BB&A ENVIRONMENTAL

EUGENE
32986 Roberts Court, Coburg, OR 97408
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25195 SW Parkway Ave., Suite 207
Wilsonville, OR 97070
(503) 570-9484

August 12, 2021

Paul Fairbairn
Stantec
11130 NE 33rd Place, Suite 200
Bellevue, WA 98008-1465

RE: **Pilot Test - In-Situ Site Remediation using BOS 200®**

FOR: 7-Eleven Store #22866
14207 International Blvd./State Rt 99, Tukwila, WA

Dear Paul:

Please find enclosed an electronic copy of a proposal to conduct a pilot test at the above referenced property using conditioned activated carbon and biological remediation agents (i.e., BOS 200® and hydrocarbon-degrading microbes) to reduce GROs and VOCs to targeted treatment goals.

Should you have any questions regarding the scope of work or cost proposal, please do not hesitate to contact me at your convenience. Thank you for the opportunity to be of service. We look forward to working on this project with you.

Sincerely,

BB&A Environmental

Randall J. Boese, RG/LHG
Principal / President

Enclosures

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WORK PLAN AND AGREEMENT

Cost Proposal for Pilot Test
In-Situ Remediation using BOS 200®

CLIENT INFORMATION

Stantec
11130 NE 33rd Place, Suite 200
Bellevue, WA 98008-1465
Contacts : Paul Fairbairn, Project Manager
Office : (425) 289-7367
Cell : (206) 369-8383
Email : Paul.Fairbairn@stantec.com

SITE LOCATION

7-Eleven Store #22866
14207 International Blvd./State Rt 99, Tukwila, WA

PURPOSE

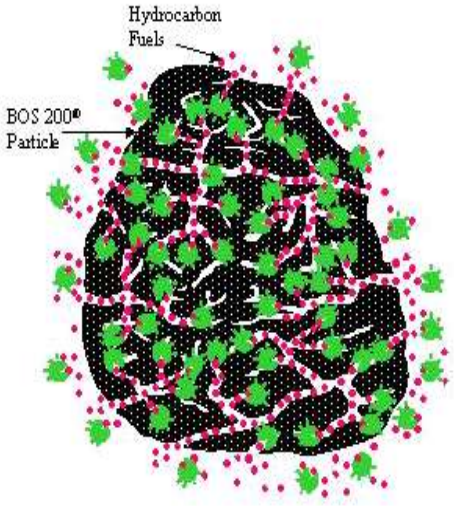
To conduct a Pilot Test in a select area of the site using BOS 200® and bacteria concentrate to reduce contaminant concentrations to target treatment goals.

Overview (Injection Design - Saturated Zone)

BOS 200® utilizes two (2) proven technologies to effectively remediate petroleum hydrocarbon sites. The two technologies are 1) trapping contaminants via carbon adsorption, and 2) subsequent treatment via biological degradation within the BOS 200® matrix as the product incorporates both aerobic and anaerobic biological processes. These two (2) proven and very powerful remediation mechanisms make what is called the "Trap and Treat" process. The "Trap" provides the immediate mass reduction and plume control, while the "Treat" provides the continued long term remedial degradation. The product comes as a fine grained dry material which consists of: carbon, calcium sulfate, nitrate, phosphate, and ammonia in a proprietary blend. BOS 200® is 77% by weight carbon and up to 19% gypsum, the sulfate source. Gypsum is 79% by weight sulfate which translates to approximately 15% by weight sulfate in BOS 200®. The BOS 200® is mixed with water and a facultative blend of microbes (inoculation with aerobic and anaerobic microbes) to create a solids suspension. This is now an ideal environment for the biological process, where hydrocarbons are adsorbed on to BOS 200® particles made up of:

- Electron Acceptors: oxygen, nitrate, ammonia and sulfate (primary);
- Nutrients - phosphorus and nitrogen; and
- Aerobic and anaerobic blend of microbes (over 26 species of microbes);

The success in achieving cleanup goals is not just in the product installed, but the distribution of the product in subsurface. Distribution is controlled by the injection techniques used (i.e., vertical and horizontal spacing is a function of soil type, high pressure injection vs. low pressure injection, and top down vs. bottom up). For this site, given the soil type and contaminant mass, BB&A proposes to optimize the injectate distribution by 1) using top-down techniques; 2) using relatively high pressure injections (enough pressure to provide localized soil lifting and propagation of BOS 200® from the injection tip); and 3) adjusting the horizontal and vertical injection spacing.



