

REMOVAL SITE EVALUATION

Colville and Makah Tribal Drum Sites Colville Indian Reservation, Washington

Paschal Sherman Indian School, Omak
Tribal Fish and Wildlife Department, Nespelem
Brewster Heights Packing, Omak
Mt. Tolman Complex, Keller

Makah Indian Reservation, Washington

Makah Drum and Trailer, Neah Bay

TDD: 02-06-0007

Prepared for

U.S. Environmental Protection Agency - Region 10

September 2002

Note:

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Prepared for

U.S. Environmental Protection Agency - Region 10
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List of Abbreviations and Acronyms

AST	aboveground storage tank
EPA	Environmental Protection Agency
mg/Kg	milligrams per kilogram
mg/L	milligram per liter
OSC	On-Scene Coordinator
PID	Photo-ionization detector
PQL	Practical Quantitation Limit
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
SQAP	Sampling and Quality Assurance Plan
START	Superfund Technical Assessment and Response Team
SVOC	Semivolatile Organic Compounds
TFWD	Tribal Fish and Wildlife Department
TDD	Technical Direction Document
ug/Kg	micrograms per kilogram
ug/L	micrograms per liter
VOC	Volatile Organic Compounds

Introduction

The U.S. Environmental Protection Agency (EPA) tasked the Herrera Environmental Consultants Inc. (Herrera) Superfund Technical Assessment and Response Team (START) under Technical Direction Document (TDD) 02-06-0007 to assess risks associated with abandoned drums and containers located on the Colville Indian Reservation, Washington and Makah Indian Reservation, Washington. The START observed and documented site conditions, conducted sampling activities, and conducted field hazard categorization analysis as part of a removal site evaluation. The objectives of the evaluation were to determine if hazardous materials were present in drums located at four locations on the Colville Reservation and one location on the Makah Reservation, and to determine if the materials had been released, or were likely to be released, to the environment, threatening human health and the environment.

During July 12, 2002 through July 14, 2002, the START visited three sites; Paschal Sherman Indian School in Omak, the Tribal Fish and Wildlife Department in Nespelem, and Brewster Heights Packing in Omak (Figures 1A, B, and C). Fieldwork at the Mt. Tolman Complex and the Makah Drum Site is scheduled for later dates; reporting and evaluation of these sites will be submitted as an addendum to this report at the completion of fieldwork. EPA On-Scene Coordinator (OSC) Michael Szerlog was onsite for fieldwork activities conducted at the Tribal Fish and Wildlife Department and Brewster Heights Packing. During the site visits, the START documented existing conditions in logbooks and with 35-millimeter photographs (Appendix A), sampled drums and containers, and conducted field hazard categorization analysis.

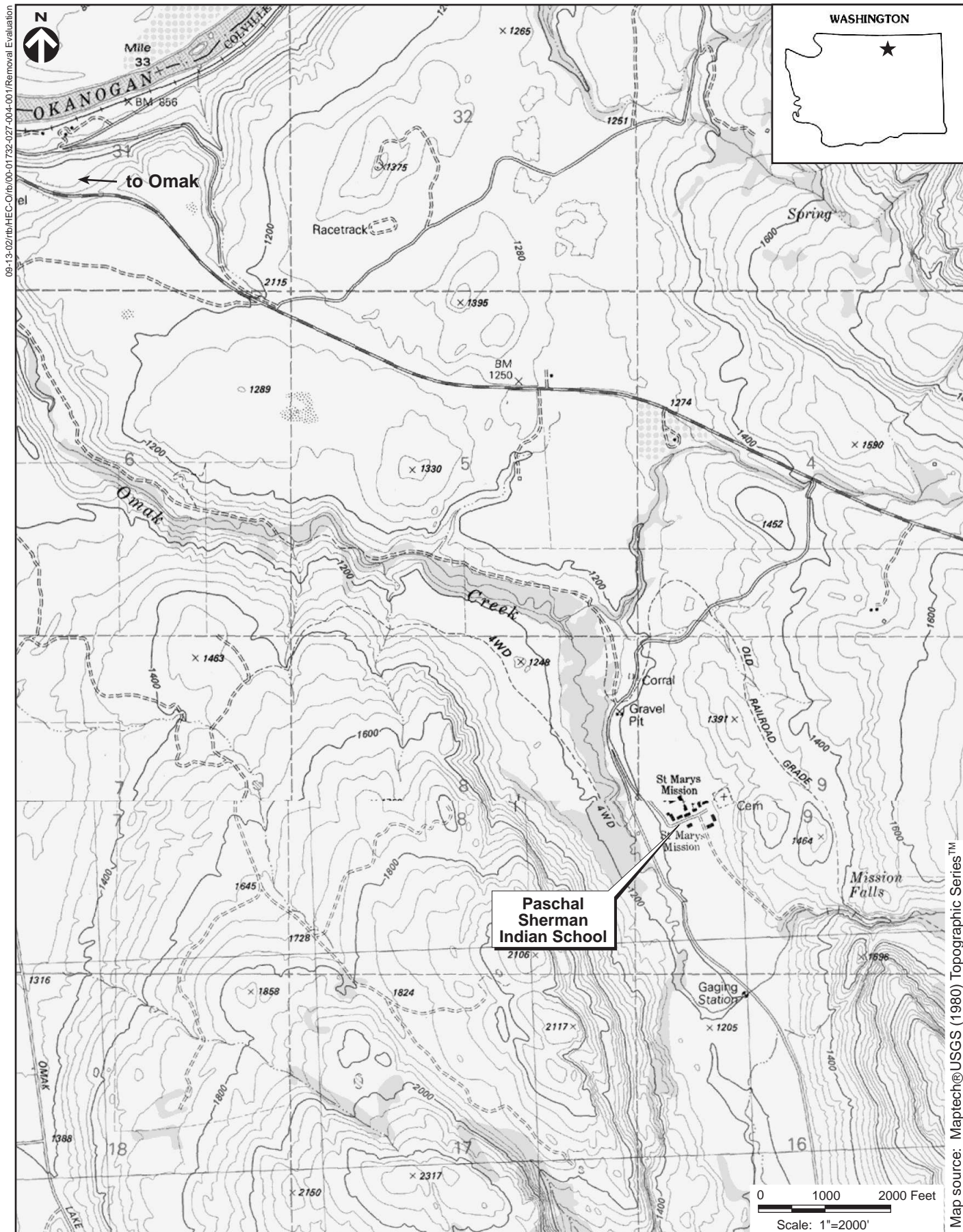


Figure 1A. Vicinity map of the Paschal Sherman Indian School site on the Colville Indian reservation, Washington.

