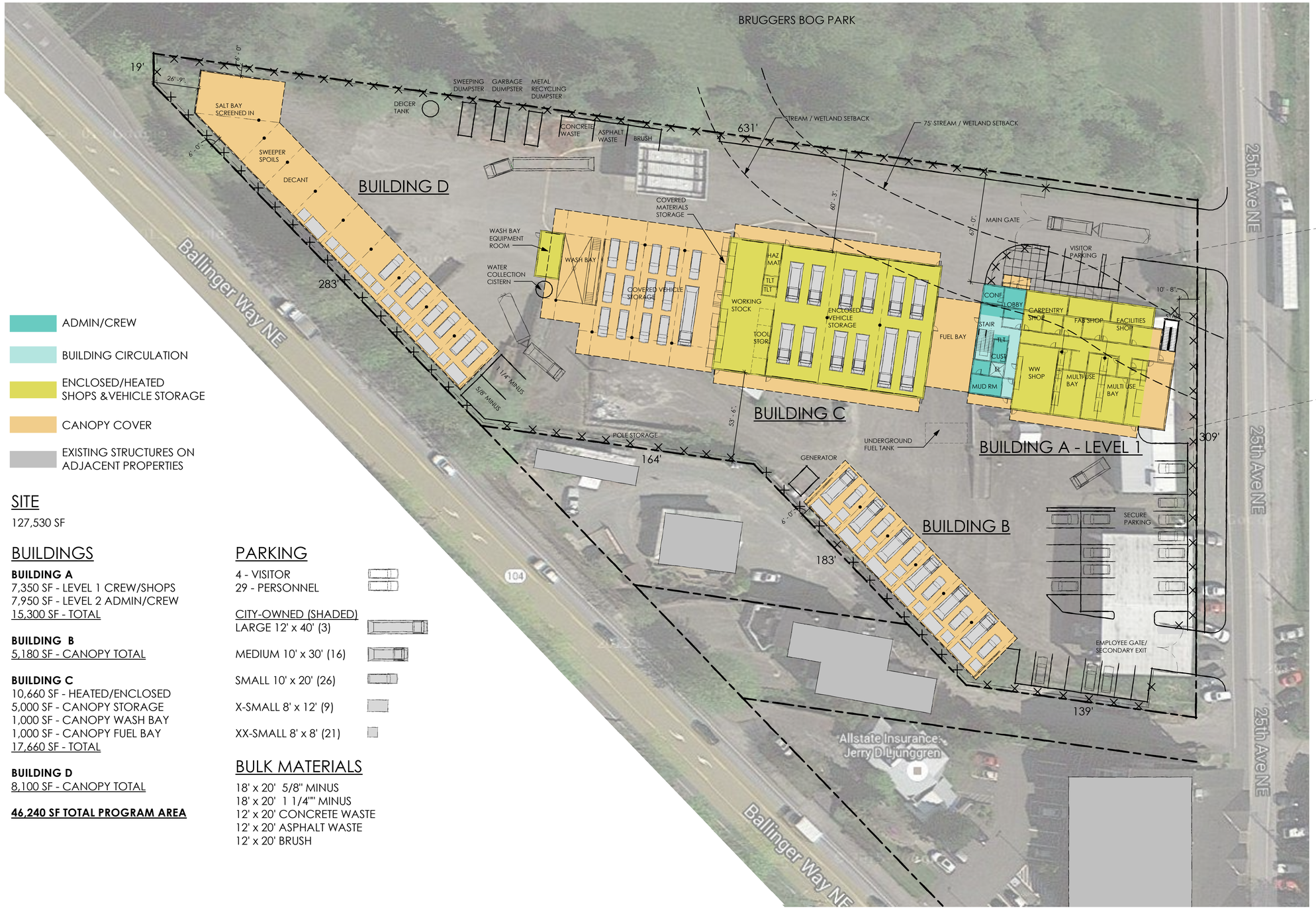
SITE AND BUILDING DEVELOPMENT - ALTERNATIVE B.1

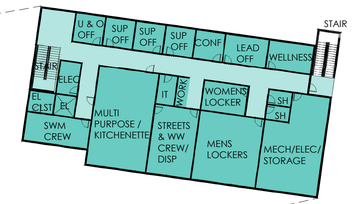
NORTH

NOTE: DRAWING MAY BE REDUCED
0 15' 30' 60'

CITY OF SHORELINE

TCF Architecture





BUILDING A - LEVEL 2

- ADMIN/CREW
- BUILDING CIRCULATION
- ENCLOSED/HEATED SHOPS &VEHICLE STORAGE
- CANOPY COVER
- EXISTING STRUCTURES ON ADJACENT PROPERTIES

SITE

127,530 SF

BUILDINGS

BUILDING A
7,350 SF - LEVEL 1 CREW/SHOPS
7,950 SF - LEVEL 2 ADMIN/CREW
15,300 SF - TOTAL

BUILDING B
5,180 SF - CANOPY TOTAL

BUILDING C
10,660 SF - HEATED/ENCLOSED
5,000 SF - CANOPY STORAGE
1,000 SF - CANOPY WASH BAY
1,000 SF - CANOPY FUEL BAY
17,660 SF - TOTAL

BUILDING D
8,100 SF - CANOPY TOTAL

46,240 SF TOTAL PROGRAM AREA

PARKING

4 - VISITOR
29 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)
MEDIUM 10' x 30' (16)
SMALL 10' x 20' (26)
X-SMALL 8' x 12' (9)
XX-SMALL 8' x 8' (21)

BULK MATERIALS

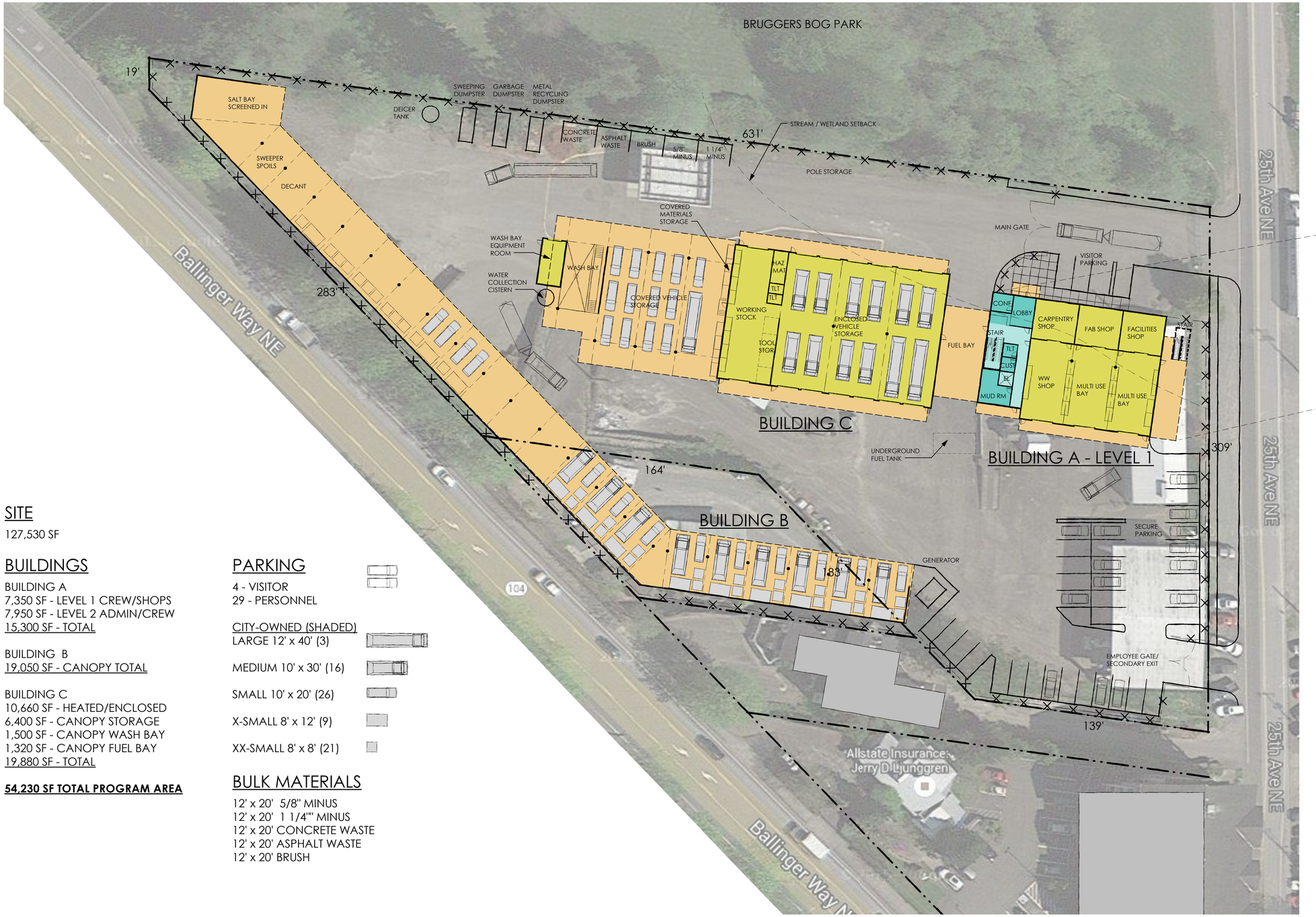
18' x 20' 5/8" MINUS
18' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

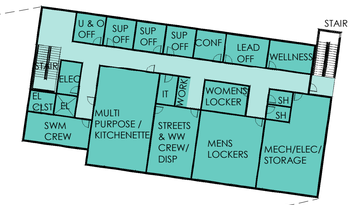
CITY OF SHORELINE - NORTH MAINTENANCE FACILITY
19547 25TH AVE NE SEATTLE, WA 98155 8 MARCH 2016 PRE DESIGN PHASE

SITE AND BUILDING DEVELOPMENT - ALTERNATIVE C

NORTH
NOTE: DRAWING MAY BE REDUCED
0 15' 30' 60'

CITY OF SHORELINE
TCF Architecture





BUILDING A - LEVEL 2

SITE

127,530 SF

BUILDINGS

BUILDING A
7,350 SF - LEVEL 1 CREW/SHOPS
7,950 SF - LEVEL 2 ADMIN/CREW
15,300 SF - TOTAL

BUILDING B
19,050 SF - CANOPY TOTAL

BUILDING C
10,660 SF - HEATED/ENCLOSED
6,400 SF - CANOPY STORAGE
1,500 SF - CANOPY WASH BAY
1,320 SF - CANOPY FUEL BAY
19,880 SF - TOTAL

54,230 SF TOTAL PROGRAM AREA

PARKING

4 - VISITOR
29 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)

MEDIUM 10' x 30' (16)

SMALL 10' x 20' (26)

X-SMALL 8' x 12' (9)

XX-SMALL 8' x 8' (21)

BULK MATERIALS

12' x 20' 5/8" MINUS
12' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 8 MARCH 2016 PRE DESIGN PHASE

SITE AND BUILDING DEVELOPMENT - ALTERNATIVE C.1

CITY OF SHORELINE

TCF Architecture



BUILDING A - LEVEL 2
ACCESS OFF BALLINGER WAY

SECTION 1

SECTION 2

ADMIN/CREW

BUILDING CIRCULATION

ENCLOSED/HEATED SHOPS &VEHICLE STORAGE

CANOPY COVER

EXISTING STRUCTURES ON ADJACENT PROPERTIES

SITE
127,530 SF
13,400 SF ADJACENT PARCEL
140,930 SF TOTAL

BUILDINGS
BUILDING A
7,300 SF - LEVEL 1 CREW/SHOPS
5,300 SF - ENCLOSED VEHICLE PARKING
12,400 SF - CANOPY VEHICLE PARKING
6,600 SF - LEVEL 2 ADMIN/CREW
31,600 SF - TOTAL

BUILDING B
3,400 SF - CANOPY TOTAL

BUILDING C
470 SF - HEATED/ENCLOSED
11,700 SF - CANOPY STORAGE
1,000 SF - CANOPY WASH BAY
1,000 SF - CANOPY FUEL BAY
14,170 SF - TOTAL

49,170 SF TOTAL PROGRAM AREA

PARKING
3 - VISITOR
35 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)
MEDIUM 10' x 30' (16)
SMALL 10' x 20' (26)
X-SMALL 8' x 12' (9)
XX-SMALL 8' x 8' (21)

BULK MATERIALS
18' x 20' 5/8" MINUS
18' x 20' 1 1/4"' MINUS
18' x 20' CONCRETE WASTE
18' x 20' ASPHALT WASTE
18' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 8 MARCH 2016 PRE DESIGN PHASE

SITE AND BUILDING DEVELOPMENT - ALTERNATIVE D

CITY OF SHORELINE

TCF Architecture

4 - DESIGN NARRATIVES

Architectural

Building Program

Building A: Operations/Shops Building 15,500 SF: A two-story building providing office and crew facilities for Waste Water, Public Works, Surface Water Management with limited presence of Facilities, Traffic Engineering and Environmental Services employees, including locker rooms, mud room, wellness room, dispatch rooms, multipurpose/lunch room, lobby, supervisor offices and shop and multi-use bays.

Building B: Vehicle and Equipment Storage: 8,000 SF: A one-story canopy with walls on three sides providing covered, unheated storage for vehicles and equipment including snow plows, spreaders and equipment on trailers.

Building C: Vehicle and Materials Storage, Vehicle Fuel and Wash: 17,600 SF: A one-story building providing both enclosed/heated and canopy covered vehicle and material storage as well as wash and fueling bays.

Building D: Materials and Equipment Storage: 4,200 SF: A one-story canopy with walls on three sides providing covered, unheated storage for equipment and materials including salt and sweeper spoils, as well as a decant facility.

Building and Site Configuration / Circulation

The unusually shaped site along with the wetland and stream buffer along the north eastern edge of the site add complexity to the site layout and design. As with all maintenance facilities, clarity and efficiency of the circulation systems is essential to the functional success of the facility design. Clear, logical circulation systems for people, materials and vehicles have been established in the design both within the building and throughout the site. Crew vehicle parking is secluded from visitor and city owned vehicle parking. One main entry/exit and a secondary entry/exit provide circulation options in and out of the site. It is intended for the main entry/exit be used on a regular basis and the secondary entrance/exit be used on an as needed basis. The fuel bay is towards the front of the site so that police and other city vehicles, non NMF vehicles do not need to circulate deep into the site. Turning radii and clearances between buildings are sufficient for nearly any vehicle type to flow and circulate throughout the site.

Building A has primary people entrance/egress points adjacent to the crew parking lot to the east, the yard area to the west and at the public entrance to the north. The elevator and main stairs are located near the noted entrance/egress points for ease of access and movement through the building. The mud room is near the yard entrance/egress point on the first floor for immediate access by crews as they enter the building from the field, while the locker room and crew rooms are located on the second level along with offices and other crew functions. Building C will have a dedicated central circulation spine through the building along with entrance/egress points as needed along the enclosed portion of the building.

Character and Massing

It is anticipated that the buildings will be skinned with durable low maintenance materials and comply with all City design standards. This includes, metal, concrete, CMU, wood, fiber cement panels, etc., Pre-engineered metal building systems will be utilized where found appropriate. Interior finishes will be of materials appropriate to the function of the spaces, office, industrial, etc. This includes, but not limited to, painted drywall, ceramic tile, acoustical ceiling tiles, polished and sealed concrete, carpet, wood, open structure, etc. The architectural character, massing and finishes will be developed in the upcoming Schematic Design phase.

Sustainability

The city has a goal of LEED Silver for Building A, with the possibility of exploring LEED Gold certification. Several strategies for obtaining certification include, increase in mechanical, water and electrical efficiencies, recycled content, daylighting and stormwater designs. See the full preliminary LEED scorecard under this section. This project will fall under LEED 2009 for new construction guidelines.

Security

The site will be fully fenced, including the crew parking, with barbed wire as allowed by the Shoreline Municipal Code (SMC) and zoning requirements. The main entry gate will have controllable opening by use of card reader or garage openers in vehicles. CCTV and ample lighting are anticipated throughout the site. The building will have security features including CCTV and card readers. The design and extent of the security systems will be further refined in the upcoming Schematic Design phase.

Regulatory Review

The facility will be designed to comply with the 2012 International Building Code (IBC) family of codes, which includes the International Fire Code (IFC), International Mechanical Code (IMC), Uniform Plumbing Code (UPC), the National Electrical Code (NEC), along with the Washington Ventilation and Indoor Air Quality Code, and the International Energy Conservation Code (IECC) with Washington State Energy Code (WSEC) amendments. All design and local standards required by the SMC will be followed. Refer to the Regulatory Review section of this report for a preliminary summary and analysis of the project.

Structural

Building A

- Building A is anticipated to involve a two-story structure that will include maintenance bays, various shops as well as locker room and crew office areas. It is anticipated that this structure will consist primarily of conventional wood framed construction.
- The roof framing for Building A is anticipated to include 19/32" plywood roof sheathing, which will span between pre-engineered wood joists (either plywood web joists at concealed locations or open web joists at exposed locations). The roof joists will span between steel or glu-lam beams at the building interior, or loadbearing wood stud walls at the building exterior.
- The floor framing for Building A is anticipated to include 1 ½" of non-structural concrete topping over 23/32" plywood floor sheathing. The sheathing will span between pre-engineered wood joists (either plywood web joists at concealed locations or open web joists at exposed locations). The floor joists will span between steel or glu-lam beams at the building interior, or loadbearing wood stud walls at the building exterior.
- The interior and exterior walls will consist of conventional wood stud construction. The typical walls will consist of 2x6 DF #2 studs at 16" on center. These studs will be sheathed with 15/32" plywood sheathing at all shearwall locations.
- Rectangular steel (HSS) columns will be used to support heavily loaded / long span beams.
- Lateral loads for the building will be resisted by conventional wood framed diaphragms. The horizontal roof and floor sheathing will transfer lateral loads to wood framed shearwalls. The shearwalls will transfer lateral loads from the roof and floor levels to the building foundations. At heavily loaded locations, steel braced frames may be utilized instead of the plywood sheathed shearwalls.
- Foundations for the structure are assumed to consist of conventional spread footings at all building columns and conventional strip footings at all loadbearing walls.

- The slab on grade at the maintenance and shop areas will consist of a 6" thick concrete slab on grade with #4 reinforcing bars at 18" o.c. each way at the slab centerline. The slab on grade for locker room and office areas will consist of a 4" thick concrete slab on grade with 6x6 W1.4xW1.4 WWF reinforcing at the slab centerline.

- **Building B**
- This structure is anticipated to include an Enclosed Vehicle Storage area, a Covered Vehicle Storage area, a Fuel Bay Canopy as well as a Wash Bay and Wash Bay Equipment Room.

- **Building B Enclosed Vehicle Storage**
- The framing for the Enclosed Vehicle Storage Building will consist of a pre-engineered building structure.
    - The roof framing will involve light gage metal roofing spanning between light gage steel purlins.
    - The roof purlins will span between built-up steel moment frames.
    - The moment frames will span across the vehicle storage areas (in the short direction), and include a small exterior canopy above the overhead doors. A row of interior columns will be provided in order to reduce the frame spans, and eliminate the need for continuous cross-ties at the building foundation.
- Lateral loads for the Enclosed Vehicle Storage area will be resisted by the steel moment frames in the transverse direction. Portal frames will be provided to resist lateral loads in the long direction.
- The exterior walls will consist of the following:
    - The base of the exterior walls will consist of a cantilevered masonry wainscot (6" or 8" CMU depending upon the height of the wainscot). The wainscot will be nominally reinforced (typically #4 bars each way at 24" o.c.), and grouted solid.
    - Above the CMU wainscot, the exterior walls will be provided by the metal building manufacturer. These walls will consist of light gage metal siding spanning vertically between light gage steel girts. The wall girts will span between frame columns.
    - An alternate wall system consisting of light gage metal studs may be used instead of the conventional pre-engineered wall system. The metal studs will likely consist of 6" x 20 gage metal studs at 16" on center. The studs may be sheathed with GWB (or similar non-structural finishes) on both faces of the studs.
- Foundations for the structure are assumed to consist of conventional spread footings at all frame columns and conventional strip footings at all CMU wainscot walls.
- The slab on grade for the structure will consist of a 6" thick concrete slab on grade with #4 reinforcing bars at 18" oc each way at the slab centerline. A thickened slab edge will be provided at the exterior perimeter of the slab on grade.

- **Building B Covered Vehicle Storage**
- The framing for the Covered Vehicle Storage Building will consist of an open pre-engineered canopy structure.
    - The roof framing will involve light gage metal roofing spanning between light gage steel purlins.
    - The roof purlins will span between built-up steel moment frames.

- The moment frames will span across the vehicle storage areas (in the short direction), and include a large overhang at either end of the canopy. A row of interior columns will be provided in order to reduce the frame spans, and eliminate the need for continuous cross-ties at the building foundation.
- A seismic joint will be provided between the Covered Vehicle Storage Building and adjacent Enclosed Vehicle Storage Building.

- Lateral loads for the Covered Vehicle Storage area will be resisted by the steel moment frames in the transverse direction. Portal frames will be provided to resist lateral loads in the long direction.
- Foundations for the structure are assumed to consist of conventional spread footings at all frame columns.
- The slab on grade for the structure will consist of a 6" thick concrete slab on grade with #4 reinforcing bars at 18" o.c. each way at the slab centerline. A thickened slab edge will be provided at the exterior perimeter of the slab on grade.

- **Building B Fuel Canopy**
- The framing for the Fuel Canopy will consist of an open pre-engineered canopy structure.
  - The roof framing will involve light gage metal roofing spanning between light gage steel purlins.
  - The roof purlins will span between built-up steel moment frames.
  - The moment frames will span parallel to the adjacent building structure (in the long direction of the canopy), and include a large overhang on three sides of the canopy.
  - A seismic joint will be provided between the Fuel Canopy and adjacent Enclosed Vehicle Storage Building.
- Lateral loads for the Fuel Canopy will be resisted by the cantilevered steel columns, which will resist loads in both the longitudinal and transverse directions.
- Foundations for the structure will consist of large conventional spread footings at all frame columns. The footings will be designed as a "flag pole" type foundation in order to resist loads from the cantilevered canopy columns.
- The slab on grade for the structure will consist of a 6" thick concrete slab on grade with #4 reinforcing bars at 18" o.c. each way at the slab centerline. A thickened slab edge will be provided at the exterior perimeter of the slab on grade.

- **Building B Vehicle Wash Canopy**
- The framing for the Vehicle Wash Canopy will likely consist of an extension of the adjacent pre-engineered Covered Vehicle Storage Building structure.
  - The roof framing will involve light gage metal roofing spanning between light gage steel purlins.
  - The roof purlins will span between built-up steel moment frames.
  - The moment frames will span across the wash bay (in the short direction of the building), and include a large overhang at either end of the canopy. A row of interior columns will be provided in order to reduce the frame spans, and eliminate the need for continuous cross-ties at the building foundation.
- Lateral loads for the Vehicle Wash Canopy will be resisted by the steel moment frames in the transverse direction. Portal frames will be provided to resist lateral loads in the long direction.

- A separation wall between the Wash Bay and adjacent Covered Vehicle Storage will likely consist of a full height CMU wall. This wall will be 8" thick, and nominally reinforced (#5 vertical reinforcing at 24" oc, and (2) #5 horizontal reinforcing at 48" o.c.). This wall will be braced at the top of the wall by the Vehicle Wash Canopy structure.
- Foundations for the structure are assumed to consist of conventional spread footings at all frame columns and conventional strip footings at all CMU wainscot walls.
- The slab on grade for the structure will consist of a 6" thick concrete slab on grade with #4 reinforcing bars at 18" o.c. each way at the slab centerline. A thickened slab edge will be provided at the exterior perimeter of the slab on grade.

- **Building B Wash Bay Equipment Room**
- The framing for the Wash Bay Equipment Room will likely consist of a site built light gage steel structure. The Wash Bay Equipment Room will be constructed as an independent structure that is located partially beneath the Vehicle Wash Bay canopy.
    - The roof framing will involve fire treated plywood (or light gage metal roof deck) spanning between light gage steel joists.
    - The roof joists will span between load bearing light gage steel studs at the exterior perimeter of the Equipment Room.
- Lateral loads for the Wash Bay Equipment Room will be resisted by exterior shear walls. The sheathing at these shear walls will consist of either fire treated plywood sheathing of light gage steel sheet sheathing.
- The exterior walls will consist of the following:
    - The base of the exterior walls may consist of a cantilevered masonry wainscot (6" or 8" CMU depending upon the height of the wainscot). The wainscot will be nominally reinforced (typically #4 bars each way at 24" o.c.), and grouted solid.
    - Above the CMU wainscot, the exterior walls will consist of light gage metal studs (or full height studs could be provided is the wainscot is not desired). The metal studs will likely consist of 6" x 20 gage metal studs at 16" on center. The studs will be sheathed with fire treated plywood sheathing or light gage steel sheet sheathing as needed for shear resistance.
- Foundations for the structure are assumed to consist of conventional strip footings at all CMU wainscot walls or loadbearing light gage stud walls.
- The slab on grade for the structure will consist of a 4" thick concrete slab on grade with 6x6 W1.4xW1.4 WWF reinforcing at the slab centerline.

- **Building C**
- This structure is anticipated to be a Vehicle Storage Canopy, which will be enclosed on three sides and open along one side.
- The framing for this building will likely be a pre-engineered canopy structure.
    - The roof framing will involve light gage metal roofing spanning between light gage steel purlins.
    - The roof purlins will span between built-up steel moment frames.
    - The moment frames will clear span across the vehicle storage areas (in the short direction), and include a large overhang along the open end of the canopy.

- Lateral loads for the canopy will be resisted by the steel moment frames in the transverse direction. Rod bracing will be provided in the longitudinal direction at the closed end of the canopy. At the open end of the canopy, portal frames will be provided to resist lateral loads in the long direction.
- The exterior walls on three sides of the canopy will consist of the following:
    - The base of the exterior walls will consist of a cantilevered masonry wainscot (6" or 8" CMU depending upon the height of the wainscot). The wainscot will be nominally reinforced (typically #4 bars each way at 24" o.c.), and grouted solid.
    - Above the CMU wainscot, the exterior canopy walls will be provided by the metal building manufacturer. These walls will consist of light gage metal siding spanning vertically between light gage steel girts. The wall girts will span between frame columns.
- Foundations for the structure are assumed to consist of conventional spread footings at all frame columns and conventional strip footings at all CMU wainscot walls.
- The slab on grade for the structure will consist of a 6" thick concrete slab on grade with #4 reinforcing bars at 18" o.c. each way at the slab centerline. A thickened slab edge will be provided along the open end of the canopy.

- **Building D**
- This structure is anticipated to be a storage canopy, which will include areas for Salt Storage, Sweeper Spoils, Vactor Decant and General Storage. This structure will be partially enclosed along three sides of the canopy, and open along one end.
- The framing for this canopy will likely be a pre-engineered canopy structure.
    - The roof framing will involve light gage metal roofing spanning between light gage steel purlins.
    - The roof purlins will span between built-up steel moment frames.
    - The moment frames will clear span across the storage areas, and include a large overhang along the open end of the canopy.
- Lateral loads for the canopy will be resisted by the steel moment frames in the transverse direction. Rod bracing (or portal frames) will be provided in the longitudinal direction at the closed end of the canopy. At the open end of the canopy, portal frames will be provided to resist lateral loads in the long direction.
- The exterior walls on three sides of the canopy may consist of the following:
    - Ecology blocks (2'-0" x 4'-0" x 2'-0" tall) at three sides of the Salt Storage area. The blocks may be placed on a 2'-0" wide by 2'-0" tall concrete curb at the base of the wall.
    - The remaining areas of the canopy can utilize ecology block walls, or use a cantilevered masonry wall (8" CMU).
    - If desired, the canopy may include a continuous soffit directly above the ecology block or CMU walls. The soffit will be provided by the metal building manufacturer, and will consist of light gage metal siding spanning vertically between light gage steel girts. The wall girts will span between frame columns.
- Foundations for the structure are assumed to consist of conventional spread footings at all frame columns and conventional strip footings at all CMU walls.

- The slab on grade for the structure will consist of a 6" thick concrete slab on grade with #4 reinforcing bars at 18" o.c. each way at the slab centerline. A thickened slab edge will be provided along the open end of the canopy.

Mechanical, Plumbing and Fire Protection

General Design Conditions – BLDG A

Weather data is based on conditions at Seattle, Washington.

Outside Winter:	Dry Bulb: 25° F
Inside Winter:	General spaces: 70° F
	Shops/Storage: 62°F
	Mechanical/Fire Protection, Equipment Spaces: 45°F
	Telecom: 64°F
Outside Summer:	Dry Bulb: 83° F Wet Bulb: 66° F.
Inside Summer:	General spaces: 75° F
	Shops/Storage: 80°F (Goal. Space is heat only with exhaust cooling).
	Mechanical/Fire Protection, Equipment Spaces: 85°F
	Telecom: 75°F.

Minimum Outdoor Air (Ventilation) Per ASHRAE Standard 62

Energy Use and Conservation

Energy conservation measures are planned, including the insulation levels for the envelope, low lighting densities and energy efficient equipment. Specific energy conserving elements are plate and frame heat exchanger on the outside air system, CO2 sensors in the open areas/shop areas used to match outside air quantities with the occupancy within that specific zone of the building, high efficiency compressors for the Telecom room cooling units, and high efficiency motors with variable drives or ECM. These mechanical elements are coupled with a highly insulated building envelope, high efficiency windows, and high efficiency lighting throughout the facility.

Mechanical Systems

HVAC, Offices Administration Area: One heat recovery air handling unit will provide air-to-air heat recovery and ventilation to individually controlled variable refrigerant flow (VRF) indoor cassette units. A return fan in the heat recovery air handling unit will be used to maintain building pressure and heat will be recovered from the exhaust via a plate and frame air-to-air heat exchanger. Both fans will be provided with variable frequency drives or will be equipped with electronically controlled motors (ECM). The VRF cassette units will be tied to a central condensing unit plant. The DX outdoor condenser is planned to be located on the ground for ease of maintenance.

HVAC, Shop: Heat in the shops is planned to be provided via electric unit heaters. Ventilation will be provided by propeller wall fans with variable flow capabilities. A NOx/CO sensor will be installed to increase the exhaust fans to full speed in the event of high exhaust concentrations otherwise the exhaust fans will run at minimum speeds to provide code minimum ventilation rates.

Other Ventilation: (1) Vehicle exhaust system will be provided with connection point located between multi-use bays.

Telecom Room: The telecom rooms shall be cooled with a split system cooling unit capable of cooling with outdoor temperatures of 0 degrees F.

Elevator Machine Room: The elevator machine room shall be cooled or heated if necessary with a split system heat pump unit capable of cooling with outdoor temperatures of 0 degrees F.

Direct Digital Controls (DDC): Direct digital controls will be provided for all systems provided in the building including but not limited to the main heating, ventilating and air conditioning systems. All HVAC equipment will be DDC controlled.

Plumbing Systems

Piping: Interior water piping and fittings will be type L copper and underground shall be type K copper. All waste and vent shall be hubless cast iron. Water supply piping buried under concrete floors will be kept at a minimum. Floor drains will be fitted with trap primers. The backflow preventer shall be of the reduced pressure backflow assembly type. Plumbing materials, installation, backflow prevention and drainage will meet the latest Uniform Plumbing Code requirements.

Plumbing System Fixtures: Fixtures will be water conservation types, in accordance with UPC. Toilet room plumbing fixtures will all be water conserving type. The water closets will be water conserving 1.28 gallon per flush with sensor flush valves. The urinals will be 0.125 gallons per flush (ultra-low flush) with sensor flush valves. Lavatories and sensor faucets will be provided. The sensor batteries for the lavatories are self-charging using the water flow to spin a micro-turbine. Floor drains will be provided in the toilet rooms, locker rooms, and in the mechanical rooms. Trench drains will be provided in the vehicle bays and will route through an oil/water separator prior to connecting to the site sewer system. Automatic trap primers will be provided for all floor drains.

Plumbing System Domestic Hot Water: Domestic water heating will be accomplished by electric storage type water heaters storing water at 140 degrees (sized for an incoming water temperature of 40 degrees). A central thermostatic mixing valve will provide 110° F water for all plumbing fixtures requiring hot water and circulated to minimize the wait time for hot water. Piping will be provided with zone isolation valves so portions of each system may be isolated for operations and/or maintenance purposes without affecting the entire system.

Fire Protection Sprinkler System

Building – A: This building will be provided with a complete fire protection system in compliance with the latest adopted edition of N.F.P.A. #13 requirements. A single wet pipe automatic fire protection sprinkler system will be provided to protect all areas within the buildings envelope and any exterior overhangs that are required to be protected will be protected with dry sidewall sprinklers. A single dry pipe automatic fire protection sprinkler system will be installed to protect all areas outside of the buildings envelope that cannot be protected by the wet pipe sprinkler system.

The design density, remote area size, and hose stream allowance requirements shall be taken from the latest adopted edition of N.F.P.A. #13 for Ordinary Hazard Group II, Ordinary Hazard Group I, and Light Hazard Occupancies. All hydraulic calculation procedures, seismic bracing procedures, sprinkler head location requirements, and system component requirements outlined in the latest adopted edition of N.F.P.A. #13 will be followed.

General Design Conditions – BLDG C

Weather data is based on conditions at Seattle, Washington.

Outside Winter: Dry Bulb: 25° F

Inside Winter:	Shops/Storage/High Bay Area: 45°F Mechanical/Fire Protection, Equipment Spaces: 45°F
Outside Summer:	Dry Bulb: 83° F Wet Bulb: 66° F.
Inside Summer:	Vehicle/Equipment Storage: 80°F (Goal. Space is heat only with exhaust cooling). Mechanical/Fire Protection, Equipment Spaces: 85°F

Minimum Outdoor Air (Ventilation) Per ASHRAE Standard 62

Energy Use and Conservation

Energy conservation measures are planned, including the insulation levels for the envelope, low lighting densities and energy efficient equipment. Specific energy conserving elements are plate and frame heat exchanger on the outside air system, CO2 sensors in the open areas/shop areas used to match outside air quantities with the occupancy within that specific zone of the building, high efficiency compressors for the Telecom room cooling units, and high efficiency motors with variable drives or ECM. These mechanical elements are coupled with a highly insulated building envelope, high efficiency windows, and high efficiency lighting throughout the facility.

Mechanical Systems

HVAC, Shop and High Bay Area: Heat in the shops is planned to be provided via electric unit heaters. Ventilation will be provided by propeller wall fans with variable flow capabilities. A NOx/CO sensor will be installed to increase the exhaust fans to full speed in the event of high exhaust concentrations otherwise the exhaust fans will run at minimum speeds to provide code minimum ventilation rates.

Direct Digital Controls (DDC): Direct digital controls will be provided for all systems provided in the building including but not limited to the main heating, ventilating and air conditioning systems. All HVAC equipment will be DDC controlled.

Plumbing Systems

Piping: Interior water piping and fittings will be type L copper and underground shall be type K copper. All waste, vent, and rainwater leaders shall be hubless cast iron. Water supply piping buried under concrete floors will be kept at a minimum. Floor drains will be fitted with trap primers. The backflow preventer shall be of the reduced pressure backflow assembly type. Plumbing materials, installation, backflow prevention and drainage will meet the latest Uniform Plumbing Code requirements.

Plumbing System Fixtures: Fixtures will be water conservation types, in accordance with UPC. Toilet room plumbing fixtures will all be water conserving type. The water closets will be water conserving 1.28 gallon per flush with sensor flush valves. Lavatories with sensor faucets will be provided. The sensor batteries for the lavatories are self-charging using the water flow to spin a micro-turbine. Trench drains will be provided in the vehicle storage areas. A large area drain will be provided in the wash bay. Automatic trap primers will be provided for all floor drains. Vehicle storage drains will route through an oil/water separator prior to connecting to the site sewer system.

Plumbing System Domestic Hot Water: Domestic water heating will be accomplished by electric storage type water heaters storing water at 140 degrees (sized for an incoming water temperature of 40 degrees). A central thermostatic mixing valve will provide 110° F water for all plumbing fixtures requiring hot water and circulated to minimize the wait time for hot water. Piping will be provided with zone isolation valves so portions of each system may be isolated for operations and/or maintenance purposes without affecting the entire system.

Fire Protection Sprinkler System

Building – C: This building will be provided with a complete fire protection system in compliance with the latest adopted edition of N.F.P.A. #13 requirements. A single wet pipe automatic fire protection sprinkler system will be provided to protect all areas within the building's envelope and any exterior overhangs that are required to be protected will be protected with dry sidewall sprinklers. A single dry pipe automatic fire protection sprinkler system will be installed to protect all areas outside of the building envelope that cannot be protected by the wet pipe sprinkler system.

The design density, remote area size, and hose stream allowance requirements shall be taken from the latest adopted edition of N.F.P.A. #13 for Ordinary Hazard Group II, Ordinary Hazard Group I, and Light Hazard Occupancies. All hydraulic calculation procedures, seismic bracing procedures, sprinkler head location requirements, and system component requirements outlined in the latest adopted edition of N.F.P.A. #13 will be followed.

Electrical

Site

Electrical Site Service

Electrical service to the building will be provided Seattle City Lights, SCL (to be verified). A new pad mounted service transformer will be located north of building C adjacent to the generator. The proposed service will be 208Y/120V, 3-phase, 4-wire system. SCL will be installing and providing the new service transformer and primary cabling. Electrical contractor will provide all excavation, trenching, backfill, primary conduits and secondary conduits and wires.

Power Site Distribution

The Site Main Distribution Board (MDB) will be sized adequately to support the new building and future expansion. The MDB and Automatic Transfer Switch will be located exterior adjacent to the SCL transformer to be centrally located. Building Service Panelboards will be located on each Building. Panels to have copper buses, bolt on breakers and be fully rated for available fault current with 10% spare capacity.

Emergency Generator System

The emergency generator will be sized adequately to support the user requirements for the Administrative Office, Maintenance Shops, Fuel Building and site/building lighting emergency needs. The emergency generator will be provided with integral base fuel tank to be sized per the user's run time requirements. A load shedding control system will be installed to control the HVAC DDC controls to rotate heating and ventilating equipment according to the overall site load being monitored at the site MDB.

The generator will be strategically located and sound attenuated with wall enclosure north of the site, adjacent to the SCL service transformer, opposite of the residential area on the south side. Further evaluation and coordination will be performed to assess level of sound attenuation enclosure requirements.

Telephone, Cable TV and Cable Internet Service

Service conduits for CenturyLink (telephone) and Comcast (cable television and cable internet) services will be provided and installed from building A IT room to the service connection point established by the each utility company.

Outdoor Lighting

Site lighting will be combination of building mounted and pole mounted LED type lighting fixtures with full cut-off optics dark-sky compliant with color temperature of 4000K. All areas will be illuminated to the minimum levels

recommended by the IESNA. Site lighting will be design to meet the LEED SSc8 credit. All exterior lighting will be controlled by a time clock with photocell.

Low Voltage System
Site CCTV coverage will be provided per owner's requirements.

The main entry gate will be provided with an intercom communication system between the gate pedestal and building A reception desk. Proximity card access control system will be provided at the main entry gate operator.

Building A

Building Service and Distribution
Building A Service Distribution Board will be sized adequately to support the new building and any future expansion. All panelboards will be located in the electrical room to support the Administration/Office area and additional panels in the shop area to support the maintenance bay shops. Panels to have copper buses, bolt on breakers and be fully rated for available fault current with 10% spare capacity. Surge protection devices shall be installed at the main switchboard and panelboards serving computers and critical equipment.

Voltage Drop
Circuits are sized to limit voltage drop to approximately 3 percent for branch circuits and 2 percent for panelboard feeders for not more than 5 percent from distribution transformer to point of utilization in accordance with the National Electrical Code (NEC).

Branch Circuit and Wiring Method

Dedicated circuits will be provided to all shop equipment. Receptacles will be provided on all four walls of each office. All branch circuit conductors will be copper. No more than six duplex receptacles or three quad receptacles to be connected to a single branch circuit. Lighting and outlets shall be run on separate circuits. Dedicated circuits will be provided for to all shop equipment. GFCI type duplex receptacle will be provided in restrooms, break rooms and exterior per NEC requirement. All GFCI receptacles shall be dedicated, no downstream GFCI circuiting allowed.

Interior Lighting System
All Interior lighting will be designed with LED Fixtures with 4000 Kelvin color temperature. All areas will be illuminated to the minimum levels in accordance with IES recommendations. Shop areas will be provided with highbay LED fixtures. Administration and office areas will utilize Direct/Indirect suspended LED linear fixtures and recessed volumetric LED fixtures. Wrap-a-round LED fixtures will be installed in storage and utility rooms.

In compliance with Washington State Non-Residential Energy Code, each area/room enclosed by walls will be provided with lighting control switch/system. The switches shall be located adjacent to the entrance to the space. Where there is more than one entrance to the space, lighting system controls will be provided at each entrance. Lighting control system will utilize a combination of vacancy/occupancy sensors, daylight harvesting photosensors, wall switches and Daylight Harvesting Room Controller where daylighting controls are required. All artificial lighting within the daylight zones (windows and overhead skylights) shall utilize daylight harvesting controls per Washington State Non-Residential Energy Code.

Exit and Emergency Egress Lighting - Exits are marked by readily visible signs in all cases where the exit or way to reach it is not readily apparent to the occupants. Signs are located not more than 10 feet from exits, are internally illuminated, and of the type consuming less than 3 watts per side. Egress lighting is provided at an average 1 foot-candle in accordance with NFPA 101. Egress lighting is accomplished by selective illumination of normal lighting fixtures. Power for egress and exit lighting will be powered through the Emergency Generator "Life Safety" branch Automatic Transfer Switch (ATS).

Fire Alarm Systems

Fire Alarm system will be provided in accordance to City of Shoreline Requirements. Fire Sprinkler system to be monitored through the fire alarm system.

Data/Voice Communications System

A complete telecommunications system will be provided to include infrastructure, cabling and headend equipment. Horizontal cabling for voice and data will consists of CAT 6 cables installed in 1" conduits from the outlet to the nearest IT room or to accessible ceiling space. Telecommunication outlets will be provided with (2) CAT 6 cables per jack location to be terminated as required; voice on 110 punch-down blocks; data in rack mounted RJ45 patch panels. Telecommunication outlets shall be installed with a minimum of (2) location per enclosed office rooms and (1) per designated workstation or office/shop equipment that requires data connection.

Building A IT room will house the CenturyLink and Comcast D-Marks.

Access Control Subsystem

The access control system shall be compatible and integrated into the existing city of Shoreline facility access control card system. The access control system will be provided complete including all conduits, cabling, junction boxes, readers, controllers, sensors and associated hardware and software for a fully functioning system. The System will be provided with 5% spare software licenses and will utilize the IP network for data transmission. Card readers will be provided at all exterior man doors plus other doors identified by the user.

Closed Circuit Television System (CCTV)

A complete CCTV system will be provided to include CCTV devices, infrastructure, cabling and headend equipment. CCTV locations and coverage requirements to be determined by the user.

Building B

Building Service and Distribution

Building B Panelboard will be sized adequately to support the new building and any future expansion. Panelboard to have copper buses, bolt on breakers and be fully rated for available fault current with 10% spare capacity.

Voltage Drop

Circuits are sized to limit voltage drop to approximately 3 percent for branch circuits and 2 percent for panelboard feeders for not more than 5 percent from distribution transformer to point of utilization in accordance with the National Electrical Code (NEC).

Branch Circuit and Wiring Method

Dedicated circuits will be provided to all equipment. All branch circuit conductors will be copper. No more than six duplex receptacles or three quad receptacles to be connected to a single branch circuit. Lighting and outlets shall be run on separate circuits. Dedicated circuits will be provided for to all shop equipment. GFCI type duplex receptacle will be provided on all exterior/exposed to weather locations per NEC requirement. All GFCI receptacles shall be dedicated, no downstream GFCI circuiting allowed.

Lighting System

Building B canopy lighting will consist of vapor tight type LED Fixtures with 4000 Kelvin color temperature. All areas will be illuminated to the minimum levels in accordance with IES recommendations. Canopy lighting will be controlled via timeclock and occupancy sensors.

Fire Alarm Systems

Fire Alarm system will be provided in accordance to City of Shoreline Requirements. Fire Sprinkler system to be monitored through the fire alarm system.

Closed Circuit Television System (CCTV)

A complete CCTV system will be provided to include CCTV devices, infrastructure, cabling and headend equipment. CCTV locations and coverage requirements to be determined by the user.

Building C

Building Service and Distribution

Building C Service Distribution Board will be sized adequately to support the new building and any future expansion. All panelboards will be located in the electrical room to support the fuel bays, storage bays and wash bays. Panels to have copper buses, bolt on breakers and be fully rated for available fault current with 10% spare capacity. Surge protection devices shall be installed at the main switchboard and panelboards serving computers and critical equipment.

Voltage Drop

Circuits are sized to limit voltage drop to approximately 3 percent for branch circuits and 2 percent for panelboard feeders for not more than 5 percent from distribution transformer to point of utilization in accordance with the National Electrical Code (NEC).

Branch Circuit and Wiring Method

Dedicated circuits will be provided to all shop equipment. All branch circuit conductors will be copper. No more than six duplex receptacles or three quad receptacles to be connected to a single branch circuit. Lighting and outlets shall be run on separate circuits. Dedicated circuits will be provided for to all shop equipment. GFCI type duplex receptacle will be provided in restrooms, break rooms and exterior per NEC requirement. All GFCI receptacles shall be dedicated, no downstream GFCI circuiting allowed.

All devices, conduit and wiring in the wash bays shall be watertight. All equipment wiring in the fuel bay area shall be in accordance to NEC 514,

Interior Lighting System

All Interior lighting will be designed with LED Fixtures with 4000 Kelvin color temperature. All areas will be illuminated to the minimum levels in accordance with IES recommendations. The fuel bay, storage bay and wash bay areas will be provided with highbay LED fixtures. Wrap-a-round LED fixtures will be installed in storage and utility rooms.

In compliance with Washington State Non-Residential Energy Code, each area/room enclosed by walls will be provided with lighting control switch/system. The switches shall be located adjacent to the entrance to the space. Where there is more than one entrance to the space, lighting system controls will be provided at each entrance. Lighting control system will utilize a combination of vacancy/occupancy sensors, daylight harvesting photosensors, wall switches and Daylight Harvesting Room Controller where daylighting controls are required. All artificial lighting within the daylight zones (windows and overhead skylights) shall utilize daylight harvesting controls per Washington State Non-Residential Energy Code.

Exit and Emergency Egress Lighting - Exits are marked by readily visible signs in all cases where the exit or way to reach it is not readily apparent to the occupants. Signs are located not more than 10 feet from exits, are internally illuminated, and of the type consuming less than 3 watts per side. Egress lighting is provided at an average 1 foot-candle in accordance with NFPA 101. Egress lighting is accomplished by selective illumination of normal lighting

fixtures. Power for egress and exit lighting will be powered through the Emergency Generator "Life Safety" branch Automatic Transfer Switch (ATS).

Fire Alarm Systems
Fire Alarm system will be provided in accordance to City of Shoreline Requirements. Fire Sprinkler system to be monitored through the fire alarm system.

Data/Voice Communications System
A complete telecommunications system will be provided to include infrastructure, cabling and headend equipment. Horizontal cabling for voice and data will consists of CAT 6 cables installed in 1" conduits from the outlet to the nearest IT room or to accessible ceiling space. Telecommunication outlets will be provided with (2) CAT 6 cables per jack location to be terminated as required; voice on 110 punch-down blocks; data in rack mounted RJ45 patch panels. Telecommunication outlets shall be installed with a minimum of (2) location per enclosed office rooms and (1) per designated workstation or equipment that requires data connection.

Access Control Subsystem
The access control system shall be compatible and integrated into the existing city of Shoreline facility access control card system. The access control system will be provided complete including all conduits, cabling, junction boxes, readers, controllers, sensors and associated hardware and software for a fully functioning system. The System will be provided with 5% spare software licenses and will utilize the IP network for data transmission. Card readers will be provided at all exterior man doors plus other doors identified by the user.

Closed Circuit Television System (CCTV)
A complete CCTV system will be provided to include CCTV devices, infrastructure, cabling and headend equipment. CCTV locations and coverage requirements to be determined by the user.

Building D

Building Service and Distribution
Building D Panelboard will be sized adequately to support the new building and any future expansion. Panelboard to have copper buses, bolt on breakers and be fully rated for available fault current with 10% spare capacity.

Voltage Drop
Circuits are sized to limit voltage drop to approximately 3 percent for branch circuits and 2 percent for panelboard feeders for not more than 5 percent from distribution transformer to point of utilization in accordance with the National Electrical Code (NEC).

Branch Circuit and Wiring Method
Dedicated circuits will be provided to all equipment. All branch circuit conductors will be copper. No more than six duplex receptacles or three quad receptacles to be connected to a single branch circuit. Lighting and outlets shall be run on separate circuits. Dedicated circuits will be provided for to all shop equipment. GFCI type duplex receptacle will be provided on all exterior/exposed to weather locations per NEC requirement. All GFCI receptacles shall be dedicated, no downstream GFCI circuiting allowed.

Lighting System
Building B canopy lighting will consist of vapor tight type LED Fixtures with 4000 Kelvin color temperature. All areas will be illuminated to the minimum levels in accordance with IES recommendations. Canopy lighting will be controlled via timeclock and occupancy sensors.

Fire Alarm Systems
Fire Alarm system will be provided in accordance to City of Shoreline Requirements. Fire Sprinkler system to be monitored through the fire alarm system.

Closed Circuit Television System (CCTV)
A complete CCTV system will be provided to include CCTV devices, infrastructure, cabling and headend equipment. CCTV locations and coverage requirements to be determined by the user.

Civil

Site Overview
This City of Shoreline North Maintenance Facility (NMF) project is located within the northeastern portion of Shoreline, Washington. This 2.87-acre site is bordered by Ballinger Way NE to the west and south, Brugger's Bog Park to the north, 25th Avenue NE to the east, and several private properties to the south.

Topography and Existing Conditions
The site has a somewhat triangular shape reducing from approximately 310' wide along 25th Avenue NE to the east and narrowing to less than 20' wide at its western edge. The site is moderately sloped from northwest to southeast. The western portion of the site along Ballinger Way NE is up to 25 feet lower than Ballinger Way NE. The difference in elevation is supported by an ecology block wall on the NMF site, vegetated steep slopes, and a gabion wall in the Ballinger Way NE right-of-way.

The site has been used since the 1950s as a public works maintenance facility by King County and, more recently, to provide fueling operations and materials storage for the City of Shoreline. In addition to the fueling island and above ground fuel tanks, the site contains several other structures that have been unused since the site was vacated by King County. These other structures include one large concrete slab-on-grade office/garage building, a vactor waste decant shed with concrete floor, and an open-air concrete truck scale with a small scale house office building. The site is mostly paved with asphalt and there are several open-air soil and gravel storage bin areas on the west side of the property.

Demolition of Existing Facilities
The first order of work for the project will be to demolish all the existing structures on the site. Due to the age of the existing facilities, it is unlikely that any building materials could be salvaged. While preliminary geotechnical investigations have shown the existing pavement section is only 1-2" thick, the intent of the project is to pulverize asphalt pavement onsite to be used as CSBC or general fill.

Soils Conditions
Information interpreted from the borings indicates that surficial soil, to an approximate depth of between 2 and 7 feet across most of the site, is uncontrolled fill consisting of loose to medium dense sand with variable silt and gravel content. Pockets of buried topsoil consisting of peat, organic silt, and silt are indicated below the fill between depths of 3 and 10.5 feet. Borings indicate that dense, clean to silty sands with variable gravel content underlie both the fill and topsoil across the site and extend below the depths of the explorations. Ground water was observed in each of our explorations and was typically within 5 feet or less of the existing ground surface.

Environmental Considerations
Soil and groundwater samples collected from 16 boring locations were analyzed for gasoline-, diesel-, and oil-range total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and Washington State Model Toxics Control Act (MTCA) metals (arsenic, cadmium, chromium, lead, and mercury). Gasoline- and diesel-range TPH were identified in soil at 3 feet below ground surface (bgs) at boring B1, located near the flammable storage building on

the eastern portion of the site, at concentrations exceeding the MTCA Method A cleanup levels. The lateral extents of the soil impacts at B1 are unknown. Diesel-range TPH, oil-range TPH, and/or arsenic in groundwater samples collected from six locations (B1, B2, B4, B5, B6, and MW4) slightly exceeded the MTCA Method A cleanup levels. Boring B2 is located in the garage/office building on the eastern portion of the site, B4 is located south of the truck building in the southcentral portion of the site, B5 is located southeast of the fuel aboveground storage tanks (ASTs) in the northcentral portion of the site, B6 is located in the former underground storage tank (UST) area in the northwestern portion of the site, and MW4 is located in the northeastern portion of the site.

Clearing and Grading

Since the majority of the site is developed without significant vegetation, there will be limited clearing on the site. A small portion of the site along Ballinger Way NE will be cleared, but this area contains mostly shrubs and no significant trees.

The site topography gently slopes up from 25th Avenue NE to the NW corner of the site. Because the proposed building layout maximizes the site area, there is minimal opportunity for change in elevation between the proposed buildings. In general, the site will be leveled out by the proposed grading: fill on the lower, eastern portion of the site and a cut on the upper, west portion of the site. Additionally, useable site area will be maximized by constructing cut walls on the west portion of the site closer to the property line than the existing ecology block walls. Fill depth in the east portion of the site can be expected up to five feet and cut depths generally up to three feet, except where the usable site area will be expanded near the Ballinger Way NE right-of-way line. These cuts along Ballinger Way NE will be up to 25 feet deep.

Site Access

The site is accessed via a driveway to 25th Avenue NE at the northeast corner of the site. The project proposes to retain this driveway location as well as add a secondary access driveway to 25th Avenue NE at the southeast corner of the site.

Civil Design References

- 2014 Engineering Development Manual (City of Shoreline)
- Stormwater Management Manual for Western Washington (2012, Dept. of Ecology)
- Water System Design Manual (Washington State Department of Health)
- Criteria for Sewage Works Design (Washington State Department of Ecology)
- ADA Accessibility Guidelines for Buildings and Facilities, ICC A117.1
- Fire Protection Engineering for Facilities, UFC 3-600-01

Water Systems

An unknown size water main is located near the site within 25th Avenue NE. There are existing connections to this water main of unknown sizes that will be removed. If required, two new connections to this water main could provide a looped water main system on the NMF site. The water system requirements will be determined during preliminary design.

Storm and Drainage Systems

The site will likely use one or more media filters vaults and detention vaults to treat and detain stormwater from the site. Stormwater on site will be collected from the pavement in a series of catch basins and will be conveyed to one or more media filter vaults for treatment. Detention will be provided in one or more vaults prior to or after treatment. The stormwater management design will follow the City of Shoreline Engineering Development Manual, which references the State of Washington Department of Ecology Stormwater Management Manual for Western Washington (2005 Edition).

Sanitary Sewer System

An existing 8" sanitary sewer is located in 25th Avenue NE. There are currently two connections to the sewer system from the site. The first is an 8" drain line from the fuel island which appears to connect to the existing sewer main near the NE corner of the site. The other connection is from the decant facility to a manhole near the southeast corner of the site in 25th Avenue NE. The proposed project will likely have single connection to this same manhole.

Paving Design

Site paving will be a combination of asphalt and concrete. Any portions of the site where heavy maintenance vehicles and trucks are expected will be 8" cement concrete pavement over 2" CSTC and 6" CSBC. There are three parking locations on the site that will be paved with 2" Hot Mixed Asphalt (HMA) and 4" Asphalt Treated Base (ATB) over 2" CSTC. These are the main parking lot on the east portion of the site, the visitor parking area north of Building A and the additional parking area south of Building A. Frontage improvements will be required on 25th Avenue NE which include widening of the paved road and a half-street 2" grind and overlay. Pavement for the widening will be 2" HMA and 4" ATB over 2" CSTC.

Landscape

General

Plant material proposed for the project include native and drought tolerant species where possible. Trees will include species adapted to the climate and tolerant of urban conditions. All planting beds or planting pits will be amended with suitable planting soil. All plant beds will receive a mulch layer to conserve water and minimize weed species.

Street Frontage Landscape

The planting will provide a layer of visual interest that compliments the project location and architecture and at the same time meets the requirements of the city. The frontage planting on 25th Avenue NE will consist of street trees spaced evenly with groundcover within a planter strip. Clear distances to driveways and utilities will be respected. The project is required to provide 5' of type II landscape along the frontage. This will include a continuous masonry wall, 3'-4' in height and shrub and groundcover planting.

The project also has frontage along Ballinger Way NE. This street is also a state highway and frontage improvements will be coordinated with the City of Shoreline and WSDOT. The requirements for planting along this frontage are undefined at this time. The existing conditions include a sidewalk at the back of the curb and a jersey barrier at the back of the sidewalk. The plantable area slopes towards the project site and has considerable existing vegetation. The existing vegetation will remain.

Parking Area Landscape

The parking lot has planting requirements. Planting will be provided at 25 square feet per stall. Plant material will include groundcovers with one tree per every 10 stalls. Trees will be upright branching and suited to urban conditions.

On Site Landscape

Various size and configurations of plant beds are proposed around the new maintenance facility. These beds will receive a variety of low growing shrubs and groundcovers.

Irrigation

A fully automatic irrigation system providing full coverage to all planted areas is proposed. The system will include rain sensors and soil moisture sensors to prevent over watering.

Project Delivery

Construction Delivery

The project will be delivered using the traditional public bidding system of lowest responsible bidder. TCF architecture will work with the City to develop contract language for the construction process during the design development phase. The City and the Design Team are reviewing the feasibility of preparing a separate early site development contract and final site development/building package to compress overall construction schedule. The early site package will include demolition of existing structures, clearing and grubbing, rough grading, major utilities and storm water systems. The final site development/buildings packages will include remaining utilities, final site work and landscaping.

Contract Documents

Drawings will be produced at full size in 22x34 landscape format and organized by site and building. A separate 8.5x11 project manual will be provided including general conditions, technical specifications organized using the traditional CSI system.

March 4, 2016
215-275
RE: SNMF, Shoreline, Washington, Climate Zone 4C

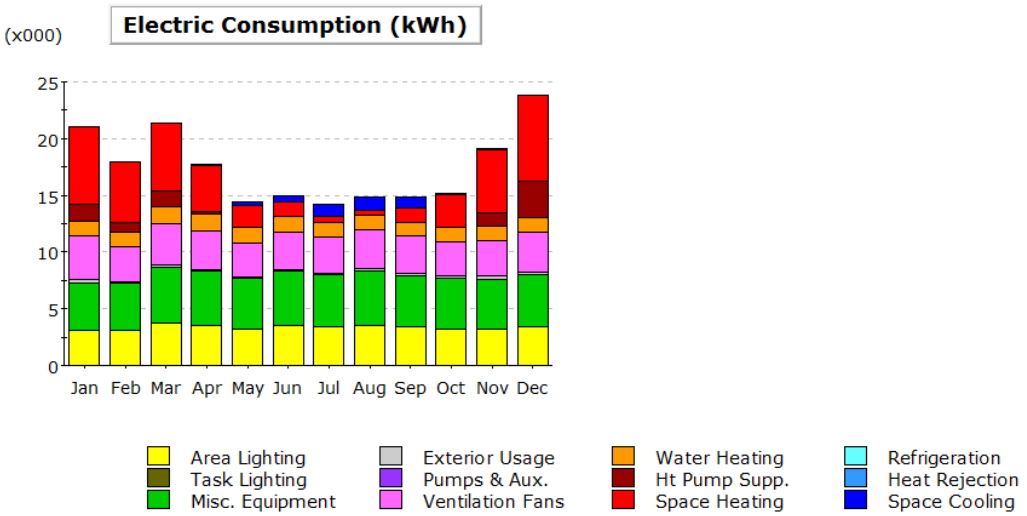
	Baseline	Proposed
Roof Description	U= 0.048 R-20 above deck insulation	U= 0.029 Single rafter wood beams with R-38 batt
Wall Description	U = 0.064 R-7.5 c.i. w/R-13 batt	U = 0.063 wood frame R-21 batt
Floor	slab, R-10 2ft perimeter insulation	slab, R-10 2ft perimeter insulation
Exposed to air Floor	U=0.038 R-30	U=0.038 R-30
Windows@6.2%	U=0.55, SHGC = 0.4	U=0.55, SHGC = 0.4
Window Area	742 sqft	742 sqft
Doors	Single U=0.7, Overhead U=1.5	Single U=0.5, Overhead U= 0.5
Floor Area	15,393 sqft	15,393 sqft
Wall Area	12,063 sqft	12,063 sqft
Roof Area	10,090 sqft	10,090 sqft
Heating	PSZHP COP = 2.25*	VRF COP = 4.3
Cooling	PSZHP EER = 11.0 -11.5	VRF EER = 13.7
Fans kw/cfm	PSZHP 0.001 kw/cfm	(32)VRF 0.00015 kw/cfm (1) HX SF&RF, 8000 cfm ea. @ 0.00039 kw/cfm (3) Auto shop EF, 1500 cfm ea. @ 0.0003 kw/cfm
Total Airflow	12,795 cfm	13,219 cfm
Unit Safety Factor	Clg = 1.15, Htg = 1.25	Clg and Htg = 1.0
Economizer	yes @ 75F	yes @ 75 on auto shop only
Demand Control Ventilation	none	none
Heat Recovery	none	0.65% efficient sensible HX
DHW	Electric	Heat Pump 2.7 COP @ 140 F
Temperature Limits	Htg. = 70 F, Clg. = 76 F	Htg. = 70 F, Clg. = 76 F
Humidity H. Limit	100% RH in units	100% RH in units
OSA Requirements	6,812	6,812
Lights (w/sqft)	0.9	0.68
Exterior Lights	0.77 kW	0.77 kW
Area Types	25% Auto shop, 12% Shop, 15% Lobby-Corridor, 48% Other	
Process Loads	26% baseline	26% baseline
People	57	57
Schedule	7 a.m. to 5:00 p.m., 5 days a week	7 a.m. to 5:00 p.m., 5 days a week
Electric	$0.06/kWh	$0.06/kWh

Energy Savings

Energy Usage kbtu/sf-yr	46.5 @unmet hrs 0 clg, 287 htg	36.1 @unmet hrs 0 clg, 289 htg
energy savings		22.4%
Energy cost	$12,575	$9,771
energy cost savings		22.3%

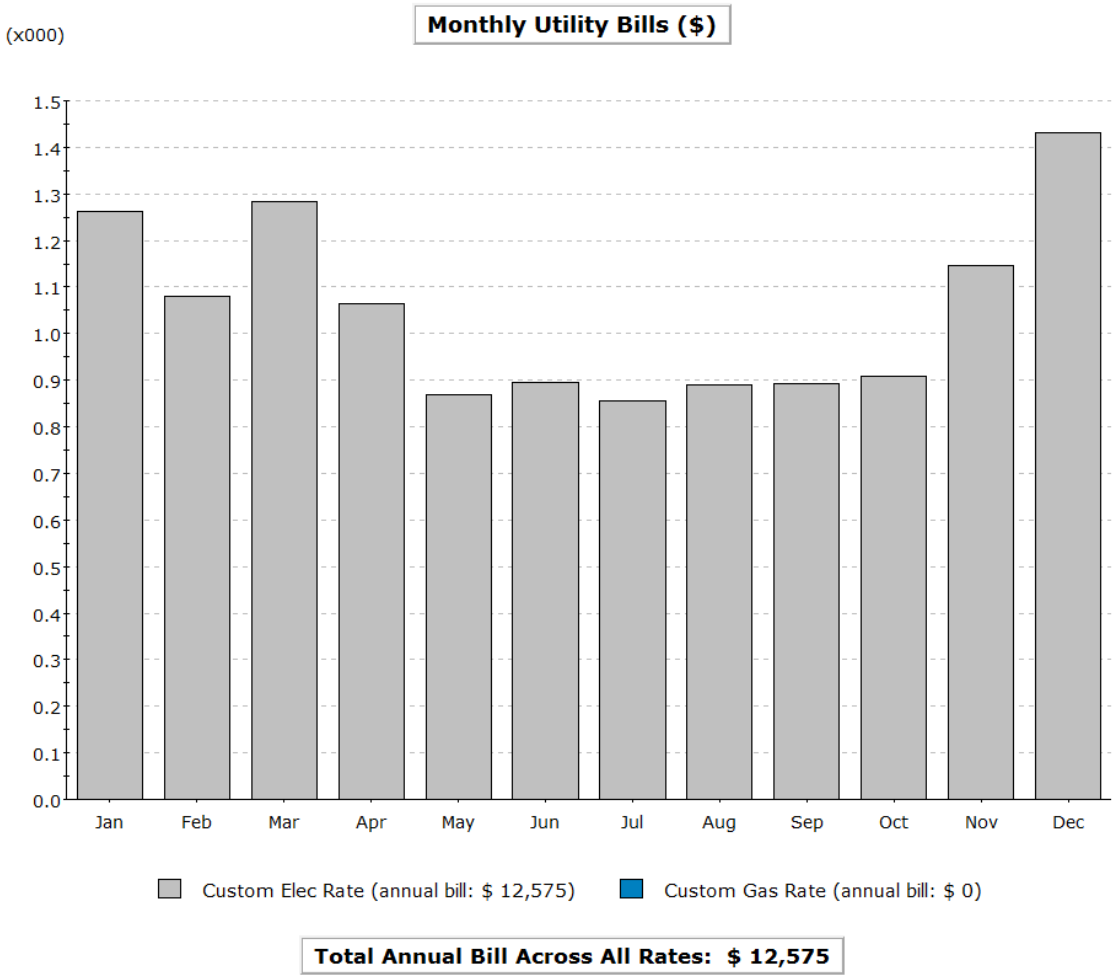
*PSZHP Heating COP based on 17F db/15F wb outdoor since VRF system is capable of running at those temperatures.

(x000)

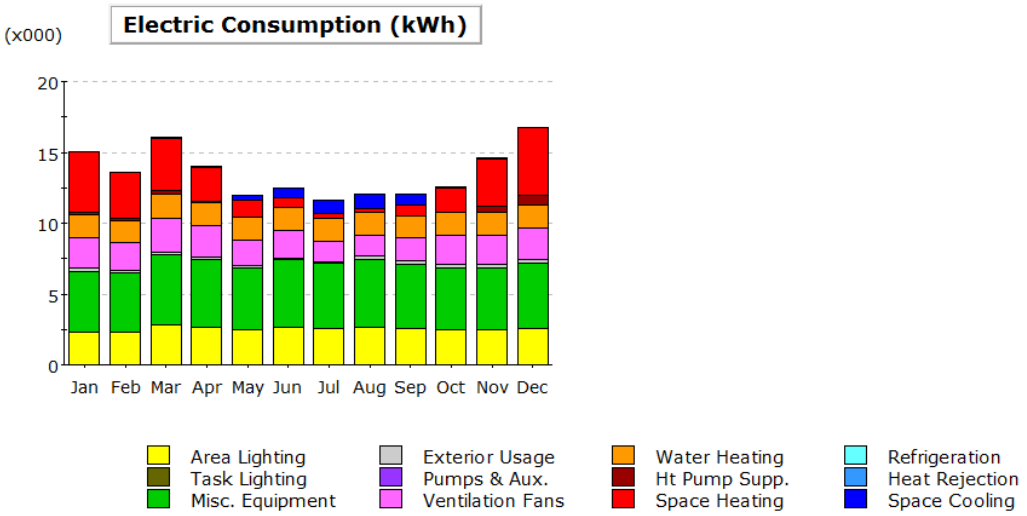


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.02	0.02	0.03	0.07	0.32	0.55	1.16	1.18	1.00	0.04	0.02	0.03	4.44
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	6.78	5.34	6.03	4.03	2.00	1.24	0.51	0.46	1.26	2.87	5.55	7.53	43.61
HP Supp.	1.55	0.85	1.31	0.25	-	-	-	-	-	0.08	1.21	3.22	8.46
Hot Water	1.29	1.30	1.55	1.47	1.30	1.36	1.26	1.28	1.23	1.21	1.25	1.36	15.85
Vent. Fans	3.81	3.08	3.61	3.40	3.07	3.38	3.22	3.38	3.22	3.07	3.18	3.46	39.88
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	0.27	0.19	0.21	0.20	0.13	0.12	0.13	0.22	0.22	0.22	0.26	0.27	2.44
Misc. Equip.	4.21	4.14	4.94	4.73	4.40	4.74	4.58	4.76	4.55	4.39	4.37	4.58	54.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	3.09	3.08	3.71	3.55	3.25	3.55	3.40	3.56	3.40	3.25	3.24	3.40	40.50
Total	21.03	17.99	21.40	17.72	14.46	14.94	14.26	14.84	14.88	15.14	19.08	23.84	209.58



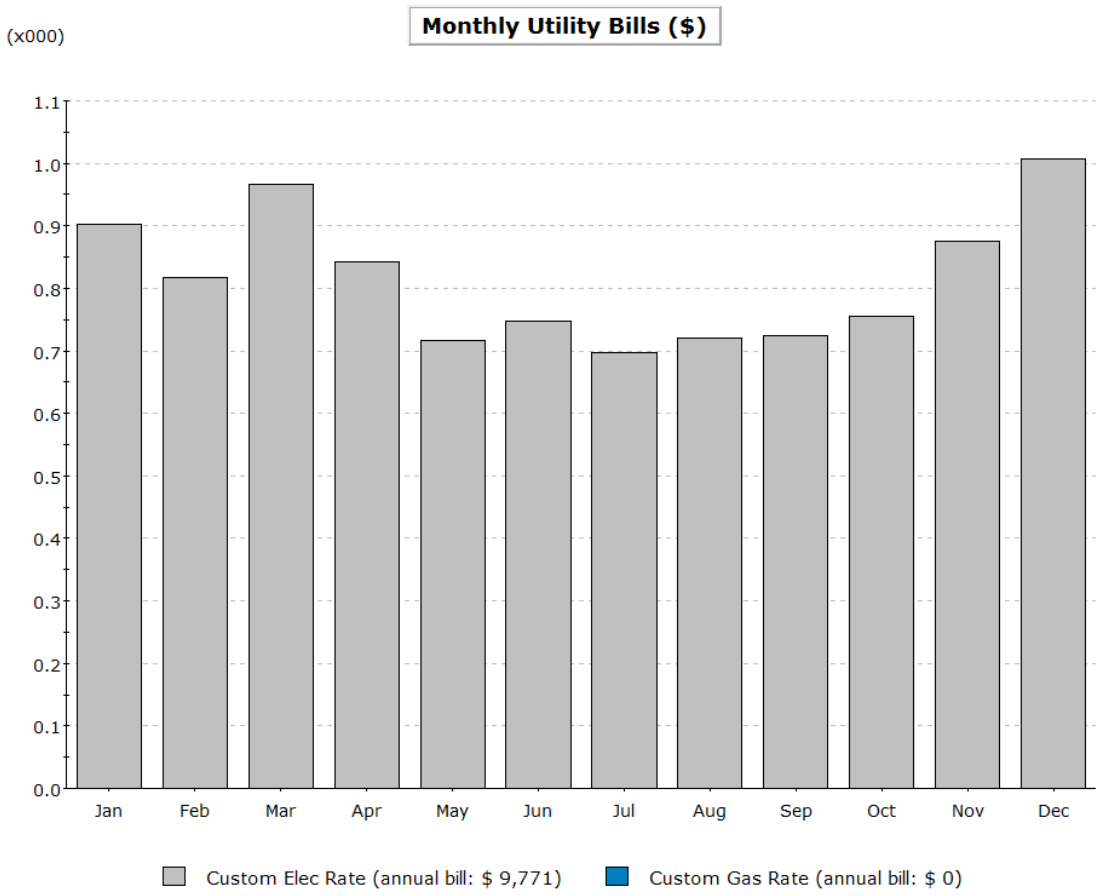
Total Annual Bill Across All Rates: $ 12,575



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.03	0.04	0.08	0.15	0.33	0.61	0.93	0.95	0.79	0.14	0.06	0.03	4.13
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	4.26	3.25	3.73	2.40	1.18	0.75	0.30	0.27	0.74	1.67	3.36	4.77	26.67
HP Supp.	0.17	0.15	0.25	0.03	-	-	-	-	-	0.00	0.39	0.66	1.66
Hot Water	1.63	1.51	1.69	1.63	1.65	1.62	1.64	1.65	1.59	1.63	1.59	1.65	19.47
Vent. Fans	2.12	2.01	2.39	2.22	1.82	1.93	1.46	1.47	1.63	2.08	2.11	2.25	23.49
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	0.27	0.19	0.21	0.20	0.13	0.12	0.13	0.22	0.22	0.22	0.26	0.27	2.44
Misc. Equip.	4.21	4.14	4.94	4.73	4.40	4.74	4.58	4.76	4.55	4.39	4.37	4.58	54.40
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.34	2.33	2.81	2.68	2.46	2.69	2.57	2.69	2.57	2.45	2.45	2.57	30.60
Total	15.04	13.61	16.10	14.05	11.95	12.44	11.61	12.01	12.08	12.59	14.58	16.78	162.86

Monthly Utility Bills ($)



Total Annual Bill Across All Rates: $ 9,771

LEED 2009 for New Construction and Major Renovations

Project Checklist

Shoreline North Maintenance Facility

March

Sustainable Sites — Possible Points: 26

Y	?	N			
Y			Prereq 1	Construction Activity Pollution Prevention	
		1	Credit 1	Site Selection	1
	5		Credit 2	Development Density and Community Connectivity	5
		1	Credit 3	Brownfield Redevelopment	1
6			Credit 4.1	Alternative Transportation—Public Transportation Access	6
1			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
3			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
		2	Credit 4.4	Alternative Transportation—Parking Capacity	2
		1	Credit 5.1	Site Development—Protect or Restore Habitat	1
		1	Credit 5.2	Site Development—Maximize Open Space	1
1			Credit 6.1	Stormwater Design—Quantity Control	1
1			Credit 6.2	Stormwater Design—Quality Control	1
1			Credit 7.1	Heat Island Effect—Non-roof	1
1			Credit 7.2	Heat Island Effect—Roof	1
	1		Credit 8	Light Pollution Reduction	1

Water Efficiency — Possible Points: 10

Y	?	N			
Y			Prereq 1	Water Use Reduction—20% Reduction	
2		2	Credit 1	Water Efficient Landscaping	2 to 4
		2	Credit 2	Innovative Wastewater Technologies	2
2		2	Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y	?	N			
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
7	2	10	Credit 1	Optimize Energy Performance	1 to 19
		7	Credit 2	On-Site Renewable Energy	1 to 7
	2		Credit 3	Enhanced Commissioning	2
		2	Credit 4	Enhanced Refrigerant Management	2
	3		Credit 5	Measurement and Verification	3
		2	Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y	?	N			
Y			Prereq 1	Storage and Collection of Recyclables	
		3	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
		1	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
2			Credit 2	Construction Waste Management	1 to 2
		2	Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N			
2			Credit 4	Recycled Content	1 to 2
1	1		Credit 5	Regional Materials	1 to 2
		1	Credit 6	Rapidly Renewable Materials	1
1			Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 15

Y	?	N			
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
1			Credit 1	Outdoor Air Delivery Monitoring	1
1			Credit 2	Increased Ventilation	1
1			Credit 3.1	Construction IAQ Management Plan—During Construction	1
1			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
1			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
1			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
1			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
1			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
1			Credit 5	Indoor Chemical and Pollutant Source Control	1
1			Credit 6.1	Controllability of Systems—Lighting	1
1			Credit 6.2	Controllability of Systems—Thermal Comfort	1
1			Credit 7.1	Thermal Comfort—Design	1
1			Credit 7.2	Thermal Comfort—Verification	1
1			Credit 8.1	Daylight and Views—Daylight	1
	1		Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

?	N			
1		Credit 1.1	Innovation in Design: Public Educations Materials/Signage	1
		Credit 1.2	Innovation in Design: Exemplary Waste Management	1
		Credit 1.3	Innovation in Design: Exemplary Recycled Content	1
1		Credit 1.4	Innovation in Design: Exemplary Regoinal Materail	1
	1	Credit 1.5	Innovation in Design: Specific Title	1
		Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

?	N			
		Credit 1.1	Regional Priority: Certified Wood	1
		Credit 1.2	Regional Priority: Stormwater - Quantity Control	1
1		Credit 1.3	Regional Priority: Optimize Energy Performance (verify threshold)	1
	1	Credit 1.4	Regional Priority: Specific Credit	1

Total — Possible Points: 110

50	18	42

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

5 – PROJECT ECONOMICS

Overview

Preliminary costs budgets for four site layout alternatives were prepared by the Design Team using recent cost history from similar projects. The broad cost categories are used to determine initial budgetary estimates for construction at this Predesign phase. Site costs are organized into a number of sub-categories allowing for a sufficient level of cost detail, while building costs are based on building types such as administrative/crew facilities, enclosed storage facilities, canopy covered storage and fuel and wash facilities. In addition to the "hard" construction cost estimates, budgets for "soft" costs such as sales tax, professional services fees, permit fees, special testing fees, along with budgets for furnishings, fixtures and equipment (FF&E), land costs and contingencies. The combination of hard and soft costs provides a total budget, including escalation with the current schedule.

Budgets

Total budgetary costs range from $14 million to $18 million, summarized below, among the 4 site layout alternatives. For general comparative purposes, a 5% range, 2.5% above and below the preliminary budget number. Primary differences in cost between the site layout alternatives include varying building square footages, land acquisition cost of the adjacent parcel, and potential wetland mitigation. It is assumed that the site would be completely upgraded regardless of which site layout alternative is selected. Site cost numbers are consistent throughout, except for B.1 because of the additional site area. As noted in section 3 of this report, site layout alternative B.1 has been selected to be explored further. Costs for this alternative range between $17.1 - $18 million. Site layout alternative B.1 does require the acquisition of an adjacent parcel to the south. If the acquisition of this property is unsuccessful, site alternative B, with an estimated range of $15.9 - $16.7 million, would move forward. A more detailed estimate will be completed for site layout alternative B.1 in the upcoming Schematic Design phase.

Table 5A - Summary of Site Layout Alternatives Cost Models

	Site Alternative A	Site Alternative B	Site Alternative B.1	Site Alternative C
Preliminary Budget	$14,333,920	$16,273,117	$17,690,095	$16,851,253
5% +/- Range	$14.0 - 14.7 million	$15.9 - 16.7million	$17.1 - 18.0 million	$16.4 - 17.3 million

City of Shoreline
North Maintenance Facility

SITE ALTERNATIVE A

Project Scope Description	Qty	Unit	Unit Cost	Budgetary Estimate	Remarks

The cost estimates figure below are budgetary only, for the purpose of intital evaluation of conceptual site development alternatives. A more detailed estimate will be completed once a preferred alternative direction is determined. Estimates are inclusive of mobilization and general conditions.

PHASE 1 - SITE PREPARATION

SITE COST BUDGETS

PHASE 1 SITE WORK

On-Site Work					
Demolition / Clearing / Erosion Control	1.00	LS	$361,000	$361,000	
Grading	1.00	LS	$378,000	$378,000	
Retaining Systems	1.00	LS	$530,000	$530,000	
Stormwater Systems	1.00	LS	$1,024,000	$1,024,000	
Utilities	1.00	LS	$0	$0	See Phase 2
Landscaping	1.00	LS	$0	$0	See Phase 2
Fencing/Temp Gates /Misc	1.00	LS	$18,000	$18,000	
Soil Remediation Allowance	1.00	LS	$65,000	$65,000	Area around scales. Confirm extent.
Off-Site Work					
25th Avenue Improvements				$0	
Total Estimated Phase 1 Site Costs				**$2,376,000**	

SOFT COSTS ON PHASE 1 SITE WORK

Washington State Sales Tax			9.50%	$225,720	
Professional Services (Concept through construction)			6.00%	$142,560	
Permitting / Misc Fees			1.50%	$35,640	Confirm with City Planning Dept.
Special Testing Services			1.50%	$35,640	
Management Reserve			10.00%	$237,600	For Unforseen Conditions / Additional Scope
Total Estimated Soft Costs			**28.50%**	**$677,160**	
Total Budget Estimate - Phase 1 Site Work				**$3,053,160**	**Not incl. Escalation**

PHASE 2 - BUILDINGS AND FINAL SITE WORK

PHASE 2 - FINAL SITE WORK

On-Site Work					
Fine Grading	1.00	LS	$62,000	$62,000	
Stormwater Systems	1.00	LS	$134,000	$134,000	
Utilities	1.00	LS	$246,000	$246,000	
Fencing / Gates / Security / Misc Site Accessories	1.00	LS	$100,000	$100,000	
Landscaping & Irrigation	1.00	LS	$100,000	$100,000	
Site Electrical	1.00	LS	$160,000	$160,000	
Hardscaping	1.00	LS	$108,000	$108,000	
Surfacing - Concrete	1.00	LS	$639,000	$639,000	
Surfacing (Asphalt)	1.00	LS	$78,000	$78,000	
Off-Site Work					
25th Avenue - Final Improvements	1.00	LS	$75,000	$75,000	
Total Estimated Phase 1 Site Costs				**$1,702,000**	

PHASE 2 - BUILDINGS

Building A - Admin/Crew	7,000	SF	$250	$1,750,000	One story wood-framed building
Building B - Covered Storage	5,180	SF	$120	$621,600	Pre-engineered metal, shed roof with walls on 3 sides
Building C - Enclosed	11,300	SF	$180	$2,034,000	Pre-engineered metal bldg system, enclosed, heated
Building C - Mezzanine & Stair	1,600	SF	$75	$120,000	Steel & wood-framed with steel stair
Building C - Canopy	6,400	SF	$100	$640,000	Not including Fuel & Wash Equipment - See Below
Building C - Canopy Fuel and Wash Canopies	2,820	SF	$150	$423,000	Including special foundation / drainage systems
Building C - Wash Equipment Enclosure	300	SF	$180	$54,000	Not including Wash Equipment - See Below
Building D - Covered Storage/Decant	4,220	SF	$120	$506,400	Pre-engineered metal, shed roof with walls on 3 sides
Wash Equipment System	1	LS	$100,000	$100,000	Water Reclaim System & Pressure Washer equip.
Fuel Equipment System & Tanks	1	LS	$100,000	$100,000	
Deicer Tank & Pump Equipment	1	LS	$15,000	$15,000	
Generator & Fuel Tank System	1	LS	$100,000	$100,000	
Total Estimated Building Costs	**38,820**	**SF**	**$167**	**$6,464,000**	
Subtotal Phase 2 Site & Building Estimate				**$8,166,000**	

City of Shoreline
North Maintenance Facility

SITE ALTERNATIVE A

Project Scope Description	Qty	Unit	Unit Cost	Budgetary Estimate	Remarks
SOFT COSTS ON PHASE 2 COSTS					
Washington State Sales Tax			9.50%	$775,770	
Professional Services (Concept through construction)			14.00%	$1,143,240	Budgetary only
Permitting / Misc Fees			1.50%	$122,490	Confirm
Special Testing Services			1.00%	$81,660	
Management Reserve			10.00%	$816,600	For Unforseen Conditions / Additional Scope
Total Estimated Soft Costs on MACC			**36.00%**	**$2,939,760**	
Total Phase 2 Budget Estimate				**$11,105,760**	
FURNISHINGS FIXTURES AND EQUIPMENT (FF&E) 0WNER-PROVIDED					
Office Furnishings	1	LS	$25,000	$25,000	
Technology Systems by Owner (Telecomm/data)	1	LS	$50,000	$50,000	
Shop Equipment & Storage Systems	1	LS	$100,000	$100,000	
Total Estimated FF&F Cost Budget				**$175,000**	
Subtotal Phase 1, Phase 2, Soft Costs and FF&E				**$14,333,920**	
ESCALATION					
Escalation to _____				$0	Assume built into above numbers. Adjust if project delayed.
Total Escalation Budget			**$0**	**$0**	
GRAND TOTAL PROJECT COST BUDGET				**$14,333,920**	

City of Shoreline
North Maintenance Facility

SITE ALTERNATIVE B

Project Scope Description	Qty	Unit	Unit Cost	Budgetary Estimate	Remarks

The cost estimates figure below are budgetary only, for the purpose of intital evaluation of conceptual site development alternatives. A more detailed estimate will be completed once a preferred alternative direction is determined. Estimates are inclusive of mobilization and general conditions.