It is expected that the injection pressures will vary from 100 to 600 psig (measured at the discharge of the injection pump - the injection system pressure losses are approximately 100 psig – for hoses, valves and injection tips). Additionally, in clay-rich soils there is typically a break pressure (soil lifting pressure) that is sustained momentarily and then the pressure drops off. The discussion of the vertical and horizontal injection spacing is provided below for each of the proposed injection areas.

PILOT TEST
BOS 200® INJECTION

1.0 BOS 200® Injection

1.1 Underground Injection Control (UIC) Permitting

An underground injection control (UIC) permit will need to be obtained from the Washington Department of Ecology prior to injection of BOS 200® and bacteria concentrate.

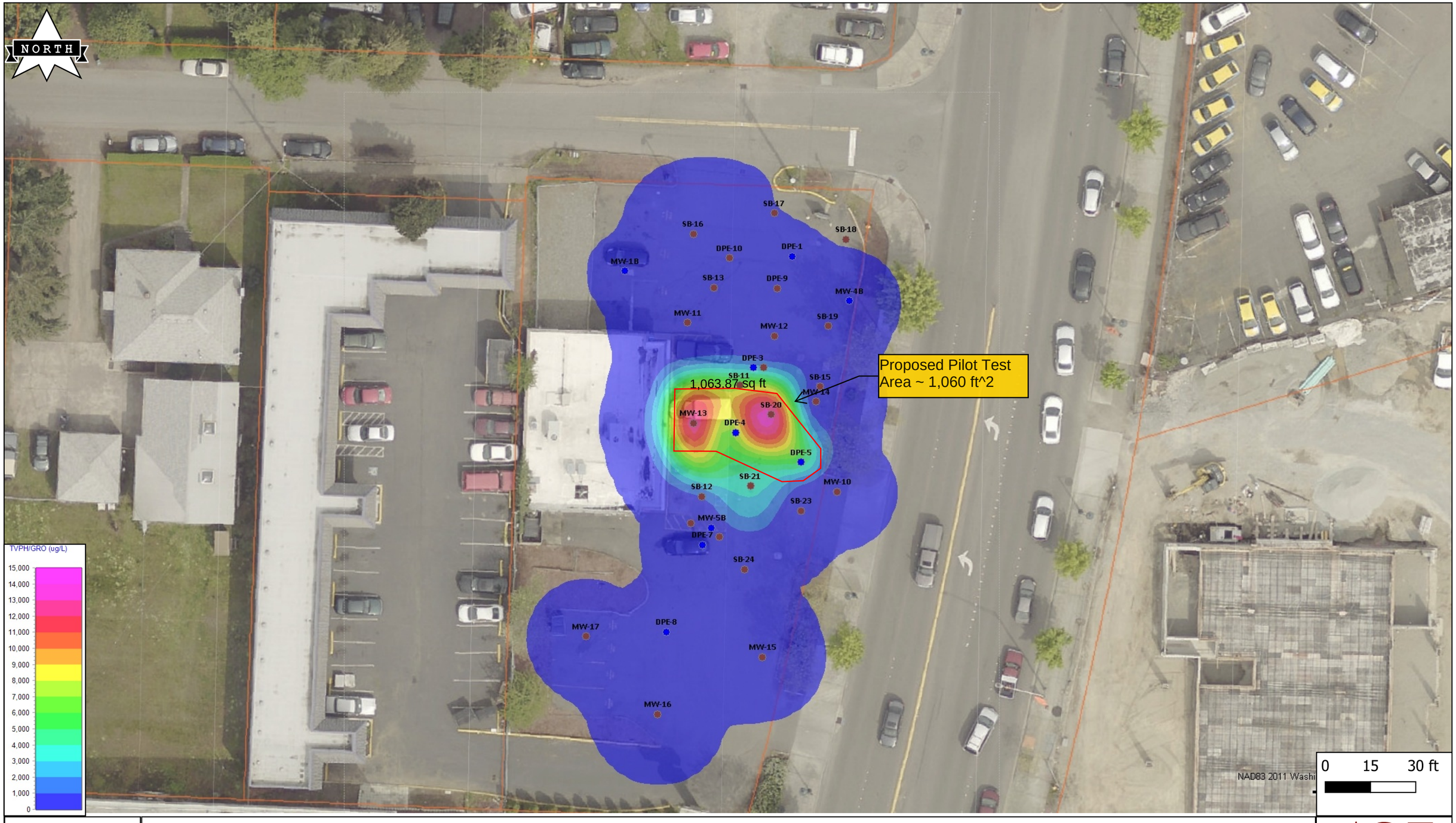
1.2 Target Zones, Injections, and Dosing