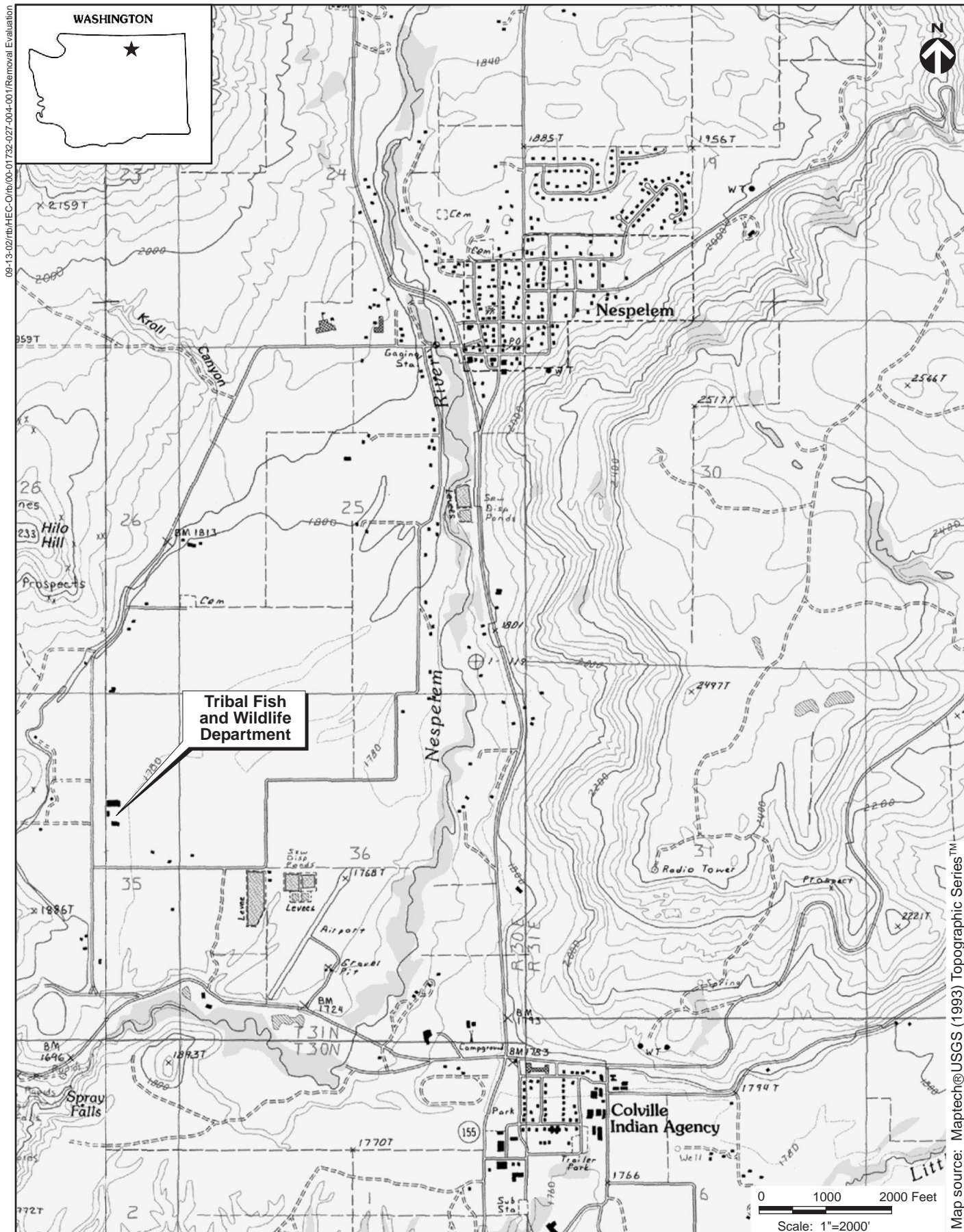


Figure 1B. Vicinity map of the Tribal Fish and Wildlife Department site on the Colville Indian reservation, Washington.