PHASE 1 - SITE PREPARATION

SITE COST BUDGETS

PHASE 1 SITE WORK

On-Site Work					
Demolition / Clearing / Erosion Control	1.00	LS	$361,000	$361,000	
Grading	1.00	LS	$378,000	$378,000	
Retaining Systems	1.00	LS	$530,000	$530,000	
Stormwater Systems	1.00	LS	$1,024,000	$1,024,000	
Utilities	1.00	LS	$0	$0	See Phase 2
Landscaping	1.00	LS	$0	$0	See Phase 2
Fencing/Temp Gates /Misc	1.00	LS	$18,000	$18,000	
Soil Remediation Allowance	1.00	LS	$65,000	$65,000	Area around scales. Confirm extent.
Off-Site Work					
25th Avenue Improvements				$0	
Total Estimated Phase 1 Site Costs				**$2,376,000**	

SOFT COSTS ON PHASE 1 SITE WORK

Washington State Sales Tax			9.50%	$225,720	
Professional Services (Concept through construction)			6.00%	$142,560	
Permitting / Misc Fees			1.50%	$35,640	Confirm with City Planning Dept.
Special Testing Services			1.50%	$35,640	
Management Reserve			10.00%	$237,600	For Unforseen Conditions / Additional Scope
Total Estimated Soft Costs			**28.50%**	**$677,160**	
Total Budget Estimate - Phase 1 Site Work				**$3,053,160**	**Not incl. Escalation**

PHASE 2 - BUILDINGS AND FINAL SITE WORK

PHASE 2 - FINAL SITE WORK

On-Site Work					
Fine Grading	1.00	LS	$62,000	$62,000	
Stormwater Systems	1.00	LS	$134,000	$134,000	
Utilities	1.00	LS	$246,000	$246,000	
Fencing / Gates / Security / Misc Site Accessories	1.00	LS	$100,000	$100,000	
Landscaping & Irrigation	1.00	LS	$100,000	$100,000	
Site Electrical	1.00	LS	$160,000	$160,000	
Hardscaping	1.00	LS	$108,000	$108,000	
Surfacing - Concrete	1.00	LS	$639,000	$639,000	
Surfacing (Asphalt)	1.00	LS	$78,000	$78,000	
Off-Site Work					
25th Avenue - Final Improvements	1.00	LS	$75,000	$75,000	
Total Estimated Phase 1 Site Costs				**$1,702,000**	

PHASE 2 - BUILDINGS

Building A - Admin/Crew	15,500	SF	$220	$3,410,000	Two- story wood-framed building
Building B - Covered Storage	5,180	SF	$120	$621,600	Pre-engineered metal, shed roof with walls on 3 sides
Building C - Enclosed	10,666	SF	$180	$1,919,880	Pre-engineered metal bldg system, enclosed, heated
Building C - Mezzanine & Stair	0	SF	$0	$0	No mezzanine in this Alternative
Building C - Canopy	6,400	SF	$100	$640,000	Not including Fuel & Wash Equipment - See Below
Building C - Canopy Fuel and Wash Canopies	2,820	SF	$150	$423,000	Including special foundation / drainage systems
Building C - Wash Equipment Enclosure	300	SF	$180	$54,000	Not including Wash Equipment - See Below
Building D - Covered Storage/Decant	4,220	SF	$120	$506,400	Pre-engineered metal, shed roof with walls on 3 sides
Wash Equipment System	1	LS	$100,000	$100,000	Water Reclaim System & Pressure Washer equip.
Fuel Equipment System & Tanks	1	LS	$100,000	$100,000	
Deicer Tank & Pump Equipment	1	LS	$15,000	$15,000	
Generator & Fuel Tank System	1	LS	$100,000	$100,000	
Total Estimated Building Costs	**45,090**	**SF**	**$175**	**$7,889,880**	
Subtotal Phase 2 Site & Building Estimate				**$9,591,880**	

City of Shoreline
North Maintenance Facility

SITE ALTERNATIVE B

Project Scope Description	Qty	Unit	Unit Cost	Budgetary Estimate	Remarks
SOFT COSTS ON PHASE 2 COSTS					
Washington State Sales Tax			9.50%	$911,229	
Professional Services (Concept through construction)			14.00%	$1,342,863	Budgetary only
Permitting / Misc Fees			1.50%	$143,878	Confirm
Special Testing Services			1.00%	$95,919	
Management Reserve			10.00%	$959,188	For Unforseen Conditions / Additional Scope
Total Estimated Soft Costs on MACC			**36.00%**	**$3,453,077**	
Total Phase 2 Budget Estimate				**$13,044,957**	
FURNISHINGS FIXTURES AND EQUIPMENT (FF&E) 0WNER-PROVIDED					
Office Furnishings	1	LS	$25,000	$25,000	
Technology Systems by Owner (Telecomm/data)	1	LS	$50,000	$50,000	
Shop Equipment & Storage Systems	1	LS	$100,000	$100,000	
Total Estimated FF&F Cost Budget				**$175,000**	
Subtotal Phase 1, Phase 2, Soft Costs and FF&E				**$16,273,117**	
ESCALATION					
Escalation to _____				$0	Assume built into above numbers. Adjust if project delayed.
Total Escalation Budget			**$0**	**$0**	
GRAND TOTAL PROJECT COST BUDGET				**$16,273,117**	

SITE ALTERNATIVE B.1

Project Scope Description	Qty	Unit	Unit Cost	Budgetary Estimate	Remarks

The cost estimates figure below are budgetary only, for the purpose of intital evaluation of conceptual site development alternatives. A more detailed estimate will be completed once a preferred alternative direction is determined. Estimates are inclusive of mobilization and general conditions.

PHASE 1 - SITE PREPARATION

SITE COST BUDGETS

PHASE 1 SITE WORK

On-Site Work					
Demolition / Clearing / Erosion Control	1.00	LS	$393,000	$393,000	
Grading	1.00	LS	$384,000	$384,000	
Retaining Systems	1.00	LS	$591,000	$591,000	
Stormwater Systems	1.00	LS	$1,120,000	$1,120,000	
Utilities	1.00	LS	$0	$0	See Phase 2
Landscaping	1.00	LS	$0	$0	See Phase 2
Fencing/Temp Gates /Misc	1.00	LS	$18,000	$18,000	
Soil Remediation Allowance	1.00	LS	$65,000	$65,000	Area around scales. Confirm extent.
Off-Site Work					
25th Avenue Improvements				$0	
Total Estimated Phase 1 Site Costs				**$2,571,000**	

SOFT COSTS ON PHASE 1 SITE WORK

Washington State Sales Tax			9.50%	$244,245	
Professional Services (Concept through construction)			6.00%	$154,260	
Permitting / Misc Fees			1.50%	$38,565	Confirm with City Planning Dept.
Special Testing Services			1.50%	$38,565	
Management Reserve			10.00%	$257,100	For Unforseen Conditions / Additional Scope
Total Estimated Soft Costs			**28.50%**	**$732,735**	
Total Budget Estimate - Phase 1 Site Work				**$3,303,735**	**Not incl. Escalation**

PHASE 2 - BUILDINGS AND FINAL SITE WORK

PHASE 2 - FINAL SITE WORK

On-Site Work					
Fine Grading	1.00	LS	$66,000	$66,000	
Stormwater Systems	1.00	LS	$134,000	$134,000	
Utilities	1.00	LS	$246,000	$246,000	
Fencing / Gates / Security / Misc Site Accessories	1.00	LS	$100,000	$100,000	
Landscaping & Irrigation	1.00	LS	$100,000	$100,000	
Site Electrical	1.00	LS	$160,000	$160,000	
Hardscaping	1.00	LS	$108,000	$108,000	
Surfacing - Concrete	1.00	LS	$751,000	$751,000	
Surfacing (Asphalt)	1.00	LS	$78,000	$78,000	
Off-Site Work					
25th Avenue - Final Improvements	1.00	LS	$75,000	$75,000	
Total Estimated Phase 1 Site Costs				**$1,818,000**	

PHASE 2 - BUILDINGS

Building A - Admin/Crew	15,500	SF	$220	$3,410,000	Two- story wood-framed building
Building B - Covered Storage	8,090	SF	$120	$970,800	Pre-engineered metal, shed roof with walls on 3 sides
Building C - Enclosed	10,660	SF	$180	$1,918,800	Pre-engineered metal bldg system, enclosed, heated
Building C - Mezzanine & Stair	0	SF	$0	$0	No mezzanine in this Alternative
Building C - Canopy	6,400	SF	$100	$640,000	Not including Fuel & Wash Equipment - See Below
Building C - Canopy Fuel and Wash Canopies	2,820	SF	$150	$423,000	Including special foundation / drainage systems
Building C - Wash Equipment Enclosure	300	SF	$180	$54,000	Not including Wash Equipment - See Below
Building D - Covered Storage/Decant	4,220	SF	$120	$506,400	Pre-engineered metal, shed roof with walls on 3 sides
Wash Equipment System	1	LS	$100,000	$100,000	Water Reclaim System & Pressure Washer equip.
Wash Bay Catwalk	1	LS	$20,000	$20,000	
Deicer Tank & Pump Equipment	1	LS	$15,000	$15,000	
Generator & Fuel Tank System	1	LS	$100,000	$100,000	
Total Estimated Building Costs	**47,994**	**SF**	**$170**	**$8,158,000**	
Subtotal Phase 2 Site & Building Estimate				**$9,976,000**	

SITE ALTERNATIVE B.1

Project Scope Description	Qty	Unit	Unit Cost	Budgetary Estimate	Remarks
SOFT COSTS ON PHASE 2 COSTS					
Washington State Sales Tax			9.50%	$947,720	
Professional Services (Concept through construction)			14.00%	$1,396,640	Budgetary only
Permitting / Misc Fees			1.50%	$149,640	Confirm
Special Testing Services			1.00%	$99,760	
Management Reserve			10.00%	$997,600	Unforseen Conditions / Additional Scope
Total Estimated Soft Costs on MACC			**36.00%**	**$3,591,360**	
Total Phase 2 Budget Estimate				**$13,567,360**	
FURNISHINGS FIXTURES AND EQUIPMENT (FF&E) 0WNER-PROVIDED					
Office Furnishings	1	LS	$25,000	$25,000	
Technology Systems by Owner (Telecomm/data)	1	LS	$50,000	$50,000	
Shop Equipment & Storage Systems	1	LS	$100,000	$100,000	
Total Estimated FF&F Cost Budget				**$175,000**	
Subtotal Phase 1, Phase 2, Soft Costs and FF&E				**$17,046,095**	
ESCALATION					
Escalation to _____				$0	Assume built into above numbers. Adjust if project delayed.
Total Escalation Budget			**$0**	**$0**	
PROPERTY ACQUISITION					
Purchase South Parcel			$650,000	$650,000	Guess - to be confirmed.
GRAND TOTAL PROJECT COST BUDGET				**$17,696,095**	

City of Shoreline
North Maintenance Facility

SITE ALTERNATIVE C

Project Scope Description	Qty	Unit	Unit Cost	Budgetary Estimate	Remarks

The cost estimates figure below are budgetary only, for the purpose of intital evaluation of conceptual site development alternatives. A more detailed estimate will be completed once a preferred alternative direction is determined. Estimates are inclusive of mobilization and general conditions.

PHASE 1 - SITE PREPARATION

SITE COST BUDGETS

PHASE 1 SITE WORK

On-Site Work					
Demolition / Clearing / Erosion Control	1.00	LS	$361,000	$361,000	
Grading	1.00	LS	$378,000	$378,000	
Retaining Systems	1.00	LS	$530,000	$530,000	
Stormwater Systems	1.00	LS	$1,024,000	$1,024,000	
Utilities	1.00	LS	$0	$0	See Phase 2
Landscaping	1.00	LS	$0	$0	See Phase 2
Fencing/Temp Gates /Misc	1.00	LS	$18,000	$18,000	
Soil Remediation Allowance	1.00	LS	$65,000	$65,000	Area around scales. Confirm extent.
Off-Site Work					
25th Avenue Improvements				$0	
Total Estimated Phase 1 Site Costs				**$2,376,000**	

SOFT COSTS ON PHASE 1 SITE WORK

Washington State Sales Tax			9.50%	$225,720	
Professional Services (Concept through construction)			6.00%	$142,560	
Permitting / Misc Fees			1.50%	$35,640	Confirm with City Planning Dept.
Special Testing Services			1.50%	$35,640	
Management Reserve			10.00%	$237,600	For Unforseen Conditions / Additional Scope
Total Estimated Soft Costs			**28.50%**	**$677,160**	
Total Budget Estimate - Phase 1 Site Work				**$3,053,160**	**Not incl. Escalation**

PHASE 2 - BUILDINGS AND FINAL SITE WORK

PHASE 2 - FINAL SITE WORK

On-Site Work					
Fine Grading	1.00	LS	$62,000	$62,000	
Stormwater Systems	1.00	LS	$134,000	$134,000	
Utilities	1.00	LS	$246,000	$246,000	
Fencing / Gates / Security / Misc Site Accessories	1.00	LS	$100,000	$100,000	
Landscaping & Irrigation	1.00	LS	$100,000	$100,000	
Site Electrical	1.00	LS	$160,000	$160,000	
Hardscaping	1.00	LS	$108,000	$108,000	
Surfacing - Concrete	1.00	LS	$639,000	$639,000	
Surfacing (Asphalt)	1.00	LS	$78,000	$78,000	
Off-Site Work					
25th Avenue - Final Improvements	1.00	LS	$75,000	$75,000	
Total Estimated Phase 1 Site Costs				**$1,702,000**	

PHASE 2 - BUILDINGS

Building A - Admin/Crew	15,500	SF	$220	$3,410,000	Two- story wood-framed building
Building B - Covered Storage	5,180	SF	$120	$621,600	Pre-engineered metal, shed roof with walls on 3 sides
Building C - Enclosed	10,666	SF	$180	$1,919,880	Pre-engineered metal bldg system, enclosed, heated
Building C - Mezzanine & Stair	0	SF	$0	$0	No mezzanine in this Alternative
Building C - Canopy	6,400	SF	$100	$640,000	Not including Fuel & Wash Equipment - See Below
Building C - Canopy Fuel and Wash Canopies	2,820	SF	$150	$423,000	Including special foundation / drainage systems
Building C - Wash Equipment Enclosure	300	SF	$180	$54,000	Not including Wash Equipment - See Below
Building D - Covered Storage/Decant	8,100	SF	$115	$931,500	Pre-engineered metal, shed roof with walls on 3 sides
Wash Equipment System	1	LS	$100,000	$100,000	Water Reclaim System & Pressure Washer equip.
Fuel Equipment System & Tanks	1	LS	$100,000	$100,000	
Deicer Tank & Pump Equipment	1	LS	$15,000	$15,000	
Generator & Fuel Tank System	1	LS	$100,000	$100,000	
Total Estimated Building Costs	**48,970**	**SF**	**$170**	**$8,314,980**	
Subtotal Phase 2 Site & Building Estimate				**$10,016,980**	

City of Shoreline
North Maintenance Facility

SITE ALTERNATIVE C

Project Scope Description	Qty	Unit	Unit Cost	Budgetary Estimate	Remarks
SOFT COSTS ON PHASE 2 COSTS					
Washington State Sales Tax			9.50%	$951,613	
Professional Services (Concept through construction)			14.00%	$1,402,377	Budgetary only
Permitting / Misc Fees			1.50%	$150,255	Confirm
Special Testing Services			1.00%	$100,170	
Management Reserve			10.00%	$1,001,698	For Unforseen Conditions / Additional Scope
Total Estimated Soft Costs on MACC			**36.00%**	**$3,606,113**	
Total Phase 2 Budget Estimate				**$13,623,093**	
FURNISHINGS FIXTURES AND EQUIPMENT (FF&E) 0WNER-PROVIDED					
Office Furnishings	1	LS	$25,000	$25,000	
Technology Systems by Owner (Telecomm/data)	1	LS	$50,000	$50,000	
Shop Equipment & Storage Systems	1	LS	$100,000	$100,000	
Total Estimated FF&F Cost Budget				**$175,000**	
Subtotal Phase 1, Phase 2, Soft Costs and FF&E				**$16,851,253**	
ESCALATION					
Escalation to _____				$0	Assume built into above numbers. Adjust if project delayed.
Total Escalation Budget			**$0**	**$0**	
GRAND TOTAL PROJECT COST BUDGET				**$16,851,253**	

6 - REGULATORY REVIEW

Overview

The information included in this section provides a basis for subsequent design phases to better understand the requirements for permitting through the City of Shoreline. On March 15, 2016 TCF Architecture along with representatives from the City of Shoreline Public Works department met with the City of Shoreline's Planning and Community Development department for a Pre-Application meeting to review initial site and building concepts in relation to codes and regulations. A full code summary will be provided as the buildings and site are developed in the upcoming Schematic Design phase.

Governing Codes, Standards and References

Governing Jurisdiction: City of Shoreline

Governing Fire District: City of Shoreline

Building Code: International Building Code, IBC (2012)

Fire Code: International Fire Code, IFC (2012)

Plumbing Code: Uniform Plumbing Code, UPC (2012) with Washington State Amendments

Mechanical Code: International Mechanical Code, IMC (2012)

Energy Code: International Energy Conservation Code, IECC, with Washington State Amendments, WSEC

Electrical Code: National Electric Code, NEC (2014)

Fuel Code: International Fuel Gas Code, NGFC (2012) with Washington State Amendments

Accessibility: ICC/ANSI A117.1-2009 with Washington State Amendments

State Industrial: Washington Industrial Safety and Health, WSHA

Stormwater: Stormwater Management Manual for Western Washington, (2012)

Water: Water System Design Manual (Washington State Department of Health)

Zoning: R-24, Chapter 20.40 Zoning and Use Provisions

Development Standards: Shoreline Municipal Code, Chapter 20.5 Development Standards

Local Standards: Shoreline Comprehensive Plan, City of Shoreline Engineering Development Manual

General Site and Building Information

Site Address: 19547 25th AVE NE 98155

Parcel Number: 0426049043

Legal Description: BEG N 362.40 FT FR SEC CENTER TH N 83-16-00 W 169.25 FT TH N 45-10-13 W 183.12 FT TH N 82-13-50 W TO ELY RD MGN TH NWLY ALG SD RD MGN TO INTRSN WITH E LN OF SE 1/4 OF SE 1/4 OF NW 1/4 TH N 30.5 FT TH S 83-16-00 E TO N & S C/L SEC TH SLY ALG SD C/L TO BEG LESS E 30 FT

Set Backs: Front - 10' (5' with low wall) along 25th Ave and Ballinger Way, Sides/Back - 5'

Wetland Buffer: 165' (Wetland A, type II) An updated Wetland and Stream delineation report has been provided by The Watershed Company per the updated Critical Area Ordinance 2014 revision and is included at the end of this section. The wetland buffer increased significantly from the previous delineation report and will need to be explored further to understand how this affects the project.

Stream Buffer: 115' (Stream A, type F) An updated Wetland and Stream delineation report has been provided by The Watershed Company per the updated Critical Area Ordinance 2014 revision and is included at the end of this

section. The stream buffer increased significantly from the previous delineation report and will need to be explored further to understand how this affects the project.

Building A: Operations/Shops Building 15,500 SF: Wood framed, Type IV-B construction with A-3, B and S-1 occupancies all non-separated mixed use with the most stringent controlling. Fully sprinklered.

Building B: Vehicle and Equipment Storage: 8,000 SF: Pre-engineered metal building, type II-B construction S-2 occupancy. No sprinkling required.

Building C: Vehicle and Materials Storage, Vehicle Fuel and Wash: 17,600 SF: Pre-engineered metal building, type II-B construction with S-1, S-2 and B occupancy, non-separated mixed use with the most stringent controlling. Fully sprinklered. A mezzanine is expected with stairs but no elevator.

Building D: Materials and Equipment Storage: 4,200 SF: Pre-engineered metal building, type II-B construction, S-2 occupancy

Permitting Process

Special Use Permit (SUP): Required based on the NMF site Zoning of R-24 and the new facility being categorized as a Government Public Agency Office and Yard Facility per table 20.40.140 of the SMC. SUP requires a public process involving a public meeting and a hearing examiners review who will make a determination on the proposal. Timeline is 4-6 months.

State Environmental Policy Act (SEPA): Required since total building area is over 30,000SF.

Building Permits: Each new building will have a separate permit package for review by the City of Shoreline. Review time is 2 months, permits can't be issued until the SUP has been approved and completed

Site Permits: A site development permit is required for site work and miscellaneous structures such as retaining walls. Demolition of existing buildings is required and can be part of this submittal.

Other Items

Contamination Clean Up: Contamination has been found on site, see the Geotech and Environmental report in the Appendix of this report. Confirmation of clean up required from Dept. of Ecology.

National Pollutant Discharge Elimination System (NPDES) Permit: Required for disturbances over 1 acre.

Traffic Impact Analysis: Required along 25th ave.

Right of Way Permit: Required as part of the site development package.

Frontage Improvements: Required along 25th ave and Ballinger Way. Specifics of requirements along Ballinger are forthcoming from the City.

Stormwater: All on site stormwater facilities shall be recorded with King County prior to permit issuance

Accessibility: All buildings will be fully accessible as required by code

Permit Phasing

The project is expected to be broken into two separate bid packages, early site development and final site development and structures. The early site package will include demolition of existing structures, clearing and grubbing, rough grading, major utilities and storm water systems, it will be submitted to the City several months before the final site development and building packages will be submitted for review. The final site development/buildings packages will include remaining utilities, final site work and landscaping. The final site development will be tied to the Building A permit.

CITY OF SHORELINE

Planning & Community Development

17500 Midvale Avenue North
Shoreline, WA 98133
(206) 801-2500 ♦ Fax (206) 801-2788

March 15, 2016

Mark Hurley

Mark@tcfarchitecture.com

Re: Pre-application meeting #202124 on March 8, 2016

Dear Mr. Hurley:

Thank you for attending the pre-application meeting to discuss the City of Shoreline North Maintenance facility at 19547 25th Ave NE. The following is a summary of the issues discussed. This summary is not intended to represent a review of the plans submitted to date. You are responsible for compliance with the codes upon submittal of a formal application. Please let us know if you have any additional questions.

Codes and Regulations:
Shoreline Municipal Code (SMC)
Shoreline Comprehensive Plan (SCP)
City of Shoreline Engineering Development Manual
2012 Department of Ecology Stormwater Management Manual for Western Washington
2012 International Building Code (IBC) with Washington State Amendments
2009 ICC/ANSI A117.1-2009 Accessibility Requirements with Washington State Amendments
2012 International Mechanical Code (IMC) with Washington State Amendments
2012 International Fuel Gas Code (IFGC) with Washington State Amendments
2012 International Energy Conservation Code with Washington State Amendments (WSEC)
2012 Uniform Plumbing Code (UPC) with Washington State Amendments
2012 International Fire Code (IFC) with Shoreline and Washington State Amendments

SHORELINE MUNICIPAL CODE AND COMPREHENSIVE PLAN
Kim Lehmberg (206) 801-2552

1. A Special Use Permit is required. This is a public process with a hearing by the Hearing Examiner. A Neighborhood Meeting is required to be held prior to application; a summary report of which will be a part of the application materials.

Once an application is submitted and the City determines that it is complete, City staff will send out a Notice of Application and the applicant will be required to post signage at the subject site. City staff will review the materials and schedule the public hearing in front of the Hearing Examiner, who makes a determination on the project and any proposed conditions.

2. State Environmental Policy Act (SEPA) review is required if total building area is 30,000 square feet or more.
3. The parking must be screened from the right-of-way pursuant to the landscaping standards under 20.50.470, A or B. Either 10 feet of Type II landscaping, or five feet of Type II landscaping with a 3-4 foot high masonry wall is required. Parking lot landscaping is required pursuant to 20.50.500.
4. Setbacks for R-24 are ten feet from rights-of-way, five feet for sides. Any variation to these setbacks will require a zoning variance, which would also be decided by the Hearing Examiner. The criteria for a variance under SMC 20.30.310 would have to be addressed.
5. Hardscape in R-24 is limited to 85% of the area of the lot.
6. Building coverage in R-24 is limited to 70% of the area of the lot.
7. The Critical Areas Ordinance has been revised since the first round of planning for this site. The wetland will have to be further studied by a qualified professional in order to determine its type and required buffer. The stream is assumed to be a Type F Anadromous stream with a 115 foot buffer.
8. No additional pavement can be placed in the stream buffer, however, existing pavement may be replaced under the exemption in SMC 20.80.030.C.1.
9. A separate building permit is required for each building. A separate Site Development Permit is required for the site work. Demolition may be done under the Site Development Permit if all of the materials contained on the Demolition Permit checklist are submitted with the Site Development application.
10. A contamination clean-up confirmation from the Department of Ecology will be required.

SURFACE WATER DESIGN AND ENGINEERING

Danielle Angiono (206) 801-2529 or
Kevin Kinsella (206) 802-2428

Drainage requirements:

1. A soils analysis is required to determine infiltration rates.
2. Minimum requirements 1-9 of the 2012 Stormwater Management Manual for Western Washington will be required.
3. The City will be looking for Low Impact Development such as Bioswales, Rain gardens and/or rainwater planters where applicable.
4. Refer to the following website for more information on Bioswales and Rain Gardens: http://county.wsu.edu/mason/nrs/water/Documents/Raingarden_handbook.pdf
5. Refer to the 2012 DOE Stormwater Management Manual for Western Washington for all stormwater design.
6. All on site stormwater facilities shall be recorded with King County prior to permit issuance.

7. An NPDES permit required for disturbance of more than 1 acre of land.

Frontage Improvements:

1. A Traffic Impact Analysis will be required.
2. A separate right of way permit is required and will be issued concurrently with the site development permit.
3. Full frontage improvements are required on 25th Avenue North East. Frontage improvements consist of the following:
    - 11- Foot travel lane, 8-foot parking, 6-inch curb, 5-foot amenity zone and an 8-foot sidewalk.
4. Full frontage improvements are required on Ballinger Way North East. Frontage improvements consist of the following:
    - The curb to curb width will be determined by WSDOT.
    - At this time the frontage improvements are ***to be determined***.
    - Provide ***existing and proposed*** cross sections of both 25th Avenue North East and Ballinger way North East.

Traffic Impact Fees:

1. On January 1, 2015 the City of Shoreline implemented Traffic Impact fees.
    - **Approximate** Impact fees for this project are ***to be determined***.

General: The second driveway access on the southeast corner may be allowed as long as it is set back at least three feet from the neighboring property line.

References:

1. References for erosion prevention and sediment control:

Department of Ecology *Stormwater Management Manual for Western Washington*

http://www.ecy.wa.gov/programs/wq/stormwater/manual.html

References for City of Shoreline Engineering requirements:

City of Shoreline *Engineering Development Manual*

http://www.shorelinewa.gov/index.aspx?page=251

INTERNATIONAL BUILDING CODE & ACCESSIBILITY

Steve McGlocklin (206) 801-2542

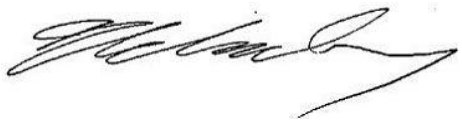
1. A separate building permit is required for each building.
2. A site development permit is required for site work, paving, grading, etc. Building review of miscellaneous structures such as retaining walls can be done under the site development permit. Demolition review can also be done under the site development if all demolition permit checklist items are submitted.
3. The 2015 International Building Code (IBC) will be adopted July 1, 2016.

INTERNATIONAL FIRE CODE
Derek LaFontaine (206) 533-6565

1. On site hydrant(s) required
2. Buildings A and C require sprinkler, fire alarm and possible standpipe
3. No sprinklers required in canopies if they are fully non combustible construction
4. Gates require Knox automatic gate switch
5. Minimum road width 20'

NOTE: This information is time sensitive and subject to change. A pre-application meeting does not vest this proposal under the current code, nor does it constitute full review of submitted material. If more than a year has passed since this meeting and an application has not been submitted, a new meeting may be required to satisfy SMC 20.30.080.

Sincerely,



Kim Lehmberg
Associate Planner

City of Shoreline

Planning & Community Development

17500 Midvale Avenue North Shoreline, WA 98133-4905
Phone: (206) 801-2500 Fax: (206) 801-2788
Email: pcd@shorelinewa.gov Web: www.shorelinewa.gov

PRE-APPLICATION MEETING REQUEST

PARCEL INFORMATION (Include all parcel(s) information. Attach additional sheets, if necessary.)

Project Address: (Leave blank if address is not assigned) 19547 25th AVE NE 98155

Parcel Number (Property Tax Account Number) 0426049043

PROPERTY OWNER INFORMATION

Name City of Shoreline Email -

Address 17500 Midvale Ave N City Shoreline State WA Zip 98133

Phone 206 801 2700 Phone Cell -

CONTACT INFORMATION

Name Mark Hurley Email mark@tcfarchitecture.com

Address 902 N. 2nd St City Tacoma State WA Zip 98403

Phone 253 572 3993 Phone Cell -

PROJECT DESCRIPTION

The City of Shoreline purchased the former King County Maintenance yard off of Ballinger Way and 25th Ave adjacent to Brugger's Bog Park, with the intent of bringing several maintenance departments together on one site. These departments include Public Works Streets and Surface Water Management (SWM), Ronald Waste Water (WW) groups. It has been determined that the existing structures all existing structures will be demolished, removed and nearly the entire site will be regraded to accommodate the new structures. The existing structures include a wood framed structure, two pre-engineered canopies and fuel dispensers and above ground fuel tanks. The new public works and maintenance facility will comprise of administrative and crew functions, vehicle storage (enclosed and canopy covered), shops, vehicle washing, vehicle fueling with diesel and gasoline in a below ground fuel tank, deicer tank storage, decant facility and bulk materials storage.

There are 4 buildings planned on this site:
- Building A is the Administration and crew building, wood framed, Type IV-B construction with A-3 and B occupancies (and S-1 with the 2 story scheme) all non-separated mixed use with the most stringent controlling. It is expected that this will be fully sprinklered.
- Building B is a vehicle and equipment canopy pre-engineered metal building, type II-B construction S-2 occupancy.
- Building C is vehicle storage, enclosed and canopy covered, small shops (carpentry shop, metal fabrication shop and facilities shop), equipment storage vehicle wash bay and vehicle fuel bay, pre-engineered metal building , type II-B construction with S-1, S-2 and B occupancy, non-separated mixed use with the most stringent controlling. It is expected that this will be fully sprinklered.
- Building D is a vehicle and material storage canopy, pre-engineered metal building, type II-B construction, S-2 occupancy.

Construction Value unknown

FOR OFFICE USE ONLY:

Meeting Date: _____

Meeting Time: _____

Project Manager: _____

TRANSMITTED TO:

- ☐ Building
- ☐ Public Works
- _____
- ☐ Shoreline Fire
- ☐ Ronald Wastewater
- ☐ Shoreline Water
- ☐ Seattle Public Utilities
- ☐ WSDOT
- ☐ _____

PRE-APPLICATION MEETING SUBMITTAL CHECKLIST

Planning & Community Development

Pre-application meetings are an integral part of the application process. It is at this stage that the applicant can be provided with a description of the process, application submittal criteria, and help clarify other agency involvement. It also allows us, other city departments and some external agencies to acquaint ourselves with the proposal. **Pre-application meetings are mandatory for certain types of permits and land use actions. Optional pre-application meetings are available by request if desired.**

The following information is necessary to schedule a pre-application meeting:

☐ **Pre-Application Meeting Request (1 copy only)**

☐ **Submittal Fees:**

- Mandatory meeting: $483.75 ($161.25 hourly rate, 3 hour minimum).
- Optional meeting: $161.25 ($161.25 hourly rate, 1 hour minimum).

☐ **Description of proposed project (5 copies):**

- Written description, include as much detail as possible.

☐ **General Information (5 copies):**

- Address and parcel number of the property.
- Existing use of property.
- Proposed number of dwelling units (if applicable).

☐ **List of Questions (5 copies):**

- Specific areas that need clarification

☐ **Site Plan Information (to scale, 5 copies, 11 x 17 minimum size)**

- Property lines with dimensions.
- Proposed site modifications, structures, building and parking layout.
- Existing site conditions, structures, building location and setbacks.
- Proposed vehicular access and driveways.
- Location of proposed lot lines (if subdivision or other plat).
- "Significant trees" (8" diameter at breast height for conifers, 12" for all others if known).
- Existing frontage improvements (e.g. sidewalk).
- Location of utilities and hydrants (if known).
- Location of easements if known – access, sidewalk, utilities.
- Estimate of grading quantity (if known).
- Critical areas (streams, wetlands, steep slopes, etc.), use the Critical Areas Worksheet to help assess these features. Provide copies of any preliminary studies (stream typing, wetland delineation, geotechnical, etc.) if available.

☐ **Building Information (5 copies):**

- Square footage (footprint and total).
- Number of floors proposed.
- Elevation (schematic).
- Type of construction (if known).
- Type of occupancy (if known).
- Conceptual building floor plans (if possible).

☐ **Optional Additional Information (5 copies):**

- Water and sewer certificates
- Structural calculations
- Geotechnical reports
- Other draft studies or reports

Pre-application meetings are scheduled on Tuesdays from either 9:00 to 10:30 or 10:30 to 12:00 am with a 14-day minimum lead time.

NOTE: Plans presented at a pre-application meeting are non-binding and do not vest a project in the event of a code change. Please be sure that all drawings are clear and information is legible. Number each page consecutively and staple them together with the site plan as your first sheet. No pencil drawings will be accepted.

Fees effective 1/2016 and are subject to change.

The Development Code (Title 20) is located at CodePublishing.com

Business Hours: M – F 8:00 a.m. to 5:00 p.m. ♦ Permit Processing Hours: M – F 8:00 a.m. to 4:00 p.m.

17500 Midvale Avenue North, Shoreline, Washington 98133-4905
Telephone (206) 801-2500 Fax (206) 801-2788 Email pcd@shorelinewa.gov

CITY OF SHORELINE
NORTH MAINTENANCE FACILITY
PRE-SUBMITTAL CONFERENCE

Site Address: 19547 25th AVE NE 98155

Parcel Number: 0426049043

Zoning: Currently industrial Use, zoned as R-24 (Will need Special Use Permit)

The City of Shoreline purchased the former King County Maintenance yard off of Ballinger Way and 25th Ave adjacent to Brugger's Bog Park, with the intent of bringing several maintenance departments together on one site. These departments include Public Works Streets and Surface Water Management (SWM), Ronald Waste Water (WW) groups, with limited presence of Facilities, Traffic Engineering, Environmental Services, and Police. After the first round of programming it was determined that the existing structures were not adequate for the new program and functions, all existing structures will be demolished, removed and nearly the entire site will be regraded to accommodate the new structures. The existing structures include a wood framed structure, two pre-engineered canopies and fuel dispensers and above ground fuel tanks. The new public works and maintenance facility will comprise of administrative and crew functions, vehicle storage (enclosed and canopy covered), shops, vehicle washing, vehicle fueling with diesel and gasoline in a below ground fuel tank, deicer tank storage, decant facility and bulk materials storage.

The NMF site is bounded by Brugger's Park on the north, 25th Ave NE on the east, R-24 zoned Multifamily residential on the south and Ballinger Way on the Western edge. The eastern edge of the NMF site, along 25 Ave NE, floods during high rainfall events. The City is actively looking to correct this issue with the "25th Ave NE Floor Reduction Project". The intent of this project is to correct the flooding issue on the NMF site, the design strategy is yet to be determined. High ground water table and possible fish passage requirements could add complexity to the site design. It is expected that the flood reduction project schedule will be behind the NMF project schedule so strategies for the NMF project will need to be implemented to prevent flooding of the new structures until the flood reduction project is complete. Coordination between the two projects is expected throughout design and construction.

There are 4 buildings planned on this site, all slab on grade construction. At this early stage we have several site layout options:

- ***Building A*** is the Administration and crew building, most likely wood framed, Type IV-B construction with A-3 and B occupancies (and S-1 with the 2 story scheme) all non-separated mixed use with the most stringent controlling. It is expected that this will be fully sprinklered.
- ***Building B*** is a vehicle and equipment canopy pre-engineered metal building, type II-B construction S-2 occupancy.
- ***Building C*** is vehicle storage, enclosed and canopy covered, small shops (carpentry shop, metal fabrication shop and facilities shop), equipment storage vehicle wash bay and vehicle fuel bay, pre-engineered metal building , type II-B construction with S-1, S-2 and B occupancy, non-separated mixed use with the most stringent controlling. It is expected that this will be fully sprinklered. A mezzanine is expected with stairs but no elevator.
- ***Building D*** is a vehicle and material storage canopy, pre-engineered metal building, type II-B construction, S-2 occupancy.

The buildings are expected to be cladded with durable materials and meet all applicable codes and requirements.

Questions

1. It appears a SUP is required? What is the process and requirements?
2. What standards is this project to follow, residential, commercial, other? Is this based on zoning or use?
3. What are the frontage improvement requirements for the site?
4. Is regrading and new paving allowed within the stream buffer? If not will mitigation be allowed so that we can pave and regrade with in the setback? Currently the site is paved within the wetland buffer. If buildings are within the setback what type of mitigation is required? Where are the mitigation requirements located within the SMC?
5. Will the City approve a partially functioning storm water system until the 25th Ave NE Flood Reduction Project is designed and constructed?
6. We are planning on breaking out the site into a separate bid package, with the buildings following a couple month behind the site in a separate permit submittal package. All rough grading and main site utilities would be installed early in the early package. We would plan on submitting the site grading and site utilities as an early permit submittal. Do you see an issue with this from a permitting standpoint? What information would you expect to see with the site submittal permit?
7. Since there are several buildings will there be a permit per building or will all buildings fall under one permit?
8. Deferred submittal s are expected, pre-engineered metal building, fire sprinkler, water reclaim system, fuel system. Do you see issues with this?
9. What typical issues have come up in other projects that I should be aware of?
10. Who will be the contact person to continue communication with?
11. We have added a new secondary drive way on in the south east corner, it is adjacent to an existing driveway. Is a variance required for this? What is the process for obtaining a variance?
12. Minimum set backs are 10’ along 25th ave, all other are 5’, are these setback assumptions accurate?
13. Is parking allowed with in front, side or back set backs?



SITE

127,530 SF

BUILDINGS

BUILDING A
7,000 SF - ADMIN/CREW TOTAL

BUILDING B
5,180 SF - CANOPY TOTAL

BUILDING C
11,300 SF - HEATED/ENCLOSED
6,400 SF - CANOPY STORAGE
1,500 SF - CANOPY WASH BAY
1,320 SF - CANOPY FUEL BAY
20,520 SF - TOTAL

BUILDING D
4,220 SF - CANOPY TOTAL

36,920 FS TOTAL PROGRAM AREA

PARKING

4 - VISITOR
30 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)
MEDIUM 10' x 30' (17)
SMALL 10' x 20' (29)
X-SMALL 8' x 12' (9)
XX-SMALL 8' x 8' (21)

BULK MATERIALS

18' x 20' 5/8" MINUS
18' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

PROS

- ALL SHOPS/STORAGE ARE TOGETHER
- SHOPS HAVE ACCESS ON TWO SIDES
- WETLAND MITIGATION IS NOT REQUIRED
- CLEAR DRIVE AISLE BETWEEN BLDG A & C
- CREW AND ADMIN PROGRAM ON ONE LEVEL

CONS

- REDUCED FLEXIBILITY IN SHOPS & MULTIUSE BAYS
- (3) EXTRA SMALL PIECES OF EQUIPMENT NOT COVERED
- (15) SMALL CITY VEHICLES NOT COVERED

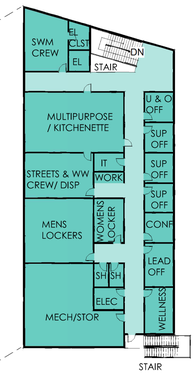
CITY OF SHORELINE - NORTH MAINTENANCE FACILITY
19547 25TH AVE NE SEATTLE, WA 98155 26 JANUARY 2016 PRE DESIGN PHASE

SITE AND BUILDING DEVELOPMENT - ALTERNATIVE A

NORTH
NOTE: DRAWING MAY BE REDUCED
0 15' 30' 60'

CITY OF SHORELINE
TCF Architecture





BUILDING A - LEVEL 2

PROS

- WETLAND MITIGATION IS NOT REQUIRED
- CLEAR DRIVE AISLE BETWEEN BLDG A & C
- INCREASED ENCLOSED HEATED VEHICLE STORAGE BY (8)

CONS

- (3) EXTRA SMALL PIECES OF EQUIPMENT NOT COVERED
- (8) SMALL CITY VEHICLES NOT COVERED
- SHOPS LIMITED TO ACCESS ON ONE SIDE
- HIGH FLOOR TO FLOOR HEIGHT AT BLDG

SITE

127,530 SF

BUILDINGS

BUILDING A
7,000 SF - LEVEL 1 CREW/SHOPS
8,500 SF - LEVEL 2 ADMIN/CREW
15,500 SF - TOTAL

BUILDING B
5,180 SF - CANOPY TOTAL

BUILDING C
10,660 SF - HEATED/ENCLOSED
6,400 SF - CANOPY STORAGE
1,500 SF - CANOPY WASH BAY
1,320 SF - CANOPY FUEL BAY
19,880 SF - TOTAL

BUILDING D
4,220 SF - CANOPY TOTAL

44,780 FS TOTAL PROGRAM AREA

PARKING

4 - VISITOR
36 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)
MEDIUM 10' x 30' (17)
SMALL 10' x 20' (29)
X-SMALL 8' x 12' (9)
XX-SMALL 8' x 8' (21)

BULK MATERIALS

18' x 20' 5/8" MINUS
18' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 26 JANUARY 2016 PRE DESIGN PHASE

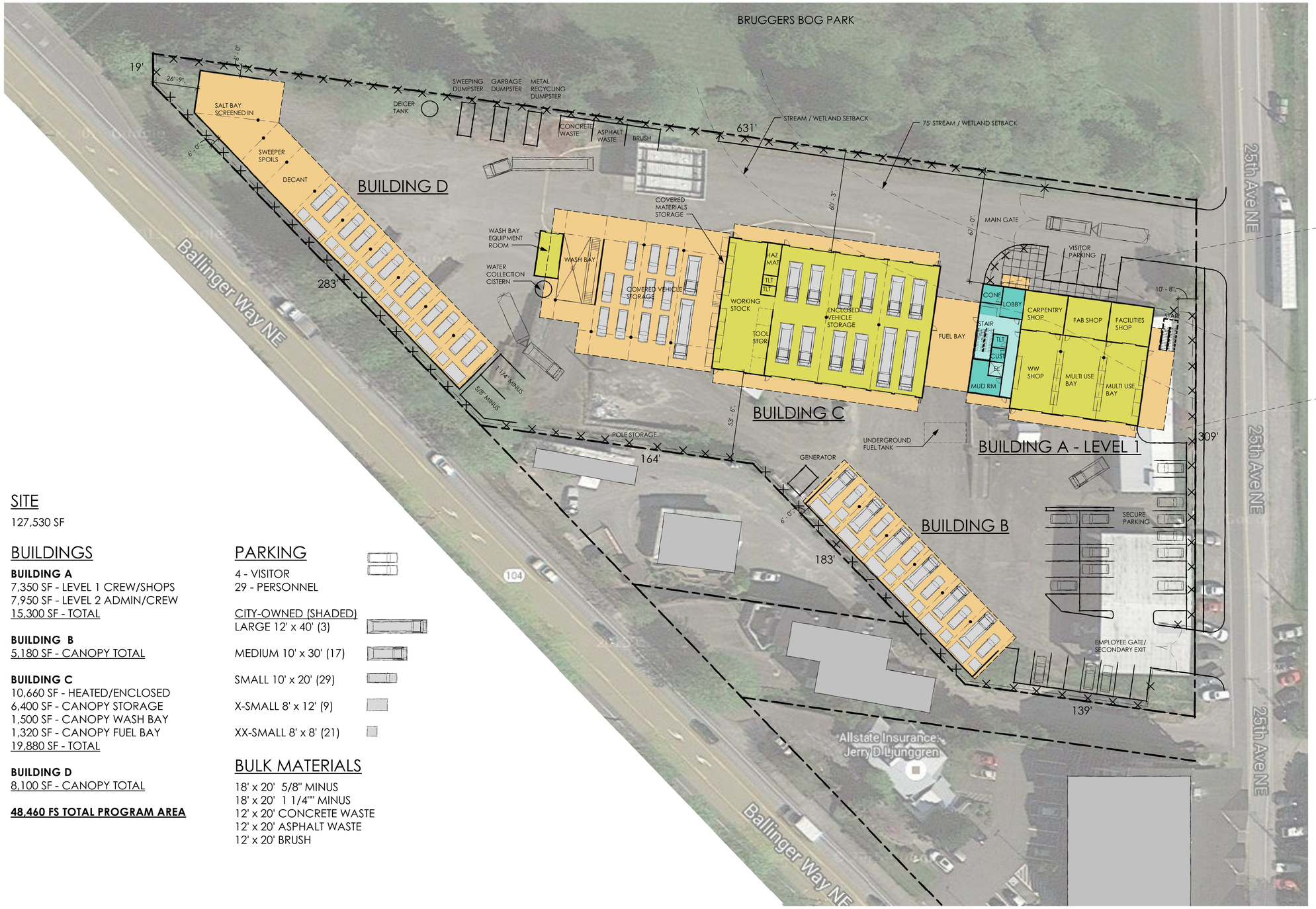
SITE AND BUILDING DEVELOPMENT - ALTERNATIVE B

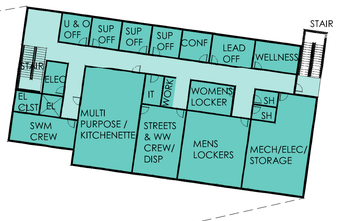
NORTH

NOTE: DRAWING MAY BE REDUCED
0 15' 30' 60'

CITY OF SHORELINE

TCF Architecture





BUILDING A - LEVEL 2

PROS

- ALL PROGRAMMED VEHICLE & EQUIP ARE COVERED
- MOST BUILDING AREA POTENTIAL

CONS

- WETLAND MITIGATION IS REQUIRED
- SHOPS LIMITED TO ACCESS ON ONE SIDE
- HIGH FLOOR TO FLOOR HEIGHT AT BLDG A
- FUTURE CREW PARKING NEEDS NOT ACCOUNTED FOR

SITE

127,530 SF

BUILDINGS

BUILDING A
7,350 SF - LEVEL 1 CREW/SHOPS
7,950 SF - LEVEL 2 ADMIN/CREW
15,300 SF - TOTAL

BUILDING B
5,180 SF - CANOPY TOTAL

BUILDING C
10,660 SF - HEATED/ENCLOSED
6,400 SF - CANOPY STORAGE
1,500 SF - CANOPY WASH BAY
1,320 SF - CANOPY FUEL BAY
19,880 SF - TOTAL

BUILDING D
8,100 SF - CANOPY TOTAL

48,460 FS TOTAL PROGRAM AREA

PARKING

4 - VISITOR
29 - PERSONNEL

CITY-OWNED (SHADED)
LARGE 12' x 40' (3)
MEDIUM 10' x 30' (17)
SMALL 10' x 20' (29)
X-SMALL 8' x 12' (9)
XX-SMALL 8' x 8' (21)

BULK MATERIALS

18' x 20' 5/8" MINUS
18' x 20' 1 1/4"" MINUS
12' x 20' CONCRETE WASTE
12' x 20' ASPHALT WASTE
12' x 20' BRUSH

CITY OF SHORELINE - NORTH MAINTENANCE FACILITY
19547 25TH AVE NE SEATTLE, WA 98155 26 JANUARY 2016 PRE DESIGN PHASE

SITE AND BUILDING DEVELOPMENT - ALTERNATIVE C

NORTH
NOTE: DRAWING MAY BE REDUCED
0 15' 30' 60'

CITY OF SHORELINE
TCF Architecture

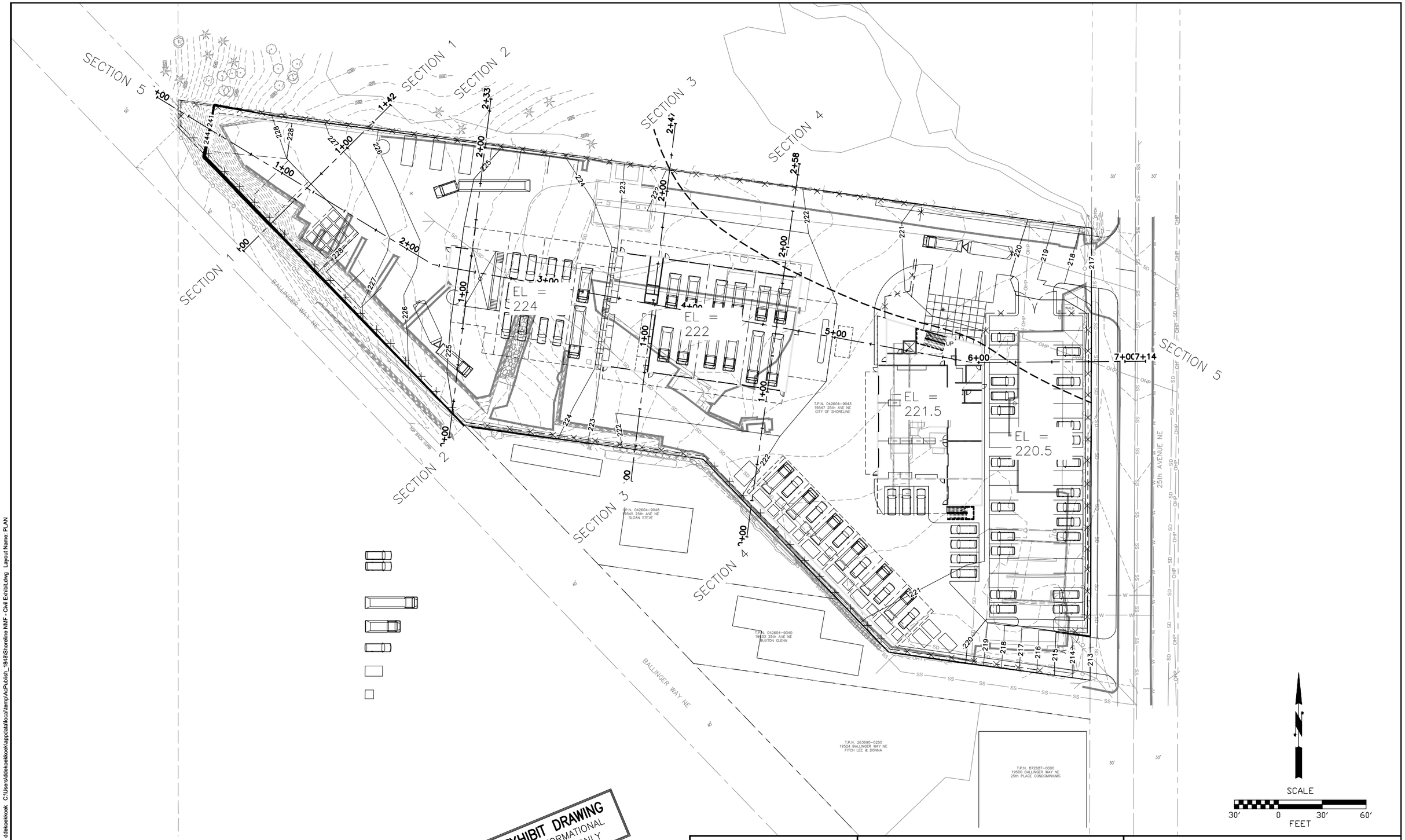


EXHIBIT DRAWING
FOR INFORMATIONAL PURPOSES ONLY

Perteet
425-252-7700 | 1-800-615-9900
2707 Colby Avenue, Suite 900
Everett, Washington 98201

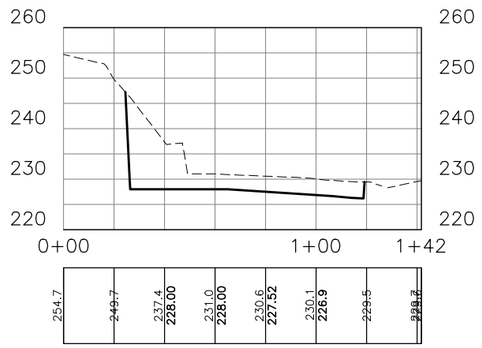
CITY OF SHORELINE
NORTH MAINTENANCE FACILITY

PROJECT NO. 20150180
1/28/2016

CITY OF SHORELINE NORTH MAINTENANCE FACILITY

Jan 28, 2016 - 10:55pm ddekoekkoek C:\Users\ddekoekkoek\appdata\local\temp\AcPublish_1948\Shoreline NMF - Civil Exhibit.dwg Layout Name: PLAN

Section 1



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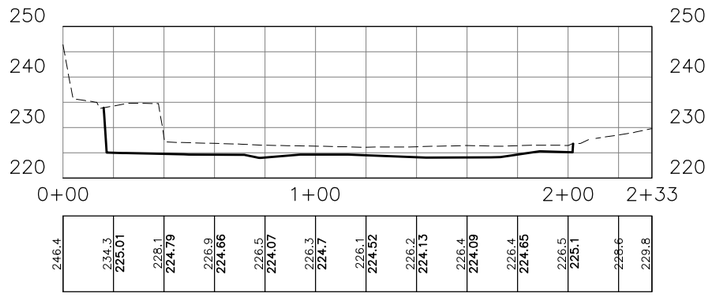

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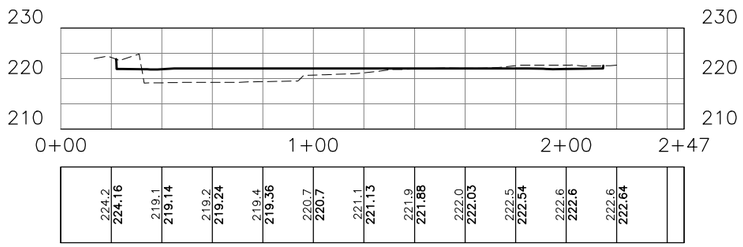

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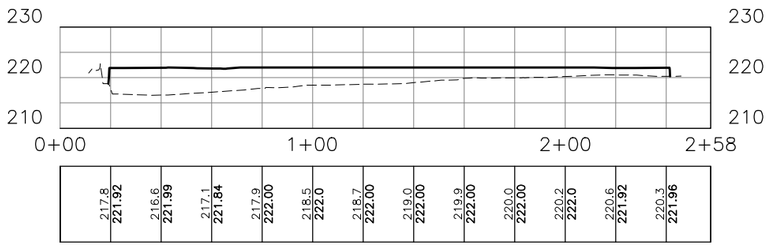


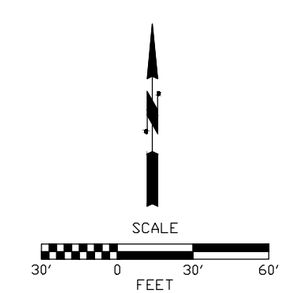


EXHIBIT DRAWING
FOR INFORMATIONAL PURPOSES ONLY

Perteet
425-252-7700 | 1-800-615-9900
2707 Colby Avenue, Suite 900
Everett, Washington 98201

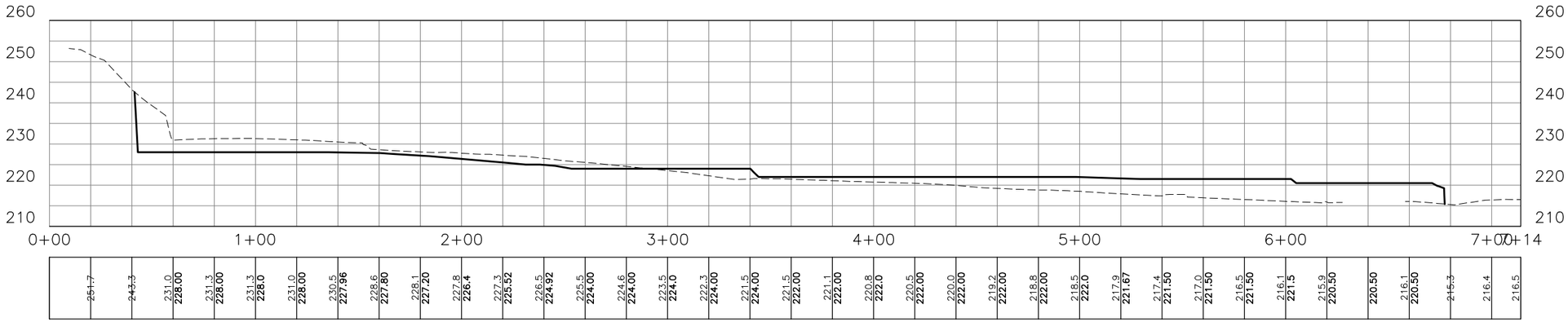
CITY OF SHORELINE
NORTH MAINTENANCE FACILITY

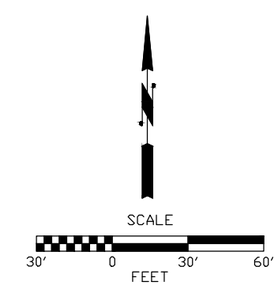
PROJECT NO. 20150180
1/28/2016

CITY OF SHORELINE
NORTH MAINTENANCE FACILITY

Jan 28, 2016 - 10:55pm ddekoekkoek C:\Users\ddekoekkoek\appdata\local\temp\AcPublish_1848\Shoreline NMF - Civil Exhibit.dwg Layout Name: SECTIONS 1

Section 5





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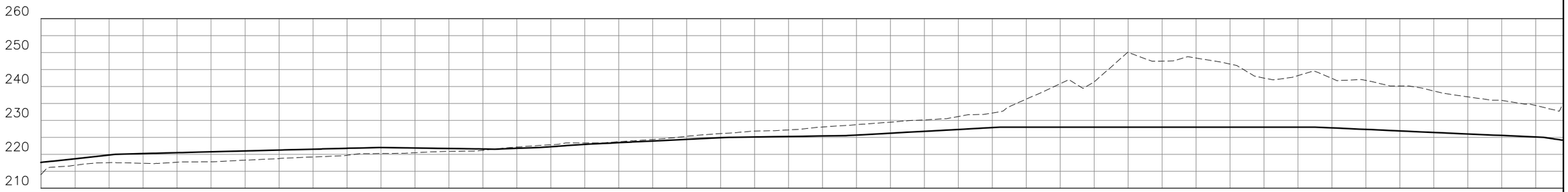
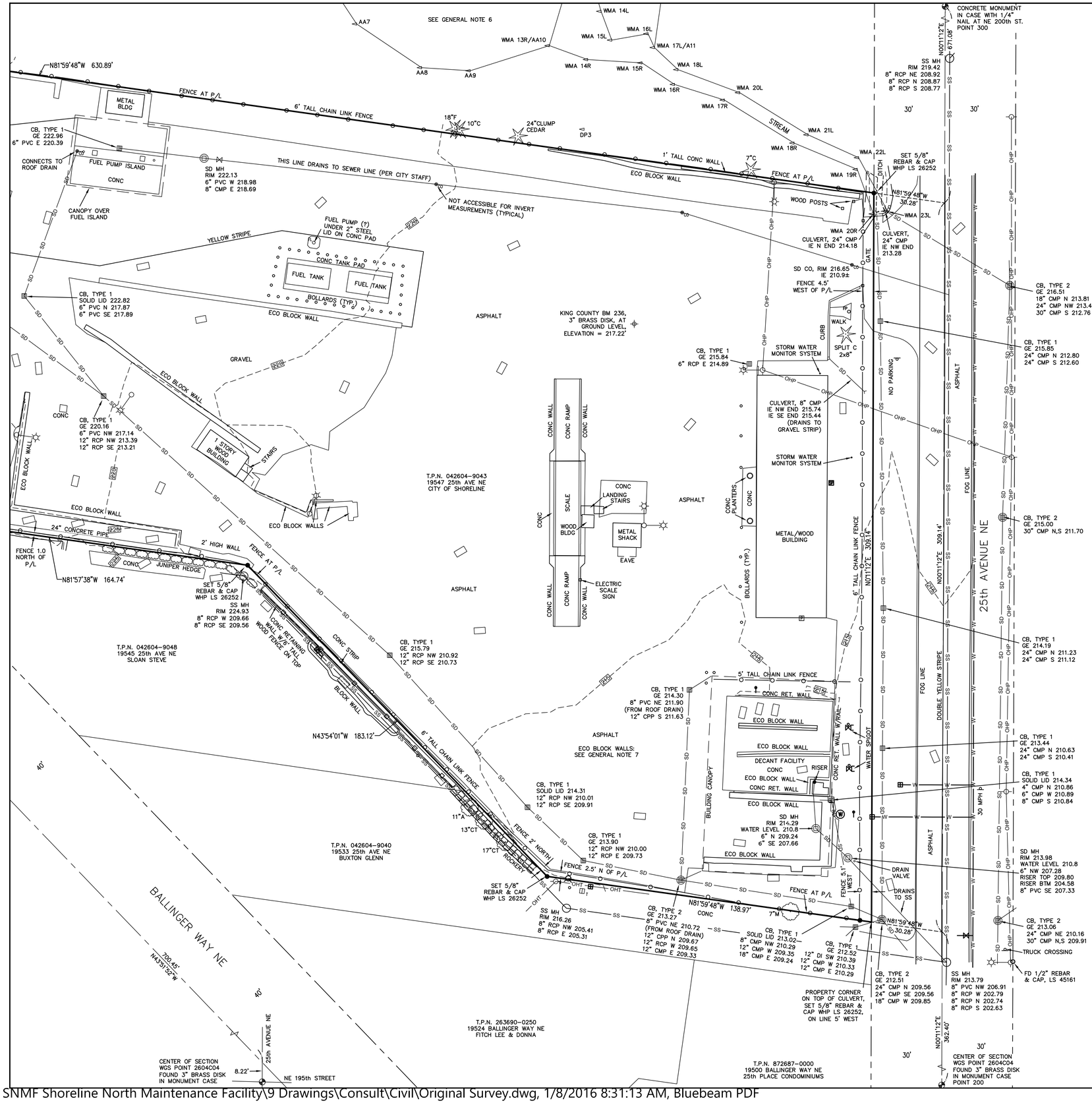
Jan 28, 2016 - 10:55pm ddekoekkoek C:\Users\ddekoekkoek\appdata\local\temp\AcPublish_1848\Shoreline NMF - Civil Exhibit.dwg Layout Name: SECTIONS 2


260
250
240
230
220
210
0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+

| | | |

NORTHWEST QUARTER, SECTION 4, TOWNSHIP 26 NORTH, RANGE 4 EAST, W.M.
CITY OF SHORELINE, KING COUNTY, WASHINGTON



LEGEND

UTILITY POLE WITH LIGHT		CONIFER TREE	A ALDER, C CEDAR
POWER VAULT		DECIDUOUS TREE	CT COTTONWOOD, F FIR, M MAPLE
UTILITY POLE		CATCH BASIN, TYPE 1	
GUY ANCHOR		CATCH BASIN, TYPE 2	
YARD LIGHT, NO ARM		STORM MANHOLE	
POWER JUNCTION BOX		STORM CLEANOUT	
POWER METER		CULVERT	
TELEPHONE MANHOLE		SANITARY SEWER MANHOLE	
TELEPHONE JUNCTION BOX		ROCKERY	
GAS VALVE		SIGNPOST	
WATER MANHOLE		MAILBOX	
FIRE HYDRANT		WETLAND FLAG	
WATER VALVE		MONUMENT	
WATER METER		STORM DRAIN LINE	SD
PRESSURE RELIEF VALVE		GAS LINE	G
IRRIGATION CONTROL VALVE		OVERHEAD POWER LINE	OHP
WATER BLOWOFF VALVE		UNDERGROUND POWER LINE	P
FIRE DEPT. STANDPIPE		SANITARY SEWER LINE	SS
WATER MARKER		OVERHEAD TELEPHONE LINE	OHT
WATER SPIGOT		UNDERGROUND TELEPHONE LINE	T
WATER SERVICE		OVERHEAD CABLE TV LINE	OHTV
BOLLARD		WATER LINE	W
		CHAIN LINK FENCE	
		WOOD FENCE	
		METAL/WIRE FENCE	X
		R/W CENTERLINE	
		R/W MARGIN	

GENERAL NOTES:

1. HORIZONTAL DATUM: NAD 83/91, WASHINGTON NORTH ZONE

2. VERTICAL DATUM: NAVD 1988

KING COUNTY 236, BRASS DISK IN BRUGGERS BOG KING COUNTY MAINTENANCE FACILITY ON 25th AVE NE, N OF BALLINGER WAY, SET FLUSH WITH GRADE, 75' S OF N FENCELINE, 100' SW OF ENTRANCE GATE, 55' NW OF NW CORNER SHOP BUILDING, ELEVATION 217.22'

3. FIELD WORK FOR THIS SURVEY WAS PERFORMED IN OCTOBER AND NOVEMBER 2013. MONUMENTS SHOWN AS FOUND WERE VISITED IN OCTOBER 2013.

4. THE SURVEY DEPICTED HEREIN WAS PERFORMED BY FIELD TRAVERSE METHODS, EMPLOYING A LEICA 1201 TOTAL STATION, THE RESULTS OF WHICH MEET OR EXCEED THE LINEAR CLOSURE REQUIREMENTS SPECIFIED BY WAC 332-130-090. SAID TOTAL STATION HAS A STANDARD DEVIATION OF 1 SECOND FOR A HORIZONTAL ANGLE MEASUREMENT AND A STANDARD DEVIATION OF 2MM+2PPM FOR A DISTANCE MEASUREMENT. SAID TOTAL STATION HAS BEEN MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND COMPARED AND ADJUSTED (AS NECESSARY) TO A NATIONAL GEODETIC BASELINE, WITHIN THE PAST YEAR.

5. THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY OF OBSERVABLE FEATURES AND SUPPLEMENTED WITH INFORMATION FROM EXISTING DRAWINGS AND PAINT MARKS BY OTHERS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES ARE IN THE EXACT LOCATION INDICATED, BUT ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.

6. WETLAND POINT DESIGNATION PER WATERSHED COMPANY WETLAND FIELD DELINEATION, AUGUST 2013.

7. WHERE CONTOURS ARE SHOWN ALONG AND WITHIN ECO BLOCK WALLS, THESE WALLS SERVE AS RETAINING WALLS. WHERE CONTOURS ARE NOT SHOWN ALONG AND WITHIN ECO BLOCK WALLS, THESE WALLS ARE "FREE STANDING" AND CONTOURS REPRESENT GROUND SURFACE.

CONTROL CHART	NAD 83/91		NAVD 88	
POINT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
200	612463.58	1607224.38	222.35	MONUMENT AT BALLINGER WAY AND 25th AVE NE
				(3" BRASS DISK IN CASE)
300	613806.19	1607228.76	248.70	MONUMENT AT NE 200th ST AND 25th AVE NE
				(CONC MON W/NAIL, IN CASE)
236	613083.79	1607094.95	217.22	KING COUNTY BENCH MARK IN BRUGGERS BOG
				MAINTENANCE SHOP (SEE GENERAL NOTE 2)

COORDINATES SHOWN ARE NAD 83/91 SCALED TO GROUND BY A COMBINED SCALE FACTOR OF 0.99995366 AND TRANSLATED TO A PROJECT DATUM BY ADDING 100,000 METERS (328083.333 FEET) TO BOTH NORTHINGS AND EASTINGS.

N

SCALE
20 0 10 20 40
(FEET)
1 INCH = 20 FT.

WHPacific
12100 NE 195th St, Ste 300
Bothell, WA 98011
425-951-4800 Fax 425-951-4808
www.whpacific.com

REVISIONS

NO.	BY	DATE	REMARKS

SHEET INFO	
SURVEYED	MBE/BDC
DRAWN	CPC
CHECKED	RAD
APPROVED	
LAST EDIT	01/15/2014
PLOT DATE	01/15/2014
SUBMITTAL	

EXISTING CONDITIONS SURVEY
CITY OF SHORELINE
BRUGGERS BOG MAINTENANCE FACILITY

SCALE 1" = 20'

PROJECT NUMBER 038016

DRAWING FILE NAME 038016-V-TP00

SHEET NUMBER 1
1 of 2

X:\2015-016 SNMF Shoreline North Maintenance Facility\9 Drawings\Consult\Civil\Original Survey.dwg, 1/8/2016 8:31:13 AM, Bluebeam PDF

WEST LINE EAST HALF OF SE 1/4 OF NW 1/4 SECTION 4

T.P.N. 042604-9049
BRUGGERS BOG PARK
CITY OF SHORELINE

FENCE 0.3 SOUTH
FENCE 0.5 EAST
SET 5/8" REBAR & CAP WHP LS 26252
N0°00'47"W 18.69'
FENCE 1.0 EAST
50'
N45°08'08"E 40.00'
FENCE 0.5 NORTH
ECO BLOCK WALL
TOP BACK OF WALL
6' TALL CHAIN LINK FENCE
N81°59'48"W 630.89'
FENCE AT P/L
GRAVEL
ASPHALT
ECO BLOCK WALLS: SEE GENERAL NOTE 7
METAL BLDG
CB, TYPE 1
GE 222.96
6" PVC E 220.39
CONNECTS TO ROOF DRAIN
FUEL PUMP ISLAND
CONC
CANOPY OVER FUEL ISLAND
SD MH
RIM 222.13
6" PVC W 218.98
8" CMP E 218.69
THIS LINE DRAINS TO SEWER LINE (PER CITY STAFF)
NOT ACCESSIBLE FOR INVERT MEASUREMENTS (TYPICAL)
SD MH
RIM 227.57
6" SW 216.32
6" W 216.27
6" NW 216.23
12" RCP SE 216.31
CONNECTIONS NOT FOUND
YELLOW STRIPE
FUEL PUMP (?) UNDER 2" STEEL LID ON CONC PAD
CONC TANK PAD
FUEL TANK
FUEL /TANK
BOLLARDS (TYP.)
CB, TYPE 1
SOLID LID 222.82
6" PVC N 217.87
6" PVC SE 217.89
CB, TYPE 1
SOLID LID 224.04
12" RCP NW 217.79
12" RCP SE 217.92
(CONNECTIONS UNKNOWN)
CB, TYPE 1
GE 220.16
6" PVC NW 217.14
12" RCP NW 213.39
12" RCP SE 213.21
1 STORY WOOD BUILDING
STAIRS
ECO BLOCK WALLS
6' TALL CHAIN LINK FENCE
24" CONCRETE PIPE
2' HIGH WALL
FENCE AT P/L
CONC JUNIPER HEDGE
FENCE 1.0 NORTH OF P/L
N81°57'38"W 164.74'
SET 5/8" REBAR & CAP WHP LS 26252
SS MH
RIM 224.93
8" RCP W 209.66
8" RCP SE 209.56
CONC RETAINING WALL 6' TALL WOOD FENCE ON TOP
CONC STRIP
CB, TYPE 1
GE 215.79
12" RCP NW 210.92
12" RCP SE 210.73
T.P.N. 042604-9048
19545 25th AVE NE
SLOAN STEVE
T.P.N. 042604-9043
19547 25th AVE NE
CITY OF SHORELINE
KING COUNTY BM 236,
3" BRASS DISK, AT
GROUND LEVEL,
ELEVATION = 217.22'
CB, TYPE 1
GE 215.84
6" RCP E 214.89
CONC WALL
CONC RAMP
SCALE
WOOD BLDG
CONC LANDING STAIRS
METAL SHACK
EAVE
ELECTRIC SCALE SIGN
CONC PLANTERS
BOLLARDS (TYP.)
ASPHALT
BALLINGER WAY NE
282.89'
N43°51'52"W
700.45'
N43°51'52"W 780.88'
40'
12'
17'
4'
10"M
8"M
9"M
14"M
6"M
10"A
12"M
9"A
8"A
20"A
45"F
17"F
18"F
20"M
7"C
24"CLUMP CEDAR
DP3
1' TALL CONC WALL
ECO BLOCK WALL
WALL
RIP RAP
CONC
N46°08'08"E 40.00'
FD REBAR & CAP WHP LS 16996
BUILDING LINE

WMA 1R
WMA 1L
DP2
DP1
A2
WMA 2L
WMA 2R
STREAM
A3
WMA 3L
WMA 3R
WMA 4L
A4
WETLAND A
WMA 4R
WMA 5L
A5
A6
WMA 6L
WMA 5R/AA1
WMA 7L
WMA 8L
A7
WMA 9L/A8
WMA 6R
WMA 7R
WMA 8R
WMA 9R
STREAM
WMA 10L
AA4
AA3
AA2
WMA 10R
WMA 11L
AA5
WMA 11R
WMA 12L/A9
WETLAND A
AA6
WMA 12R
WMA 13L
WETLAND A
A-10
AA7
SEE GENERAL NOTE 6
WMA 14L
WMA 16L
WMA 13R/AA10
WMA 15L
WMA 17L/A11
AA8
AA9
WMA 14R
WMA 15R
WMA 18L
WMA 16R
WMA 20L
WMA 17R

N
SCALE
20 0 10 20 40
(FEET)
1 INCH = 20 FT.

X:\2015-016 SNMF Shoreline North Maintenance Facility\9 Drawings\Consult\Civil\Original Survey.dwg, 1/8/2016 8:33:45 AM, Bluebeam PDF

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Bothell, WA 98011
425-951-4800 Fax 425-951-4808
www.whpacific.com

REGISTERED PROFESSIONAL LAND SURVEYOR
STATE OF WASHINGTON
R. A. DICKMAN
24252
REGISTERED PROFESSIONAL LAND SURVEYOR

REVISIONS			
NO.	BY	DATE	REMARKS

SHEET INFO	
SURVEYED	MBE/BDC
DRAWN	CPC
CHECKED	RAD
APPROVED	
LAST EDIT	01/15/2014
PLOT DATE	01/15/2014
SUBMITTAL	

EXISTING CONDITIONS SURVEY

CITY OF SHORELINE
BRUGGERS BOG MAINTENANCE FACILITY

SCALE 1" = 20'

PROJECT NUMBER 038016
DRAWING FILE NAME 038016-V-TP00

SHEET NUMBER 2
2 of 2

September 3, 2013

Kim Lehmberg
City of Shoreline Planning
17500 Midvale Ave N
Shoreline, WA 98133

Re: City of Shoreline Maintenance Facility
Wetland and Stream Delineation Report
The Watershed Company Reference Number: 100503

Dear Ms. Lehmberg:

On August 22, 2013, Ecologist Nell Lund and I visited Brugger's Bog Park in Shoreline. The purpose of our visit was to conduct a wetland and stream delineation study, in part, to determine the extent of any buffer areas that may encumber the maintenance facility south of the park. Since no wetland or stream features are found within the maintenance facility property, this study focused on the areas south of the stream bridge to the park's southern property line. This letter summarizes the findings of this study and details applicable federal, state, and local regulations. The following attachments are included:

- Wetland Delineation Map (pending survey)
- Wetland Determination Data Forms

Methods

Public-domain information on the subject properties was reviewed for this delineation study. These sources include USDA Natural Resources Conservation Service Soil maps, U.S. Fish and Wildlife Service National Wetland Inventory maps, Washington Department of Fish and Wildlife interactive mapping programs (PHS on the Web and SalmonScape), King County's GIS mapping website (iMAP), *City of Shoreline Stream and Wetland Inventory and Assessment* (Tetra Tech/KCM, Inc. 2004), and *The City of Lake Forest Park Surface Water Comprehensive Plan Update* (Otak, Inc. 2009).

Prior to our visit, we conducted a review of the *Brugger's Bog Park, Wetland and Stream Delineation Report* (The Watershed Company, 2011) (2011 Watershed Report), which was prepared as part of a culvert replacement/bridge construction project over Ballinger Creek. The 2011 study focused on areas in the immediate vicinity of the proposed bridge crossing.

The study area was evaluated for wetlands using methodology from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys,*

and Coast Region Version 2.0 (Regional Supplement) (US Army Corps of Engineers [Corps] May 2010). The wetland boundary was determined on the basis of an examination of vegetation, soils, and hydrology. Areas meeting the criteria set forth in the Regional Supplement were determined to be wetland. Soil, vegetation, and hydrologic parameters were sampled at several locations along the wetland boundary to make the determination. Data points on-site are marked with yellow- and black-striped flags. We recorded data at three of these locations.

Delineated wetlands were classified according to the criteria defined in the Shoreline Municipal Code (SMC).

The ordinary high water mark (OHWM) of Ballinger Creek was determined based on the definition provided by the Washington Department of Fish and Wildlife and WAC 220-110-020(69). The OHWM is located by examining the bed and bank physical characteristics and vegetation to ascertain the water elevation for mean annual floods. Areas meeting the definition were determined to be the OHWM and flagged. Field observations were used to classify streams according to the criteria defined in the SMC.

Findings

The study area is located in Brugger's Bog Park, a City of Shoreline municipal park. The park has large lawn areas, a play structure and patchy forested areas that are dominated by a mix of Douglas-fir, western hemlock, western red-cedars, Pacific madrone, and bitter cherry. Salal, Himalayan blackberry, and bracken fern are dominant in the understory. The study area covered those wetlands and streams that could potentially encumber the maintenance facility to the south. There is one wetland, Wetland A (see below), and one stream, Ballinger Creek (see below), located in the study area. There are no wetlands or streams located on the maintenance facility property.

Wetland A

Wetland A is a riverine wetland complex associated with Ballinger Creek. The wetland complex contains three sub-units on alternating sides of Ballinger Creek. Since the sub-units are in very close proximity and mutually influence one another, they are considered one wetland for the purposes of classification/rating. Wetland A contains forested and scrub-shrub Cowardin vegetation communities. Common vegetation includes Pacific and Sitka willow, red alder, red-osier dogwood, salmonberry, skunk cabbage, mannagrass, and creeping buttercup. The soil in Wetland A is a black (10YR 2/1) sandy loam with organic accumulations masking redoximorphic features. Hydrology is provided by a high groundwater table and overbank flooding from Ballinger Creek. Soil saturation was present at the soil surface at our data point location. Other areas in Wetland A contained very shallow surface water during our inspection.

Ballinger Creek

The delineated portion of Ballinger Creek begins at the small, on-site bridge and flows southeast before exiting the property via a culvert at the southeast corner of the park property. The permanently-flowing creek continues southeast for approximately one mile before its confluence with Lyon Creek within the City of Lake Forest Park. Segments of the creek are alternately piped and ditched, and portions flow through braided channels, ponds, and wetlands within Lake Forest Park (*City of Lake Forest Park Surface Water Comprehensive Plan Update*). Several partial fish barriers and two total fish passage barriers are documented downstream of the project area (WDFW *SalmonScape,* 2013). However, downstream portions of Ballinger Creek are documented to contain Coho salmon habitat (WDFW *SalmonScape,* 2013), and resident cutthroat trout cannot be definitively ruled out of the reach within Brugger's Bog Park.

Ditch

An excavated ditch is located adjacent to the southern property line, south of Wetland A and Ballinger Creek. The ditch connects with Ballinger Creek approximately 50 feet upstream from the southeast property corner. The ditch is clearly constructed, as evidenced by its steeply excavated banks and geometrically-straight configuration. No active hydrology was present during our inspection, but water-stained leaves were observed at the bottom of the ditch, suggesting that occasional flooding occurs in the ditch. Despite containing evidence of hydrology and a hydrophytic plant community, the ditch did not satisfy the hydric soil criteria, as no organic matter or redoximorphic features were observed in the soil profile. Furthermore, regulated wetlands in the City of Shoreline do not include "artificial wetlands created entirely from non-wetland sites, including, but not limited to, irrigation and drainage ditches" (SMC 20.80.310.A). It also contains no historic stream flow based physical characteristics, lack of natural upstream channels, overall landscape position and the proximity to Ballinger Creek Therefore, the on-site ditch is not a jurisdictional wetland or stream and does not have an associated buffer.

Local Regulations

Wetlands and streams in Shoreline are regulated under SMC 20.80. Under the code, wetlands are rated as one of four types based on size, composition, and the presence of rare or listed species. Wetland A is less than one-half acre and contains a forested vegetation class; however, it does not contain rare or listed plant or animal species; it is not considered a natural heritage wetland; and it is not hydrologically isolated. Based on these criteria, Wetland A qualifies as a Type III wetland (SMC 18.20.320.C). Type III wetlands are required to have a standard buffer width of 65 feet (SMC 20.80.330.B).

Streams in Shoreline are classified as one of four types based on inventory status as Shorelines of the State, salmonid use, and size. Ballinger Creek is not considered a Shoreline of the State; therefore, it is not a Type I stream. Streams that are not Type I and

have salmonid fish use or salmonid habitat value are considered Type II streams. Since Ballinger Creek contains documented Coho salmon habitat downstream of the study area and cutthroat trout cannot be definitively ruled out of the study area, the creek satisfies the criteria for a Type II stream. Type II streams are required to have a standard buffer width of 115 feet (SMC 20.80.480.B).

Both the wetland and stream classifications are consistent with previous determinations provided in the 2011 Watershed Report.

State and Federal Regulations

Wetlands, streams, and some ditches are also regulated by the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act. Any filling of Waters of the State, including wetlands (except isolated wetlands), would require notification and permits from the Corps. However, in general, neither the Corps nor Ecology regulates wetland buffers, unless direct impacts are proposed. We understand the proposed project will not result in direct impacts to the wetland, stream, or ditch. Therefore, no state or federal wetland- or stream-related permitting would be triggered by the proposed improvements.

Disclaimer

The information contained in this letter or report is based on the application of technical guidelines currently accepted as the best available science and in conjunction with the manuals and criteria outlined in the methods section. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available to us at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, State and Federal regulatory authorities. No other warranty, expressed or implied, is made.

Please call if you have any questions or if we can provide you with any additional information.

Sincerely,



Ryan Kahlo, WPIT
Ecologist

Enclosures



LEGEND

- DELINEATED WETLAND BOUNDARY
- WETLAND/STREAM BUFFER
- 35' MINIMUM TYPE III WETLAND BUFFER
- 75' MINIMUM TYPE II STREAM BUFFER

NOTES

1. CRITICAL AREAS DELINEATED BY THE WATERSHED COMPANY ON AUGUST 22, 2013.
2. SURVEY RECEIVED FROM WHPACIFIC, INC., 425-951-4897.

WETLAND AND STREAM DELINEATION MAP

SCALE 1"=50'

0 25' 50' 100'

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THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242 f 425.827.8136
www.watershedco.com
Science & Design

BRUGGER'S BOG PARK
WETLAND AND STREAM DELINEATION MAP
PREPARED FOR KIM LEHMBERG

19827 25TH AVE NE
SHORELINE, WA 98155

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	10-17-13	REVIEW SET	MD

SHEET SIZE:
ORIGINAL PLAN IS 11X17.
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: –
DRAFTED: MD
CHECKED: RK
JOB NUMBER: 100503
SHEET NUMBER: 1 OF 1

DATE 10/14/2014 | PRINTED BY MIKE DROSKE | FILENAME 100503_BRUGGERS BOG WETLAND.DWG

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-1

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **1**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Riverbank** Slope (%) **2**	Local relief (concave, convex, none)	**Concave**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No			
Wetland Hydrology Present?	☒ Yes	☐ No			

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size 5m diam.)			
1. ***Alnus rubra***	**50**	**Yes**	**FAC**
2. ***Salix babylonica****	**50**	**No***	**FACW**
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Cornus sericea***	**25**	**Yes**	**FACW**
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**40**	**Yes**	**FACW**
2. ***Phalaris arundinacea***	**10**	**No**	**FACW**
3. ***Ranunculus repens***	**20**	**Yes**	**FACW**
4. ***Oenanthe sarmentosa***	**2**	**No**	**OBL**
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover			
Woody Vine Stratum (Plot size)			
1. ***Convulvulus arvensis***	**70**	**No****	**NI**
2. ***Rubus armeniacus***	**5**	**No**	**FACU**
= Total Cover			

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**3**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: ***Rooted out of feature – overhanging.**
****NI species not included in dominance calculations.**

SOIL **Sampling Point – DP-1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	**10YR 2/1**	**100**					**Sandy loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☒ No ☐

Remarks: **Organic masking redox**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	☐	Yes	☒	No	Depth (in):		
Water Table Present?	☒	Yes	☐	No	Depth (in):	**14**	
Saturation Present? (includes capillary fringe)	☐	Yes	☐	No	Depth (in):	**Surface**	

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-2

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **2**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Terrace** Slope (%) **5**	Local relief (concave, convex, none)	**None**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☐ Yes ☒ No
Hydric Soils Present?	☐ Yes	☒ No		
Wetland Hydrology Present?	☐ Yes	☒ No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Salix baylonica***	**90**	**Yes**	**FACW**
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Rosa nutkana***	**10**	**Yes**	**FAC**
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**10**	**No**	**FACW**
2. ***Polystichum munitum***	**10**	**No**	**FACU**
3. ***Field grass***	**40**	**Yes**	**FAC***
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Remarks: **Presumed FAC**

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**3**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL **Sampling Point – DP-2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	**10YR 2/2**	**100**					**Sandy loam**	
8-12	**10YR 4/2**	**100**					**Sandy loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☐ Yes	☒ No	Depth (in):	
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):	

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-3

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **3**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Ditch** Slope (%) **2**	Local relief (concave, convex, none)	**Concave**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☐ Yes	☒ No
Hydric Soils Present?	☐ Yes	☒ No			
Wetland Hydrology Present?	☒ Yes	☐ No			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Salix lucida***	**90**	**Yes**	**FACW**
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Rubus spectabilis***	**50**	**Yes**	**FAC**
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**10**	**Yes**	**FACW**
2. ***Ranunculus repens***	**10**	**Yes**	**FACW**
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size)			
1. ***Rubus armeniacus***	**15**	**Yes**	**FACU**
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**80**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL **Sampling Point – DP-3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	**7.5YR 2.5/2**	**100**					**Loam**	
8-12	**2.5Y 3/1**	**100**					**Loamy sand**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☐ Yes	☒ No	Depth (in):	
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):	

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



LEGEND

- DELINEATED WETLAND BOUNDARY
- WETLAND/STREAM BUFFER
- 35' MINIMUM TYPE III WETLAND BUFFER
- 75' MINIMUM TYPE II STREAM BUFFER

NOTES

1. CRITICAL AREAS DELINEATED BY THE WATERSHED COMPANY ON AUGUST 22, 2013.
2. SURVEY RECEIVED FROM WHPACIFIC, INC., 425-951-4897.

