



QUALITY ASSURANCE PROJECT PLAN:
BURNT BRIDGE CREEK WATER
QUALITY MONITORING

Prepare by

PBS ENGINEERING AND ENVIRONMENTAL
1310 Main Street
Vancouver, WA 98660

Prepared for
City of Vancouver
Surface Water Management
4500 SE Columbia Way
P. O. Box 1995
Vancouver, WA 98668-1995

June 2004

QUALITY ASSURANCE PROJECT PLAN:
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QUALITY MONITORING

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Approvals:

Project Manager: Annette Griffy Date: 6/15/04
Annette Griffy, City of Vancouver, Surface Water Management

Supervisor: Victor Ehrlich Date: 6/17/04
Victor Ehrlich, City of Vancouver, Engineering Services

Client: Victor Ehrlich Date: 6/17/04
Victor Ehrlich, City of Vancouver, Engineering Services

Consultant: Skip Haak Date: 6/7/04
Skip Haak, PBS Engineering and Environmental

Laboratory: Kathy Fugiel Date: 6/2/04
Kathy Fugiel, Am Test Laboratories

WDOE Project Mgr: Cindy James Date: 6/24/04
Cindy James



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BACKGROUND AND PROBLEM STATEMENT

Burnt Bridge Creek is a perennial stream that flows westward from its headwaters, near Orchards, Washington, to its terminus at Vancouver Lake, draining a watershed of approximately 27 square miles (Clark County 1995). Before settlers arrived, the creek originated at a marsh near present day NE 18th Street. Water flowed northwesterly from the marsh into a deep ravine and toward Vancouver Lake. The marsh extended east to the headwaters, near present day 162nd Avenue. Early settlers discovered the marsh to be good for farming and excavated a channel between the headwaters and NE 18th Street to facilitate drainage and making the land more suitable for farming, thus forming the current drainage system. Although many historical farms have given way to commercial and residential developments, farming practices east of NE 18th Street have continued to present day.

From the headwaters, the creek flows across flat land within an excavated channel, past residential and commercial developments and under I-205 and into Beaver Marsh, the end upstream of the study area (Figure 1). The creek flows through Beaver Marsh in a series of excavated and braided channels and onto Royal Oaks Country Club. The creek remains in an excavated channel from Royal Oaks Country Club across a flat meadow, into the Meadow Brook Marsh immediately south of NE Burton Road, and then westerly across the flat historic marsh/farmland to NE 18th Street, the downstream end of the study area (Figure 1). From NE 18th Street, the creek flows down a steep gradient and into a steep-sided ravine, then westerly to I-5. Below I-5, the stream flows in a ditch, excavated across a broad plain, to its confluence with Vancouver Lake.

The study area for this Quality Assurance Project Plan (QAPP) is between NE 18th Street and I-205 (Figure 1). There are two minor tributaries within the study area that flow into Burnt Bridge Creek. Peterson Ditch is a minor tributary located near the southern end of Royal Oaks Country Club (Figure 2). Burton Ditch is a minor tributary located south of Burton Road, near the southern end of Meadow Brook Marsh (Figure 2).

Water quality in Burnt Bridge Creek has been monitored extensively since 1972 (EDS 1998). Over 30 sites within the watershed were monitored between 1972 and 1997 (EDS 1998). The actual number of samples collected at each site varies by water quality parameter. At most sites, less than 10 samples have been collected. Several hundred samples have been collected at four or five sites, depending on the parameter. Long-term trend analysis is available for fecal coliform, conductivity, dissolved oxygen, nitrate, pH, total phosphorus, temperature, and turbidity (EDS 1998). Other parameters for which monitoring data is available include total suspended solids, ammonia, total Kjeldahl nitrogen, total nitrogen, and dissolved (orthophosphate) phosphorus (Gaddis 1994).