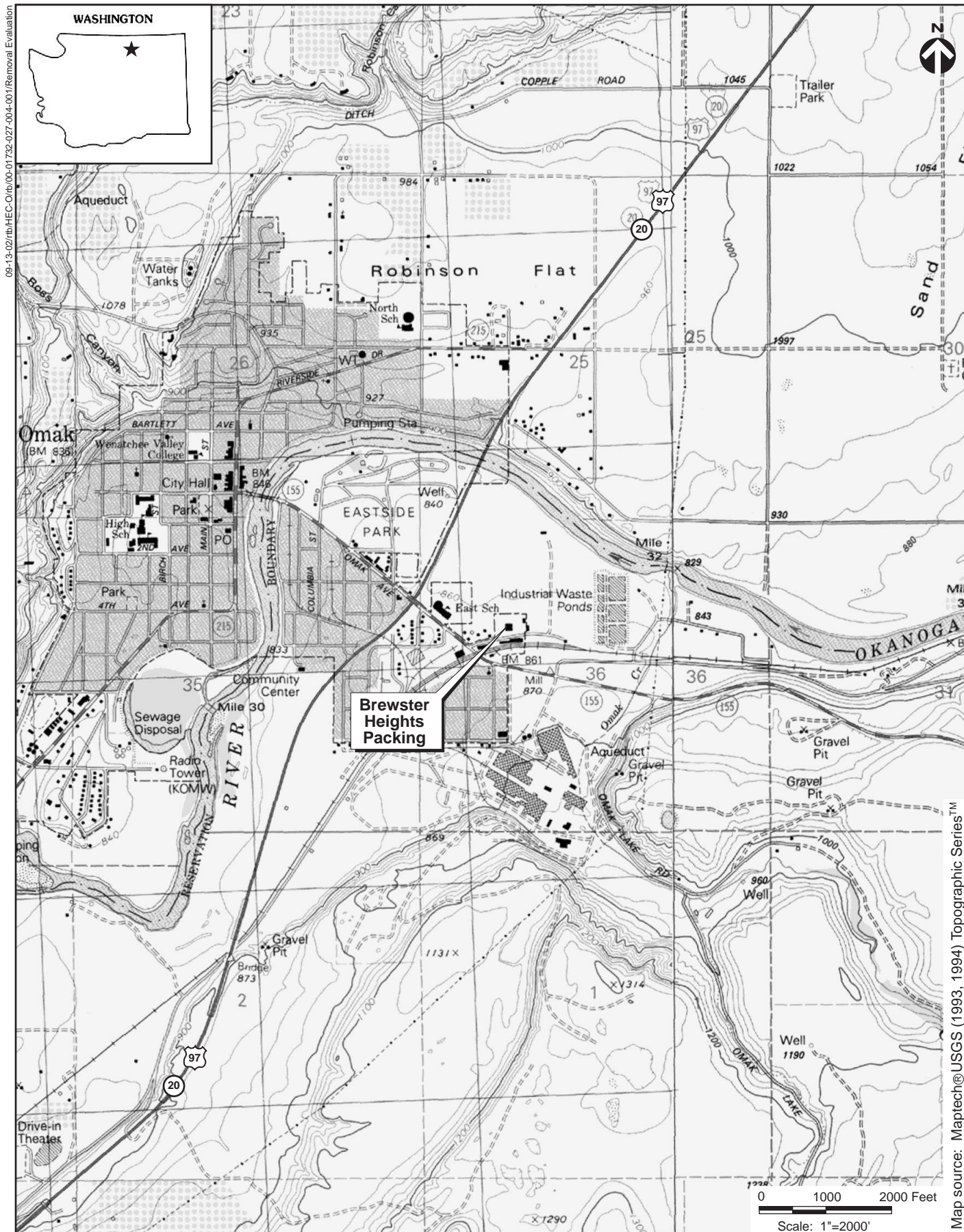


Figure 1C. Vicinity map of the Brewster Heights Packing site on the Colville Indian reservation, Washington.

Paschal Sherman Indian School

Observations

The Paschal Sherman Indian school is located at 25A Mission Road in Omak, Washington, approximately 4.5 miles southeast of the town center (Figure 2A). It is a K-9 school and dormitory that serves approximately 160 students. At the time of the visit, no children were present.

The START conducted fieldwork activities on Friday, July 12, 2002. Samples were collected for hazard categorization and laboratory analysis, and site conditions were documented with logbooks and 35mm camera.

The following observations were made while onsite:

- Six drums and containers were identified as scheduled for pickup by Safety Kleen; however, the site contact, Mr. Arnie McCraigie, was not certain of the pickup date.
- Three drums and two 5-gallon containers were identified as empty. Two other drums reported onsite during a previous EPA site visit, containing old fertilizer, could not be located during the site visit.
- One 500-gallon diesel above ground storage tank was observed onsite. The tank nozzle was padlocked shut and the fill port was not accessible. The tank sounded to be empty when struck.
- A pallet with eight lead-acid batteries was located in the scrap yard area near Drum-9 (described below).
- Stained soil was observed at numerous locations at the site.
- Ten drums were identified as having unknown contents:
 - Drum-1, located in the firehouse building, was approximately 25% full and contained a brown non-viscous liquid.
 - Drum-2, located on the west side of the firehouse building, was approximately 5% full and contained a brown liquid; PID reading at the opening was >1000 ppm (1 ppm background).
 - Drum-3, located on the west side of the firehouse building, was approximately 5% full and contained a rusty watery liquid; PID reading at the opening was 25 ppm (1 ppm background).
 - Drum-4, located on the west side of the firehouse building, was approximately 50% full and contained a clear liquid and 3" of rusty sludge on the bottom; PID reading at the opening was 205 ppm (1 ppm background).

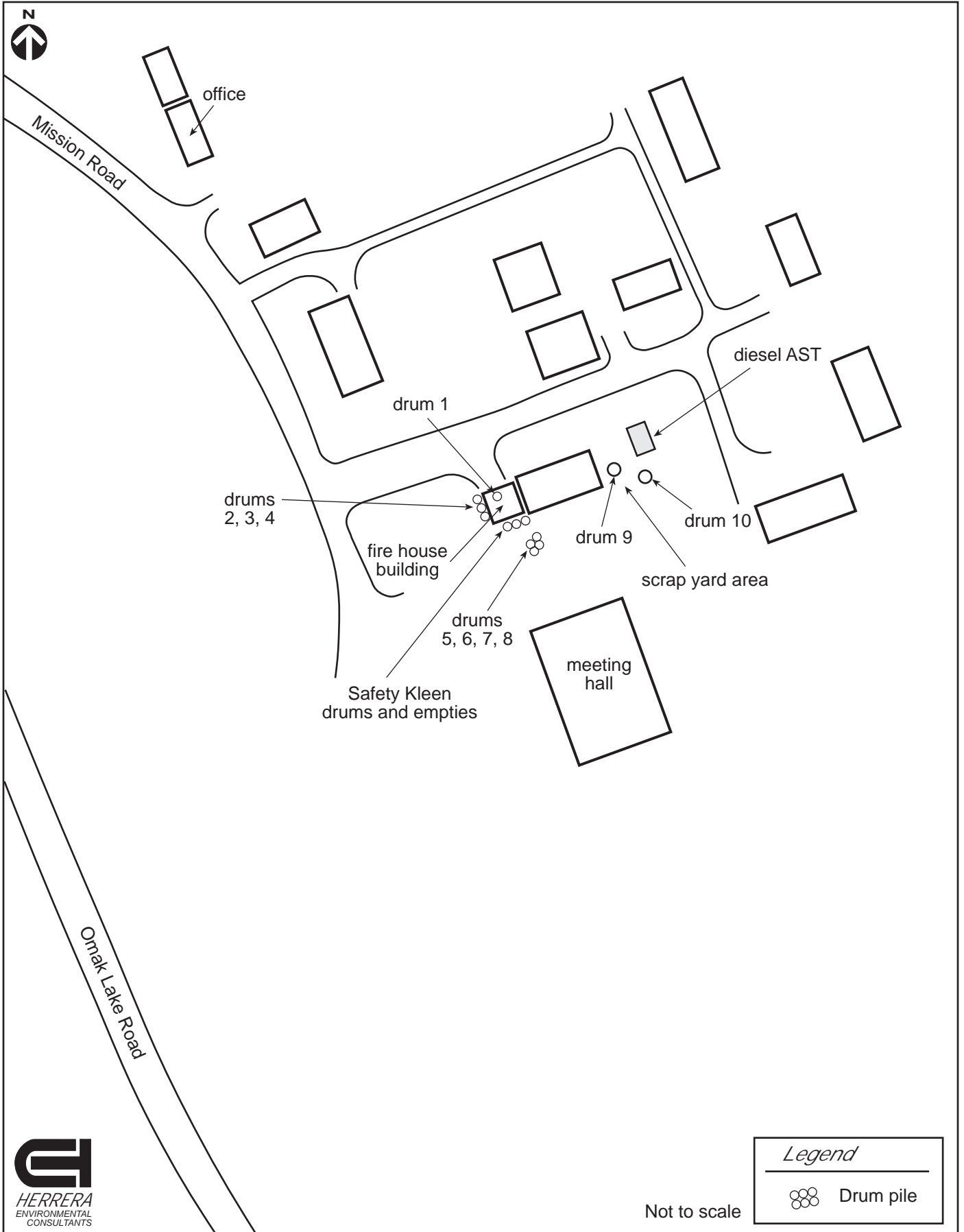


Figure 2A. Site map of the Paschal Sherman Indian School site on the Colville Indian reservation, Washington.