WETLAND AND STREAM DELINEATION MAP

SCALE 1"=50'

0 25' 50' 100'

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THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242 f 425.827.8136
www.watershedco.com
Science & Design

BRUGGER'S BOG PARK
WETLAND AND STREAM DELINEATION MAP
PREPARED FOR KIM LEHMBERG

19827 25TH AVE NE
SHORELINE, WA 98155

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	10-17-13	REVIEW SET	MD

SHEET SIZE:
ORIGINAL PLAN IS 11X17.
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: –
DRAFTED: MD
CHECKED: RK
JOB NUMBER: 100503
SHEET NUMBER: 1 OF 1

DATE 10/14/2014 | PRINTED BY MIKE DROSKE | FILENAME 100503_BRUGGERS BOG WETLAND.DWG

Brugger's Bog Site Development Questions and Answers

1) The fuel station pumps and covered canopy are located directly adjacent to the north property line - are they grandfathered in the buffer zone?
Given the wetland delineation study that was just completed for the southern portion of the Brugger's Bog Park site, the fuel station pumps and covered canopy are likely not in a wetland or stream buffer zone at all. Once the final survey has been completed, the City will provide the actual buffer area on the property.

2) What does the code require for the number of parking stalls? Can the yard's parking requirements be met by providing on-street parking on 25th, possibly partially extending into the site with a relocated sidewalk?

Parking requirement for a public agency yard is 1 space for every 300 square feet of offices, plus 0.9 per 1000 square feet of storage area.

Under the Development Code, required parking for a use must be on site. The Director can determine whether a parking reduction is allowed. Also, typically parking can't be in a front yard setback which in this zone is 10 feet. If it's already existing parking, it can be used but development of new parking areas must meet the code.

Street parking is allowed where ever it isn't prohibited, but it doesn't count toward required parking (although the presence of available street parking can be a factor if there is a request for a parking reduction). Also, you can't create new parking spaces that are partially in the ROW.

3) The truck scale is equipment that has been placed on top of the asphalt with dirt access ramps. Can this be placed in the buffer zone?
Given the wetland delineation study that was just completed for the southern portion of the Brugger's Bog Park site, the current truck scale is likely not in the wetland or stream buffer zone at all. Once the final survey has been completed, the City will provide the actual buffer area on the property. Although we cannot place the scale (if needed) in the buffer, given the likely size and location of the buffer, this would probably not be a desirable location for the scale if we want to move it. Thus, this is likely a moot issue.

4) The existing shed/operations building on the east boundary line likely extends into the stream/wetland buffer zone. Can we retain the portion of the shed that is in the buffer zone as grandfathered and demolish and rebuild the portion that is outside of the buffer zone or must we keep the whole structure to qualify?
You can retain the portion of the shed that is in the buffer and demolish and rebuild the portion that is outside the buffer. The shed meets the CAO partial exemption. You can

modify, replace or expand any portion of that structure as long as you don't increase any building footprint within the buffer.

5) The slope under Ballinger Way extends into the west portion of the site adjoining the material bins. Can we cut into the slope to provide a retaining wall to redefine and expand the material bins or will this require approval by WSDOT?
A cursory field inspection concludes there is enough set-back from Ballinger Way to allow cutting into the slope for placement of a retaining wall requiring a City of Shoreline Site Development permit. The permitting situation, however, depends on the volume of soil removed. There is a threshold which will trigger a State Environmental Policy Act (SEPA) review which can bring other regulatory agents into the picture.

6) Can the south boundary setback be 0 so that we could place buildings on the property line - don't think a setback would be much good anyway as the a 0-line setback would provide additional visual buffer and back into the slope.
There isn't anything in the code that would allow this, other than a zoning variance. This would need to follow Planning's standard variance criteria and checklist.

7) Assuming the paved yard and fuel station are grandfathered nonconforming uses are they ok to remain and possibly be improved (overlay paving)?
While the fuel station is likely outside the buffer, the paved yard inside the likely buffer on the site is a grandfathered nonconforming use and can be improved (overlay paving or replacement of the asphalt with new asphalt are ok).

8) Must all structures be placed 115 feet back from the north property line?
No new structures can be built in the stream/wetland buffer on the property. Given the wetland delineation study that was just completed for the southern portion of the Brugger's Bog Park site, the buffer will likely cross the site near the northeastern corner of the maintenance yard (where Ballinger creek culverts under the road). Without mitigation, all structures would have to be 115' from the stream. Once the final survey has been completed, the City will provide the actual buffer area on the property.

As well, the Planning Department will help provide information about mitigation that may be conducted to reduce the size of the buffer to 75'. This will likely require hiring an expert to provide information to the City about what sorts of stream/wetland enhancements can be conducted to improve the environmental function of the stream. The City will also need to appropriate the funds for the stream/wetland mitigation work; this is currently not in the project budget.

9) Will a weighing station be required if the decant facility is downsized and relocated?
Staff is currently researching the regulatory environment around stormwater decanting. Once this information is better understood, along with the City's options regarding how the City will decant our own vehicles in the near and long terms, we will provide this information to you. This will help inform what the City's needs are with regard to the scope, size, location and additional infrastructure (truck scales) of a decant facility.

10) If the current configuration is retained, it will use up a considerable portion of the east end of the site with the decamp building, weigh station, and access routes. Is retention a deal breaker?
See answer to Question #8.

11) What is the extent of setbacks around the property required in the zoning code?
Setbacks for the R-24 zone are 10 feet for street front, 5 feet for sides. Since there are two street frontages, there is no rear yard (SMC 20.50.020).

12) Can the fuel station be relocated to improve efficiency and possible additional building capacity (would move it north towards material bins).
Yes, as long as the station is moved outside the buffer zone, it can be relocated. However, given that staff is working now to get the current fueling station operational, any plan to move the station would have to be a part of the longer term site redevelopment. There may also be additional permit requirements and environmental assessments that would need to be conducted if the station were to move.

13) Can we place a Nema Enclosure (small utility cabinet for fiber optic end point) on the utility pole that is right next to the north property line fence (and in the wetland buffer) and then run a network cable in underground conduit through the wetland buffer (would need to dig up asphalt and then repave) to wherever the cable needs to go?
This will be allowed under the exemption SMC 20.80.030(B)(5) and SMC 20.80.040(M), as long as the cable isn't going into the wetland or stream.

14) Can we replace the utility pole referenced above, given that it is in the buffer? If so, would we get some mitigation credit for the replacement, given that a new utility pole would likely not have the environmental impacts (no creosote, proper footing) of the current pole?
Replacement is exempt from the CAO under SMC 20.80.030(A)(1). The SMC doesn't have a provision for "mitigation credits."

15) Can we demolish the existing operations building if part of the building is in the wetland buffer and then rebuild on the footprint of the old building?
Yes, exempt under SMC 20.80.030(A)(1). See also answer to question #4.

16) What would the likely cost be of wetland restoration so that we could get the reduced 75 foot buffer? Given that this will likely require hiring an expert to provide information to the City about what sorts of stream/wetland enhancements can be conducted to improve the environmental function of the stream, do we have past examples of expert recommendations and the costs to implement them?
A recommendation and enhancement plan from a qualified professional is required. Cost depends on square footage of enhancement area and varies depending on the work. We would probably be looking at invasive removal and planting, if not actually restoring to buffer some of the areas that are now grass. Recent projects have run between 5 – 8

dollars per square foot of installation. Watershed should be able to provide examples of plans and an estimate of providing an enhancement plan.

17) Can a Nema Enclosure be placed in the 10 foot setback area from the front property line (east side of site, facing 25th Ave NE)?
Yes. Utility structures of that size may project into setbacks.

18) Does the buffer extend beyond the property into the City's right-of-way?
Yes, however, many activities in the right-of-way are exempt under SMC 20.80.030(B).

19) Can we place a card reader kiosk in the buffer (outside of the fence line) with trenched conduit running to it?
This will be allowed under the exemption 20.80.040(M),

City of Shoreline
Geographic Information System

ZONING
Representation of Official Zoning Map Adopted By City Ordinance No. 292.

Shows amendments through March 16, 2010.

Other Map Features
- City Boundary
- Open Water
- Outside Shoreline
- Interstate
- Principal Arterial
- Minor Arterial
- Collector Arterial
- Neighborhood Collector
- Local Street
- Park
- Tax Parcel Boundary
- Unclassified Right of Way

Zoning Designation
- R-48; Residential, 48 units/acre
- R-24; Residential, 24 units/acre
- R-18; Residential, 18 units/acre
- R-12; Residential, 12 units/acre
- R-8; Residential, 8 units/acre
- R-6; Residential, 6 units/acre
- R-4; Residential, 4 units/acre
- I; Industrial
- Mixed Use Zone
- Mixed Use Contract Zone
- PA; Planned Area
- C; Campus
- NCBD: North City Business District
- O; Office
- CB; Community Business
- NB; Neighborhood Business
- CZ; Contract Zone

1 inch = 2,000 feet

0 500 1,000 2,000 3,000 4,000 Feet

No warranties of any sort, including accuracy, fitness, or merchantability, accompany this product.

CITY OF SHORELINE

Filename: Zoning.mxd
Updated: 3/2010

THE WATERSHED COMPANY

September 3, 2013, revised April 18, 2016

Noel Hupprich
Capital Project Manager II
City of Shoreline, Public Works Department
17500 Midvale Avenue N
Shoreline, WA 98133-4905

Re: City of Shoreline Maintenance Facility, Wetland and Stream Delineation Report

The Watershed Company Reference Number: 160329 and 100503

Dear Mr. Hupprich:

On April 13, 2016, I visited Brugger's Bog Park in Shoreline to update the wetland classification using the Department of Ecology *Wetland Rating System for Western Washington, 2014 Update* (Ecology Rating System) as currently required by the City of Shoreline. Prior to recent updates to the Shoreline Critical Areas Regulations, a wetland classification system specific to the City of Shoreline was used for all delineation studies in the City. Similarly, Shoreline has revised its stream classification system to be substantially similar to the Department of Natural Resources Stream Typing System.

The wetland and stream were originally delineated by The Watershed Company on August 22, 2013. The delineation and classification studies have been conducted, in part, to determine the extent of any buffer areas that may encumber the maintenance facility south of the park. Since no wetland or stream features are found within the maintenance facility property, this study focused on the areas south of the stream bridge to the park's southern property line.

This letter summarizes the findings of this study and details applicable federal, state, and local regulations. The following attachments are included:

- Wetland and Stream Delineation Map
- Wetland Determination Data Forms
- Wetland Rating Form

Methods

Public-domain information on the subject properties was reviewed for this delineation study. These sources include USDA Natural Resources Conservation Service Soil maps,

U.S. Fish and Wildlife Service National Wetland Inventory maps, Washington Department of Fish and Wildlife interactive mapping programs (PHS on the Web and SalmonScape), King County's GIS mapping website (iMAP), *City of Shoreline Stream and Wetland Inventory and Assessment* (Tetra Tech/KCM, Inc. 2004), and *The City of Lake Forest Park Surface Water Comprehensive Plan Update* (Otak, Inc. 2009).

Prior to our visit, we conducted a review of the *Brugger's Bog Park, Wetland and Stream Delineation Report* (The Watershed Company, 2011) (2011 Watershed Report), which was prepared as part of a culvert replacement/bridge construction project over Ballinger Creek. The 2011 study focused on areas in the immediate vicinity of the proposed bridge crossing.

The study area was evaluated for wetlands using methodology from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Regional Supplement) (US Army Corps of Engineers [Corps] May 2010). The wetland boundary was determined on the basis of an examination of vegetation, soils, and hydrology. Areas meeting the criteria set forth in the Regional Supplement were determined to be wetland. Soil, vegetation, and hydrologic parameters were sampled at several locations along the wetland boundary to make the determination. Data points on-site are marked with yellow- and black-striped flags. We recorded data at three of these locations.

Delineated wetlands were classified according to the criteria defined in the Shoreline Municipal Code (SMC).

The ordinary high water mark (OHWM) of Ballinger Creek was determined based on the definition provided by the Washington Department of Fish and Wildlife and WAC 220-110-020(69). The OHWM is located by examining the bed and bank physical characteristics and vegetation to ascertain the water elevation for mean annual floods. Areas meeting the definition were determined to be the OHWM and flagged. Field observations were used to classify streams according to the criteria defined in the SMC.

Findings

The study area is located in Brugger's Bog Park, a City of Shoreline municipal park. The park has large lawn areas, a play structure and patchy forested areas that are dominated by a mix of Douglas-fir, western hemlock, western red-cedars, Pacific madrone, and bitter cherry. Salal, Himalayan blackberry, and bracken fern are dominant in the understory. The study area covered those wetlands and streams that could potentially encumber the maintenance facility to the south. There is one wetland, Wetland A (see below), and one stream, Ballinger Creek (see below), located in the study area. There are no wetlands or streams located on the maintenance facility property.

Wetland A

Wetland A is a riverine wetland complex associated with Ballinger Creek. The wetland complex contains three sub-units on alternating sides of Ballinger Creek. Since the sub-units are in very close proximity and mutually influence one another, they are considered one wetland for the purposes of classification/rating. Wetland A contains a forested Cowardin vegetation community. Common vegetation includes black cottonwood, Pacific and Sitka willow, red alder, red-osier dogwood, salmonberry, skunk cabbage, small-fruited bulrush, mannagrass, and creeping buttercup. The soil in Wetland A is a black (10YR 2/1) sandy loam with organic accumulations masking redoximorphic features. Hydrology is provided by a high groundwater table and overbank flooding from Ballinger Creek. Soil saturation was present at the soil surface at our data point location. Other areas in Wetland A contained very shallow surface water during our inspection.

Ballinger Creek

The delineated portion of Ballinger Creek begins at the small, on-site bridge and flows southeast before exiting the property via a culvert at the southeast corner of the park property. The permanently-flowing creek continues southeast for approximately one mile before its confluence with Lyon Creek within the City of Lake Forest Park. Segments of the creek are alternately piped and ditched, and portions flow through braided channels, ponds, and wetlands within Lake Forest Park (*City of Lake Forest Park Surface Water Comprehensive Plan Update*). Several partial fish barriers and two total fish passage barriers are documented downstream of the project area (WDFW *SalmonScape,* 2016). However, downstream portions of Ballinger Creek are documented to contain Coho salmon habitat (WDFW *SalmonScape,* 2016), and resident cutthroat trout cannot be definitively ruled out of the reach within Brugger's Bog Park.

Ditch

An excavated ditch is located adjacent to the southern property line, south of Wetland A and Ballinger Creek. The ditch connects with Ballinger Creek approximately 50 feet upstream from the southeast property corner. The ditch is clearly constructed, as evidenced by its steeply excavated banks and geometrically-straight configuration. No active hydrology was present during our inspection, but water-stained leaves were observed at the bottom of the ditch, suggesting that occasional flooding occurs in the ditch. Despite containing evidence of hydrology and a hydrophytic plant community, the ditch did not satisfy the hydric soil criteria, as no organic matter or redoximorphic features were observed in the soil profile. Furthermore, regulated wetlands in the City of Shoreline do not include "artificial wetlands created entirely from non-wetland sites, including, but not limited to, irrigation and drainage ditches" (SMC 20.80.310.A). It also contains no historic stream flow based physical characteristics, lack of natural upstream channels, overall landscape position and the proximity to Ballinger Creek Therefore, the on-site ditch is not a jurisdictional wetland or stream and does not have an associated buffer.

Local Regulations

Wetlands and streams in Shoreline are regulated under SMC 20.80. Under the code, wetlands are rated as one of four categories based on the Ecology Rating System. According to the Rating System, Wetland A scored seven points for water quality functions, seven points for hydrologic functions, and six points for habitat functions, for a total score of 20 points. This score qualifies Wetland A as a Category II wetland. Wetland buffers in Shoreline are determined based on a combination of the wetland category and the habitat score. Category II wetlands with a habitat score of six points are required to have a standard buffer width of 165 feet (SMC 20.80.330.A.3).

Streams in Shoreline are classified as one of four categories based on inventory status as Shorelines of the State, fish use, and permanence of flow. Ballinger Creek is not considered a Shoreline of the State; therefore, it is not a Type S stream. Streams that are not Type S and have fish use or fish habitat are considered Type F streams. Since Ballinger Creek contains documented Coho salmon habitat downstream of the study area, cutthroat trout cannot be definitively ruled out of the study area; and downstream constructed fish migration barriers could theoretically be removed, the creek satisfies the criteria for a Type F stream with anadromous fish use. Type F streams with anadromous fish use are required to have a standard buffer width of 115 feet (SMC 20.80.280.C.1).

State and Federal Regulations

Wetlands, streams, and some ditches are also regulated by the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act. Any filling of Waters of the State, including wetlands (except isolated wetlands), would require notification and permits from the Corps. However, in general, neither the Corps nor Ecology regulates wetland buffers, unless direct impacts are proposed. We understand the proposed project will not result in direct impacts to the wetland, stream, or ditch. Therefore, no state or federal wetland- or stream-related permitting would be triggered by the proposed improvements.

Disclaimer

The information contained in this letter or report is based on the application of technical guidelines currently accepted as the best available science and in conjunction with the manuals and criteria outlined in the methods section. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available to us at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, State and Federal regulatory authorities. No other warranty, expressed or implied, is made.

Please call if you have any questions or if we can provide you with any additional information.

Sincerely,



Ryan Kahlo, PWS
Ecologist

Enclosures

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LEGEND

- DELINEATED WETLAND BOUNDARY
- 165' STANDARD CATEGORY II WETLAND BUFFER
- 115' STANDARD TYPE F STREAM BUFFER

NOTES

1. CRITICAL AREAS DELINEATED BY THE WATERSHED COMPANY ON AUGUST 22, 2013.
2. SURVEY RECEIVED FROM WHPACIFIC, INC., 425-951-4897.

WETLAND AND STREAM DELINEATION MAP

SCALE 1"=50'

0 25' 50' 100'

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THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242 f 425.827.8136
www.watershedco.com
Science & Design

BRUGGER'S BOG PARK
WETLAND AND STREAM DELINEATION MAP
PREPARED FOR KIM LEHMBERG
SITE ADDRESS:
19827 25TH AVE NE
SHORELINE, WA 98155

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	10-17-13	REVIEW SET	MD
2	4-18-2016	DELINEATION UPDATE	KMB

SHEET SIZE:
ORIGINAL PLAN IS 11X17.
SCALE ACCORDINGLY.

PROJECT MANAGER: HM
DESIGNED: --
DRAFTED: MD
CHECKED: RK
JOB NUMBER:
100503
SHEET NUMBER:
1 OF 1

DATE	PRINTED BY	FILENAME
10/14/2013	KYLE BRAUN	*100503_BRUGGERS BOG WETLAND.DWG

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-1

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **1**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Riverbank** Slope (%) **2**	Local relief (concave, convex, none)	**Concave**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No			
Wetland Hydrology Present?	☒ Yes	☐ No			

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size 5m diam.)			
1. ***Alnus rubra***	**50**	**Yes**	**FAC**
2. ***Salix babylonica****	**50**	**No***	**FACW**
3.			
4.			
= Total Cover			
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Cornus sericea***	**25**	**Yes**	**FACW**
2.			
3.			
4.			
5.			
= Total Cover			
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**40**	**Yes**	**FACW**
2. ***Phalaris arundinacea***	**10**	**No**	**FACW**
3. ***Ranunculus repens***	**20**	**Yes**	**FACW**
4. ***Oenanthe sarmentosa***	**2**	**No**	**OBL**
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover			
Woody Vine Stratum (Plot size)			
1. ***Convulvulus arvensis***	**70**	**No****	**NI**
2. ***Rubus armeniacus***	**5**	**No**	**FACU**
= Total Cover			

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**3**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: ***Rooted out of feature – overhanging.**
****NI species not included in dominance calculations.**

SOIL **Sampling Point – DP-1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	**10YR 2/1**	**100**					**Sandy loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☒ No ☐

Remarks: **Organic masking redox**

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	☐	Yes	☒	No	Depth (in):		
Water Table Present?	☒	Yes	☐	No	Depth (in):	**14**	
Saturation Present? (includes capillary fringe)	☐	Yes	☐	No	Depth (in):	**Surface**	

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-2

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **2**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Terrace** Slope (%) **5**	Local relief (concave, convex, none)	**None**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☐ Yes ☒ No
Hydric Soils Present?	☐ Yes	☒ No		
Wetland Hydrology Present?	☐ Yes	☒ No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Salix baylonica***	**90**	**Yes**	**FACW**
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Rosa nutkana***	**10**	**Yes**	**FAC**
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**10**	**No**	**FACW**
2. ***Polystichum munitum***	**10**	**No**	**FACU**
3. ***Field grass***	**40**	**Yes**	**FAC***
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Remarks: **Presumed FAC**

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**3**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL **Sampling Point – DP-2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	**10YR 2/2**	**100**					**Sandy loam**	
8-12	**10YR 4/2**	**100**					**Sandy loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☐ Yes	☒ No	Depth (in):	
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):	

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-3

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **3**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Ditch** Slope (%) **2**	Local relief (concave, convex, none)	**Concave**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☐ Yes	☒ No
Hydric Soils Present?	☐ Yes	☒ No			
Wetland Hydrology Present?	☒ Yes	☐ No			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Salix lucida***	**90**	**Yes**	**FACW**
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Rubus spectabilis***	**50**	**Yes**	**FAC**
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**10**	**Yes**	**FACW**
2. ***Ranunculus repens***	**10**	**Yes**	**FACW**
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size)			
1. ***Rubus armeniacus***	**15**	**Yes**	**FACU**
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**80**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL **Sampling Point – DP-3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	**7.5YR 2.5/2**	**100**					**Loam**	
8-12	**2.5Y 3/1**	**100**					**Loamy sand**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2]Loc: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

[3] Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required: check all that apply):

- ☐ Surface water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (**except MLRA 1, 2, 4A & 4B**) (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (explain in remarks)

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☐ Yes	☒ No	Depth (in):	
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):	

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland name or number: Wetland A

RATING SUMMARY – Western Washington

Name of wetland (or ID Wetland A): Date of site visit: 4/11/2016

Rated by: Kahlo, R Trained by Ecology? ☒Y ☐N Date of training: 9/2014

HGM Class used for rating: Riverine Wetland has multiple HGM classes? ☒Y ☐N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map: King County iMAP and Google Earth

OVERALL WETLAND CATEGORY (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

- ☐ **Category I** – Total score = 23 - 27
- ☒ **Category II** – Total score = 20 - 22
- ☐ **Category III** – Total score = 16 - 19
- ☐ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H **M** L	H **M** L	H **M** L	
Landscape Potential	**H** M L	**H** M L	H M **L**	
Value	**H** M L	**H** M L	**H** M L	**TOTAL**
Score Based on Ratings	8	8	6	22

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	☒

Wetland name or number: Wetland A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Ponded depressions	R 1.1	1
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	2
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	2
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	2
Map of the contributing basin	R 2.2, R 2.3, R 5.2	4
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	6

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number: Wetland B

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   ☒NO – go to 2 ☐**YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   ☒NO – go to 3 ☐**YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ☐The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ☐At least 30% of the open water area is deeper than 6.6 ft (2 m).

   ☒NO – go to 4 ☐**YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ☐The wetland is on a slope (*slope can be very gradual*),
   ☐The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ☐The water leaves the wetland **without being impounded**.

   ☒NO – go to 5 ☐**YES –** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ☒The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ☒The overbank flooding occurs at least once every 2 years.

Wetland name or number: Wetland B

☐NO – go to 6 ☒**YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

☐NO – go to 7 ☐**YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

☐NO – go to 8 ☐**YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number: Wetland B

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover > 3/4 area of wetland points = 8 Depressions cover > 1/2 area of wetland points = 4 Depressions present but cover < 1/2 area of wetland points = 2 No depressions present points = 0	4
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes) Trees or shrubs > 2/3 area of the wetland points = 8 Trees or shrubs > 1/3 area of the wetland points = 6 **Herbaceous plants (> 6 in high) > 2/3 area of the wetland points = 6** Herbaceous plants (> 6 in high) > 1/3 area of the wetland points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of the wetland points = 0	6
Total for R 1 Add the points in the boxes above	10

Rating of Site Potential If score is: ☐**12-16 = H** ☒**6-11 = M** ☐**0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	2
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? Yes = 1 No = 0	1
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	0
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources_____ Yes = 1 No = 0	0
Total for R 2 Add the points in the boxes above	4

Rating of Landscape Potential If score is: ☒**3-6 = H** ☐**1 or 2 = M** ☐**0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	1
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	1
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (*answer YES if there is a TMDL for the drainage in which the unit is found*) Yes = 2 No = 0	0
Total for R 3 Add the points in the boxes above	2

Rating of Value If score is: ☒**2-4 = H** ☐**1 = M** ☐**0 = L** *Record the rating on the first page*

Wetland name or number: Wetland B

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Hydrologic Functions - Indicators that site functions to reduce flooding and stream erosion

R 4.0. Does the site have the potential to reduce flooding and erosion?

R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* If the ratio is more than 20 If the ratio is 10-20 If the ratio is 5-<10 If the ratio is 1-<5 If the ratio is < 1	points = 9 points = 6 points = 4 points = 2 points = 1	4
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes).* Forest or shrub for > 1/3 area OR emergent plants > 2/3 area Forest or shrub for > 1/10 area OR emergent plants > 1/3 area Plants do not meet above criteria	points = 7 points = 4 points = 0	7
Total for R 4	Add the points in the boxes above	11

Rating of Site Potential If score is: ☐**12-16 = H** ☒**6-11 = M** ☐**0-5 = L** *Record the rating on the first page*

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?

R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1 No = 0	1
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0 No = 1	1
Total for R 5	Add the points in the boxes above	3

Rating of Landscape Potential If score is: ☒**3 = H** ☐**1 or 2 = M** ☐**0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?

R 6.1. Distance to the nearest areas downstream that have flooding problems? *Choose the description that best fits the site*. The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream	points = 2 points = 1 points = 0	2
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = 0	0
Total for R 6	Add the points in the boxes above	2

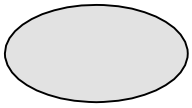
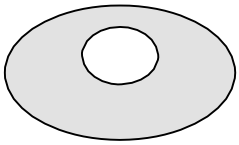
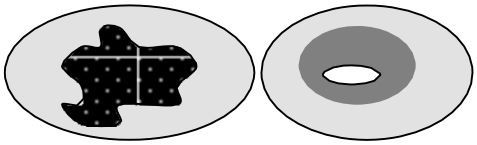
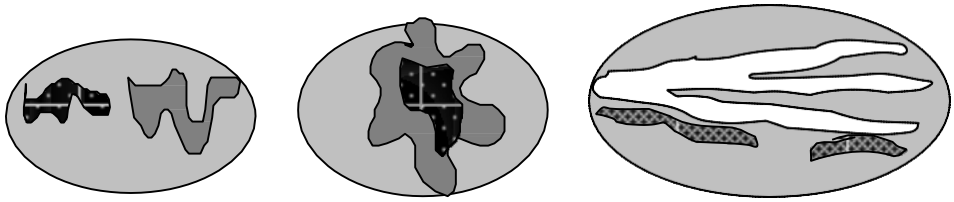
Rating of Value If score is: ☒**2-4 = H** ☐**1 = M** ☐**0 = L** *Record the rating on the first page*

Wetland name or number: Wetland B

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* ☐ Aquatic bed — 4 structures or more: points = 4 ☐ Emergent — 3 structures: points = 2 ☐ Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 ☒ Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ☒ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ☐ Permanently flooded or inundated — 4 or more types present: points = 3 ☐ Seasonally flooded or inundated — 3 types present: points = 2 ☒ Occasionally flooded or inundated — 2 types present: points = 1 ☒ Saturated only — 1 type present: points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland **<u>≤10%</u>** ☐ **Lake Fringe wetland** — **2 points** ☐ **Freshwater tidal wetland** — **2 points**	1
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	2
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points  **Low** = 1 point  **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3points 	0

Wetland name or number: Wetland B

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☒ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ☒ Standing snags (dbh > 4 in) within the wetland ☒ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☒ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	4
Total for H 1 Add the points in the boxes above	8

Rating of Site Potential If score is: ☐**15-18 = H** ☒**7-14 = M** ☐**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat: **0+** [(% moderate and low intensity land uses)/2]: **0 =0%** If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat: **4 +** [(% moderate and low intensity land uses)/2]: **0 = 4%** Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	0
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-2

Rating of Landscape Potential If score is: ☐**4-6 = H** ☐**1-3 = M** ☒**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ☒ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ☒**2 = H** ☐**1 = M** ☐**0 = L** *Record the rating on the first page*

Wetland name or number: Wetland B

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

☐ **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi- layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

☐ **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

☒ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

☒ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

☐ **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

☒ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number: Wetland B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐Yes –Go to **SC 1.1** ☒No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐Yes = **Category I** ☐No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐Yes = **Category I** ☐No= **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐Yes **– Go to SC 2.2** ☒No **– Go to SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐Yes **= Category** I ☐No **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐Yes **– Contact WNHP/WDNR and go to SC 2.4** ☒No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐Yes **= Category I** ☐No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐Yes – Go to **SC 3.3** ☒No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐Yes – Go to **SC 3.3** ☒No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐Yes = **Is a Category I bog** ☐No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐Yes = **Is a Category I bog** ☐No **= Is not a bog**	**Cat. I**

Wetland name or number: Wetland B

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** ☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. ☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). ☐Yes **= Category I** ☒No **= Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks ☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* ☐Yes – Go to **SC 5.1** ☒No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- mowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) ☐Yes = **Category I** ☒No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 ☐Yes – Go to **SC 6.1** ☒No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? ☐Yes = **Category I** ☐No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? ☐Yes = **Category II** ☐No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? ☐Yes = **Category III** ☐No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	NA

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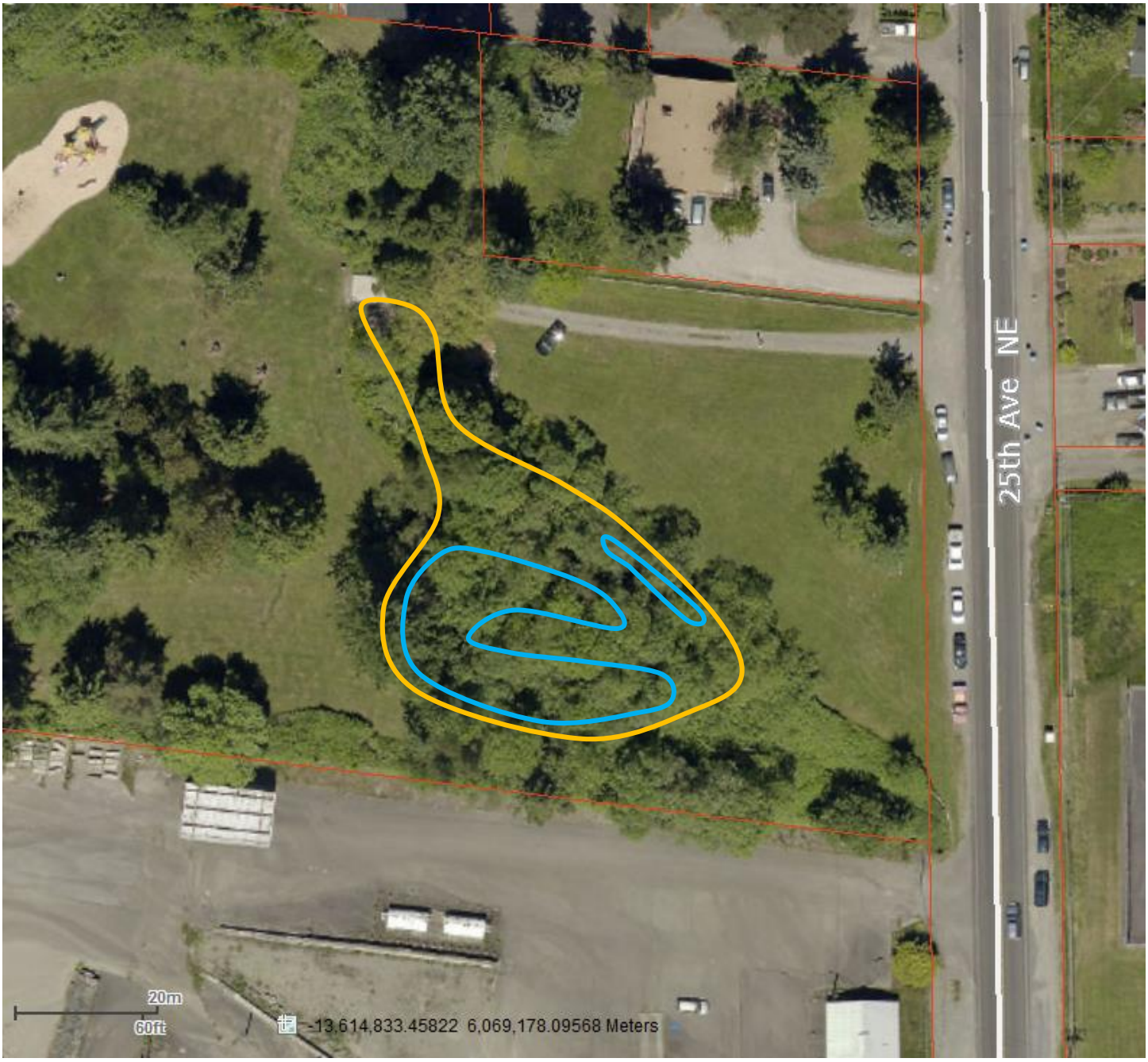


Figure 1: H1.1, H1.4, H1.2, H1.1

Forested / Saturated Only

Ponded Depressions / Occasionally flooded

Stream present but it comprises less than 10% of wetland.

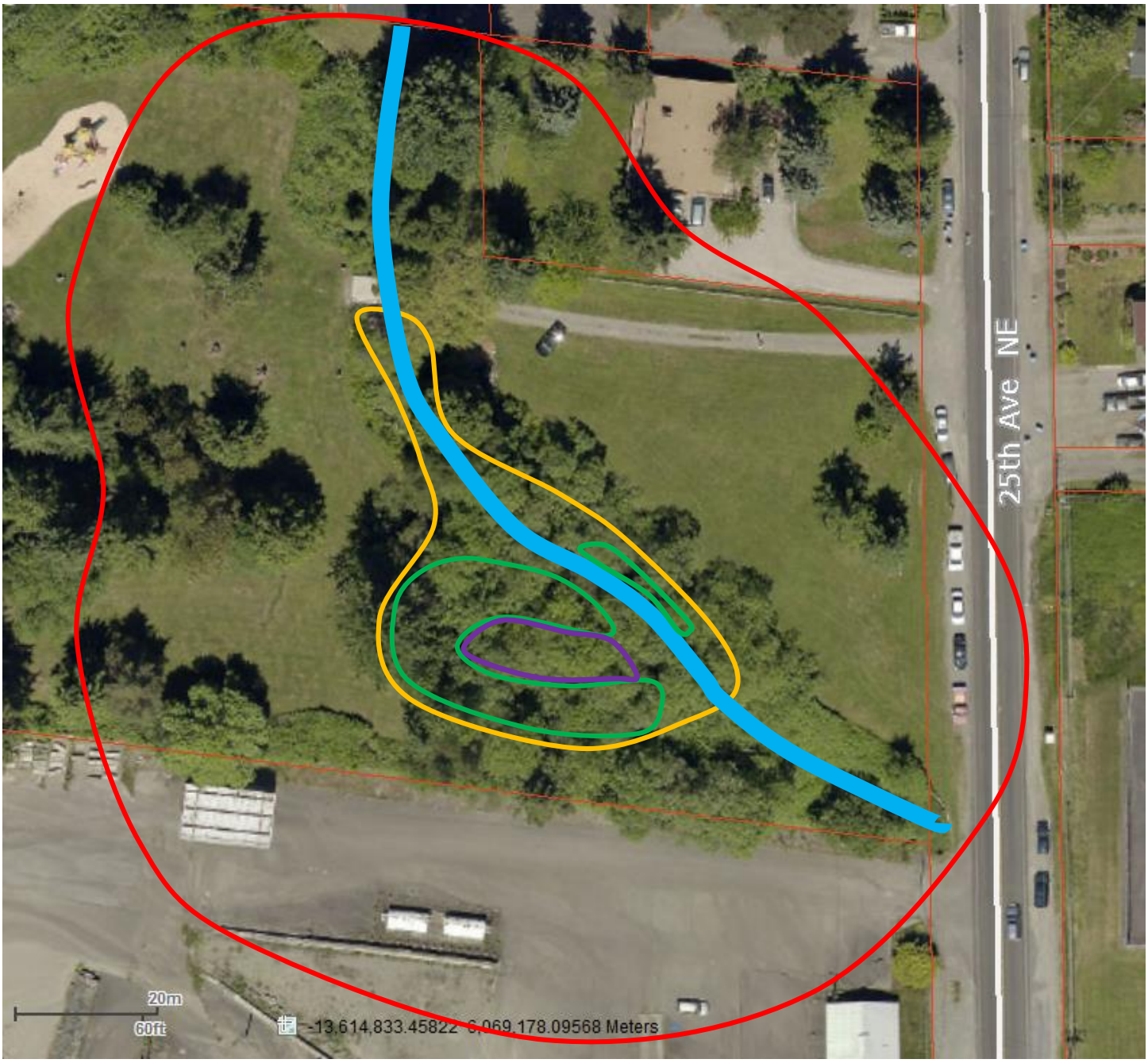


Figure 2: R2.4, R1.2, R4.2, R4.1

Areas of dense tree and shrub

Areas of dense emergent

150-foot buffer

Stream

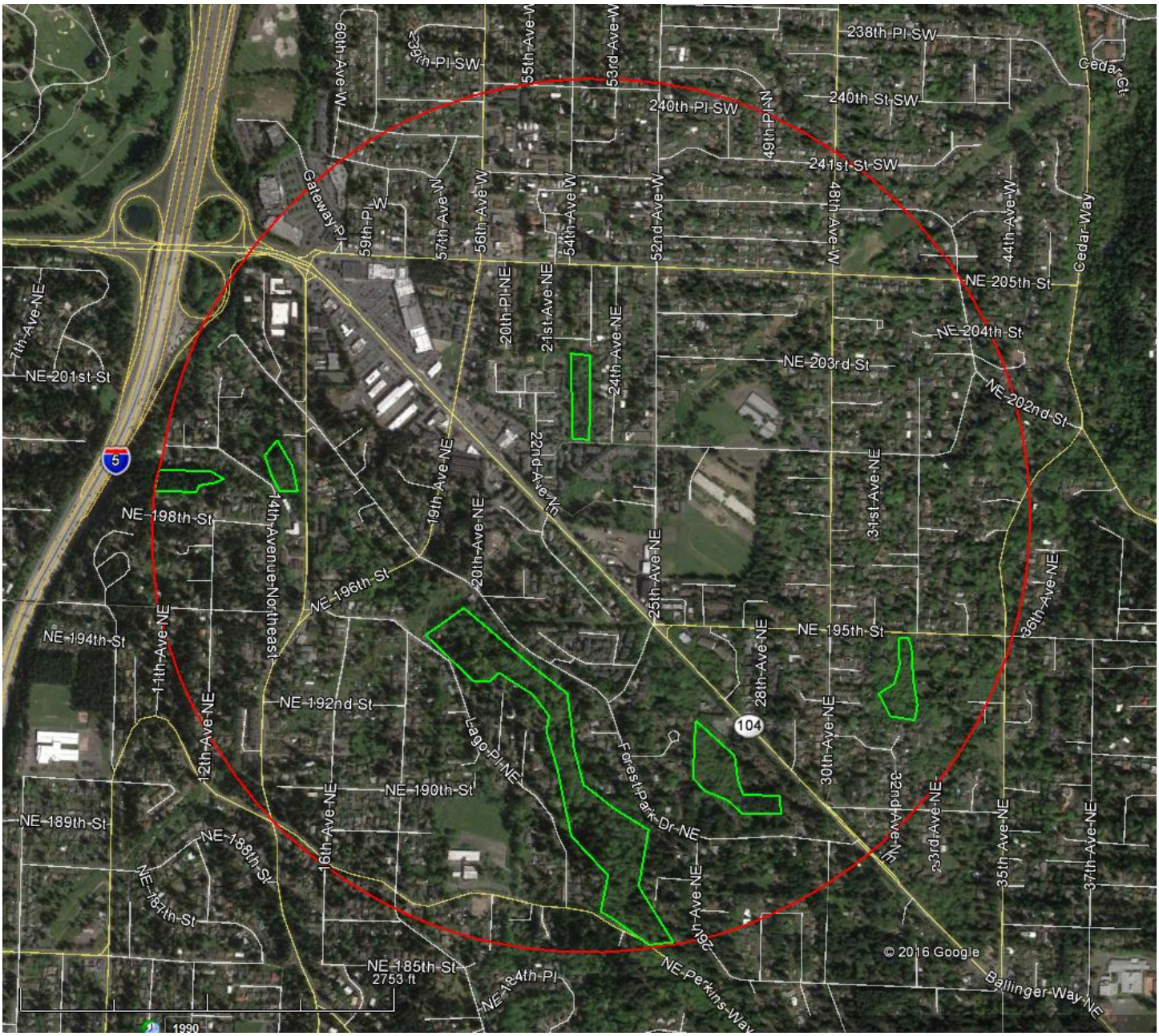


Figure 3: H2.1, H2.2

1km radius

Relatively undisturbed habitat

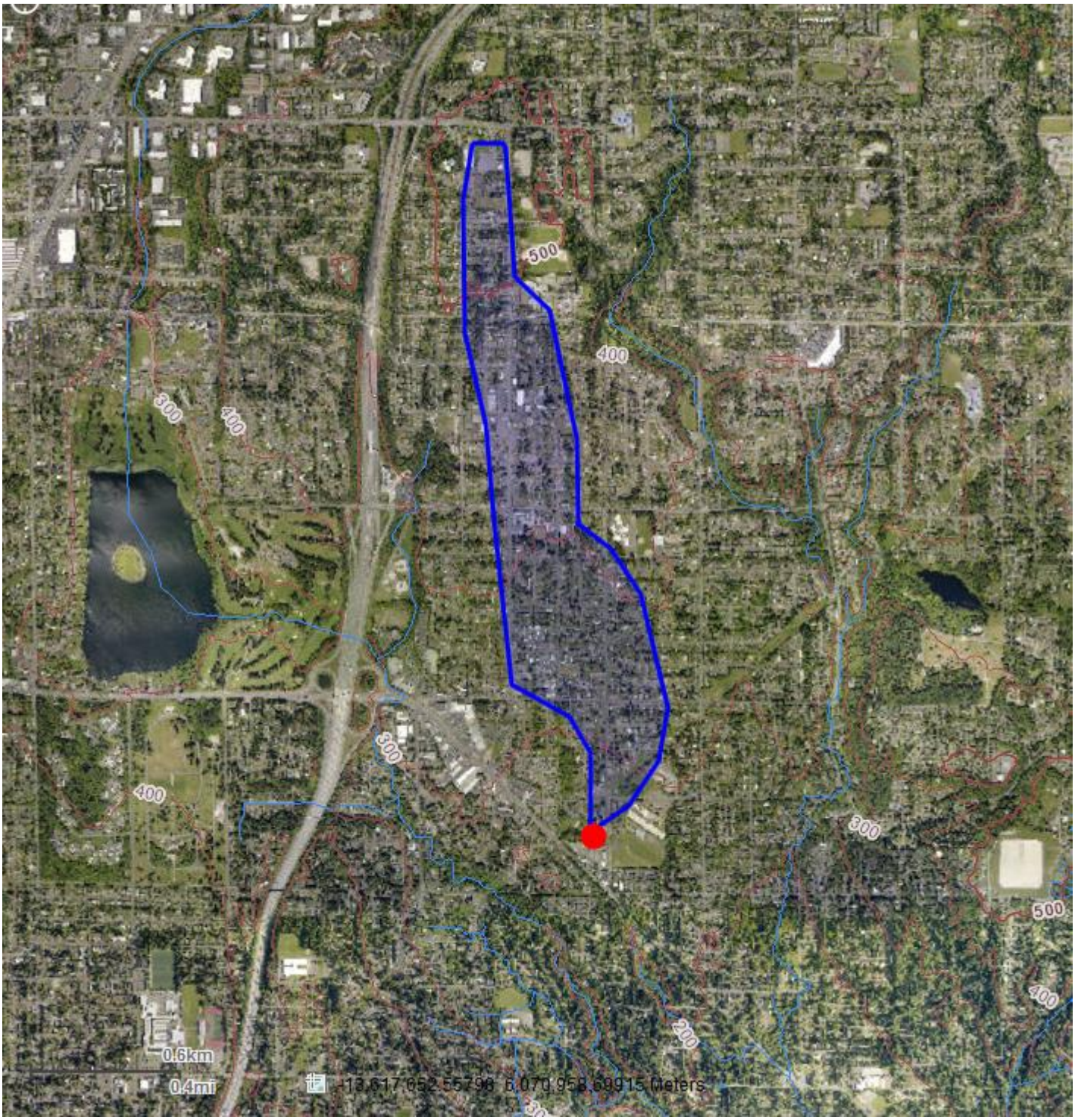


Figure 4: R2.2, R5.2

Contributing basin

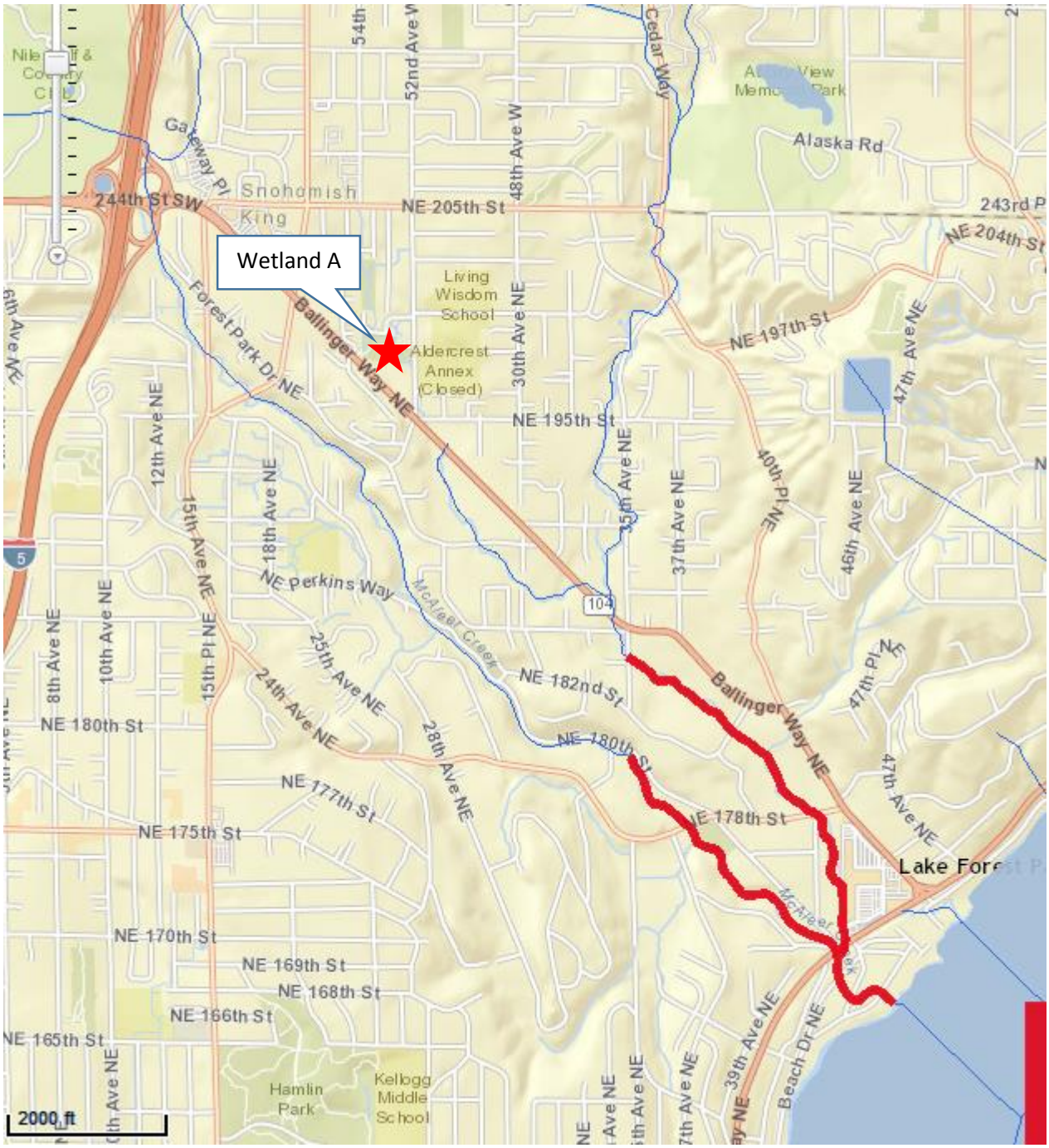
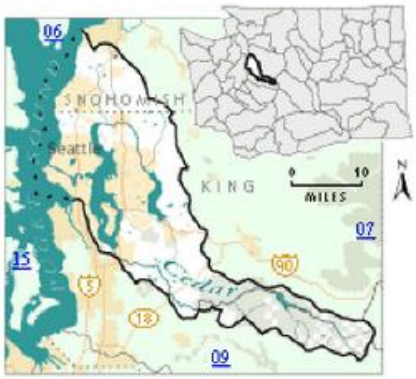

Wetland A
Snohomish
King
244th St SW
NE 205th St
Alaska Rd
243rd P
NE 204th St
Living
Wisdom
School
Aldercrest
Annex
(Closed)
Ballinger Way NE
Forest Park Dr NE
NE 195th St
NE 197th St
NE Perkins Way
McAleer Creek
NE 182nd St
NE 180th St
NE 177th St
NE 178th St
NE 175th St
NE 170th St
NE 169th St
NE 168th St
NE 166th St
NE 165th St
Hamlin
Park
Kellogg
Middle
School
Lake Forest
2000 ft

Figure 5: R3.1

Water Quality Improvement Projects (TMDLs)

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.



Counties

- King
- Snohomish

Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform Dissolved Oxygen Temperature	Approved by EPA Approved by EPA	Joan Nolan 425-649-4425
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrjcek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svrjcek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036

** ***Status*** *will be listed as one of the following: Approved by EPA, Under Development or Implementation*

Figure 6: R3.2, 3.3

7A - GEOTECHNICAL AND ENVIRONMENTAL REPORTS

OVERVIEW

These documents provide preliminary understanding of Geotechnical and Environmental considerations on the NMF site. This includes geology, ground water, soil and water sampling and monitoring wells information, as well as recommendations and results of findings.

Preliminary Geotechnical Engineering Report

Proposed Shoreline North Maintenance Facility
Shoreline, Washington

February 25, 2016
Terracon Project No. 81155070

Prepared for:
TCF Architecture PLLC
Tacoma, Washington

Prepared by:
Terracon Consultants, Inc.
Mountlake Terrace, Washington

terracon.com

Terracon

Environmental • Facilities • Geotechnical • Materials

Terracon

February 25, 2016

TCF Architecture PLLC
902 North Second Street
Tacoma, Washington

Attn: Mr. Mark Hurley
P: [253] 572-3993
E: Mark@tcfarchitecture.com

Re: Preliminary Geotechnical Engineering Report
Proposed Shoreline North Maintenance Facility
Shoreline, Washington
Terracon Project Number: 81155070

Dear Mr. Hurley:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering pre-design services for the above referenced project. This study was performed in general accordance with our proposal number P81150284 dated September 21, 2015 and an Agreement between TCF Architecture and Terracon dated December 11, 2015. This preliminary report presents the findings of the subsurface exploration, presents alternative foundation types suitable for the site, recommended retaining wall type, discusses storm water infiltration, and outlines geotechnical considerations concerning earthwork for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Tori Hesedahl, E.I.T.
Geotechnical Engineer

Dennis R. Stettler, P.E.
Senior Consultant

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APPENDIX A – FIELD EXPLORATION

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Exhibit A-2	Site and Exploration Plan
Exhibit A-3	Field Exploration Description
Exhibit A-4 to A-9	Boring Logs GB1 to GB6
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APPENDIX B – LABORATORY TESTING

Exhibit B-1	Laboratory Testing Description
Exhibit B-2	Grain Size Distribution

APPENDIX C – SUPPORTING DOCUMENTS

Exhibit C-1	General Notes
Exhibit C-2	Unified Soil Classification System

APPENDIX D – FIELD EXPLORATIONS BY OTHERS

Exhibit D-1 Boring Log HWA-BH-7
Exhibit D-2 to D-4 Boring Logs WSDOT-HH-07 to WSDOT-HH-12

GEOTECHNICAL ENGINEERING REPORT
Proposed Shoreline North Maintenance Facility
Shoreline, Washington

Terracon Project No. 81155070
February 25, 2016

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) is pleased to present the results of our geotechnical engineering pre-design services for the proposed City of Shoreline North Maintenance Facility (SNMF). The site is located at 19547 25th Avenue NE, Shoreline, Washington. Logs of the site explorations along with a site location map and exploration plan are included in Appendix A of this report.

The purpose of these services is to provide pre-design information and preliminary geotechnical engineering recommendations relative to:

- subsurface soil conditions
- groundwater conditions
- retaining walls
- pavements
- foundation type alternatives
- earthwork
- storm water infiltration

This information and preliminary recommendations are intended to support pre-design of the project. Once the site layout, preliminary grading concepts, and structure configuration are finalized, this preliminary report should be revised and updated to address the specific details of the planned site development.

2.0 PROJECT INFORMATION

2.1 Project Description

Item	Description
Site layout	See Appendix A, Exhibit A-2: Site and Exploration Plan
Structures	Four buildings or canopy structures are proposed to accommodate various functions, including: ■ Administrative Office and Crew Building ■ Covered Parking ■ Work Shops and Wash Bay and Fuel Bay ■ Covered Decant and Material Storage
Finished floor elevation	Finish Elevations have yet to be determined

Item	Description
Below Grade Areas	Fuel Storage Tank
Grading	Approximately 4 - 5 feet of fill on the south east side of the site Approximately 2 - 4 feet of cut on the western side of the site
Retaining walls	The southwestern property boundary slopes steeply up to Ballinger Way NE. There is an existing gabion basket retaining wall near the top of the slope, just off the property in the Washington State Department of Transportation (WSDOT) right-of-way. A retaining wall is being considered on the property near the toe of slope to provide more useable space on the property.

2.2 Site Location and Description

Item	Description
Location	19547 25th Avenue NE, Shoreline, Washington
Existing improvements	Truck Scale Fuel Island and Canopy Various outbuildings
Current ground cover	Mostly paved with asphalt concrete
Existing topography	Slopes gently down to the east

3.0 SUBSURFACE CONDITIONS

3.1 Geology

The Geologic map of the Edmonds East and part of the Edmonds West quadrangles, Washington (Minard 1983) shows the surficial geology for the site is mapped as Qtb – Transitional beds at the eastern portion of the site and Qva – Advance outwash at the western portion of the site. The transitional beds are named so because they are found at the transition from the Fraser glaciation to pre-Fraser glaciation. Transitional beds are described as consisting of interbedded layers of clay, silt, and fine sand. The advance outwash was deposited by water flowing out from advancing glaciers of the Vashon Stade and Fraser-age. Advance outwash typically consists of clean to slightly silty sand and gravel, and typically fines downward.

3.2 Typical Profile

Based on the results of the borings, subsurface conditions on the project site can be generalized as follows:

Stratum	Approximate Depth to Bottom of Stratum (feet)	Material Description	Consistency/ Density
1	2 to 7, typically at approximately 4	Uncontrolled fill [1] consisting of silty sand	Loose to medium dense
2	3 to 13.5, typically at approximately 6	Buried topsoil – Peat, Organic Silt, and Silt	Soft to stiff
3	Undetermined [2]	Advance outwash – Sand and gravel with varying fines content	Medium dense to very dense

1. Uncontrolled fill is material that was placed without moisture and density control. This material is typically variable in composition, consistency, density, moisture, and depth.
2. Borings GB1 through GB3 and GB5 were terminated at planned depth of approximately 20 feet below ground surface (bgs) within this stratum. Boring GB4 was terminated within this stratum at 14 feet bgs due to heaving sands. GB6 was terminated in this stratum at 14 feet bgs due to drill rig break down.

Soils encountered in our explorations are generally consistent with those indicated on the published geologic maps. Conditions encountered at each boring location are indicated on the individual boring logs. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in situ, the transition between materials may be gradual. Details for each of the borings can be found on the boring logs in Appendix A of this report.

3.3 Groundwater

Groundwater seepage was observed in each of our six geotechnical explorations, and in each of ten explorations advanced by Terracon for environmental sampling, at depths ranging from ¼ feet to 10 feet bgs. Groundwater levels can be expected to vary seasonally and from year to year depending on precipitation, site utilization, and other on- and off-site factors.

4.0 PRELIMINARY RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

- Existing uncontrolled fill
- Compressible soils
- High groundwater table
- Slope up to Ballinger Way NE

4.1.1 Existing Uncontrolled Fill and Compressible soils

Based on our interpretation of the soils observed in our explorations, it appears that uncontrolled fill was placed over most of the site to bring the site to its present grade. At most of the boring locations fill soils in the upper 4 to 7 feet were very loose to loose. Where these loose soils are below the water table, they are subject to liquefaction during a major earthquake that would result in loss of strength and settlement during and immediately following an earthquake.

Varying thicknesses of organic soil were observed beneath the fill in most of the borings running down the middle of the site from east to west. It is likely that when the site was developed originally, some stripping and grubbing, and some removal of organic surficial soils took place before fill placement. However, a significant thickness of buried topsoil and organic soils appears to have been left in place. These soils are of particular concern as settlement to structures founded over organic soil continues to occur long after construction is complete. Decay of the organic material results in secondary compression that may continue for decades.

4.1.2 Groundwater

Groundwater was observed within 5 feet of present ground surface in most of our explorations (and less than 1 foot bgs in some areas). Shallow groundwater will likely present constructability issues related to overexcavation of compressible soils, excavation for footings, excavations for buried utilities, and for the proposed underground storage tank excavation.

We anticipate that, with careful construction sequencing, shallow excavations less than approximately 2 feet below water table may be dewatered with sumps and pumps. Examples of sequencing construction to manage groundwater include, but are not limited to, starting at the low end of excavation and opening only limited areas so that seepage remains within the removal capacity of the equipment on hand. The excavations for buried utilities and the underground storage tank may require dewatering consisting of deep wells or a shallow well point system.

4.1.3 Slope up to Ballinger Way NE

The southwestern edge of the site slopes up to Ballinger Way NE at approximately 2H:1V. There is an approximately six to eight foot tall ecology block wall at the toe of slope on the site. There is a gabion basket wall near the top of slope, in Washington State Department of Transportation Right-of-Way. We understand that a retaining wall at the property line is desired to maximize the usable area on the site. This area will require further analysis of the planned slope and retaining wall cross section in order to design a retaining wall that maintains both temporary and long-term slope stability.

4.2 Earthwork

Based on the subsurface conditions encountered in our exploration, we expect that all of the on-site soils within the limits of construction can be removed with conventional excavation equipment. Cobbles and boulders were not observed in our exploration but are often found in advance

outwash. The contractor should be prepared to deal with cobbles and boulders. Preliminary recommendations for site preparation, structural fill, and permanent slopes are presented below.

4.2.1 Site Preparation

Prior to equipment arriving onsite, clearing and grading limits should be established and marked. Silt fences should be constructed along the downslope side of all areas planned for clearing and grading. Preparation for site grading and construction should begin with procedures intended to control surface water runoff. The sandy site soils are moderately susceptible to erosion by flowing water

Stripping efforts should include removal of existing pavements, vegetation, organic materials, and any deleterious debris from building areas. It appears that up to about 0.5 feet of stripping will be necessary in areas with light vegetation, and asphalt pavements are generally less than 1 to 2 inches thick. Greater depths of stripping and grubbing may be necessary in areas with thick vegetation and tree roots, such as areas around the perimeter of the site. These materials are not suitable for reuse as structural fill. Site disturbance beyond the work area should be limited to reduce the potential for erosion and off-site sediment transport. Disturbance of existing vegetation and soil structure on and above the approximately 2H:1V slope up to Ballinger Way NE should be avoided if at all practical; if disturbance is necessary the area should be restored with landscaping as soon as possible.

Areas that are stripped or excavated to the design subgrade elevation, or that are to receive structural fill, should be proofrolled with heavy rubber-tired construction equipment (e.g. loaded dump truck). Any soft, loose, or otherwise unsuitable areas identified during proofrolling should be recompacted if practical or removed and replaced with structural fill. We recommend that proofrolling of the subgrade be observed by a representative of our firm to assess the adequacy of the subgrade conditions and identify areas needing remedial work. We recommend that this procedure not be performed during wet weather. During wet conditions, systematic probing should be used to evaluate the subgrade.

4.2.2 Reuse of site soils

The existing relatively thin asphalt pavement section that is present across much of the site and concrete slab surfacing that is locally present on site could be crushed and reused on site.

Some of the fill on site is relatively granular and could be reusable as site fill, provided that the moisture content is in a range that is compactable to the required density. As the fines content (silt and clay size soil smaller than the No. 200 mesh sieve) increases, the soils become more sensitive to moisture and become difficult to compact unless the moisture content is within a relatively narrow optimum range. The fines content varied considerably in samples tested, from 5 to 22 percent. Material that is suitable based on grain size distribution will have to be segregated from unsuitable material. Furthermore in-situ moisture content of soils suitable based on grain size will likely be considerably wet of optimum due to the presence of a relatively high groundwater

level over most of the site. Moisture conditioning by drying the soil back, or mixing with drier material may be required. In that regard, earthwork would be greatly facilitated by construction occurring during seasonally drier summer and early fall months.

Existing soils that contain organics (such as peat or organic silt) are generally not suitable for reuse as compacted fills and would need to be removed and wasted off site or used in on site landscaping areas. From a practical perspective, it may be difficult to effectively segregate the unsuitable organic soils from the soils that may be suitable for reuse as structural fill.

4.3 Stormwater Infiltration

Groundwater was observed at less than 5 feet below present grade in our borings. It is our opinion based on the guidance given in the Stormwater Management Manual for Western Washington 2014 that stormwater infiltration is infeasible at this site.

4.4 Foundations

Foundations should not be placed above loose or organic soils. The unsuitable soils should be removed and replaced with compacted structural fill. Lightly to moderately loaded structures may be supported by shallow foundations founded on medium dense to very dense native sand or silty sand, or on newly placed and compacted structural fill placed above the medium dense to very dense native sand or silty sand. Structural fill should consist of properly placed and compacted relatively clean granular material. Shallow foundations founded on medium dense to very dense native soils, or on compacted structural fill above the medium dense to very dense native sand or silty sand, could be designed for typical foundation design bearing pressures of about 3,000 to 5,000 psf.

Removal of unsuitable loose and organic soils and replacement with compacted structural fill would require control and removal of groundwater from the excavations during construction.

Alternatively, to avoid the need for overexcavation of fill and organic soils below the water table, buildings may be supported on pin piles or rammed aggregate piers that extend through the uncontrolled fill and compressible soils into medium dense to very dense native granular soil. Pin piles generally consist of 2 to 6 inch diameter steel pipe that is driven into the ground with a specially modified jack hammer or concrete breaker. Rammed aggregate piers (RAPs) generally consist of crushed stone that has been tamped, in lifts, into holes bored into the matrix soil on a regular pattern. The construction method displaces the matrix soil laterally thereby densifying the matrix soil in the vicinity of the pier.

Foundation support alternatives can be further evaluated and finalized once the configuration, layout, and planned floor elevations of the proposed buildings and structures on the site are finalized.

4.5 Retaining Wall

A retaining wall will be required to support the slope up to Ballinger Way NE if the toe of slope is to be cut out as proposed. Perteet provided us with an exhibit drawing which shows an initial conceptual grading plan. Based on this drawing, we anticipate maximum wall height to be approximately 25 feet near the west corner of the property. In our opinion the most practical choice for a cut wall of this height is a soldier pile and lagging wall. Soldier pile walls can be installed vertically, which maximizes space and lagging can be installed as the excavation proceeds in front of the wall to preclude the need for a large temporary excavation.

Soldier piles can readily be installed as a cantilever wall up to heights of about 12 feet. However, the required retaining wall height of up to 25 feet as shown on conceptual grading plans is beyond the practical limit for cantilevered walls and the higher portions of the soldier pile wall would need to be tied back with tieback ground anchors. Tieback anchors consist of steel bars or groups of steel tensioning strands that are grouted into the retained soil at a sub-horizontal angle, attached to the piles and tensioned. Permanent walls are typically given a shotcrete facing, but with proper corrosion inhibitors and maintenance the piles and lagging may be left exposed. A permanent easement would be required to install tieback anchors extending beyond the SNMF property line.

4.6 Pavements

Properly prepared subgrades consisting of compacted structural fill subgrade or medium dense to very dense native granular soils will provide adequate support for pavement structures. We understand that Portland cement concrete is being considered over most of the area to better accommodate heavy vehicles and turning movements. Asphalt paving is being considered in parking areas for smaller vehicles or as an alternate to Portland cement concrete paving. Rammed aggregate piers could be used, if desired, to improve subgrade support and limit the potential for long-term settlement under heavily loaded pavements where compressible soils are indicated by the borings. The spacing of RAPs for pavements is typically wider than for foundations.

5.0 GENERAL COMMENTS

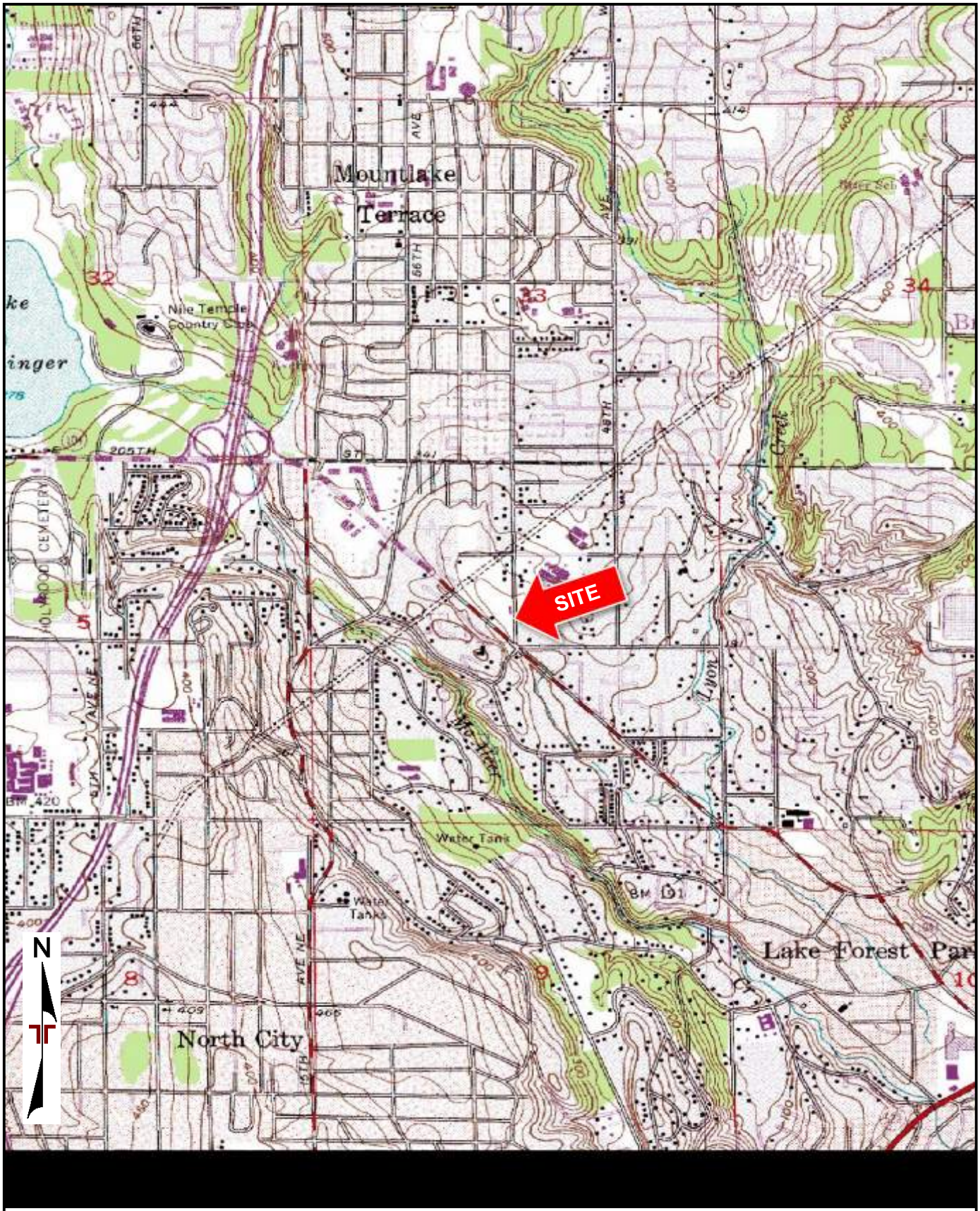
This report has been prepared to support the pre-design phase of the project. Terracon should be retained to provide design phase geotechnical services once the project configuration is finalized in order to develop specific recommendations for site development, foundations, retaining walls, and paved areas. Near the completion of the design, Terracon should review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation,

foundation construction and other earth-related construction phases of the project. Terracon is available to provide additional construction materials testing beyond the earthwork and foundation portions of the construction including inspection and testing of concrete, asphalt, steel, and related construction materials services.

The analysis and preliminary recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

This report has been prepared for the exclusive use of TCF Architecture and the City of Shoreline for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A
FIELD EXPLORATION



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: EDMONDS EAST, WA (1/1/1981) and SEATTLE NORTH, WA (1/1/1983).

Project Manager: D. Stettler	Project No. 81155070	Terracon 21905 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	SITE LOCATION Shoreline North Maintenance Facility 19547 25th Avenue NE Shoreline, WA
Drawn by: T. Hesedahl	Scale: 1"=24,000 SF		
Checked by: D. Stettler	File Name: Site.docx		
Approved by: D. Stettler	Date: January 2016		Exhibit A-1

N

Oil storage shed

B7(hand auger)

GB3

Former UST Location

GB2

Material storage areas

B6

MW2

Product line

MW3

Fuel pump island and canopy

Fuel ASTs

GB1/MW4

B5

GB4

Gravel area

HWA-MW-07

WSDOT-HH-11

WSDOT-HH-12

Truck building

B4

MW1A

MW1

Truck scale

Flammable storage building

Garage/ office building

B1

B2

Former AST Location

GB5

WSDOT-HH-10

WSDOT-HH-09

BALLINGER WAY NE

WSDOT-HH-08

WSDOT-HH-07

Decant Facility

B3

GB6

Covered Storage area

25th AVENUE NE

LEGEND:

- SITE BOUNDARY
- MW1A — MONITORING WELL NUMBER AND APPROXIMATE LOCATION
- GB1 — HOLLOW STEM AUGER BORING NUMBER AND APPROXIMATE LOCATION
- B1 — DIRECT PUSH BORING NUMBER AND APPROXIMATE LOCATION
- GB1 — EXPLORATIONS BY OTHERS
- TOPOGRAPHIC CONTOURS (feet) — 230

50 0 25 50

SCALE IN FEET

Basemap PDF file provided by Client and modified by Terracon.

Project Mngr:	TH
Drawn By:	HRG
Checked By:	TH
Approved By:	DS
Project No.	81155070
Scale:	1:50
File No.	*.dwg
Date:	February 2016

Terracon
Consulting Engineers and Scientists
21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

SITE EXPLORATION PLAN

Shoreline North Maintenance Facility
19547 25th Avenue NE
Shoreline, King County, Washington

EXHIBIT 2

Field Exploration Description

The proposed boring locations were laid out in the field by a Terracon representative using a scaled site plan provided by the client and utilizing hand-held GPS equipment. Ground surface elevations indicated on the boring logs were measured in the field using a surveyor's level and grade rod. The elevations are referenced to King County Bench Mark 236, which is a 3-inch brass disk set flush with grade on the east side of the project site, and are rounded to the nearest ½ foot. Survey information provided by WHPacific indicates this permanent benchmark is mounted at elevation of 217.22 feet in the North American Vertical Datum 1988 (NAVD88). The locations and elevations of the borings should be considered accurate only to the degree implied by the means and methods used to define them.

Six borings were drilled with a truck-mounted rotary drill rig using hollow-stem augers to advance the boreholes. Samples of the soil encountered in the borings were obtained using split-barrel sampling procedures. A standpipe piezometer was constructed in boring GB-1 to monitor ground water level.

In split-barrel sampling procedures, the number of blows required to advance a standard 2-inch O.D. split-barrel sampler the last 12 inches of the typical total 18-inch penetration by means of a 140-pound hammer with a free fall of 30 inches, is the standard penetration resistance value (SPT-N). This value is used to estimate the in situ relative density of cohesionless soils and consistency of cohesive soils.

An automatic SPT hammer was used to advance the split-barrel sampler in the borings performed on this site. A significantly greater efficiency is achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. This higher efficiency has an appreciable effect on the SPT-N value. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

Ten push probe explorations were advanced by direct push for the environmental limited site investigation. Direct push methods advance an approximately 2-inch inside diameter mandrel into the soil by means of hydraulic force. A continuous soil core is retrieved.

The samples were tagged for identification, sealed to reduce moisture loss, and taken to our laboratory for further examination, testing, and classification. Information provided on the boring logs attached to this report includes soil descriptions, consistency evaluations, boring depths, sampling intervals, and groundwater conditions. The borings were backfilled with bentonite chips prior to the drill crew leaving the site.

A field log of each boring was prepared by a Terracon geologist. These logs included visual classifications of the materials encountered during drilling as well as the geologist's interpretation of the subsurface conditions between samples. Final boring logs included with this report represent the engineer's interpretation of the field logs and include modifications based on laboratory observation and tests of the samples.

WELL LOG NO. GB1/MW-4

PROJECT: Shoreline North Maintenance Facility

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION: See Exhibit A-2

Latitude: 47.771851° Longitude: -122.303263°

Approximate Surface Elev: 217.6 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description
0.2	217.5+/-	**ASPHALT 1-2"**
1.0	216.5+/-	**SILTY SAND (SM)**, with gravel, dark brown, moist
		SAND (SP-SM), with silt, trace gravel, dark gray, medium dense, wet
		grades to dense
7.0	210.5+/-	**SAND (SP-SM)**, with silt and gravel, dark gray, dense, wet
9.5	208+/-	**GRAVEL (GP)**, with sand, trace silt, very dense, wet
20.5	197+/-	**SANDY SILT (ML)**, with gravel,
21.5	196+/-	gray, hard, wet
		Boring Terminated at 21.5 Feet

INSTALLATION DETAILS: Solid 2" PVC pipe packed in bentonite; Slotted 2" PVC pipe packed in sand; Slough in bottom of hole

DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		6	5-11-10 N=21	S-1	16		11
		12	11-16-16 N=32	S-2			
		12	16-19-20 N=39	S-3			
10		6	20-50/6" N=50/6"	S-4			
		12	19-25-21 N=46	S-5			
15		6	50/6" N=50/6"	S-6			
20		12	30-50/6" N=50/6"	S-7			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
2" Monitoring Well

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/20/2016 | Well Completed: 1/20/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81155070 | Exhibit: A-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-WELL 81155070 BORING LOGS.GPJ TERRACON2012.GDT 2/24/16

BORING LOG NO. GB2

PROJECT: Shoreline North Maintenance Facility

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.772009° Longitude: -122.304141°

Approximate Surface Elev: 223.1 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description
0.2	223+/-	**ASPHALT 1-2"**
		SILTY SAND (SM), with gravel, trace organics, dark brown, loose, moist
		grades to very dense, wet
6.5	216.5+/-	
		SAND (SP-SM), with silt and gravel, brown, very dense, wet
11.0	212+/-	
		SILTY SAND (SM), with gravel, gray, very dense, wet
12.0	211+/-	
		SAND (SP), with gravel, trace silt, brown, very dense, wet
13.0	210+/-	
13.5	209.5+/-	**SILTY SAND (SM)**, with gravel, brown, very dense, wet
		GRAVEL (GP), with sand, trace silt, brown, very dense, wet
21.5	201.5+/-	
		Boring Terminated at 21.5 Feet

DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		4	2-2-2 N=4	S-1	8		13
		6	8-22-36 N=58	S-2			
		9	24-24-36 N=60	S-3	12		5
10		12	13-23-30 N=53	S-4			
		16	26-41-50/4" N=50/4"	S-5			
15		17	17-37-50/5" N=50/5"	S-6			
20		10	19-50/4" N=50/4"	S-7			

WATER LEVEL OBSERVATIONS: ▽ While drilling

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/20/2016 Boring Completed: 1/20/2016

Drill Rig: B-59 Driller: Holt Services, Inc.

Project No.: 81155070 Exhibit: A-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 81155070 BORING LOGS.GPJ TERRACON2015.GDT 2/24/16

BORING LOG NO. GB3

PROJECT: Shoreline North Maintenance Facility

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.772009° Longitude: -122.305103°

Approximate Surface Elev: 230.2 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
		SILTY SAND (SM), with gravel, brown, moist									
2.0	228+/-										
		SILTY SANDY GRAVEL (GP-GM), trace organics, brown, medium dense, moist			X	9	13-11-9 N=20	S-1			
4.5	225.5+/-										
		PEAT (PT), with silt, dark brown, medium dense, moist	5		X	12	3-5-6 N=11	S-2	81		
6.5	223.5+/-										
		SILT (ML), with peat, gray, soft, moist			X	18	1-1-3 N=4	S-3	161	NP	
9.5	220.5+/-										
10.5	219.5+/-	**SILT (ML)**, with organics brown, dark brown, stiff, wet	10	▽							
		SANDY GRAVEL (GP-GM), with silt, gray, medium dense, wet			X	18	9-11-13 N=24	S-4			
					X	12	3-11-11 N=22	S-5			
14.5	215.5+/-										
		SILTY SAND (SM), with gravel, gray, medium dense, wet	15		X	12	3-7-12 N=19	S-6			
			20		X	18	13-11-8 N=19	S-7			
21.0	209+/-										
21.5	208.5+/-	**SANDY SILT (ML)**, gray, medium dense, wet									
		Boring Terminated at 21.5 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/21/2016 Boring Completed: 1/21/2016

Drill Rig: B-59 Driller: Holt Services, Inc.

Project No.: 81155070 Exhibit: A-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 81155070 BORING LOGS.GPJ TERRACON2015.GDT 2/24/16

BORING LOG NO. GB4

PROJECT: Shoreline North Maintenance Facility

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.771746° Longitude: -122.304663°

Approximate Surface Elev: 225.7 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DESCRIPTION
0.2	225.5+/-	**ASPHALT 1-2"**
1.0	224.5+/-	**SILTY SAND (SM)**, with gravel, dark brown, moist
		SILTY SAND (SM), with gravel, brown, loose, moist
		grades to wet
4.5	221+/-	
		SILT (ML), with organics, dark brown, stiff, wet
6.0	219.5+/-	
		SILTY SAND (SM), trace gravel, gray, medium dense, wet
		grades to very dense
13.5	212+/-	
14.0	211.5+/-	**GRAVEL (GP)**, with sand, trace silt, gray, very dense, wet
		Boring Terminated at 14 Feet

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	▽							
		X	0	3-3-4 N=7	S-1			
5		X	18	1-1-7 N=8	S-2	53	NP	
		X	9	8-8-20 N=28	S-3	18		22
10		X	8	24-25-22 N=47	S-4			
		X	18	21-36-26 N=62	S-5			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/21/2016 Boring Completed: 1/21/2016

Drill Rig: B-59 Driller: Holt Services, Inc.

Project No.: 81155070 Exhibit: A-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 81155070 BORING LOGS.GPJ TERRACON2015.GDT 2/24/16

BORING LOG NO. GB5

PROJECT: Shoreline North Maintenance Facility

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.771465° Longitude: -122.303631°

Approximate Surface Elev: 217.3 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.2 **ASPHALT 1-2"**	217+/-									
1.0 **SILTY SAND (SM)**, with gravel, dark brown, moist	216.5+/-									
SILTY SAND (SM), trace gravel, gray, very loose, moist			▽							
3.0 grades to wet	214.5+/-			X	6	1-1-1 N=2	S-1			
SILT (ML), with organics, dark brown, soft, wet										
grades to medium dense		5		X	12	7-10-13 N=23	S-2			
5.5	212+/-									
SILTY SAND (SM), with gravel, gray, dense, wet				X	18	16-16-27 N=43	S-3			
		10		X	12	9-8-24 N=32	S-4			
12.0	205.5+/-									
GRAVEL (GP), with sand and silt, gray, very dense, wet				X	18	16-20-50 N=70	S-5			
		15		X	18	30-23-27 N=50	S-6			
grades to medium dense		20		X	18	30-29-50 N=79	S-7			
21.5	196+/-									
Boring Terminated at 21.5 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/21/2016 Boring Completed: 1/21/2016

Drill Rig: B-59 Driller: Holt Services, Inc.

Project No.: 81155070 Exhibit: A-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 81155070 BORING LOGS.GPJ TERRACON2015.GDT 2/24/16

BORING LOG NO. GB6

PROJECT: Shoreline North Maintenance Facility

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.771262° Longitude: -122.303336°

Approximate Surface Elev: 216.9 (Ft.) +/-

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SAMPLE NUMBER	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.2 **ASPHALT 1-2"**	216.5+/-									
1.0 **SILTY SAND (SM)**, with gravel, dark brown, moist	216+/-									
SILTY SAND (SM), with gravel, gray, loose, moist			▽	X	9	4-2-4 N=6	S-1	15		21
grades to wet										
4.5	212.5+/-									
SILTY SAND (SM), with gravel, gray, dense, wet		5		X	9	15-16-20 N=36	S-2			
grades to very dense				X	9	17-22-44 N=66	S-3			
9.5	207.5+/-									
GRAVELLY SAND (SP), trace silt, gray, very dense, wet		10		X	18	8-17-24 N=41	S-4			
				X	18	13-47-50 N=97	S-5			
14.0	203+/-									
Boring Terminated at 14 Feet										

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/21/2016 Boring Completed: 1/21/2016

Drill Rig: B-59 Driller: Holt Services, Inc.