The following discussion by water quality parameter is taken from *Burnt Bridge Creek: Water Quality Data Trend Analysis* (EDS 1998), unless another source is cited:

Fecal Coliform: The long-term trend analysis indicates that fecal coliform levels are decreasing at all but one site along Burnt Bridge Creek. Results of microbial tracking study conducted in the late 1990s indicated that the largest source of fecal coliform

Assurance Project Plan (QAPP) was developed according to the WSDOE *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* (Lombard and Kirchmer 2001). The *Technical Guidance for assessing the Quality of Aquatic Environments* (Cusimano 1994) was also consulted in the preparation of this QAPP.

Table 1. Proposed Monitoring Stations with Excursions from Water Quality Standards¹

Parameter	Location	Water Quality Standard	Number of Samples	Excursions	
				Number	Percent
Fecal Coliform	BBC U/S of Golf Course (Royal Oaks Drive)	100 CFU/100 ml	387	261	67
	BBC2 (18 th Street)		461	366	79
	BBC65th (65 th Avenue) ²		-	-	-
	BBC3 (86 th Avenue)		44	25	57
	BBC4 (Burton Road)		57	31	54
	BBC6 (Peterson Ditch)		19	13	68
Temperature ³	BBC U/S of Golf Course (Royal Oaks Drive)	≤18°C	482	37	8
	BBC2 (18 th Street)		471	60	13
	BBC65th (65 th Avenue)		-	-	-
	BBC3 (86 th Avenue)		49	8	16
	BBC4 (Burton Road)		187	34 ²	18 ²
	BBC6 (Peterson Ditch)		20	1	5
pH	BBC U/S of Golf Course (Royal Oaks Drive)	6.5 to 8.5	386	16	4
	BBC2 (18 th Street)		465	16	3
	BBC65th (65 th Avenue)		-	-	-
	BBC3 (86 th Avenue)		48	1	2
	BBC4 (Burton Road)		91	2	2
	BBC6 (Peterson Ditch)		19	0	0
Dissolved Oxygen (DO)	BBC U/S of Golf Course (Royal Oaks Drive)	≥8.0 mg/L	383	8	2
	BBC2 (18 th Street)		467	64	14
	BBC65th (65 th Avenue)		-	-	-
	BBC3 (86 th Avenue)		49	5	10
	BBC4 (Burton Road)		93	10	11
	BBC6 (Peterson Ditch)		19	1	5

¹ Source: EDS (1998).

² This is a new monitoring location; therefore, no historical data are available for this site.

³ WAC standard for determining excursions at this site reported as 16°C (EDS 1998).

ORGANIZATION AND SCHEDULE

The city of Vancouver has received a Centennial Clean Water Fund grant from WSDOE to monitor water quality in Burnt Bridge Creek. The city has contracted PBS Engineering and Environmental (PBS) to assist the city with the preparation of this QAPP and the monitoring of water quality within the creek.

Consultant Contract

The city of Vancouver Surface Water Management has contracted PBS to prepare this Quality Assurance Project Plan and conduct the monitoring described herein. Contact information for PBS is provided below:

Skip Haak
PBS Engineering and Environmental
1310 Main Street
Vancouver, WA 98660
360-690-4331

Schedule

Six stations have been selected between NE 18th Street and I-205 for monitoring water quality (Figure 1). The location of each station has been selected based on previous monitoring locations and a desire to better understand how changes along the creek affect water quality. Samples will be collected monthly from June through November at each location for two years beginning in June 2004.

Preparation for sampling trips will occur on Mondays. This will allow time for calibrating equipment, organizing sample bottles water sampling, and preparing shipping documents. Water quality sampling will occur on Tuesdays after 10:00 am. The specific timing of the sampling is to ensure the shipment of water samples will be received at the laboratory within 24 hours of collection. Laboratory results will be available via FAX within 14 days.

Monitoring will be completed in November 2005, and a draft report will be submitted to the city and WSDOE for review in March 2006. A final report, which incorporates comments from reviewers, will be prepared and submitted in June 2006.

The only limitation on the schedule is holding time for the water sample for fecal coliform. Water samples must be collected, transported to the laboratory, and analyzed within 24 hours. The proposed schedule facilitates analysis of samples within a 24-hour period. Other parameters also have 24-hour hold periods, but there is flexibility in the holding if the samples are handled appropriately.