Based upon a review of historical and recent analytical data provided by Stantec, the target zone of treatment (vertical distribution of contamination) is estimated to be between five (5) and 20 feet below land surface (BLS). The effectiveness of BOS 200® and bacteria concentrate in this area should be confirmed post injection by followup groundwater monitoring.

2.0 INJECTION DESIGN

2.1 Target Zones, Injections, and Dosing

Based upon a review of analytical data collected from soil borings and monitoring wells provided, the target zone of treatment (vertical distribution of contamination) is estimated to be between seven (7) and 20 feet BLS. Treatment at the site consists of a single target area as described below (see embedded **Figure** for Proposed Treatment Area).



AST Environmental
665 Mckinney Ave
Midway, Kentucky 40347
(859)846-4900

Figure 15: TVPH and GRO in Groundwater Samples Collected January to March 2021
7-Eleven #22866
14207 International Blvd/ SR 99
Tukwilla, Washington

AST ENVIRONMENTAL, INC.

Pilot Test Area - Shallow

- ~1,060 ft^2, 40 injection points on 5.0' triangular grid
- Total number of Injections and vertical spacing: 160 injections (alternate 5', 7, 9', & 11' BLS and 6', 8', 10', & 12' BLS) - 2.0 foot vertical spacing
- Contaminant Mass Average: based on 2,000 mg/kg TPH-GRO in soil
- BOS 200® loading: ~25 lbs of BOS 200® per injection = 4,000 lbs BOS 200®
- Supplemental Sulfate (Gypsum) loading: ~20 lbs of Gypsum per injection = 3,200 lbs
- Bacteria concentrate: 8 gallons
- ~2,400 gallons of water (~15 gallons/injection)

Pilot Test Area - Deep

- ~1,060 ft^2, 40 injection points on 5.0' triangular grid
- Total number of Injections and vertical spacing: 160 injections (alternate 13', 15', 17', & 19' BLS and 14', 16', 18', & 20' BLS) - 2.0 foot vertical spacing
- Contaminant Mass Average: based on 500 mg/kg TPH-GRO in soil
- BOS 200® loading: ~15 lbs of BOS 200® per injection = 2,500 lbs BOS 200®
- Supplemental Sulfate (Gypsum) loading: None
- Bacteria concentrate: 5 gallons
- ~2,400 gallons of water (~15 gallons/injection)

SUMMARY - Totals

Treatment Area ft^2:	1,060 ft^2
Number of Injection Pts:	40
Number of Injections:	320
BOS 200®:	6,400 lbs
Gypsum:	3,200 lbs
Bacteria Concentrate:	15 gallons
Water:	~4,800+ gallons

PROJECT ASSUMPTIONS

For purposes of preparing this work plan and cost estimate, it is assumed that:

- Underground utilities are present in the project area. Those on-site utilities not marked by Utilities Notification Service or privately located will be located by the property owner prior to the beginning of the project;
- By signing this Work Plan and Agreement, the responsible party authorizes BB&A, its employees, and authorized subcontractors to enter the property to complete the assessment activities.
- The injection borings will be backfilled with bentonite and other natural earth materials. Surface restoration will consist of redi-mix concrete or cold patch asphalt depending on surrounding surface materials.
- Work days will be Monday through Saturday.
- Potable water will be provided by the client and are readily available on-site.
- Off-site access to be provided by Stantec.
- UIC permitting by Stantec.
- Injections can be completed with standard Geoprobe (DT 7822 or equivalent).
- Private utility clearance by Stantec.
- Right-of-way access and traffic control (as-necessary) by Stantec.

COST PROPOSAL:
The cost proposal presented below based upon the project assumptions and scope of services detailed above.