- Drums -5, -6, -7, and -8, located south of the firehouse building, contained dark oily liquid. Drum-6 could not be opened since it was on its side; dark oily liquid was observed around the bung hole. Each of the other drums were sampled. They were full and had a thicker sludge layer on the bottom. PID readings at the drum openings ranged from 200 to 270 ppm (1 ppm background). Safety Kleen reportedly would not accept these drums, since the contents could not be verified.
- Drum-9, located in the scrap yard area, was approximately 35% full and contained clear yellow liquid, with rusty watery liquid on the bottom; PID reading at the opening was 40 ppm (1 ppm background).
- Drum-10, located in the scrap yard area was approximately 5% full and contained thick sludge and water; PID reading at the opening was 2 ppm (1 ppm background).

Table 1. Summary of containers observed at the Paschal Sherman School site located on the Colville Indian Reservation, Washington.

Type of Containers	Total Number of Containers	Total Number Assigned Identification Numbers
55-gallon drums with unknown contents	10	10
55-gallon drums scheduled for pickup by Safety Kleen	6	None
Empty 55-gallon drums	3	None
Empty 5-gallon containers	2	None
500-gallon diesel aboveground storage tank (AST)	1	None
Lead-acid batteries	8	None

Procedure and Results

Samples were collected from drums and containers using dedicated glass drum thieves. Samples were placed in pre-labeled glass sample jars and stored on ice until hazard categorization analysis was conducted. Hazard categorization documentation is provided in Appendix C. Samples were collected and analyzed in accordance with the Herrera START Sampling and Quality Assurance Plan (SQAP) for the Colville Drum Sites, August 2002. A total of 22 containers were inspected, of these nine were sampled for field hazard categorization. Based on hazard categorization results, two samples that represented individual waste streams were delivered to Severn Trent Services in Tacoma, Washington, for confirmation laboratory analysis. The following analyses were conducted on select samples based on field hazard categorization results: flash by EPA 1020, halogenated volatile organics by EPA method 5035/8260B, and polynuclear aromatic hydrocarbons (PAHs) by EPA method 8270. Table 2 summarizes field hazard categorization results and detected constituents from laboratory analysis. Data Validation

and Laboratory Reports with a complete list of laboratory analytical results for product samples are provided in Appendix B.

Table 2. Hazard categorization and analytical results for Paschal Sherman Indian School.

Container ID (Sample ID)	Hazard Categorization Result	Laboratory Analytical Results – detected constituents				Materials Designation
Drum-1 (PSPS1)	Flammable Liquid (oil-like)	Chloromethane	44100	JB	ug/Kg	Flammable material
		Naphthalene	2480000		ug/Kg	
		2-Methylnaphthalene	337000		ug/Kg	
		Fluorene	50900		ug/Kg	
		Pyrene	6270	JB	ug/Kg	
		Flash	100-140		°F	
Drum-2	Flammable Liquid (oil-like)	NA				Flammable material
Drum-3	Non-Hazardous Liquid	NA				Oil-water mixture
Drum-4	Non-Hazardous Liquid	NA				Oil-water mixture
Drum-5	Combustible Liquid (w/ water)	NA				Hazardous material (based on representative sample from Drum 7)
Drum-7 (PSPS7)	Flammable/Combustible Liquid (oil-like)	Tetrachloroethene	16700		ug/Kg	Oil with solvents
		Naphthalene	230000		ug/Kg	
		2-Methylnaphthalene	412000		ug/Kg	
		Fluorene	22000		ug/Kg	
		Phenanthrene	49700		ug/Kg	
		Anthracene	8710	JB	ug/Kg	
		Fluoranthene	39300		ug/Kg	
		Pyrene	64500		ug/Kg	
Drum-8	Flammable/Combustible Liquid (oil-like)	NA				Hazardous material (based on representative sample from Drum 7)
Drum-9	Combustible Liquid (oil-like)	NA				Oil-water mixture
Drum-10	Flammable/Combustible Liquid (oil-like)	NA				Oil-water mixture

NA Not available. Either laboratory analysis was not requested for the sample or no constituents were detected.

J The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.

U The material was analyzed for, but was not detected. The associated numerical value is the practical quantitation limit.

UJ The material was analyzed for, but was not detected. The reported detection limit is estimated because quality control criteria were not met.

B Detection concentration is between instrument detection limit and the practical quantitation limit.

Conclusion

The START conducted fieldwork activities at the Paschal Sherman Indian school on July 12, 2002. Samples were collected for hazard categorization and laboratory analysis, and site conditions were documented with logbooks and 35mm camera. A total of ten drums were identified having unknown contents. Soil staining was observed at several locations near these drums. In general, the drums were unsecured, did not have secondary containment, and were accessible to the general public. Table 3 summarizes estimated material types and quantities at the site.

Table 3. Potential chemical hazards at the Paschal Sherman Indian School, Omak, Washington.

Type of Material	Description	Estimated Quantity ^a	Potential Hazard
Oil-water mixtures	Oil water mixtures located in 55-gallon drums.	60 gallons	Human and environmental exposure to petroleum products
Flammable and oil with solvents	Waste oil located in 55-gallon drums containing halogenated solvents	220 gallons	Human and environmental exposure to hazardous materials
Lead-acid batteries	Batteries stored outside on a pallet in the scrap yard	8 batteries	Human and environmental exposure to corrosives and hazardous materials

^a Volumes were estimated by grouping drum and container contents that had similar properties and PID results and assigning a material type based on field and laboratory analyses of similar materials in these groups.

Material designation was based on field hazard categorization and laboratory analysis results. Materials were grouped into similar waste streams based on physical properties and photo-ionization detection (PID) instrument readings. Representative samples from these waste streams were analyzed with field hazard categorization analysis and laboratory analysis. Based on these results, waste streams were assigned a likely material designation. When field results were inconsistent with laboratory results (e.g., flash point) material designation was based on laboratory results. Material volumes were calculated based on waste streams with similar material designations and estimated drum and container volumes.

These containers have the potential to release hazardous materials to the environment, due to drum deterioration over time. Currently, there are no known parties likely to actively manage the materials. The cost to transport and properly dispose of these materials is estimated, based on cost rates from Philips Services of Tacoma, at \$2,960 to \$4,015 (see Appendix C).