Project No.: 81155070 Exhibit: A-9

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 81155070 BORING LOGS.GPJ TERRACON2015.GDT 2/24/16

WELL LOG NO. B1

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
0.5	**SILTY SAND (SM)**, with gravel, brown/dark brown	
	SAND (SP), gray, moist, hydrocarbon odor	
	grades to saturated	
4.0		
4.5	**SILT (ML)**, with organics, dark brown, moist	
5.0	**SAND (SP)**, with gravel, gray, wet	
	SILT (ML), with organics, dark brown, moist	
6.5		
	GRAVELLY SAND (SP), gray, wet	
8.0		
8.5	**CLAYEY SILT (CL-ML)**, tan, moist	
	GRAVELLY SAND (SP), gray, wet	
13.0		
	SANDY SILT (SM), tan, wet	
14.0		
	Boring Refusal at 14 Feet	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
			<1		
	▽	■	48.7		B1-3'
5			3.8		
			<1		
10					
			<1		

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B2

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	SILTY SAND (SM), with gravel, brown/dark brown, moist	
	grades to gray	
5.5	**SILTY SAND (SM)**, with organics, gray, wet	
7.0		
7.5	**SILT (ML)**, gray, moist	
	GRAVELLY SAND (SP), gray, wet	
13.0	**GRAVEL (GP)**, with sand, gray, wet	
15.0	***Boring Terminated at 15 Feet***	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
5			<1		
			<1		
			<1		
	▽	■	<1		B2-7.5'
10			<1		
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B3

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.3	**3-4" Concrete**	
	GRAVEL (GP), with sand, gray, wet	
5.0		
	GRAVEL (GP), gray, wet	
6.0		
	SAND (SP), with gravel, gray-brown, wet	
8.0		
	SAND (SP), black	
10.0		
	GRAVELLY SAND (GP), gray, wet	
	grades to brown	
15.0		
	Boring Terminated at 15 Feet	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
	▽				
		■	<1		B3-1'
			<1		
5		■	<1		B3-2'
			<1		
10			<1		
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-12

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B4

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	SAND (SP), light brown, moist	
4.0		
	SILTY SAND (SM), with organics and gravel, brown, wet	
5.0		
	SILTY SAND (SM), with gravel, gray, wet	
	grades to gray	
10.0		
	SAND (SP), gray, wet	
14.5		
15.0	**SILTY SAND (SM)**, with gravel, gray, wet	
	Boring Terminated at 15 Feet	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
			<1		
	▽	■	<1		B4-4'
5			<1		
10			<1		
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-13

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B5

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
1.0	**GRAVELLY SAND (SP)**, with silt, gray-brown, moist	
2.0	**SAND (SP-SM)**, with silt and gravel, dark brown, moist	
3.5	**SAND (SP)**, gray with orange mottling, moist	
5.0	**SILTY SAND (SM)**, with gravel and organics, dark brown, moist	
5.5	**SILTY SAND (SM)**, gray, wet	
6.0	**SANDY SILT (ML)**, with organics, dark brown, wet	
	GRAVELLY SAND (SP-SM), with silt, gray, wet	
	grades to light brown	
15.0	***Boring Terminated at 15 Feet***	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
	▽		<1		
			<1		
5		■	<1		B5-5'
			<1		
10					
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/12/2016 | Well Completed: 1/12/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-14

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B6

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	GRAVELLY SAND (SP), with silt, brown/gray, moist	
3.5	**SILTY SAND (SM)**, with organics, dark brown, moist	
5.5	**SILTY SAND (SM)**, brown, wet	
7.0	**SILTY SAND (SM)**, with gravel, light brown, wet	
9.0	**GRAVELLY SAND (SP)**, gray, wet	
15.0	***Boring Terminated at 15 Feet***	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
5	▽	■	<1		B6-5'
			<1		
10			<1		
			<1		
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/12/2016 | Well Completed: 1/12/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-15

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. B7

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
0.8	**8" CONCRETE**							
	GRAVELLY SAND (SP-SM), with cobbles and silt, brown, damp				1	1.5 2.1		B7-1'
2.5	***Refusal at 2.5 Feet***					1.2		

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Hand Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/12/2016 | Boring Completed: 1/12/2016
Drill Rig: Hand Auger | Driller: Terracon
Project No.: 81157201 | Exhibit: A-16

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. MW1

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
0.2	**ASPHALT 1-2"**							
	SAND (SP), brown-gray, moist					<1		
4.0	grades to wet			▽	■	<1		MW1-3.5
4.5	**SILT (ML)**, with organics, dark brown, moist							
	SAND (SP), gray, wet		5			<1		
7.0	grades to brown							
	SILT (ML), light brown with orange mottling, wet							
8.0	**SILTY SAND (SM)**, with gravel, gray, wet					<1		
			10					
11.0	***Refusal at 11 Feet***							

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/11/2016 | Boring Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-17

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. MW1A

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

Approximate Surface Elev: 218.8 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHAL 1-2"**	218.6+/-
	SAND (SP), brown-gray, moist	
4.0	grades to wet	214.8+/-
4.5	**SILT (ML)**, with organics, dark brown, moist	214.3+/-
	SAND (SP), gray, wet	
7.0	grades to brown	211.8+/-
8.0	**SILT (ML)**, light brown with orange mottling, wet	210.8+/-
	SILTY SAND (SM), with gravel, gray, wet	
10.0		208.8+/-
11.0	**GRAVELLY SAND (SP)**, gray, wet	207.8+/-
	SILTY SAND (SM), with gravel, brown, wet	
12.5		206.3+/-
13.5	**SANDY SILT (ML)**, with gravel, brown, wet	205.3+/-
	SILTY SAND (SM), with gravel, brown, wet	
15.0		203.8+/-
	Boring Terminated at 15 Feet	

INSTALLATION DETAILS

Well Completion:

Solid 2" PVC pipe packed in bentonite

2" Slotted PVC pipe packed in sand

DEPTH (ft): 5, 10, 15

WATER LEVEL OBSERVATIONS | SAMPLE TYPE | OVA/PID (ppm) | SPT N-VALUE | SAMPLE NUMBER

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
2" slotted PVC pipe

See Appendices for description of field procedures.

Notes:
- See MW1 for lithology

WATER LEVEL OBSERVATIONS

GW sampling

GW sampling

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-18

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. MW2

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

Approximate Surface Elev: 222.8 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	222.6+/-
	SILTY SAND (SM), with gravel, dark brown, moist	
4.0		218.8+/-
	SILT (ML), with sand, gravel and organics, dark brown, moist	
5.0		217.8+/-
	SILTY SAND (SM), brown, wet	
6.0		216.8+/-
	GRAVELLY SAND (SP-SM), with silt, gray, wet	
7.5		215.3+/-
	SILTY SAND (SM), with gravel, gray, wet grades to light brown	
10.0		212.8+/-
	GRAVELLY SAND (SP), gray, wet	
11.0		211.8+/-
	SAND (SP), with gravel, gray, wet	
12.5		210.3+/-
	SILTY SAND (SM), with gravel, brown, wet	
15.0		207.8+/-
	Boring Terminated at 15 Feet	

INSTALLATION DETAILS

Well Completion:

Solid 2" PVC pipe packed in bentonite

2" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
			<1		
			<1		MW2-2'
			<1		
5			<1		
			<1		
10					
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
2" slotted PVC pipe

See Appendices for description of field procedures.

Notes:

WATER LEVEL OBSERVATIONS

While Drilling

GW sampling

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/12/2016 | Well Completed: 1/12/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-19

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. MW3

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	GRAVELLY SAND (SP-SM), with silt, light brown/gray	
1.8	**SAND (SP)**, gray-brown	
4.0	**SANDY SILT (ML)**, with gravel, brown	
5.0	**SAND (SP-SM)**, with silt and gravel, brown	
6.0	**GRAVELLY SILTY SAND (SM)**, gray	
8.0	**SILTY SAND (SM)**, brown	
9.0	**GRAVELLY SILTY SAND (SP-SM)**, gray	
10.0	**GRAVELLY SAND (SP)**, gray	
12.0	**SILTY SAND (SM)**, with gravel, gray	
13.0	**GRAVELLY SAND (SP)**, with silt, gray	
15.0	***Boring Terminated at 15 Feet***	

INSTALLATION DETAILS

Well Completion:

Solid 2" PVC pipe packed in bentonite

2" Slotted PVC pipe packed in sand

DEPTH (ft): 5, 10, 15

WATER LEVEL OBSERVATIONS | SAMPLE TYPE | OVA/PID (ppm) | SPT N-VALUE | SAMPLE NUMBER

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Hollow Stem Auger

Abandonment Method:
2" slotted PVC pipe

See Appendices for description of field procedures.

Notes:
- See MW3 (Boring) for lithology

WATER LEVEL OBSERVATIONS

▽ *GW sampling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/20/2016 | Well Completed: 1/20/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-20

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. MW3 (No Well)

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
0.2	**ASPHALT 1-2"**							
	GRAVELLY SAND (SP-SM), with silt, light brown/gray, moist							
1.8	hydrocarbon odor					<1		MW3-1.5
	SAND (SP), gray-brown, moist					<1		
4.0								
	SANDY SILT (ML), with gravel, brown, moist							
5.0			5					
	SAND (SP-SM), with silt and gravel, brown, wet					<1		MW3-5'
6.0	grades to wet			▽				
	GRAVELLY SILTY SAND (SM), gray, wet							
8.0						<1		
	SILTY SAND (SM), brown, wet							
9.0								
	GRAVELLY SILTY SAND (SP-SM), gray, wet							
10.0			10			<1		
	GRAVELLY SAND (SP), gray, wet							
12.0								
	SILTY SAND (SM), with gravel, gray, wet							
13.0								
	GRAVELLY SAND (SP), with silt, gray, wet							
15.0			15					
	Boring Terminated at 15 Feet							

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/12/2016 | Boring Completed: 1/12/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: A-21

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

APPENDIX B
LABORATORY TESTING

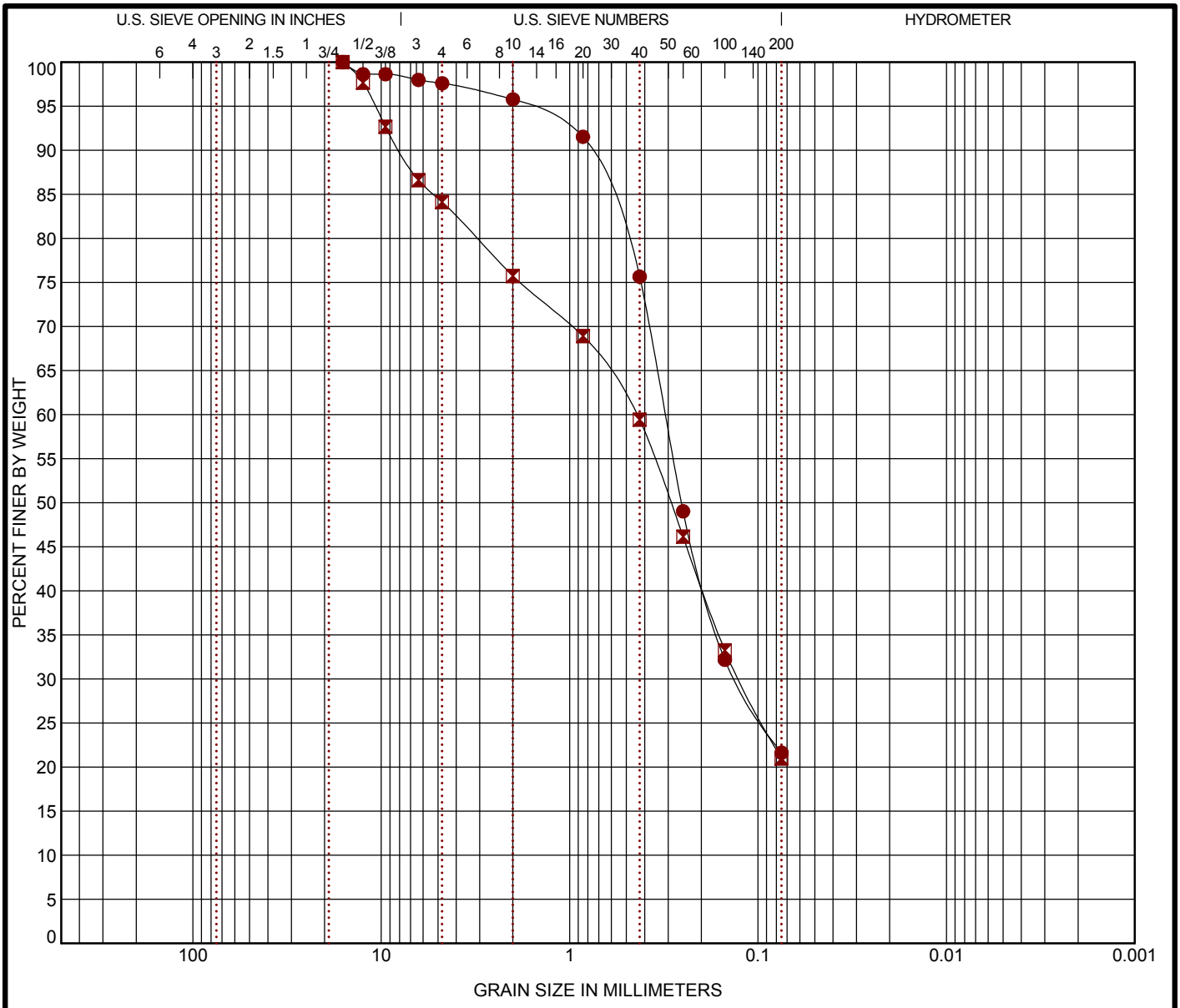
Laboratory Testing Description

Soil samples were tested in the laboratory to measure their natural water content. The test results are provided on the boring logs included in Appendix A.

Descriptive classifications of the soils indicated on the boring logs are in accordance with the enclosed General Notes and the Unified Soil Classification System. Also shown are estimated Unified Soil Classification Symbols. A brief description of this classification system is attached to this report. All classification was by visual manual procedures. Selected samples were further classified using the results of grain size distribution and Atterberg limit testing. The Atterberg limit test and fines content results are provided on the boring logs. Grain size distribution results are presented on Exhibit B-2.

GRAIN SIZE DISTRIBUTION

ASTM D422



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	USCS Classification	LL	PL	PI	Cc	Cu
● B-4	SILTY SAND (SM)					
⊠ B-6	SILTY SAND (SM)					

Sample ID	D_{100}	D_{60}	D_{30}	D_{10}	%Gravel	%Sand	%Fines
● B-4	16	0.311	0.13		2.4	76.0	21.6
⊠ B-6	16	0.443	0.125		15.9	63.2	21.0

PROJECT: Shoreline North Maintenance Facility

SITE: 19547 25th Avenue NE
Shoreline, Washington

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

PROJECT NUMBER: 81155070

CLIENT: TCF Architecture
Tacoma, Washington

EXHIBIT: B-2

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 81155070 BORING LOGS.GPJ 35159097 - ATTERBERG ISSUE.GPJ 2/14/16

APPENDIX C
SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

Split Spoon

WATER LEVEL

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

N	**Standard Penetration Test Resistance (Blows/Ft.)**
(HP)	**Hand Penetrometer**
(T)	**Torvane**
(DCP)	**Dynamic Cone Penetrometer**
(PID)	**Photo-Ionization Detector**
(OVA)	**Organic Vapor Analyzer**

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		**CONSISTENCY OF FINE-GRAINED SOILS** (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (psf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 500	0 - 1
Loose	4 - 9	Soft	500 to 1,000	2 - 4
Medium Dense	10 - 29	Medium Stiff	1,000 to 2,000	4 - 8
Dense	30 - 50	Stiff	2,000 to 4,000	8 - 15
Very Dense	> 50	Very Stiff	4,000 to 8,000	15 - 30
		Hard	> 8,000	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

Exhibit: C-1

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

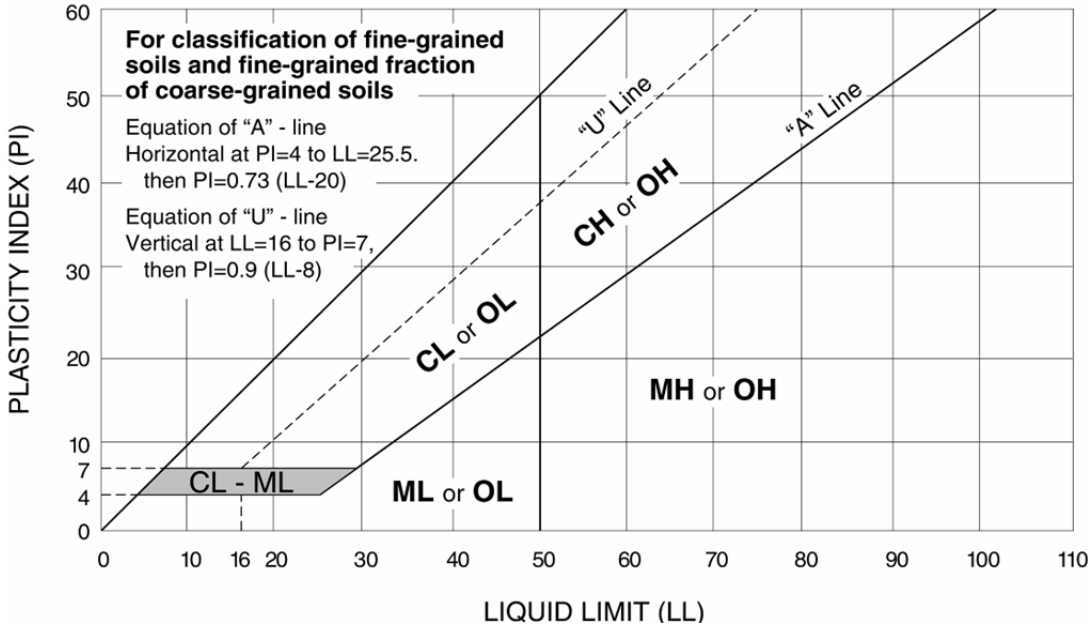
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Exhibit C-2

APPENDIX D
FIELD EXPLORATIONS BY OTHERS

Project: CSI Brightwater
Project Location: King and Snohomish Counties
Contract Number: E83004E

Log of Boring MW- 7

Sheet 1 of 5

Date(s) Drilled	12/10/01 - 12/12/01	Geotechnical Consultant	HWA GeoSciences Inc.	Logged By	BKH	Checked By	MLR/SEG
Drilling Method/ Rig Type	Becker Hammer/ Truck	Drilling Contractor	Layne Christensen Company	Total Depth of Borehole	266.5 feet
Drill Bit Size/Type	Dual Wall Reverse Circ.	Hammer Weight/Drop (lbs/in.)	300#, 30"	Ground Surface Elevation/Datum	213 feet / NAVD88
Location	Bruger Bog K.C. Public Works Facility	Coordinates	N. 47.77175 W. 122.30361	Elevation Source	Plan

Elevation, feet	Depth, feet	SAMPLES Type	Number	Blows / 6 in. (N)	Recovery, %	Graphic Log	USCS	MATERIAL DESCRIPTION	Piezometer Schematic	Lab Tests	Moisture Content, %	REMARKS AND OTHER TESTS
	0						SP-SM	*Medium dense*, olive gray, slightly silty, gravelly, fine to coarse SAND, wet.				3/28/2002 0.4 ft ▽ 2/8/2002 0.93 ft
210								(ALLUVIUM, Qal)				
	5											VWP-17.9 feet Artesian Head, 3/28/2002
	10		S-1	6 - 8 - 5 (13)	100					M	16.5	
200								Abundant wood pieces present in cuttings.				
	15											
	20		S-2	6 - 20 - 39 (59)	100		SP	Dense, grayish brown, fine gravelly, fine to coarse SAND, wet.		M SA	12.2	
190								(GLACIAL FLUVIAL, Qva)				
	25											
	30		S-3	14 - 37 - 35 (72)	100		ML	Hard, gray, slightly fine sandy, SILT, moist.		M SA	22.4	
180								(GLACIOLACUSTRINE, Qvgl)				
	35											
	40		S-4	4 - 5 - 7 (12)	100			At 39 feet, silt becomes stiff and interbedded thin, fine sand seams are present.		M SA HA	28.3	
170												
	45											
	50			3 - 7 - 10						M	29.9	

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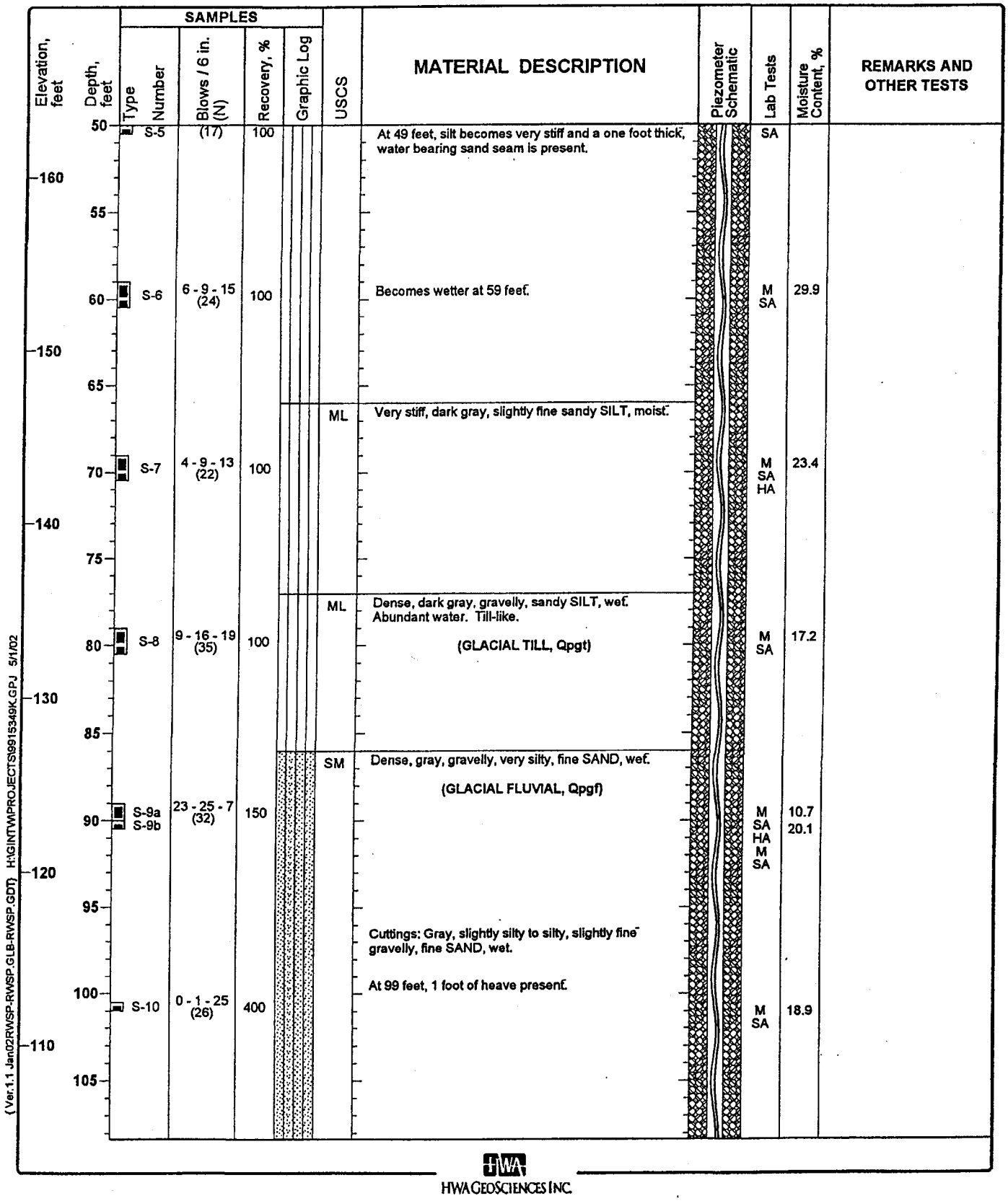
HWA GEOSCIENCES INC.

EXHIBIT D-1

Project: CSI Brightwater
Project Location: King and Snohomish Counties
Contract Number: E83004E

Log of Boring MW- 7

Sheet 2 of 5



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HWA GEOSCIENCES INC.

EXHIBIT D-1

Project: CSI Brightwater
Project Location: King and Snohomish Counties
Contract Number: E83004E

Log of Boring MW- 7

Sheet 3 of 5

Elevation, feet	Depth, feet	SAMPLES Type	Number	Blows / 6 in. (N)	Recovery, %	Graphic Log	USCS	MATERIAL DESCRIPTION	Piezometer Schematic	Lab Tests	Moisture Content, %	REMARKS AND OTHER TESTS
			S-11		0			Fine gravel and coarse sand present in cuttings.				
	110						SP	8 feet of heave present at 110 feet. No sample driven. Cuttings are gray, very gravelly, fine to medium SAND, wet.		M SA	10.8	
100	115							No water in cuttings.				
	120							5 feet of heave present at 120 feet.				
90							SC	Medium dense, gray, clayey, gravelly, fine to medium SAND to slightly gravelly, very fine sandy CLAY, moist to wet. Till-like. Trace fine, rounded gravel and trace rounded coarse sand.				
	125		S-12		0			(GLACIOMARINE DRIFT, Qpgm)		M	21.7	
	130		S-13	7 - 9 - 12 (21)	100					M SA HA	16.0	
80							CL	Very stiff, gray with whitish banding, slightly fine to medium gravelly, CLAY, moist. Sub-angular gravel.				
	135							(GLACIOLACUSTRINE, Qpgl)				
	140		S-14	5 - 9 - 14 (23)	100					M SA AL HA	21.6	
70	145		S-15	7 - 10 - 14 (24)	100			At 145 feet, clay becomes highly plastic.		M SA AL	28.8	
			S-16	110	83		SM	Very dense, gray, very silty, fine to coarse gravelly, fine to medium SAND, moist. Sub-rounded to sub-angular gravel.		M SA HA	8.9	
	150							(GLACIAL TILL, Qpgt)				
60	155		S-17	104	83			At 155 feet, sand becomes fine to coarse.		M SA	9.1	
	160		S-18	99	83		GM	Very dense, gray, silty, gravelly SAND to silty, sandy GRAVEL, moist to wet. Sand is fine to coarse and gravel is fine to coarse and subrounded.		M	9.5	
50							ML	Hard, gray, SILT, moist. Laminated. Low plasticity.				
	165		S-19	78	83					M	20.4	

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HWA GEOSCIENCES INC.

EXHIBIT D-1

Project: CSI Brightwater
Project Location: King and Snohomish Counties
Contract Number: E83004E

Log of Boring MW- 7

Sheet 4 of 5

Elevation, feet	Depth, feet	SAMPLES Type	Number	Blows / 6 in. (N)	Recovery, %	Graphic Log	USCS	MATERIAL DESCRIPTION	Piezometer Schematic	Lab Tests	Moisture Content, %	REMARKS AND OTHER TESTS
										SA		
	170	S-20		74	83		CL	Hard, dark gray with light gray bandings, slightly sandy, CLAY, moist. (GLACIOLACUSTRINE, Qpgl)		M SA AL HA	15.6	
-40	175	S-21		92	83		CL	Hard, gray, CLAY interbedded with very dense, gray, slightly fine gravelly, fine to medium SAND, moist.		M	16.6	
	180	S-22		15 - 23 - 35 (58)	100		CH	Hard, dark gray with light gray banding and mottling, CLAY, moist. High plasticity.		M SA AL HA	16.9	
-30	185	S-23		82	83		SC	Very dense, gray, fine to coarse gravelly, very clayey, fine to coarse SAND, moist. Occasional wood fragments and sub-rounded gravel present. (NONGLACIAL FLUVIAL, Qpnf)		M SA HA	11.3	
	190	S-24		78	83		SP-SM	Very dense, gray, slightly silty, gravelly, fine to coarse SAND, moist.		M SA	12.1	
-20	195	S-25		19 - 30 - 51 (81)	100		CL	Hard, gray to dark gray with light gray mottling, fine to coarse gravelly, fine to coarse sandy, CLAY, moist. Till-like. (GLACIAOMARINE DRIFT, Qpgm)		M SA AL HA	12.2	
	200	S-26		11 - 18 - 27 (45)	100		CL	Very stiff to hard, gray to dark gray with light gray banding, CLAY, moist. (NONGLACIAL LACUSTRINE, Qpnl) Two 1-2 mm seams of fine sand present at 199 feet.				
-10	205	S-27		10 - 18 - 32 (50)	100			At 205 feet, soil becomes slightly fine sandy CLAY with several thin light gray sandy seams.		M SA AL HA	18.8	
	210	S-28		8 - 19 - 40 (59)	100		CL	Hard, gray with light gray flecks, slightly fine to coarse gravelly, slightly fine to medium sandy, CLAY, moist.		M SA AL	14.5	
0	215	S-29		8 - 15 - 23 (38)	100		CL	Hard, gray, slightly fine sandy, CLAY, moist. Trace fine to coarse gravel.		M SA AL	19.3	
	220	S-30		8 - 16 - 19 (35)	100		CH	Hard, dark gray with light gray streaks, slightly fine gravelly, CLAY, moist. Highly plastic.		M SA	20.6	
-10	225							At 225 feet, clay becomes very stiff and contains light gray to white vertically oriented laminations.				

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HWA GEOSCIENCES INC.

EXHIBIT D-1

Project: CSI Brightwater
Project Location: King and Snohomish Counties
Contract Number: E83004E

Log of Boring MW- 7

Sheet 5 of 5

Elevation, feet	Depth, feet	SAMPLES Type	Number	Blows / 6 in. (N)	Recovery, %	Graphic Log	USCS	MATERIAL DESCRIPTION	Piezometer Schematic	Lab Tests	Moisture Content, %	REMARKS AND OTHER TESTS
	225	S	S-31	6 - 11 - 13 (24)	100					M SA AL HA	31.8	
-20	230	S	S-32	5 - 5 - 11 (16)	100			At 229 feet, clay becomes highly fractured. Abundant white to light gray seams and randomly oriented laminations.		M SA	32.0	
	235	S	S-33	8 - 9 - 14 (23)	100					M SA AL HA	29.7	
	240	S	S-34	5 - 9 - 11 (20)	100		CL	Very stiff, dark gray with white laminations, CLAY, moist.		M SA AL HA	26.5	
-30	245	S	S-35	5 - 7 - 14 (21)	100		CH	Very stiff, dark gray with white laminations, CLAY, moist. Highly plastic.		M SA AL	31.3	
	250	S	S-36	6 - 9 - 12 (21)	100					M SA HA	32.1	
-40	255	S	S-37	6 - 8 - 10 (18)	100		CL	Very stiff, gray with ligh gray laminations, CLAY, moist.		M SA AL HA	26.7	
	260	S	S-38	5 - 7 - 11 (18)	100		CH	Very stiff, gray with light gray laminations, CLAY, moist. Highly plastic.		M SA	31.8	
-50	265	S	S-39	5 - 8 - 9 (17)	100			At 265 feet, no laminations noted.		M SA AL	33.3	
-60	270							Bottom of boring at 266.5 feet. 2" piezometer installed to 265 feet. Vibrating Wire Piezometer installed at 115 feet.				
	275											
-70	280											

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HWA GEOSCIENCES INC.

EXHIBIT D-1

EXHIBIT D-2

JOB NO. L-8009 HWY. NO. SR 104 SHEET ___ OF ___

SECTION 15TH AVE. N.E. TO 25TH N. E.

STA. 46~ OFFSET 33.0' RT RCL ELEV. 233.0'

EQUIPMENT Portable Penetrometer DATE 4-6-84

INSPECTOR D. J. HOLE NO. 7

DEPTH	BLOWS PER FOOT	PROFILE	TUBE SAMPLE NO	DESCRIPTION OF MATERIAL
				FILL
			2	brown moist soft
1	3		4	slightly gravelly, slightly
			4	clayey SILT w/ roots
.2			3	O. G.
			5	moist brown, soft
3	6		9	slightly gravelly, slightly
			10	sandy SILT
4			13	moist brown medium
	20/6"		41	dense, slightly clayey
				silty, gravelly fine to
				course SAND
				end of boring 4.5'
				No free water
				"Note"
				blows per foot are
				equivalent standard
				penetrometer values

JOB NO. L-8009 HWY. NO. 104 SHEET 1 OF 1

SECTION 15th Ave NE to 25th Ave NE

STA. 47~ OFFSET 16' 4" RCL ELEV. -0.3'

EQUIPMENT Hand Tools DATE 4/6/84

INSPECTOR DJ HOLE NO. 8

4 LINES = 1 FOOT

DEPTH	BLOWS PER FOOT	PROFILE	TUBE SAMPLE NO	DESCRIPTION OF MATERIAL
0.0				EDGE OF SHOULDER
				Brown, Moist, Loose
				slightly Silty, Sandy
-1.0				Fine to Coarse GRAVEL
				Mottled Moist Stiff
			SS #1	Clayey SILT
-2.5				END OF BORING -2.5'
				No FREE WATER

EXHIBIT D-3

JOB NO. L-8009 HWY. NO. SR 104 SHEET ___ OF ___

SECTION 15th Ave. N.E. To 25th Ave. N.E.

STA. 47 ~ OFFSET 33.0' RT RCC & ELEV. 233.6'

EQUIPMENT Portable Penetrometer DATE 4-6-84

INSPECTOR D. J. HOLE NO. 9

DEPTH	BLOWS PER FOOT	PROFILE	TUBE SAMPLE NO	DESCRIPTION OF MATERIAL
0				FILL
			2	MOIST, dark brown
1	5		4	SILTY, gravelly, fine to
.3			6	course SAND w/ roots
.2			6	o. G.
			10	MOIST, brown, SILTY
3	26		25	slightly gravelly
			28	fine to course SAND
				end of boring 3.5'
				No free water
				"NOTE"
				blows per foot are
				equivalent standard
				penetrometer values

JOB NO. L-8009 HWY. NO. SR 104 SHEET ___ OF ___

SECTION 15th Ave. N.E. To 25th Ave. N.E.

STA. 48 ~ OFFSET 33.0' RT RCC & ELEV. 240.5'

EQUIPMENT Portable Penetrometer DATE 4-6-84

INSPECTOR D. J. HOLE NO. 10

DEPTH	BLOWS PER FOOT	PROFILE	TUBE SAMPLE NO.	DESCRIPTION OF MATERIAL
0				FILL
			1	MOIST brown, slightly
1	3		3	SILTY, gravelly fine to
			3	Course SAND w/ occ.
2			3	Cobble and roots
			3	loose
3	3		3	
			3	o. G.
.6				
4			10	MOIST MOTTLED CLAYEY
	10		12	SILT silt
5			17	end of boring 5.0'
				No free water
				"NOTE"
				blows per foot are
				equivalent standard
				penetrometer values

EXHIBIT D-4

JOB NO. L-8009 HWY. NO. SR 164 SHEET ___ OF ___

SECTION 15th Ave. N.E. To 25th Ave. N.E. (PCC)

STA. 98+50 OFFSET 33.0' RT. (PCC) ELEV. 245.0'

EQUIPMENT Portable Penetrometer DATE 4-6-84

INSPECTOR D.J. HOLE NO. 1

DEPTH	BLOWS PER FOOT	PROFILE	TUBE SAMPLE NO.	DESCRIPTION OF MATERIAL
				FILL
			4	moist, brown, loose
	1 5		5	silty, gravelly fine
			5	to course SAND w/
	2		5	cobbles and roots
			5	
-8	3 9		9	O.G.
			15	Moist, mottled, silty
	4		19	clayey SILT
				end of boring 4.0'
				No free water
				"Note"
				blows per foot are
				equivalent standard
				Penetrometer values

JOB NO. L-8009 HWY. NO. 104 SHEET 1 OF 1

SECTION 15th Ave NE to 25th Ave NE (PCC)

STA. 49+ OFFSET 16' Lt. & (PCC) ELEV. 0.3'

EQUIPMENT Hand Tools DATE 4/6/84

INSPECTOR DS HOLE NO. 2

4 LINES = 1 FOOT

DEPTH	BLOWS PER FOOT	PROFILE	TUBE SAMPLE NO.	DESCRIPTION OF MATERIAL
0.0				EDGE OF SHOULDER
-0.3				Brown Moist Slight Silty Sandy GRAVEL
			SS #2	GREY Moist Very Dense Silty Gravelly Fine to Medium SAND
-2.0				END OF BORING - 2.0'
				NO FREE WATER

Environmental Limited Site Investigation

Proposed Shoreline North Maintenance Facility
19547 25th Avenue NE
Shoreline, Washington

February 24, 2016
Terracon Project No. 81157201

Prepared for:
TCF Architecture PLLC
Tacoma, Washington

Prepared by:
Terracon Consultants, Inc.
Mountlake Terrace, Washington

terracon.com

Terracon

Environmental ■ Facilities ■ Geotechnical ■ Materials

February 24, 2016

Terracon

TCF Architecture PLLC
902 North Second Street
Tacoma, Washington 98403

Attn: Mr. Mark Hurley
P: (253) 572-3993
E: Mark@tcfarchitecture.com

Re: **Environmental Limited Site Investigation**
Proposed Shoreline North Maintenance Facility
19547 25th Avenue NE
Shoreline, Washington
Terracon Project No. 81157201

Dear Mr. Hurley:

Terracon Consultants, Inc. (Terracon) is pleased to submit our report of Environmental Limited Site Investigation (LSI) activities completed at the site referenced above. The report presents data from recent field activities that included the completion of soil borings and the collection of soil and groundwater samples for chemical analysis. The activities were completed to address the findings of the draft Phase I Environmental Site Assessment (ESA) of the property completed by GeoEngineers, Inc., dated August 24, 2011. Terracon conducted the Environmental LSI in general accordance with our proposal (P81150284) dated September 21, 2015, and the consultant agreement between TCF Architecture PLLC and Terracon, dated December 11, 2015.

Terracon appreciates this opportunity to provide environmental services to TCF Architecture PLLC and the City of Shoreline. Should you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely,
Terracon Consultants, Inc.

State of Washington
Hydrogeologist
1403
Licensed Geologist
MICHAEL D. NOLL

Sabine Datum, G.I.T.
Staff Geologist

Michael D. Noll, L.G., L.Hg.
Senior Project Manager

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APPENDIX D – ANALYTICAL REPORTS AND CHAIN OF CUSTODY FORMS

ENVIRONMENTAL LIMITED SITE INVESTIGATION
PROPOSED SHORELINE NORTH MAINTENANCE FACILITY
19547 25TH AVENUE NE
SHORELINE, WASHINGTON

Terracon Project No. 81157201
February 24, 2016

1.0 SITE DESCRIPTION

The site consists of an approximately 2.87-acre tract of land located at 19547 25th Avenue NE in Shoreline, King County, Washington and is occupied by a City of Shoreline road maintenance facility, formerly the Brugger's Bog King County Maintenance Facility. The road maintenance facility has reportedly operated since the late 1950s. The site includes a covered vactor waste decant facility, a fleet vehicle fueling area, and a construction materials and equipment storage yard. Additional site improvements include an office/garage building, truck scale, and various outbuildings. The site is paved with asphalt and/or concrete, with some landscaping and vegetation along the site borders. Several soil and materials storage areas with asphalt paving and surrounding concrete blocks are located on the western portion of the site. A Topographic Map showing the site location is included as Exhibit 1, and a Site Diagram depicting the site features is included as Exhibit 2, in Appendix A.

Terracon was provided a previous draft Phase I Environmental Site Assessment (ESA) report completed at the site in August 2011 by GeoEngineers, Inc. (GEI). GEI identified the following recognized environmental conditions (RECs) associated with the historical and current operations at the site:

- An existing fueling system consisting of two aboveground storage tanks (ASTs), buried product piping, and dispenser islands that has been in use for approximately 20 years;
- Oil staining and free product on the floor of an oil house;
- Historical use of a fuel AST located near the truck scale from approximately 1957 to 1975;
- Historical use, storage, and waste disposal of lubricants and solvents in the garage building;
- Historical placement of contaminated roadside ditch spoils, street sweeping waste and vactor truck waste on the surface of the site;
- Approximately 2 to 4 feet of fill material of unknown origin identified on the site from historical geotechnical borings; and
- Historical fuel underground storage tanks (USTs) installed on the northwestern portion of the site in 1975 and removed in 1988.

Based on the findings of the previous ESA, Terracon conducted soil and groundwater sampling at the site to assess if potential releases from the above-mentioned features/RECs have impacted the site. Findings of this Environmental LSI will be used in connection with site redevelopment for the design and project specification process in order to limit the potential for unexpected conditions during construction that could impact the project budget and construction schedule. The site will be redeveloped as a new City of Shoreline maintenance facility (North Maintenance Facility) supporting Public Works and Facilities Maintenance. Redevelopment for the North Maintenance Facility will include the removal of the existing structures, and construction of structures for administrative and maintenance use, including a shop with repair bays and a wash bay, and fueling and materials storage areas.

2.0 SCOPE OF SERVICES

Terracon's scope of services was conducted in general accordance with our proposal (P81150284) dated September 21, 2015, and the consultant agreement between TCF Architecture PLLC and Terracon, dated December 11, 2015. This Environmental LSI was performed in conjunction with our Preliminary Geotechnical Engineering Study (Terracon Project 81155070) submitted under separate cover. Our scope of services included completion of the following tasks:

- Performance of pre-mobilization activities, including public and private underground utility clearances and preparation of a site specific health and safety plan;
- Advancement of 10 environmental investigation soil borings and 6 geotechnical investigation soil borings, and collection of soil samples from the borings;
- Completion of six of the environmental investigation soil borings as temporary groundwater monitoring wells and collection of groundwater samples;
- Completion of three of the environmental investigation soil borings and one of the geotechnical investigation soil borings as permanent groundwater monitoring wells and collection of groundwater samples
- Completion of laboratory analyses of soil and groundwater samples; and
- Preparation of this Environmental LSI summary report.

The Environmental LSI was conducted to investigate if potential releases from the long-term site use as a road maintenance facility, associated on-site features, and the above-discussed RECs have impacted site soil and/or groundwater. The Preliminary Geotechnical Engineering Study, performed in conjunction with this Environmental LSI, and provided under separate cover, included subsurface explorations to develop design and construction recommendations for anticipated future uses of the site

Please note that this scope of services was not intended to identify every chemical possibly associated with the site or surrounding facilities, or to address corrective action costs.

2.1 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding the findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. These Environmental LSI services were performed in accordance with the scope of services agreed with you, our client, as reflected in our proposal, and were not restricted by American Society for Testing and Materials (ASTM) standard E1903-11, *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process*.

2.2 Additional Scope Limitations

Findings, conclusions, and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of services; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable, or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this Environmental LSI. Subsurface conditions may vary from those encountered at specific borings or wells or during other surveys, tests, assessments, investigations, or exploratory services. The data, interpretations, findings, and our recommendations are based solely upon data obtained at the time and within the scope of these services.

2.3 Reliance

This report has been prepared for the exclusive use of TCF Architecture PLLC and the City of Shoreline, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of TCF Architecture PLLC, the City of Shoreline, and Terracon. Any unauthorized distribution or reuse is at TCF Architecture PLLC's and the City of Shoreline's sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions, and limitations stated in the proposal, Environmental LSI report, and Terracon's Agreement for Services.

3.0 FIELD INVESTIGATION

Terracon has a 100% commitment to the safety of all its employees. As such, and in accordance with our *Incident and Injury Free*® safety goals, Terracon conducted the fieldwork under a site specific health and safety plan developed for this project. Work was performed using the Occupational Health and Safety Administration (OSHA) Level D work attire, consisting of hard hats, safety glasses, protective gloves, and protective boots. In an effort to locate underground utilities in the work area, Terracon contacted the Washington State Utility Notification Center to arrange for public underground utility clearance for the site. In addition, a private utility location service was subcontracted by Terracon to identify the locations and depths of the various utilities located near the proposed boring locations to avoid damage to such utilities.

3.1 Soil Sampling

Sixteen soil borings were advanced at the site. Ten soil borings (B1 through B7 and MW1/MW1A through MW3) were advanced primarily for environmental sampling purposes, and six soil borings (GB1/MW4 through GB6) were used primarily for geotechnical evaluations. Boring locations relative to site features are depicted on Exhibit 2 of Appendix A.

Borings B1 and MW1 were completed near the flammables storage structure and former fuel AST at the truck scale on the eastern portion of the site. Boring B2 was advanced inside the garage structure, and boring B3 was drilled within the decant facility, on the eastern portion of the site. Boring B4 was advanced near the truck building on the southern portion of the site. Borings B5 and MW3 were advanced at the fuel ASTs located in the northern portion of the site. Boring B6 was advanced near the former UST location in the northwestern portion of the site. Boring B7 was advanced inside the oil house. Borings MW2 and GB2 were completed adjacent to dispenser islands and product piping. Boring GB1/MW-4 was advanced in the northeastern site portion. Borings GB3 through GB6 were advanced along the southern portion of the site.

Terracon field representative Kyle Long mobilized to the site on January 11 and 12, 2016 to oversee the drilling of the environmental soil borings. Nine borings (B1 through B6, and MW1 through MW3) were advanced using a truck-mounted direct-push drill rig owned and operated by Holt Services Inc. (Holt), a Washington State-licensed driller. The direct-push borings were advanced using a direct-push sampler equipped with disposable acetate sample sleeves. Throughout the drilling operation, soil samples were obtained continuously (to the extent practical) from five-foot long pushes driven into the ground using a 500 foot-pound, percussion hammer. The steel sampling tube was extracted from the hole and the liners were removed and split open for soil sample recovery. Non-disposable sampling equipment was cleaned using a non-phosphate soap wash and potable water rinse prior to the beginning the project and before collecting each soil sample. Equipment decontamination water was contained in a properly labeled Department of Transportation (DOT)-approved drum and temporarily stored onsite.

The direct-push borings were advanced to depths of approximately 15 feet below the ground surface (bgs), with the exception of boring B1, where drilling refusal was encountered at approximately 14 feet bgs. Soil cuttings from borings B1 through B7 and MW1/MW1A through MW3 were contained in properly labeled DOT-approved drums and temporarily stored onsite.

Boring B7 was advanced inside the oil house using hand tools and a clean hand auger. Prior to advancing the boring, the approximately 9 ½ -inch thick concrete surface was cored. Boring B7 was advanced to approximately 2.5 feet bgs, where hand auger refusal was encountered on coarse gravel.

On January 20 and 21, 2016, Terracon field representative Heather Gadwa mobilized to the site to oversee the drilling of six geotechnical soil borings (GB1/MW4 through GB6). The borings were advanced using a trailer-mounted hollow-stem auger (HSA) drill rig operated by Holt Services. Throughout the drilling operation, soil samples were obtained at 2.5- or five-foot depth intervals via the Standard Penetration Test (SPT) method (ASTM D-1586). An automatic SPT hammer was used to advance a 2-inch outside diameter steel split-spoon sampler in the borings. The split-spoon sampler was extracted from the hole and opened for soil sample recovery. Drilling equipment was cleaned using a high pressure washer prior to beginning the project and before beginning each soil boring. Sampling equipment was cleaned using a non-phosphate soap wash and potable water rinse prior to the beginning of the project and before collecting each soil sample. Equipment decontamination water was contained in a properly labeled Department of Transportation (DOT)-approved drum and temporarily stored onsite.

Soil borings GB1/MW-4 through GB3 and GB5 were advanced to approximately 21.5 feet bgs. Borings GB4 and GB6 were terminated at approximately 14 feet bgs due to drilling refusal and heaving sands. Soil cuttings from borings GB1/MW4 through GB6 were stockpiled on the concrete slab beneath the decant facility canopy, with the approval of the City of Shoreline project contact.

Terracon field screened soil samples from each boring for volatile organic vapors using a photoionization detector (PID). This device provides a direct reading in parts per million (ppm) isobutylene equivalents. Upon removal of the sampler from the borehole, Terracon put a portion of each sample in a sealable plastic bag. After a stabilization period, Terracon screened the headspace above the soil using the PID. Terracon calibrated the PID in accordance with the manufacturer's recommendations prior to field activities. The boring logs included in Appendix C list the PID field screening results for each soil boring.

Seventeen soil samples collected from the borings were submitted for laboratory analysis. One soil sample was collected from each environmental soil boring, at the capillary fringe zone (approximately 4 to 5 feet bgs) and/or intervals with elevated PID readings. Two soil samples were collected from boring MW3 for analysis, based on dark staining observed in the soil sample

collected at 1.5 feet bgs. One soil sample was collected from hand auger boring B7 at approximately 1.5 feet bgs. One environmental soil sample was collected from each geotechnical at approximately 2.5 feet bgs, except for boring GB4, where the soil sample collected at 5 feet bgs was submitted due to a lack of soil recovery for the drive sample at 2.5 feet bgs.

Soil samples were extracted by hand using disposable gloves and placed directly into laboratory supplied glassware. Soil samples collected for volatile organic compounds (VOCs) analysis were collected using a USEPA 5035 sampling kit, as required by the Washington state Department of Ecology (Ecology).

Each sample container was labeled with the project number, date, time, boring number, and sample ID. Sample containers were placed in a chilled cooler immediately after sampling, and subsequently transported to ALS Environmental (ALS), a Washington State-accredited analytical laboratory located in Everett, Washington, under strict chain-of-custody procedures.

At the completion of field activities, borings not completed as permanent groundwater monitoring wells were decommissioned using bentonite chips hydrate with potable water and the borings were capped to approximately match the existing ground surface.

3.2 Temporary Groundwater Monitoring Wells

Soil borings B1 through B6 were converted to temporary groundwater monitoring wells in order to facilitate the collection of grab groundwater samples. The temporary monitoring wells were constructed as follows:

- 10 feet of ¾-inch inside diameter (I.D.), 0.010-inch machine slotted poly-vinyl chloride (PVC) well screen with a threaded bottom cap
- A ¾-inch diameter, threaded, flush-joint PVC riser pipe to surface
- Formation sand was allowed to collapse around the well screens as a sand pack.

Following installation, one grab groundwater sample was collected from each temporary monitoring well and submitted for laboratory analysis. Approximately 2 gallons of water were purged from each temporary monitoring well prior to sampling; however, groundwater samples collected remained slightly turbid and contained some sediment, which could create biased high results. Temporary well purge water was contained in a properly labeled DOT-approved drum and temporarily stored onsite.

The groundwater samples were collected using a peristaltic pump and dedicated tubing and placed into laboratory-supplied glassware. The sample containers were labeled with the project number, date, time, and sample ID and placed in a chilled cooler. The sample containers were subsequently transported to ALS under strict chain-of-custody procedures.

At the completion of groundwater sampling activities, the temporary well equipment was removed from the boring and boring was decommissioned using bentonite chips hydrated with potable water, and capped to approximately match the existing ground surface.

3.3 Permanent Groundwater Monitoring Wells

Soil borings MW1A, MW2, MW3, and GB1/MW-4 were completed as permanent groundwater monitoring wells. The permanent groundwater monitoring wells were constructed with the following materials:

- A 10 foot length of 2-inch I.D., 0.010-inch machine slotted PVC well screen with a threaded bottom cap
- A 2-inch diameter, threaded, flush-joint PVC riser pipe to surface
- Pre-sieved 10/20 grade silica sand for annular sand pack around the well screen from the bottom of the boring to approximately two feet above the top of the well screen interval and overlain by hydrated bentonite chips and concrete
- A lockable plug secured with a ground surface flush monument plate

Monitoring wells MW1A and MW2 were completed in direct-push borings using 2-inch pre-pack well screens, with no additional sand pack added. The direct-push well installations were completed by reaming the initial direct-push soil sample boring from 2-inch diameter to 4-inch diameter using a larger diameter sample barrel and drive rod to make the borehole diameter large enough to accommodate the pre-pack well screen. During the direct-push well installation process at soil borings MW1 and MW3, the drill rig 4-inch tooling encountered refusal prior to reaching the target well installation depth of 15 feet bgs. Therefore, boring MW1A was advanced to 15 feet bgs approximately 1 ½ feet north of MW1, and the monitoring well was installed. The direct-push drill rig 4-inch tooling encountered refusal on multiple attempts to reach the target well installation depth of 15 feet bgs at MW3. Therefore, monitoring well for MW3 was completed on January 20, 2016 approximately 1 foot north from the original MW3 direct-push soil boring using the HSA drill rig.

At the time of well completion the monitoring wells were developed by surging with a decontaminated electric down-hole submersible pump in an effort to remove turbid groundwater. Approximately 15 to 50 gallons of development water were removed from each well before groundwater appeared relatively free of sediment. Monitoring well development water was contained in properly labeled DOT-approved drums and temporarily stored onsite.

3.4 Groundwater Sampling

After waiting a minimum of 48-hours to allow the developed wells to equilibrate to surrounding aquifer conditions, Terracon Field Technician, Kyle Long, returned to the site on January 15, 2016

to collect groundwater samples from monitoring wells MW1A and MW2, and on January 22, 2016 to collect groundwater samples from monitoring wells MW3 and MW4. Prior to sample collection, all monitoring wells were opened and exposed to surficial atmospheric conditions and static groundwater elevations were measured from the top of the casing. The water level probe was cleaned using a non-phosphate soap and potable water wash and a distilled water rinse before use in each well. Equipment decontamination water was contained in a properly labeled DOT-approved drum and temporarily stored onsite.

Prior to sampling, the permanent wells were purged with a peristaltic pump using low-flow sampling techniques. Approximately 0.5 to 0.75 gallons of water were purged from each well. Monitoring well purge water was contained in a properly labeled DOT-approved drum and temporarily stored onsite. During purging, groundwater quality parameters, including temperature, electrical conductivity (EC), pH, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP), were measured at regular intervals using a water quality meter. Purging was considered complete when three consecutive readings for EC, pH, DO, ORP and turbidity were observed within approximately 10% of one another.

The groundwater samples were collected using a peristaltic pump and dedicated tubing and placed into laboratory-supplied glassware. The sample containers were labeled with the project number, date, time, and sample number and placed in a chilled cooler immediately after sampling. The sample containers were subsequently transported to ALS under strict chain-of-custody procedures.

Following groundwater sampling, and in order to establish the groundwater gradient, Terracon field staff surveyed the top-of-casing (TOC) elevations of each permanent groundwater monitoring well relative to an onsite King County elevation benchmark BM235 3-inch diameter brass marker with a reported elevation of 217.22 feet relative to the North American Vertical Datum of 1988 (NAVD88).

4.0 RESULTS OF THE FIELD INVESTIGATION

4.1 Geology/Hydrogeology

In general, Terracon encountered asphalt paving 1 to 2 inches thick, underlain by sand with silt and/or silty sand with varying amounts of gravel and intermittent layers of silt and/or sandy silt to depths of approximately 9 to 15 feet bgs. Layers of organic silt, silt with organics, peat, and silt with peat measuring approximately 0.5 to 3 feet thick were encountered in borings B1, B2, B5, B6, GB3, GB4 and GB5 at depths ranging from approximately 3 to 8 feet bgs. Sand, sandy gravel, gravelly sand, and gravel with sand were observed in layers ranging from approximately 4 to 9 feet thick at depths ranging from approximately 6 to 21.5 feet bgs, the deepest depth explored. The boring logs in Appendix C detail the observed soil stratigraphy.

At the time of drilling, groundwater was observed in the soil borings at depths ranging from approximately 1.5 to 10 feet bgs. Stabilized depth to water measurements in permanent groundwater monitoring wells MW1 through MW4 on January 22, 2016 ranged from 0.25 feet below TOC at MW1A to 1.86 feet below TOC at MW2. Based on depth to groundwater measurements and well survey data, the groundwater elevations at the monitoring wells ranged from 216.89 feet at monitoring well MW4 to 220.92 feet at monitoring well MW2 (Table 3, Appendix B). Based on groundwater level measurements collected during Terracon's January 22, 2016 groundwater sampling event, the groundwater flow direction at the site is generally toward the east and northeast, at a horizontal gradient of approximately 0.013 to 0.018 feet per foot (ft/ft), as illustrated on Exhibit 3 of Appendix A.

4.2 Field Screening

Elevated PID readings above 1.0 ppm were detected in the soil sample collected from boring B1 at approximately 3 feet bgs. A reading of 48.7 ppm was recorded and a hydrocarbon odor was noted. PID readings between 1.2 and 2.1 ppm were also recorded in the soil samples collected from hand auger boring B7. A hydrocarbon-like odor was detected in the soil sample collected from boring MW3 at 2 feet bgs. No other indications of possible chemical impacts were not noted in any of the soils and/or the well development or purge water collected from the temporary and permanent groundwater monitoring wells. The field screening results are summarized on the boring logs in Appendix C.

5.0 ANALYTICAL RESULTS

The soil and groundwater samples were analyzed for gasoline-range total petroleum hydrocarbons (TPH) by Northwest Method NWTPH-Gx, diesel- and oil-range TPH by Northwest Method NWTPH-Dx, VOCs by EPA Method 8260, and MTCA 5 metals (arsenic, cadmium, chromium, lead, and mercury) by EPA Method 6010 and EPA Method 7471 (mercury). The groundwater samples analyzed for MTCA 5 metals were field-filtered using a 40-micron filter.

In addition to TPH and VOCs, three soil cutting stockpile samples and one composite drummed soil sample were analyzed for Resource Conservation and Recovery Act (RCRA) 8 metals (arsenic, barium, cadmium, chromium, lead, selenium, and silver) by EPA Method 6010 and EPA Method 7471 (mercury), and one composite drummed equipment decontamination and well purge water sample was analyzed for RCRA 8 metals by EPA Method 200.8 and EPA Method 245.1 (mercury).

Soil and groundwater concentrations reported by the analytical laboratory were compared with the Washington State Model Toxics Control Act (MTCA) Method A cleanup levels for unrestricted land use, or with MTCA Method B cleanup levels for compounds for which no MTCA Method A cleanup level has been established.

The laboratory analytical reports and chain-of-custody records are attached in Appendix D. The following sections describe the results of the testing.

5.1 Soil Sampling Results

Gasoline-range TPH was identified in the soil sample collected at 3 feet bgs from boring B1, located east of the flammable storage building, at a concentration of 450 milligrams per kilogram (mg/kg), which is above the MTCA Method A cleanup level of 100 mg/kg. In addition, diesel-range TPH was identified in the soil sample collected at 3 feet bgs from boring B1 at a concentration of 4,800 mg/kg, exceeding the MTCA Method A cleanup level of 2,000 mg/kg.

The remaining soil sample results were either below the analytical laboratory method reporting limits (MRLs), or were below the MTCA Method A or MTCA Method B cleanup levels.

The soil sampling analytical results are summarized in Table 1 of Appendix B.

5.2 Groundwater Sampling Results

Diesel-range TPH was identified in the grab groundwater sample collected from the temporary well installed in boring B1 at a concentration of 870 micrograms per liter (µg/L), which is above the MTCA Method A cleanup level of 500 µg/L.

Oil-range TPH was identified in the grab groundwater samples collected from the temporary wells installed in borings B2, B4, and B6 at concentration ranging from 520 µg/L to 1,600 µg/L, which exceed the MTCA Method A cleanup level of 500 µg/L. Boring B2 is located in the garage/office building on the east portion of the site, boring B4 is located south of the truck building in the south central portion of the site, and boring B6 is located in the former UST area in the northwest portion of the site.

Arsenic was identified in the grab groundwater samples collected from the temporary wells installed in borings B1 and B5, and in the groundwater sample collected from monitoring well MW-4, at concentrations ranging from 5.2 µg/L to 7.6 µg/L, exceeding the MTCA Method A cleanup level of 5 µg/L. Boring B5 is located southeast of the fuel ASTs in the north central portion of the site, and well MW4 is located in the northeastern portion of the site.

The remaining groundwater sample results were either below the analytical laboratory MRLs, or were below the MTCA Method A or MTCA Method B cleanup levels.

The groundwater sampling analytical results are summarized in Table 2 of Appendix B.

5.3 Quality Assurance/Quality Control Results

The analytical results for the current investigation were checked for completeness immediately upon receipt from the laboratory to ensure that data and QA/QC information requested were present. Data quality was assessed by considering hold times, surrogate recovery, method blanks, matrix spike and matrix spike duplicate (MS/MSD) recovery, and detection limits. QA/QC review was completed using guidance described in *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (Draft Final, USEPA, 2005). Our evaluation assumes that the QA/QC is correct as reported by the laboratory, and merely provides an interpretation of the QA/QC results.

Hold Times. All analyses were completed within specified hold times.

Surrogate Recoveries. All surrogate recoveries were within laboratory limits.

Method Blanks. Analytes were not detected in any of the laboratory method blanks.

MS/MSD Results. MS and MSD recoveries were all within laboratory limits, and Relative Percent Differences (RPDs) between MS and MSD recoveries were all within laboratory limits.

Laboratory Reporting Limits. Reporting limits were below relevant MTCA cleanup levels.

Based upon our interpretation of quality control information provided by the laboratories, it is our opinion that the overall dataset is useable as qualified for the purposes of this Environmental LSI.

6.0 INVESTIGATION DERIVED WASTES

One 55-gallon drum and one 20-gallon drum of drill cuttings and three 55-gallon drums of monitoring well development/purge water and equipment decontamination water were containerized as investigation derived wastes (IDWs) during the field activities. The drums are currently staged on-site along the northern site boundary near the site entrance from 25th Avenue NE. Per the City of Shoreline's request, the soil cuttings from the geotechnical investigation were stockpiled in a concrete-lined containment area located in the decant facility.

The composite drummed soil, stockpiled soil cuttings, and composite drummed water sample results were either below the analytical laboratory MRLs, or were below the MTCA Method A or MTCA Method B cleanup levels.

The IDW soil and water sampling analytical results are summarized in Table 4 and Table 5, respectively, of Appendix B.

7.0 CONCLUSIONS

Based on the scope of services described in this report and subject to the limitations described herein, Terracon concludes the following.

Soil impacts
Gasoline- and diesel-range TPH were identified in the soil sample collected at 3 feet bgs from soil boring B1 at concentrations exceeding the MTCA Method A cleanup levels. Boring B1 is located adjacent to the east side of the flammable storage building, on the eastern portion of the site. The lateral extents of the soil impacts are unknown, but do not appear to extend north to the location of boring MW1.

Groundwater impacts
Diesel-range TPH was also identified in the grab groundwater sample collected from the temporary monitoring well installed in boring B1 at a concentration exceeding the MTCA Method A cleanup level. Boring B1 is located in the inferred downgradient direction from the flammable storage building and the former fuel AST located near the truck scale.

Oil-range TPH was identified in the grab groundwater samples collected from the temporary wells installed in borings B2, B4, and B6 at concentrations exceeding the MTCA Method A cleanup level. Boring B2 is located in the garage/office building on the eastern portion of the site, boring B4 is located south of the truck building in the southcentral portion of the site, and boring B6 is located in the former UST area in the northwestern portion of the site.

Arsenic was identified in the grab groundwater samples collected from the temporary wells installed in borings B1 and B5, and in the groundwater sample collected from monitoring well MW-4, at concentrations exceeding the MTCA Method A cleanup level. Boring B5 is located southeast (downgradient) of the fuel ASTs in the northcentral portion of the site, and well MW4 is located in the northeastern portion of the site.

Due to the nature of sampling from temporary monitoring wells, which cannot be adequately developed and may remain slightly turbid, the grab groundwater sample results from borings B1, B2, B4, B5, and B6 may be biased high and may not be representative of actual groundwater aquifer conditions due to the presence of fines in the samples.

8.0 RECOMMENDATIONS

Based on the identified soil impacts at the site, Terracon recommends that additional soil sampling be performed in the vicinity of boring B1 to further delineate the lateral extent of soil impacts in this area. The soil impacts delineation work can be performed either prior to, or during, the planned site re-development work. Additionally, we recommend that the Ecology *Guidance for Remediation of Petroleum Contaminated Soils, Toxics Cleanup Program, Publication No. 10-09-057,* dated September 2011, be followed for the proper guidelines for on-site reuse or off-site disposal of any petroleum-contaminated soil. Ecology considers soils with gasoline-range TPH concentrations exceeding 100 mg/kg or diesel range TPH concentrations exceeding 500 mg/kg to be Category 4 soils, which can be used as landfill daily cover or in asphalt manufacturing. Soils with gasoline-range TPH concentrations between 5 mg/kg and 100 mg/kg, or diesel range TPH concentrations between 100 mg/kg and 500 mg/kg, are classified as Category 2 or Category 3 soils, which can be used as commercial fill above the groundwater table, or as paving base or road construction material.

Based on the identified groundwater impacts at the site, Terracon recommends that additional groundwater sampling be conducted in the vicinity of borings B1, B2, B4, B5, and B6. Due to the nature of sampling from temporary monitoring wells, the grab groundwater sample results from these borings may be biased high. Therefore, we recommend that permanent groundwater monitoring wells be installed, properly developed, and sampled in the vicinity of borings B1, B2, B4, B5, and B6.

Terracon also recommends that an environmental media management plan (EMMP) be prepared for the site to address the identified TPH and metals impacts that could be encountered during any future earthwork activities conducted at the site. The EMMP will include guidance to the earthwork contractor for the following: health and safety; general contractor/subcontractor environmental qualifications; equipment decontamination; worker exposure, monitoring and field screening of soils; excavation and stockpiling of impacted soils; soil segregation; soil sampling methodology and frequency of testing; remedial excavations; disposition of excavation spoils; dewatering procedures of impacted groundwater; disposition of impacted groundwater; and documentation and reporting.

With regards to the identified impacts of TPH in soil and groundwater and elevated arsenic concentrations in groundwater above MTCA action levels, a release report to Ecology is required per MTCA (Washington Administrative Code (WAC) 173-340-200 (2) a)), which states: *"Any owner or operator, who has information that a hazardous substance has been released to the environment at the owner's or operator's facility and may be a threat to human health or the environment, shall report such information to the department within 90 days of discovery."*

Terracon can assist the client with the Ecology reporting requirements.

APPENDIX A – EXHIBITS

Exhibit 1 – Topographic Map

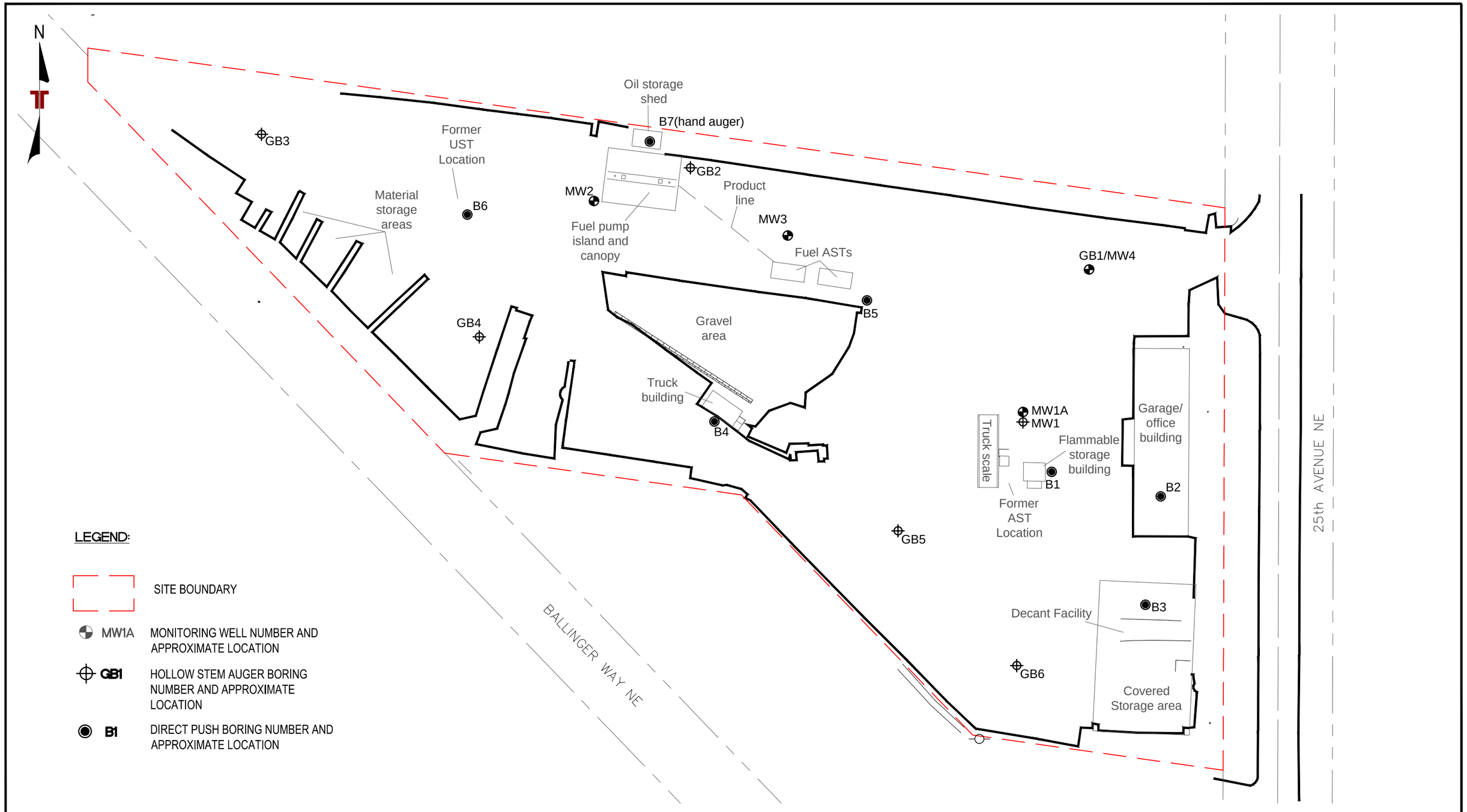
Exhibit 2 – Site Diagram

Exhibit 3 – Groundwater Flow and Gradient Map



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: EDMONDS EAST, WA (1/1/1981).

Project Manager: MDN	Project No. 81157201	Terracon 21905 64th Ave W Suite 100 Mountlake Terrace, WA 98043	TOPOGRAPHIC MAP	Exhibit
Drawn by:	Scale: 1"=2,000'		Shoreline North Maintenance Facility - LSI 19547 25th Avenue NE Shoreline, WA	1
Checked by: SKL	File Name: Exhibit 1			
Approved by: MDN	Date: January2016			



LEGEND:

- SITE BOUNDARY
- MW1A — MONITORING WELL NUMBER AND APPROXIMATE LOCATION
- GB1 — HOLLOW STEM AUGER BORING NUMBER AND APPROXIMATE LOCATION
- B1 — DIRECT PUSH BORING NUMBER AND APPROXIMATE LOCATION

50 0 25 50

SCALE IN FEET

Basemap PDF file provided by Client and modified by Terracon.

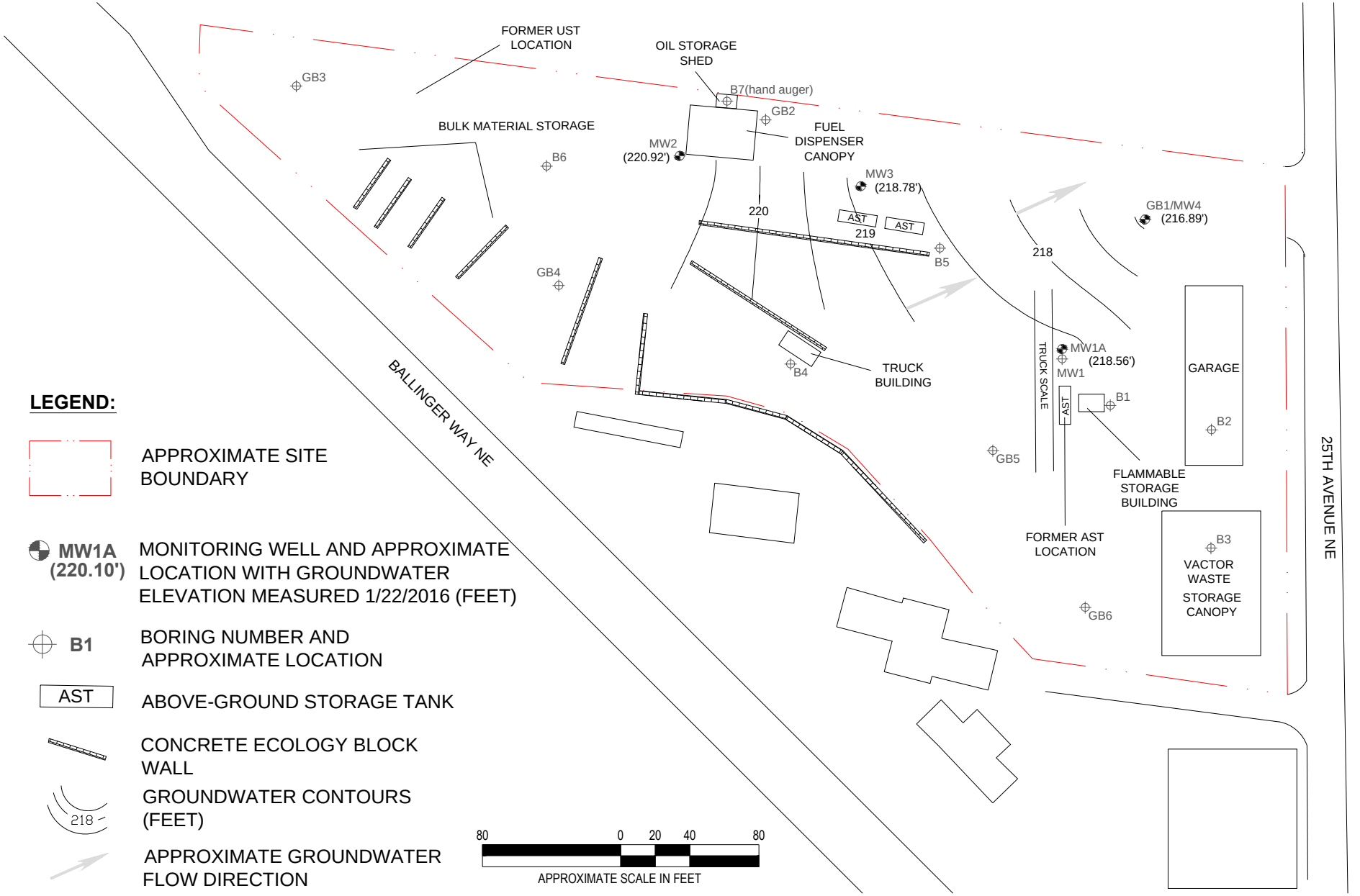
Project Mngr:	MDN
Drawn By:	HRG
Checked By:	MDN
Approved By:	MDN
Project No.	81157201
Scale:	1:50
File No.	*.dwg
Date:	February 2016

Terracon
Consulting Engineers and Scientists
21905 64th Avenue W, Ste 100 Mountlake Terrace, WA 98043
PH. (425) 771-3304 FAX. (425) 771-3549

SITE DIAGRAM

Shoreline North Maintenance Facility LSI
19547 25th Avenue NE
Shoreline, King County, Washington

EXHIBIT 2



LEGEND:

- APPROXIMATE SITE BOUNDARY
- **MW1A (220.10')** MONITORING WELL AND APPROXIMATE LOCATION WITH GROUNDWATER ELEVATION MEASURED 1/22/2016 (FEET)
- **B1** BORING NUMBER AND APPROXIMATE LOCATION
- AST ABOVE-GROUND STORAGE TANK
- CONCRETE ECOLOGY BLOCK WALL
- 218 GROUNDWATER CONTOURS (FEET)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

Basemap PDF file provided by Client and modified by Terracon.

Project Mngr:	MDN
Drawn By:	AAS
Checked By:	MDN
Approved By:	MYW
Project No.	81157201
Scale:	AS SHOWN
File No.	*.dwg
Date:	JANUARY 2016

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GROUNDWATER FLOW AND GRADIENT MAP

SHORELINE NORTH MAINTENANCE FACILITY LSI
19547 25th AVENUE NE
SHORELINE, KING COUNTY, WASHINGTON

EXHIBIT 3

APPENDIX B – TABLES

Table 1 – Summary of Soil Analytical Results
Table 2 – Summary of Groundwater Analytical Results
Table 3 – Summary of Groundwater Elevation Data
Table 4 – Summary of IDW Soil Analytical Results
Table 5 – Summary of IDW Water Analytical Results

Table 1

SUMMARY OF SOIL ANALYTICAL RESULTS
Shoreline North Maintenance Facility - LSI
19547 25th Avenue NE
Shoreline, King County, Washington 98155

all results in mg/kg (milligrams per kilogram)

Sample Location	Sample Number	Sample Date	Sample Depth (ft)	TPH			BTEX				VOCs					MTCA 5 Metals				
				Gasoline-Range	Diesel-Range	Oil-Range	Benzene	Toluene	Ethylbenzene	Xylenes	Acetone	N-Propyl Benzene	S-Butyl Benzene	N-Butylbenzene	Naphthalene	Mercury	Arsenic	Cadmium	Chromium	Lead
B1	B1-3'	1/11/2016	3	**450**	**4,800**	ND (<500)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	**0.013**	**0.020**	**0.032**	**0.041**	**0.028**	**1.7**	ND (<0.50)	**35**	**4.8**
B2	B2-7.5'	1/11/2016	7.5	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.020)	**7.5**	ND (<0.50)	**28**	**1.9**
B3	B3-1'	1/11/2016	1	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.020)	**1.6**	ND (<0.50)	**32**	**2.5**
B4	B4-4'	1/11/2016	4	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.027**	**3.3**	ND (<0.50)	**24**	**21**
B5	B5-5'	1/12/2016	5	ND (<3.0)	ND (<25)	**95**	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.021**	**1.7**	ND (<0.50)	**43**	**4.3**
B6	B6-5'	1/12/2016	5	ND (<3.0)	**59**	**95**	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	**0.49**	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.049**	**13**	ND (<0.50)	**34**	**13**
B7	B7-1'	1/12/2016	1	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.025**	**6.1**	ND (<0.50)	**30**	**8**
MW1	MW1-3.5'	1/11/2016	3.5	ND (<3.0)	**130**	**330**	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.023**	**2.7**	ND (<0.50)	**32**	**5.1**
MW2	MW2-2'	1/12/2016	2	**7.5**	**29**	**77**	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	**0.24**	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.053**	**7.9**	ND (<0.50)	**38**	**30**
MW3	MW3-1.5'	1/12/2016	1.5	ND (<3.0)	**110**	**240**	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.046**	**3.1**	ND (<0.50)	**35**	**75**
MW3	MW3-5'	1/12/2016	5	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.034**	**3**	ND (<0.50)	**37**	**2.4**
GB1	GB1-2.5'	1/20/2016	2.5	ND (<3.0)	**200**	**510**	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.020)	**2.7**	ND (<0.50)	**32**	**4.7**
GB2	GB2-2.5'	1/20/2016	2.5	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.038**	**3.4**	ND (<0.50)	**22**	**6.6**
GB3	GB-3-2.5'	1/21/2016	2.5	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.020)	**1.2**	ND (<0.50)	**19**	**2**
GB4	GB4-5'	1/21/2016	5	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.16)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.11**	**1.2**	ND (<0.50)	**35**	**4.3**
GB5	GB5-2.5'	1/21/2016	2.5	ND (<3.0)	ND (<26)	**490**	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.19)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.049**	**3.5**	ND (<0.50)	**18**	**13**
GB6	GB6-2.5'	1/21/2016	2.5	ND (<3.0)	ND (<25)	ND (<50)	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND (<0.050)	ND (<0.010)	ND (<0.010)	ND (<0.010)	ND (<0.010)	**0.023**	**1.9**	ND (<0.50)	**17**	**3.1**
MTCA Method A or MTCA Method B Cleanup Level				**100**	**2,000**	**2,000**	**0.03**	**7**	**6**	**9**	**72,000**	**8,000**	**8,000**	**4,000**	**5**	**2**	**20**	**2**	**2,000**	**250**

Note: Concentrations detected above laboratory reporting limits are in **BOLD** type. Shaded and bold concentrations are above MTCA cleanup levels.

MTCA - Model Toxics Control Act (MTCA Method A and MTCA Method B cleanup levels per Ecology Cleanup Level and Risk Calculation [CLARC] August 2015 data table)

TPH - total petroleum hydrocarbons

VOCs - volatile organic compounds (Table only shows analytes with detections. See ALS laboratory report for full list of results.)

ND - Not detected above laboratory reporting limit.

Table 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
Shoreline North Maintenance Facility - LSI
19547 25th Avenue NE
Shoreline, King County, Washington 98155

all results in µg/L (micrograms per liter)

Sample Location	Sample Number	Sample Date	TPH			BTEX				VOCs	MTCA 5 Metals				
			Gasoline-Range	Diesel-Range	Oil-Range	Benzene	Toluene	Ethylbenzene	Xylenes	1,2,4 - Trimethylbenzene	Mercury	Arsenic	Cadmium	Chromium	Lead
B1	B1-W	1/11/2016	ND (<50)	**870**	ND (<250)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	**5.2**	ND (<1.0)	ND (<2.0)	ND (<1.0)
B2	B2-W	1/11/2016	ND (<50)	ND (<200)	**1,600**	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	**4.7**	ND (<1.0)	**4.6**	ND (<1.0)
B3	B3-W	1/11/2016	ND (<50)	ND (<130)	ND (<250)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	**4.2**	ND (<1.0)	**17**	**2.1**
B4	B4-W	1/11/2016	ND (<50)	ND (<130)	**730**	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	**2.1**	ND (<1.0)	ND (<2.0)	ND (<1.0)
B5	B5-W	1/12/2016	ND (<50)	ND (<130)	ND (<250)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	**5.5**	ND (<1.0)	**16**	**1.7**
B6	B6-W	1/12/2016	ND (<50)	ND (<130)	**520**	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	ND (<1.0)	ND (<1.0)	ND (<2.0)	ND (<1.0)
MW1A	MW1A	1/15/2016	ND (<50)	ND (130)	**410**	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	**1.0**	ND (<1.0)	ND (<2.0)	ND (<1.0)
MW2	MW2	1/15/2016	ND (<50)	ND (130)	**500**	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	ND (<1.0)	ND (<1.0)	ND (<2.0)	ND (<1.0)
MW3	MW3	1/22/2016	**62**	**190**	**250**	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	**2.3**	ND (<0.20)	**1.6**	ND (<1.0)	ND (<2.0)	ND (<1.0)
MW4	MW4	1/22/2016	ND (<50)	**350**	ND (<250)	ND (<2.0)	ND (<2.0)	ND (<2.0)	ND (<6.0)	ND (<2.0)	ND (<0.20)	**7.6**	ND (<1.0)	ND (<2.0)	ND (<1.0)
MTCA Method A or MTCA Method B Cleanup Level			**1,000**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**NE**	**2**	**5**	**5**	**50**	**15**

Note: Concentrations detected above laboratory reporting limits are in **BOLD** type. Shaded and bold concentrations are above MTCA cleanup levels.

MTCA - Model Toxics Control Act (MTCA Method A and MTCA Method B cleanup levels per Ecology Cleanup Level and Risk Calculation [CLARC] August 2015 data table)

TPH - Total petroleum hydrocarbons

VOCs - Volatile organic compounds (Table only shows analytes with detections. See ALS laboratory report for full list of results.)

NE - Not Established per CLARC August 2015 data table

ND - Not detected above laboratory reporting limit.

TABLE 3

SUMMARY OF GROUNDWATER ELEVATION DATA
Shoreline North Maintenance Facility - LSI
19547 25th Avenue NE
Shoreline, King County, Washington 98155

Well Number	Date	TOC Elevation (Feet)	Northing (Feet)	Easting (Feet)	Depth to Water (Feet)	Groundwater Elevation (Feet)
MW1A	1/22/2016	218.81	-110.00	-100.00	0.25	218.56
screened 5-15 feet						
MW2	1/22/2016	222.78	-33.00	-345.00	1.86	220.92
screened 5-15 feet						
MW3	1/22/2016	220.46	-32.00	-235.00	1.68	218.78
screened 5-15 feet						
MW4	1/22/2016	217.22	-32.00	-70.00	0.33	216.89
screened 5-15 feet						

TOC: top of casing

Elevations based off of King County Bench Mark BM235 3" brass disk at ground level on site (217.22 ft.), relative to the North American Vertical Datum of 1988 (NAVD88)

Northing and Easting relative to the north gate post at 25th Avenue NE.