Budget

The budget for preparing the QAPP and conducting the associated water quality monitoring is \$36,000.

PROJECT DESCRIPTION

The monitoring of Burnt Bridge Creek will attempt to answer the following questions:

- Does water quality within the creek meet Washington water quality standards?

DATA QUALITY OBJECTIVES

Bias

Specific measures will be implemented to reduce bias in monitoring results. First, standardized methods for collecting water samples and taking instantaneous water quality measurements have been adopted. These methods are well documented with only minor changes proposed in this QAPP. Second, field crews will be trained and provided with documents presenting methods. Third, sample blanks will be provided by the laboratory and handled in a manner similar to water samples collected for analysis. The sample blanks will be analyzed by the laboratory and results of these analyses evaluated for potential bias.

Precision

Precision will be estimated from replicate field measurements and laboratory analyses. Replicate field measurements will be made at each monitoring location. Upon arriving at a monitoring location, temperature, pH, and dissolved oxygen will be measured using the field equipment. Water samples will then be collected and placed in a cooler. Following collection of the water samples, the three parameters will be measured again prior to moving to the next monitoring location. In addition, instantaneous measurements of temperature will be compared with temperatures measured continuously using data loggers. These data will be used to evaluate the precision of the field measurements. Replicate laboratory analyses will be performed on water samples. The relative standard deviation of the analytical results will be calculated and compared with the measurement quality objectives presented in Table 3. Water samples will be stored for reanalysis for some parameters if the laboratory results are questionable.

Reporting Limits

Reporting limits for laboratory analyses have been set to allow comparison with state and EPA standards, as well as historical data. Likewise, accuracy of field measurements has been set to allow compliance with state standards to be determined.

Measurement Quality Objectives

The measurement quality objectives (MQOs) refers to the performance standards or acceptance criteria, such as precision, bias, and reporting limits. MQOs provide the basis for determining the sampling and analytical procedures.

Field and laboratory methods and equipment have been selected to meet project goals. Field procedures will allow reliable estimation of monthly and spatial variability of each parameter. Measurements will be taken using readily available and industry standard equipment, which is commonly used for similar compliance and effects monitoring. Field measurements and data management will employ quality control procedures appropriate to the parameter being evaluated. Measurement quality objectives for field measurements and laboratory analyses are shown in Table 3.

Representativeness

Data collected throughout the study are intended to be representative of conditions at each monitoring location; however, there are limitations in the representativeness that can be achieved with the proposed sampling plan. Measurements and samples will be collected on a monthly during summer and early fall for two years at each location. The monitoring period was selected to concentrate the monitoring during the period of the year when streamflows are low and pollutant concentrations tend to be greatest. The monitoring frequency will not allow for diurnal variability to be assessed. The only exception is temperature, which will be monitored continuously. Some parameters can, in some cases, change dramatically throughout the day. Therefore, measurements and samples will be taken at consistent times during the day throughout the monitoring period.

The proposed monitoring, except for temperature, is not designed to capture the full range in variability for each parameter. Nonetheless, the proposed monitoring will allow compliance with water quality standards to be assessed and changes in water quality associated with particular stream reaches to be assessed. The frequency of monitoring was a compromise between the need for more frequent monitoring to increase the likelihood of obtaining representative samples, the cost of monitoring, and available budget for the project.

Comparability

All measurement and analytical procedures will be documented so that the data will be comparable with samples collected and analyzed in a similar manner. Extensive water quality monitoring has occurred in the past on Burnt Bridge Creek. Procedures and monitoring locations have been selected to promote comparability between the new and historical data.