Tribal Fish and Wildlife Department

Observations

The Tribal Fish and Wildlife Department (TFWD) is located at 63A Schoolhouse Road in Nespelem, Washington, approximately 2.5 miles southwest of the town center (Figure 2B). The facility serves as offices for the Tribal Fish and Wildlife Department, the tribal logging group, and the tribal roads group.

The START conducted fieldwork activities on Saturday, July 13, 2002. Samples were collected for hazard categorization and laboratory analysis, and site conditions were documented with log books and 35mm camera.

The following observations were made while onsite:

- One hundred and twenty two drums were identified as having unknown contents; the majority of which were 55-gallon, steel, and of varying color.
- Ninety 5-gallon plastic containers of varying color were observed onsite. Of these, approximately 50 contained unknown materials.
- One black plastic drum was located in the TFWD garage. The drum appeared to be unopened and labeled formaldehyde.
- Approximately 40 containers of laboratory chemicals, test kit reactants, and paints were observed stored on a table located in the TFWD garage. The chemicals were stored around other TFWD equipment and could easily be knocked over. In addition, there were no controls to prevent access to these chemicals.
- Several empty drums, gasoline and diesel tanks, and old underground storage tanks were observed onsite in the bone yard areas.
- Five lead-acid batteries and several miscellaneous paint cans were observed in the unclaimed building, located southeast of the TFWD garage.
- Soil staining was observed throughout the site.

Descriptions of container types and their characteristics are provided in Table 5. In general, only containers holding material were numbered; however, in some cases empty drums were given identification numbers.

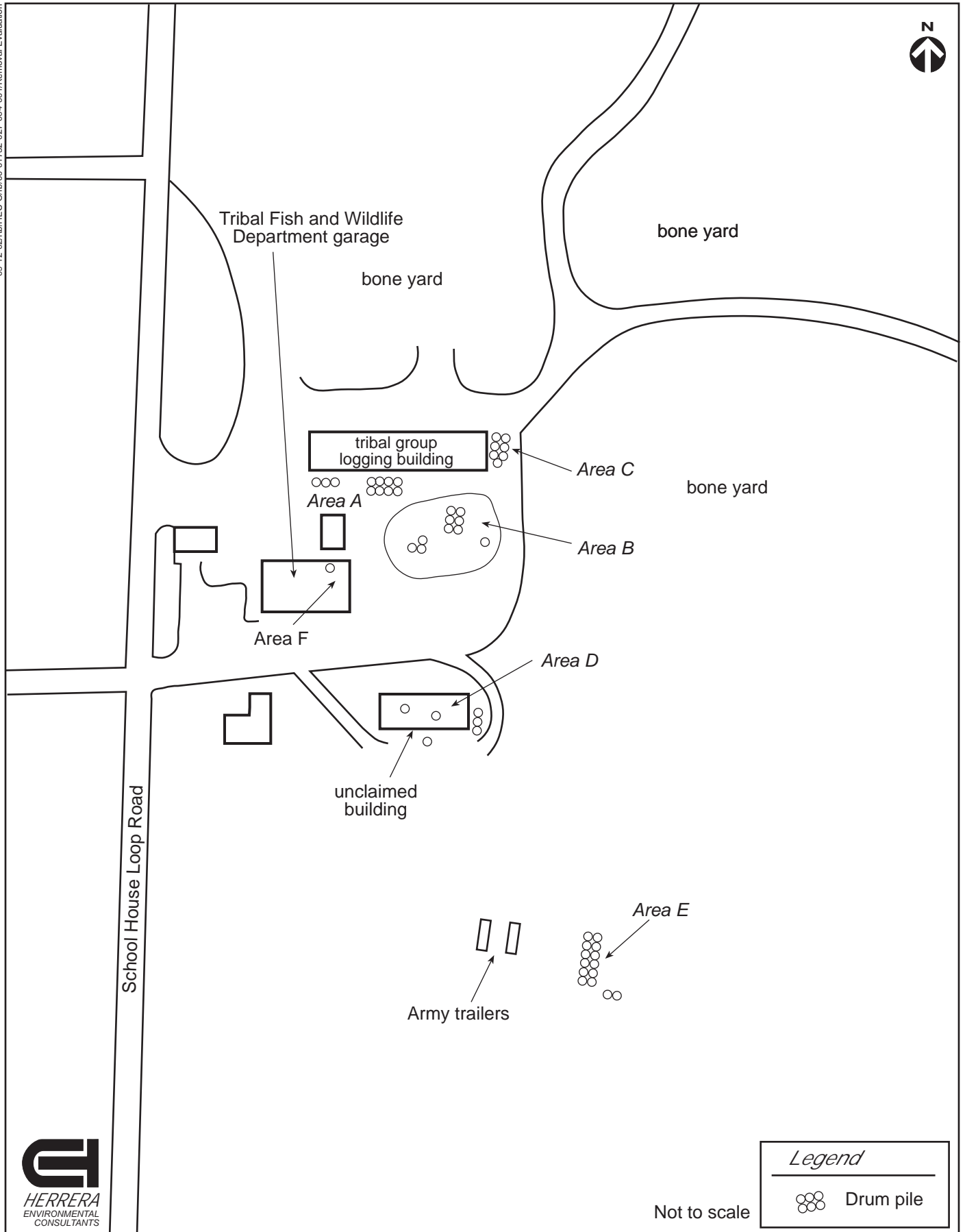


Figure 2B. Site map of the Tribal Fish and Wildlife Department site on the Colville Indian reservation, Washington.

Table 4. Summary of containers observed at the Tribal Fish and Wildlife Department site located on the Colville Indian Reservation, Washington.

Type of Containers	Total Number of Containers	Total Number Assigned Identification Numbers
55-gallon drums with unknown contents	108	108
35-gallon drums with unknown contents	2	2
15-gallon drums with unknown contents	3	3
Empty 55-gallon drums	9	9
Empty storage tanks of various sizes (greater than 55 gallons) associated with the bone yard areas	>25	None
5-gallon plastic containers, approximately half with unknown contents	90	3
55-gallon drum labeled formaldehyde	1	None
Various sized (less than 2 gallons) containers of laboratory chemicals, test kit reactants, and paint related materials	40	None
Lead-acid batteries	5	None

Table 5. Description of observed containers at the Tribal Fish and Wildlife Department, Nespelem, Washington.

