SCOPE OF WORK

RESPONSE ACTIONS FOR SOURCE AND NON-SOURCE AREAS

PM NORTHWEST SITE
NEAR ANACORTES, WASHINGTON

25 September 2000

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INTRODUCTION

This Scope Of Work (SOW) outlines a general management approach and tasks that will serve as the basis for the development and implementation of response actions at the PM Northwest site (Site)[1] on the Swinomish Indian Reservation in Washington. The purpose of the response action(s) is to remove source material, to investigate the nature and extent of contamination, assess the potential risk to human health and the environment, and develop and evaluate potential response alternatives and implement the approved response actions[2] if any are necessary. The response action(s) shall be conducted as removal actions developed in two phases. Phase 1 would involve source removal as a time-critical removal (TCR) and Phase 2, as a non-time critical removal (NTCR), would focus on investigation of the nature and extent of contamination, assessment of the potential risk associated with the contamination, evaluation of potential response actions[3] and implementation of specified EPA response actions through acceptance of the final *Site Completion Report*. The Phase 2 investigation may be conducted concurrently with Phase 1 source response actions.

The U.S. Environmental Protection Agency (EPA), in consultation with the Swinomish Indian Tribal Community (Tribe), completed a site assessment for the PM Northwest Site and reported findings in a draft report dated August 1999: "PM Northwest Site, Phase 2 Integrated Site Assessment Report." This report was attached to a "Notice of Potential Liability and Information Request" letter sent by EPA to three Potentially Responsible Parties (Respondents) via certified mail on March 13, 2000. The draft site assessment report is also attached to this SOW. An earlier draft report, dated January, 1999, provides findings from the "Draft Phase 1 Integrated Site Assessment Report PM Northwest Site."

The Respondents will develop a Work Plan(s) and conduct response actions for the Site, except for the community relations components which will be conducted by EPA in conjunction with the Tribe. The Respondents will produce the response action reports in accordance with this SOW, Work Plans, and cited Guidances (a list of the primary guidance is included as Attachment 1), as well as any additional requirements in the Administrative Order on Consent (AOC). EPA Guidance regarding Work Plans describe the report format and the required content. The

[1] Site means "facility" as defined in CERCLA section 101(9) which means "...any building, structure...or any site or area, where a hazardous substance has been deposited of, or placed, or otherwise come to be located...".

[2] Assessment of risk, evaluation and/or implementation of alternatives may be curtailed, as determined by EPA, in consultation with the Tribe, based on the findings of the nature and extent of contamination.

[3] The evaluation of potential response actions will include the evaluation of a "No Further Action" alternative.

Respondents will furnish all necessary personnel, materials, and services needed, or incidental to, performing the response actions, except as otherwise specified in the AOC.

Response actions will be selected by EPA, in consultation with the Tribe. The response actions will constitute a final action for the site and accordingly will meet the cleanup standards specified in CERCLA Section 121. That is, the selected response actions will be protective of human health and the environment; will be in compliance with, or include a waiver of, applicable or relevant and appropriate requirements of other laws; will be cost-effective; will utilize, to the maximum extent practicable, permanent solutions and alternative treatment technologies or resource recovery technologies; and will address the statutory preference for treatment as a principal element. The technical support documentation, as adopted by U.S. EPA in consultation with the Tribe, will, as part of the administrative record, form the basis for the selection of response actions and will provide the information necessary to support the development of the decision documentation.

As specified in CERCLA Section 104(a)(1), as amended by SARA, EPA, in conjunction with the Tribe, will provide oversight of the Respondents activities throughout all response actions. The Respondents will support EPA's and the Tribe's initiation and conduct of activities related to the implementation of oversight activities and will coordinate with EPA and the Tribe on all Site-related activities.

A. SITE BACKGROUND AND DESCRIPTION

1. Site Location.

Site Name:	PM Northwest
CERCLIS ID No:	WAD980639090
Location:	5 miles southeast of Anacortes, Washington
Latitude:	48 26' 48" North
Longtitude:	122 31' 46" West
Legal Description:	Eastern half of Section 10, Township 34 North, Range 2 East
Congressional District:	2nd District in Skagit County
Site Owner/Contact:	Dick Huntley, Jr. PM Northwest, Inc. 1490 Memorial Highway, P.O. Box 549 Mt. Vernon, Washington 98273 (360) 424-3209

The PM Northwest Site (Site) is located in a wooded area on Fidalgo Island near Anacortes, Washington in Skagit County approximately 1 mile south-southeast of the petroleum refineries at March Point. This approximately seven acre site, which

encompasses former disposal pond locations and surrounding properties, is located within the Swinomish Indian Reservation.

2. Site Description

The Site is a former petroleum refinery waste dump where buried containers and sludges were disposed of in ponds. Access to the site is restricted by a locked gate at the property access road intersection with Padilla Heights Road. The Site and the surrounding terrain generally slope downward to the northeast. Surface water runoff from the Site was observed to be flowing to the northeast during Phase 2 Integrated Site Assessment fieldwork. A bluff located approximately 150 yards east of the Site slopes steeply down to the low-lying Swinomish Channel area. An intermittent stream flows along the base of the bluff, and the Swinomish Channel is approximately 0.5 miles east of the bluff. Padilla Bay is 2 miles north of the Site, and Similk Bay is 0.8 miles west of the Site.

3. Site Ownership History

The PM NW site property was purchased by Plant Maintenance, Inc. in about 1957. PM Northwest, Inc. succeeded Plant Maintenance in 1960. The use of the property to dispose of refinery waste from Texaco and Shell Oil began about 1959 until 1969. Since that time. the dump has been closed and the property has been unused.

4. Previous Investigations

EPA has conducted several investigations at the Site. Results from these investigations may be found in various reports, (E&E 1986), (E&E 1997), (E&E 1999a), (E&E 1999b), and (SITC 1997) listed in the attached bibliography. The following is a summary of the Phase 1 and 2 Integrated Site Assessment.

(1) Samples taken from source area surface and subsurface soils, sludge and drum contents revealed that the following constituents exceeded Region 9 Soil PRGs or MTCA Method B Soil Cleanup Levels: Benzene, Benzo[a]anthracene, Benzo[b]fluoranthene, Benzo(a)pyrene, Carbazole, Carbon Tetrachloride, Chrysene, 1,2-Dibromo-3-chloropropane, 2,6-Dinitrotoluene, Naphthalene, n-Nitrosodiphenylamine, Tetrachloroethene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Toluene, TPH, Aluminum, Antimony, Arsenic, Barium, Cadmium, Chromium, Copper, Iron, Lead, Sodium, and Zinc.