FIELD PROCEDURES

Field sampling procedures were based on procedures outlined in *Recommended Protocols for Measuring Conventional Water Quality Variables and Metals in Fresh Water of the Puget Sound Region* (PSAT 1990). Variations to these procedures are discussed below by parameter:

Temperature - Temperature will be measured at each location during each monitoring trip using the Hydrolab Surveyor[®] 3 Data Logger with H2O Water Quality Multiprobe (Table 4). Continuous water temperature readings will be taken using one Onset Optic StowAway Temp Logger at each location. Measurements taken using the Hydrolab meter will be compared with those recorded at the same time using the Optic Temp Loggers. Also, the Optic Temp Loggers will be checked for accuracy prior to deployment per manufacturer's instructions. No calibration is necessary with the Hydrolab meter; however, prior to taking any field measurements the meter readings will be compared to a thermometer with a certified accuracy traceable to the U.S. National Institute of Standards & Technology (NIST).

Dissolved oxygen - Dissolved oxygen (DO) will be measured in situ using a Hydrolab Surveyor[®] 3 Data Logger with H2O Water Quality Multiprobe (Table 4). The Hydrolab meter

Label information of quality control samples
Comments and unusual circumstances
Information regarding photo documentation

A chain-of-custody form will accompany each set of samples. The chain-of-custody form indicates the name of the collector of the samples, date and time of collection, number of containers, test to be performed, shipper, receiver, and date and time of shipping and receiving.

Table 4. Field Equipment and Specifications

PARAMETER	EQUIPMENT	RANGE	ACCURACY	RESOLUTION	REFERENCE
Temperature	Optic StowAway Temp Logger	-4°C - 37°C	0.2°C	0.16°C	Onset Computer Corporation (www.onsetcomp.com)
	Hydrolab Surveyor 3 Data Logger with H2O Water Quality Multiprobe	-5°C - 50°C	0.15°C	0.01°C	Hydrolab Inc. (http://hydrolab.com/)
pH	Hydrolab Surveyor 3 Data Logger with H2O Water Quality Multiprobe	0 - 14 units	0.2 units	0.01 units	Hydrolab Inc. (http://hydrolab.com/)
Dissolved oxygen	Hydrolab Surveyor 3 Data Logger with H2O Water Quality Multiprobe	0 - 20 mg/L	0.2 mg/L	0.01 mg/L	Hydrolab Inc. (http://hydrolab.com/)

LABORATORY PROCEDURES

The sample matrix for all samples will be surface water. The required limits for quantification of laboratory data should be attainable through the analytical methods listed in Table 5. The contracting laboratory staff will consult with the project manager if any changes in procedures are recommended or if matrix difficulties are encountered. The contracting laboratory will analyze all samples in accordance with standard methods listed in Table 5. Shipment of samples, preservatives, and sample holding times conform to the laboratories quality assurance plan and the proposed analytical methods (Table 6).

QUALITY CONTROL

Laboratory QC

Am Test Laboratories conducts their own standard QC program. For every 10 samples tested, one blank, duplicate, spike, or reference material is tested. Am Test also regularly tests audit samples and performance evaluation samples to maintain its WSDOE accreditation.

Field QC

Standard quality control procedures will be used for all field measurements. These include keeping all equipment in proper working order. Inspection and maintenance of all field measurement equipment will be done before and after field visits. When data is retrieved from

DATA MANAGEMENT PROCEDURES

Data and field notes will be recorded or retrieved, stored, and managed in both hardcopy and digital form by PBS. Raw field measurement data and field notes are recorded on field data sheets, which are scanned to provide electronic copies and then archived in binders.

Data will be managed in an Access[®] database. Constituents measured in the field are recorded manually on a standard form and entered by the sampler into a temporary Access table upon return to the office. Rough validation rules prohibit obviously incorrect data from being entered. A hardcopy of the temporary table is printed and the sampler reviews the data prior to moving it into the final results table. PBS will be responsible for validating and cross-checking data entry and explaining any necessary data qualifiers.

Water temperature data recorded by the Optic StowAway Temp Loggers will be retrieved in the field using an Optic Shuttle[™]. Data from all six Optic Temp Loggers can be retrieved on a single Optic Shuttle[™]. Upon returning to the office, data stored on the Optic Shuttle[™] will be downloaded onto a computer. Using Onset's proprietary data management software, BoxCar[®] Pro, the downloaded data will be exported as an ASCII file and then imported into the Access[®] database.