Location	Container Number	Description
Area A – tribal logging group storage building, south exterior wall	1 – 42	<ul style="list-style-type: none"> Fifty-six 5-gallon plastic containers (only two were given identification numbers); approximately half contained unknown material; PID = 50 ppm Twenty-four 55-gallon drums with oil or oil/water mixtures; 13 - PID < 10 ppm; 11 - PID >10 and <100 ppm Eight 55-gallon drums with rusty water; 8 - PID <10 ppm Eight 55-gallon drums with oily sludge, soil, or debris; 6 - PID <10 ppm; 1 - PID >10 and <100 ppm; 1 - PID >100 and <500 ppm PID background reading was 2 ppm.
Area B – open area east of TFWD garage	43 – 71	<ul style="list-style-type: none"> Seventeen 55-gallon drums with oil or oil/water mixtures; 7 – PID < 10 ppm; 6 - PID >10 and <100 ppm; 1 - PID >100 and <500 ppm; 2 – PID > 500 ppm Two 55-gallon drums with rusty water; 2 - PID <10 ppm Three 55-gallon drums with oily sludge, soil, or debris; 3 - PID <10 ppm One 55-gallon drum with suspected antifreeze oil mixture; 1 – PID >100 and <500 ppm Two 55-gallon drums were bulging and were not opened One 35-gallon drum was bulging and was not opened Four 55-gallon drums were empty PID background reading was 2 ppm.
Area C – tribal logging group storage building, east of exterior wall	72 – 94	<ul style="list-style-type: none"> Twelve 55-gallon drums with oil or oil/water mixtures; 6 – PID < 10 ppm; 5 - PID >10 and <100 ppm; 1 - PID >100 and <500 ppm Five 55-gallon drums with rusty water; 3 - PID <10 ppm; 2 - PID >10 and <100 ppm Four 55-gallon drums with oily sludge, soil, or debris; 1 – PID < 10 ppm; 2 - PID >10 and <100 ppm; 1 - PID >100 and <500 ppm Two 55-gallon drums were empty PID background reading was 2 ppm.
Area D – unclaimed building southeast of TFWD garage, interior and exterior	95 – 99	<ul style="list-style-type: none"> One 55-gallon drum with oil or oil/water mixtures; 1 – PID < 10 ppm One 55-gallon drum with rusty water; 1 - PID <10 ppm Three 55-gallon drums with oily sludge, soil, or debris; 2 – PID < 10 ppm; 1 - PID >10 and <100 ppm PID background reading was 2 ppm.
Area E – southeast of buildings near Army trailers	100 – 125	<ul style="list-style-type: none"> Twenty 55-gallon drums with oil or oil/water mixtures; 8 - PID < 10 ppm; 8 - PID >10 and <100 ppm; 2 - PID >100 and <500 ppm; 2 – PID >500 One 55-gallon drum with rusty water; 1 - PID <10 ppm One 55-gallon drum with oily sludge, soil, or debris; 1 - PID <10 ppm Three 55-gallon drums were empty Twenty-six 5-gallon plastic containers with oil or oil water mixture. Containers were in poor condition and leaking PID background reading was 2 ppm.
Area F – inside TFWD garage	No assigned numbers	<ul style="list-style-type: none"> One 55-gallon plastic drum labeled formaldehyde was unopened Thirty-nine glass and plastic containers of various sizes, ranging from 1-gallon jugs to small vials, contained paint-related materials, corrosive acids, toxic chemical reactants, flammable liquids, and preserved fish.

Procedure and Results

Samples were collected from drums and containers using dedicated glass drum thieves. Samples were placed in pre-labeled glass sample jars and stored on ice until hazard categorization analysis was conducted. Hazard categorization documentation is provided in Appendix C. Samples were collected and analyzed in accordance with the Herrera START SQAP for the Colville Drum Sites, August 2002. A total of 278 containers were inspected; of these 56 were sampled for field hazard categorization. Based on hazard categorization results, twelve samples that represented individual waste streams were delivered to Severn Trent Services in Tacoma, Washington for confirmation laboratory analysis. The following analyses were conducted on select samples based on field hazard categorization results: flash by EPA 1020, halogenated volatile organics by EPA method 5035/8260B, PAHs by EPA method 8270, volatile organic compounds (VOCs) by EPA method 8260B, semivolatile organic compounds (SVOCs) by EPA method 8270C, ethylene glycol by EPA method 8015, and pH by EPA method 9040B. Table 6 summarizes field hazard categorization results and detected constituents from laboratory analysis. Data Validation and Laboratory Reports with a complete list of laboratory analytical results for product samples are provided in Appendix B.

Conclusion

The START conducted fieldwork activities at the TFWF on July 13, 2002. Samples were collected for hazard categorization and laboratory analysis and site conditions were documented with logbooks and 35mm camera. One hundred and twenty two drums were identified as having unknown contents. The majority of these drums were 55-gallon steel drums of varying color. Approximately fifty 5-gallon containers with unknown materials were observed. Soil staining was observed at several locations near the drums and containers. In general, the drums were unsecured, did not have any secondary containment, and were accessible by the general public. In addition, 39 containers of various sizes, containing paint-related materials, corrosive acids, toxic chemical reactants, flammable liquids, and preserved fish, were located in the Tribal Fish and Wildlife Garage. These materials were in various plastic and glass containers that ranged in size from 1-gallon jugs to small vials. Table 7 summaries estimated material types and quantities at the site.

Material designation was based on field hazard categorization and laboratory analysis results. Materials were grouped into similar waste streams based on physical properties and photo-ionization detection (PID) instrument readings. Representative samples from these waste streams were analyzed with field hazard categorization analysis and laboratory analysis. Based on these results, waste streams were assigned a likely material designation. When field results were inconsistent with laboratory results (e.g., flash point), material designation was based on laboratory results. Material volumes were calculated based on waste streams with similar material designations and estimated drum and container volumes.

Table 6. Hazard categorization and analytical results for the Tribal Fish and Wildlife Department, Nespelem, Washington.