(2) Groundwater samples collected from monitoring wells screened above the glacial till unit approximately three to five feet below ground surface revealed concentrations of the following substances in exceedance of Region 9 PRGs (tap

water), EPA MCLs or MTCA Cleanup Levels: Benzene, Benzo[b]fluoranthene, bis(2-Ethylhexyl)phthalate, Carbazole, Chrysene, Dibenzofuran, 1,2-Dichloroethane, Ethylbenzene, Methylene Chloride, Naphthalene, 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Toluene, Vinyl Chloride, Xylene, TPH, Aluminum, Antimony, Arsenic, Barium, Chromium, Iron, Lead, and Manganese.

(3) Surface water samples collected from seeps in the bluff below the site, locations in and near the wetland area revealed concentrations of the following substances in exceedance of EPA Water Quality Criteria, EPA MCLs or MTCA Method B Surface Water Cleanup Levels: bis(2-Ethylhexyl)phthalate, Arsenic, Aluminum, Copper, Iron, Lead, Manganese, Mercury, and Nickel.

(4) Sediment samples collected from locations in and near the wetland area revealed concentrations of bis(2-Ethylhexyl)phthlate and cadmium in exceedance of the MTCA Sediment Quality Standards.

(5) Numerous other volatile organic, semi-volatile organic compounds and metals were also detected in the various media sampled at the Site. Even though these detected substances were below screening or regulatory levels, VOCs and SVOCs are not naturally occurring chemicals and should not be present. Metals can be found naturally in the environment and, in some cases, detected metals exceeded background concentrations.

These findings support the conclusion that hazardous substances at the PM Northwest Site are present in soils, in and around the disposal ponds, and are present in groundwater above screening or regulatory levels and maybe impacting surface water and sediments in the wetland area east of the site. Evidence indicates that shallow groundwater has been contaminated by contaminants found in the waste disposal pools. Surface water and wetland sediments could be impacted from contaminated groundwater that appears as seeps above and at the level of the wetlands. Based on available information, EPA can not determine the extent, if at all, contamination has migrated into the deeper groundwater below the glacial till, into local drinking water wells or into the nearby wetlands and the degree of impact that contaminant migration may or could cause.

However, given the generally, undeveloped nature of the area and possible direction of the groundwater flow as well as near by evidence that the till may not serve as a complete aquitard, EPA believes that it is reasonable to assume that the PM NW Site could adversely impact the wetlands and local drinking water wells over time.

Future data gathering should include information that addresses the permeability of the glacial till layer, basic area hydrogeology, or possible contamination in groundwater aquifers.

B. Site Objectives.

EPA has determined a general management approach and site objectives, as described in this SOW, for the Site. Consistent with the general management approach and site objectives, specific project scope and tasks will be planned by the Respondents and documented in the *TCR Waste Removal Work Plan*, the *NTCR Site Investigation Work Plan* and *NTCR Action Work Plan*. EPA in consultation with the Tribe will review and comment and approve the *NTCR Waste Removal Work Plan*, the *NTCR Site Investigation Work Plan* and *NTCR Action Work Plan*.

The objectives for this Site have been preliminarily determined, based on available data. They are to:

(1) remove the waste materials as soon as practicable and dispose and/or treat the material, as approved by EPA in consultation with the Tribe, in order to quickly stop ongoing migration of contaminants;

(2) conduct post-waste removal investigations to determine the nature and extent of contamination in surface and subsurface soils, groundwater and the wetlands, including any risk assessments that may be required based on an analysis of the exposure pathways and contaminant concentrations, as approved by EPA, in consultation with the Tribe, for remaining waste residuals, if any, in:

(a) glacial till, surface and near-surface soils;

(b) groundwater above the glacial till between the sources, and between the sources and the bluff, other discharge points, and the tribal utility wellfield and domestic drinking water wells;

(c) soil and groundwater in and underneath the glacial till under the sources, between the sources, and the bluff, or other discharge points, and around the site, and the tribal utility wellfield and domestic drinking water wells; and,

(d) soil, sediment, surface water, and groundwater in and surrounding the wetland area east of the site.

(3) identify and evaluate appropriate response actions that are protective of public health and the environment.

(4) implement response actions, as approved by EPA, in consultation with the Tribe, that are necessary to protect human health and the environment from unacceptable risk posed by the historic, current and future presence of waste residuals at the site.

The strategy inherent in this SOW is to focus on removal of the waste materials for off-site disposal and/or treatment as soon as practicable and only thereafter to conduct the surface, subsurface and wetland investigations including any risk assessments that may be required based on an analysis of the exposure pathways and contaminant concentrations, as approved by EPA, in consultation with the Tribe, for remaining waste residuals.

The strategy for the general management of this Site includes development of a sampling strategy which: (1) is based on current information about contaminants at this Site, (2) fills data gaps as necessary, (3) meets the above objectives, (4) is consistent with the NCP, CERCLA, and related policy and guidance, and (5) is approved by EPA, in consultation with the Tribe. The data generated will be used to meet the requirements of the response actions as outlined in relevant guidance, the Work Plans, and this SOW.

When developing the work plans for this Site, the Respondents must meet or otherwise discuss with EPA all project planning decisions and special concerns associated with this Site.

C. Waste Removal Action –Time-Critical Removal Action. The objective of the TCR action is to remove the all source material and contaminated soil exceeding cleanup levels as specified in the *TCR Waste Removal Work Plan*. EPA, in consultation with the Tribe, shall approve the permanent backfilling of excavated areas. Confirmational sampling results of the excavated area demonstrating the obtainment of cleanup levels must be available to EPA and the Tribe before approval of permanent backfilling can be made.

(1) Site Visit. As part of the response action(s) planning effort, the Respondents will participate in a site visit with EPA and the Tribe.

(2) **Scoping Deliverables.** The Respondents will submit an *TCR Waste Removal Project Work Plan*, a *Sampling and Analysis Plan (SAP)*, and a Site *Health and Safety Plan (HSP)* as described below. The Work Plan and SAP must be reviewed and approved by EPA, in consultation with the Tribe, prior to the initiation of field activities.

(a) ***TCR Waste Removal Work Plan***. Within 45 days after the effective date of the AOC, the Respondents shall submit a *TCR Waste Removal Work Plan* for review and approval by EPA, in consultation with the Tribe. The work plan should be developed in conjunction with the sampling and analysis plan and the Site health and safety plan, although each plan may be delivered under separate schedule for completion. In addition, it must include a clear and complete rationale of the problem(s) and potential problem(s) posed by the Site and of the objectives of the waste removal project. In addition, the work plan will incorporate a description of the Site management strategy, a process for determining the extent of the source area, and of securing the excavated area such that residual materials do not pose a hazard to the public or the environment.

Finally, the major part of the work plan is a detailed description of the tasks to be performed, information needed for each task, information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to EPA and the Tribe. This includes the deliverables set forth in the remainder of this SOW; a schedule for each of the required activities; and a project management plan, including a data management plan (e.g., requirements for project management systems and software, minimum data requirements, data format and backup data management), monthly reports to EPA and the conduct of meetings and presentations for EPA and the Tribe at major junctures during the TCR process.