Laboratory data, once available, will be entered into the Access[®] database. Station, date, and time must match the field data entered earlier.

Review and verification of field and laboratory data will be conducted by both the field crews and QA Officer. See Data Review, Verification, and Validation for additional information about the steps that will be taken to ensure the quality of the data.

WSDOE maintains an Environmental Information Management (EIM) system, which allows easy access to environmental data via the worldwide web. Data from this project will be submitted to WSDOE using Excel spreadsheets developed by the agency for the EIM system.

AUDITS AND REPORTS

Audits and reports are designed to ensure that the QAPP is implemented correctly, yielding acceptable data in the projected time period.

Audits

PBS will periodically review the field data, methods, and data management activities to make an assessment of the program and identify corrective actions or method revisions.

Reports

Interim and final reports will be submitted to the city and WSDOE. On or before December 1, 2005, PBS will submit an interim report to the city to comply with grant requirements. By March

- Logic checks (total phosphorus greater than soluble reactive phosphorus or total nitrogen greater than nitrate/nitrite plus ammonia) are violated.
- Sample values are outside the normal range for the constituent based on historical data.

Data will be reviewed by the QA Officer before and after entry into the database. Any data considered suspect will be flagged for more extensive review in Step 3.

Step 3

Once data have been reviewed in Steps 1 or 2, compliance with the MQOs will be determined. As necessary, the analytical laboratory will be contacted to assess whether MQOs for analyzed constituents have been met.

The data will then be coded for quality by the QA Officer. If laboratory data are suspect, analytical results will be discussed with laboratory personnel. Quality codes will be assigned based on review of field and calibration logs, conversations with laboratory personnel, and best professional judgment as follows:

1. Data appear good based on reviews in Steps 1 and 2.
2. Data flagged in either Steps 1 or 2 but subsequent review indicated data acceptable.
3. Data flagged in either Steps 1 or 2 but subsequent review indicated an adjustment to the data was warranted. Data modified.
4. Data flagged in either Steps 1 or 2 and subsequent review indicated data continued to be suspect. Data are not to be used.
5. Data exceed Measurement Quality Objectives. Data are not to be used.


Whenever data are modified from the original value, the reason for the modification, the modifying value, and the new modified value will be recorded in the database. The original field or laboratory value will remain unchanged in the database.

Data given a quality code of 4 or 5 will not be reported or used in any data analyses.

DATA QUALITY ASSESSMENT

Data Quality Assessment for this project will include reviewing the DQOs and sampling design, preparing summary statistics and graphs, and drawing conclusions from the data. Hypothesis testing will not be conducted due to the relatively low number of samples proposed for collection. Instead, conclusions will be drawn based on comparisons with water quality standards and historical values.

SERVICES REQUEST FORM
 (Request for Proposals, Professional Services (over \$5,000), Interlocals)
<http://citynet/procurement/forms/Services Request Form.doc>