Container ID (Sample ID)	Hazard Categorization Results	Laboratory Analytical Results – detected constituents				Material Designation
Drum-1	Flammable Liquid (oil-like)	NA				Flammable material
Drum-9	Combustible Liquid (with water)	NA				Combustible oil- water mixture
Drum-14 (TFPS14)	Combustible Liquid (with water)	Flash	>200		°F	Combustible liquids and potentially toxic
Drum-20 (TFPS20)	Inorganic Liquid (slightly corrosive)	bis(2-ethylhexyl)phthalate pH	308 4.18	B1 U	ug/L pH units	Water with residue
Drum-37 (TFPS37)	Flammable Liquid	Naphthalene 2-Methylnaphthalene Fluorene Phenanthrene Anthracene Pyrene Flash	61200 313000 13900 39400 9360 31000 >200	J	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg °F	Potentially toxic
Drum-50 (TFPS50)	Flammable Liquid	Benzene Naphthalene 1,2,4-Trimethylbenzene 4-Isopropyltoluene Naphthalene 2-Methylnaphthalene Dibenzofuran Fluorene Phenanthrene Pyrene Flash	21700 758000 11100 2390 903000 2780000 156000 453000 505000 53300 >200	JB B J D10	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg °F	Hazardous material
Drum-54 (TFPS54)	Flammable Liquid (oil-like)	Chloromethane Naphthalene 2-Methylnaphthalene Acenaphthene Fluorene Phenanthrene Pyrene Flash	41900 368000 922000 99500 101000 183000 80700 100 - 140	JB	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg °F	Flammable material
Drum-56 (TFPS56)	Antifreeze with waste oil	Ethylene Glycol	516000		mg/Kg	Combustible oil- water mixture
Drum-57	Combustible Liquid (with water)	NA				Combustible oil- water mixture
Drum-71 (TFPS71)	Flammable Liquid (oil/solvent)	Naphthalene 2-Methylnaphthalene Fluorene Phenanthrene Pyrene Flash	850000 2150000 500000 392000 94100 100-140	D10	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg °F	Flammable material

Table 6. Hazard categorization and analytical results for the Tribal Fish and Wildlife Department, Nespelem, Washington (continued).

Container ID (Sample ID)	Hazard Categorization Results	Laboratory Analytical Results – detected constituents			Material Designation
Drum-72 (TFPS72)	Flammable Liquid	Chloromethane	57100	ug/Kg	Flammable material hazardous material
		Benzene	60000	ug/Kg	
		Toluene	238000	ug/Kg	
		Ethylbenzene	125000	ug/Kg	
		m,p-Xylenes	543000	ug/Kg	
		o-Xylene	284000	ug/Kg	
		n-Propylbenzene	138000	ug/Kg	
		1,2,4-Trimethylbenzene ^a	803000	ug/Kg	
		sec-Butylbenzene	122000	ug/Kg	
		4-Isopropyltoluene	76400	ug/Kg	
		Naphthalene ^a	506000	ug/Kg	
		2-Methylnaphthalene	2140000	ug/Kg	
		Acenaphthene	395000	ug/Kg	
		Fluorene	633000	ug/Kg	
		Phenanthrene	494000	ug/Kg	
		Pyrene	88600	ug/Kg	
		bis(2-Ethylhexyl)phthalate	155000 JB	ug/Kg	
		Flash	140-200	°F	
Drum-98 (TFPS98)	Oxidizer/Corrosive	Potassium	69.2 JB	mg/Kg	Corrosive material
		Sodium	90.3 JB	mg/Kg	
		bis(2-Ethylhexyl)phthalate	121000 JB	ug/Kg	
		PH	1.62	pH Units	
		Total Phosphorous	58,000	mg/Kg	
Drum-100 (TFPS100)	Combustible Liquid	Chloromethane	4630	ug/Kg	Combustible oil- water mixture
		Flash	>200	°F	
Drum-111 (TFPS111)	Flammable/Combustible Liquid	Chloromethane	2000	ug/Kg	Combustible oil- water mixture
		Flash	>200	°F	
Drum-113	Flammable Liquid	NA			Flammable material
Drum-116 (TFPS116)	Flammable Liquid	Chloromethane	37700 JB	ug/Kg	Flammable material
		Naphthalene	227000	ug/Kg	
		2-Methylnaphthalene	567000	ug/Kg	
		Fluorene	134000	ug/Kg	
		Phenanthrene	134000	ug/Kg	
		Flash	100-140	°F	

^a Two results were report for the detected constituent, the higher value is reported to be conservative.

NA Not available. Either laboratory analysis was not requested for the sample or no constituents were detected.

J The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.

U The material was analyzed for, but was not detected. The associated numerical value is the practical quantitation limit.

UJ The material was analyzed for, but was not detected. The reported detection limit is estimated because quality control criteria were not met.

D10 The report result for this analyte was calculated based on a secondary dilution factor.

B Detection concentration is between instrument detection limit and the practical quantitation limit.

B1 Analyte was detected in the method blank and was determined to be significantly higher than the associated method blank (less than 10 times the blank concentration).

Table 7. Potential chemical hazards at the Tribal Fish and Wildlife Department site, Nespelem, Washington.

Type of Material	Description	Estimated Quantity ^a	Potential Hazard
Rusty water with residue	55-gallon drums	230 gallons	Release of water with potentially small quantities of various contaminants
Combustible oil-water mixtures	Oil water mixtures in 55-gallon drums.	650 gallons	Human and environmental exposure to petroleum products
Flammable and potentially toxic	Grease / sludge / water mixtures in 55-gallon drums	560 gallons	Human and environmental exposure to hazardous materials
Flammable and hazardous materials	Black waste oils with elevated PID readings halogenated solvents and flash point below 140°F	620 gallons	Human and environmental exposure to hazardous materials
Combustible liquids and potentially toxic	Yellow and orange grease / sludge mixtures, with elevated PID readings in 55-gallon drums	60 gallons	Human and environmental exposure to hazardous materials
Corrosives (Phosphoric, murratic, acetic, hydrochloric, nitric, and hydrofluoric acids)	Hazardous materials with low pH found in 55-gallon drum and various containers (1-pint to 1-gallon) laboratory acids in TFWD garage	21 gallons	Human and environmental exposure to corrosive materials
Potential toxic chemical	Various laboratory reactants from Hach test kits located in TFGD Garage	Approximately 1 pound	Exposure to humans and potential improper disposal
Hazardous substances	55-gallon drum labeled Formaldehyde and miscellaneous containers with formaldehyde located in the TFWD Garage	50 gallons	Human and environmental exposure to hazardous materials

^a Volumes were estimated by grouping drum and container contents that had similar properties and PID results and assigning a material type based on field and laboratory analyses of similar materials in these groups.

These containers have the potential to release hazardous materials to the environment, due to drum deterioration over time. Currently, there are no known parties likely to actively manage the materials. The cost to transport and properly dispose these materials is estimated, based on cost rates from Philips Services of Tacoma, at \$21,005 to \$29,389 (see Appendix D).

Brewster Heights Packing

Observations

Brewster Heights Packing is located at 1124 Omak Ave in Omak, Washington (Figure 2C). The facility provides cold storage for apples. The building appeared to be abandoned; however, it is likely used during apple storage seasons.

The START conducted fieldwork activities on Friday, July 12, 2002, and Sunday, July 14, 2002. Samples were collected for hazard categorization and laboratory analysis, and site conditions were documented with logbooks and 35mm camera.