The Respondents shall refer to Appendix B for Guidance for a comprehensive description of the contents of the required work plan.

(b) ***Sampling and Analysis Plan*.** Within 45 days after the effective date of the AOC, the Respondents shall submit a *TCR Sampling and Analysis Plan* for review and approval by EPA, in consultation with the Tribe. The purpose of a SAP is to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet DQOs. The SAP provides a mechanism for planning field

activities and consists of a field sampling plan (FSP) and a quality assurance project plan (QAPjP).

The FSP will define the sampling and data-gathering methods that will be used on the project. It will include sampling objectives, sample location and frequency, sampling equipment and procedures, and sample handling and analysis. The QAPjP will describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that will be used to achieve the desired DQOs. The DQOs will, at a minimum, reflect use of analytical methods to identify contamination and remediate contamination consistent with the levels for remedial action objectives identified in the National Contingency Plan. In addition, the QAPjP will address sampling procedures, sample custody, analytical procedures, and data reduction, validation, reporting, and personnel qualifications.

Field personnel should be available for EPA QA/QC training and orientation, where applicable. The Respondents will demonstrate, in advance to EPA's satisfaction, that any laboratory it intends to use is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the chemicals of concern in the media of interest within detection and quantification limits consistent with both QA/QC procedures and DQOs approved in the QAPjP for the Site by EPA. The laboratory must have and follow an approved QA program. If a laboratory not in the Contract Laboratory Program (CLP) is selected, methods consistent with CLP methods that would be used at this Site for the purposes proposed and QA/QC procedures approved by EPA will be used. If the laboratory is not in the CLP program, a laboratory QA program must be submitted for EPA review and acceptance. EPA may require that the Respondents submit detailed information to demonstrate that the laboratory is qualified to conduct the work, including information on personnel qualifications, equipment and material specifications. The Respondents will provide assurances that EPA has access to laboratory personnel, equipment and records for sample collection, transportation and analysis.

(c) **Site *Health and Safety Plan*.** Within 45 days after the effective date of the AOC, a *Health and Safety Plan* (HSP) will be prepared in conformance with the Respondents health and safety program, and in compliance with OSHA regulations and protocols. The health and safety plan will include the 11 elements described in the RI/FS Guidance, such as a health and

safety risk analysis. Specifically, the plan should address risks from characterizing and moving waste materials.

(3) Implementation of Approved *TCR Waste Removal Work Plan*. Within 30 days after EPA issues a Notice To Proceed (NTP)[4], the Respondents shall initiate on-site activities in accordance with the Work Plan, SAP and HSP.

(4) *TCR Waste Removal Report.* Within 90 days, after completing waste removal activities, the Respondents will prepare a concise draft *Waste Removal Report* for EPA and Tribal review and comment. The Respondents shall incorporate all EPA comments and issue the *Waste Removal Report* as final.

D. Site Investigation Action – Non-Time Critical Removal Action. The NTCR action for this Site culminates in an *Engineering Evaluation and Cost Analysis* (*EE/CA*). The process is reiterative and divided into two parts: the investigative part and the alternative evaluation part. The first part, Site investigation, includes a focused/streamlined risk assessment. The Tribe will be involved in developing (or at a minimum reviewing) the Conceptual Site Model, exposure scenarios, receptors to be protected and other elements of the risk assessment. Information derived from the risk assessment will help provide some direction in selecting alternatives to evaluate. The second part, the Alternative Evaluation, is meant to be a focused evaluation where only viable alternatives[5] suited to the site are considered in the evaluation.

Based on information from the Site Investigation, EPA in consultation with the Tribe and Respondents, will identify select alternatives to be evaluated. Information from both parts, the site investigation and the alternative evaluation, will be used by EPA to develop an *EE/CA.* In the *EE/CA*, an alternative will be proposed for the Site and open to a 30-day comment period. After EPA considers the public comments on the *EE/CA*, EPA, in consultation with the Tribe, will select a final alternative for the Site which is documented in an action memorandum.

The purpose of the NTCR action is to determine (a) whether surface soils, subsurface soils and/or sediments in the source area extending outward and in the wetlands, are contaminated above

[4] EPA anticipates issuing a Notice To Proceed (NTP) 30 days before a satisfactory field season is anticipated. EPA expects that the latest the NTP would be issued is June 1, 2001. A satisfactory field season will include considerations such as amount of rainfall, depth of shallow groundwater and other site condistions that may or may not be favorable to site excavation.

[5] Viable alternatives to be considered will include a "No Further Action" alternative.

~~un~~acceptable levels[6]; (b) if contamination from the source material has entered the glacial till zone or any soils below the glacial till; (c) the direction of groundwater flow for each zone; and (d) whether the groundwater is contaminated above ~~un~~acceptable levels[7] in either the surficial zone or the underlying aquifer systems and, if so, the nature and extent of contamination; and (e) based on the above information, define the areas of contamination that exceeds acceptable levels, including public and private drinking water wells.

The Respondents will perform the activities described in this task, including the preparation of a *NTCR Site Investigation Work Plan* and an *NTCR Site Investigation Report* for EPA, in consultation with the Tribe, review and approval.

The *NTCR Site Investigation Report* shall summarize available data on the physical, demographic, and other characteristics of the site and surrounding areas. These data may be available from PA/SI reports, from previous site investigations, or from other EPA activities at the Site. Background engineering data for analysis of response alternatives should also be included.

The overall objective of the *NTCR Site Investigation Report* which is to describe areas of a Site that may pose a threat to human health or the environment and to identify actions that can mitigate site risk. Site characterization should include: (a) Site physiography, geology, and hydrology; (b) surface and subsurface pathways and extent of contaminant migration as well as volume and any changes to contaminants' physical or chemical characteristics; (c) and, the nature, extent, volume, physical and chemical constituents and concentrations of the sources of contamination in the affected media. Using this information, contaminant fate and transport can be determined and projected. A conceptual site model will be developed accordingly. The Respondents may partially rely on previous Site work to assist them in completing this evaluation.

During this phase of the response action, the *NTCR Site Investigation Work Plan*, *SAP*, and *HSP* are implemented. Field data are collected and analyzed to provide the information required to accomplish the objectives of the study. The Respondents will notify EPA and the Tribe at least 2 weeks in advance of the field work regarding the planned dates for field activities, including any field surveys, sampling, excavation, installation of wells, installation and calibration of equipment, pump tests, and initiation of analysis and other field investigation activities.

Respondents shall provide EPA and the Tribe with analytical data within 60 days of each sampling activity, in an electronic format (i.e., computer disk or tape) showing the location, medium and results.

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[6] Acceptable levels are to be determined based on information gathered about the site including RAOs, ARARs, risk assessment results and future land use.