To be filled out by Project Manager and provided to Procurement Services along with the scope of work, fee schedule and any other required information. Your contacts are: Request for Proposals - Bob Bess - 619-1027 Interlocal Agreements - Anna Vogel - 619-1032 Professional Services - Scott Cramer - 619-1026					
Date: August 19, 2003	Request Type (check one):	<input type="checkbox"/> Professional Services (over \$5,000)	<input type="checkbox"/> Interlocal	<input type="checkbox"/> Encumbrance Request	
		<input checked="" type="checkbox"/> PSA Amendment to PO#15487			
Approved Budget ID Number:	083098				
Title of Project/Services:	BBC Regional Wetland Bank & Greenway Trail				
Project Manager/Phone No:	Annette Griffy x8452				
Pertinent staff that correspondence should also be directed to:					
Supplier Name, Contact, Address, Phone/Fax (Refer to the Supplier Request form located on http://citynet/vision , if they do not exist in Vision):	PBS Engineering and Environmental, Ron Rathburn 1310 Main Street, Vancouver, WA 98660 360-690-4331 Fax 360-696-9064				
Funding Type(mark all that apply):	<input checked="" type="checkbox"/> Local	<input checked="" type="checkbox"/> State	<input type="checkbox"/> Federal		
If State or Federal, what is the source? Special Requirements?	Centennial Clean Water Fund Grant				
WSP Background Check successfully completed? (if applicable)	Yes No				
Scope of Work (attach):	See Attached				
Fee Schedule (attach):	See Attached				
Special Insurance Requirements:	N/A				
Effective Dates:	Beginning: August 2003		End: December 2005		
Not to Exceed Amount (if over Council threshold, will require RFP and/or Council award):	\$36,000 Staff Report #148-02 Council Award Date 08/26/02				
Amendment Request: (Check the box for the action needed and attach any applicable backup)	Increase/Decrease Contract Amount: X		Extend Effective Dates:		
	Scope of Work Change:		Reduced Encumbrance Amount:		
2003 Encumbrance Amount:					
Charge Account (for multiple accounts, attach a separate sheet if necessary):	Fund: 444	Org: 854500	Object:	Location:	Project (GL only): 085001
Task Project (for multiple tasks, attach a separate sheet if necessary):	Project:		Task: 04.01.00	Expenditure Type:	
Organization Signature Authorization (located at http://citynet/vision - Requisition approvers by Org):	Annette Griffy 				

Preparation of other documents, reports, agency review forms or letters, or other presentations that may be required by local or other agencies during the project can be prepared at an additional cost.

SCHEDULE

This project will be initiated upon receipt of a signed agreement confirming a notice to proceed. All work will be completed within a 24-month sampling period.

TERMS AND CONDITIONS

This proposal and the attached Terms and Conditions comprise the entire agreement between the parties. This agreement may not be changed without the prior written consent of the parties. This proposal, its terms and conditions may not be assigned without the prior written consent of the other party.

Please indicate acceptance of this agreement by returning a signed copy of this agreement or a purchase order incorporating the terms of the agreement.

We appreciate the opportunity to submit this proposal. Please contact us if you have any questions concerning our proposed scope of work or fees.

Sincerely,



Ron Rathburn
Principal
Natural Resources Division

ACCEPTED BY:



Name (Please Print)

ANNETTE GRIFFY

Signature

9/19/03

Date

Attachment: General Terms and conditions for Professional Services (3/02)

A:\70000\70254\City QAPP Proposal.doc



6. **LIABILITY INSURANCE:** PBS carries comprehensive General Liability insurance which, subject to its terms and limits, may provide protection against liability arising out of bodily injury or property damage arising out of PBS operations. PBS makes no representations or warranties concerning the effect, applicability or scope of such insurance. Upon request in writing by Client to PBS, PBS will request its insurer to name Client as an additional insured on such policies and to issue certificates to Client to that effect. PBS makes no representations or warranties regarding any act by its insurer(s), and shall not be responsible for performing any act with respect to such insurance not specifically called for by this paragraph.
7. **PROFESSIONAL LIABILITY AND LIMITATION THEREOF:** This paragraph relates only to Professional Liability and not General Liability. In performing our professional services, we will use that standard of care and skill ordinarily recognized under similar circumstances by members of our profession in the state and region at the time the services are performed. No other warranty, either expressed or implied, is made in connection with our rendering of professional services.
8. **CONTRACTED WORK:** PBS, including its subconsultants, are retained hereunder for the limited purpose of performing certain environmental surveys, providing the results of such surveys to client, and making recommendations with respect to the data produced by the surveys. PBS is not responsible for the overall environmental status of Client's project, for the interpretation of the survey results by others, for any use of its reports by Client or others except as specifically set forth herein, or for any other matter not encompassed in the specific assignment given to PBS by Client. Any unauthorized use or distribution of PBS' work shall be at the Client and recipients sole risk. If Client desires to release, or for PBS to provide, our report(s) to a third party not described above for that party's reliance, PBS will agree to such a release provided we receive written acceptance from such third party to be bound by acceptable terms and conditions similar to this agreement, in addition to a fee for extending our liability to a new party. The Client shall indemnify, defend and hold harmless PBS and its subconsultants from any claims, damages, costs, losses and expenses, including but not limited to attorney fees and costs on arbitration, trial or appeal arising out of unauthorized or third party use of PBS' reports.
9. **SAMPLES:** All samples will be discarded 30 days after submission of our final report unless other arrangements are made.
10. **PAYMENTS TO CONSULTANT:** Invoices will be submitted periodically for prior services. An account will become delinquent thirty days after date of billing. It is agreed that a late charge will be added to delinquent accounts at the rate of one-and-one-half percent (1-1/2%) for each thirty days delinquent (provided the rate of such late charge shall not exceed the maximum allowable by the laws of the state in which our office submitting the invoice is located).
11. **OTHER PROVISIONS:** Neither party shall hold the other responsible for delay in performance caused by acts of God, strikes, lockouts, weather, accidents, or other events beyond the control of the other or the other's employees and agents.