All of the monitoring wells are 2-inch diameter

Table 4

SUMMARY OF IDW SOIL ANALYTICAL RESULTS

Shoreline North Maintenance Facility - LSI
19547 25th Avenue NE
Shoreline, King County, Washington 98155

all results in mg/kg (milligrams per kilogram)

Sample Location	Sample Number	Sample Date	TPH			BTEX				VOCs	RCRA 8 Metals							
			Gasoline-Range	Diesel-Range	Oil-Range	Benzene	Toluene	Ethylbenzene	Xylenes	VOCs	Mercury	Arsenic	Cadmium	Chromium	Lead	Barium	Selenium	Silver
CS-1**	CS-1	1/21/2016	ND (<3.0)	ND (<27)	**320**	NT	NT	NT	NT	NT	**0.049**	**6.4**	ND (<0.50)	**43**	**38**	**110**	ND (<6.0)	ND (<0.50)
CS-2**	CS-2	1/21/2016	**15**	**210**	**490**	NT	NT	NT	NT	NT	**0.024**	**2.0**	ND (<0.50)	**28**	**9.0**	**60**	ND (<5.0)	ND (<0.50)
CS-3**	CS-3	1/21/2016	ND (<3.0)	**150**	**310**	NT	NT	NT	NT	NT	ND (<0.020)	**2.3**	ND (<0.50)	**26**	**6.2**	**44**	ND (<5.0)	ND (<0.50)
Soil Drum	Soil Drum	1/22/2016	ND (<3.0)	**200**	**200**	ND (<0.0050)	ND (<0.010)	ND (<0.010)	ND (<0.030)	ND*	ND (<0.020)	**1.8**	ND (<0.50)	**22**	**8.2**	**43**	ND (<5.0)	ND (<0.50)
MTCA Method A or MTCA Method B Cleanup Level			**100**	**2,000**	**2,000**	**0.03**	**7**	**6**	**9**	--	**2**	**20**	**2**	**2,000**	**250**	**16,000**	**400**	**400**

Note: Concentrations detected above laboratory reporting limits are in **BOLD** type.

IDW - Investigation derived waste

MTCA - Model Toxics Control Act (MTCA Method A and MTCA Method B cleanup levels per Ecology Cleanup Level and Risk Calculation [CLARC] August 2015 data table)

RCRA - Resource Conservation and Recovery Act

TPH - total petroleum hydrocarbons

VOCs - volatile organic compounds (Table only shows analytes with detections. See ALS laboratory report for full list of results.)

-- - Cleanup levels vary for multiple chemicals

ND - Not detected above laboratory reporting limit

ND* - Not detected above laboratory reporting limits for multiple chemicals

Table 5

SUMMARY OF IDW WATER ANALYTICAL RESULTS
Shoreline North Maintenance Facility - LSI
19547 25th Avenue NE
Shoreline, King County, Washington 98155

all results in µg/L (micrograms per liter)

Sample Number	Sample Date	TPH			BTEX				VOCs	RCRA 8 Metals							
		Gasoline-Range	Diesel-Range	Oil-Range	Benzene	Toluene	Ethylbenzene	Xylenes	VOCs	Mercury	Arsenic	Barium	Cadmium	Chromium	Lead	Selenium	Silver
Water Drum	1/22/2016	**270**	**290**	ND (<250)	ND (<2.0)	**39**	ND (<2.0)	ND (<6.0)	ND*	ND (<0.20)	**3.6**	**79**	ND (<1.0)	**11**	**2.5**	ND (<4.0)	ND (<1.0)
MTCA Method A or MTCA Method B Cleanup Level		**800**	**500**	**500**	**5**	**1,000**	**700**	**1,000**	**--**	**2**	**5**	**3,200**	**5**	**50**	**15**	**80**	**80**

Note: Concentrations detected above laboratory reporting limits are in **BOLD** type.

IDW - Investigation derived waste

MTCA - Model Toxics Control Act (MTCA Method A and MTCA Method B cleanup levels per Ecology Cleanup Level and Risk Calculation [CLARC] August 2015 data table)

RCRA - Resource Conservation and Recovery Act

TPH - Total petroleum hydrocarbons

VOCs - Volatile organic compounds (Table only shows analytes with detections. See ALS laboratory report for full list of results.)

-- - Cleanup levels vary

ND - Not detected above laboratory reporting limit.

ND* - Not detected above laboratory reporting limits for multiple chemicals.

APPENDIX C – SOIL BORING LOGS
B-1 through B-7, MW1 through MW3, GB-1 through GB-6

WELL LOG NO. B1

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
0.5	**SILTY SAND (SM)**, with gravel, brown/dark brown	
	SAND (SP), gray, moist, hydrocarbon odor	
	grades to saturated	
4.0		
4.5	**SILT (ML)**, with organics, dark brown, moist	
5.0	**SAND (SP)**, with gravel, gray, wet	
	SILT (ML), with organics, dark brown, moist	
6.5		
	GRAVELLY SAND (SP), gray, wet	
8.0		
8.5	**CLAYEY SILT (CL-ML)**, tan, moist	
	GRAVELLY SAND (SP), gray, wet	
13.0		
	SANDY SILT (SM), tan, wet	
14.0		
	Boring Refusal at 14 Feet	

INSTALLATION DETAILS

Well Completion: 3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
			<1		
	▽	■	48.7		B1-3'
5			3.8		
			<1		
10					
			<1		

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-1

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B2

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	SILTY SAND (SM), with gravel, brown/dark brown, moist	
	grades to gray	
5.5	**SILTY SAND (SM)**, with organics, gray, wet	
7.0		
7.5	**SILT (ML)**, gray, moist	
	GRAVELLY SAND (SP), gray, wet	
13.0	**GRAVEL (GP)**, with sand, gray, wet	
15.0	***Boring Terminated at 15 Feet***	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
5			<1		
			<1		
			<1		
	▽	■	<1		B2-7.5'
10			<1		
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-2

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B3

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.3	**3-4" Concrete**	
	GRAVEL (GP), with sand, gray, wet	
5.0		
	GRAVEL (GP), gray, wet	
6.0		
	SAND (SP), with gravel, gray-brown, wet	
8.0		
	SAND (SP), black	
10.0		
	GRAVELLY SAND (GP), gray, wet	
	grades to brown	
15.0		
	Boring Terminated at 15 Feet	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

SAMPLE NUMBER	OVA/PID (ppm)
B3-1'	<1
	<1
B3-2'	<1
	<1
	<1

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B4

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	SAND (SP), light brown, moist	
4.0		
	SILTY SAND (SM), with organics and gravel, brown, wet	
5.0		
	SILTY SAND (SM), with gravel, gray, wet	
	grades to gray	
10.0		
	SAND (SP), gray, wet	
14.5		
15.0	**SILTY SAND (SM)**, with gravel, gray, wet	
	Boring Terminated at 15 Feet	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
			<1		
	▽	■	<1		B4-4'
5			<1		
10			<1		
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B5

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
1.0	**GRAVELLY SAND (SP)**, with silt, gray-brown, moist	
2.0	**SAND (SP-SM)**, with silt and gravel, dark brown, moist	
3.5	**SAND (SP)**, gray with orange mottling, moist	
5.0	**SILTY SAND (SM)**, with gravel and organics, dark brown, moist	
5.5	**SILTY SAND (SM)**, gray, wet	
6.0	**SANDY SILT (ML)**, with organics, dark brown, wet	
	GRAVELLY SAND (SP-SM), with silt, gray, wet	
	grades to light brown	
15.0	***Boring Terminated at 15 Feet***	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
			<1		
			<1		
5	▽	■	<1		B5-5'
			<1		
10					
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/12/2016 | Well Completed: 1/12/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. B6

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	GRAVELLY SAND (SP), with silt, brown/gray, moist	
3.5	**SILTY SAND (SM)**, with organics, dark brown, moist	
5.5	**SILTY SAND (SM)**, brown, wet	
7.0	**SILTY SAND (SM)**, with gravel, light brown, wet	
9.0	**GRAVELLY SAND (SP)**, gray, wet	
15.0	***Boring Terminated at 15 Feet***	

INSTALLATION DETAILS

Well Completion:

3/4" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
5	▽	■	<1		B6-5'
			<1		
10			<1		
			<1		
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:
- Temporary well removed after groundwater sample collection.

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/12/2016 | Well Completed: 1/12/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. B7

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
0.8	**8" CONCRETE**							
	GRAVELLY SAND (SP-SM), with cobbles and silt, brown, damp				1	1.5 2.1		B7-1'
2.5	***Refusal at 2.5 Feet***					1.2		

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Hand Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:

WATER LEVEL OBSERVATIONS

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/12/2016 | Boring Completed: 1/12/2016
Drill Rig: Hand Auger | Driller: Terracon
Project No.: 81157201 | Exhibit: B-7

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. MW1

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	SAND (SP), brown-gray, moist	
4.0	grades to wet	
4.5	**SILT (ML)**, with organics, dark brown, moist	
	SAND (SP), gray, wet	
7.0	grades to brown	
	SILT (ML), light brown with orange mottling, wet	
8.0	**SILTY SAND (SM)**, with gravel, gray, wet	
11.0	***Refusal at 11 Feet***	

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
	▽		<1		
		■	<1		MW1-3.5
5			<1		
			<1		
10					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While Drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/11/2016 | Boring Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-8

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. MW1A

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

Approximate Surface Elev: 218.8 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHAL 1-2"**	218.6+/-
	SAND (SP), brown-gray, moist	
4.0	grades to wet	214.8+/-
4.5	**SILT (ML)**, with organics, dark brown, moist	214.3+/-
	SAND (SP), gray, wet	
7.0	grades to brown	211.8+/-
8.0	**SILT (ML)**, light brown with orange mottling, wet	210.8+/-
	SILTY SAND (SM), with gravel, gray, wet	
10.0		208.8+/-
11.0	**GRAVELLY SAND (SP)**, gray, wet	207.8+/-
	SILTY SAND (SM), with gravel, brown, wet	
12.5		206.3+/-
13.5	**SANDY SILT (ML)**, with gravel, brown, wet	205.3+/-
	SILTY SAND (SM), with gravel, brown, wet	
15.0		203.8+/-
	Boring Terminated at 15 Feet	

INSTALLATION DETAILS

Well Completion:

Solid 2" PVC pipe packed in bentonite

2" Slotted PVC pipe packed in sand

DEPTH (ft): 5, 10, 15

WATER LEVEL OBSERVATIONS | SAMPLE TYPE | OVA/PID (ppm) | SPT N-VALUE | SAMPLE NUMBER

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
2" slotted PVC pipe

See Appendices for description of field procedures.

Notes:
- See MW1 for lithology

WATER LEVEL OBSERVATIONS

GW sampling

GW sampling

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/11/2016 | Well Completed: 1/11/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-9

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. MW2

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

Approximate Surface Elev: 222.8 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	222.6+/-
	SILTY SAND (SM), with gravel, dark brown, moist	
4.0		218.8+/-
	SILT (ML), with sand, gravel and organics, dark brown, moist	
5.0		217.8+/-
	SILTY SAND (SM), brown, wet	
6.0		216.8+/-
	GRAVELLY SAND (SP-SM), with silt, gray, wet	
7.5		215.3+/-
	SILTY SAND (SM), with gravel, gray, wet grades to light brown	
10.0		212.8+/-
	GRAVELLY SAND (SP), gray, wet	
11.0		211.8+/-
	SAND (SP), with gravel, gray, wet	
12.5		210.3+/-
	SILTY SAND (SM), with gravel, brown, wet	
15.0		207.8+/-
	Boring Terminated at 15 Feet	

INSTALLATION DETAILS

Well Completion:

Solid 2" PVC pipe packed in bentonite

2" Slotted PVC pipe packed in sand

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	OVA/PID (ppm)	SPT N-VALUE	SAMPLE NUMBER
			<1		
			<1		MW2-2'
			<1		
5			<1		
			<1		
10					
15					

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
2" slotted PVC pipe

See Appendices for description of field procedures.

Notes:

WATER LEVEL OBSERVATIONS

While Drilling

GW sampling

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/12/2016

Well Completed: 1/12/2016

Drill Rig: AMS Power Probe

Driller: Holt Services, Inc.

Project No.: 81157201

Exhibit: B-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. MW3

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	
	GRAVELLY SAND (SP-SM), with silt, light brown/gray	
1.8	**SAND (SP)**, gray-brown	
4.0	**SANDY SILT (ML)**, with gravel, brown	
5.0	**SAND (SP-SM)**, with silt and gravel, brown	
6.0	**GRAVELLY SILTY SAND (SM)**, gray	
8.0	**SILTY SAND (SM)**, brown	
9.0	**GRAVELLY SILTY SAND (SP-SM)**, gray	
10.0	**GRAVELLY SAND (SP)**, gray	
12.0	**SILTY SAND (SM)**, with gravel, gray	
13.0	**GRAVELLY SAND (SP)**, with silt, gray	
15.0	***Boring Terminated at 15 Feet***	

INSTALLATION DETAILS

Well Completion:

Solid 2" PVC pipe packed in bentonite

2" Slotted PVC pipe packed in sand

DEPTH (ft): 5, 10, 15

WATER LEVEL OBSERVATIONS | SAMPLE TYPE | OVA/PID (ppm) | SPT N-VALUE | SAMPLE NUMBER

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic SPT Hammer

Advancement Method:
Hollow Stem Auger

Abandonment Method:
2" slotted PVC pipe

See Appendices for description of field procedures.

Notes:
- See MW3 (Boring) for lithology

WATER LEVEL OBSERVATIONS

▽ *GW sampling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/20/2016 | Well Completed: 1/20/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. MW3 (No Well)

PROJECT: Shoreline North Maintenance Facility - LSI

CLIENT: TCF Architecture
Seattle, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit 2

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	OVA/PID (ppm)	SAMPLE NUMBER
0.2	**ASPHALT 1-2"**			
	GRAVELLY SAND (SP-SM), with silt, light brown/gray, moist			
1.8	hydrocarbon odor		<1	MW3-1.5
	SAND (SP), gray-brown, moist		<1	
4.0				
	SANDY SILT (ML), with gravel, brown, moist			
5.0				
	SAND (SP-SM), with silt and gravel, brown, wet		<1	MW3-5'
6.0	grades to wet			
	GRAVELLY SILTY SAND (SM), gray, wet			
8.0			<1	
	SILTY SAND (SM), brown, wet			
9.0				
	GRAVELLY SILTY SAND (SP-SM), gray, wet			
10.0			<1	
	GRAVELLY SAND (SP), gray, wet			
12.0				
	SILTY SAND (SM), with gravel, gray, wet			
13.0				
	GRAVELLY SAND (SP), with silt, gray, wet			
15.0				
	Boring Terminated at 15 Feet			

DEPTH (ft): 5, 10, 15

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

SPT N-VALUE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Advancement Method:
Direct Push

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.

Notes:

WATER LEVEL OBSERVATIONS

While Drilling

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/12/2016 | Boring Completed: 1/12/2016

Drill Rig: AMS Power Probe | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-12

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81157201 BORING LOGS-ENVIRO DIRECT PUSH.GPJ TERRACON2012.GDT 2/23/16

WELL LOG NO. GB1/MW-4

PROJECT: Shoreline North Maintenance Facility-LSI

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.771851° Longitude: -122.303263°

Approximate Surface Elev: 217.6 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	217.4+/-
1.0	**SILTY SAND (SM)**, with gravel, dark brown, moist	216.6+/-
	SAND (SP-SM), with silt, trace gravel, dark gray, medium dense, wet	
	grades to dense	
7.0		210.6+/-
	SAND (SP-SM), with silt and gravel, dark gray, dense, wet	
9.5		208.1+/-
	GRAVEL (GP), with sand, trace silt, very dense, wet	
20.5		197.1+/-
	SANDY SILT (ML), with gravel, gray, hard, wet	
21.5		196.1+/-
	Boring Terminated at 21.5 Feet	

INSTALLATION DETAILS

Well Completion:

Solid 2" PVC pipe packed in bentonite

Slotted 2" PVC pipe packed in sand

Slough in bottom of hole

DEPTH (ft)	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE	SAMPLE NUMBER	OVA/PID
5		6	5-11-10 N=21	GB1-2.5'	<1
		12	11-16-16 N=32		<1
		12	16-19-20 N=39		<1
10		6	20-50/6" N=50/6"		<1
		12	19-25-21 N=46		<1
15		6	50/6" N=50/6"		<1
20		12	30-50/6" N=50/6"		<1

WATER LEVEL OBSERVATIONS

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
2" Monitoring Well

WATER LEVEL OBSERVATIONS

While drilling

See Appendices for description of field procedures.

See Appendices for description of laboratory procedures and additional data (if any).

See Appendices for explanation of symbols and abbreviations.

Elevations were measured in the field using an engineer's level and grade rod.

Notes:

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Well Started: 1/20/2016 | Well Completed: 1/20/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-1

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81155070 BORING LOGS-GEOTECH HOLLOW STEM.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. GB2

PROJECT: Shoreline North Maintenance Facility-LSI

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.772009° Longitude: -122.304141°

Approximate Surface Elev: 223.1 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	222.9+/-
	SILTY SAND (SM), with gravel, trace organics, dark brown, loose, moist	
	grades to very dense, wet	
6.5		216.6+/-
	SAND (SP-SM), with silt and gravel, brown, very dense, wet	
11.0		212.1+/-
	SILTY SAND (SM), with gravel, gray, very dense, wet	
12.0		211.1+/-
	SAND (SP), with gravel, trace silt, brown, very dense, wet	
13.0		210.1+/-
13.5	**SILTY SAND (SM)**, with gravel, brown, very dense, wet	209.6+/-
	GRAVEL (GP), with sand, trace silt, brown, very dense, wet	
21.5		201.6+/-
	Boring Terminated at 21.5 Feet	

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE	SAMPLE NUMBER	OVA/PID
		X	4	2-2-2 N=4	GB2-2.5'	<1
	▽					
5		X	6	8-22-36 N=58		<1
		X	9	24-24-36 N=60		<1
10		X	12	13-23-30 N=53		<1
		X	16	26-41-50/4" N=50/4"		<1
15		X	17	17-37-50/5" N=50/5"		<1
20		X	10	19-50/4" N=50/4"		<1

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/20/2016 | Boring Completed: 1/20/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-2

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81155070 BORING LOGS-GEOTECH HOLLOW STEM.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. GB3

PROJECT: Shoreline North Maintenance Facility-LSI

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.772009° Longitude: -122.305103°

Approximate Surface Elev: 230.2 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.0	**SILTY SAND (SM)**, with gravel, brown, moist	230.2+/-
2.0	**SILTY SANDY GRAVEL (GM)**, trace organics, brown, medium dense, moist	228.2+/-
4.5	**PEAT (PT)**, with silt, dark brown, medium dense, moist	225.7+/-
6.5	**SILT (ML)**, with peat, gray, soft, moist	223.7+/-
9.5	**SILT (ML)**, with organics brown, dark brown, stiff, wet	220.7+/-
10.5	**SANDY GRAVEL (GP-GM)**, with silt, gray, medium dense, wet	219.7+/-
14.5	**SILTY SAND (SM)**, with gravel, gray, medium dense, wet	215.7+/-
21.0	**SANDY SILT (ML)**, gray, medium dense, wet	209.2+/-
21.5	***Boring Terminated at 21.5 Feet***	208.7+/-

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE	SAMPLE NUMBER	OVA/PID
			9	13-11-9 N=20	GB3-2.5'	<1
5			12	3-5-6 N=11		<1
			18	1-1-3 N=4		<1
10	▽		18	9-11-13 N=24		<1
			12	3-11-11 N=22		<1
15			12	3-7-12 N=19		<1
20			18	13-11-8 N=19		<1

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/20/2016 | Boring Completed: 1/20/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-3

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81155070 BORING LOGS-GEOTECH HOLLOW STEM.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. GB4

PROJECT: Shoreline North Maintenance Facility-LSI

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.771746° Longitude: -122.304663°

Approximate Surface Elev: 225.7 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	RECOVERY (In.)	SPT N-VALUE	SAMPLE NUMBER	OVA/PID
0.2	**ASPHALT 1-2"**	225.5+/-				
1.0	**SILTY SAND (SM)**, with gravel, dark brown, moist	224.7+/-				
	SILTY SAND (SM), with gravel, brown, loose, moist		0	3-3-4 N=7		<1
	grades to wet					
4.5		221.2+/-				
	SILT (ML), with organics, dark brown, stiff, wet		18	1-1-7 N=8	GB4-5'	<1
6.0		219.7+/-				
	SILTY SAND (SM), trace gravel, gray, medium dense, wet		9	8-8-20 N=28		<1
	grades to very dense		8	24-25-22 N=47		<1
13.5		212.2+/-	18	21-36-26 N=62		<1
14.0	**GRAVEL (GP)**, with sand, trace silt, gray, very dense, wet	211.7+/-				
	Boring Terminated at 14 Feet					

DEPTH (ft): 5, 10

WATER LEVEL OBSERVATIONS: While drilling

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

While drilling

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/21/2016 | Boring Completed: 1/21/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-4

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81155070 BORING LOGS-GEOTECH HOLLOW STEM.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. GB5

PROJECT: Shoreline North Maintenance Facility-LSI

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.771465° Longitude: -122.303631°

Approximate Surface Elev: 217.3 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)	RECOVERY (In.)	SPT N-VALUE	SAMPLE NUMBER	OVA/PID
0.2	**ASPHALT 1-2"**	217.1+/-				
1.0	**SILTY SAND (SM)**, with gravel, dark brown, moist	216.3+/-				
	SILTY SAND (SM), trace gravel, gray, very loose, moist					
3.0	grades to wet	214.3+/-	6	1-1-1 N=2	GB5-2.5'	<1
	SILT (ML), with organics, dark brown, soft, wet					
	grades to medium dense		12	7-10-13 N=23		<1
5.5		211.8+/-				
	SILTY SAND (SM), with gravel, gray, dense, wet		18	16-16-27 N=43		<1
			12	9-8-24 N=32		<1
12.0		205.3+/-				
	GRAVEL (GP), with sand and silt, gray, very dense, wet		18	16-20-50 N=70		<1
			18	30-23-27 N=50		<1
	grades to medium dense		18	30-29-50 N=79		<1
21.5		195.8+/-				
	Boring Terminated at 21.5 Feet					

DEPTH (ft): 5, 10, 15, 20

WATER LEVEL OBSERVATIONS

SAMPLE TYPE

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.
Elevations were measured in the field using an engineer's level and grade rod.

Notes:

WATER LEVEL OBSERVATIONS

While drilling

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/21/2016 | Boring Completed: 1/21/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-5

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81155070 BORING LOGS-GEOTECH HOLLOW STEM.GPJ TERRACON2012.GDT 2/23/16

BORING LOG NO. GB6

PROJECT: Shoreline North Maintenance Facility-LSI

CLIENT: TCF Architecture
Tacoma, Washington

SITE: 19547 25th Avenue NE
Shoreline, Washington

LOCATION See Exhibit A-2

Latitude: 47.771262° Longitude: -122.303336°

Approximate Surface Elev: 216.9 (Ft.) +/-

DEPTH	MATERIAL DESCRIPTION	ELEVATION (Ft.)
0.2	**ASPHALT 1-2"**	216.7+/-
1.0	**SILTY SAND (SM)**, with gravel, dark brown, moist	215.9+/-
	SILTY SAND (SM), with gravel, gray, loose, moist	
	grades to wet	
4.5		212.4+/-
	SILTY SAND (SM), with gravel, gray, dense, wet	
	grades to very dense	
9.5		207.4+/-
	GRAVELLY SAND (SP), trace silt, gray, very dense, wet	
14.0		202.9+/-
	Boring Terminated at 14 Feet	

DEPTH (ft)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	SPT N-VALUE	SAMPLE NUMBER	OVA/PID
	▽	X	9	4-2-4 N=6	GB6-2.5'	<1
5		X	9	15-16-20 N=36		<1
		X	9	17-22-44 N=66		<1
10		X	18	8-17-24 N=41		<1
		X	18	13-47-50 N=97		<1

The stratification lines represent the approximate transition between differing soil types and/or rock types; in-situ these transitions may be gradual or may occur at different depths than shown.

Hammer Type: Automatic SPT Hammer

Advancement Method:
8" Hollow Stem Auger

Abandonment Method:
Borings backfilled with bentonite chips upon completion

WATER LEVEL OBSERVATIONS

▽ *While drilling*

See Appendices for description of field procedures.
See Appendices for description of laboratory procedures and additional data (if any).
See Appendices for explanation of symbols and abbreviations.
Elevations were measured in the field using an ~~engineer's level and grade rod.~~

Notes:

Terracon
21905 64th Ave. W, Suite 100
Mountlake Terrace, Washington

Boring Started: 1/21/2016 | Boring Completed: 1/21/2016

Drill Rig: B-59 | Driller: Holt Services, Inc.

Project No.: 81157201 | Exhibit: B-6

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ENVIRONMENTAL SMART LOG 81155070 BORING LOGS-GEOTECH HOLLOW STEM.GPJ TERRACON2012.GDT 2/23/16

APPENDIX D
ANALYTICAL REPORTS AND CHAIN OF CUSTODY FORMS

January 18, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On January 12th, 24 samples were received by our laboratory and assigned our laboratory project number EV16010063. The project was identified as your 81157201. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group



Rick Bagan
Laboratory Director

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ALS Group USA, Corp dba ALS Environmental

Environmental www.alsglobal.com
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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 9:25:00 AM
CLIENT SAMPLE ID	B1-3'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	**450**	30	10	MG/KG	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	**4800**	250	10	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	U	500	10	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 9:25:00 AM
CLIENT SAMPLE ID	B1-3'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	**0.013**	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	**0.020**	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	**0.032**	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	**0.041**	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.028**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**1.7**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**35**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**4.8**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 9:25:00 AM
CLIENT SAMPLE ID	B1-3'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT 10X Dilution	NWTPH-GX	**141 GS2**	01/13/2016	PAB
C25 10X Dilution	NWTPH-DX	**116 DS2**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**124**	01/14/2016	DLC
Toluene-d8	EPA-8260	**112**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**90.5**	01/14/2016	DLC

GS2 - Surrogate outside of control limits due to dilution.
U - Analyte analyzed for but not detected at level above reporting limit.
DS2 - Due to high dilution factor surrogate results should be considered uncontrolled.
Chromatogram indicates that it is likely that sample contains highly weathered gasoline and weathered diesel.
Gasoline range product results biased high due to semivolatile range product overlap.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 10:14:00 AM
CLIENT SAMPLE ID	B2-7.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/14/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 10:14:00 AM
CLIENT SAMPLE ID	B2-7.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	U	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**7.5**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**28**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**1.9**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**79.0**	01/14/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 10:14:00 AM
CLIENT SAMPLE ID	B2-7.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**93.1**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**95.0**	01/14/2016	DLC
Toluene-d8	EPA-8260	**94.1**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**106**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 12:10:00 PM
CLIENT SAMPLE ID	B3-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 12:10:00 PM
CLIENT SAMPLE ID	B3-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	U	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**1.6**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**32**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**2.5**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**89.2**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 12:10:00 PM
CLIENT SAMPLE ID	B3-1'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**83.4**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**102**	01/14/2016	DLC
Toluene-d8	EPA-8260	**96.7**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**105**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-06
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 2:20:00 PM
CLIENT SAMPLE ID	MW1-3.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	**130**	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	**330**	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-06
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 2:20:00 PM
CLIENT SAMPLE ID	MW1-3.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.023**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**2.7**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**32**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**5.1**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**87.4**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-06
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 2:20:00 PM
CLIENT SAMPLE ID	MW1-3.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**93.0**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**98.2**	01/14/2016	DLC
Toluene-d8	EPA-8260	**94.4**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**102**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains bunker C.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-07
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 3:30:00 PM
CLIENT SAMPLE ID	B4-4'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-07
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 3:30:00 PM
CLIENT SAMPLE ID	B4-4'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.027**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**3.3**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**24**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**21**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**86.4**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-07
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 3:30:00 PM
CLIENT SAMPLE ID	B4-4'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**76.7**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**101**	01/14/2016	DLC
Toluene-d8	EPA-8260	**95.9**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**105**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-09
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 9:51:00 AM
CLIENT SAMPLE ID	B5-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	**95**	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-09
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 9:51:00 AM
CLIENT SAMPLE ID	B5-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.021**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**1.7**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**43**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**4.3**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**87.9**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-09
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 9:51:00 AM
CLIENT SAMPLE ID	B5-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**101**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**99.0**	01/14/2016	DLC
Toluene-d8	EPA-8260	**95.7**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**103**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-10
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:30:00 AM
CLIENT SAMPLE ID	B6-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	**59**	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	**95**	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	**0.49**	0.15	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-10
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:30:00 AM
CLIENT SAMPLE ID	B6-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.049**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**13**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**34**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**13**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**99.8**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-10
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:30:00 AM
CLIENT SAMPLE ID	B6-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**96.8**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**90.3**	01/14/2016	DLC
1,2-Dichloroethane-d4	EPA-8260	**96.2**	01/14/2016	DLC
Toluene-d8	EPA-8260	**96.8**	01/14/2016	DLC
Toluene-d8	EPA-8260	**93.6**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**100**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**105**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains an unidentified diesel range product and an unidentified oil range product.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-11
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 11:26:00 AM
CLIENT SAMPLE ID	MW2-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	**7.5**	3.0	1	MG/KG	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	**29**	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	**77**	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	**0.24**	0.20	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-11
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 11:26:00 AM
CLIENT SAMPLE ID	MW2-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.053**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**7.9**	1.2	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**38**	0.59	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**30**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**90.0**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-11
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 11:26:00 AM
CLIENT SAMPLE ID	MW2-2'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**100**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**87.8**	01/14/2016	DLC
1,2-Dichloroethane-d4	EPA-8260	**84.6**	01/14/2016	DLC
Toluene-d8	EPA-8260	**102**	01/14/2016	DLC
Toluene-d8	EPA-8260	**96.6**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**101**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**98.0**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains an unidentified diesel range product and an unidentified oil range product.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-13
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 12:24:00 PM
CLIENT SAMPLE ID	MW3-1.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/14/2016	PAB
TPH-Diesel Range	NWTPH-DX	**110**	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	**240**	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-13
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 12:24:00 PM
CLIENT SAMPLE ID	MW3-1.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.046**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**3.1**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**35**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**75**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**103**	01/14/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-13
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 12:24:00 PM
CLIENT SAMPLE ID	MW3-1.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**84.8**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**117**	01/14/2016	DLC
Toluene-d8	EPA-8260	**95.3**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**104**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel and lube oil.
Diesel range product results biased high due to oil range product overlap.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-14
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 12:31:00 PM
CLIENT SAMPLE ID	MW3-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/14/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-14
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 12:31:00 PM
CLIENT SAMPLE ID	MW3-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.034**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**3.0**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**37**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**2.4**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**93.6**	01/14/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-14
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 12:31:00 PM
CLIENT SAMPLE ID	MW3-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**127**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**94.4**	01/14/2016	DLC
Toluene-d8	EPA-8260	**93.5**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**103**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-15
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 11:15:00 AM
CLIENT SAMPLE ID	B7-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/14/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-15
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 11:15:00 AM
CLIENT SAMPLE ID	B7-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/14/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/14/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/14/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/14/2016	DLC
Mercury	EPA-7471	**0.025**	0.020	1	MG/KG	01/13/2016	RAL
Arsenic	EPA-6020	**6.1**	1.0	5	MG/KG	01/13/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/13/2016	RAL
Chromium	EPA-6020	**30**	0.50	5	MG/KG	01/13/2016	RAL
Lead	EPA-6020	**8.0**	0.50	5	MG/KG	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**90.3**	01/14/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-15
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 11:15:00 AM
CLIENT SAMPLE ID	B7-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**106**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**100**	01/14/2016	DLC
Toluene-d8	EPA-8260	**94.9**	01/14/2016	DLC
4-Bromofluorobenzene	EPA-8260	**102**	01/14/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-18
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 11:10:00 AM
CLIENT SAMPLE ID	B1-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	**870**	130	1	UG/L	01/13/2016	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	01/13/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/13/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/13/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/13/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-18
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 11:10:00 AM
CLIENT SAMPLE ID	B1-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/13/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/13/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/15/2016	RAL
Arsenic	EPA-200.8	**5.2**	1.0	1	UG/L	01/13/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/13/2016	RAL
Chromium	EPA-200.8	U	2.0	1	UG/L	01/13/2016	RAL
Lead	EPA-200.8	U	1.0	1	UG/L	01/13/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**92.4**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-18
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 11:10:00 AM
CLIENT SAMPLE ID	B1-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**86.5**	01/13/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**98.3**	01/13/2016	DLC
Toluene-d8	EPA-8260	**95.2**	01/13/2016	DLC
4-Bromofluorobenzene	EPA-8260	**103**	01/13/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-19
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 11:05:00 AM
CLIENT SAMPLE ID	B2-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	200	1	UG/L	01/13/2016	EBS
TPH-Oil Range	NWTPH-DX	**1600**	250	1	UG/L	01/13/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/13/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/13/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/13/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-19
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 11:05:00 AM
CLIENT SAMPLE ID	B2-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/13/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/13/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/15/2016	RAL
Arsenic	EPA-200.8	**4.7**	1.0	1	UG/L	01/15/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL
Chromium	EPA-200.8	**4.6**	2.0	1	UG/L	01/15/2016	RAL
Lead	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**91.8**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-19
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 11:05:00 AM
CLIENT SAMPLE ID	B2-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**89.8**	01/13/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**101**	01/13/2016	DLC
Toluene-d8	EPA-8260	**95.4**	01/13/2016	DLC
4-Bromofluorobenzene	EPA-8260	**103**	01/13/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.
Diesel range product reporting limits raised due to motor oil range product overlap.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-20
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 12:55:00 PM
CLIENT SAMPLE ID	B3-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	01/13/2016	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	01/13/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/13/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/13/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/13/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-20
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 12:55:00 PM
CLIENT SAMPLE ID	B3-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/13/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/13/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/15/2016	RAL
Arsenic	EPA-200.8	**4.2**	1.0	1	UG/L	01/15/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL
Chromium	EPA-200.8	**17**	2.0	1	UG/L	01/15/2016	RAL
Lead	EPA-200.8	**2.1**	1.0	1	UG/L	01/15/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**94.2**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-20
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 12:55:00 PM
CLIENT SAMPLE ID	B3-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**90.6**	01/13/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**99.0**	01/13/2016	DLC
Toluene-d8	EPA-8260	**95.4**	01/13/2016	DLC
4-Bromofluorobenzene	EPA-8260	**110**	01/13/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-21
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 3:50:00 PM
CLIENT SAMPLE ID	B4-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	01/13/2016	EBS
TPH-Oil Range	NWTPH-DX	**730**	250	1	UG/L	01/13/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/13/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/13/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/13/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-21
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 3:50:00 PM
CLIENT SAMPLE ID	B4-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/13/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/13/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/15/2016	RAL
Arsenic	EPA-200.8	**2.1**	1.0	1	UG/L	01/15/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL
Chromium	EPA-200.8	U	2.0	1	UG/L	01/15/2016	RAL
Lead	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**90.5**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-21
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/11/2016 3:50:00 PM
CLIENT SAMPLE ID	B4-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**90.4**	01/13/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**101**	01/13/2016	DLC
Toluene-d8	EPA-8260	**97.0**	01/13/2016	DLC
4-Bromofluorobenzene	EPA-8260	**111**	01/13/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-22
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:00:00 AM
CLIENT SAMPLE ID	B5-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	01/13/2016	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	01/13/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/13/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/13/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/13/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-22
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:00:00 AM
CLIENT SAMPLE ID	B5-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/13/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/13/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/15/2016	RAL
Arsenic	EPA-200.8	**5.5**	1.0	1	UG/L	01/15/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL
Chromium	EPA-200.8	**16**	2.0	1	UG/L	01/15/2016	RAL
Lead	EPA-200.8	**1.7**	1.0	1	UG/L	01/15/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**89.2**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-22
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:00:00 AM
CLIENT SAMPLE ID	B5-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**91.1**	01/13/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**99.5**	01/13/2016	DLC
Toluene-d8	EPA-8260	**95.9**	01/13/2016	DLC
4-Bromofluorobenzene	EPA-8260	**109**	01/13/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-23
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:53:00 AM
CLIENT SAMPLE ID	B6-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/13/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	01/13/2016	EBS
TPH-Oil Range	NWTPH-DX	**520**	250	1	UG/L	01/13/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/13/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/13/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/13/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/18/2016 EV16010063 EV16010063-23
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:53:00 AM
CLIENT SAMPLE ID	B6-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/13/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/13/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/13/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/13/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/15/2016	RAL
Arsenic	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL
Chromium	EPA-200.8	U	2.0	1	UG/L	01/15/2016	RAL
Lead	EPA-200.8	U	1.0	1	UG/L	01/15/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**89.0**	01/13/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS JOB#:	EV16010063
		ALS SAMPLE#:	EV16010063-23
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/12/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/12/2016 10:53:00 AM
CLIENT SAMPLE ID	B6-W	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**90.1**	01/13/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**101**	01/13/2016	DLC
Toluene-d8	EPA-8260	**97.3**	01/13/2016	DLC
4-Bromofluorobenzene	EPA-8260	**104**	01/13/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/18/2016
ALS SDG#: EV16010063
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBG-011316S - Batch 100547 - Soil by NWTPH-GX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	MG/KG	3.0	01/13/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MBG-011216W - Batch 100477 - Water by NWTPH-GX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	UG/L	50	01/12/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011516S - Batch 100576 - Soil by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	MG/KG	25	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	U	MG/KG	50	01/15/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-010816W - Batch 100417 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	UG/L	130	01/08/2016	EBS
TPH-Oil Range	NWTPH-DX	U	UG/L	250	01/08/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011316S - Batch 100606 - Soil by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Chloromethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Vinyl Chloride	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Bromomethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Chloroethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Carbon Tetrachloride	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Trichlorofluoromethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Carbon Disulfide	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Acetone	EPA-8260	U	MG/KG	0.050	01/13/2016	DLC
1,1-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Methylene Chloride	EPA-8260	U	MG/KG	0.020	01/13/2016	DLC
Acrylonitrile	EPA-8260	U	MG/KG	0.050	01/13/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 1/18/2016
ALS SDG#: EV16010063
WDOE ACCREDITATION: C601

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

LABORATORY BLANK RESULTS

MB-011316S - Batch 100606 - Soil by EPA-8260

Methyl T-Butyl Ether	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,1-Dichloroethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
2-Butanone	EPA-8260	U	MG/KG	0.050	01/13/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
2,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Bromochloromethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Chloroform	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,1-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,2-Dichloroethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Benzene	EPA-8260	U	MG/KG	0.0050	01/13/2016	DLC
Trichloroethene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Dibromomethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Bromodichloromethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	MG/KG	0.050	01/13/2016	DLC
Toluene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
2-Hexanone	EPA-8260	U	MG/KG	0.050	01/13/2016	DLC
1,3-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Tetrachloroethylene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Dibromochloromethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,2-Dibromoethane	EPA-8260	U	MG/KG	0.0050	01/13/2016	DLC
Chlorobenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Ethylbenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
m,p-Xylene	EPA-8260	U	MG/KG	0.020	01/13/2016	DLC
Styrene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
o-Xylene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Bromoform	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Isopropylbenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Bromobenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
N-Propyl Benzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
2-Chlorotoluene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
4-Chlorotoluene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
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Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/18/2016
ALS SDG#: EV16010063
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-011316S - Batch 100606 - Soil by EPA-8260

T-Butyl Benzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
S-Butyl Benzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
P-Isopropyltoluene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
N-Butylbenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	MG/KG	0.050	01/13/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Hexachlorobutadiene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
Naphthalene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	01/13/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

MB-010816W - Batch 100406 - Water by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Chloromethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Vinyl Chloride	EPA-8260	U	UG/L	0.20	01/08/2016	DLC
Bromomethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Chloroethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Carbon Tetrachloride	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Trichlorofluoromethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Carbon Disulfide	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Acetone	EPA-8260	U	UG/L	25	01/08/2016	DLC
1,1-Dichloroethene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Methylene Chloride	EPA-8260	U	UG/L	5.0	01/08/2016	DLC
Acrylonitrile	EPA-8260	U	UG/L	10	01/08/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,1-Dichloroethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
2-Butanone	EPA-8260	U	UG/L	10	01/08/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
2,2-Dichloropropane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Bromochloromethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Chloroform	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,1-Dichloropropene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,2-Dichloroethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC

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CERTIFICATE OF ANALYSIS

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21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

DATE: 1/18/2016
ALS SDG#: EV16010063
WDOE ACCREDITATION: C601

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

LABORATORY BLANK RESULTS

MB-010816W - Batch 100406 - Water by EPA-8260

Benzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Trichloroethene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,2-Dichloropropane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Dibromomethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Bromodichloromethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	UG/L	10	01/08/2016	DLC
Toluene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
2-Hexanone	EPA-8260	U	UG/L	10	01/08/2016	DLC
1,3-Dichloropropane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Tetrachloroethylene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Dibromochloromethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,2-Dibromoethane	EPA-8260	U	UG/L	0.010	01/08/2016	DLC
Chlorobenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Ethylbenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
m,p-Xylene	EPA-8260	U	UG/L	4.0	01/08/2016	DLC
Styrene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
o-Xylene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Bromoform	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Isopropylbenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Bromobenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
N-Propyl Benzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
2-Chlorotoluene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
4-Chlorotoluene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
T-Butyl Benzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
S-Butyl Benzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
P-Isopropyltoluene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
N-Butylbenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	UG/L	10	01/08/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
Hexachlorobutadiene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC

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CLIENT PROJECT: 81157201

DATE: 1/18/2016
ALS SDG#: EV16010063
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-010816W - Batch 100406 - Water by EPA-8260

Naphthalene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	UG/L	2.0	01/08/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-267741 - Batch R267741 - Soil by EPA-7471

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-7471	U	MG/KG	0.020	01/13/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-1152016 - Batch R267783 - Water by EPA-245.1

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-245.1	U	UG/L	0.20	01/15/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011316S - Batch 100526 - Soil by EPA-6020

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-6020	U	MG/KG	0.20	01/13/2016	RAL
Cadmium	EPA-6020	U	MG/KG	0.10	01/13/2016	RAL
Chromium	EPA-6020	U	MG/KG	0.10	01/13/2016	RAL
Lead	EPA-6020	U	MG/KG	0.10	01/13/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011316W - Batch 100524 - Water by EPA-200.8

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-200.8	U	UG/L	1.0	01/13/2016	RAL
Cadmium	EPA-200.8	U	UG/L	1.0	01/13/2016	RAL
Chromium	EPA-200.8	U	UG/L	2.0	01/13/2016	RAL
Lead	EPA-200.8	U	UG/L	1.0	01/13/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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DATE: 1/18/2016
ALS SDG#: EV16010063
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 100547 - Soil by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	82.6			01/13/2016	PAB
TPH-Volatile Range - BSD	NWTPH-GX	82.9	0		01/13/2016	PAB

ALS Test Batch ID: 100477 - Water by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	93.3			01/12/2016	PAB
TPH-Volatile Range - BSD	NWTPH-GX	91.6	2		01/12/2016	PAB

ALS Test Batch ID: 100576 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	104			01/15/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	94.9	9		01/15/2016	EBS

ALS Test Batch ID: 100417 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	83.0			01/08/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	92.0	10		01/08/2016	EBS

ALS Test Batch ID: 100606 - Soil by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	89.0			01/14/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	85.6	4		01/14/2016	DLC
Benzene - BS	EPA-8260	94.7			01/14/2016	DLC
Benzene - BSD	EPA-8260	94.1	1		01/14/2016	DLC
Trichloroethene - BS	EPA-8260	93.4			01/14/2016	DLC
Trichloroethene - BSD	EPA-8260	91.8	2		01/14/2016	DLC
Toluene - BS	EPA-8260	88.2			01/14/2016	DLC
Toluene - BSD	EPA-8260	86.8	1		01/14/2016	DLC
Chlorobenzene - BS	EPA-8260	86.0			01/14/2016	DLC
Chlorobenzene - BSD	EPA-8260	85.6	1		01/14/2016	DLC

ALS Test Batch ID: 100406 - Water by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	127			01/08/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/18/2016
ALS SDG#: EV16010063
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BSD	EPA-8260	**115**	**10**		01/08/2016	DLC
Benzene - BS	EPA-8260	**124**			01/08/2016	DLC
Benzene - BSD	EPA-8260	**113**	**9**		01/08/2016	DLC
Trichloroethene - BS	EPA-8260	**121**			01/08/2016	DLC
Trichloroethene - BSD	EPA-8260	**112**	**8**		01/08/2016	DLC
Toluene - BS	EPA-8260	**111**			01/08/2016	DLC
Toluene - BSD	EPA-8260	**103**	**8**		01/08/2016	DLC
Chlorobenzene - BS	EPA-8260	**104**			01/08/2016	DLC
Chlorobenzene - BSD	EPA-8260	**95.9**	**8**		01/08/2016	DLC

ALS Test Batch ID: R267741 - Soil by EPA-7471

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-7471	**94.2**			01/13/2016	RAL
Mercury - BSD	EPA-7471	**96.9**	**3**		01/13/2016	RAL

ALS Test Batch ID: R267783 - Water by EPA-245.1

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-245.1	**100**			01/15/2016	RAL
Mercury - BSD	EPA-245.1	**99.0**	**1**		01/15/2016	RAL

ALS Test Batch ID: 100526 - Soil by EPA-6020

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-6020	**108**			01/13/2016	RAL
Arsenic - BSD	EPA-6020	**111**	**3**		01/13/2016	RAL
Cadmium - BS	EPA-6020	**111**			01/13/2016	RAL
Cadmium - BSD	EPA-6020	**112**	**1**		01/13/2016	RAL
Chromium - BS	EPA-6020	**112**			01/13/2016	RAL
Chromium - BSD	EPA-6020	**113**	**1**		01/13/2016	RAL
Lead - BS	EPA-6020	**111**			01/13/2016	RAL
Lead - BSD	EPA-6020	**112**	**1**		01/13/2016	RAL

ALS Test Batch ID: 100524 - Water by EPA-200.8

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-200.8	**109**			01/13/2016	RAL
Arsenic - BSD	EPA-200.8	**110**	**1**		01/13/2016	RAL
Cadmium - BS	EPA-200.8	**106**			01/13/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/18/2016
		ALS SDG#:	EV16010063
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Cadmium - BSD	EPA-200.8	**111**	**5**		01/13/2016	RAL
Chromium - BS	EPA-200.8	**107**			01/13/2016	RAL
Chromium - BSD	EPA-200.8	**109**	**2**		01/13/2016	RAL
Lead - BS	EPA-200.8	**104**			01/13/2016	RAL
Lead - BSD	EPA-200.8	**109**	**5**		01/13/2016	RAL

APPROVED BY



Laboratory Director

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Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1601063

Date 1/12/16 Page 1 Of 2

PROJECT ID: 81157201
REPORT TO COMPANY: Terracon
PROJECT MANAGER: Mike Noll
ADDRESS: 21905 64th Ave W Ste 200
Mountlake Terrace, WA 98043
PHONE: 425-771-3304 FAX:
P.O. #: E-MAIL: mnoll@terracon.com
INVOICE TO COMPANY:
ATTENTION: Same
ADDRESS:

ANALYSIS REQUESTED

OTHER (Specify)

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA 8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 X RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	Hold	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. B1-3'	1/11/16	9:25	Soil	1		X	X	X			X						X				4	
2. B2-7.5'		10:14		2		X	X	X			X						X				4	
3. B2-1'		10:19		3																X	4	
4. B3-1'		12:10		4		X	X	X			X						X				4	
5. B3-5'		12:20		5																X	4	
6. MW1-3.5'		14:20		6		X	X	X			X						X				4	
7. B4-4'	⇓	15:30		7		X	X	X			X						X				4	
8. B5-1.5'	1/11/16	9:40		8																X	4	
9. B5-5'	↓	9:51		9		X	X				X						X				4	
10. B6-5'	⇓	10:30	⇓	10		X	X				X						X				4	

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Terracon 1/12/16 4:05
Received By: ALS 1/12/16 4:05
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | SAME DAY

OTHER: Specify: per national account

*Turnaround request less than standard may incur Rush Charges

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
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Fax (425) 356-2626
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Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1601006 3

Date 1/12/16 Page 2 Of 3

PROJECT ID:
REPORT TO COMPANY: See page 1
PROJECT MANAGER:
ADDRESS:
PHONE: FAX:
P.O. #: E-MAIL:
INVOICE TO COMPANY:
ATTENTION:
ADDRESS:

ANALYSIS REQUESTED / OTHER (Specify)

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA 8021 (SKL)	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 X RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐							PAH		NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. MW2-2'	1/12/16	11:26	Soil	11		X	X	X			X						X											4	
2. MW2-5'	↓	11:39	↓	12																						X		4	
3. MW3-1.5'		12:24		13		X	X				X						X											4	
4. MW3-5'		12:31		14		X	X	X			X						X											4	
5. B7-1'		11:15		15		X	X				X						X											4	
6. B7-1.5'		11:38		16																						X		4	
7. B7-2.5'		12:40		17																						X		4	
8. B1-W	1/11/16	11:10	Water	18		X	X				X						X											7	
9. B2-W	↓	11:05	↓	19		X	X				X						X											7	
10. B3-W		12:55		20		X	X				X						X											7	

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: [signature] Terracon 1/12/16 4:05
   Received By: [signature] ALS 1/12/16 4:05
2. Relinquished By: _____
   Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | (5) | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: (5) Standard | 3 | 1 | SAME DAY

OTHER: Specify: per national account

*Turnaround request less than standard may incur Rush Charges

ALS Environmental
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Everett, WA 98208
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Fax (425) 356-2626
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Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1601 0063

Date 1/12/16 Page 3 Of 3

PROJECT ID:
REPORT TO COMPANY: See page
PROJECT MANAGER:
ADDRESS:
PHONE: FAX:
P.O. #: E-MAIL:
INVOICE TO COMPANY:
ATTENTION:
ADDRESS:

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	~~BTEX by EPA 8021~~ SKL	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 X RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. B4-W	1/11/16	15:50	Water	21		X	X	X			X						X				7	
2. B5-W	1/12/16	10:00	"	22		X	X	X			X						X				7	
3. B6-W	1/12/16	10:53	"	23		X	X	X			X						X				7	
4. Trip Blank	1/12/16	0000	W	24																	2	
5.																						
6.																						
7.																						
8.																						
9.																						
10.																						

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: [illegible] Terracon 1/12/16 4:05
   Received By: [illegible] ALS 1-12-16 9:05
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | (5) | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: (5) Standard | 3 | 1 | SAME DAY

OTHER: Specify: Perrational account

*Turnaround request less than standard may incur Rush Charges

January 22, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On January 15th, 2 samples were received by our laboratory and assigned our laboratory project number EV16010093. The project was identified as your 81157201. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group



Rick Bagan
Laboratory Director

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/22/2016
		ALS JOB#:	EV16010093
		ALS SAMPLE#:	EV16010093-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/15/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/15/2016 10:30:00 AM
CLIENT SAMPLE ID	MW1A	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/16/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	**410**	250	1	UG/L	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/16/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/16/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/16/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/22/2016
		ALS JOB#:	EV16010093
		ALS SAMPLE#:	EV16010093-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/15/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/15/2016 10:30:00 AM
CLIENT SAMPLE ID	MW1A	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/16/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/16/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/21/2016	RAL
Arsenic	EPA-200.8	**1.0**	1.0	1	UG/L	01/20/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/20/2016	RAL
Chromium	EPA-200.8	U	2.0	1	UG/L	01/20/2016	RAL
Lead	EPA-200.8	U	1.0	1	UG/L	01/20/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/22/2016
		ALS JOB#:	EV16010093
		ALS SAMPLE#:	EV16010093-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/15/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/15/2016 10:30:00 AM
CLIENT SAMPLE ID	MW1A	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**90.1**	01/16/2016	PAB
C25	NWTPH-DX	**110**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**99.6**	01/16/2016	DLC
Toluene-d8	EPA-8260	**95.2**	01/16/2016	DLC
4-Bromofluorobenzene	EPA-8260	**107**	01/16/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/22/2016
		ALS JOB#:	EV16010093
		ALS SAMPLE#:	EV16010093-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/15/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/15/2016 9:34:00 AM
CLIENT SAMPLE ID	MW2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/16/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	130	1	UG/L	01/15/2016	EBS
TPH-Oil Range	NWTPH-DX	**500**	250	1	UG/L	01/15/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/16/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/16/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/16/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/22/2016
		ALS JOB#:	EV16010093
		ALS SAMPLE#:	EV16010093-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/15/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/15/2016 9:34:00 AM
CLIENT SAMPLE ID	MW2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/16/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/16/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/16/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/16/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/21/2016	RAL
Arsenic	EPA-200.8	U	1.0	1	UG/L	01/20/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/20/2016	RAL
Chromium	EPA-200.8	U	2.0	1	UG/L	01/20/2016	RAL
Lead	EPA-200.8	U	1.0	1	UG/L	01/20/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**97.3**	01/16/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/22/2016 EV16010093 EV16010093-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/15/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/15/2016 9:34:00 AM
CLIENT SAMPLE ID	MW2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**111**	01/15/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**100**	01/16/2016	DLC
Toluene-d8	EPA-8260	**95.6**	01/16/2016	DLC
4-Bromofluorobenzene	EPA-8260	**104**	01/16/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/22/2016
ALS SDG#: EV16010093
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBG-011516W - Batch 100570 - Water by NWTPH-GX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	UG/L	50	01/15/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011416W - Batch 100542 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	UG/L	130	01/14/2016	EBS
TPH-Oil Range	NWTPH-DX	U	UG/L	250	01/14/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011516W - Batch 100571 - Water by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Chloromethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Vinyl Chloride	EPA-8260	U	UG/L	0.20	01/15/2016	DLC
Bromomethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Chloroethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Carbon Tetrachloride	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Trichlorofluoromethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Carbon Disulfide	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Acetone	EPA-8260	U	UG/L	25	01/15/2016	DLC
1,1-Dichloroethene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Methylene Chloride	EPA-8260	U	UG/L	5.0	01/15/2016	DLC
Acrylonitrile	EPA-8260	U	UG/L	10	01/15/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,1-Dichloroethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
2-Butanone	EPA-8260	U	UG/L	10	01/15/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
2,2-Dichloropropane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Bromochloromethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Chloroform	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,1-Dichloropropene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,2-Dichloroethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Benzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Trichloroethene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/22/2016
ALS SDG#: EV16010093
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-011516W - Batch 100571 - Water by EPA-8260

1,2-Dichloropropane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Dibromomethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Bromodichloromethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	UG/L	10	01/15/2016	DLC
Toluene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
2-Hexanone	EPA-8260	U	UG/L	10	01/15/2016	DLC
1,3-Dichloropropane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Tetrachloroethylene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Dibromochloromethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,2-Dibromoethane	EPA-8260	U	UG/L	0.010	01/15/2016	DLC
Chlorobenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Ethylbenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
m,p-Xylene	EPA-8260	U	UG/L	4.0	01/15/2016	DLC
Styrene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
o-Xylene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Bromoform	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Isopropylbenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Bromobenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
N-Propyl Benzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
2-Chlorotoluene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
4-Chlorotoluene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
T-Butyl Benzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
S-Butyl Benzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
P-Isopropyltoluene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
N-Butylbenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	UG/L	10	01/15/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Hexachlorobutadiene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
Naphthalene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	UG/L	2.0	01/15/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/22/2016
		ALS SDG#:	EV16010093
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY BLANK RESULTS

MB-011516W - Batch 100571 - Water by EPA-8260

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-268111 - Batch R268111 - Water by EPA-245.1

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-245.1	U	UG/L	0.20	01/21/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011916W - Batch 100666 - Water by EPA-200.8

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-200.8	U	UG/L	1.0	01/20/2016	RAL
Cadmium	EPA-200.8	U	UG/L	1.0	01/20/2016	RAL
Chromium	EPA-200.8	U	UG/L	2.0	01/20/2016	RAL
Lead	EPA-200.8	U	UG/L	1.0	01/20/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/22/2016
ALS SDG#: EV16010093
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 100570 - Water by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	**93.9**			01/15/2016	PAB
TPH-Volatile Range - BSD	NWTPH-GX	**92.8**	**1**		01/15/2016	PAB

ALS Test Batch ID: 100542 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**93.1**			01/14/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**99.8**	**7**		01/14/2016	EBS

ALS Test Batch ID: 100571 - Water by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	**115**			01/15/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	**120**	**4**		01/15/2016	DLC
Benzene - BS	EPA-8260	**109**			01/15/2016	DLC
Benzene - BSD	EPA-8260	**120**	**9**		01/15/2016	DLC
Trichloroethene - BS	EPA-8260	**107**			01/15/2016	DLC
Trichloroethene - BSD	EPA-8260	**114**	**6**		01/15/2016	DLC
Toluene - BS	EPA-8260	**98.3**			01/15/2016	DLC
Toluene - BSD	EPA-8260	**104**	**6**		01/15/2016	DLC
Chlorobenzene - BS	EPA-8260	**90.7**			01/15/2016	DLC
Chlorobenzene - BSD	EPA-8260	**95.7**	**5**		01/15/2016	DLC

ALS Test Batch ID: R268111 - Water by EPA-245.1

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-245.1	**97.0**			01/21/2016	RAL
Mercury - BSD	EPA-245.1	**97.0**	**0**		01/21/2016	RAL

ALS Test Batch ID: 100666 - Water by EPA-200.8

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-200.8	**96.6**			01/20/2016	RAL
Arsenic - BSD	EPA-200.8	**97.9**	**1**		01/20/2016	RAL
Cadmium - BS	EPA-200.8	**97.4**			01/20/2016	RAL
Cadmium - BSD	EPA-200.8	**99.4**	**2**		01/20/2016	RAL
Chromium - BS	EPA-200.8	**97.1**			01/20/2016	RAL
Chromium - BSD	EPA-200.8	**99.1**	**2**		01/20/2016	RAL
Lead - BS	EPA-200.8	**94.9**			01/20/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/22/2016
		ALS SDG#:	EV16010093
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Lead - BSD	EPA-200.8	**96.5**	**2**		01/20/2016	RAL

APPROVED BY



Laboratory Director

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Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1610093

Date 1/15/16 Page 1 Of 1

PROJECT ID: 81157201
REPORT TO COMPANY: Terracon
PROJECT MANAGER: Mike Noll
ADDRESS: 21905 64th Ave W Ste 200
Mountlake Terrace, WA 98043
PHONE: 425-771-3304 FAX:
P.O. #: E-MAIL: mdnoll@terracon.com
INVOICE TO COMPANY:
ATTENTION: Same
ADDRESS:

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☒ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. MW1A	1/15/16	10:30	GW	1		X	X				X						X				7	
2. MW2	1/15/16	9:34	GW	2		X	X				X						X				7	
3.																						
4.																						
5.																						
6.																						
7.																						
8.																						
9.																						
10.																						

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: [signature] Terracon 1/15/16 2:00pm
Received By: [signature] ALS 1-15-16 2:00
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | (5) | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: (5) Standard | 3 | 1 | SAME DAY

OTHER: Specify: Ref national account

*Turnaround request less than standard may incur Rush Charges

January 27, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On January 20th, 2 samples were received by our laboratory and assigned our laboratory project number EV16010119. The project was identified as your 81157201. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group



Rick Bagan
Laboratory Director

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010119
		ALS SAMPLE#:	EV16010119-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/20/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/20/2016 11:05:00 AM
CLIENT SAMPLE ID	GB1-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/20/2016	PAB
TPH-Diesel Range	NWTPH-DX	**200**	25	1	MG/KG	01/25/2016	EBS
TPH-Oil Range	NWTPH-DX	**510**	50	1	MG/KG	01/25/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/21/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/21/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010119
		ALS SAMPLE#:	EV16010119-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/20/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/20/2016 11:05:00 AM
CLIENT SAMPLE ID	GB1-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/21/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/21/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Mercury	EPA-7471	U	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**2.7**	1.0	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**32**	0.50	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**4.7**	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010119 EV16010119-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/20/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/20/2016 11:05:00 AM
CLIENT SAMPLE ID	GB1-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**98.0**	01/20/2016	PAB
C25	NWTPH-DX	**106**	01/25/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**124**	01/21/2016	DLC
Toluene-d8	EPA-8260	**97.2**	01/21/2016	DLC
4-Bromofluorobenzene	EPA-8260	**104**	01/21/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel and lube oil.
Diesel range product reporting limits raised due to motor oil range product overlap.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010119
		ALS SAMPLE#:	EV16010119-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/20/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/20/2016 2:15:00 PM
CLIENT SAMPLE ID	GB2-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/20/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/26/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/26/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/21/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/21/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010119 EV16010119-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/20/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/20/2016 2:15:00 PM
CLIENT SAMPLE ID	GB2-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/21/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/21/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/21/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/21/2016	DLC
Mercury	EPA-7471	**0.038**	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**3.4**	1.0	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**22**	0.50	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**6.6**	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**99.0**	01/20/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010119
		ALS SAMPLE#:	EV16010119-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/20/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/20/2016 2:15:00 PM
CLIENT SAMPLE ID	GB2-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**109**	01/26/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**127**	01/21/2016	DLC
Toluene-d8	EPA-8260	**99.5**	01/21/2016	DLC
4-Bromofluorobenzene	EPA-8260	**100**	01/21/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/27/2016
ALS SDG#: EV16010119
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBG-011916S - Batch 100659 - Soil by NWTPH-GX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	MG/KG	3.0	01/19/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012516S - Batch 100888 - Soil by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	MG/KG	25	01/25/2016	EBS
TPH-Oil Range	NWTPH-DX	U	MG/KG	50	01/25/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012016S - Batch 100754 - Soil by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Chloromethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Vinyl Chloride	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Bromomethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Chloroethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Carbon Tetrachloride	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Trichlorofluoromethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Carbon Disulfide	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Acetone	EPA-8260	U	MG/KG	0.050	01/20/2016	DLC
1,1-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Methylene Chloride	EPA-8260	U	MG/KG	0.020	01/20/2016	DLC
Acrylonitrile	EPA-8260	U	MG/KG	0.050	01/20/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,1-Dichloroethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
2-Butanone	EPA-8260	U	MG/KG	0.050	01/20/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
2,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Bromochloromethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Chloroform	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,1-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,2-Dichloroethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Benzene	EPA-8260	U	MG/KG	0.0050	01/20/2016	DLC
Trichloroethene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/27/2016
ALS SDG#: EV16010119
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-012016S - Batch 100754 - Soil by EPA-8260

1,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Dibromomethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Bromodichloromethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	MG/KG	0.050	01/20/2016	DLC
Toluene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
2-Hexanone	EPA-8260	U	MG/KG	0.050	01/20/2016	DLC
1,3-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Tetrachloroethylene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Dibromochloromethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,2-Dibromoethane	EPA-8260	U	MG/KG	0.0050	01/20/2016	DLC
Chlorobenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Ethylbenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
m,p-Xylene	EPA-8260	U	MG/KG	0.020	01/20/2016	DLC
Styrene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
o-Xylene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Bromoform	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Isopropylbenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Bromobenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
N-Propyl Benzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
2-Chlorotoluene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
4-Chlorotoluene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
T-Butyl Benzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
S-Butyl Benzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
P-Isopropyltoluene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
N-Butylbenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	MG/KG	0.050	01/20/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Hexachlorobutadiene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
Naphthalene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	01/20/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS SDG#:	EV16010119
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY BLANK RESULTS

MB-012016S - Batch 100754 - Soil by EPA-8260

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-1222016 - Batch R268308 - Soil by EPA-7471

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-7471	U	MG/KG	0.020	01/22/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012216S - Batch 100834 - Soil by EPA-6020

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-6020	U	MG/KG	0.20	01/26/2016	RAL
Cadmium	EPA-6020	U	MG/KG	0.10	01/26/2016	RAL
Chromium	EPA-6020	U	MG/KG	0.10	01/26/2016	RAL
Lead	EPA-6020	U	MG/KG	0.10	01/26/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/27/2016
ALS SDG#: EV16010119
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 100659 - Soil by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	**85.9**			01/19/2016	PAB
TPH-Volatile Range - BSD	NWTPH-GX	**87.9**	**2**		01/19/2016	PAB

ALS Test Batch ID: 100888 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**97.7**			01/25/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**100**	**3**		01/25/2016	EBS

ALS Test Batch ID: 100754 - Soil by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	**86.6**			01/20/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	**87.3**	**1**		01/20/2016	DLC
Benzene - BS	EPA-8260	**104**			01/20/2016	DLC
Benzene - BSD	EPA-8260	**108**	**4**		01/20/2016	DLC
Trichloroethene - BS	EPA-8260	**101**			01/20/2016	DLC
Trichloroethene - BSD	EPA-8260	**106**	**4**		01/20/2016	DLC
Toluene - BS	EPA-8260	**92.6**			01/20/2016	DLC
Toluene - BSD	EPA-8260	**96.3**	**4**		01/20/2016	DLC
Chlorobenzene - BS	EPA-8260	**93.3**			01/20/2016	DLC
Chlorobenzene - BSD	EPA-8260	**96.8**	**4**		01/20/2016	DLC

ALS Test Batch ID: R268308 - Soil by EPA-7471

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-7471	**98.0**			01/22/2016	RAL
Mercury - BSD	EPA-7471	**102**	**4**		01/22/2016	RAL

ALS Test Batch ID: 100834 - Soil by EPA-6020

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-6020	**94.3**			01/26/2016	RAL
Arsenic - BSD	EPA-6020	**93.5**	**1**		01/26/2016	RAL
Cadmium - BS	EPA-6020	**97.4**			01/26/2016	RAL
Cadmium - BSD	EPA-6020	**95.1**	**2**		01/26/2016	RAL
Chromium - BS	EPA-6020	**98.0**			01/26/2016	RAL
Chromium - BSD	EPA-6020	**96.0**	**2**		01/26/2016	RAL
Lead - BS	EPA-6020	**97.9**			01/26/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS SDG#:	EV16010119
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Lead - BSD	EPA-6020	**96.9**	**1**		01/26/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS SDG#:	EV16010119
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

MATRIX SPIKE RESULTS

ALS Test Batch ID: 100888 - Soil
Parent Sample: **Batch QC**

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - MS	NWTPH-DX	**97.3**			01/25/2016	EBS

APPROVED BY

Laboratory Director

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Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1601019

Date 1/20/16 Page 1 Of 1

PROJECT ID: 81157201
REPORT TO COMPANY: TERRACON
PROJECT MANAGER: MIKE NOLL
ADDRESS: 2905 64th AVE W. SUITE 100
MOUNTLAKE TERRACE, WA 98043
PHONE: 425-771-3304 FAX:
P.O. #: E-MAIL: mdnoll@terracon.com
INVOICE TO COMPANY:
ATTENTION:
ADDRESS:

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☒ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. GB1 - 2.5'	01/20/16	1105	SOIL	1		X	X				X						X				4	
2. GB2 - 2.5'	01/20/16	1415	SOIL	2		X	X				X						X				4	
3.																						
4.																						
5.																						
6.																						
7.																						
8.																						
9.																						
10.																						

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Terracon 1/20/16 4:45
   Received By: ALS 1/20/16 4:45
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: ~~Standard~~ ☒ Standard | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: ☒ Standard | 3 | 1 | SAME DAY

OTHER: Specify: Per National account

*Turnaround request less than standard may incur Rush Charges

January 27, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On January 21st, 7 samples were received by our laboratory and assigned our laboratory project number EV16010130. The project was identified as your 81157201. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group



Rick Bagan
Laboratory Director

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ALS Group USA, Corp dba ALS Environmental

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010130 EV16010130-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 9:10:00 AM
CLIENT SAMPLE ID	GB-3-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/22/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/22/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/24/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/24/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010130 EV16010130-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 9:10:00 AM
CLIENT SAMPLE ID	GB-3-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/24/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/24/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Mercury	EPA-7471	U	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**1.2**	1.0	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**19**	0.50	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**2.0**	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010130
		ALS SAMPLE#:	EV16010130-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 9:10:00 AM
CLIENT SAMPLE ID	GB-3-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**92.6**	01/22/2016	PAB
C25	NWTPH-DX	**95.2**	01/22/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**84.1**	01/24/2016	DLC
Toluene-d8	EPA-8260	**97.9**	01/24/2016	DLC
4-Bromofluorobenzene	EPA-8260	**102**	01/24/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010130
		ALS SAMPLE#:	EV16010130-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 10:00:00 AM
CLIENT SAMPLE ID	GB4-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/22/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/22/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Acetone	EPA-8260	U	0.16	1	MG/KG	01/25/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/24/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/24/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010130 EV16010130-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 10:00:00 AM
CLIENT SAMPLE ID	GB4-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/24/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/24/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/24/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/24/2016	DLC
Mercury	EPA-7471	**0.11**	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**1.2**	1.0	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**35**	0.52	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**4.3**	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**90.6**	01/22/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010130
		ALS SAMPLE#:	EV16010130-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 10:00:00 AM
CLIENT SAMPLE ID	GB4-5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**103**	01/22/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**93.3**	01/24/2016	DLC
1,2-Dichloroethane-d4	EPA-8260	**104**	01/25/2016	DLC
Toluene-d8	EPA-8260	**102**	01/24/2016	DLC
Toluene-d8	EPA-8260	**101**	01/25/2016	DLC
4-Bromofluorobenzene	EPA-8260	**107**	01/24/2016	DLC
4-Bromofluorobenzene	EPA-8260	**99.3**	01/25/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010130 EV16010130-03
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 11:45:00 AM
CLIENT SAMPLE ID	GB5-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	26	1	MG/KG	01/22/2016	EBS
TPH-Oil Range	NWTPH-DX	**490**	50	1	MG/KG	01/22/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Acetone	EPA-8260	U	0.19	1	MG/KG	01/26/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/26/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/26/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010130 EV16010130-03
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 11:45:00 AM
CLIENT SAMPLE ID	GB5-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/26/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/26/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Mercury	EPA-7471	**0.049**	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**3.5**	1.2	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**18**	0.59	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**13**	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**90.4**	01/22/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010130
		ALS SAMPLE#:	EV16010130-03
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 11:45:00 AM
CLIENT SAMPLE ID	GB5-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**128**	01/22/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**106**	01/26/2016	DLC
1,2-Dichloroethane-d4	EPA-8260	**96.8**	01/26/2016	DLC
Toluene-d8	EPA-8260	**106**	01/26/2016	DLC
Toluene-d8	EPA-8260	**101**	01/26/2016	DLC
4-Bromofluorobenzene	EPA-8260	**112**	01/26/2016	DLC
4-Bromofluorobenzene	EPA-8260	**98.8**	01/26/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010130
		ALS SAMPLE#:	EV16010130-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 2:00:00 PM
CLIENT SAMPLE ID	GB6-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	01/22/2016	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	01/22/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/26/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/26/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010130 EV16010130-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 2:00:00 PM
CLIENT SAMPLE ID	GB6-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/26/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/26/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Mercury	EPA-7471	**0.023**	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**1.9**	1.0	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**17**	0.50	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**3.1**	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**94.1**	01/22/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/27/2016 EV16010130 EV16010130-04
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 2:00:00 PM
CLIENT SAMPLE ID	GB6-2.5'	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**93.8**	01/22/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**104**	01/26/2016	DLC
Toluene-d8	EPA-8260	**97.8**	01/26/2016	DLC
4-Bromofluorobenzene	EPA-8260	**102**	01/26/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010130
		ALS SAMPLE#:	EV16010130-05
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 3:15:00 PM
CLIENT SAMPLE ID	CS-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	U	27	1	MG/KG	01/22/2016	EBS
TPH-Oil Range	NWTPH-DX	**320**	50	1	MG/KG	01/22/2016	EBS
Mercury	EPA-7471	**0.049**	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**6.4**	1.4	5	MG/KG	01/26/2016	RAL
Barium	EPA-6020	**110**	0.50	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**43**	0.70	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**38**	0.50	5	MG/KG	01/26/2016	RAL
Selenium	EPA-6020	U	6.0	5	MG/KG	01/26/2016	RAL
Silver	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**83.7**	01/22/2016	PAB
C25	NWTPH-DX	**106**	01/22/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010130
		ALS SAMPLE#:	EV16010130-06
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 3:20:00 PM
CLIENT SAMPLE ID	CS-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	**15**	3.0	1	MG/KG	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	**210**	50	2	MG/KG	01/22/2016	EBS
TPH-Oil Range	NWTPH-DX	**490**	100	2	MG/KG	01/22/2016	EBS
Mercury	EPA-7471	**0.024**	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**2.0**	1.0	5	MG/KG	01/26/2016	RAL
Barium	EPA-6020	**60**	0.50	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**28**	0.50	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**9.0**	0.50	5	MG/KG	01/26/2016	RAL
Selenium	EPA-6020	U	5.0	5	MG/KG	01/26/2016	RAL
Silver	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**102**	01/22/2016	PAB
C25 2X Dilution	NWTPH-DX	**101**	01/22/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains highly weathered gasoline, diesel and lube oil.
Diesel range product results biased high due to oil range product overlap.
Gasoline range product results biased high due to semivolatile range product overlap.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS JOB#:	EV16010130
		ALS SAMPLE#:	EV16010130-07
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/21/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/21/2016 3:25:00 PM
CLIENT SAMPLE ID	CS-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	**150**	25	1	MG/KG	01/22/2016	EBS
TPH-Oil Range	NWTPH-DX	**310**	50	1	MG/KG	01/22/2016	EBS
Mercury	EPA-7471	U	0.020	1	MG/KG	01/22/2016	RAL
Arsenic	EPA-6020	**2.3**	1.0	5	MG/KG	01/26/2016	RAL
Barium	EPA-6020	**44**	0.50	5	MG/KG	01/26/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL
Chromium	EPA-6020	**26**	0.50	5	MG/KG	01/26/2016	RAL
Lead	EPA-6020	**6.2**	0.50	5	MG/KG	01/26/2016	RAL
Selenium	EPA-6020	U	5.0	5	MG/KG	01/26/2016	RAL
Silver	EPA-6020	U	0.50	5	MG/KG	01/26/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**91.8**	01/22/2016	PAB
C25	NWTPH-DX	**109**	01/22/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel and lube oil.
Diesel range product results biased high due to oil range product overlap.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/27/2016
ALS SDG#: EV16010130
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBG-011916S - Batch 100659 - Soil by NWTPH-GX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	MG/KG	3.0	01/19/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012016S - Batch 100760 - Soil by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	MG/KG	25	01/20/2016	EBS
TPH-Oil Range	NWTPH-DX	U	MG/KG	50	01/20/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012316S - Batch 100854 - Soil by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Chloromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Vinyl Chloride	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromomethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Chloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Carbon Tetrachloride	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Trichlorofluoromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Carbon Disulfide	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Acetone	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
1,1-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Methylene Chloride	EPA-8260	U	MG/KG	0.020	01/23/2016	DLC
Acrylonitrile	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1-Dichloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
2-Butanone	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
2,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromochloromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Chloroform	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2-Dichloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Benzene	EPA-8260	U	MG/KG	0.0050	01/23/2016	DLC
Trichloroethene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/27/2016
ALS SDG#: EV16010130
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-012316S - Batch 100854 - Soil by EPA-8260

1,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Dibromomethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromodichloromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
Toluene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
2-Hexanone	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
1,3-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Tetrachloroethylene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Dibromochloromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2-Dibromoethane	EPA-8260	U	MG/KG	0.0050	01/23/2016	DLC
Chlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Ethylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
m,p-Xylene	EPA-8260	U	MG/KG	0.020	01/23/2016	DLC
Styrene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
o-Xylene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromoform	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Isopropylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
N-Propyl Benzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
2-Chlorotoluene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
4-Chlorotoluene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
T-Butyl Benzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
S-Butyl Benzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
P-Isopropyltoluene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
N-Butylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Hexachlorobutadiene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Naphthalene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS SDG#:	EV16010130
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY BLANK RESULTS

MB-012316S - Batch 100854 - Soil by EPA-8260

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-1222016 - Batch R268308 - Soil by EPA-7471

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-7471	U	MG/KG	0.020	01/22/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012216S - Batch 100834 - Soil by EPA-6020

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-6020	U	MG/KG	0.20	01/26/2016	RAL
Barium	EPA-6020	U	MG/KG	0.10	01/26/2016	RAL
Cadmium	EPA-6020	U	MG/KG	0.10	01/26/2016	RAL
Chromium	EPA-6020	U	MG/KG	0.10	01/26/2016	RAL
Lead	EPA-6020	U	MG/KG	0.10	01/26/2016	RAL
Selenium	EPA-6020	U	MG/KG	1.0	01/26/2016	RAL
Silver	EPA-6020	U	MG/KG	0.10	01/26/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/27/2016
ALS SDG#: EV16010130
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 100659 - Soil by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	**85.9**			01/19/2016	PAB
TPH-Volatile Range - BSD	NWTPH-GX	**87.9**	**2**		01/19/2016	PAB

ALS Test Batch ID: 100760 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**110**			01/20/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**107**	**3**		01/21/2016	EBS

ALS Test Batch ID: 100854 - Soil by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	**88.7**			01/23/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	**90.4**	**2**		01/23/2016	DLC
Benzene - BS	EPA-8260	**99.9**			01/23/2016	DLC
Benzene - BSD	EPA-8260	**99.8**	**0**		01/23/2016	DLC
Trichloroethene - BS	EPA-8260	**98.9**			01/23/2016	DLC
Trichloroethene - BSD	EPA-8260	**98.5**	**0**		01/23/2016	DLC
Toluene - BS	EPA-8260	**85.3**			01/23/2016	DLC
Toluene - BSD	EPA-8260	**85.4**	**0**		01/23/2016	DLC
Chlorobenzene - BS	EPA-8260	**93.0**			01/23/2016	DLC
Chlorobenzene - BSD	EPA-8260	**95.5**	**3**		01/23/2016	DLC

ALS Test Batch ID: R268308 - Soil by EPA-7471

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-7471	**98.0**			01/22/2016	RAL
Mercury - BSD	EPA-7471	**102**	**4**		01/22/2016	RAL

ALS Test Batch ID: 100834 - Soil by EPA-6020

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-6020	**94.3**			01/26/2016	RAL
Arsenic - BSD	EPA-6020	**93.5**	**1**		01/26/2016	RAL
Barium - BS	EPA-6020	**99.2**			01/26/2016	RAL
Barium - BSD	EPA-6020	**96.9**	**2**		01/26/2016	RAL
Cadmium - BS	EPA-6020	**97.4**			01/26/2016	RAL
Cadmium - BSD	EPA-6020	**95.1**	**2**		01/26/2016	RAL
Chromium - BS	EPA-6020	**98.0**			01/26/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/27/2016
		ALS SDG#:	EV16010130
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Chromium - BSD	EPA-6020	**96.0**	**2**		01/26/2016	RAL
Lead - BS	EPA-6020	**97.9**			01/26/2016	RAL
Lead - BSD	EPA-6020	**96.9**	**1**		01/26/2016	RAL
Selenium - BS	EPA-6020	**93.1**			01/26/2016	RAL
Selenium - BSD	EPA-6020	**94.5**	**2**		01/26/2016	RAL
Silver - BS	EPA-6020	**101**			01/26/2016	RAL
Silver - BSD	EPA-6020	**99.4**	**1**		01/26/2016	RAL

APPROVED BY



Laboratory Director

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Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1601013O

Date 01/21/16 Page 1 Of 1

PROJECT ID: 81157201
REPORT TO COMPANY: TERRACON
PROJECT MANAGER: MIKE NOLL
ADDRESS: 21905 64th Ave W. Suite 100
PHONE: 425-771-3304 FAX:
P.O. #: E-MAIL: mdnoll@terracon.com
INVOICE TO COMPANY:
ATTENTION:
ADDRESS:

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☒ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	Metals RCRA-8	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. GB-3-2.5'	01/21/16	910	Soil	1		X	X				X						X			X	4	
2. GB4-5'		1000		2		X	X				X						X				4	
3. GB5-2.5'		1145		3		X	X				X						X				4	
4. GB6-2.5		1400		4		X	X				X						X				4	
5. CS-1		1515		5		X	X				X	NO								X	2	
6. CS-2		1520		6		X	X				X	NO								X	2	
7. CS-3		1525		7		X	X				X	NO								X	2	
8.																						
9.																						
10.																						

OTHER (Specify)

SPECIAL INSTRUCTIONS: Cancel VOC on 5, 6, 7 per Heather 1/21/16 SR

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Terracon 1/21/16 4:40
Received By: ALS 1-21-16 4:40
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard ☐ 5 ☒ 3 ☐ 2 ☐ 1 ☐ SAME DAY ☐

Fuels & Hydrocarbon Analysis: 5 Standard ☒ 3 ☐ 1 ☐ SAME DAY ☐

OTHER: Specify: Per national account

*Turnaround request less than standard may incur Rush Charges

January 29, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On January 22nd, 2 samples were received by our laboratory and assigned our laboratory project number EV16010146. The project was identified as your 81157201. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group



Rick Bagan
Laboratory Director

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ALS Group USA, Corp dba ALS Environmental

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS JOB#:	EV16010146
		ALS SAMPLE#:	EV16010146-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 10:34:00 AM
CLIENT SAMPLE ID	MW 3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	**62**	50	1	UG/L	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	**190**	130	1	UG/L	01/26/2016	EBS
TPH-Oil Range	NWTPH-DX	**250**	250	1	UG/L	01/26/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/27/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/27/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/27/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS JOB#:	EV16010146
		ALS SAMPLE#:	EV16010146-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 10:34:00 AM
CLIENT SAMPLE ID	MW 3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/27/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/27/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	**2.3**	2.0	1	UG/L	01/27/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/29/2016	RAL
Arsenic	EPA-200.8	**1.6**	1.0	1	UG/L	01/27/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/27/2016	RAL
Chromium	EPA-200.8	U	2.0	1	UG/L	01/27/2016	RAL
Lead	EPA-200.8	U	1.0	1	UG/L	01/27/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/29/2016 EV16010146 EV16010146-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 10:34:00 AM
CLIENT SAMPLE ID	MW 3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**100**	01/22/2016	PAB
C25	NWTPH-DX	**94.7**	01/26/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**107**	01/27/2016	DLC
Toluene-d8	EPA-8260	**92.6**	01/27/2016	DLC
4-Bromofluorobenzene	EPA-8260	**89.2**	01/27/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains highly weathered gasoline, weathered diesel and lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS JOB#:	EV16010146
		ALS SAMPLE#:	EV16010146-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 9:40:00 AM
CLIENT SAMPLE ID	MW 4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	50	1	UG/L	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	**350**	130	1	UG/L	01/26/2016	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	01/26/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/27/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/27/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/27/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Toluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/29/2016 EV16010146 EV16010146-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 9:40:00 AM
CLIENT SAMPLE ID	MW 4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/27/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/27/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/29/2016	RAL
Arsenic	EPA-200.8	**7.6**	1.0	1	UG/L	01/27/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/27/2016	RAL
Chromium	EPA-200.8	U	2.0	1	UG/L	01/27/2016	RAL
Lead	EPA-200.8	U	1.0	1	UG/L	01/27/2016	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**98.4**	01/22/2016	PAB

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS JOB#:	EV16010146
		ALS SAMPLE#:	EV16010146-02
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 9:40:00 AM
CLIENT SAMPLE ID	MW 4	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**102**	01/26/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**109**	01/27/2016	DLC
Toluene-d8	EPA-8260	**90.8**	01/27/2016	DLC
4-Bromofluorobenzene	EPA-8260	**82.9**	01/27/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains highly weathered diesel.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010146
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBG-011916W2 - Batch 100588 - Water by NWTPH-GX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	UG/L	50	01/20/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011916W - Batch 100718 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	UG/L	130	01/19/2016	EBS
TPH-Oil Range	NWTPH-DX	U	UG/L	250	01/19/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012716W - Batch 100974 - Water by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Chloromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Vinyl Chloride	EPA-8260	U	UG/L	0.20	01/27/2016	DLC
Bromomethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Chloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Carbon Tetrachloride	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Trichlorofluoromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Carbon Disulfide	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Acetone	EPA-8260	U	UG/L	25	01/27/2016	DLC
1,1-Dichloroethene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Methylene Chloride	EPA-8260	U	UG/L	5.0	01/27/2016	DLC
Acrylonitrile	EPA-8260	U	UG/L	10	01/27/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1-Dichloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
2-Butanone	EPA-8260	U	UG/L	10	01/27/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
2,2-Dichloropropane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Bromochloromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Chloroform	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1-Dichloropropene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2-Dichloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Benzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Trichloroethene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010146
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-012716W - Batch 100974 - Water by EPA-8260

1,2-Dichloropropane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Dibromomethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Bromodichloromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	UG/L	10	01/27/2016	DLC
Toluene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
2-Hexanone	EPA-8260	U	UG/L	10	01/27/2016	DLC
1,3-Dichloropropane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Tetrachloroethylene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Dibromochloromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2-Dibromoethane	EPA-8260	U	UG/L	0.010	01/27/2016	DLC
Chlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Ethylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
m,p-Xylene	EPA-8260	U	UG/L	4.0	01/27/2016	DLC
Styrene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
o-Xylene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Bromoform	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Isopropylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Bromobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
N-Propyl Benzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
2-Chlorotoluene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
4-Chlorotoluene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
T-Butyl Benzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
S-Butyl Benzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
P-Isopropyltoluene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
N-Butylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	UG/L	10	01/27/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Hexachlorobutadiene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Naphthalene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS SDG#:	EV16010146
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY BLANK RESULTS

MB-012716W - Batch 100974 - Water by EPA-8260

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-1292016 - Batch R268534 - Water by EPA-245.1

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-245.1	U	UG/L	0.20	01/29/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012616W - Batch 100904 - Water by EPA-200.8

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-200.8	U	UG/L	1.0	01/27/2016	RAL
Cadmium	EPA-200.8	U	UG/L	1.0	01/27/2016	RAL
Chromium	EPA-200.8	U	UG/L	2.0	01/27/2016	RAL
Lead	EPA-200.8	U	UG/L	1.0	01/27/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010146
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 100588 - Water by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	**85.5**			01/20/2016	PAB
TPH-Volatile Range - BSD	NWTPH-GX	**90.1**	**5**		01/20/2016	PAB

ALS Test Batch ID: 100718 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**91.5**			01/19/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**98.4**	**7**		01/19/2016	EBS

ALS Test Batch ID: 100974 - Water by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	**131**			01/27/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	**126**	**4**		01/27/2016	DLC
Benzene - BS	EPA-8260	**120**			01/27/2016	DLC
Benzene - BSD	EPA-8260	**117**	**3**		01/27/2016	DLC
Trichloroethene - BS	EPA-8260	**120**			01/27/2016	DLC
Trichloroethene - BSD	EPA-8260	**116**	**3**		01/27/2016	DLC
Toluene - BS	EPA-8260	**108**			01/27/2016	DLC
Toluene - BSD	EPA-8260	**103**	**4**		01/27/2016	DLC
Chlorobenzene - BS	EPA-8260	**107**			01/27/2016	DLC
Chlorobenzene - BSD	EPA-8260	**104**	**3**		01/27/2016	DLC

ALS Test Batch ID: R268534 - Water by EPA-245.1

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-245.1	**103**			01/29/2016	RAL
Mercury - BSD	EPA-245.1	**101**	**2**		01/29/2016	RAL

ALS Test Batch ID: 100904 - Water by EPA-200.8

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-200.8	**96.2**			01/27/2016	RAL
Arsenic - BSD	EPA-200.8	**96.4**	**0**		01/27/2016	RAL
Cadmium - BS	EPA-200.8	**96.8**			01/27/2016	RAL
Cadmium - BSD	EPA-200.8	**97.8**	**1**		01/27/2016	RAL
Chromium - BS	EPA-200.8	**95.0**			01/27/2016	RAL
Chromium - BSD	EPA-200.8	**95.3**	**0**		01/27/2016	RAL
Lead - BS	EPA-200.8	**95.8**			01/27/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS SDG#:	EV16010146
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Lead - BSD	EPA-200.8	**95.7**	**0**		01/27/2016	RAL

APPROVED BY



Laboratory Director

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Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1601014 6

Date 1/22/16 Page 1 Of 1

PROJECT ID: 81157201
REPORT TO COMPANY: Terracon
PROJECT MANAGER: Mike Noll
ADDRESS: 21905 64th Ave W Ste 200
Mountlake Terrace, WA 98043
PHONE: 425 771 3304 FAX:
P.O. #: E-MAIL: mdnoll@terracon.com
INVOICE TO COMPANY: Same
ATTENTION:
ADDRESS:

ANALYSIS REQUESTED

OTHER (Specify)

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 X RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐								NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. MW3	1/22/16	10:34	GW	1		X	X				X						X										7	
2. MW4	1/22/16	9:40	GW	2		X	X				X						X										7	
3.																												
4.																												
5.																												
6.																												
7.																												
8.																												
9.																												
10.																												