[7] see footnote 7

(1) **Scoping Deliverables.** The Respondents will submit an *Site Investigation Work Plan*, *SAP*, and a *Site Health and Safety Plan*[8] *(HSP)* as described below. The *Site Investigation Work Plan* and SAP must be reviewed and accepted by EPA, in consultation with the Tribe, prior to the initiation of field activities.

(a) **Scoping Activities.** The following are activities that occur during scoping and should be documented in scoping deliverables:

(i) collect and analyze existing site data;
(ii) identifying data needs;
(iii) project planning including refinement of remedial action objectives, data quality objectives, preliminary identification of ARARs.

(b) ***NTCR Site Investigation Work Plan*.** Within 120 days of the effective date of the AOC, the Respondents shall submit a *NTCR Site Investigation Work Plan* (see Attachment 3 for sample work plan outline) for review and approval by EPA, in consultation with the Tribe, documenting the decisions and evaluations, including a focused/streamlined risk assessment, to be completed during the scoping process. The work plan should be developed in conjunction with the sampling and analysis plan and the Site health and safety plan, although each plan may be delivered under separate cover. The work plan will include a comprehensive description of the work to be performed, including the methodologies to be utilized, as well as a corresponding schedule for completion. In addition, it must include a clear and complete rationale for performing the required activities. Specifically, the work plan will present a statement of the problem(s) and potential problem(s) posed by the Site and of the objectives of the site investigation. In addition, the work plan will incorporate a description of the Site management strategy. The work plan will also describe a process for obtaining the goals of the investigative action.

Finally, the major part of the work plan is a detailed description of the tasks to be performed, information needed for each task, information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to EPA. This includes the deliverables set forth in the remainder of this SOW; a schedule for each of the required activities; and a project management plan, including a data management plan (e.g., requirements data format and backup data

[8] The HSP for the NTCR action can be submitted with or as an addendum to the HSP for the TCR action.

management), monthly reports to EPA and the conduct of meetings and presentations for EPA at major junctures during the response process.

The Respondents shall refer to Attachment 3 for a comprehensive description of the contents of the required work plan.

(c) ***Sampling and Analysis Plan.*** Within 120 days of the effective date of the AOC, the Respondents will submit for review and approval to EPA, in consultation with the Tribe, a SAP to ensure that sample collection and analytical activities are conducted in accordance with technically acceptable protocols and that the data meet DQOs. The SAP provides a mechanism for planning field activities and consists of a field sampling plan (FSP) and a quality assurance project plan (QAPjP).

The FSP will define the sampling and data-gathering methods that will be used on the project. It will include sampling objectives, sample location and frequency, sampling equipment and procedures, and sample handling and analysis. The QAPjP will describe the project objectives and organization, functional activities, and quality assurance and quality control (QA/QC) protocols that will be used to achieve the desired DQOs. The DQOs will, at a minimum, reflect use of analytical methods to identify contamination and remediate contamination consistent with the levels for remedial action objectives identified in the National Contingency Plan. In addition, the QAPjP will address sampling procedures, sample custody, analytical procedures, and data reduction, validation, reporting, and personnel qualifications.

Field personnel should be available for EPA QA/QC training and orientation, where applicable. The Respondents will demonstrate, in advance to EPA's satisfaction, that any laboratory it intends to use is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the chemicals of concern in the media of interest within detection and quantification limits consistent with both QA/QC procedures and DQOs approved in the QAPjP for the Site by EPA. The laboratory must have and follow an approved QA program. If a laboratory not in the Contract Laboratory Program (CLP) is selected, methods consistent with CLP methods that would be used at this Site for the purposes proposed and QA/QC procedures approved by EPA will be used. If the laboratory is not in the CLP program, a laboratory QA program must be submitted for EPA review and acceptance. EPA may require that the Respondents submit detailed information to demonstrate that the laboratory

is qualified to conduct the work, including information on personnel qualifications, equipment and material specifications. The Respondents will provide assurances that EPA has access to laboratory personnel, equipment and records for sample collection, transportation and analysis.

(d) ***Site Health and Safety Plan*.** Within 120 days of the effective date of the AOC, the Respondents shall submit an addendum to *TCR HSP* if the *TCR HSP* does not cover the NTCR work.

(2) **Site Investigation.** During this phase of the response action, the work plan, SAP, and HSP are implemented. Field data are collected and analyzed to provide the information required to accomplish the objectives of the study. The Respondents will notify EPA and the Tribe at least 2 weeks in advance of the field work regarding the planned dates for field activities, including any field surveys, sampling, excavation, installation of wells, installation and calibration of equipment, pump tests, and initiation of analysis and other field investigation activities.

Respondents shall provide EPA and the Tribe with analytical data within 60 days of each sampling activity, in an electronic format (i.e., computer disk or tape) showing the location, medium and results.

At a minimum, Site investigation work should address or include the following:

(a) **implement and document field support activities.** The Respondents will initiate on-site activities following within 30 days after EPA issues a NTP[9]. Field support activities may include task scheduling, and procuring equipment, laboratory services, and/or contractors.

(b) **investigate and define site physical characteristics.** The Respondents will supplement, as described above, existing data regarding the physical characteristics of the Site and its surrounding areas. This information will be ascertained through a combination of the review of existing information, and obtaining where necessary, additional supplemental information. This information will be utilized to define potential transport pathways and human and ecological receptor populations. In better defining the Site's

[9] EPA will issue a Notice To Proceed (NTP) 30 days before a satisfactory field season is anticipated. A satisfactory field season will include site considerations that are relevant to the field work anticipated. Certain site investigation work may be started before the beginning of the summer field season depending on the nature of the investigative tasks to be accomplished.

physical characteristics, the Respondents will also obtain sufficient additional engineering data for the projection of contaminant fate and transport, and development and screening of response action alternatives, including information to assess treatment technologies.

(c) **conduct site investigation.** The Respondents shall conduct investigations including subsurface and wetland investigations, including any risk assessments that may be required based on an analysis of the exposure pathways and contaminant concentrations, as approved by EPA in consultation with the Tribe, for remaining waste residuals in:

(i) glacial till, surface and near-surface soils;

(ii) groundwater above the glacial till between the sources, and between the sources and the bluff, other discharge points, and the tribal utility wellfield and domestic drinking water wells;

(iii) soil and groundwater in and underneath the glacial till under the sources, between the sources, and the bluff, or other discharge points, and around the site, and the tribal utility wellfield and domestic drinking water wells; and,

(iv) soil, sediment, surface water, and groundwater in and surrounding the wetland area east of the site.

(3) ***NTCR Site Investigation Report.*** The *NTCR Site Investigation Report* shall summarize available data on the physical, demographic, and other characteristics of the site and surrounding areas. These data may be available from PA/SI reports, from previous site investigations, or from other EPA activities at the Site. Background engineering data for analysis of response alternatives should also be included.