Waivers by either party of any provision, term, condition or covenant, shall not be construed by the other party as a waiver of a subsequent breach of the same by the other party by providing written notice. This agreement supersedes any contract language which may be issued by client as a matter of standard purchasing protocol without regard to the unique nature of professional services.

An opinion of construction, remediation and restoration costs prepared by PBS represents our judgement as a professional. Since we have no control over the cost of labor and material, or over competitive bidding or market conditions, we do not guarantee the accuracy of our opinion as compared to contractor bids of actual cost to the Client.

It is understood and agreed by both parties that PBS, in performing professional services for the Client with respect to hazardous substances, will make recommendations to the Client but does not have the authority or responsibility to decide where disposal or treatment takes place, nor to designate how or by whom the hazardous substances are to be transported for disposal or treatment. It is understood that PBS is not the generator or site operator and does not own the hazardous waste discovered, handled or removed from the owner's property. Client agrees under advice from client's counsel to timely disclosure to appropriate public agencies as required by law; any information that may be necessary to prevent damage to human health, safety, or the environment. Client agrees that PBS and its consultants are not responsible for the creation of the condition(s) PBS is being asked to investigate and that it would be unfair for PBS to be exposed to claims of injury or damage as a result of the conditions. In addition, Client understands that it is possible that exploration and investigation may fail to reveal the presence, location or source of the condition(s) being investigated even when the condition(s) is assumed or expected to exist. Client understands that PBS' failure to discover and/or locate the condition(s) or the spread of the condition(s) through appropriate and mutually agreed upon techniques does not guarantee that the condition(s) does or does not exist. Client agrees that it would be unfair to hold PBS liable for creating the condition(s) or the spread of the condition(s) providing PBS meets a reasonable standard of care and/or as described by supplemental proposal. Accordingly, Client Waives any resulting claims against PBS and its consultants, and agrees to defend, indemnify and hold harmless PBS and its consultants from any and all claims or liability for injury or loss arising from the creation of the original condition(s) or the unintentional exacerbation of the original condition(s) by PBS, the exacerbation of hazardous conditions by others, the discovery of any condition, location of any condition and/or allowing any condition to exist. Client also agrees to fairly compensate PBS and its consultants for any time spent and expenses incurred in the defense of any such claim.

PBS does not provide legal opinions, and recommends client seek legal counsel for advise on issues such as the appropriateness of a particular scope of work to minimize legal liability, potential cost recovery from responsible parties, and to assess the value of maintaining attorney/client privilege for work conducted under this agreement.

In the event there is a dispute between PBS and the Client concerning the performance of any provision in this agreement, the losing party shall pay the prevailing party reasonable attorney's fees and costs on trial or appeal. In addition, Client agrees to pay PBS for all employee time, costs, and witness costs incurred for collection activity.

This agreement can be terminated at any time by either party. If terminated prior to the completion of a scope of work, PBS shall be entitled to its portion of fees for any work performed in accordance with the above rate schedule.