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Terracon 1/22/16 4:33 pm
Received By: ALS 1/22/16 9:33
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | (5) | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: (5) Standard | 3 | 1 | SAME DAY

OTHER: Specify: Per national account

*Turnaround request less than standard may incur Rush Charges

January 29, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On January 22nd, 1 sample was received by our laboratory and assigned our laboratory project number EV16010147. The project was identified as your 81157201. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group



Rick Bagan
Laboratory Director

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS JOB#:	EV16010147
		ALS SAMPLE#:	EV16010147-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 12:20:00 PM
CLIENT SAMPLE ID	Soil Drum	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	3.0	1	MG/KG	01/25/2016	PAB
TPH-Diesel Range	NWTPH-DX	**200**	25	1	MG/KG	01/25/2016	EBS
TPH-Oil Range	NWTPH-DX	**200**	50	1	MG/KG	01/25/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Vinyl Chloride	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromomethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Carbon Tetrachloride	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trichlorofluoromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Carbon Disulfide	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Acetone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
1,1-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Methylene Chloride	EPA-8260	U	0.020	1	MG/KG	01/26/2016	DLC
Acrylonitrile	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Butanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Chloroform	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Benzene	EPA-8260	U	0.0050	1	MG/KG	01/26/2016	DLC
Trichloroethene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Dibromomethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromodichloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
Toluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Hexanone	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
1,3-Dichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS JOB#:	EV16010147
		ALS SAMPLE#:	EV16010147-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 12:20:00 PM
CLIENT SAMPLE ID	Soil Drum	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Tetrachloroethylene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Dibromochloromethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.0050	1	MG/KG	01/26/2016	DLC
Chlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Ethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
m,p-Xylene	EPA-8260	U	0.020	1	MG/KG	01/26/2016	DLC
Styrene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
o-Xylene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromoform	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Isopropylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Bromobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
N-Propyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
2-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
4-Chlorotoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
T-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
S-Butyl Benzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
P-Isopropyltoluene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
N-Butylbenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	0.050	1	MG/KG	01/26/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Hexachlorobutadiene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Naphthalene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	0.010	1	MG/KG	01/26/2016	DLC
Mercury	EPA-7471	U	0.020	1	MG/KG	01/28/2016	RAL
Arsenic	EPA-6020	**1.8**	1.0	5	MG/KG	01/27/2016	RAL
Barium	EPA-6020	**43**	0.50	5	MG/KG	01/27/2016	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	01/27/2016	RAL
Chromium	EPA-6020	**22**	0.50	5	MG/KG	01/27/2016	RAL
Lead	EPA-6020	**8.2**	2.0	5	MG/KG	01/27/2016	RAL
Selenium	EPA-6020	U	5.0	5	MG/KG	01/27/2016	RAL
Silver	EPA-6020	U	0.50	5	MG/KG	01/27/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/29/2016 EV16010147 EV16010147-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 12:20:00 PM
CLIENT SAMPLE ID	Soil Drum	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**106**	01/25/2016	PAB
C25	NWTPH-DX	**108**	01/25/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**105**	01/26/2016	DLC
Toluene-d8	EPA-8260	**99.7**	01/26/2016	DLC
4-Bromofluorobenzene	EPA-8260	**105**	01/26/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel and lube oil.
Diesel range product reporting limits raised due to motor oil range product overlap.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010147
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBG-012516S - Batch 100871 - Soil by NWTPH-GX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	MG/KG	3.0	01/25/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012516S - Batch 100888 - Soil by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	MG/KG	25	01/25/2016	EBS
TPH-Oil Range	NWTPH-DX	U	MG/KG	50	01/25/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012316S - Batch 100854 - Soil by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Chloromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Vinyl Chloride	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromomethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Chloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Carbon Tetrachloride	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Trichlorofluoromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Carbon Disulfide	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Acetone	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
1,1-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Methylene Chloride	EPA-8260	U	MG/KG	0.020	01/23/2016	DLC
Acrylonitrile	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1-Dichloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
2-Butanone	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
2,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromochloromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Chloroform	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2-Dichloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Benzene	EPA-8260	U	MG/KG	0.0050	01/23/2016	DLC
Trichloroethene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010147
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-012316S - Batch 100854 - Soil by EPA-8260

1,2-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Dibromomethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromodichloromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
Toluene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
2-Hexanone	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
1,3-Dichloropropane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Tetrachloroethylene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Dibromochloromethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2-Dibromoethane	EPA-8260	U	MG/KG	0.0050	01/23/2016	DLC
Chlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Ethylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
m,p-Xylene	EPA-8260	U	MG/KG	0.020	01/23/2016	DLC
Styrene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
o-Xylene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromoform	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Isopropylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Bromobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
N-Propyl Benzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
2-Chlorotoluene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
4-Chlorotoluene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
T-Butyl Benzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
S-Butyl Benzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
P-Isopropyltoluene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
N-Butylbenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	MG/KG	0.050	01/23/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Hexachlorobutadiene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
Naphthalene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	MG/KG	0.010	01/23/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS SDG#:	EV16010147
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY BLANK RESULTS

MB-012316S - Batch 100854 - Soil by EPA-8260

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-1282016 - Batch R268484 - Soil by EPA-7471

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-7471	U	MG/KG	0.020	01/28/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012716S - Batch 100946 - Soil by EPA-6020

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-6020	U	MG/KG	0.20	01/27/2016	RAL
Barium	EPA-6020	U	MG/KG	0.10	01/27/2016	RAL
Cadmium	EPA-6020	U	MG/KG	0.10	01/27/2016	RAL
Chromium	EPA-6020	U	MG/KG	0.10	01/27/2016	RAL
Lead	EPA-6020	U	MG/KG	0.40	01/27/2016	RAL
Selenium	EPA-6020	U	MG/KG	1.0	01/27/2016	RAL
Silver	EPA-6020	U	MG/KG	0.10	01/27/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010147
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 100871 - Soil by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	**96.2**			01/25/2016	PAB
TPH-Volatile Range - BSD	NWTPH-GX	**97.6**	**1**		01/25/2016	PAB

ALS Test Batch ID: 100888 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**97.7**			01/25/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**100**	**3**		01/25/2016	EBS

ALS Test Batch ID: 100854 - Soil by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	**88.7**			01/23/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	**90.4**	**2**		01/23/2016	DLC
Benzene - BS	EPA-8260	**99.9**			01/23/2016	DLC
Benzene - BSD	EPA-8260	**99.8**	**0**		01/23/2016	DLC
Trichloroethene - BS	EPA-8260	**98.9**			01/23/2016	DLC
Trichloroethene - BSD	EPA-8260	**98.5**	**0**		01/23/2016	DLC
Toluene - BS	EPA-8260	**85.3**			01/23/2016	DLC
Toluene - BSD	EPA-8260	**85.4**	**0**		01/23/2016	DLC
Chlorobenzene - BS	EPA-8260	**93.0**			01/23/2016	DLC
Chlorobenzene - BSD	EPA-8260	**95.5**	**3**		01/23/2016	DLC

ALS Test Batch ID: R268484 - Soil by EPA-7471

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-7471	**104**			01/28/2016	RAL
Mercury - BSD	EPA-7471	**103**	**1**		01/28/2016	RAL

ALS Test Batch ID: 100946 - Soil by EPA-6020

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-6020	**95.2**			01/27/2016	RAL
Arsenic - BSD	EPA-6020	**100**	**5**		01/27/2016	RAL
Barium - BS	EPA-6020	**102**			01/27/2016	RAL
Barium - BSD	EPA-6020	**102**	**0**		01/27/2016	RAL
Cadmium - BS	EPA-6020	**98.1**			01/27/2016	RAL
Cadmium - BSD	EPA-6020	**101**	**3**		01/27/2016	RAL
Chromium - BS	EPA-6020	**97.6**			01/27/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010147
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Chromium - BSD	EPA-6020	**101**	**3**		01/27/2016	RAL
Lead - BS	EPA-6020	**102**			01/27/2016	RAL
Lead - BSD	EPA-6020	**106**	**4**		01/27/2016	RAL
Selenium - BS	EPA-6020	**97.0**			01/27/2016	RAL
Selenium - BSD	EPA-6020	**104**	**7**		01/27/2016	RAL
Silver - BS	EPA-6020	**101**			01/27/2016	RAL
Silver - BSD	EPA-6020	**105**	**3**		01/27/2016	RAL

APPROVED BY



Laboratory Director

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Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1601014?

Date 1/22/16 Page 1 Of 1

PROJECT ID: 81157201
REPORT TO COMPANY: Terracon
PROJECT MANAGER: Mike Noll
ADDRESS: 21905 64th Ave W Ste. 200
Mountlake Terrace, WA 98043
PHONE: 425 7713304 FAX:
P.O. #: E-MAIL: mdnoll@terracon.com
INVOICE TO COMPANY:
ATTENTION: Same
ADDRESS:

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☐ RCRA-8 ☒ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. Soil Drum	1/22/16	12:20	Soil	1		X	X				X					PCB X	X			4	
2.		12																			
3.																					
4.																					
5.																					
6.																					
7.																					
8.																					
9.																					
10.																					

OTHER (Specify)

SPECIAL INSTRUCTIONS 1/22/16 - Mike added RCRA 8 and cancelled PCB. SS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Terracon 1/22/16 4:33pm
Received By: ALS 1/22/16 933
2. Relinquished By:
Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | (5) | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: (5) Standard | 3 | 1 | SAME DAY

OTHER; Specify: Per national account

*Turnaround request less than standard may incur Rush Charges

January 29, 2016

Mr. Mike Noll
Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

Dear Mr. Noll,

On January 22nd, 1 sample was received by our laboratory and assigned our laboratory project number EV16010148. The project was identified as your 81157201. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group



Rick Bagan
Laboratory Director

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/29/2016 EV16010148 EV16010148-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 12:40:00 PM
CLIENT SAMPLE ID	Water Drum	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	**270**	50	1	UG/L	01/22/2016	PAB
TPH-Diesel Range	NWTPH-DX	**290**	130	1	UG/L	01/26/2016	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	UG/L	01/26/2016	EBS
Dichlorodifluoromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Vinyl Chloride	EPA-8260	U	0.20	1	UG/L	01/27/2016	DLC
Bromomethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Carbon Tetrachloride	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trichlorofluoromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Carbon Disulfide	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Acetone	EPA-8260	U	25	1	UG/L	01/27/2016	DLC
1,1-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Methylene Chloride	EPA-8260	U	5.0	1	UG/L	01/27/2016	DLC
Acrylonitrile	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Butanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromochloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Chloroform	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trichloroethene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Dibromomethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromodichloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
Toluene	EPA-8260	**39**	20	10	UG/L	01/29/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Hexanone	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
1,3-Dichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS JOB#:	EV16010148
		ALS SAMPLE#:	EV16010148-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 12:40:00 PM
CLIENT SAMPLE ID	Water Drum	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Tetrachloroethylene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Dibromochloromethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dibromoethane	EPA-8260	U	0.010	1	UG/L	01/27/2016	DLC
Chlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Ethylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
m,p-Xylene	EPA-8260	U	4.0	1	UG/L	01/27/2016	DLC
Styrene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
o-Xylene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromoform	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Isopropylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Bromobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
N-Propyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
2-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
4-Chlorotoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
T-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
S-Butyl Benzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
P-Isopropyltoluene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
N-Butylbenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	10	1	UG/L	01/27/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Hexachlorobutadiene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Naphthalene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	2.0	1	UG/L	01/27/2016	DLC
Mercury	EPA-245.1	U	0.20	1	UG/L	01/29/2016	RAL
Arsenic	EPA-200.8	**3.6**	1.0	1	UG/L	01/27/2016	RAL
Barium	EPA-200.8	**79**	1.0	1	UG/L	01/27/2016	RAL
Cadmium	EPA-200.8	U	1.0	1	UG/L	01/27/2016	RAL
Chromium	EPA-200.8	**11**	2.0	1	UG/L	01/27/2016	RAL
Lead	EPA-200.8	**2.5**	1.0	1	UG/L	01/27/2016	RAL
Selenium	EPA-200.8	U	4.0	1	UG/L	01/27/2016	RAL
Silver	EPA-200.8	U	1.0	1	UG/L	01/27/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE: ALS JOB#: ALS SAMPLE#:	1/29/2016 EV16010148 EV16010148-01
CLIENT CONTACT:	Mike Noll	DATE RECEIVED:	01/22/2016
CLIENT PROJECT:	81157201	COLLECTION DATE:	1/22/2016 12:40:00 PM
CLIENT SAMPLE ID	Water Drum	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
TFT	NWTPH-GX	**97.4**	01/22/2016	PAB
C25	NWTPH-DX	**99.8**	01/26/2016	EBS
1,2-Dichloroethane-d4	EPA-8260	**110**	01/27/2016	DLC
1,2-Dichloroethane-d4 10X Dilution	EPA-8260	**111**	01/29/2016	DLC
Toluene-d8	EPA-8260	**91.6**	01/27/2016	DLC
Toluene-d8 10X Dilution	EPA-8260	**102**	01/29/2016	DLC
4-Bromofluorobenzene	EPA-8260	**87.7**	01/27/2016	DLC
4-Bromofluorobenzene 10X Dilution	EPA-8260	**105**	01/29/2016	DLC

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel.
Gasoline range results primarily due to one or more individual peaks eluting in the gas range.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010148
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MBG-011916W2 - Batch 100588 - Water by NWTPH-GX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	U	UG/L	50	01/20/2016	PAB

U - Analyte analyzed for but not detected at level above reporting limit.

MB-011916W - Batch 100718 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	UG/L	130	01/19/2016	EBS
TPH-Oil Range	NWTPH-DX	U	UG/L	250	01/19/2016	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012716W - Batch 100974 - Water by EPA-8260

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Dichlorodifluoromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Chloromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Vinyl Chloride	EPA-8260	U	UG/L	0.20	01/27/2016	DLC
Bromomethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Chloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Carbon Tetrachloride	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Trichlorofluoromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Carbon Disulfide	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Acetone	EPA-8260	U	UG/L	25	01/27/2016	DLC
1,1-Dichloroethene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Methylene Chloride	EPA-8260	U	UG/L	5.0	01/27/2016	DLC
Acrylonitrile	EPA-8260	U	UG/L	10	01/27/2016	DLC
Methyl T-Butyl Ether	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Trans-1,2-Dichloroethene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1-Dichloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
2-Butanone	EPA-8260	U	UG/L	10	01/27/2016	DLC
Cis-1,2-Dichloroethene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
2,2-Dichloropropane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Bromochloromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Chloroform	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1,1-Trichloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1-Dichloropropene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2-Dichloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Benzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Trichloroethene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010148
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-012716W - Batch 100974 - Water by EPA-8260

1,2-Dichloropropane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Dibromomethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Bromodichloromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Trans-1,3-Dichloropropene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
4-Methyl-2-Pentanone	EPA-8260	U	UG/L	10	01/27/2016	DLC
Toluene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Cis-1,3-Dichloropropene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1,2-Trichloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
2-Hexanone	EPA-8260	U	UG/L	10	01/27/2016	DLC
1,3-Dichloropropane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Tetrachloroethylene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Dibromochloromethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2-Dibromoethane	EPA-8260	U	UG/L	0.010	01/27/2016	DLC
Chlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1,1,2-Tetrachloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Ethylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
m,p-Xylene	EPA-8260	U	UG/L	4.0	01/27/2016	DLC
Styrene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
o-Xylene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Bromoform	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Isopropylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,1,2,2-Tetrachloroethane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2,3-Trichloropropane	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Bromobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
N-Propyl Benzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
2-Chlorotoluene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,3,5-Trimethylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
4-Chlorotoluene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
T-Butyl Benzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2,4-Trimethylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
S-Butyl Benzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
P-Isopropyltoluene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,3-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,4-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
N-Butylbenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2-Dichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2-Dibromo 3-Chloropropane	EPA-8260	U	UG/L	10	01/27/2016	DLC
1,2,4-Trichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Hexachlorobutadiene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
Naphthalene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC
1,2,3-Trichlorobenzene	EPA-8260	U	UG/L	2.0	01/27/2016	DLC

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CERTIFICATE OF ANALYSIS

CLIENT:	Terracon 21905 - 64th Ave W, Suite 100 Mountlake Terrace, WA 98043	DATE:	1/29/2016
		ALS SDG#:	EV16010148
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Mike Noll		
CLIENT PROJECT:	81157201		

LABORATORY BLANK RESULTS

MB-012716W - Batch 100974 - Water by EPA-8260

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-1292016 - Batch R268534 - Water by EPA-245.1

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-245.1	U	UG/L	0.20	01/29/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-012616W - Batch 100904 - Water by EPA-200.8

ANALYTE	METHOD	RESULTS	UNITS	REPORTING LIMITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-200.8	U	UG/L	1.0	01/27/2016	RAL
Barium	EPA-200.8	U	UG/L	1.0	01/27/2016	RAL
Cadmium	EPA-200.8	U	UG/L	1.0	01/27/2016	RAL
Chromium	EPA-200.8	U	UG/L	2.0	01/27/2016	RAL
Lead	EPA-200.8	U	UG/L	1.0	01/27/2016	RAL
Selenium	EPA-200.8	U	UG/L	4.0	01/27/2016	RAL
Silver	EPA-200.8	U	UG/L	1.0	01/27/2016	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010148
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 100588 - Water by NWTPH-GX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range - BS	NWTPH-GX	**85.5**			01/20/2016	PAB
TPH-Volatile Range - BSD	NWTPH-GX	**90.1**	**5**		01/20/2016	PAB

ALS Test Batch ID: 100718 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**91.5**			01/19/2016	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**98.4**	**7**		01/19/2016	EBS

ALS Test Batch ID: 100974 - Water by EPA-8260

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
1,1-Dichloroethene - BS	EPA-8260	**131**			01/27/2016	DLC
1,1-Dichloroethene - BSD	EPA-8260	**126**	**4**		01/27/2016	DLC
Benzene - BS	EPA-8260	**120**			01/27/2016	DLC
Benzene - BSD	EPA-8260	**117**	**3**		01/27/2016	DLC
Trichloroethene - BS	EPA-8260	**120**			01/27/2016	DLC
Trichloroethene - BSD	EPA-8260	**116**	**3**		01/27/2016	DLC
Toluene - BS	EPA-8260	**108**			01/27/2016	DLC
Toluene - BSD	EPA-8260	**103**	**4**		01/27/2016	DLC
Chlorobenzene - BS	EPA-8260	**107**			01/27/2016	DLC
Chlorobenzene - BSD	EPA-8260	**104**	**3**		01/27/2016	DLC

ALS Test Batch ID: R268534 - Water by EPA-245.1

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-245.1	**103**			01/29/2016	RAL
Mercury - BSD	EPA-245.1	**101**	**2**		01/29/2016	RAL

ALS Test Batch ID: 100904 - Water by EPA-200.8

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-200.8	**96.2**			01/27/2016	RAL
Arsenic - BSD	EPA-200.8	**96.4**	**0**		01/27/2016	RAL
Barium - BS	EPA-200.8	**97.8**			01/27/2016	RAL
Barium - BSD	EPA-200.8	**98.0**	**0**		01/27/2016	RAL
Cadmium - BS	EPA-200.8	**96.8**			01/27/2016	RAL
Cadmium - BSD	EPA-200.8	**97.8**	**1**		01/27/2016	RAL
Chromium - BS	EPA-200.8	**95.0**			01/27/2016	RAL

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CERTIFICATE OF ANALYSIS

CLIENT: Terracon
21905 - 64th Ave W, Suite 100
Mountlake Terrace, WA 98043

CLIENT CONTACT: Mike Noll
CLIENT PROJECT: 81157201

DATE: 1/29/2016
ALS SDG#: EV16010148
WDOE ACCREDITATION: C601

LABORATORY CONTROL SAMPLE RESULTS

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Chromium - BSD	EPA-200.8	**95.3**	**0**		01/27/2016	RAL
Lead - BS	EPA-200.8	**95.8**			01/27/2016	RAL
Lead - BSD	EPA-200.8	**95.7**	**0**		01/27/2016	RAL
Selenium - BS	EPA-200.8	**95.0**			01/27/2016	RAL
Selenium - BSD	EPA-200.8	**97.8**	**3**		01/27/2016	RAL
Silver - BS	EPA-200.8	**98.7**			01/27/2016	RAL
Silver - BSD	EPA-200.8	**98.2**	**0**		01/27/2016	RAL

APPROVED BY



Laboratory Director

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Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1610148

Date 1/22/16 Page 1 Of 1

PROJECT ID: 81157201
REPORT TO COMPANY: Terracon
PROJECT MANAGER: Mike Noll
ADDRESS: 21905 64th Ave W Ste 200
Mountlake Terrace, WA 98043
PHONE: 425 771 3304 FAX:
P.O. #: E-MAIL: mnoll@terracon.com
INVOICE TO COMPANY:
ATTENTION: Same
ADDRESS:

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☐ RCRA-8 X Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. Water Drum	1/22/16	12:40	Water	1		X	X				X						X				7	
2.																						
3.																						
4.																						
5.																						
6.																						
7.																						
8.																						
9.																						
10.																						

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Terracon 1/22/16 4:33 pm
   Received By: ALS 1/22/16 4:33
2. Relinquished By:
   Received By:

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | SAME DAY

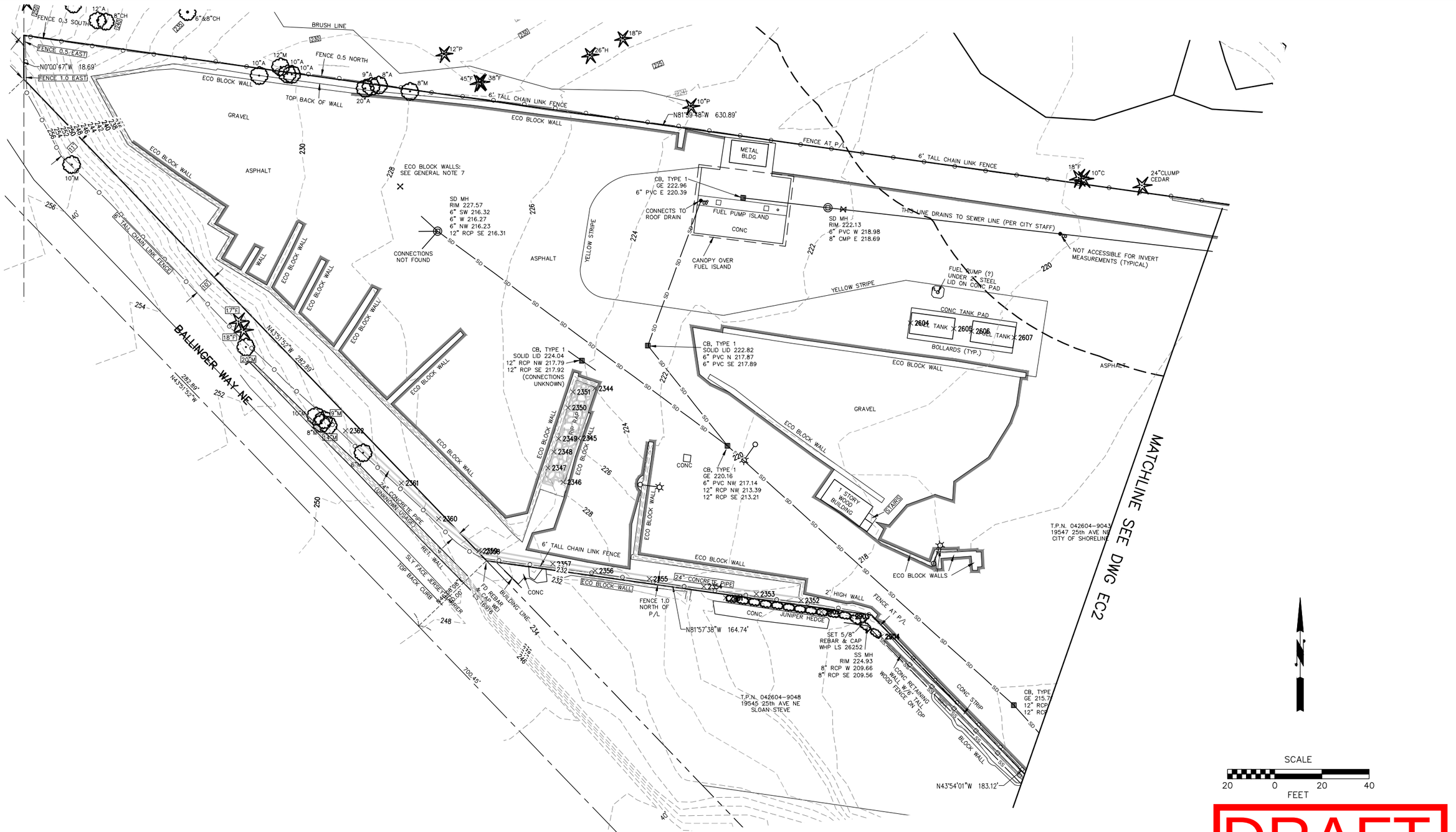
OTHER: Specify: Per national account

*Turnaround request less than standard may incur Rush Charges

7B - PRELIMINARY DRAWINGS

OVERVIEW

Included in this section are preliminary civil grading and utility plans, existing conditions plan, preliminary landscape plans as well as vehicle circulation studies.



Apr 01, 2016 - 3:32pm DDeKoekkoek X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Plan Sheets\20150180 - EC.dwg Layout Name: EC1

No.	Date	Revision	By	Appr.

Perteet
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505 5th Avenue S, Suite 300
Seattle, Washington 98104

SHORELINE

DUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By	Date
Designed By	
Checked By	
Approved By	

Project Number

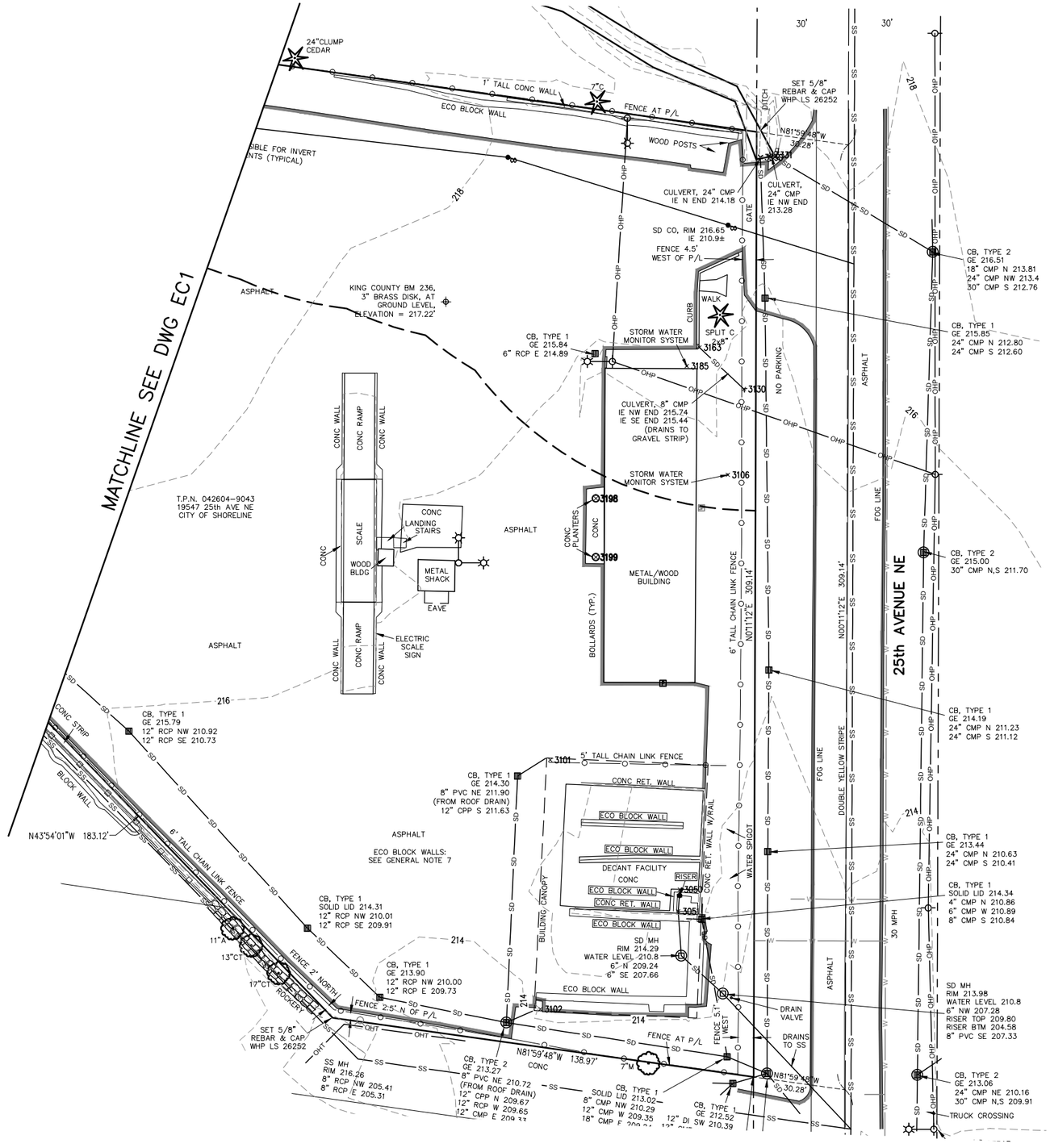
CITY OF SHORELINE

NORTH MAINTENANCE FACILITY

EXISTING CONDITIONS

Drawing No. EC

Sheet No. 1 of 5 Total



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SHORELINE

JUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By	Date
Designed By	
Checked By	
Approved By	
Project Number	

CITY OF SHORELINE

NORTH MAINTENANCE FACILITY

EXISTING CONDITIONS

Drawing No. EC

Sheet No. 2 of Total 5

REMOVE UNDERGROUND UTILITIES

REMOVE FUEL ISLAND

CLEARING AND GRUBBING

REMOVE SCALE

REMOVE BUILDING

REMOVE ECOLOGY BLOCKS

REMOVE BUILDING

REMOVE ECOLOGY BLOCKS

REMOVE ASPHALT PAVEMENT

REMOVE UNDERGROUND UTILITIES

REMOVE DECANT FACILITY

LEGEND

REMOVE ASPHALT CONCRETE PAVEMENT

CLEARING AND GRUBBING

SCALE

0 15 30 60

FEET

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DUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By	Date
Designed By	
Checked By	
Approved By	

Project Number

CITY OF SHORELINE

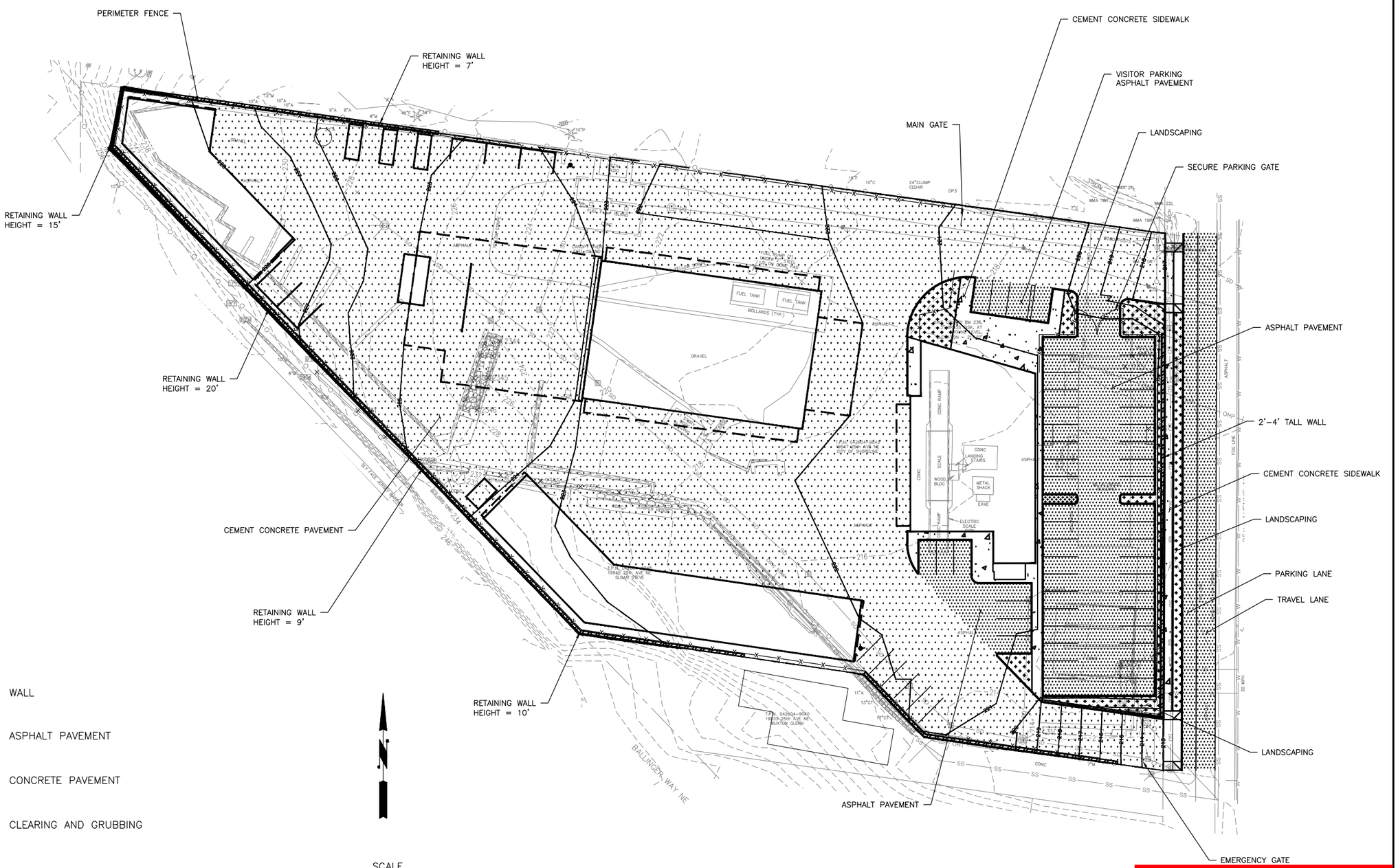
NORTH MAINTENANCE FACILITY

SITE PREP AND DEMO PLAN

Drawing No. SP

Sheet No. 3 of Total 5

Apr 01, 2016 - 3:34pm DDekKoekkoek X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Plan Sheets\20150180 - SP.dwg Layout Name: Layout1



LEGEND

- WALL
- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- CLEARING AND GRUBBING

SCALE
30 0 30 60
FEET

DRAFT

No.	Date	Revision	By	Appr.

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Seattle, Washington 98104

SHORELINE

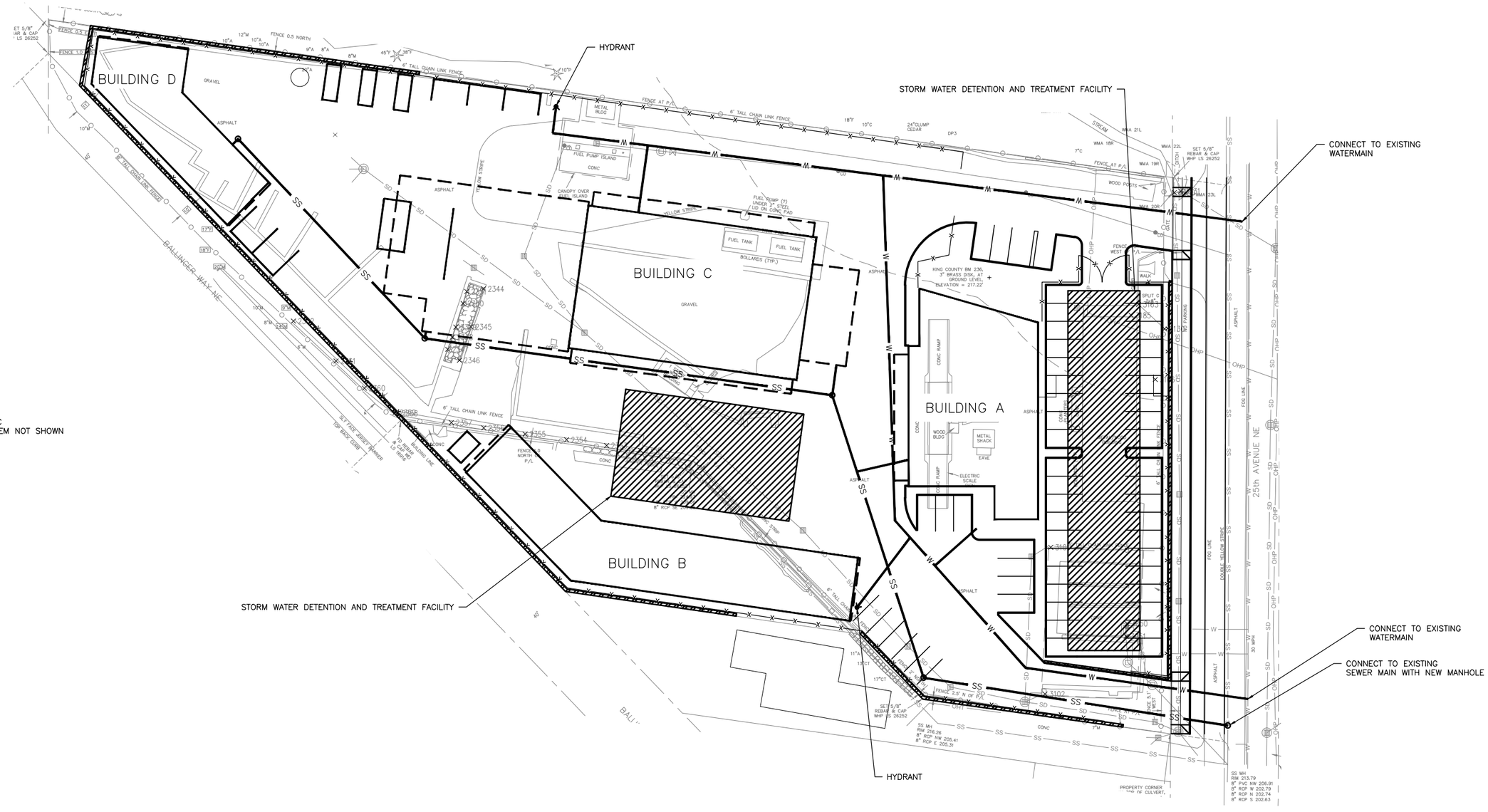
JUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By | Date
Designed By
Checked By
Approved By
Project Number

CITY OF SHORELINE
NORTH MAINTENANCE FACILITY
CONCEPTUAL SITE PLAN

Drawing No. ST
Sheet No. 4 of Total 5

Apr 01, 2016 - 3:36pm DDeKoekkoek X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Plan Sheets\20150180 - PV.dwg Layout Name: Layout1



NOTES:

1. UTILITIES SHOWN ARE SCHEMATIC
2. STORMWATER CONVEYANCE SYSTEM NOT SHOWN

SCALE
30 0 30 60
FEET

DRAFT

No.	Date	Revision	By	Appr.

Perteet
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505 5th Avenue S, Suite 300
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SHORELINE

DUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By ____ Date ____
Designed By ____
Checked By ____
Approved By ____

Project Number

CITY OF SHORELINE
NORTH MAINTENANCE FACILITY
CONCEPTUAL UTILITIES PLAN

Drawing No. UT
Sheet No. 5 of Total 5

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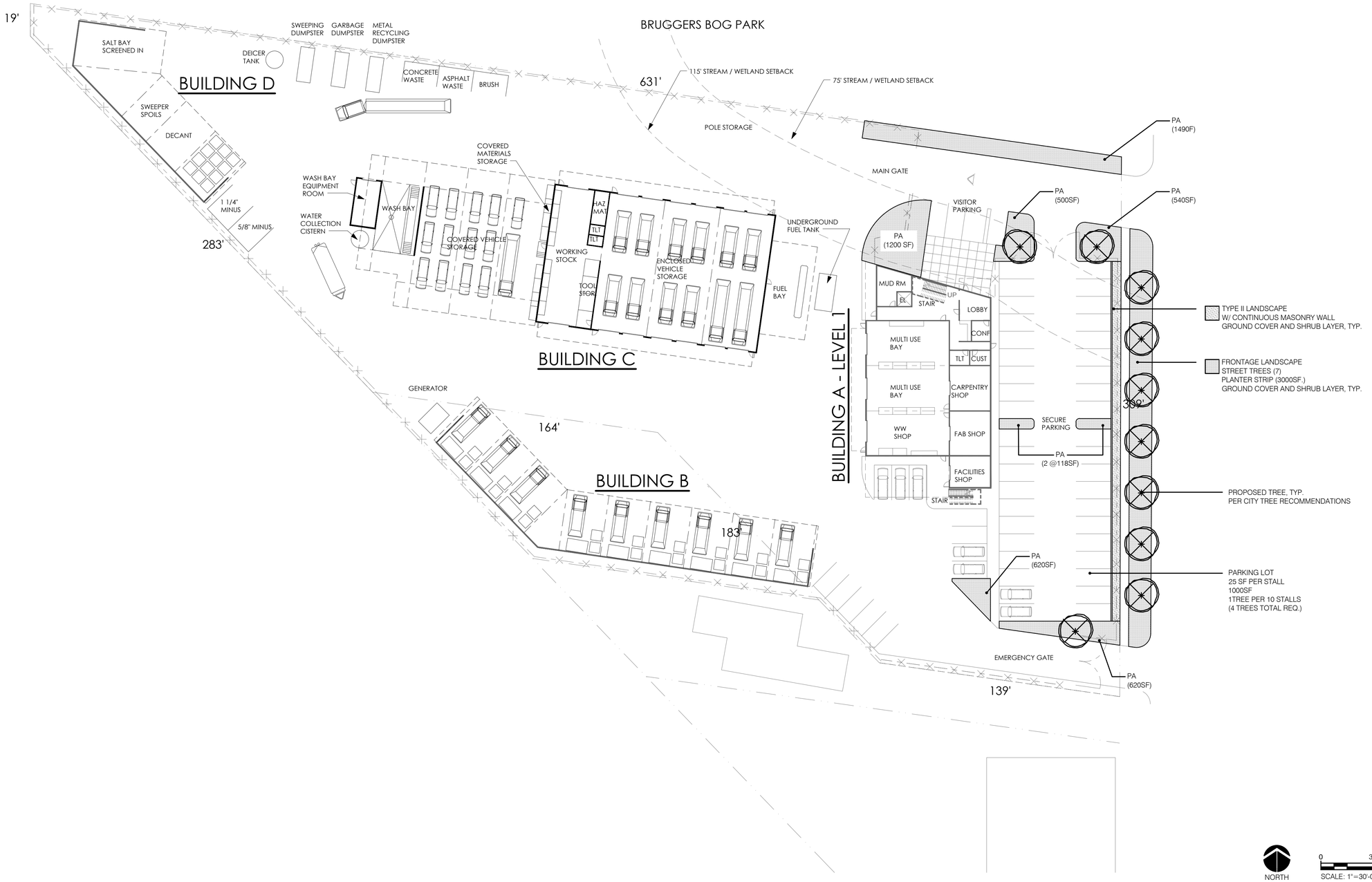
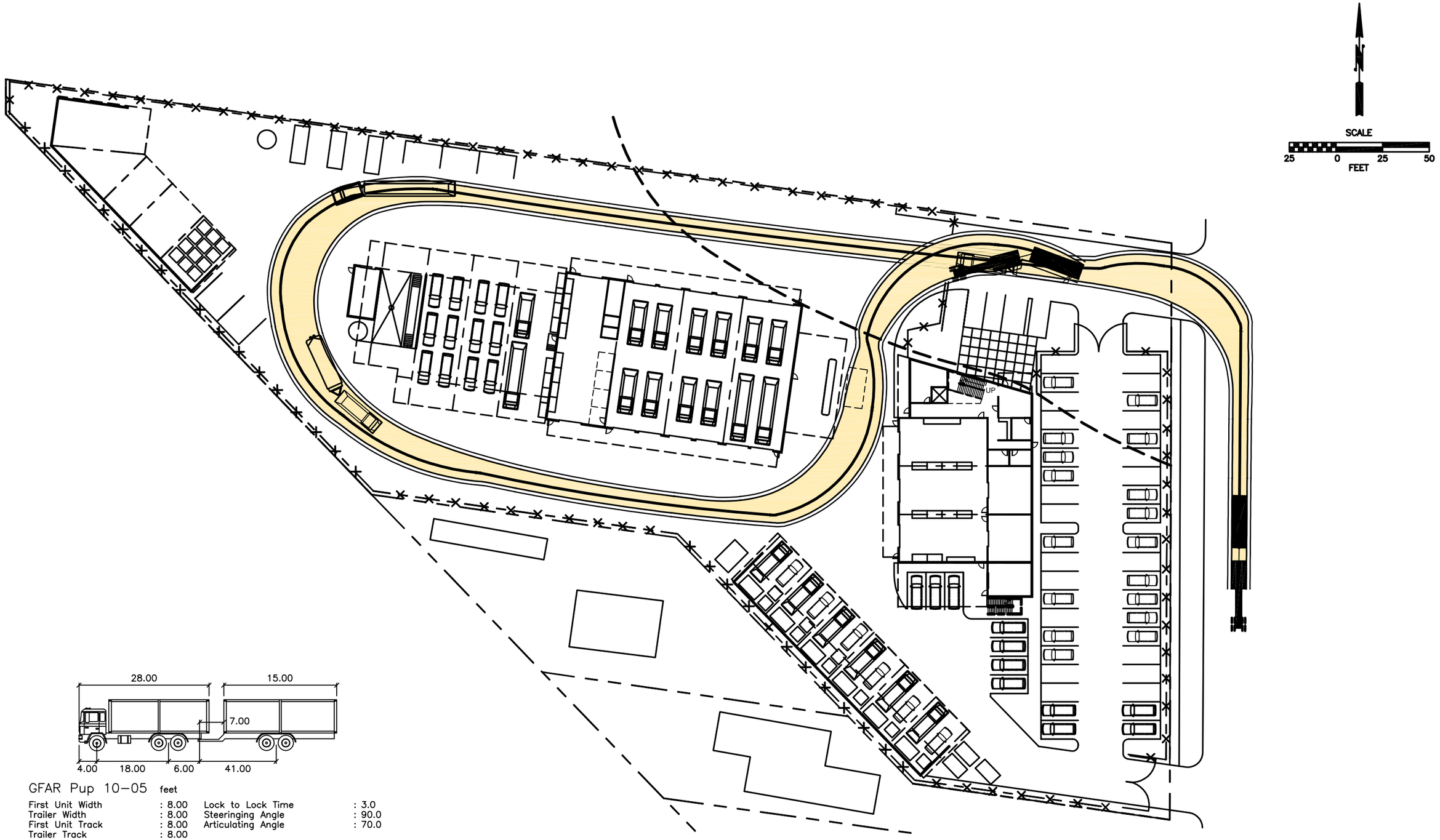


CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 31 MARCH 2016 PRE DESIGN PHASE

CITY OF SHORELINE

TCF Architecture



GFAR Pup 10–05 feet

First Unit Width	: 8.00	Lock to Lock Time	: 3.0
Trailer Width	: 8.00	Steeringing Angle	: 90.0
First Unit Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.00		

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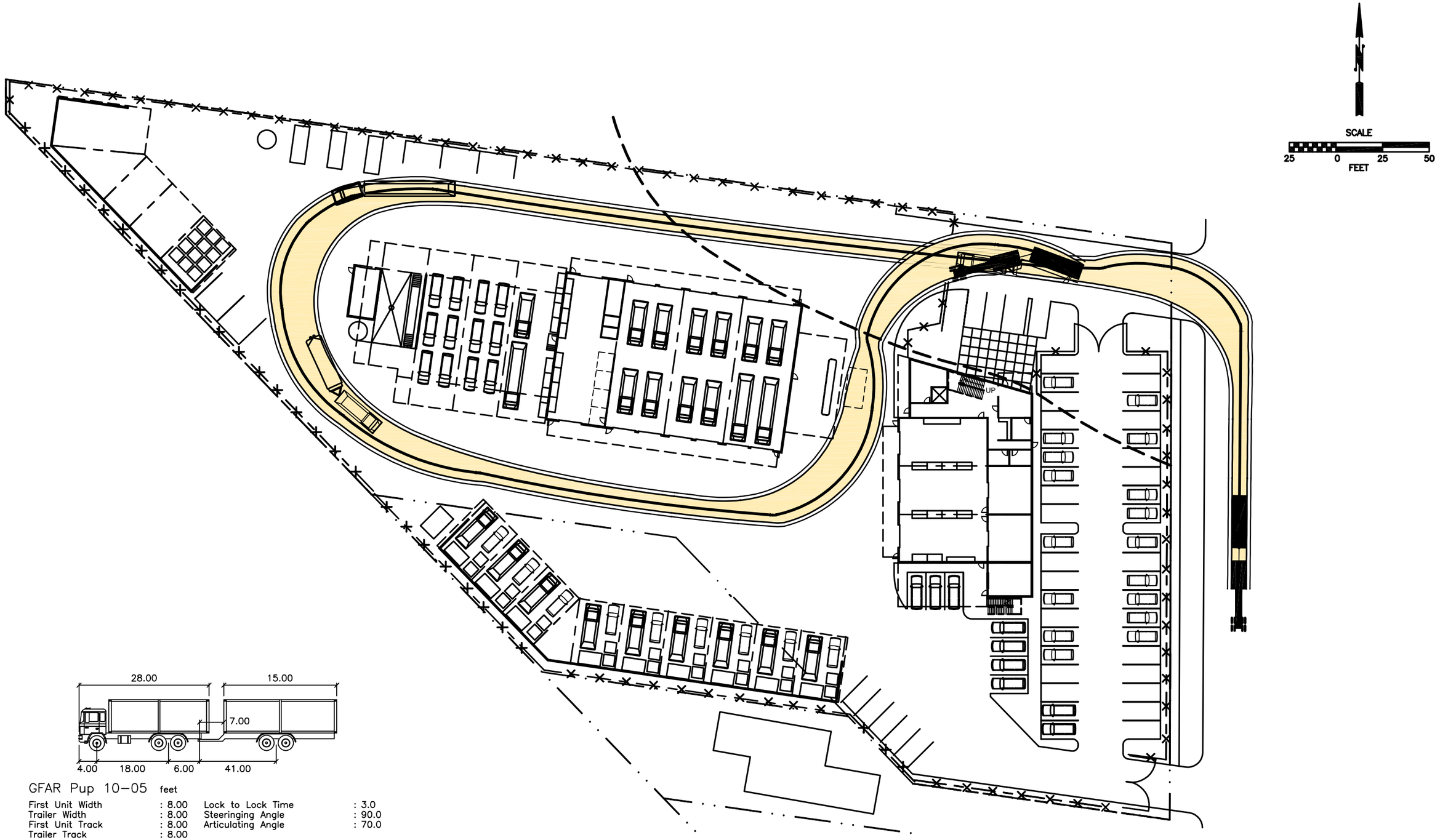
CITY OF SHORELINE
NORTH MAINTENANCE FACILITY
ALT B - TRUCK AND PUP (NORTH EXIT)

FIGURE

Feb 04, 2016 - 2:47pm jhuylar X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Exhibits\Autoturn.dwg Layout Name: Alt B - Truck and Pup (North Exit)



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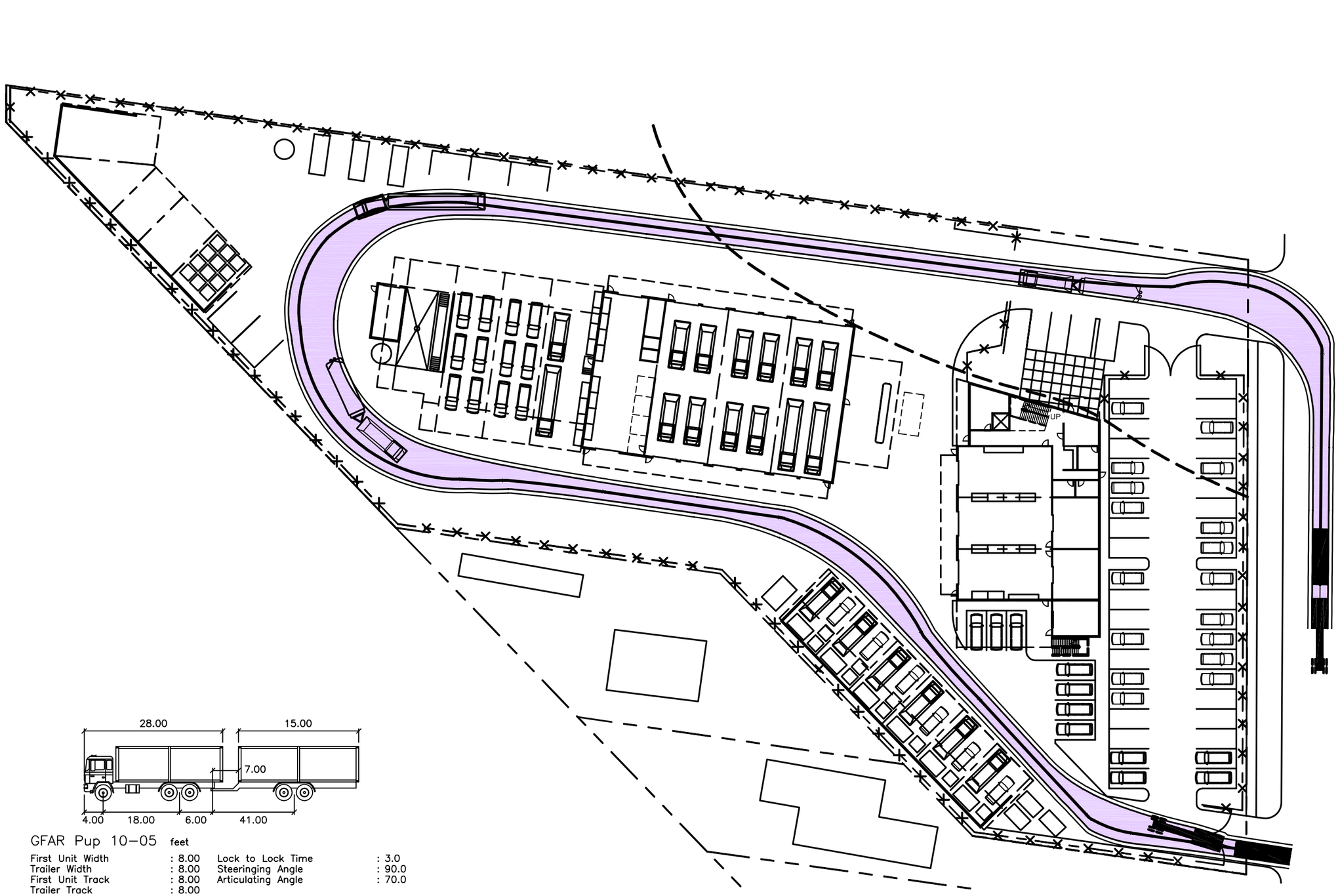
CITY OF SHORELINE
NORTH MAINTENANCE FACILITY
ALT B-1 - TRUCK AND PUP (NORTH EXIT)

FIGURE

Feb 04, 2016 - 2:49pm jhuylar X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Exhibits\Autoturn.dwg Layout Name: Alt B-1 - Truck and Pup (North Exit)



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CITY OF SHORELINE
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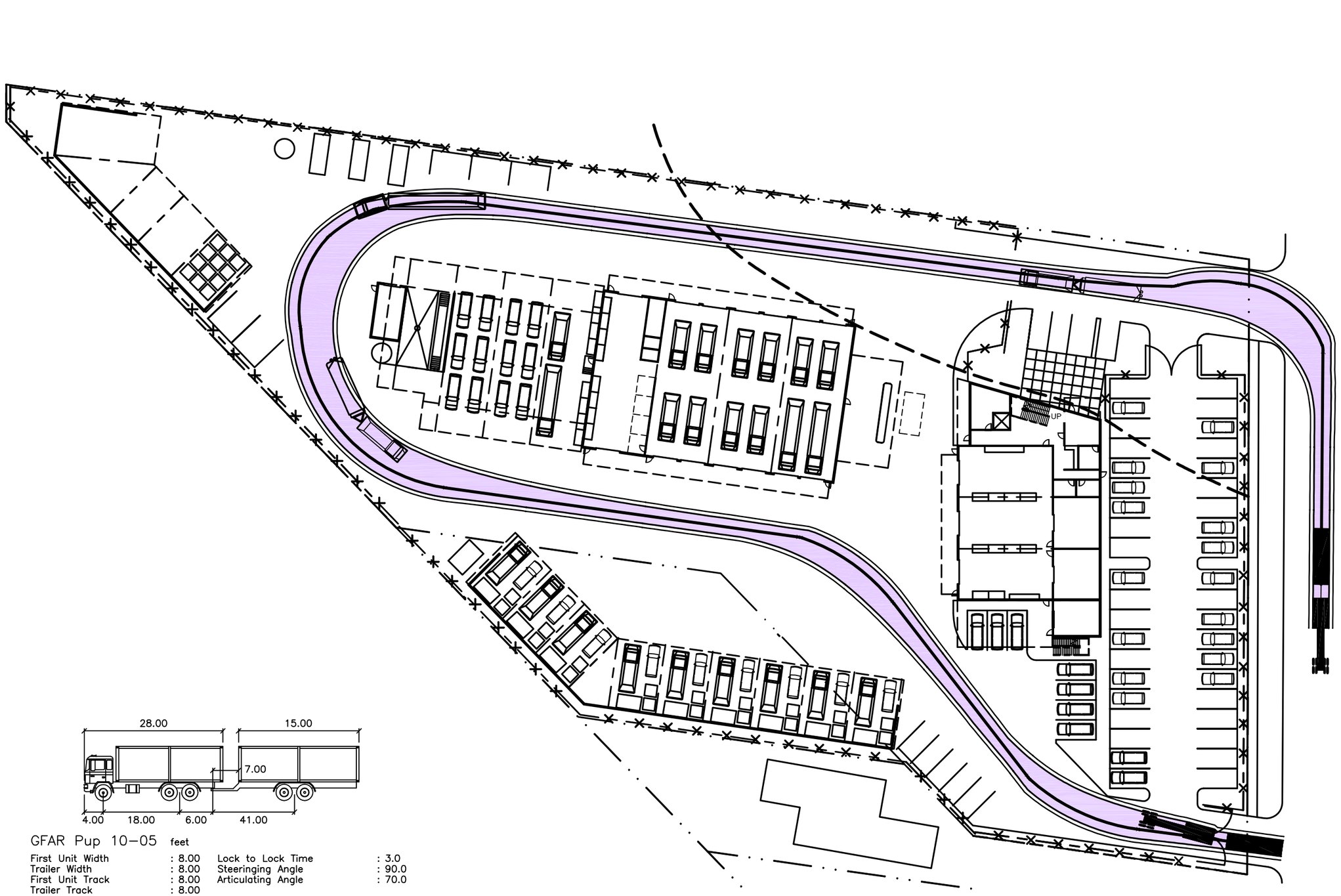
ALT B - TRUCK AND PUP (SOUTH EXIT)

FIGURE

Feb 04, 2016 - 2:52pm jhuytar X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Exhibits\Autoturn.dwg Layout Name: Alt B - Truck and Pup (Exit South)



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ALT B-1 - TRUCK AND PUP (SOUTH EXIT)

FIGURE

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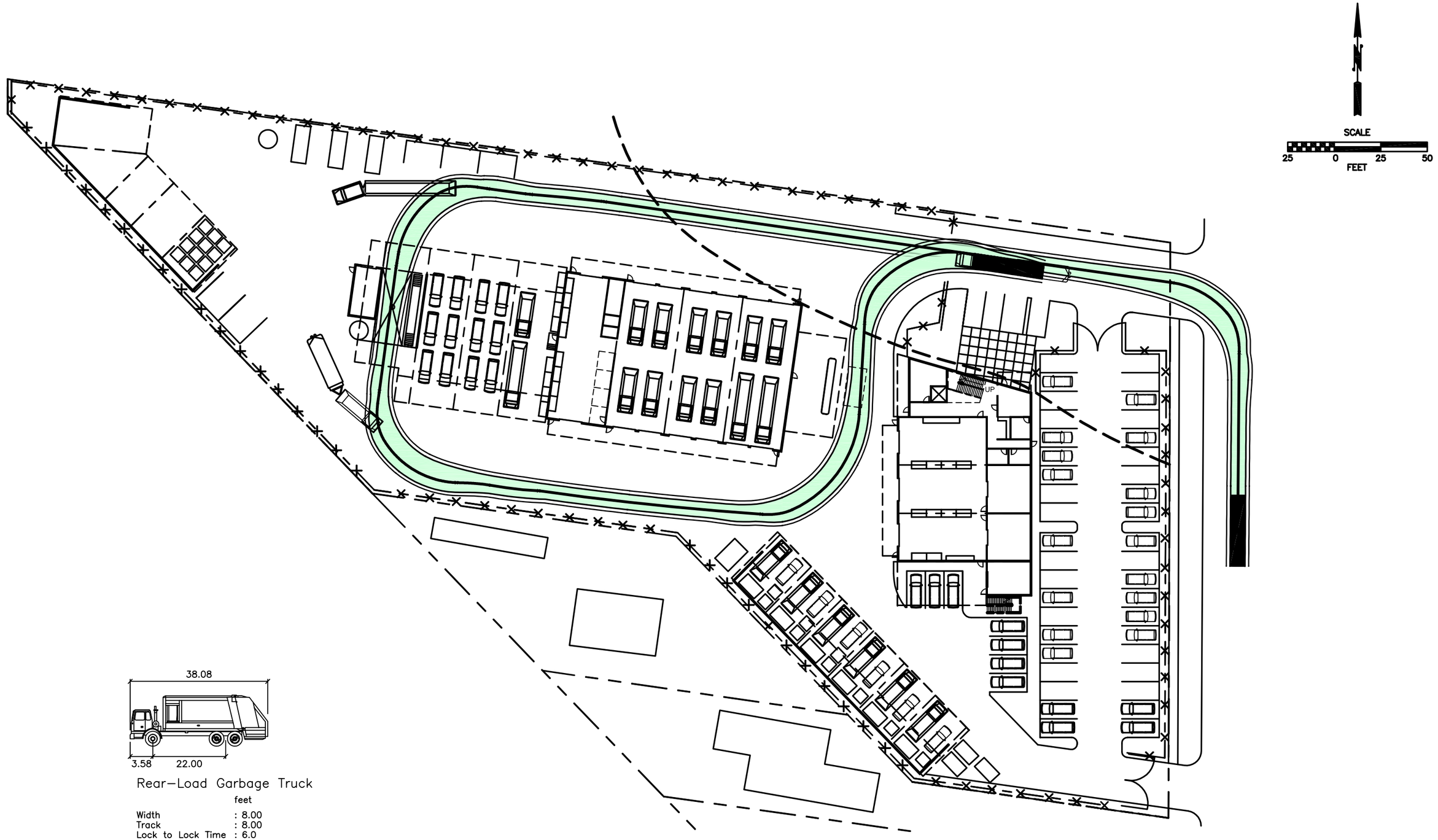

Rear–Load Garbage Truck

	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 27.4

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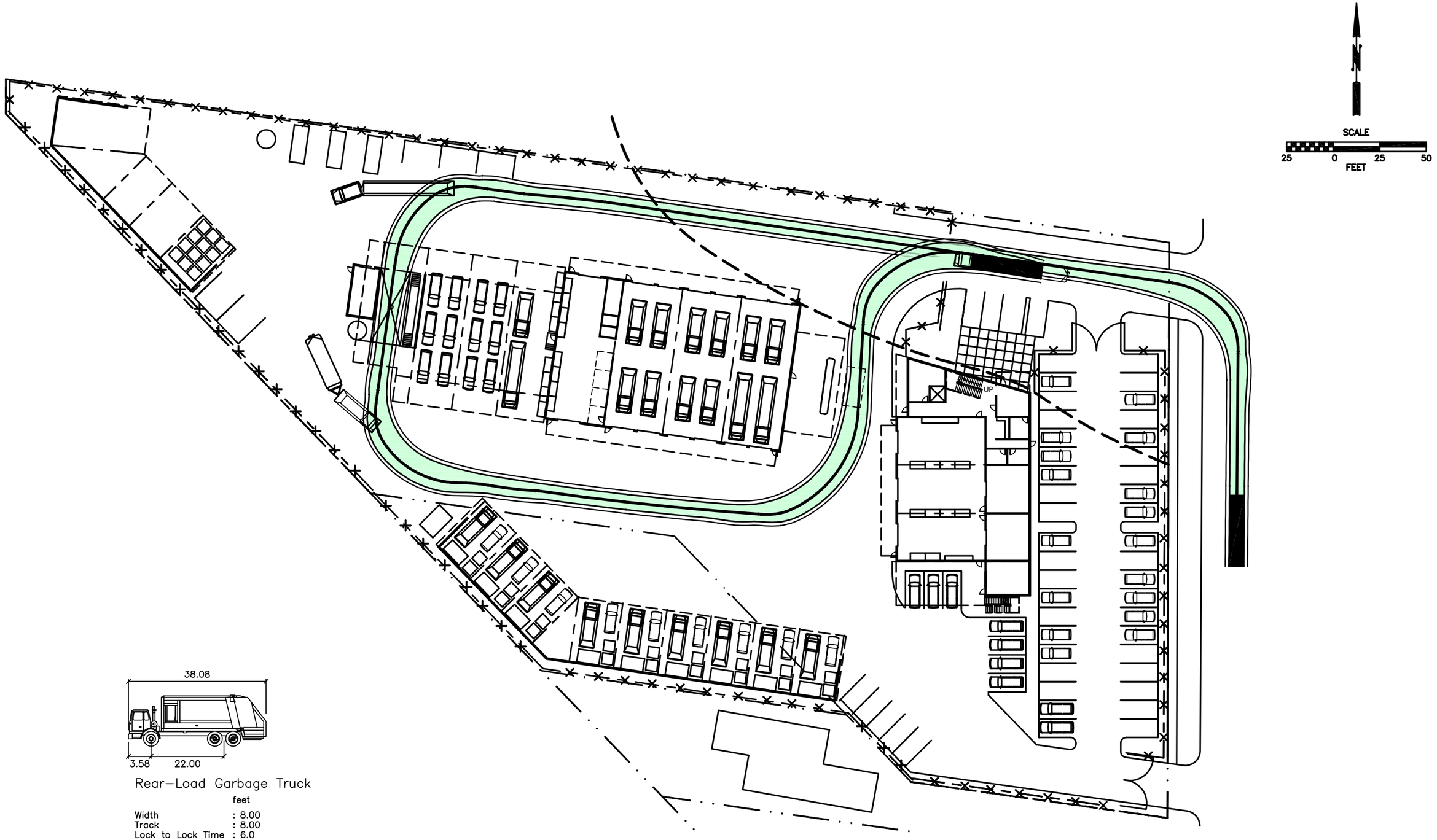
ALTERNATIVE B - WASH BAY

FIGURE

Feb 04, 2016 - 9:19am jhuylar X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Exhibits\Autoturn.dwg Layout Name: Alt B - Wash Bay



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ALTERNATIVE B-1 - WASH BAY

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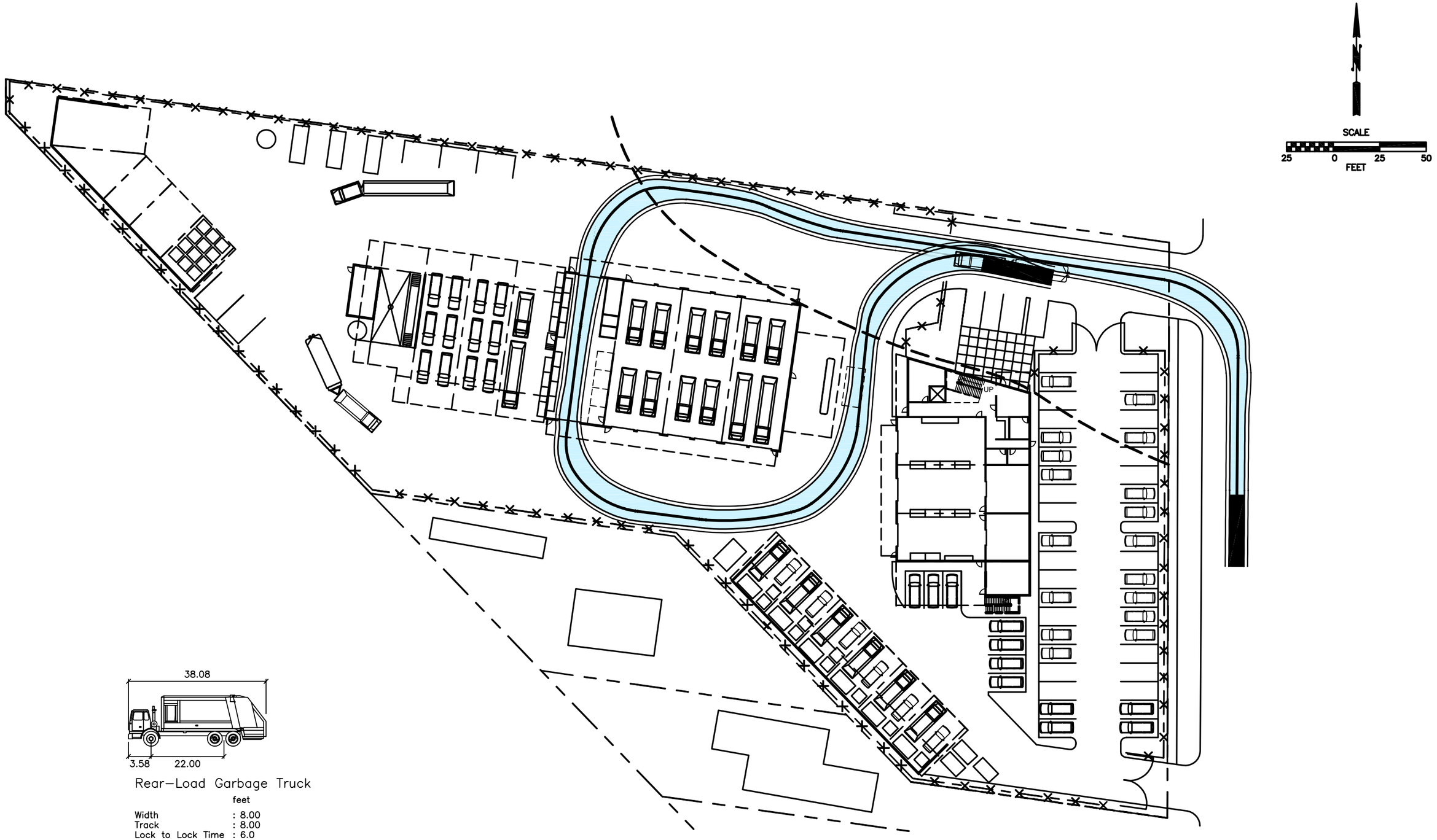

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ALTERNATIVE B - MIDDLE BAY

FIGURE

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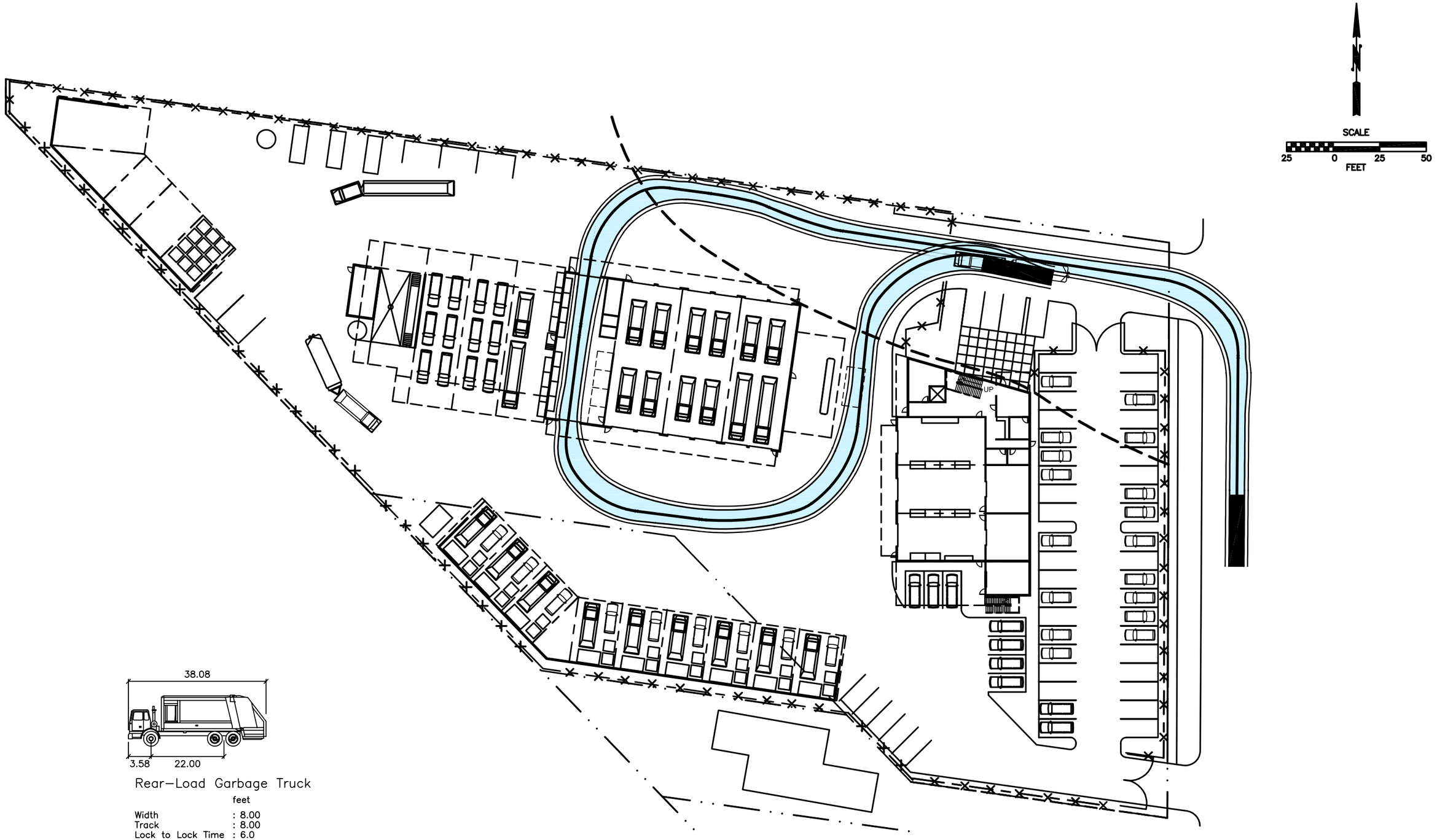

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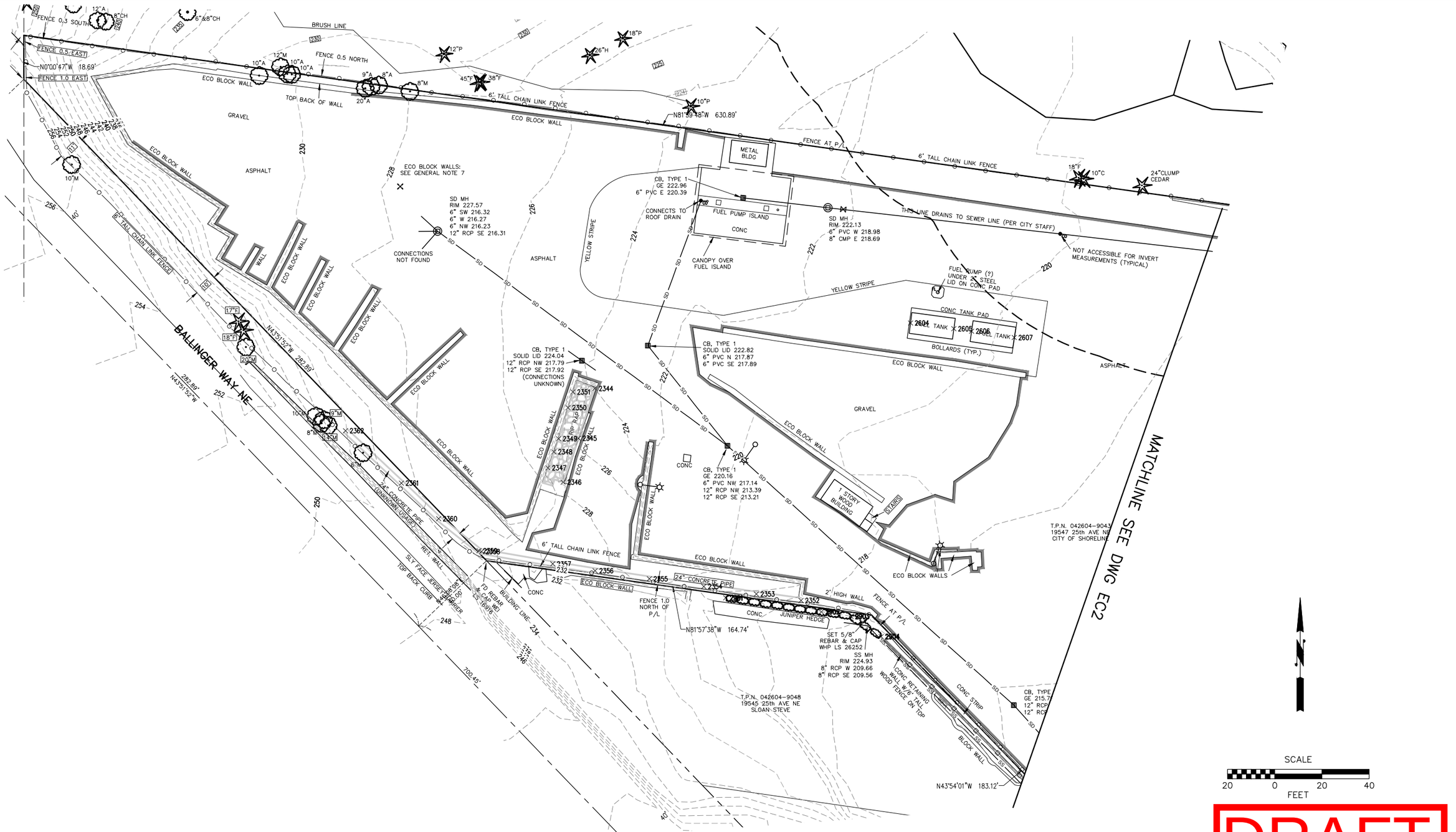
ALTERNATIVE B-1 - MIDDLE BAY

FIGURE

Feb 04, 2016 - 9:51am jhuylar X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Exhibits\Autoturn.dwg Layout Name: Alt B-1 - Middle Bay



Apr 01, 2016 - 3:32pm DDeKoekkoek X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Plan Sheets\20150180 - EC.dwg Layout Name: EC1

No.	Date	Revision	By	Appr.