The overall objective of the *NTCR Site Investigation Report* which is to describe areas of a Site that may pose a threat to human health or the environment and to identify actions that can mitigate site risk. The Respondents will analyze and evaluate the data to describe: (1) Site physical characteristics, including hydrogeological characteristics, and (2) the nature and extent of contamination. The evaluation will include the horizontal and vertical extent of contamination as well as mobility and persistence of contaminants. The Respondents will describe and display Site data documenting the location and characteristics of surface and subsurface features and contamination at the Site including the affected medium,

location, types, physical state, concentration and quantity of contaminants. In addition, the location, dimensions, physical condition and varying concentrations of each contaminant throughout the Site and the extent of contaminant migration through each of the affected media will be documented. Using this information, contaminant fate and transport can be determined and projected. A conceptual site model will be developed accordingly.

This report will also include information regarding risk to human health and the environment. The risk assessment should focus on the specific problem that the NTCR actions are intended to address. For this Site, the risk assessment projects the potential risks associated with the Site following the TCR action assuming no additional cleanup action (TCR and NTCR actions) is taken at the Site. The risk evaluation uses sampling data from the site to identify the chemicals of concern, provides an estimate of how and to what extent people or the environment might be exposed to these chemicals, and provides an assessment of the health or environmental effects associated with these chemicals. Therefore, the results of the risk evaluation help EPA decide whether to take a cleanup action at the Site, what exposures need to be addressed by the NTCR action, and in some cases define appropriate cleanup levels.

Where modeling is appropriate, such models shall be identified and described in a *Technical Memorandum on Modeling of Site Characteristics*, subject to EPA acceptance prior to use of such models. Key input information data and programming, including any proprietary programs, shall be made available to EPA together with a sensitivity analysis, if requested.

The Respondents shall agree to discuss and then collect any data identified by the EPA, in consultation with the Tribe, as necessary to complete an assessment of risk to human health and the environment. (See *Guidance for Data Usability in Risk Assessment* - OSWER Directive #9285.7-05 - October 1990.) Analyses of data collected for the Site investigation will meet the DQOs developed in the QA/QC plan stated in the SAP (or revised during the field work).

Within 90 days after completion of field work under the *NTCR Site Investigation Work Plan*, the Respondents will prepare a concise draft *NTCR Site Investigation Report* for EPA review and comment, in consultation with the Tribe. This report will review the investigative activities that have taken place and will document data collection and analysis. The Respondents shall incorporate all EPA comments and issue the *NTCR Site Investigation Report* as final.

The *NTCR Site Investigation Report* should follow the following outline, as appropriate:

Section 1 Executive Summary
Section 2 Introduction
- 2.1 Objectives
- 2.2 Site Background
- 2.3 Summary of Previous Investigations
- 2.4 Regulatory History
- 2.5 Potential Applicable or Relevant and Appropriate Requirements

Section 3 Sampling and Analysis Procedures
- 3.1 Introduction
- 3.2 Field Investigations
- 3.3 Laboratory Analysis
- 3.4 Data Quality and Analytical Approaches

Section 4 Physical and Ecological Characteristics
- 4.1 Surface Features
- 4.2 Hydrogeology
- 4.3 Surface Water
- 4.4 Ecological Features

Section 5 Nature and Extent of Contamination
- 5.1 Introduction
- 5.2 Groundwater
- 5.3 Soils
- 5.4 Surface Water
- 5.5 Sediment

Section 6.0 Contaminant Fate and Transport - Conceptual Site Model
Section 7.0 Risk Assessment
Section 8.0 Conclusions
- 8.1 Nature and Extent of Contamination
- 8.2 Probable Sources of Contamination in Groundwater
- 8.3 Contaminant Fate and Transport
- 8.4 Public Health and Environmental Effects
- 8.5 Preliminary Remediation Goals and Remedial Action Objectives
- 8.6 Sources of Uncertainty
- 8.7 Data Needs

Section 9 Bibliography

4. Response Alternative Evaluation. Concurrent with field investigations or as appropriate, the Respondents shall also develop and screen response alternatives and identify and refine ARARs. The development and screening of alternatives is performed to develop an appropriate range of waste management options that will be evaluated. Treatment is used to reduce the toxicity, mobility, or volume of hazardous substances, but varying in the types of treatment, the amount treated, and the manner in which long-term residuals or untreated hazardous substances are treated. The following activities will be performed by the Respondents as a function of the development and screening of response alternatives.

(a) Development and Screening of Response Alternatives. The Respondents will develop and evaluate a range of appropriate waste management options that, at a minimum, ensure protection of human health and the environment, concurrent with the Site characterization task.

(i) Refine and Document Response Action Objectives. Based on the risk assessment, the Respondents will review and, if necessary, modify the Site-specific response action objectives (RAOs). These modified RAOs will specify the contaminants and media of interest, exposure pathways and receptors, and an acceptable contaminant level or range of levels (at particular locations for each exposure route).

(ii) Develop General Response Actions. The Respondents will develop general response actions for each medium of interest defining containment, treatment, excavation, pumping, or other actions, singly or in combination, to satisfy the RAOs.

(iii) Identify Areas or Volumes of Media. The Respondents will identify areas or volumes of media to which general response actions may apply, taking into account requirements for protectiveness as identified in the RAOs. The chemical and physical characterization of the Site will also be taken into account.

(iv) Identify, Screen, and Document Response Technologies. The Respondents will identify and evaluate technologies applicable to each general response action to eliminate those that cannot be implemented at the Site. General response actions will be refined to specify response technology types. Technology process options for each of the technology types will be identified. Process options will be evaluated on the basis of effectiveness, implementability,

and cost factors to select and retain one or, if necessary, more representative processes for each technology type. The reasons for eliminating alternatives must be specified in the *Identification of Potential NTCR Alternatives Technical Memorandum*[10].

(v) Assemble and Document Alternatives. The Respondents will assemble selected representative technologies into alternatives for each affected medium. Together, all of the alternatives will represent a range of treatment and containment combinations that will address remaining contamination at the Site. A summary of the assembled alternatives and their related action-specific ARARs will be prepared by the Respondents. The reasons for eliminating alternatives during the preliminary screening process must be specified.

(vi) Refine Alternatives. The Respondents will refine the response alternatives to identify contaminant volume addressed by the proposed process and sizing of critical unit operations as necessary. Sufficient information will be collected for an adequate comparison of alternatives by EPA, in consultation with the Tribe. RAOs for each chemical in each medium will also be modified as necessary to incorporate any new risk assessment information presented in the focused risk assessment report[11]. Additionally, action-specific ARARs will be updated as the response alternatives are refined.

(vii) Conduct and Document Screening Evaluation of Each Alternative. EPA, in conjunction with the Tribe, may decide to perform a final screening process based on short- and long-term aspects of effectiveness, implementability, and relative cost with the Respondents. If so, the Respondents will include this and reasoning employed in screening, array the alternatives that remain after screening, and identify the action-specific ARARs for the alternatives.