PILOT TEST
7-Eleven Store #22866
14207 International Blvd./State Rt 99, Tukwila, WA

TASK	UNITS	UNIT COSTS	SUB TOTAL
UIC Permitting			
Permit Application/Forms			By Stantec
DOE Fees			By Stantec
BOS 200® Injection (Pilot Injection Area)			
Injection Services (40 points/320 injections)	1	$30,910.00	$30,910.00
BOS 200® Material	6,400	$5.75	$36,800.00
Bacteria	15	$115.00	$1,725.00
BOS 200® Shipping and Handling	6,400	$0.65	$4,160.00
Gypsum Material, Shipping, and Handling	3,200	$0.87	$2,784.00
DOE Notices of Intent to Install Remediation Well and Notice of Decommissioning	40	$69.00	$2,760.00
TOTAL:			**$79,139.00**

Notes:
1. The price listed per pound for BOS 200® and per gallon of bacteria is based on current manufacturer price and is subject to change. Rounded up to whole bag.
2. Shipping and handling costs have been included above as an estimate. Please also note that shipping and handling costs can vary widely.
3. Appropriate Washington State local, sales, and use taxes will be applied to above total (as applicable).
4. For BOS 200® and bacteria orders between 5,000 lbs. and 10,000 lbs., 50% payment on the material is required at the time the order is placed. For BOS 200® and bacteria orders over 10,000 lbs., 100% payment on the material is required at the time the order is placed.
5. The above cost proposal includes DOE fees for Injection Points classified as Resource Protection Wells 5.
6. Equipment will be supplied with an operator and applicable use tax charged per State of Washington requirements.

CONDITIONS AND LIMITATIONS:

1. The professional and construction services of BB&A Environmental will be rendered using the degree of care and skill ordinarily exercised under similar circumstances by reputable engineering and construction firms practicing in this or similar locations. No other warranty express or implied is made.

2. The conclusions and recommendations reached from this assessment will be based only on the data provided by others and observations made during field investigations. The accuracy of these findings should not be considered as scientific certainties, but rather as professional opinion based upon selected and limited data.

3. The services to be performed consist solely of those described within the Scope of Service outlined above. Other environmental assessment services (e.g., waste characterizations, soil and water sampling, compliance audits, wetlands determinations, etc.) are not included in the Scope of Work of this Level I assessment. These services may be provided as an expansion of the Scope of Service outlined above or as an additional phase of the investigation.

4. This proposal is based upon performing the assessment under Level D or less health and safety protection. If unsafe physical or chemical conditions are encountered at the site, all work will be temporarily halted, the client notified, and a new scope of work negotiated.

5. BB&A Environmental does not assume the responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. Notification to appropriate agencies as required by law is the responsibility of the client.

6. If the subject property and facilities are not owned by the client, the client warrants that all necessary permissions for BB&A Environmental to enter onto the site for the purpose of performing the Scope of Work outlined above has been obtained.

7. Monthly invoices will include all services performed through the end of the month and all payments received through the end of the month. Terms will be net 15 days from the date of invoice. Late charge of 1.5%.

8. If a dispute arises between the parties pertaining to this Agreement, the dispute shall be determined by arbitration in accordance with the arbitration provisions of Oregon Revised Statutes. Each party shall choose an arbitrator, and the two arbitrators shall choose a third. If the choice of the second or third arbitrator is not made within ten (10) days of the choosing of the prior arbitrator, either party may apply to the presiding judge of the Lane County Circuit Court to appoint the required arbitrator. The parties shall be entitled to conduct discovery in accordance with the Oregon Rules of Civil Procedure, subject to limitation by the arbitrator to secure just and efficient resolution of the dispute. If the amount in controversy exceeds $10,000.00, the arbitrator's decision shall include a statement specifying in reasonable detail the basis for and computation of the amount of the award, if any. The arbitration shall take place in Lane County, Oregon, and the award of the arbitrator shall have the effect provided in Oregon Revised Statutes governing arbitration. Cost of the arbitration shall be shared equally by the parties, and each party shall pay its own attorney fees incurred in connection with the arbitration.

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Dated: 8/12/21

BB&A Environmental

Signature

Randall J. Boese
Name (Printed or Typed)

President
Title

****

ACCEPTANCE OF PROPOSAL

You are hereby authorized to furnish all materials and labor required to complete the work detailed in the above Agreement, for which the undersigned agrees to pay the amount stated in said Agreement in accordance with the terms and conditions thereof.

Date: _____

Signature

Name (Printed or Typed)

Title