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SHORELINE

DUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By	Date
Designed By	
Checked By	
Approved By	

Project Number

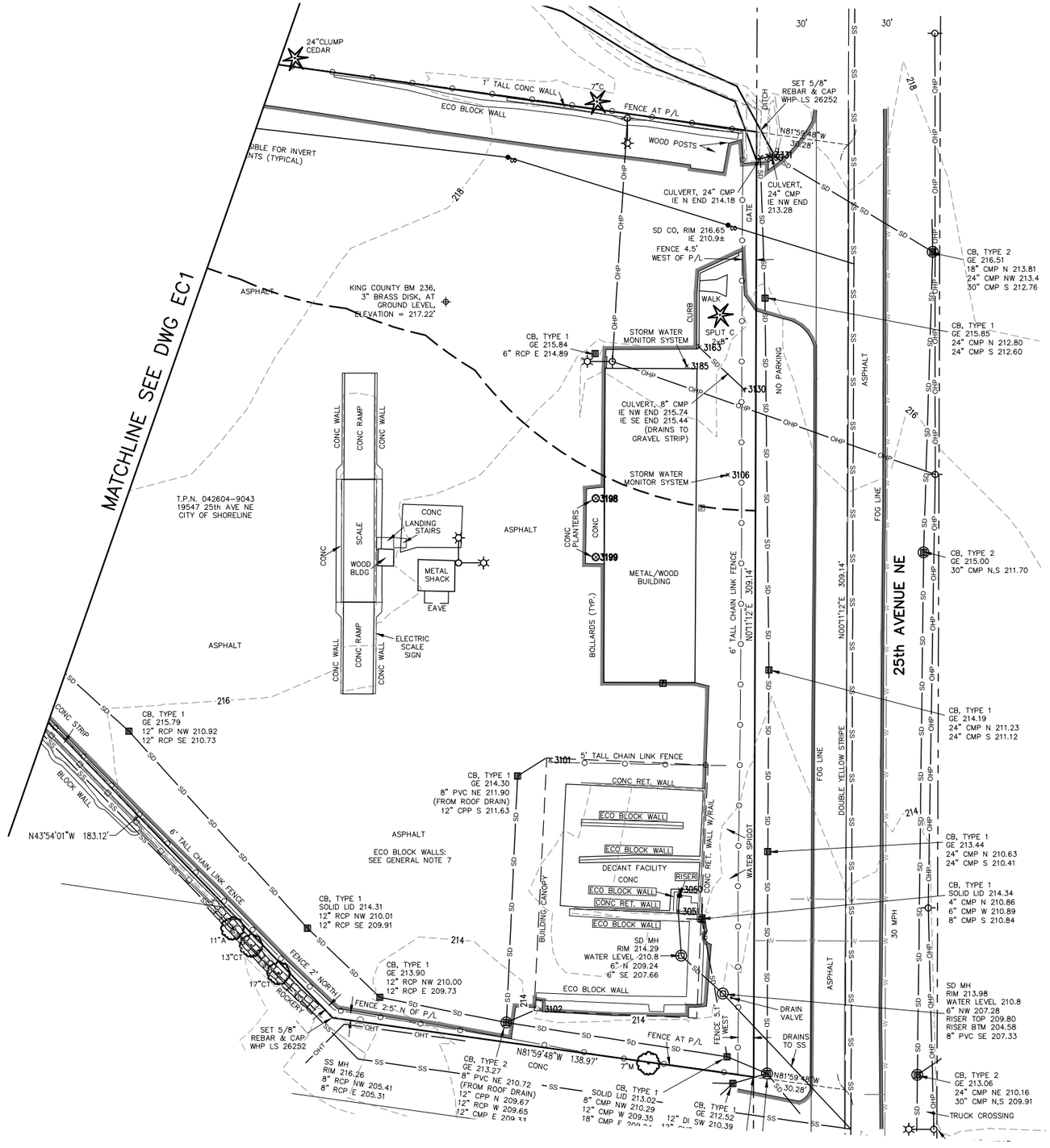
CITY OF SHORELINE

NORTH MAINTENANCE FACILITY

EXISTING CONDITIONS

Drawing No. EC

Sheet No. 1 of 5 Total



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No.	Date	Revision	By	Appr.

Perteet
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SHORELINE

JUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By	Date
Designed By	
Checked By	
Approved By	
Project Number	

CITY OF SHORELINE

NORTH MAINTENANCE FACILITY

EXISTING CONDITIONS

Drawing No. EC

Sheet No. 2 of Total 5

REMOVE UNDERGROUND UTILITIES

REMOVE FUEL ISLAND

CLEARING AND GRUBBING

REMOVE SCALE

REMOVE BUILDING

REMOVE ECOLOGY BLOCKS

REMOVE BUILDING

REMOVE ECOLOGY BLOCKS

REMOVE ASPHALT PAVEMENT

REMOVE UNDERGROUND UTILITIES

REMOVE DECANT FACILITY

LEGEND

REMOVE ASPHALT CONCRETE PAVEMENT

CLEARING AND GRUBBING

SCALE

0 15 30 60

FEET

DRAFT

No.	Date	Revision	By	Appr.

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SHORELINE

DUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By	Date
Designed By	
Checked By	
Approved By	

Project Number

CITY OF SHORELINE

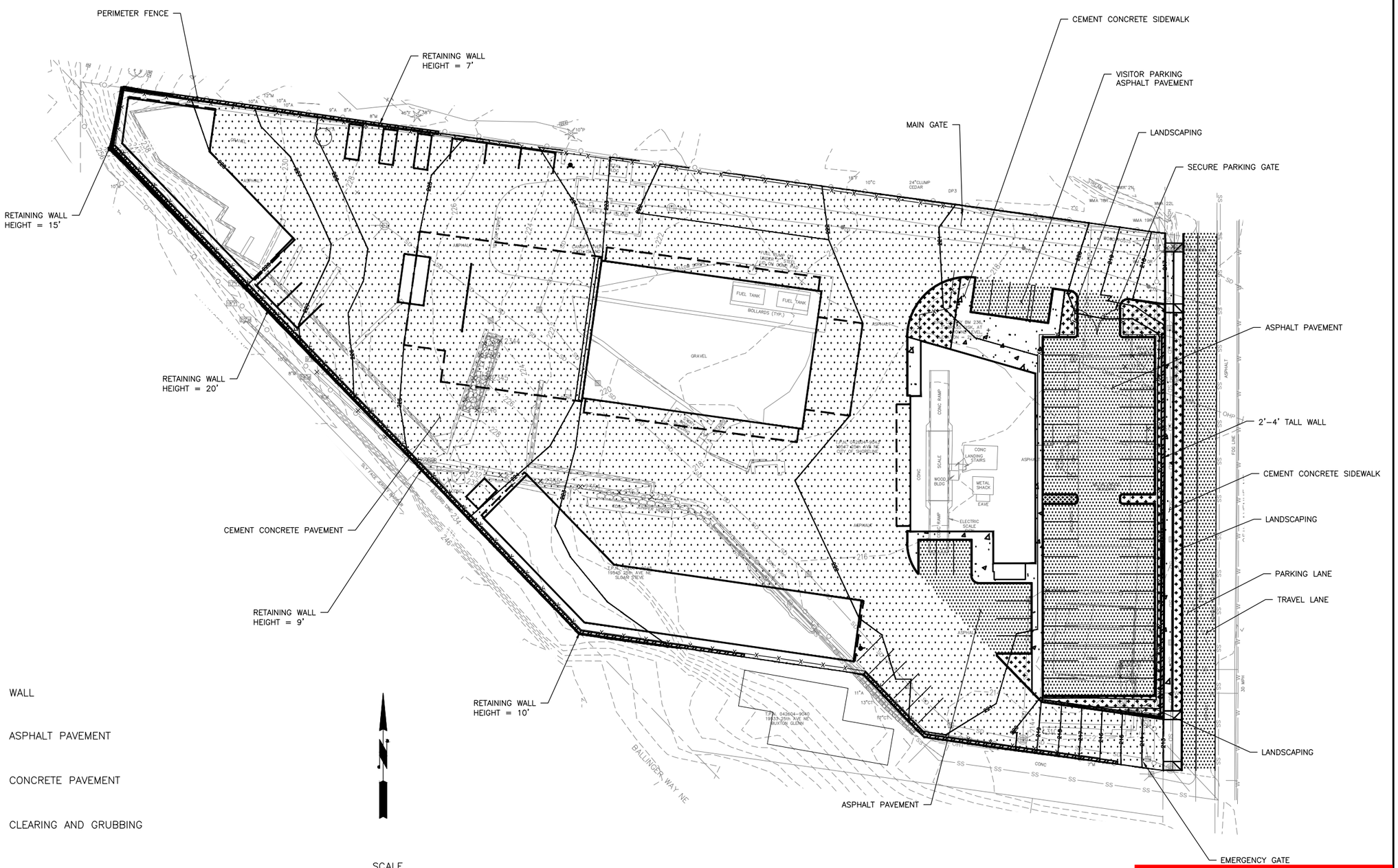
NORTH MAINTENANCE FACILITY

SITE PREP AND DEMO PLAN

Drawing No. SP

Sheet No. 3 of Total 5

Apr 01, 2016 - 3:34pm DDekKoekkoek X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Plan Sheets\20150180 - SP.dwg Layout Name: Layout1



LEGEND

- WALL
- ASPHALT PAVEMENT
- CONCRETE PAVEMENT
- CLEARING AND GRUBBING

SCALE
30 0 30 60
FEET

DRAFT

No.	Date	Revision	By	Appr.

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SHORELINE

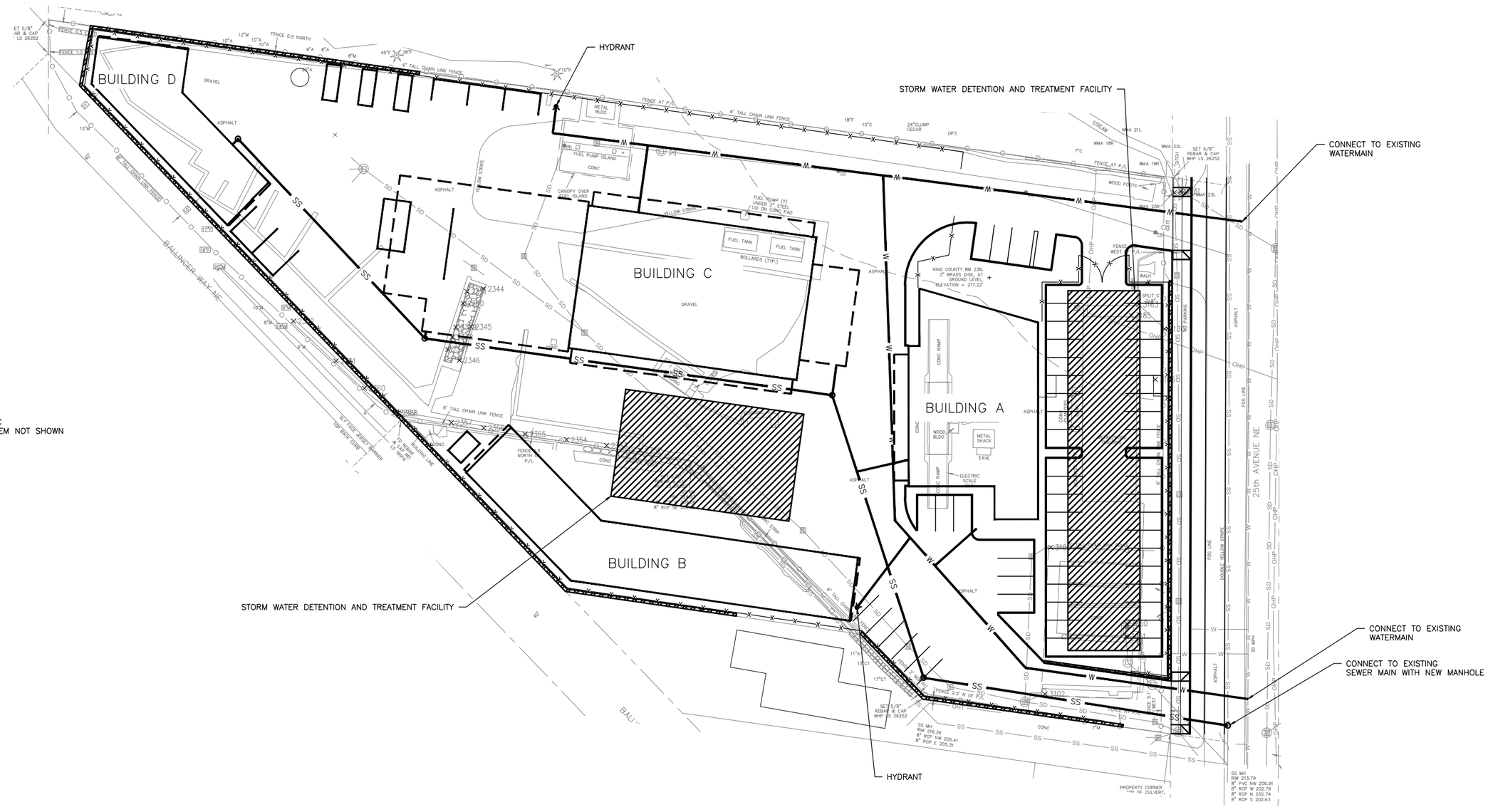
JUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

Drawn By | Date
Designed By
Checked By
Approved By
Project Number

CITY OF SHORELINE
NORTH MAINTENANCE FACILITY
CONCEPTUAL SITE PLAN

Drawing No. ST
Sheet No. 4 of Total 5

Apr 01, 2016 - 3:36pm DDeKoekkoek X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Plan Sheets\20150180 - PV.dwg Layout Name: Layout1



NOTES:

1. UTILITIES SHOWN ARE SCHEMATIC
2. STORMWATER CONVEYANCE SYSTEM NOT SHOWN

SCALE
30 0 30 60
FEET

DRAFT

No.	Date	Revision	By	Appr.

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DUSTIN DEKOEKKOEK — STATE OF WASHINGTON — 49442 — REGISTERED PROFESSIONAL ENGINEER

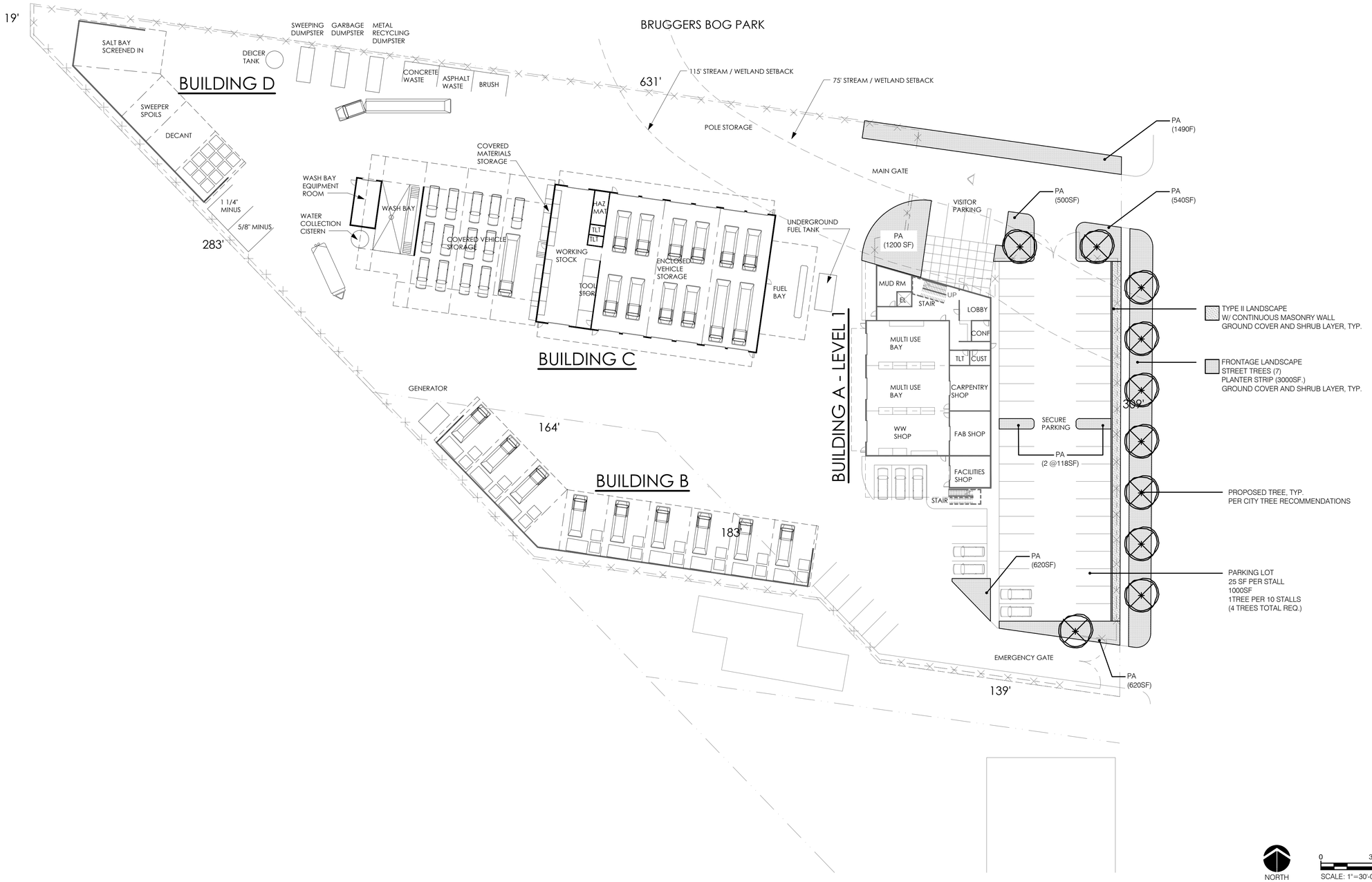
Drawn By ____ Date ____
Designed By ____
Checked By ____
Approved By ____

Project Number

CITY OF SHORELINE
NORTH MAINTENANCE FACILITY
CONCEPTUAL UTILITIES PLAN

Drawing No. UT
Sheet No. 5 of Total 5

Apr 01, 2016 - 3:35pm DDeKoekkoek X:\Shoreline, City of\Projects\20150180 - North Maintenance Facility\CADD\Plan Sheets\20150180 - UT.dwg Layout Name: Layout1

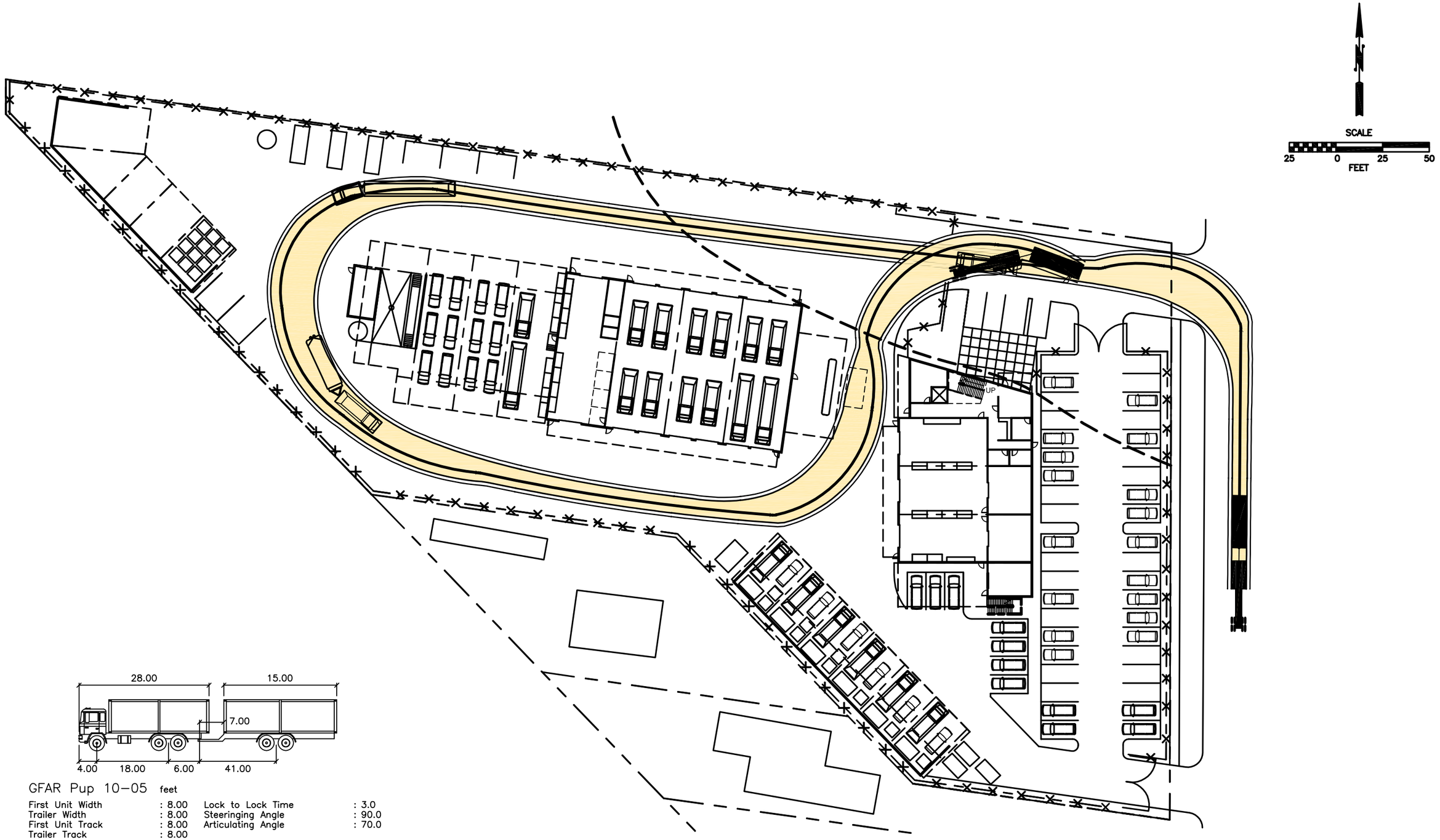


CITY OF SHORELINE - NORTH MAINTENANCE FACILITY

19547 25TH AVE NE SEATTLE, WA 98155 31 MARCH 2016 PRE DESIGN PHASE

CITY OF SHORELINE

TCF Architecture



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NORTH MAINTENANCE FACILITY
ALT B - TRUCK AND PUP (NORTH EXIT)

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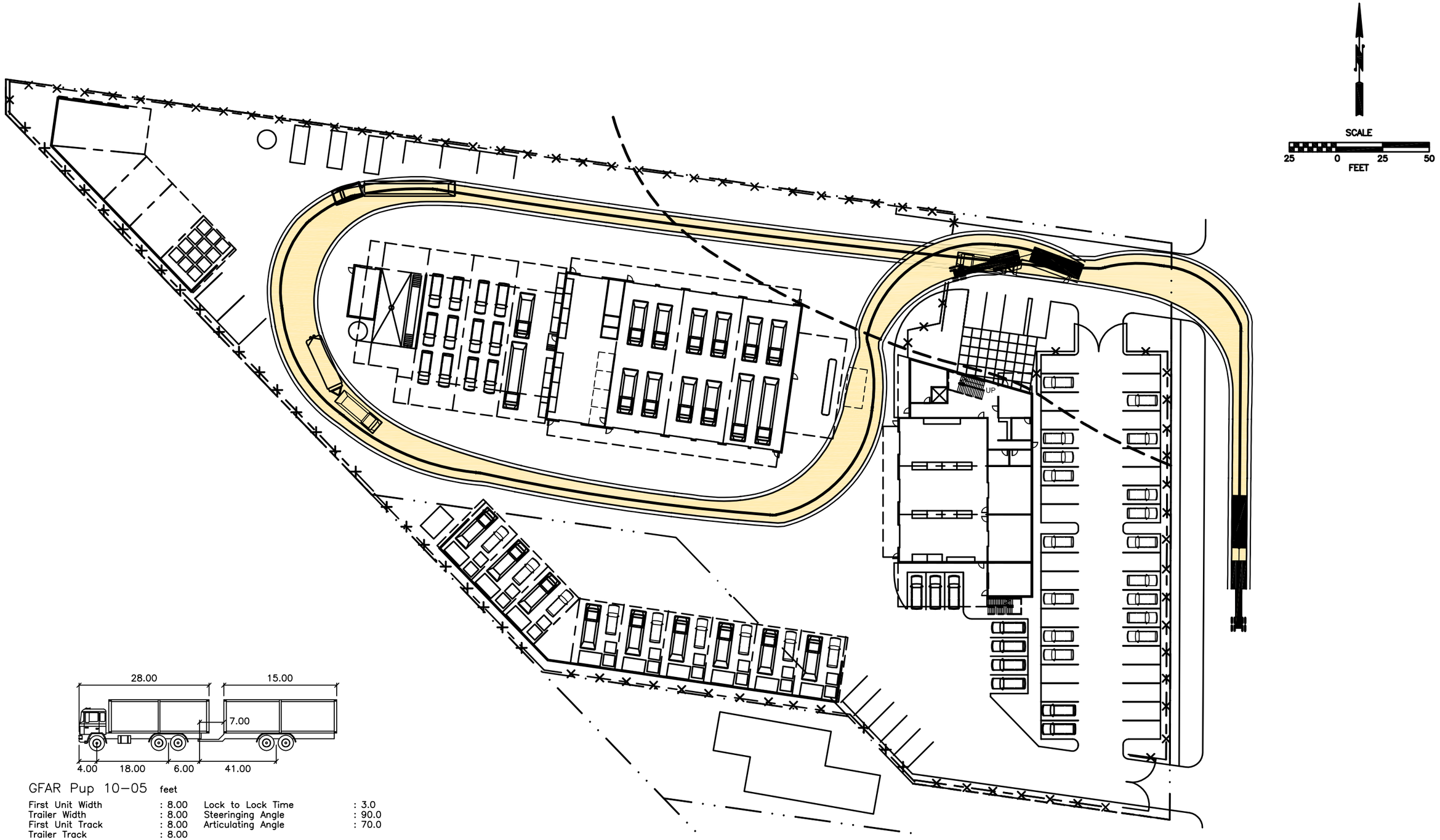

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ALT B-1 - TRUCK AND PUP (NORTH EXIT)

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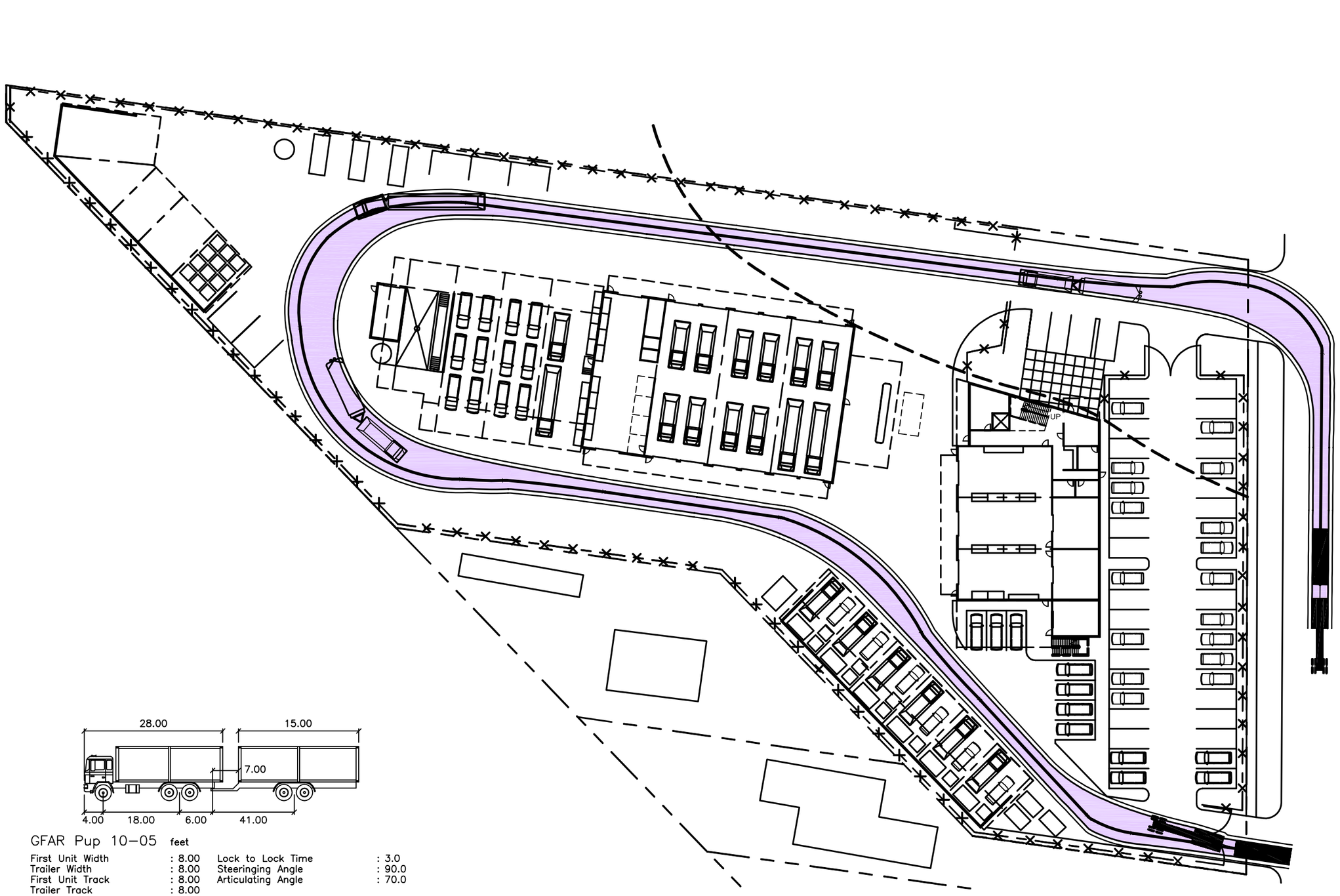

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NORTH MAINTENANCE FACILITY
ALT B - TRUCK AND PUP (SOUTH EXIT)

FIGURE

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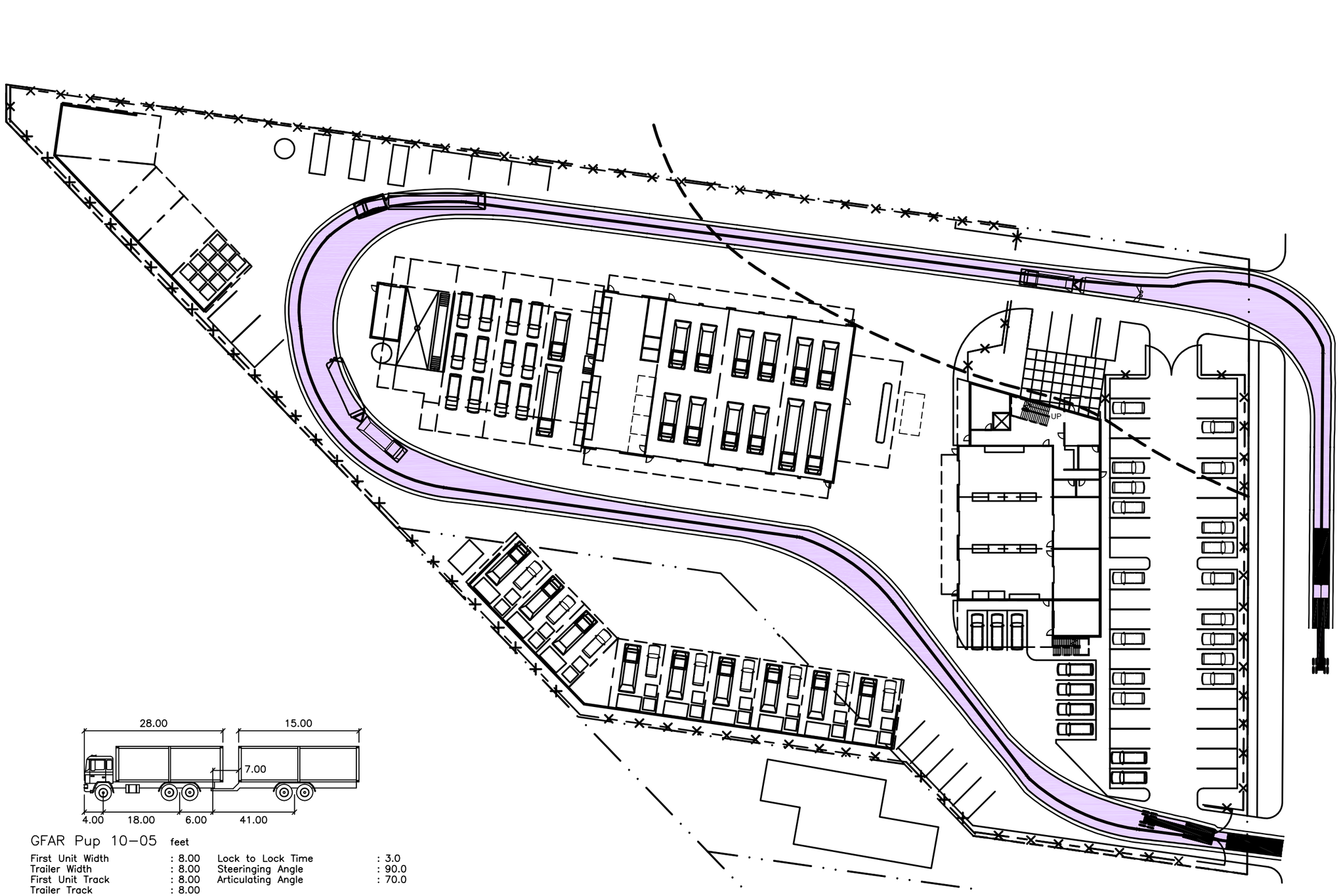

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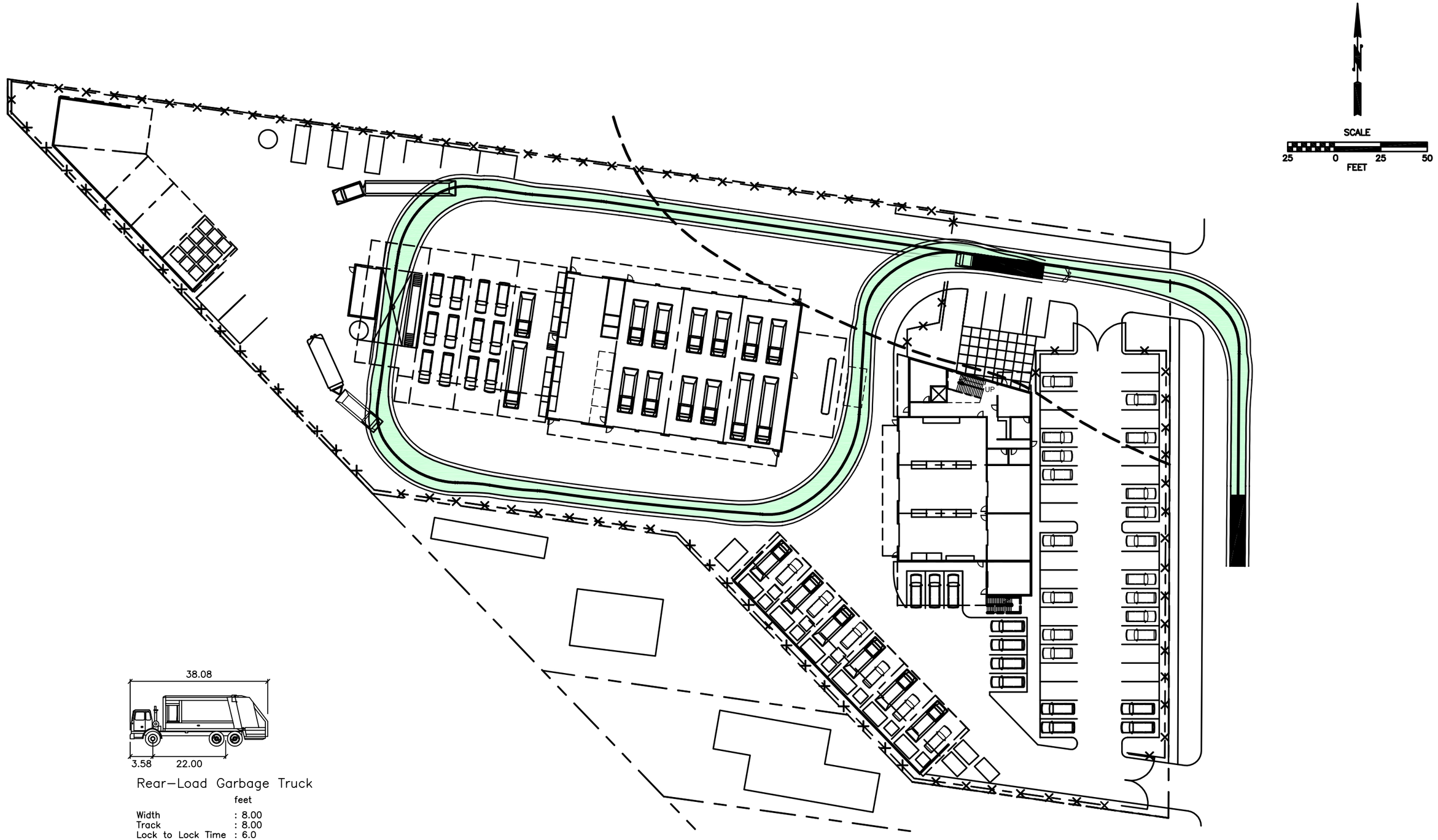

Rear–Load Garbage Truck

	feet
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FIGURE

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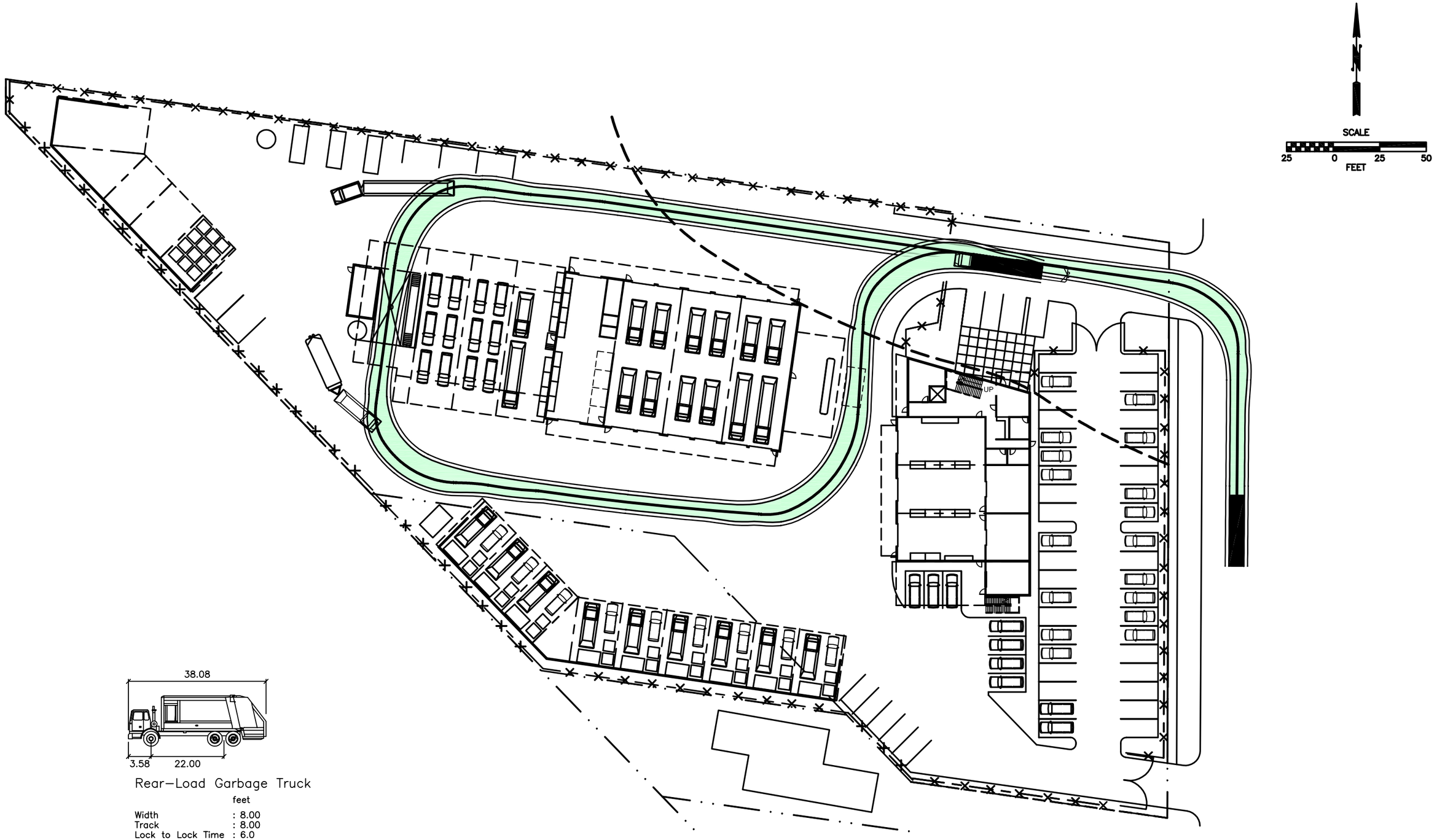

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ALTERNATIVE B-1 - WASH BAY

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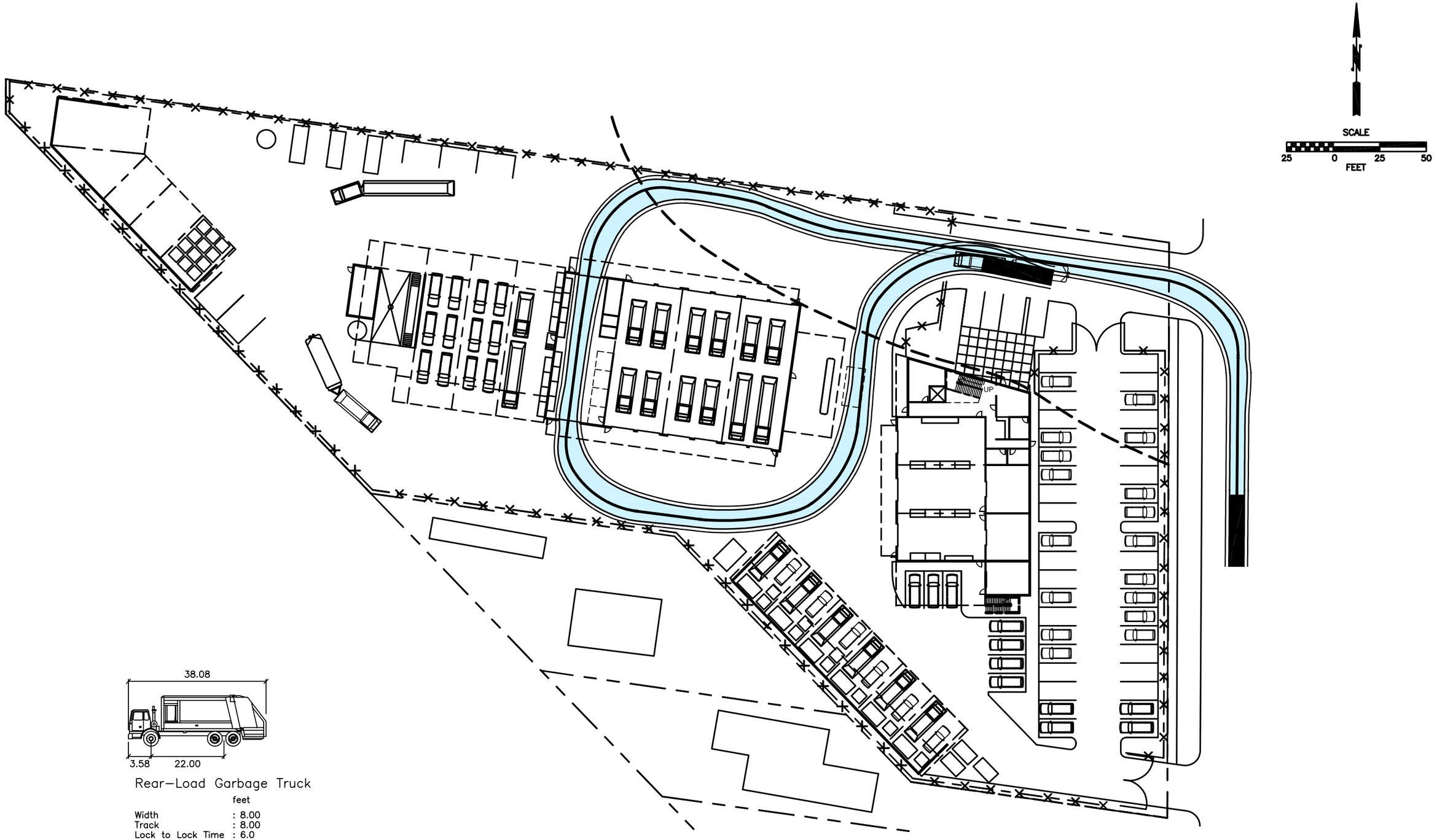

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ALTERNATIVE B - MIDDLE BAY

FIGURE

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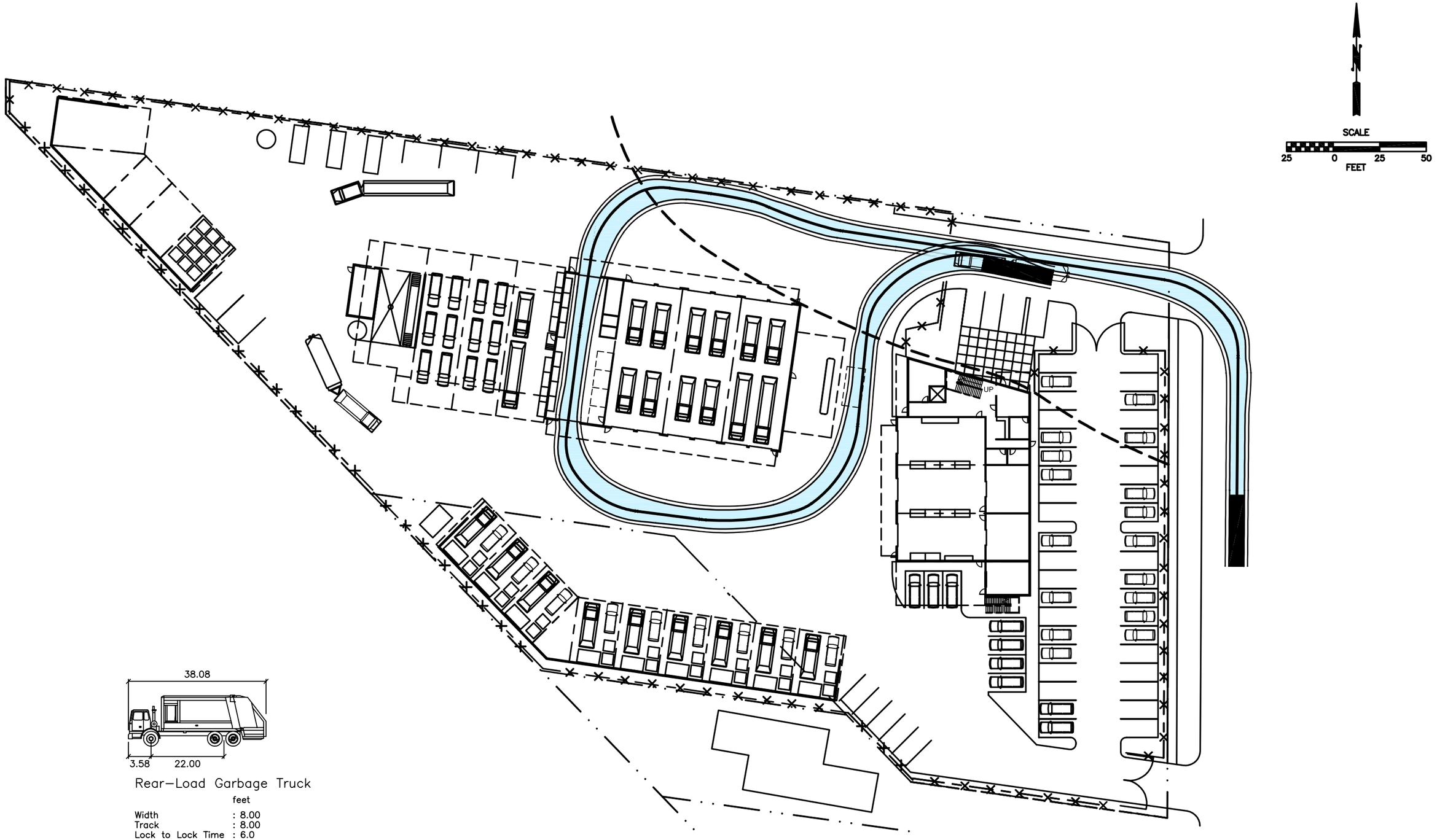

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ALTERNATIVE B-1 - MIDDLE BAY

FIGURE

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7C - MEETING AGENDAS AND NOTES

OVERVIEW

Included in this section are meeting agendas, meeting notes and the city council presentation.

City Council Dinner Meeting Agenda
February 22, 2016

Tour of Maintenance Facility Properties

This dinner meeting is a tour of maintenance facilities and properties involved in the North Maintenance Facility discussion at the regular council meeting tonight.

Staff – Randy Witt, Lance Newkirk, David LaBelle, Kirk Pederson (George dicks at RWD)
Consultant Team (TCA Architecture) – Randy Cook, Mark Hurley

4:40 Meet at the City Hall Lobby. A city van will take the councilmembers on the tour.

5:00 Leave City Hall (15 Min Drive)

5:15 Arrive at North Maintenance Facility Property (19791 25th Avenue NE) – 10 min visit
Remain in van drive around site and note:
- Size and shape of site
- Wetland in Park (Setback)
- Existing retaining walls
- Existing building, fuel inland, truck scale

5:25 Leave NMF (15 min. drive)

5:40 Arrive Hamlin Yard (16200 15th Avenue N) – 20 min visit
Leave van, David with Kirk lead quick tour
- Arrangement of existing property
  - Parks in back, PW in front
  - Long and narrow lot and building arrangement
- Facilities
  - Parks building
  - PW building
  - Conex boxes
  - Storage Bins (bins, sand, salt, decant
  - Vehicle parking

6:00 Leave Hamlin Yard (10 min. drive)

6:10 Arrive at Ronald Wastewater District Office (17505 Linden Ave N) – 10 min. visit
Leave van, George to lead quick tour
- Vehicle/equipment used in wastewater operations and storage space needed

6:20 Leave RWD (5 min. trip)

6:25 Arrive City Hall – dinner and discussion (Room 303?)

6:55 End dinner meeting

North Maintenance Facility

February 22, 2016

Randy Witt , Director of Public Works
Randy Cook, TCF Architecture

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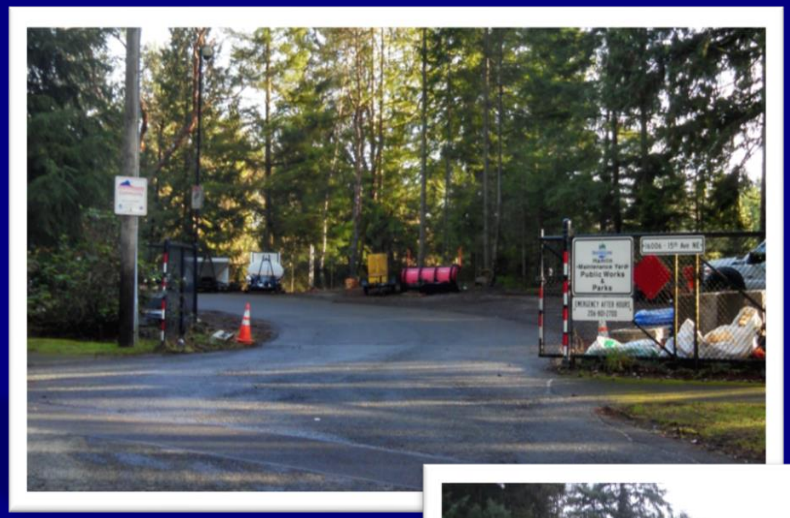
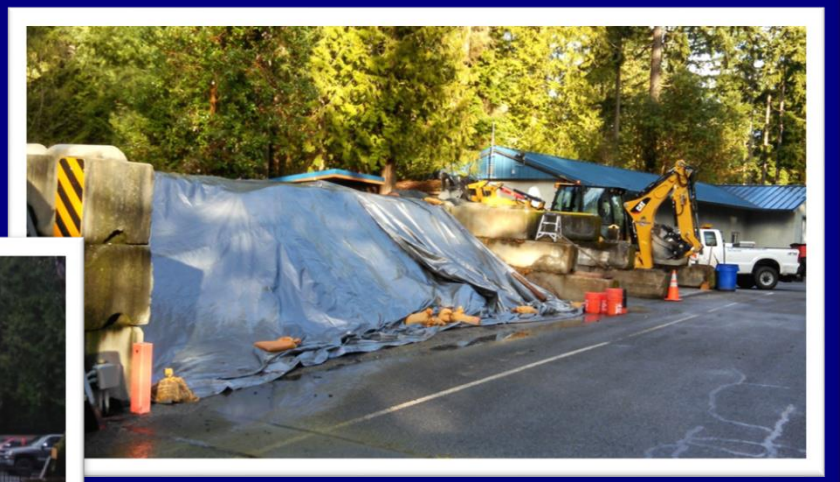
North Maintenance Facility





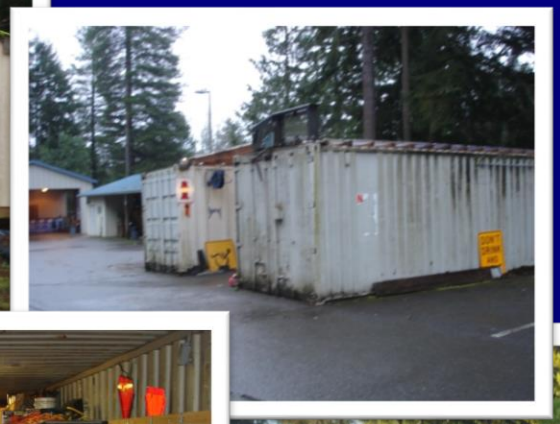
Current Facility at Hamlin Yard

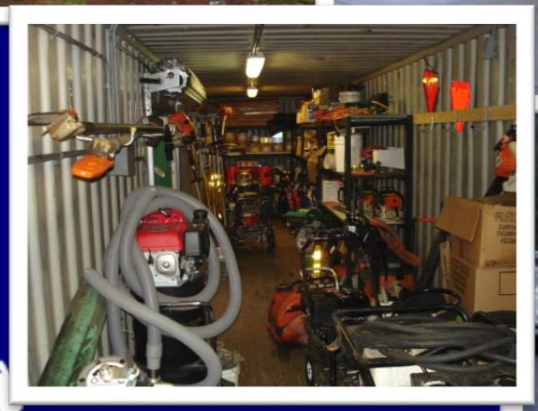


CITY OF SHORELINE

North Maintenance Facility









Current Facility at Hamlin Yard

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- Existing facilities are deteriorated and inefficient
- In 2002 the City and the Ronald Wastewater District (RWD) agreed to an assumption of RWD by the City in 2017



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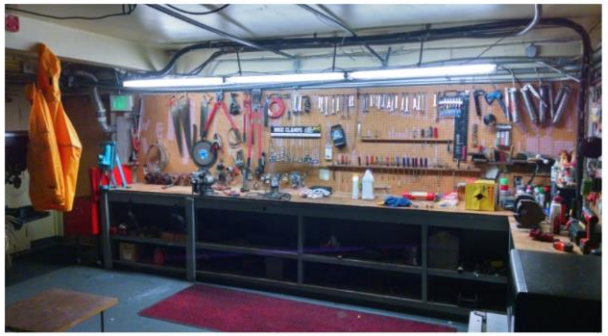
Hamlin Yard cannot absorb the RWD Ops and Maint staff and equipment









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North Maintenance Facility

In 2013 the City acquired the old County Road maintenance property

…and renamed it the North Maintenance Facility



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North Maintenance Facility







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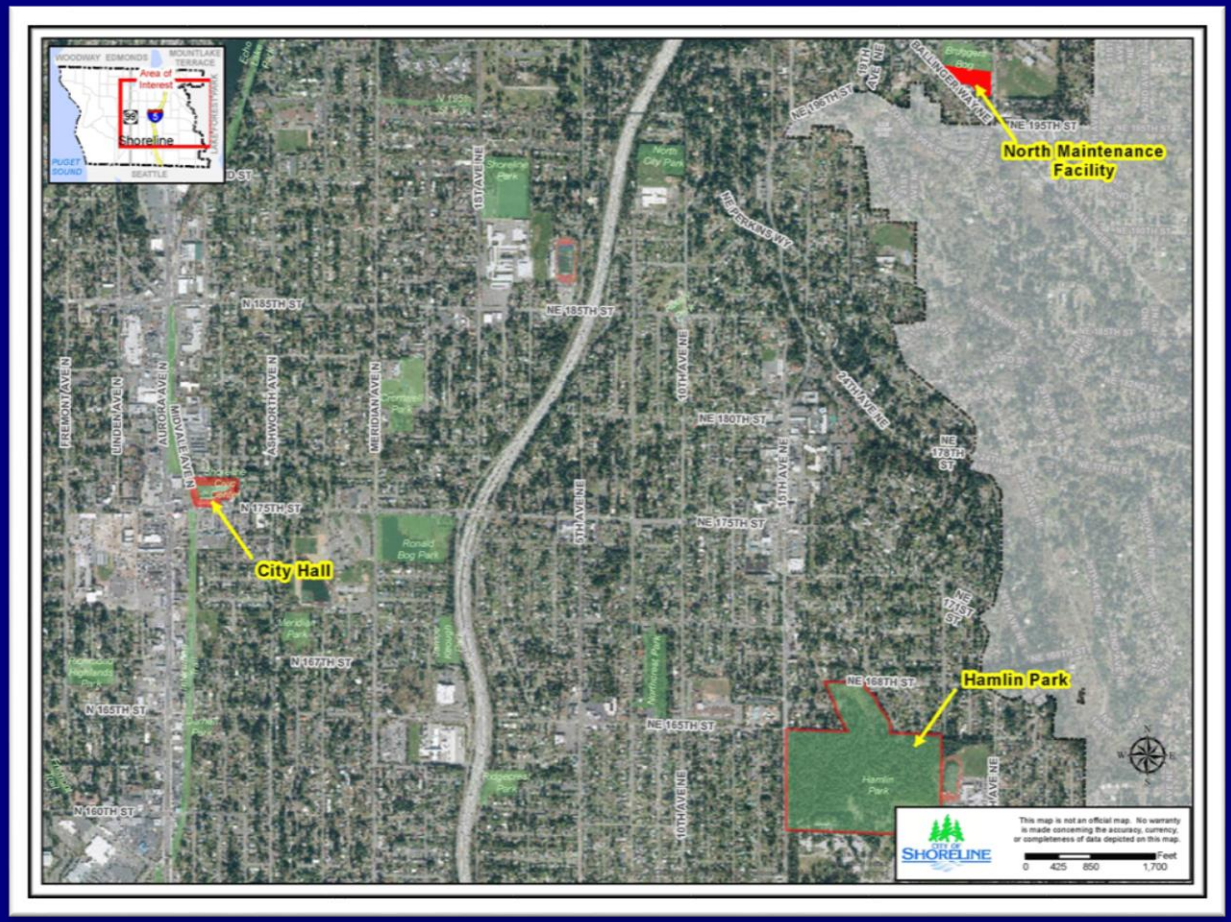
North Maintenance Facility



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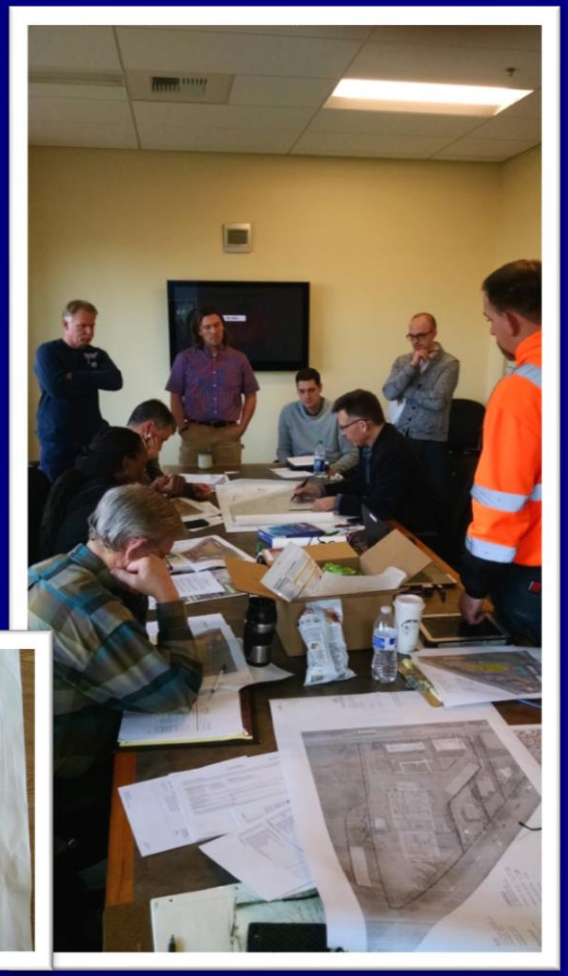
North Maintenance Facility

In October 2015 work started on the Design Criteria, Space Program and Conceptual Designs.





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North Maintenance Facility

Staff Program Requirements

	Crew	Sup.	Mgr.	Seasonal	**Totals**	Remarks
Streets	8 (10)	1 (1)	1 (1)	2 (4)	**12 (16)**	
Surface Water	3 (4)	1 (1)	-	2 (3)	**6 (8)**	
Waste Water	6 (6)	1 (1)	-		**7 (7)**	
Facilities	1 (2)	1 (1)	-	1 (1)	**3 (4)**	
Fleet	-	-	-	-	**0**	Possible future mobile mechanic
Traffic	-	-	-	-	**0**	Storage and shop space
Police	-	-	-	-	**0**	Storage of vehicles and pallets
Admin	-	-	-	-	**0**	
TOTALS	**18 (22)**	**4 (4)**	**1 (1)**	**5 (8)**	**28 (35)**	

Vehicle Program Requirements

	Large	Medium	Small	X-Small	XX-Small	**Totals**	Remarks
Heated/Enclosed	1	1	-	-	-	**2**	
Covered	2	16	31*	9	21	**79**	*(2) Police impound
Uncovered	-	-	10*	-	-	**10**	*Police vehicles
TOTALS	**3**	**17**	**41**	**9**	**21**	**91**	

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North Maintenance Facility

Space Program

Program Type	Gross Area (SF)	Description
Administrative	1,664	Offices, Conference rooms, Lobby
Crew	4,711	Crew rooms, Mud room, Locker rooms, etc.
Support	959	IT, Electrical room, Toilet rooms, Custodial, etc.
Maintenance Shops	5,702	Carpentry, Fabrication, Facilities, Multiuse vehicle bays, etc.
Enclosed Equipment/ Materials Storage	4,055	Semi heated space for Hazmat storage, Tool storage, Working stock, etc.
Enclosed Vehicle Storage	1,008	Semi-Heated space for temperature sensitive vehicles
Covered Vehicle Storage	14,106	Covered storage for non-temperature sensitive vehicles
Covered Equipment/Material Storage	5,174	Covered storage for non-temperature sensitive equipment
Covered Fueling/Wash	1,760	Fuel and Wash facilities
	39,140	**TOTAL MINIMUM PROGRAM AREA**

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North Maintenance Facility

Conceptual Site Layouts

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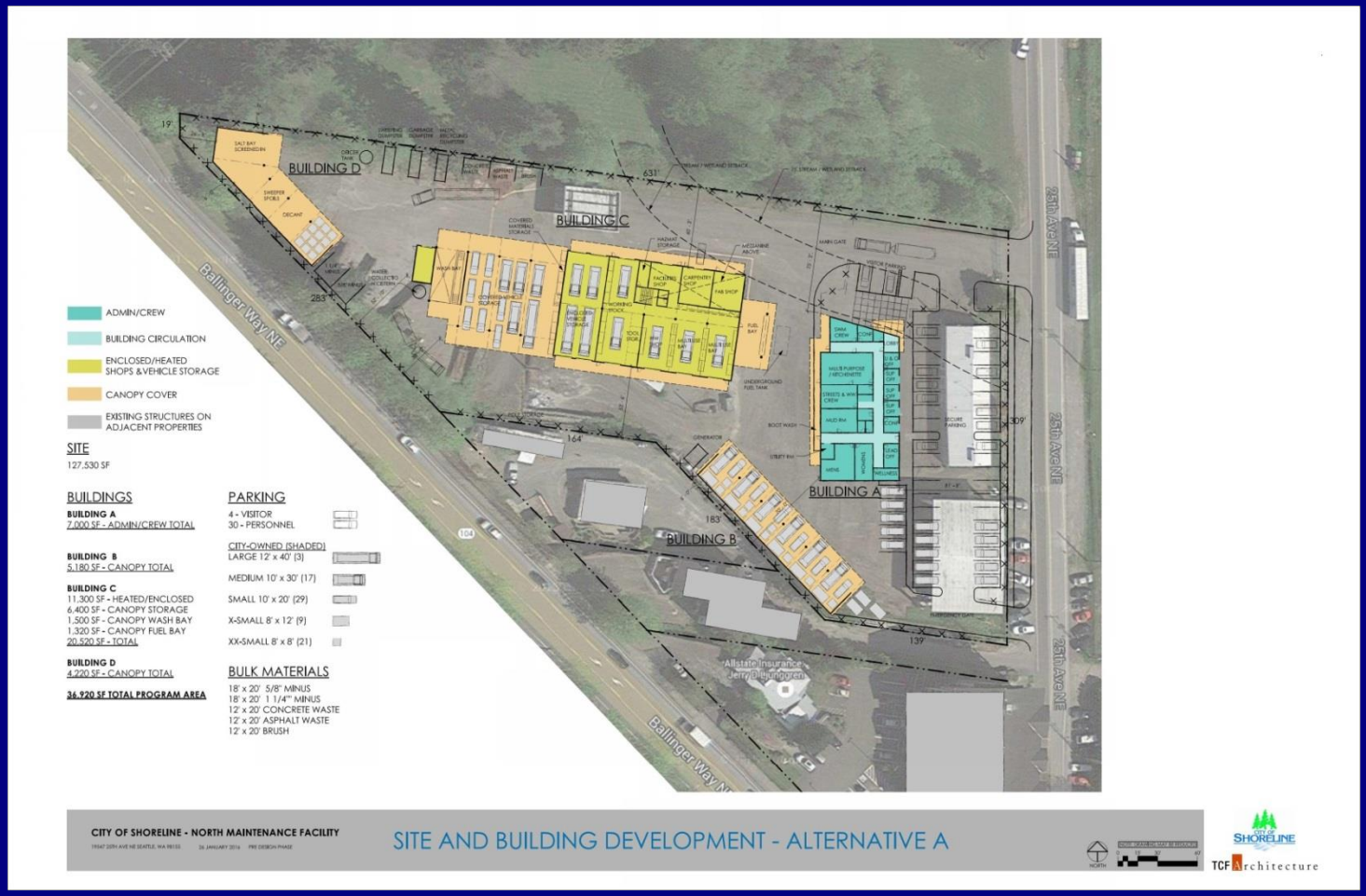
North Maintenance Facility



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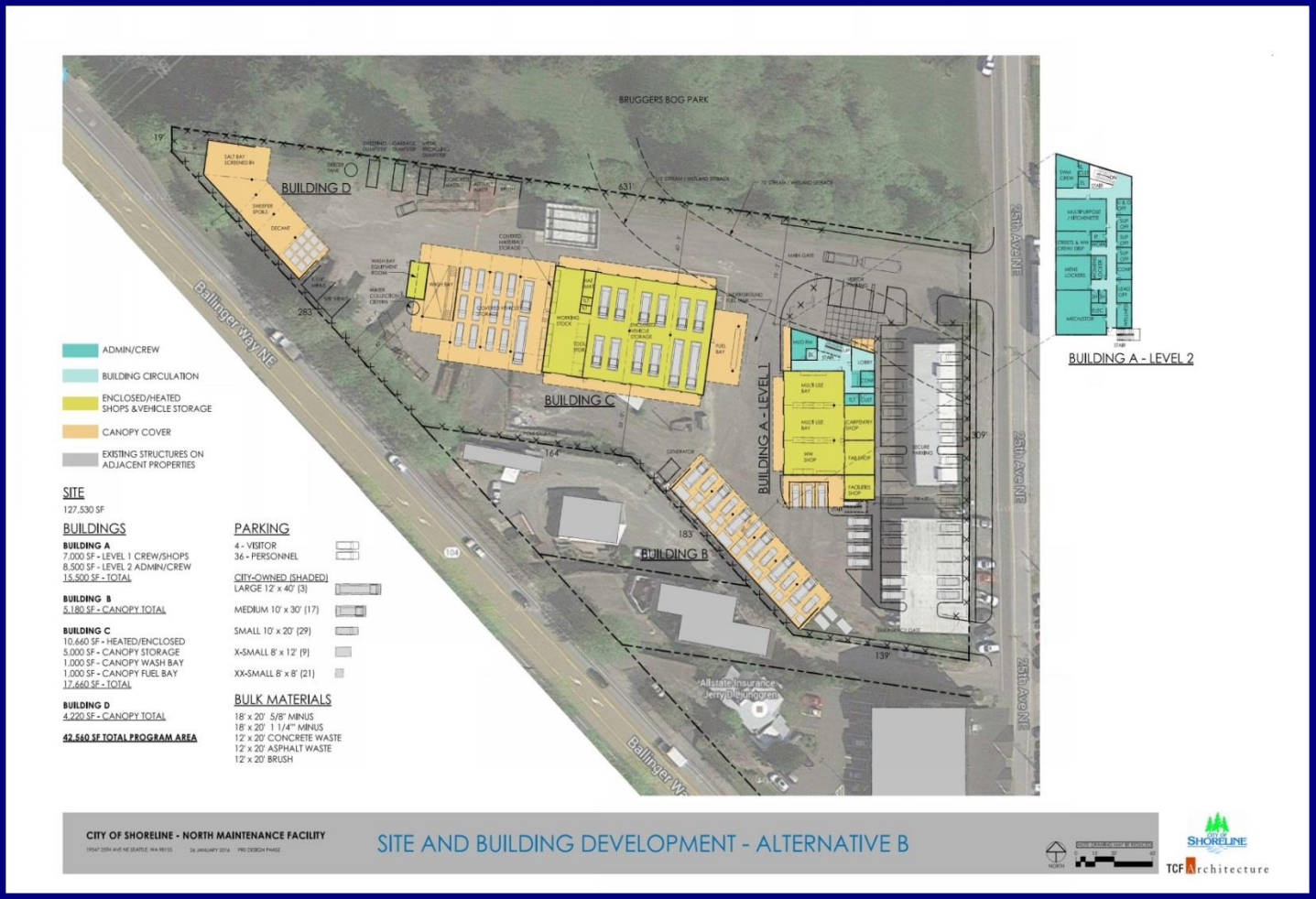
Alternate A

North Maintenance Facility



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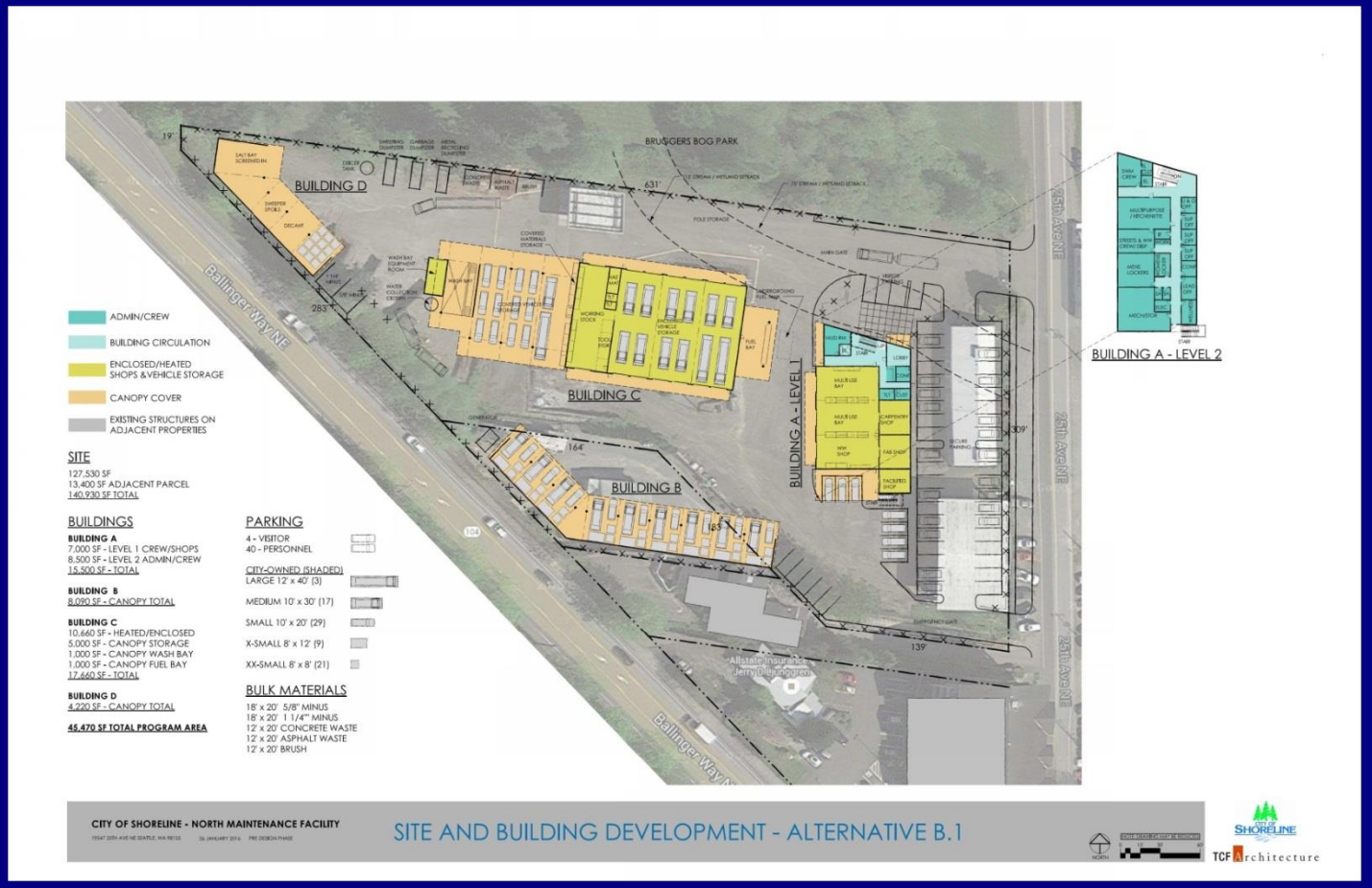
Alternate B

North Maintenance Facility



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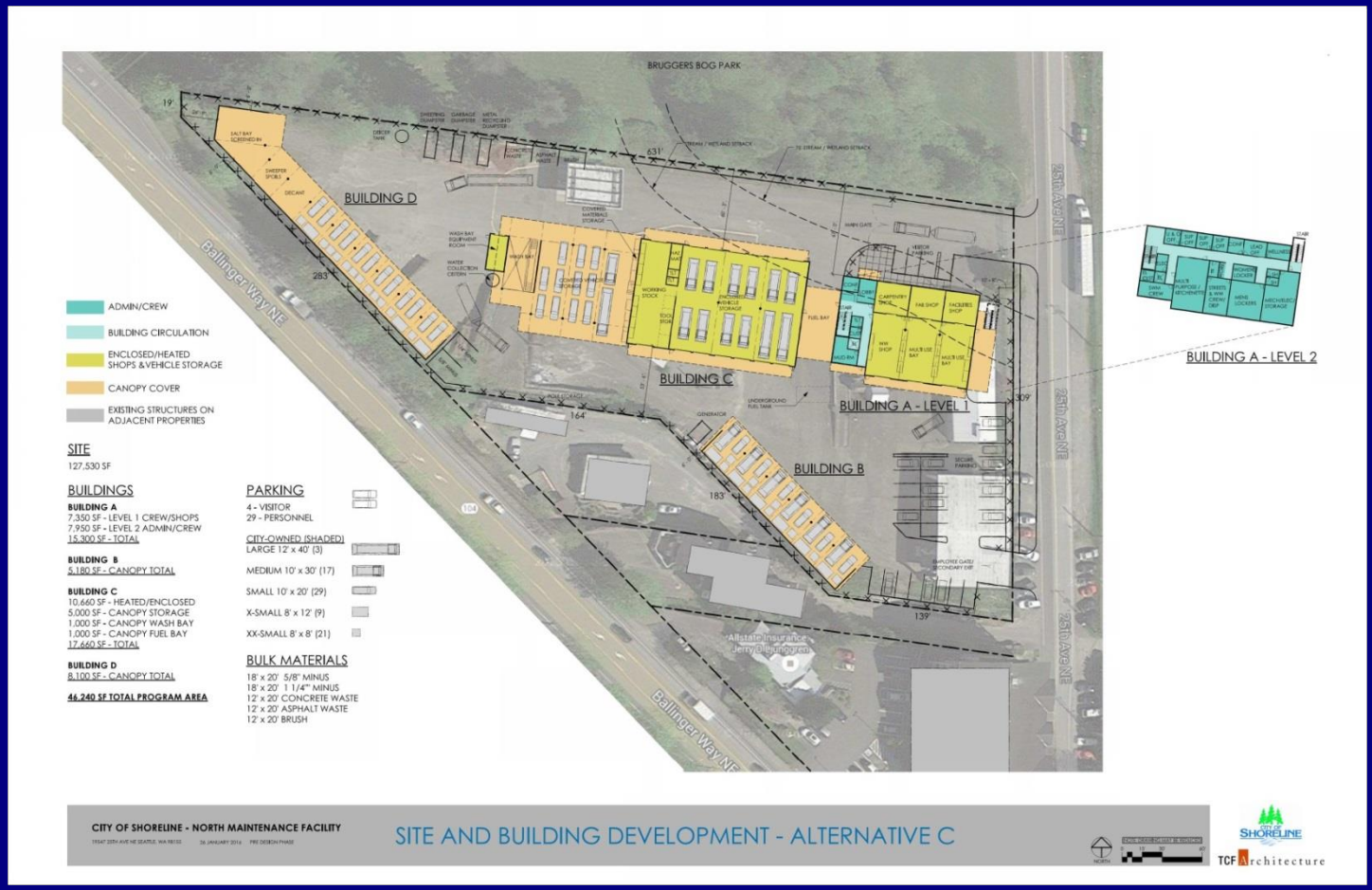
Alternate B.1

North Maintenance Facility



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Alternate C

North Maintenance Facility

Estimated Costs Associated with Each Alternative

Site Alternative	A	B	B.1	C
Approx. Building Area	39,000 SF	45,000 SF	48,000 SF	49,000 SF
Site Costs (Phase 1 & Phase 2 Combined)	$4,078,000	$4,078,000	$4,389,000	$4,078,000
Buildings (Incl. generator, fuel & wash equip)	$6,464,000	$7,889,880	$8,158,000	$8,314,980
Soft Costs (Incl. Mgmnt. Reserve Contingency)	$3,628,800	$4,142,117	$4,336,950	$4,295,153
FF&E (Furnishings, Fixtures & Equipment)	$175,000	$175,000	$175,000	$175,000
Land Acquisition (South Parcel)	0	0	$550,000	0
Wetland Mitigation (Extent not known)	0	0	0	$500,000
Escalation (Not included. Assume early 2017 Start)	0	0	0	0
Preliminary Cost Estimate Totals	**$14,345,800**	**$16,284,997**	**$17,608,950**	**$17,363,133**
Approximate Cost Range (5%)	**$14.0 - $14.7M**	**$15.9 – 16.7M**	**$17.1 – 18.0M**	**$16.9 – 17.8M**

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North Maintenance Facility

All the site alternatives have the following considerations:

- Significant grading, retaining, and stormwater management costs
- Clear, efficient people circulation in building A and C and between buildings
- No building expansion capabilities
- Can achieve successful design outcomes to address neighborhood concerns
- Achieve functional circulation for large vehicles

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North Maintenance Facility

Recommendation:

- Alternative B.1 be moved into the design phase
- Commitment to make economical design decisions that bring value to the building and site design
- Refine Costs
- Identify a funding mechanism for project design and construction within the context of the City's Ten Year Financial Sustainability Plan.

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North Maintenance Facility



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North Maintenance Facility

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Mark Hurley

From: Randy Witt <rwitt@shorelinewa.gov>
Sent: Tuesday, February 2, 2016 10:59 AM
To: Lance Newkirk
Cc: Mark Hurley; John Norris; Randy Cook; David LaBelle
Subject: RE: Ballinger NA on NMF

Categories: Filed by Newforma

Thanks again for attending this meeting Lance. Great notes.

Best, Randy

Randy Witt, Director of Public Works I City of Shoreline WA I 206-801-2401

Working together, protecting our resources, making a difference
City of Shoreline Public Works Mission

From: Lance Newkirk
Sent: Tuesday, February 02, 2016 8:44 AM
To: Randy Witt
Subject: Ballinger NA on NMF

Randy,

The presentation on the NMF at the Ballinger Neighborhood Association meeting went well. There were between 20 and 25 residents present. I provided a high level overview of the project and how the City is trying to meet its current and future operational needs on the site as represented by the three architectural renderings. There were many good questions and comments. Here are some of the neighborhood concerns that I heard and responded to last night.

Aesthetic

- Desire to have the site developed and be seen as an asset in the neighborhood; i.e. attractive building facades, land and street scaping, etc.

Environmental

- Decant operations – Make sure to address odor control; especially if RWD uses the decant site for its waste stream
- Lighting – Desire to have more information on the exterior lighting plan when available
- Noise – Audible vehicle backing alarms and after hour operations
- Vector control – Having a plan to address/prevent rodents from becoming a problem from the on-site spoils/waste products
- Vehicle idling – Emissions and noise
- Water quality –

Site Development

- Access – Consider providing vehicle access off of Ballinger Way to reduce vehicle traffic on 25th
- Parking – Make provision for electric vehicle charging station(s)and no on-street parking

- Fueling – Wanted more information on quantity of fuel to be stored on site and storage configuration (above or below ground)

Traffic
- Pedestrian Safety – Ensure pedestrian, especially children, needs (sidewalks) are addressed
- Traffic volume – Desire to have more information on the number of vehicle trips expected in and out of the site on a daily basis

Other
- Public meeting space – Desire expressed to provide public meeting space in admin building for community use
- Restrooms – Desire expressed to build public restrooms for use by Bruggers Bog park users
- Communications – Interested in having an every six month or so check-in with the neighborhood as the project progresses

I answered the neighborhood's concerns both broadly and specifically; acknowledging that some of their concerns will be addressed in more detail as the project progresses.

All in all, a very receptive audience who appreciated being brought into the know at this early stage of the project with a clear desire to stay informed and have the ability to provide feedback/input as the project goes forward. Please let me know if you want any additional detail.

Lance

Memorandum

DATE: January 28, 2016

TO: Parks, Recreation and Cultural Services Board

FROM: Randy Witt, Public Works Director

RE: North Maintenance Facility Development

CC: Eric Friedli, Parks, Recreation and Cultural Services Director

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Requested Board Action

No action is requested. This is an introduction of the project to the Board as a discussion item.

Staff Recommendation:

None

Project Background

The City of Shoreline purchased the former King County Maintenance yard off of Ballinger Way and 25th Ave NE adjacent to Brugger's Bog Park, with the intent of bringing several maintenance activities together on one site. These include Public Works Streets, Surface Water Management (SWM), and Waste Water (WW) groups, with limited presence of Facilities, Traffic Engineering, Environmental Services, and Police. This property is adjacent to and south of Brugger's Bog Park.

Several of these public works functions are currently co-located with parks maintenance in the maintenance yard at Hamlin Park. Parks maintenance operations will stay at Hamlin Park.

The City entered into a contract with TCF Architects for programing and design of a maintenance facility (the North Maintenance Facility – NMF) at the end of 2016. In the first round of programming it was determined that the existing structures were not adequate to support the new program and functions, all existing structures will be demolished and the site will be regraded to accommodate the new structures. The existing structures include a wood framed structure, two pre-engineered canopies and fuel dispensers and above ground fuel tanks. The new public works and maintenance facility will include administrative and crew functions, vehicle storage (enclosed and

canopy covered), shops, vehicle washing, vehicle fueling with diesel and gasoline in a below ground fuel tank, deicer tank storage, decant facility and bulk materials storage.

The NMF site is bounded by Brugger's Bog Park on the north, 25th Ave NE on the east, Multifamily residential on the south and Ballinger Way on the Western edge. The eastern edge of the NMF site, along 25 Ave NE, floods during high rainfall events. The City is actively looking to correct this issue with the "25th Ave NE Floor Reduction Project". The intent of this project is to correct the flooding issue in the area including on the NMF site, the design strategy is yet to be determined. It is expected that the flood reduction project will be behind the NMF project schedule so strategies for the NMF project will need to be implemented to prevent flooding of the new structures until the flood reduction project is complete. Coordination between the two projects is expected throughout design and construction.

There are 4 buildings planned on this site:

Building A - Administration, crew and shops building, at 15,500 SF.
Building B - Vehicle and equipment canopy, pre-engineered metal building at 5,180SF.
Building C - Vehicle storage, enclosed and canopy covered, equipment storage vehicle wash bay and vehicle fuel bay, pre-engineered metal building at 20,900 SF.
Building D -Vehicle and material storage canopy, pre-engineered metal building at 4,500 SF.