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[10] EPA has the discretion to waive any of the NTCR actions or documents that, in the course of the project, EPA may determine are not required, in consultation with the Tribe.

[11] The risk assessment report may be submitted as part of the *NTCR Site Investigation Report*.

(b) Documentation of Response Actions. After completing the alternative identification and screening, the Respondents will prepare a concise *Selection and Evaluation of NTCR Alternatives Technical Memorandum*[12] for EPA review and approval, in consultation with the Tribe. The Respondents shall incorporate all EPA comments and issue *Selection and Evaluation of NTCR Alternatives Technical Memorandum* as final. This memorandum will review the alternatives considered for evaluation.

(c) Evaluation and Comparative Analysis of Alternatives. EPA, in consultation with the Tribe, will conduct a detailed analysis of alternatives that will consist of an analysis of each option against seven of the nine evaluation criteria set forth in the National Contingency Plan (NCP), 40 CFR 300.430 (e) (9) (iii), and a comparative analysis of all options using the same evaluation criteria as a basis for comparison.

(i) Apply Nine Criteria and Document Analysis. EPA, in consultation with the Tribe, will evaluate each of the potential alternatives using seven of the nine evaluation criteria. The seven evaluation criteria to be used include: (1) overall protection of human health and the environment; (2) compliance with ARARs; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, and volume through treatment; (6) implementability; (7) cost. Tribal acceptance (criteria 8) and community acceptance (criteria 9), are considered in the *EE/CA Approval Memorandum* after public comment has been made on the *EE/CA.* However, note if EPA has information regarding Tribal or community acceptance that information can be used in the developing the *EE/CA.*

(ii) Compare Alternatives Against Each Other and Document the Comparison of Alternatives. EPA, in consultation with the Tribe, will perform a comparative analysis between the response alternatives. That is, each alternative will be compared against the others using the evaluation criteria as a basis of comparison. This process will be documented in the *EE/CA.* Identification and

[12] The *Identification of Potential NTCR Alternatives Technical Memorandum* could be submitted in conjunction with the *Selection and Evaluation of NTCR Alternatives Technical Memorandum* if EPA, the Tribe and Respondents agree .

selection of the preferred alternative are reserved by EPA, in consultation with the Tribe.

EPA, in consultation with the Tribe, will individually assess each alternative against the criteria. A comparative analysis should be conducted to evaluate the relative performance of each alternative in relation to each criteria. This is in contrast to the preceding analysis in which each alternative was analyzed independently without consideration of other alternatives. The purpose of the comparative analysis is to identify the advantages and disadvantages of each alternative relative to one another so that key tradeoffs that would affect the alternative selected can be identified.

If sufficient information is not provided in the *NTCR Site Investigation Report*, the *Identification of Potential NTCR Alternatives Technical Memorandum*, *Selection and Evaluation of NTCR Alternatives Technical Memorandum* or in other documentation, EPA may require further information from the Respondents or develop the data itself.

E. Engineering Evaluation and Cost Analysis and Approval Memorandum.

EPA will prepare an *EE/CA*, based on the *NTCR Site Investigation Report*, the *Identification of Potential NTCR Alternatives Technical Memorandum*, the *Selection and Evaluation of NTCR Alternatives Technical Memorandum* and other relevant information, in consultation with the Tribe. The *EE/CA* is made available for public comment. After public comment, EPA and the Tribe will review and consider all comments including Tribal and community approval prior to making a final NTCR action selection. EPA, in consultation with the Tribe, will issue an *EE/CA Approval Memorandum* documenting the selected NTCR action. In conjunction with the *EE/CA Approval Memorandum*, EPA will provide a written response to significant public comments.

F. Response Alternative Implementation.

(1) **Scoping Deliverables.** The Respondents will submit an *NTCR Action Work Plan*, *SAP*[13], and *HSP*[14]. The *NTCR Action Work Plan* and *SAP* must be reviewed and approved by EPA, in consultation with the Tribe, prior to the initiation of field activities.

(a) ***NTCR Action Work Plan*.** Within 30 days after the *EE/CA Approval Memorandum* is signed selecting the response action(s) for the Site, the Respondents shall submit a *NTCR Action Work Plan* for review and approval by EPA, in consultation with the Tribe. The work plan should be developed in conjunction with the sampling and analysis plan and the Site health and safety plan, although each plan may be delivered under separate schedule for completion. In addition, it must include a clear and complete rationale of the actions to be performed and potential problem(s) posed by such actions and of the objectives of each action. A description of the Site management strategy will be incorporated in the work plan. The work plan will address both the design and implementation work for the NTCR action.

Finally, the major part of the work plan is a detailed description of the tasks to be performed, information needed for each task, information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to EPA and the Tribe. This includes the required activities; and a project management plan, including a data management EPA and the conduct of meetings and presentations for EPA and the Tribe at major junctures during the design and implementation phases of the NTCR action.

The Respondents shall refer to Appendix B for Guidance for a comprehensive description of the contents of the required work plan.

(b) ***Sampling and Analysis Plan*.** Within 30 days of the *EE/CA Approval Memorandum* is signed, the Respondents shall submit an addendum to TCR SAP if the TCR SAP does not cover work under Section G.

[13] as an addendum to the previous SAP if previous SAP does not cover the work associated with Section F.

[14] as an addendum to the previous HSP if previous HSP does not cover the work associated with Section F.

(c) ***Site Health and Safety Plan*.** Within 30 days of the *EE/CA Approval Memorandum* is signed, the Respondents shall submit an addendum to TCR the previous HSP if it does not cover work under Section G.

(2) **Implementation of Approved *NTCR Action Work Plan*.** Within 30 days after EPA issues a *NTP*, the Respondents shall initiate on-site activities in accordance with the Work Plan, the *SAP* and *HSP*.

(3) ***NTCR Site Completion Report*.** After completing NTCR actions as specified in the *EE/CA*, *EE/CA Approval Memorandum* and the *NTCR Action Work Plan*, the Respondents shall prepare and submit a *NTCR Site Completion Report* to EPA. The Respondents shall incorporate all EPA comments and issue the as *NTCR Site Completion Report* final.

G. Data Management Procedures

The Respondents will consistently document the quality and validity of field and laboratory data compiled during the investigation and response work. Groundwater data must be supplied in a format (i.e., computer disc or equivalent) usable in the EPA Region 10 groundwater data management system. The particular electronic data file types and internal formatting shall be devised in consultation with EPA and the Tribe in advance of submission, and shall incorporate at least the data categories described in EPA Order 7500.1A, 'Minimum Set of Data Elements for Ground Water Quality' (10/29/92). In addition, geographic locations of sampling points associated with above-mentioned analytical data shall be reported to EPA and the Tribe, in accordance with provisions of EPA's Locational Data Policy (EPA Information Resources Management Policy Manual, Chapter 13, Classification 2100 CHG 3, 4/8/91), and coded appropriately using Method, Accuracy Description Information Coding Standards for the EPA Locational Data Policy (Version 6.1, 11/7/94).

(1) **Document Field Activities.** Information gathered during Site characterization will be consistently documented and adequately recorded by the respondents in well maintained field logs and laboratory reports. The method(s) of documentation must be specified in the work plan and/or the SAP. Field logs must be analytical responsibility, analytical results, adherence to prescribed protocols, nonconformity events, corrective measures, and/or data deficiencies. This information will be kept in an organized format and be available to EPA and the Tribe for review.

(2) **Maintain Sample Management and Tracking.** The Respondents will maintain field reports, sample shipment records, analytical results, and QA/QC reports to ensure that only validated analytical data are reported and utilized in the

development and evaluation of response alternatives. Analytical results developed under the work plan will not be included in the *EE/CA* unless accompanied by, or cross-referenced to, a corresponding QA/QC report. In addition, the Respondents will establish a data security system to safeguard chain-of-custody forms and other project records to prevent loss, damage, or alteration of project documentation.

I. COMMUNITY RELATIONS.

The development and implementation of community relations activities are the responsibility of EPA and will involve the Tribe as defined in the *EPA/Swinomish Indian Tribal Community Memorandum of Agreement*. The extent of Respondent involvement in community relations activities is left to the discretion of EPA. It is currently expected that the Respondents will assist EPA with the following activities, at a minimum: summarizing technical information for public distribution; and participating in any community meetings. All Respondent-conducted community relations activities will be subject to approval and oversight by EPA.

EPA has established and will maintain a community information repository near the Site to house one copy of the administrative record.

ATTACHMENT 1

REFERENCES

The following list, although not comprehensive, comprises many of the regulations and guidance documents that apply to the removal and RI/FS process:

Ecology and Environment, Inc. (E&E), August 1999b, “Phase 2 Integrated Site Assessment Report PM Northwest Dump Site”, U.S. Environmental Protection Agency, Region 10, START Contract No. 68-W6-0008, TDD No. 98-02-0016, Seattle, Washington.

_____, January 1999a, “Draft Phase I Integrated Site Assessment Report PM Northwest Dump Site”, U.S. Environmental Protection Agency, Region 10, START Contract No. 68-W6-0008, TDD No. 98-02-0016, Seattle, Washington.

_____, May 1998, “PM Northwest Dump Site Sampling and Quality Assurance Plan”, U.S. Environmental Protection Agency, Region 10, START Contract No. 68-W6-0008, TDD No. 98-02-0016, Seattle, Washington.

_____, September 1997, “Swinomish Dump Site Assessment Trip Report”, U.S. Environmental Protection Agency, Region 10, START Contract No. 68-W6-0008, TDD No. 96-07-0004, Seattle, Washington.

_____, June 1986, “Site Inspection Report of P.M. Northwest Dump, Anacortes, Washington”.

United States Environmental Protection Agency (EPA), "National Oil and Hazardous Substances Pollution Contingency Plan;" Final Rule, 40 CFR Part 300.

_____, "Amendment to the National Oil and Hazardous Substances Pollution Contingency Plan; Procedures for Planning and Implementing Off-Site Response Actions," Final Rule, 40 CFR Part 300.440. “Off-Site Policy”

_____, “Guidance for Conducting Non-Time Critical Removal Actions under CERCLA,” U.S. EPA, Office of Emergency and Remedial Response, August 1993, PB93-963402CDH.

_____, “Early Action and Long-Term Action under SACM: Interim Guidance”, Volume 1, Number 2, U.S. EPA, Office of Emergency and Remedial Response, July 1992, PB93-963263CDH.

_____, “Guidance on Implementation of Superfund Accelerated Cleanup Model (SACM),” U.S. EPA, Office of Emergency and Remedial Response, July 1992, PB93-963252CDH.

_____, “Superfund Accelerated Cleanup Model (SACM)”, U.S. EPA, Office of Emergency and Remedial Response, March 1992, PB92-963263CDH.

_____, “Superfund Accelerated Cleanup Model (SACM): Questions and Answers”, U.S. EPA, Office of Emergency and Remedial Response, July 1993, PB93-963286CDH.

_____, “Superfund Accelerated Cleanup Model (SACM), ”, Volume 1, Number 4. U.S. EPA, Office of Emergency and Remedial Response, November 1992, PB92-963287CDH.

_____, "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA," U.S. EPA, Office of Emergency and Remedial Response, October 1988, OSWER Directive No. 9355.3-01.

_____, "Interim Guidance on Potentially Responsible Party Participation in Remedial Investigation and Feasibility Studies," U.S. EPA, Office of Waste Programs Enforcement, Appendix A to OSWER Directive No. 9355.3-01.

_____, "Guidance on Oversight of Potentially Responsible Party Remedial Investigations and Feasibility Studies," Two Volumes, U.S. EPA, Office of Solid Waste and Emergency Response, July 1991, OSWER Directive No. 9835.1.(c) and (d).

_____, "A Compendium of Superfund Field Operations Methods," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, EPA/540/P-87/001a, August 1987, OSWER Directive No. 9355.0-14.

_____, "EPA NEC Policies and Procedures Manual," May 1978, revised August 1991, EPA-330/9-78-001-R.

_____, "Data Quality Objectives Process for Superfund," U.S. EPA, Office of Solid Waste and Emergency Response, EPA/540/R-93/071, September 1993, Publication 9355.0-01.

_____, "Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Research and Development, Cincinnati, OH, QA MS-004/80, June 1983 revision of December 29, 1980 version.

_____, "Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans," U.S. EPA, Office of Emergency and Remedial Response, QA MS-005/80, February 1983 revision of December 1980 version.

_____, "Users Guide to the EPA Contract Laboratory Program," U.S. EPA, Sample Management Office, August 1982, revised January 1991.

_____, "Guidance on Applicable or Relevant and Appropriate Requirements," U.S. EPA, Office of Emergency and Remedial Response, July 9, 1987, OSWER Directive No. 9234.0-05.

_____, "CERCLA Compliance with Other Laws Manual," Two Volumes, U.S. EPA, Office of Emergency and Remedial Response, August 1989 (interim final), OSWER Directive No. 9234.1-01 and -02.

_____, "Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites," U.S. EPA, Office of Emergency and Remedial Response, December 1988, OSWER Directive No. 9283.1-2.

_____, "Guidance on Preparing Superfund Decision Documents," U.S. EPA, Office of Emergency and Remedial Response, July 1989, OSWER Directive No. 9355.3-02.

_____, "Risk Assessment Guidance for Superfund - Volume I Human Health Evaluation Manual (Part A)," December 1989, EPA/540/1-89/002.

_____, "Risk Assessment Guidance for Superfund - Volume II Environmental Evaluation Manual," March 1989, EPA/540/1-89/001.