Preliminary concept plans under consideration by the design team will be shared at this meeting.

With the development of the NMF and the relocation of public works out of the Hamlin Park maintenance facility, it can be reconfigured for more efficient use by Parks Maintenance operations. Over the years there have been numerous designs developed for how a new parks maintenance facility might be configured. The Hamlin Park facility is not a part of the NMF design project but staff have taken the opportunity to resurface some of those previous designs and update them based on current operations. Park staff anticipate looking towards upgrades after the public works staff move to the NMF.

Public Involvement Process

The Parks, Recreation and Cultural Services Board are being introduced to the project at this meeting, an informal meeting with the Ballinger Neighborhood is planned for February 1, 2016 and an update of the City Council is planned for February 22, 2016. Further public meeting will be conducted during the design process.

Schedule

The NMF project is in the early design phase, the site and building plans are still being vetted by the user groups. Although a firm schedule is not been established, the design phase will continue through 2016, with construction starting towards the end of 2016 or beginning of 2017 and continuing through 2017. Occupancy of the buildings is expected in early 2018.

TCF Architecture

CITY OF SHORELINE
NORTH MAINTENANCE FACILITY (SNMF)

PROGRAMMING WORKSHOP NO. 1
December 1-2, 2015

Workshop 1 Session A
Tuesday, December 1, 2015

TIME	SESSION AGENDA	ATTENDANCE
8:30am - 10:30pm Meet at Hamlin	**Existing Site Tours** ▪ Hamlin Maintenance Facility (PW and Parks) ▪ Ronald Wastewater District Facility	**Design Team:** Randy Cook – TCF Mark Hurley – TCF Frank Coleman – PCG Civil - Perteet **City of Shoreline:** Key Stakeholders **RWD** Key Stakeholders
11:00am - 12:30pm City Hall conference room 222	**Goals / Visioning** ▪ Review City of Shoreline's goals and missions ▪ Review individual programs goals and missions ▪ Review long range plan and projections for service ▪ Discuss additional project goals & objectives, sustainability, and identify an overarching project vision and mission statement. ▪ Broadly discuss anticipated facility requirements and which workshop sessions are key to your needs.	**Design Team:** Same **City of Shoreline:** PW, Street and Storm, Facilities, Parks **RWD** Key Stakeholders
12:30pm - 1:00pm City Hall conference room 222	**Lunch** ▪ Continue conversation	**Design Team:** Same **City of Shoreline:** Key Stakeholders **RWD** Key Stakeholders
1:00pm - 2:30pm City Hall conference room 222	**Crew/Admin** ▪ Exterior areas (crew vs public) - entry, parking, patio ▪ Public uses (lobby, meeting room, etc…) ▪ Office (open vs enclosed) ▪ Crew Spaces (locker, mud room, crew/dispatch room, break room, kitchen) ▪ Common work / conference rooms	**Design Team:** Same **City of Shoreline:** Key Stakeholders **RWD** Key Stakeholders

	▪ Facilities Group ▪ Water Quality Group ▪ Other ▪ Expansion	
2:30pm - 4:30pm City Hall conference room 222	**Shops/Storage** ▪ Discuss all shop-related functions and needs for each group ▪ Review equipment needs, storage needs, vehicle access needs, and building system needs. ▪ Interior Storage ▪ Vehicle Storage ▪ Facilities Group ▪ Water Quality Group ▪ Expansion	**Design Team:** Same **City of Shoreline:** Key Stakeholders **RWD** Key Stakeholders
NOTES		

TCF Architecture

Workshop 1 Session B

Wednesday, December 2, 2015

TIME	SESSION AGENDA	ATTENDANCE
8:30am - 9:00pm City Hall conference room 303	**Review** ▪ Continue discussions from yesterday	**Design Team:** Randy Cook – TCF Mark Hurley – TCF Frank Coleman – PCG **City of Shoreline:** Key Stakeholders
9:00am - 11:00pm City Hall conference room 303	**Warehousing** ▪ Review current practices for purchasing, inventory management, and management of exempt materials ▪ Review alternatives for future inventory control and shared opportunities ▪ Review alternatives for storage systems and space configurations ▪ Shipping / Receiving ▪ Working stock	**Design Team:** Same **City of Shoreline:** Key Stakeholders
11:00am - 12:30pm City Hall conference room 303	**Site Facilities** ▪ Crew vehicle and equipment parking ▪ Provide inventory of items that will be housed on NMF site	**Design Team:** Same **City of Shoreline:** Key Stakeholders
12:30pm - 1:00pm City Hall conference room 303	**Lunch** ▪ Continue conversation	**Design Team:** Same **City of Shoreline:** Key Stakeholders
1:00pm - 3:30pm City Hall conference room 303	**Site Facilities** ▪ Fueling ▪ Washing ▪ Vactor Decant ▪ Bulk materials storage ▪ Police storage ▪ Other Areas	**Design Team:** Same **City of Shoreline:** Key Stakeholders
3:30pm - 4:30pm City Hall conference room 303	**Next Steps** ▪ Deliverables ▪ Schedule	**Design Team:** Same **City of Shoreline:** Key Stakeholders

NOTES

TCF Architecture

CITY OF SHORELINE
NORTH MAINTENANCE FACILITY (SNMF)

WORKSHOP NO. 2 - PRELIMINARY DESIGN CONCEPTS

Wednesday, December 16, 2015

TIME	SESSION AGENDA	ATTENDANCE
8:30am - 9:30pm City Hall conference room 222	**Review Program Documents** ▪ Review each program space; content, square footage and layout ▪ Confirm all spaces are accounted for	**Design Team:** Randy Cook – TCF Mark Hurley – TCF Dustin - Perteet **City of Shoreline:** PW, Street and Storm, Facilities, Core Team **RWD** Core Team
9:30am - 12:00pm City Hall conference room 222	**Review Conceptual Floor Plan and Site Plan** ▪ Review conceptual site plan conceptual, explore options ▪ Review conceptual floor plan layout, explore options ▪ Review site constraints and opportunities ▪ Review overall work flow and site flow **Review off-site Considerations** ▪ Park Access ▪ Neighbors ▪ 25th Ave Improvements	**Design Team:** Same **City of Shoreline:** PW, Street and Storm, Facilities, Core Team **RWD** Core Team
12:00pm - 1:00pm City Hall conference room 222	**Project Schedule & Next Steps** ▪ Review preliminary project schedule ▪ Review possible early site package ▪ Review public outreach approach	**Design Team:** Same **City of Shoreline:** PW, Street and Storm, Facilities, Core Team **RWD** Core Team

Existing Example Facilities Tour

Date: November 17, 2015

Project Name: **Shoreline North Maintenance Facility (SNMF)**
TCF Architecture Project Number: 2015-016

See attached photos

1. Sammamish Maintenance Facility			
1.1	**Overview**	• City of Sammamish is similar in population size to City of Shoreline • Custom steel and wood framed • 15 FTE and 30 Seasonal staff • 2 story facility because of the sloping site, crews/admin spaces on the lower level, shops on the upper level • Visual access for security from lobby is important • Public does have access to the lobby during business hours, art in lobby • Polished concrete does not create slipping issues and is used in high traffic areas • Generator on site • Fueling and vehicle washing on site • *Crew room* - combined with PW and Parks, lots of power and data in floor and walls for flexibility • *Multipurpose room* - separate from crew rooms and contains kitchen, training room and is open for public use • *Mud room* - lockers, washer dryer, restroom and outside boot wash, "dirty Lockers" • *Locker rooms* - Lockers, shower and toilet facilities, "clean lockers" • *Shops* - heated floors, added benefit is that the floor dries fast, extra storage bay, each shop allows enough space for storage, securable overhead door, MDO to 8' for durable surface, trench drains at overhead doors, no slope floor and exterior canopy at overhead doors • *Mezzanine* - Bulk item storage, infrequent use item storage, forklift access	
2. SeaTac Maintenance Facility			
2.1	**Overview**	• Pre Engineered Metal Building, some custom steel • 17 FTE and 10 Seasonal staff • 1 story admin and crew building, with shops and storage located in multiple separate structures • Public does have access to the lobby during business hours, art in lobby • PW and Parks came together in this facility and share use of several spaces • *Crew rooms* - Separate rooms for PW and Parks with a shared map room and work room in between. • *Multipurpose room* - Kitchen, break room, becomes EOC • *Wellness room* - For all users • *Locker rooms* - Lockers, shower and toilet facilities	

		• *Shops* - exposed structure and "bagged" insulation on walls and ceiling, MDO on walls for added durability, exterior exposed canopy structure need bird control • *Mezzanine* - Bulk item storage, infrequent use item storage, forklift access	
3. Pierce County Sewer and Traffic Operations Facility			
3.1	**Overview**	• Custom steel, "Costco Style" and Pre Engineered Metal Building at canopies • 100 FTE plus seasonal • 1 story admin and crew building, with shops and storage located in multiple separate structures • Public does have access to the lobby during business hours, must be "buzzed in" to get beyond lobby • Sewer and Traffic and Fleet Maintenance came together in this facility and share use of several spaces • 50 year facility, high quality durable materials • Pursuing LEED Gold by use of high efficient MEP, pervious paving in key areas, natural daylight, reclaimed wood, rain water collection among other strategies • Generator on site • Fueling and vehicle washing on site • *Crew rooms* - separated by operable partitions to form 1 large space, no sound issues between operable walls, wood ceiling helps provide good acoustics • *Resource rooms* - Adjacent to crew rooms for computer work and radio charging and storage • *Kitchen* - Dedicate kitchen and break room with outdoor gathering space • *EOC* - Separate dedicated space • *Warehouse* - Dedicated warehouse/inventory person, control access with loading and unloading drive through canopy • *Shops* - exposed structure and use of CMU for added durability	

Sammamish Maintenance Facility Photos









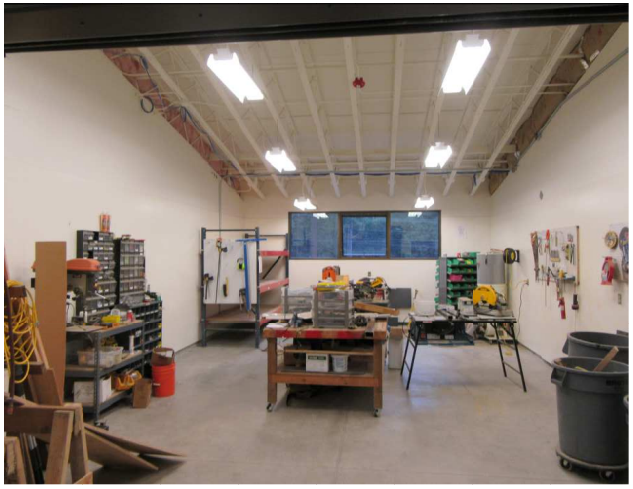





EXIT



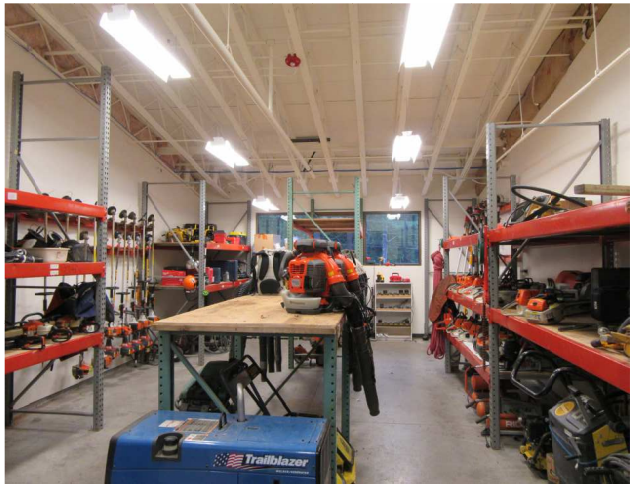











Trailblazer







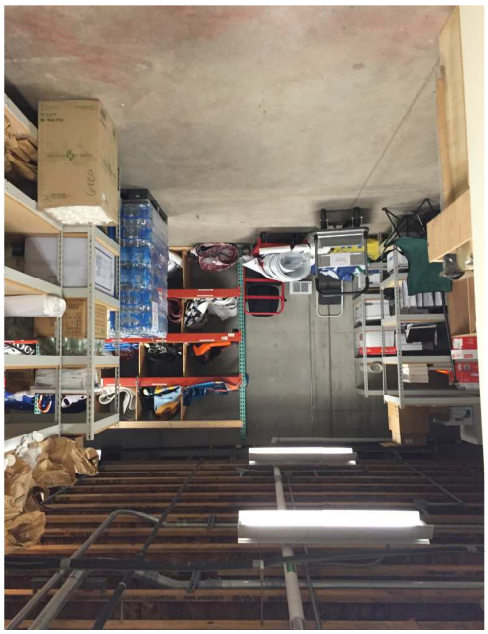


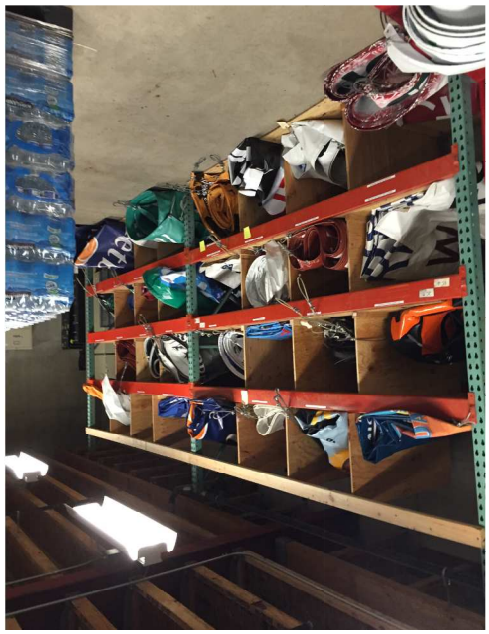
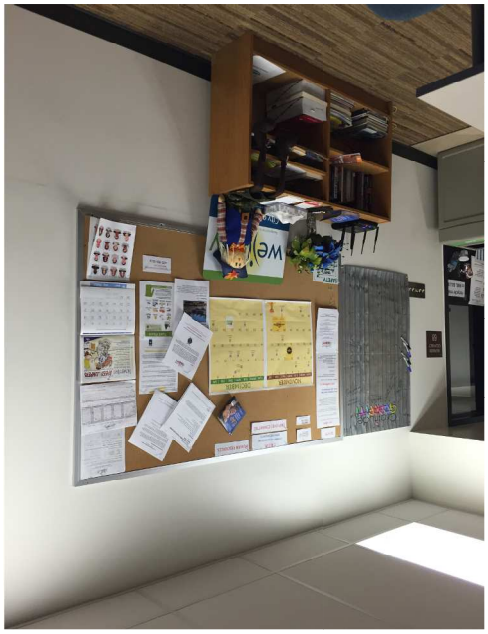
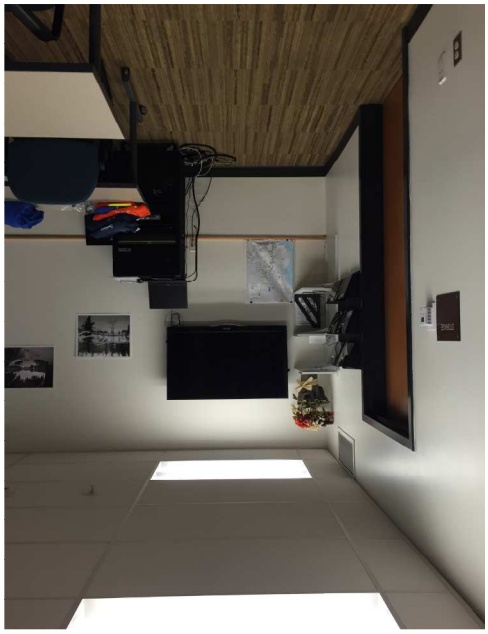
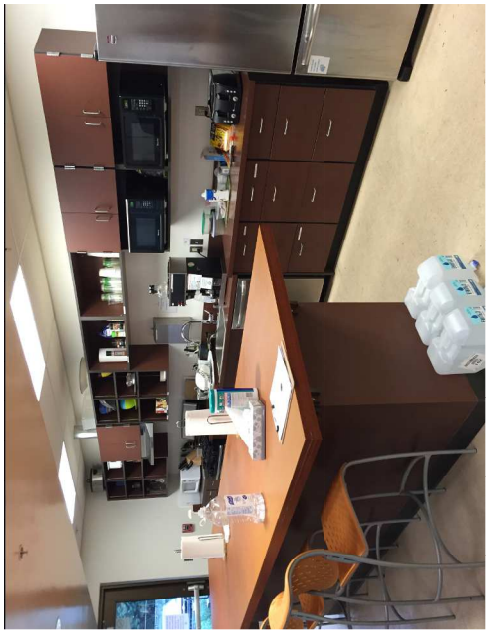
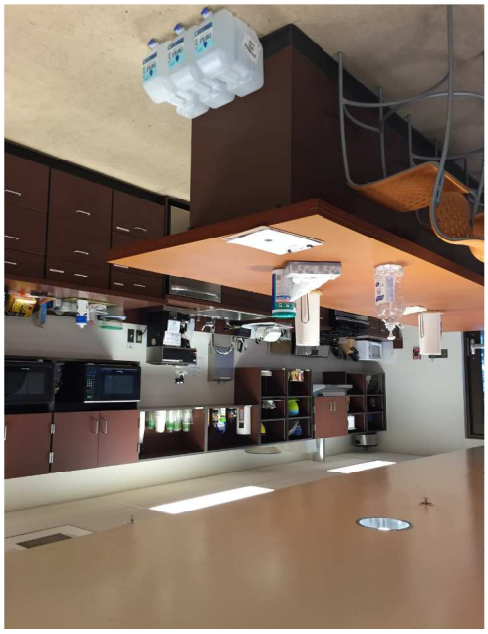
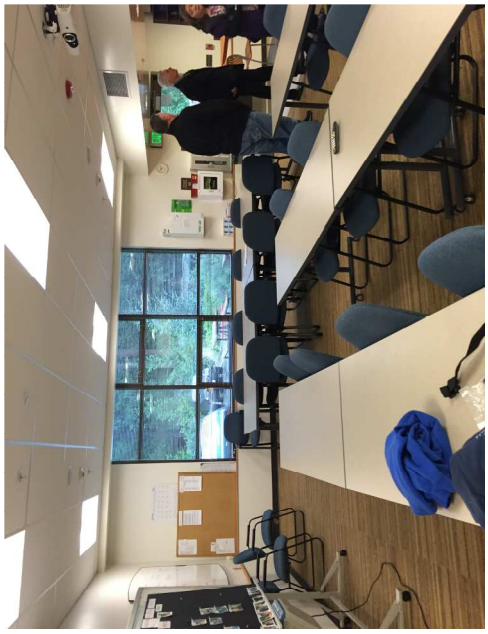
Service
Community
Together

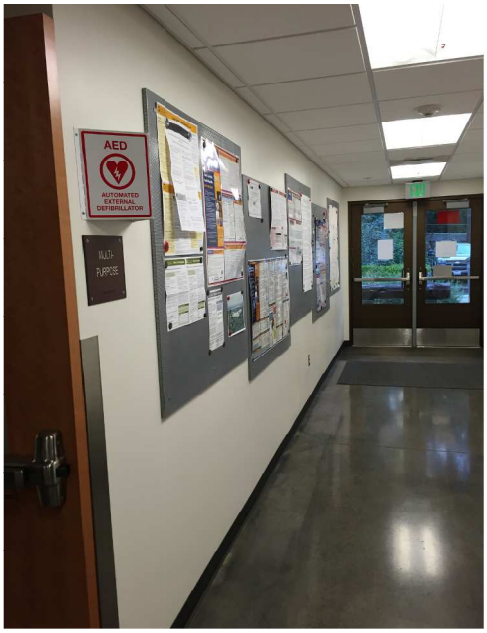
Communication

Integrity

SAFETY
NEVER HURTS
DAYS
DAYS



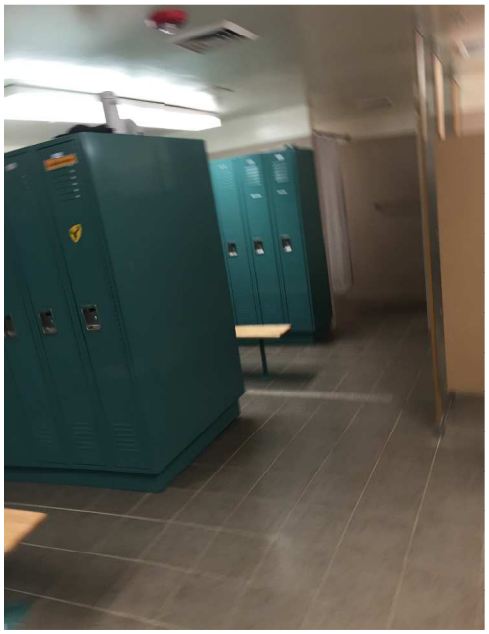







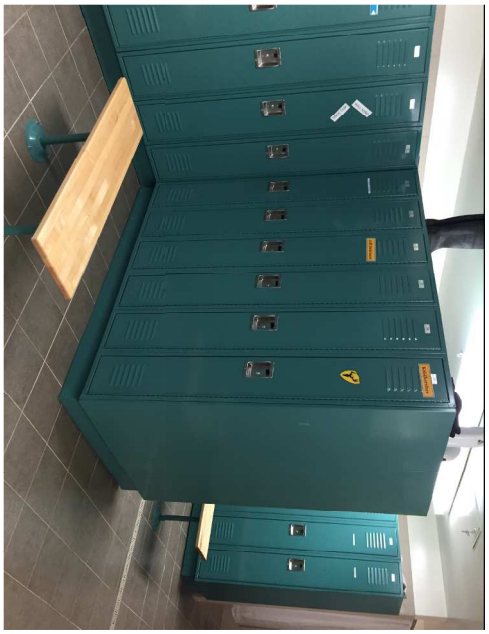


AED
AUTOMATED EXTERNAL DEFIBRILLATOR
MULTI-PURPOSE


WORK ROOM

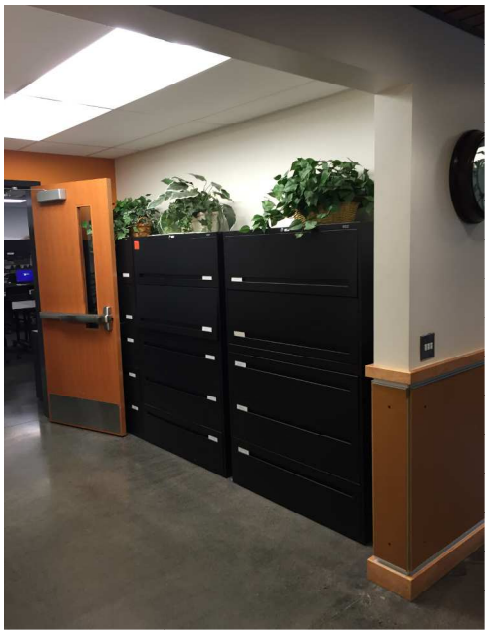



GRAINGER



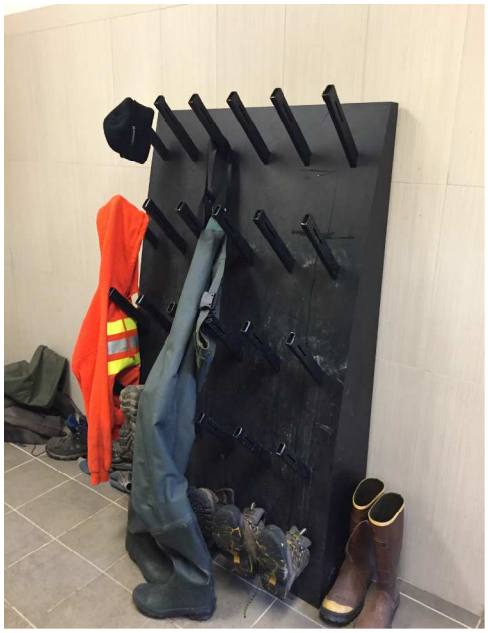




















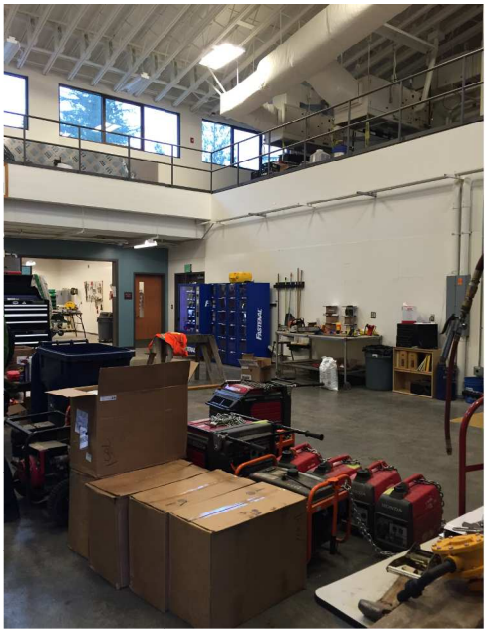






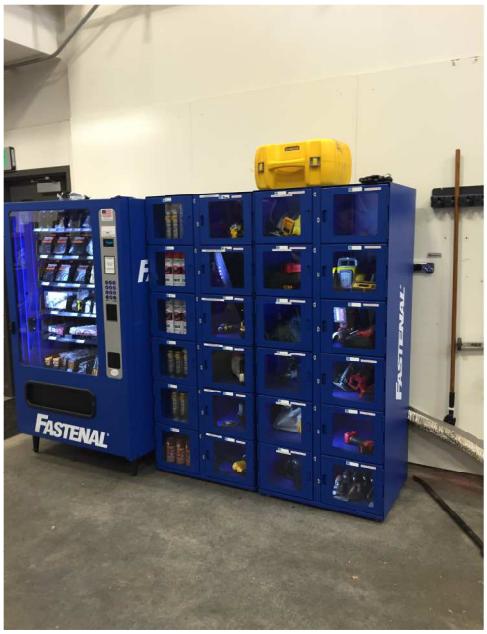






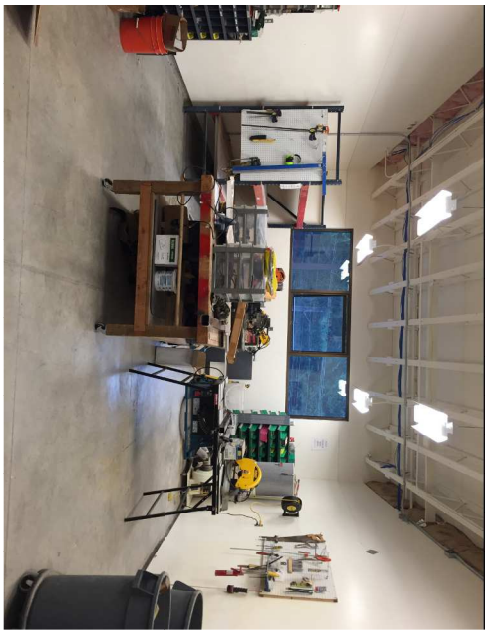


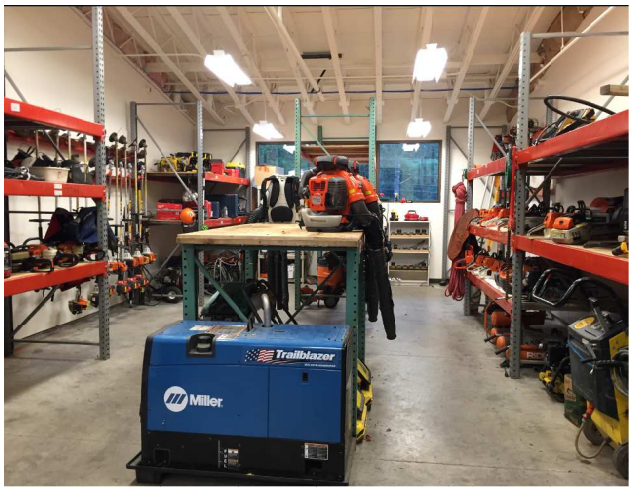



FASTENAL



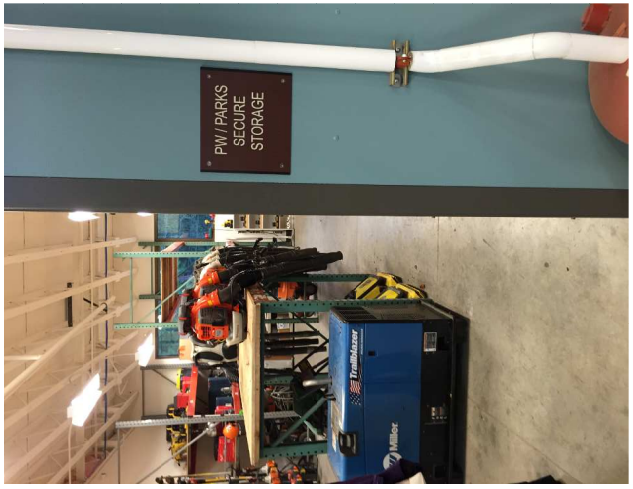

SIGN SHOP/
STORAGE




Trailblazer
Miller

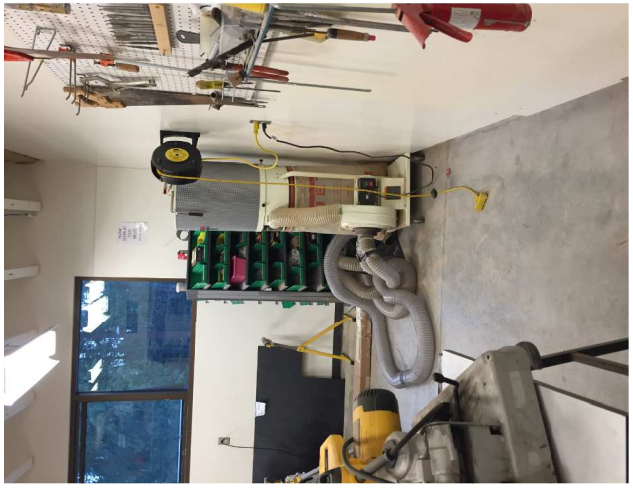


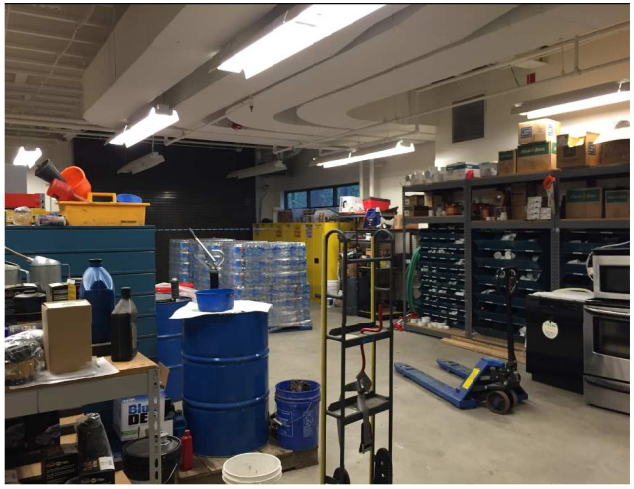



PW / PARKS
SECURE
STORAGE











SeaTac Maintenance Facility Photos

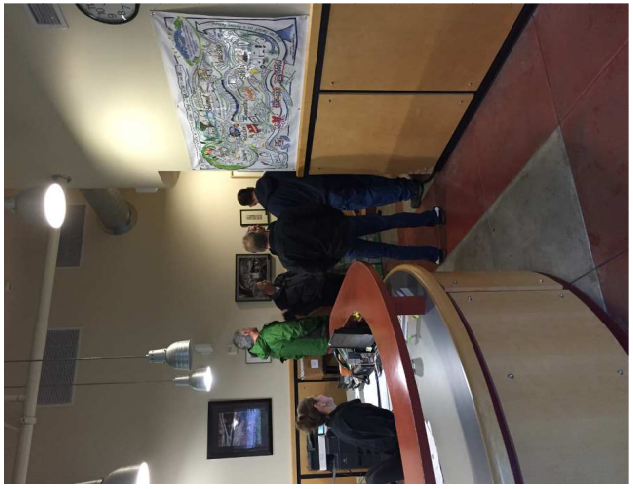









500x
410G







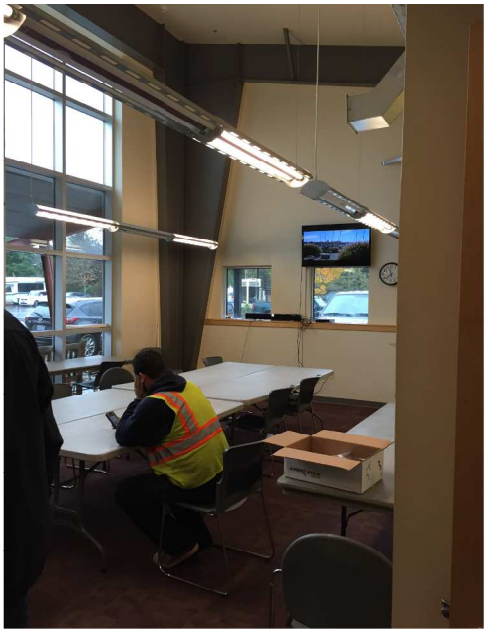


FIRST AID
STATION

FIRST AID
STATION







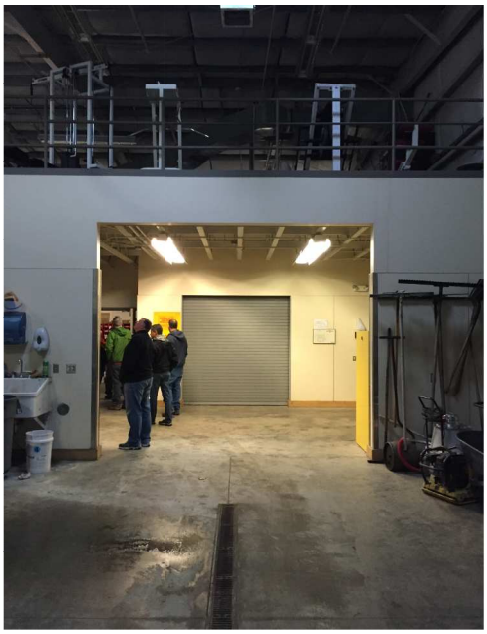


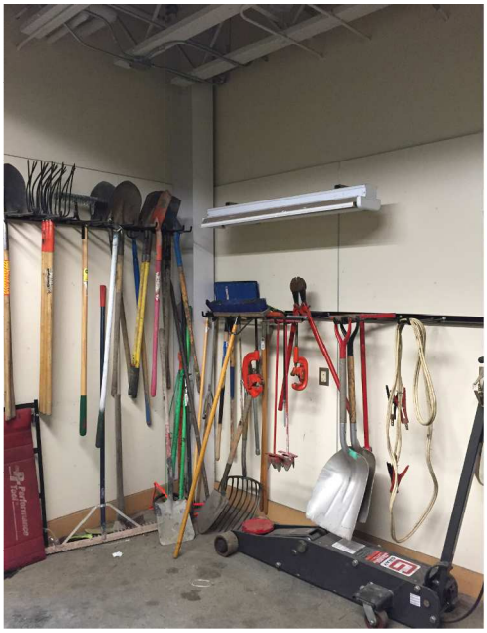




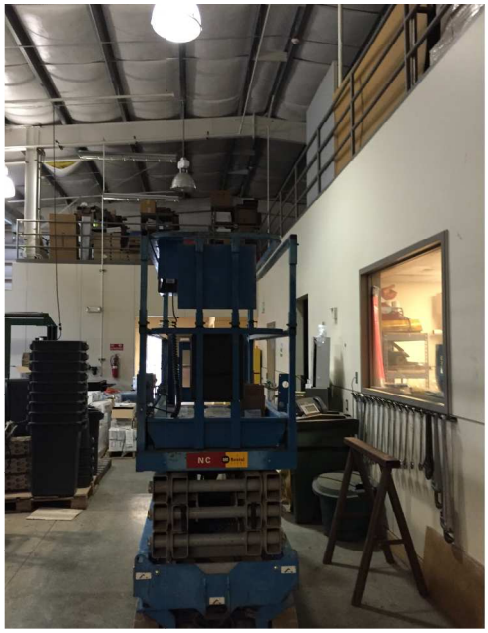




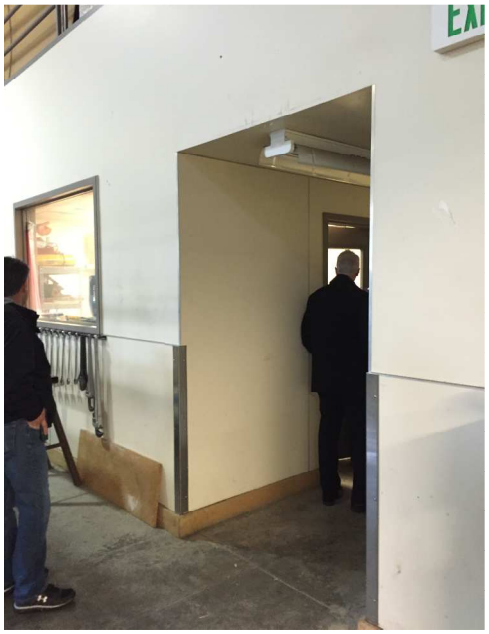




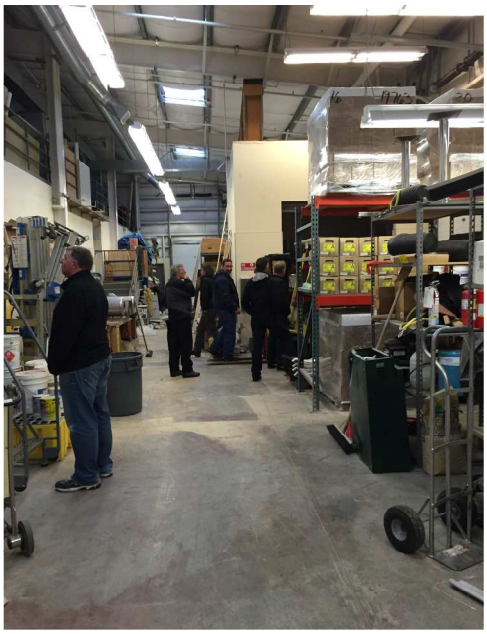


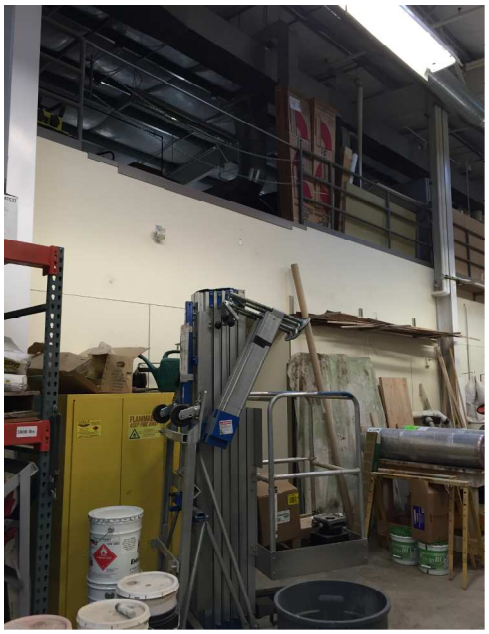








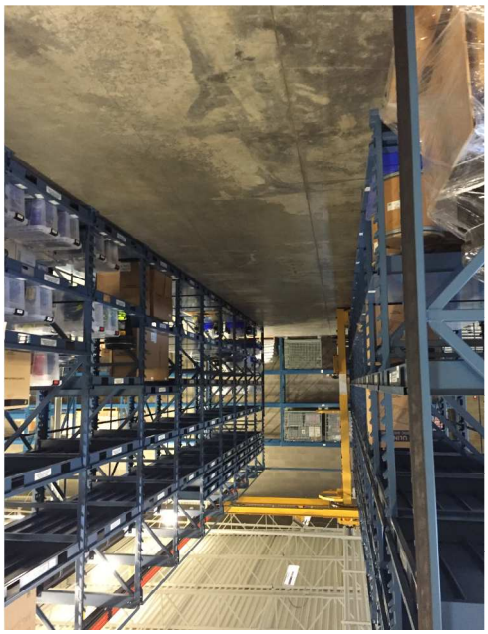
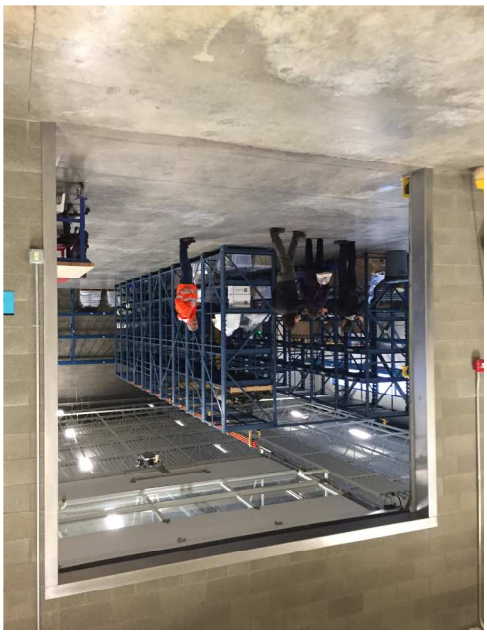
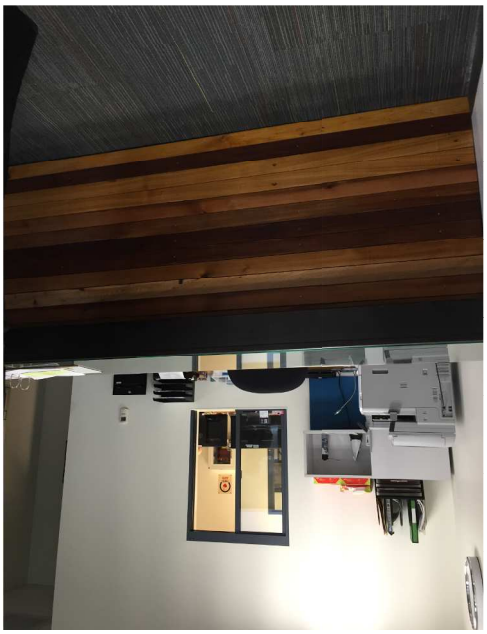


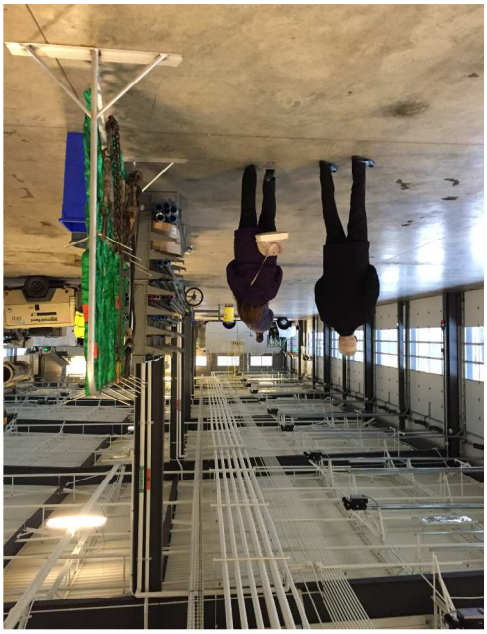


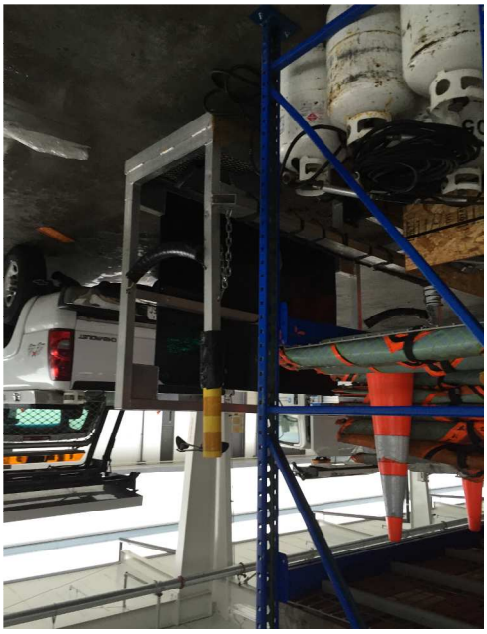


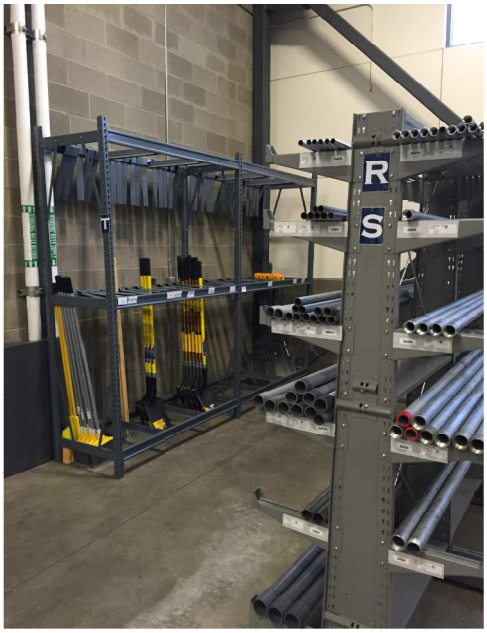
Pierce County Sewer and Traffic Operations Facility Photos

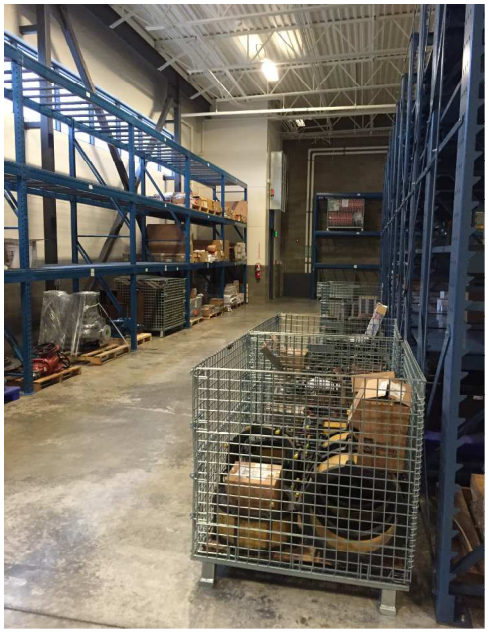
WET PAINT
DO NOT CROSS

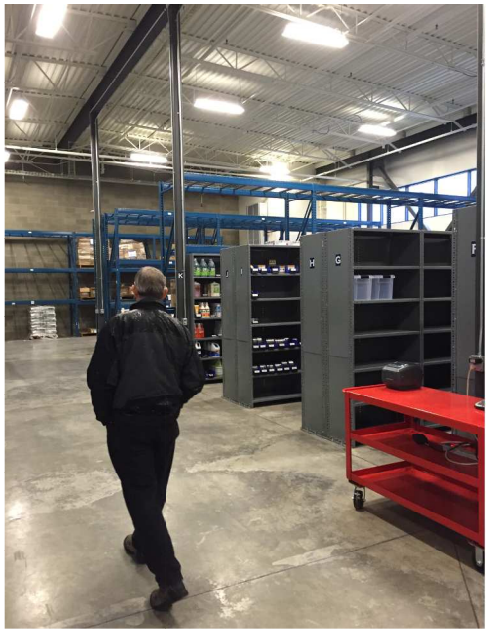






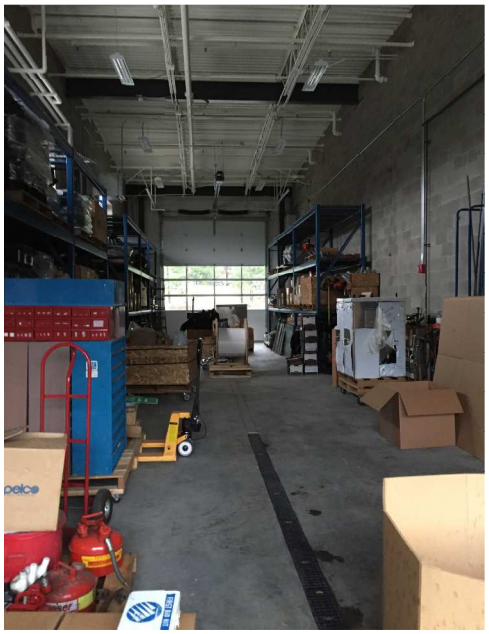

STOP
SLOW




R
S

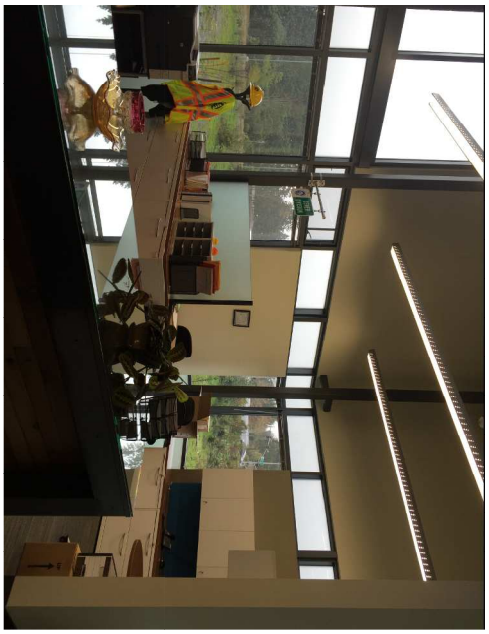


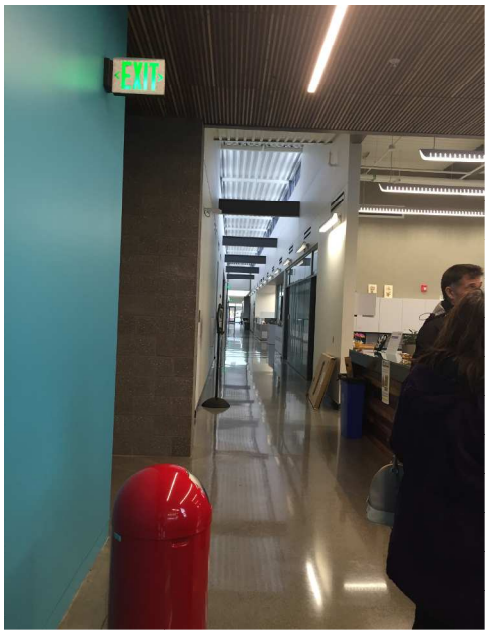


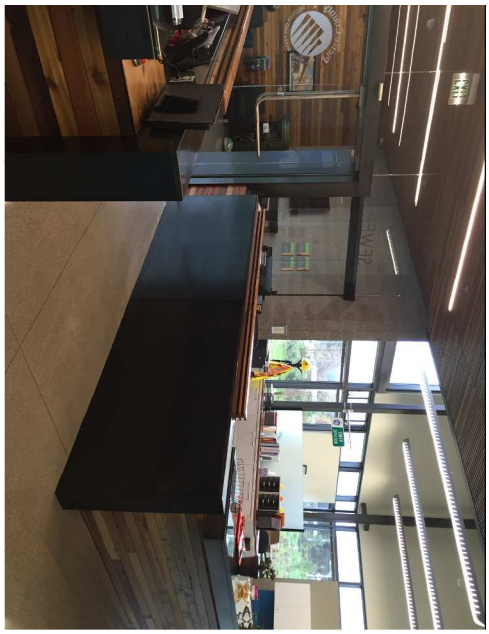


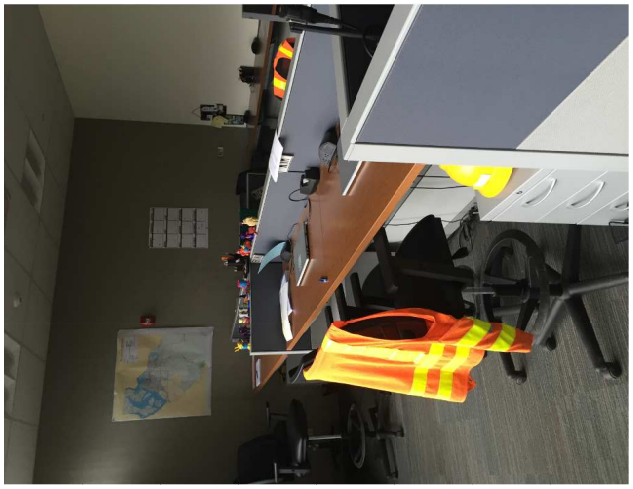


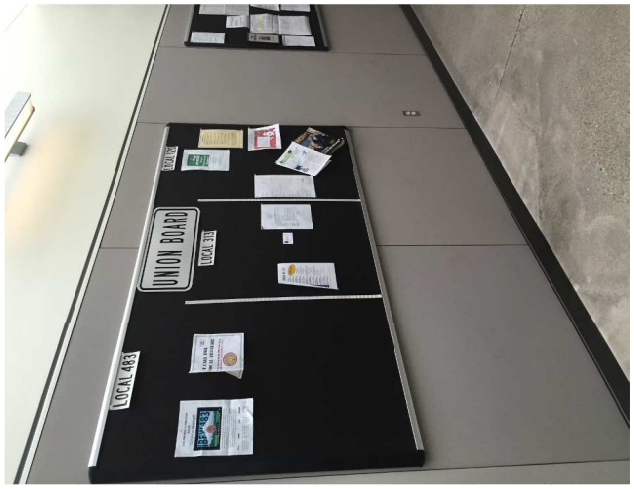




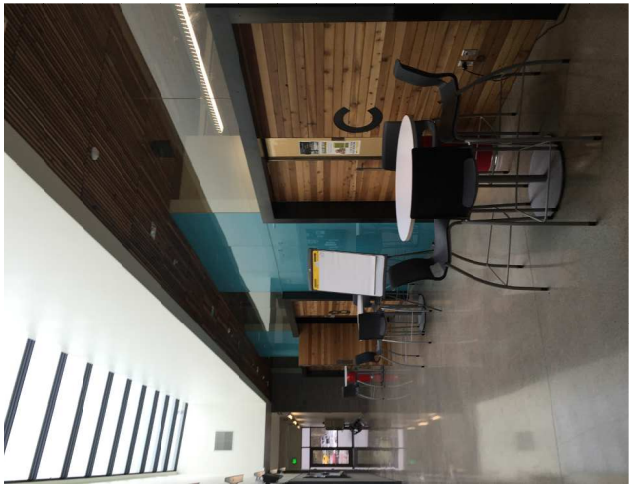

EXIT






UNION BOARD
LOCAL 483



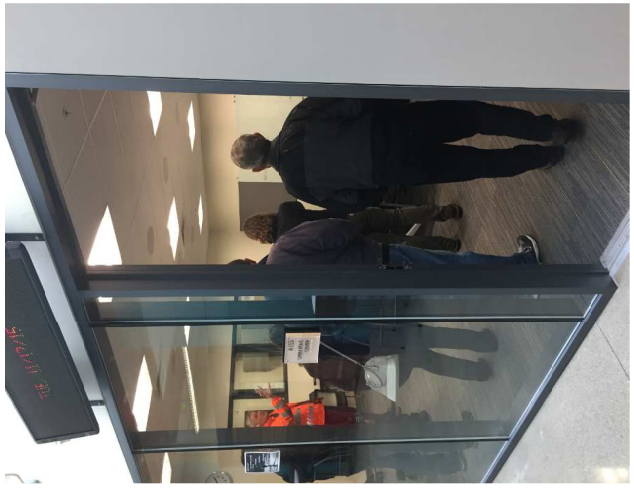












STOP
SPEED LIMIT 5

7D - EXISTING CONDITIONS PHOTOS

OVERVIEW

Included in this section are photographs of existing conditions at both the current Public Works facility, Hamlin, as well as the current Ronald Wastewater facility. Also included are images of the NMF site.

NO PARKING
FROM
TO

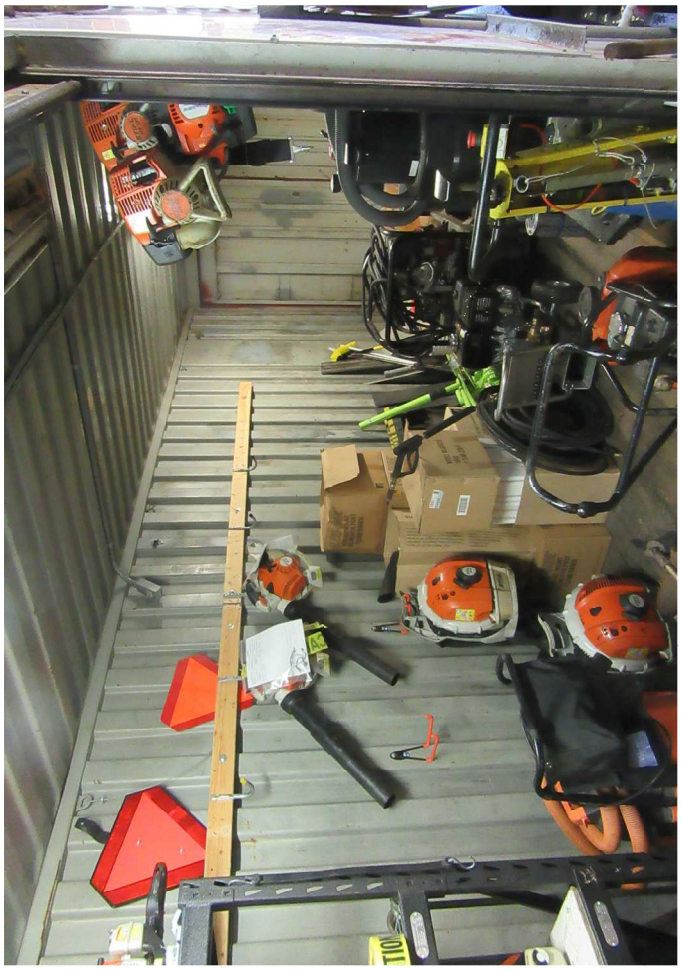
STOP


SEASONAL
EMPLOYEE
PARKING












TRAFFIC
REVISION
AHEAD
LANE
CLOSED
AHEAD

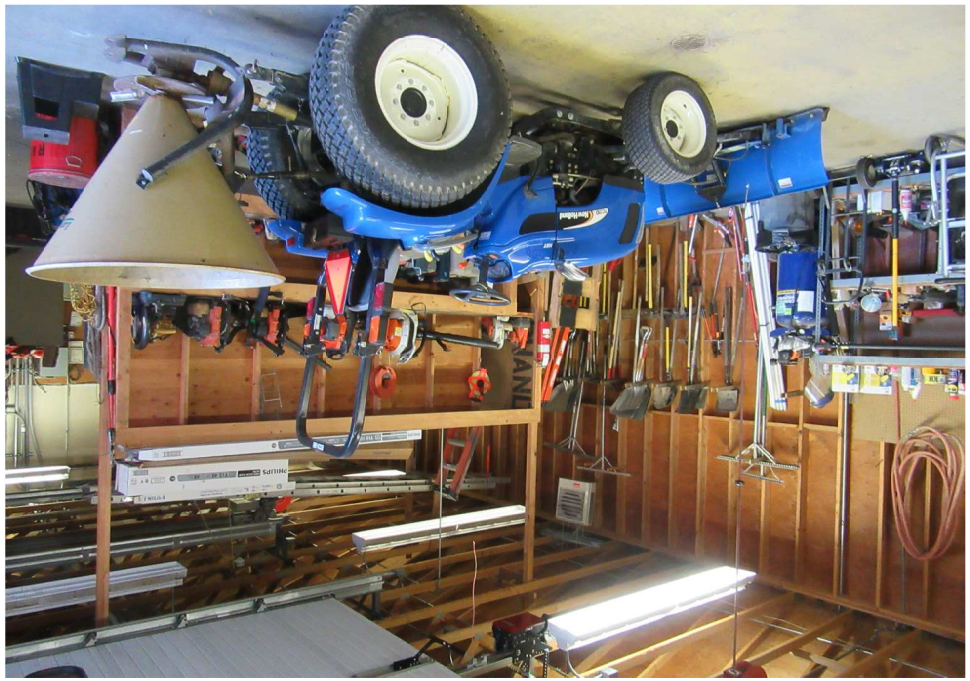


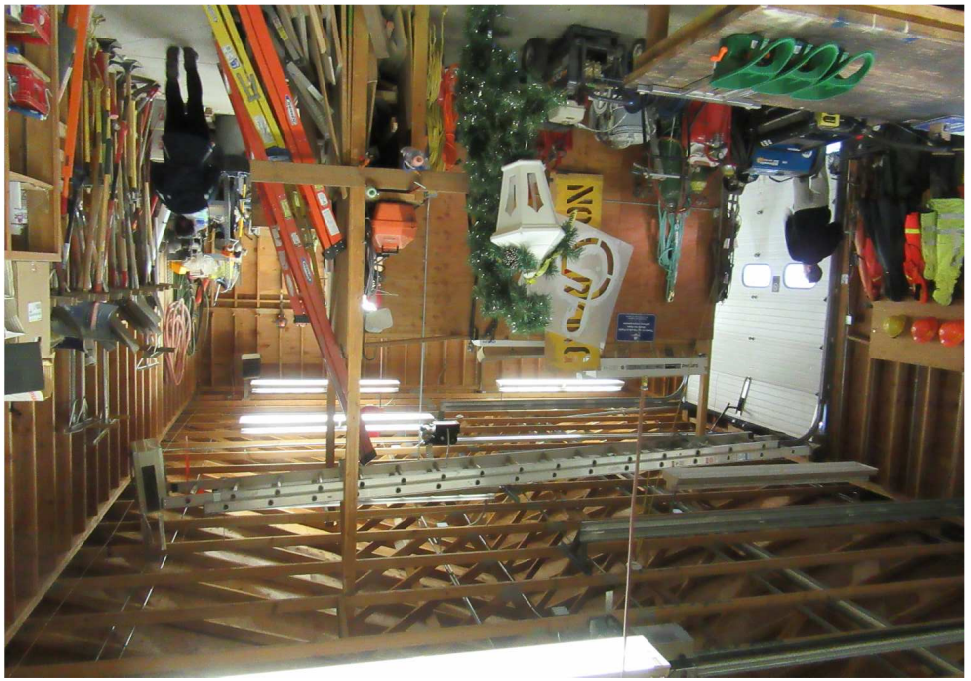
1-800-352-7171

1-800-352-7171

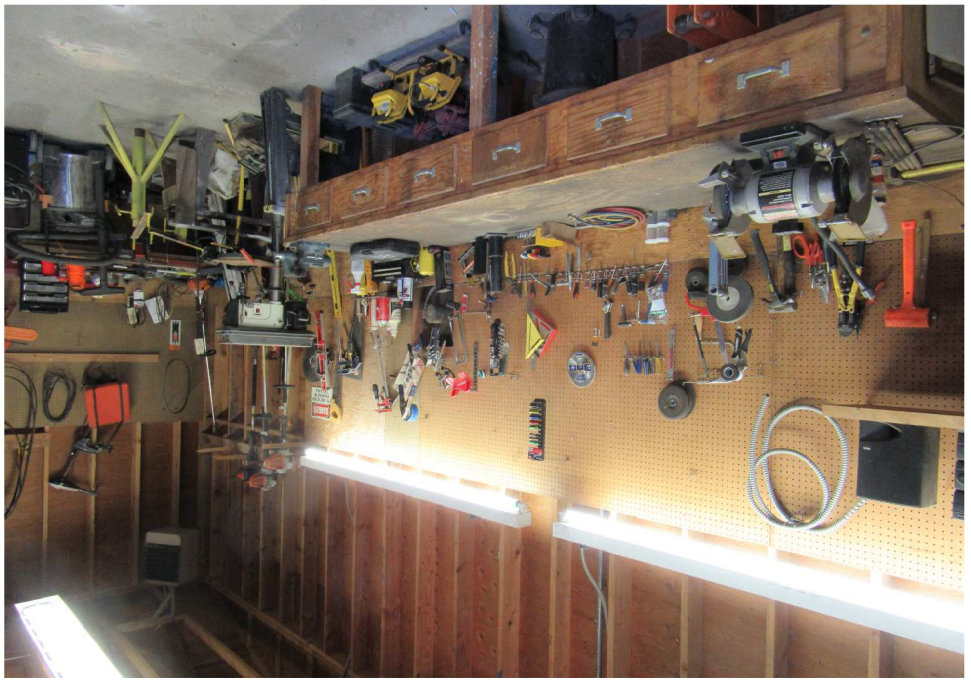
STIHL

FLAMMABLE
KEEP FIRE AWAY





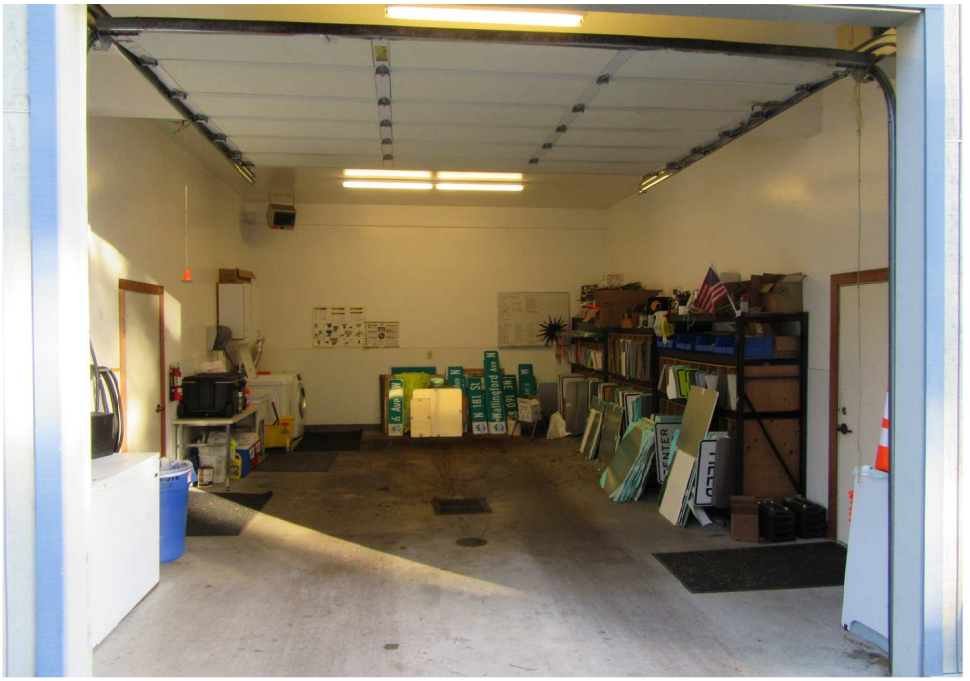







6 Ave N
N 181 St
Wallingford Ave N
160 St NE
CENTER
LANE

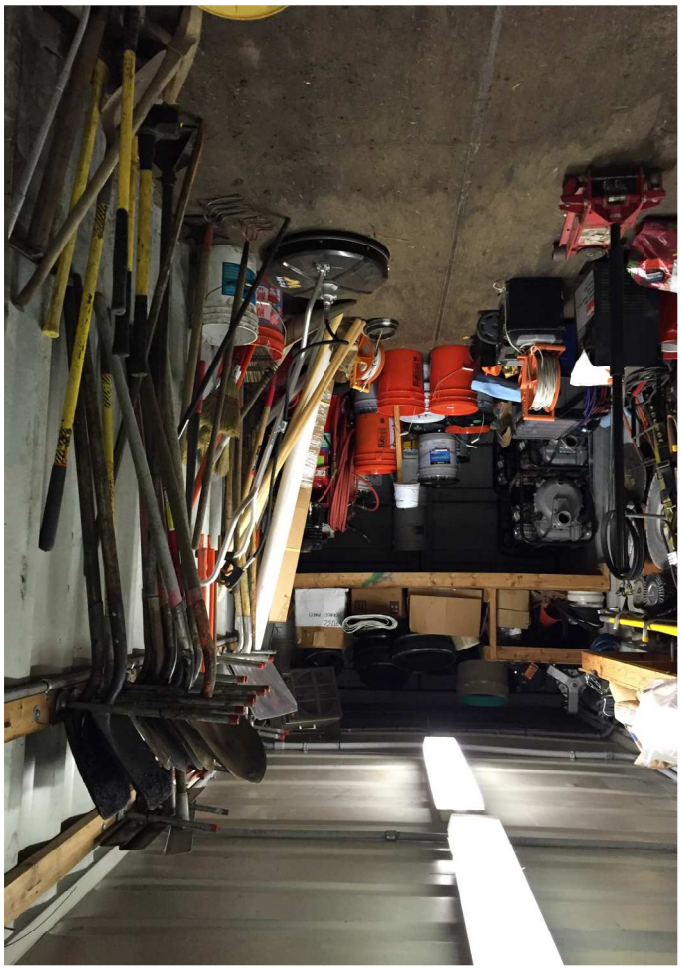




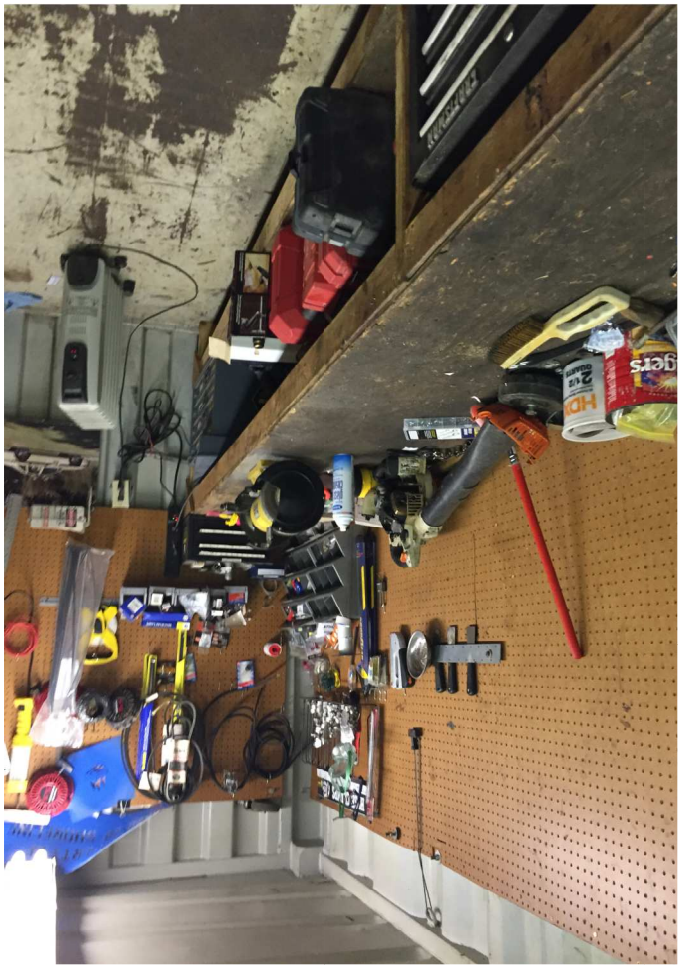
THANK YOU
MR.
DANIEL
LYDIN

MONDAY
TUESDAY
WEDNESDAY
THURSDAY
FRIDAY
HOLIDAY
HOLIDAY

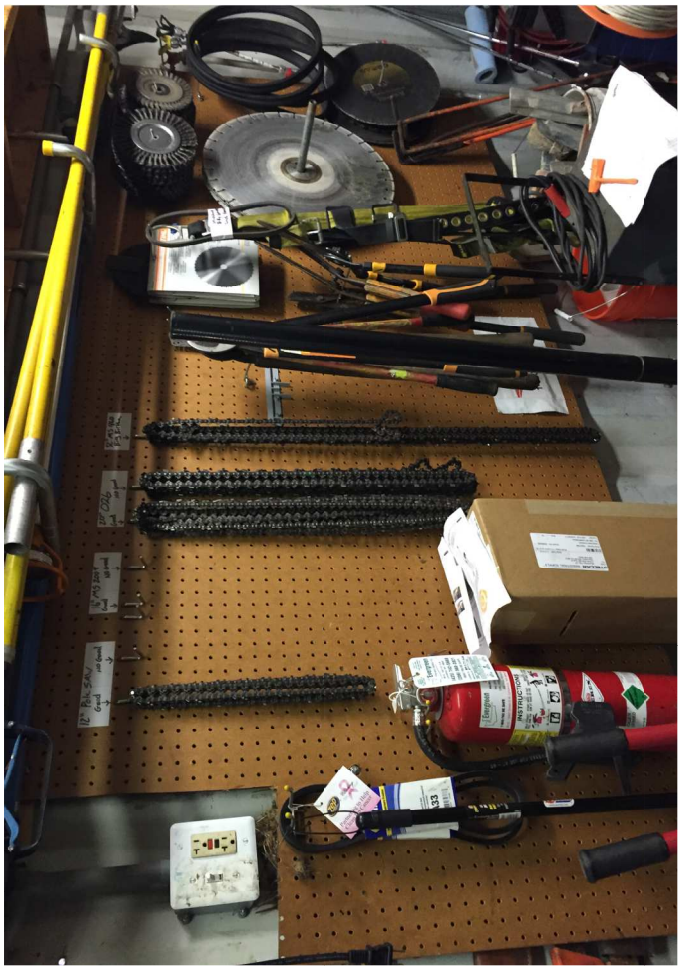
NO-IDLE
FIRST AID
FIRST AID KIT








WERNER

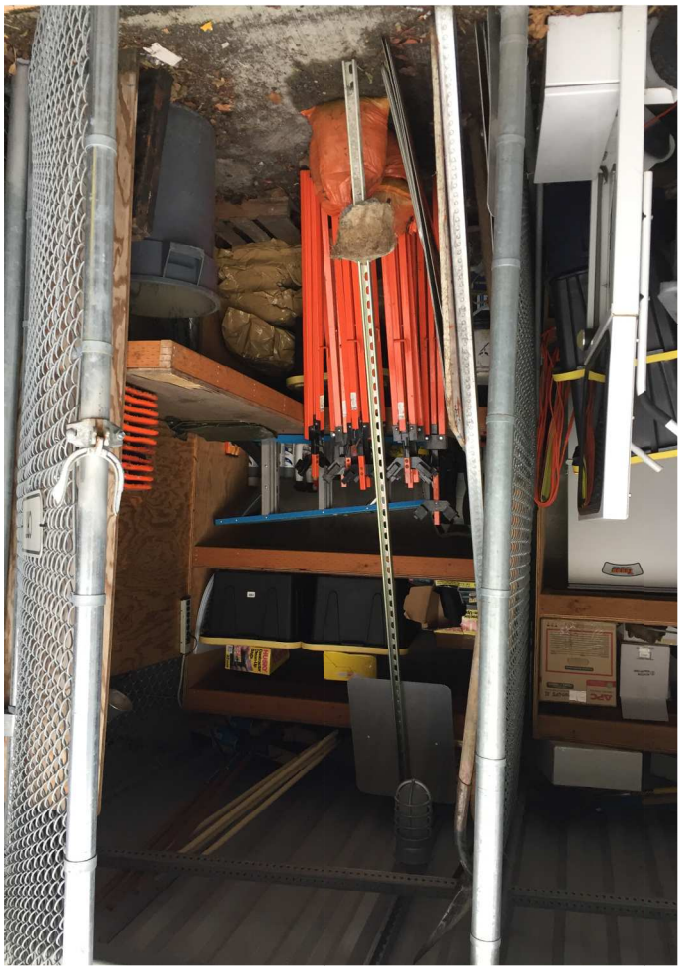


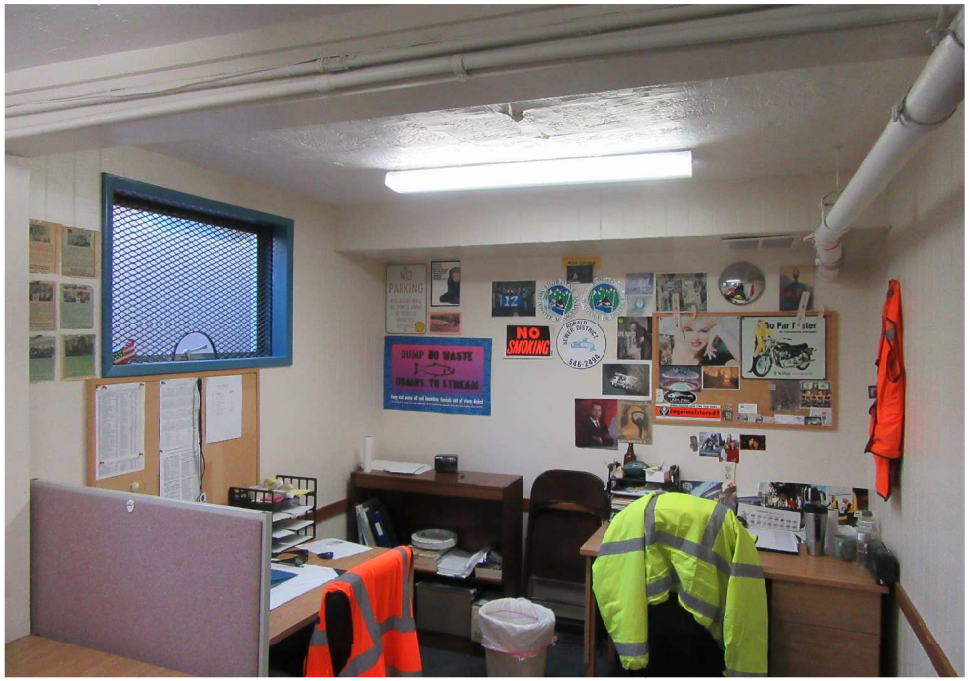



HUSKY
HUSKY



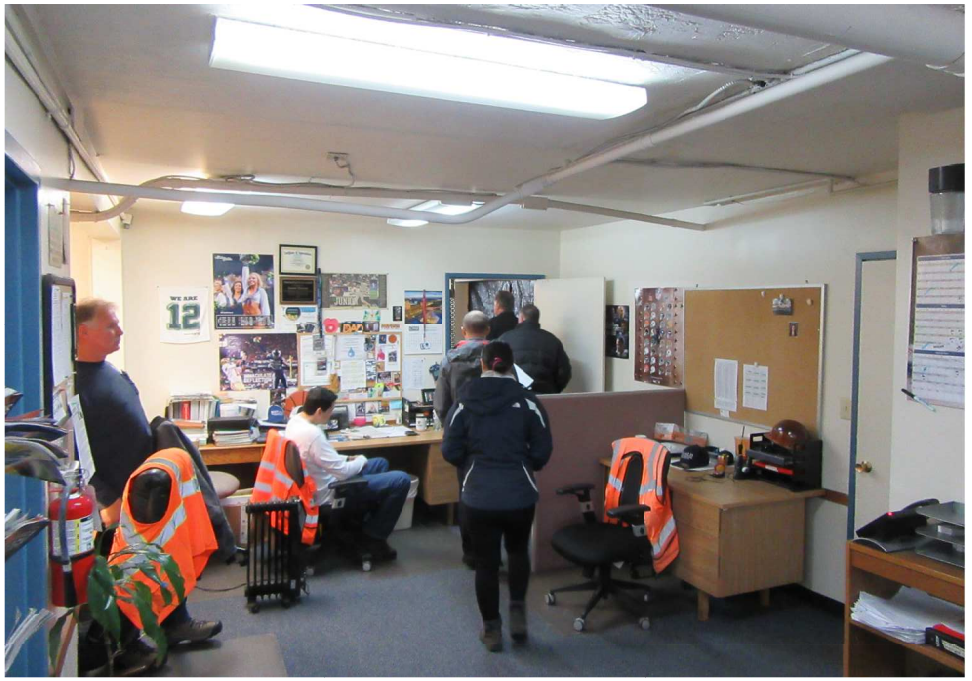
SMARTCONTROL
RIDGID




NO PARKING
DUMP NO WASTE
DRAINS TO STREAM
NO SMOKING


SMOKIN IT, LET'S RIDE




WE ARE
12





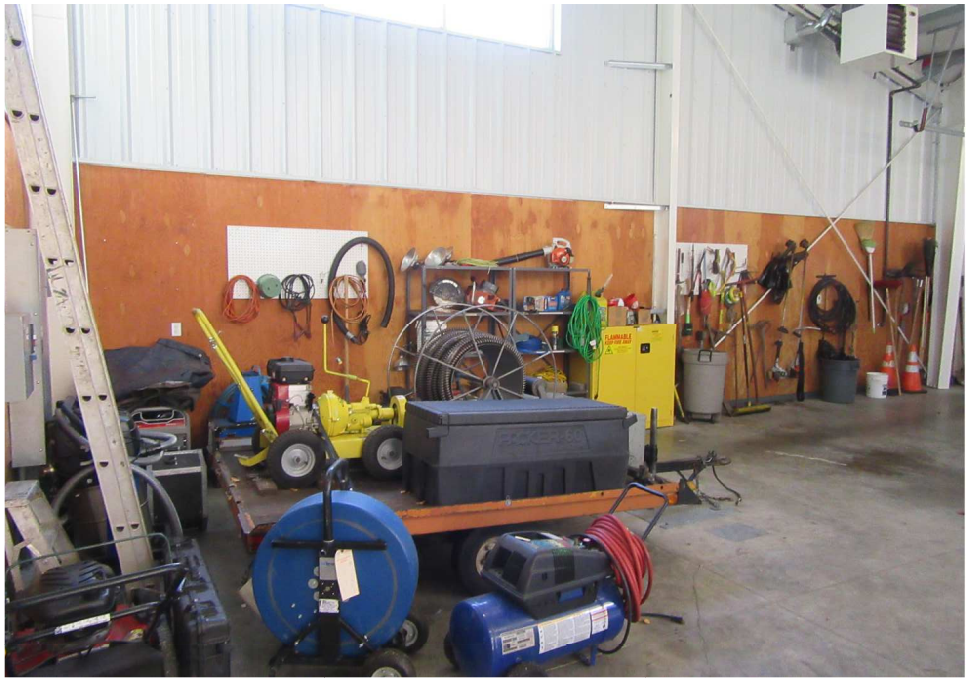



EXIT

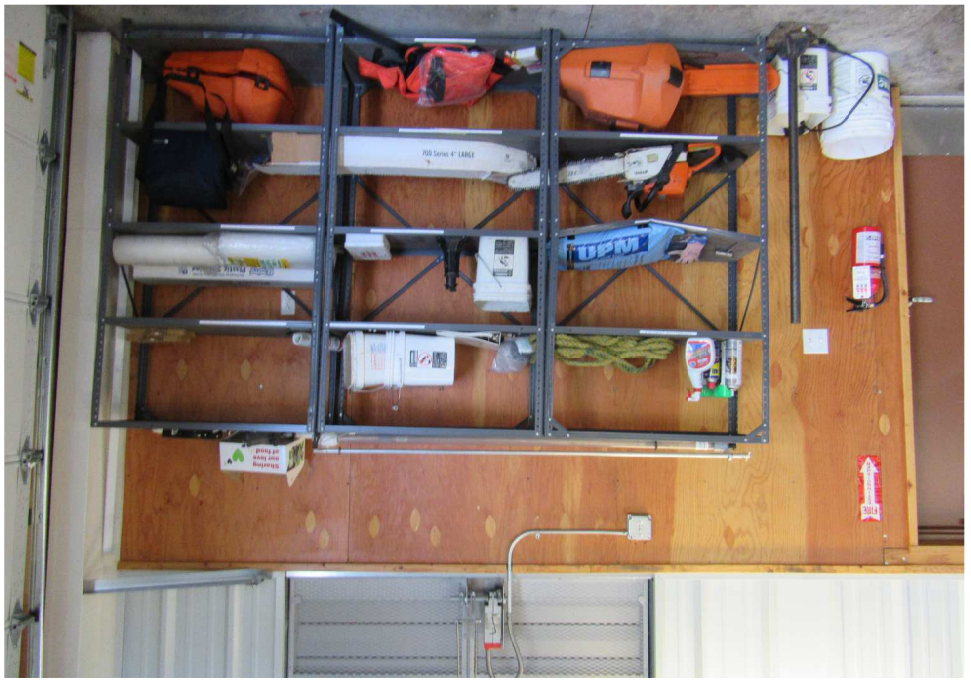





RONALD
WASTEWATER DISTRICT








INGERSOLL-RAND
150
SHORELINE WASTEWATER MANAGEMENT
KATOLIGHT



















NO PARKING SOUTH OF HERE
JESSE SALOMON

NO PARKING SOUTH OF HERE
JESSE SALOMON








L.O.B.