_____, "Guidance for Data Usability in Risk Assessment," October 1990, EPA/540/G-90/008.

_____, "Performance of Risk Assessments in Remedial Investigation/Feasibility Studies (RI/FZS) Conducted by Potentially Responsible Parties (PEPS)," August 28, 1990, OSWER Directive No 9835.15.

_____, "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions," April 22, 1991, OSWER Directive No. 9355.0-30.

_____, "Health and Safety Requirements of Employees Employed in Field Activities," U.S. EPA, Office of Emergency and Remedial Response, July 12, 1981, EPA Order no. 1440.2.

_____, OSHA Regulations in 29 CFR 1910.120 (Federal Register 45654, December 19, 1986).

_____, "Interim Guidance on Administrative Records for Selection of CERCLA Response Actions," U.S. EPA, Office of Waste Programs Enforcement, March 1, 1989, OSWER Directive No. 9833.3A.

_____, "Community Relations in Superfund: A Handbook," U.S. EPA, Office of Emergency and Remedial Response, January 1992, OSWER Directive No. 9230.0-3C.

_____, "Supplemental Risk Assessment Guidance for Superfund," Region 10 U.S. EPA, Health and Environmental Assessment Section, August 16, 1991.

_____, "Minimum Set of Data Elements for Ground Water Quality," EPA Order 7500.1A, (10/29/92).

_____, EPA's Locational Data Policy (EPA Information Resources Management Policy Manual, Chapter 13, Classification 2100 CHG 3, 4/8/91).

_____, Method, Accuracy Description Information Coding Standards for the EPA Locational Data Policy (Version 6.1, 11/7/94).

_____, "Data Quality Objectives for Remedial Response Activities: Development Process" Volume 1, U.S. EPA Office of Emergency and Remedial Response, March 1987. OSWER Directive No. 9355.0-7B.12

_____, "Behavior and Determination of Volatile Organic Compounds in Soil: A Literature Review" (EPA/600/SR-93/140, October 1993)

_____, "Presumptive Response Strategy and Ex-Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites," U.S. EPA Office of Emergency and Remedial Response, October 1996. OSWER Directive No. 9283.1-12

ATTACHMENT 2
SCHEDULE OF DELIVERABLES

DELIVERABLE/TASK	DATE
TIME CRITICAL REMOVAL (TCR) ACTION	
1. Draft *TCR Waste Removal Work Plan*	within 45 days after effective date of AOC
2. Draft *TCR Sampling and Analysis Plan* [15]	within 45 days after effective date of AOC
3. Draft *TCR Health and Safety Plan*	within 45 days after effective date of AOC
4. Final *TCR Waste Removal Work Plan*	within 45 days after receipt of EPA comments
5. Final *Sampling and Analysis Plan* [16]	within 45 days after receipt of EPA comments
6. Final *TCR Health and Safety Plan*	within 45 days after receipt of EPA comments
7. Initiate field work[17]	within 30 days after EPA issues a Notice To Proceed (NTP) to Respondents [18]
8. Draft *TCR Waste Removal Report*	within 90 days after completion of waste removal work
9. Final *TCR Waste Removal Report*	within 30 days after receipt of EPA comments on draft

[15] required if sampling of any type will be conducted for EPA consideration during the TCR action.

[16] same as footnote 13.

[17] means to undertake field investigation activities, such as site mobilization, awarding field work contract, etc. Field work should be initiated in sufficient time to permit all TCR field work to be completed by November 1, 2002.

[18] EPA anticipates issuing a Notice To Proceed (NTP) approximately 30 days before a satisfactory field season is anticipated. EPA expects that the latest the NTP would be issued is June 1, 2001. A satisfactory field season will include considerations such as amount of rainfall, depth of shallow groundwater and other site condistions that may or may not be favorable to site excavation.

NON-TIME CRITICAL REMOVAL (NTCR) ACTION - - INVESTIGATION

1. Draft *NTCR Site Investigation Work Plan*	within 120 days after effective date of AOC
2. Draft *Sampling and Analysis Plan*	within 120 days after effective date of AOC
3. Draft *Health and Safety Plan*	within 120 days after effective date of AOC
4. Final *NTCR Site Investigation Work Plan*	within 30 days after receipt of EPA comments
5. Final *Sampling and Analysis Plan*	within 30 days after receipt of EPA comments
6. *Health and Safety Plan*	within 30 days after receipt of EPA comments
7. Initiate site work	within 30 days after EPA issues NTP[19]
8. Draft *NTCR Site Investigation Report*	within 90 days after completion of field work
9. Final *NTCR Site Investigation Report*	within 30 days after receipt of EPA comments on draft
10. Draft *Identification of Potential NTCR Alternatives Technical Memorandum*	within 90 days after completion of field work or may be submitted with Task 12[20]
11. Final *Identification of Potential NTCR Alternatives Technical Memorandum*	within 30 days after receipt of EPA comments on draft

[19] EPA will issue a Notice To Proceed (NTP) 30 days before a satisfactory field season is anticipated. A satisfactory field season will include site considerations that are relevant to the field work anticipated. Certain site investigation work may be started before the beginning of the summer field season depending on the nature of the investigative tasks to be accomplished.

[20] As agreed by EPA, the Tribe and the Respondents. The deliverable developed for Task 10 can be submitted in one of two ways: (1) as a stand alone document submitted 90 days after the completion of field work or (2) delayed, beyond the 90 days, until Task 12 is completed and the Task 10 deliverable would be submitted in the deliverable for Task 12.

12. Draft *Selection and Evaluation of NTCR Alternatives Technical Memorandum*	within 60 days after completion of NTCR, Task 8
13. Final *Selection and Evaluation of NTCR Alternatives Technical Memorandum*	within 30 days after receipt of EPA comments on draft

NONTIME CRITICAL REMOVAL (NTCR) ACTION - - RESPONSE ACTION

1. Draft *NTCR Action Work Plan*	within 30 days after effective date of *EE/CA Approval Memorandum*
2. Draft *Sampling and Analysis Plan*	within 30 days after effective date of *EE/CA Approval Memorandum*
3. Draft *Health and Safety Plan*	within 30 days after effective date of *EE/CA Approval Memorandum*
4. Final *NTCR Action Work Plan*	within 30 days after receipt of EPA comments on draft
5. Final *Sampling and Analysis Plan*	within 30 days after receipt of EPA comments on draft
6. Final *Health and Safety Plan*	within 30 days after receipt of EPA comments
7. Initiate response work	within 30 days after EPA NTP
8. Draft *Site Completion Report*	within 90 days after completion of field work
9. Final *Site Completion Report*	within 30 days after receipt of EPA comments on draft

ATTACHMENT 3

SAMPLE OUTLINE FOR
NTCR SITE INVESTIGATION WORK PLAN

Table of Contents for *NTCR Site Investigation Work Plan*