Ammonia Release Incident

On Friday, July 12, 2002, at approximately 17:30 hours, START arrived at the Brewster Heights Packing facility. Michael Olson, the START project manager, attempted to make contact with site personnel on the property to inform them that the drums on the east end of the building were planned for sampling. Mr. Olson approached an open door near the building office (southwest side of the storage building) and at approximately 10 feet from the entrance noticed a burning sensation in his eyes, nose, and lungs. START personnel immediately retreated from the building to assess the situation. It was determined that an ammonia leak had occurred, but the severity of the release could not be determined. At a distance of approximately 75 yards downwind from the office door, a slight ammonia odor could still be detected. Also, START personnel observed a clear liquid and vapors being released from a vent pipe. Later, when it was possible to get closer to the vent pipe, it was determined to be the release point.

At approximately 18:00 hours, the START called OSC Michael Szerlog to inform him of the situation. It was determined that the START would attempt to find ammonia air monitoring equipment at the local fire department or other apple storage facilities. At 18:45 hours, it was determined that the local fire and police office was closed and that no personnel were available at other storage facilities. The OSC was informed of the current status and it was decided that the Brewster Heights Packing main office in Brewster, Washington, would be contacted. If they could not help determine the hazards of the situation, 911 would be called to get local emergency personnel support. No one at the Brewster Heights Packing main office could give support and at approximately 19:05 hours, START called 911 and informed the dispatcher of the situation.

At approximately 19:15 hours, the START arrived back onsite to meet Fire Chief Kevin Bowling and the local fire department. At this time, it was determined that the release was coming from the vent pipe observed earlier. Flow from the pipe had slowed substantially and the odor of ammonia was greatly reduced. Fire department personnel did not have ammonia air monitoring equipment, so the ambient air concentration could not be determined.

At approximately 18:15 hours, Mr. Birdsall, a local resident with knowledge of ammonia cooling systems, arrived onsite. He indicated the cooling fan for the system appeared to have stopped (likely due to a broken belt), and as a result of the high daytime temperatures, pressure had built-up in the ammonia storage tanks. This buildup caused the pressure release valve to open,

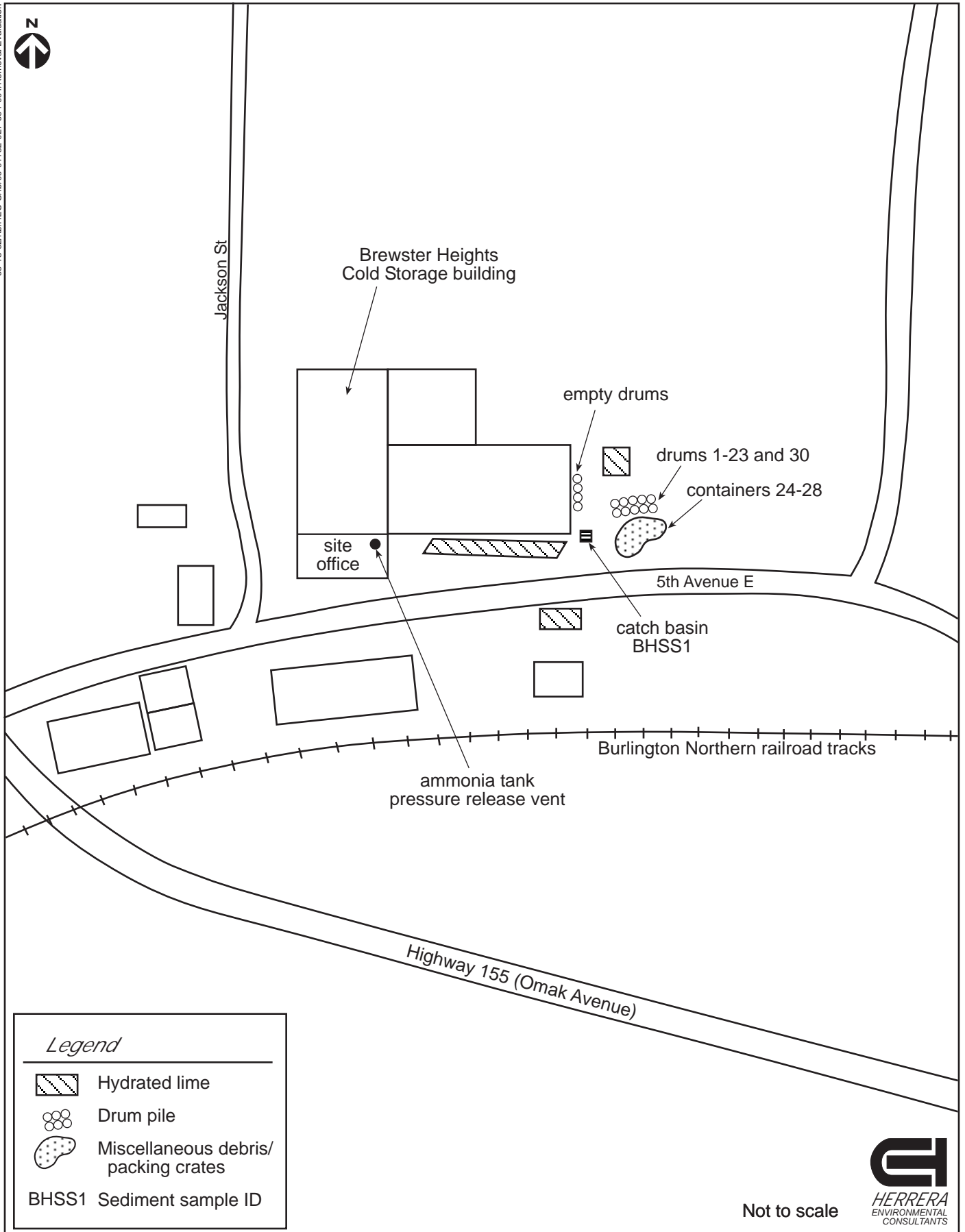


Figure 2C. Site map of the Brewster Heights Packing site on the Colville Indian reservation, Washington.

allowing ammonia to release from the vent pipe. When enough ammonia had released, the emergency low-level shutoff activated and the system shut down. Mr. Birdsall estimated the cooling system contained 300 to 500 pounds of ammonia and suspected the low-level shut off would have activated after less than 100 pounds was released. This estimate was made without inspecting the cooling system.

At approximately 21:00 hours, no more ammonia was observed as being released from the vent pipe and the fire department and START demobilized from the site. Chief Bowling contacted a representative from Brewster Heights Packing; they were mobilizing to the site to inspect the system.

On Sunday July 14, 2002, the START mobilized back to the facility to conduct drum sampling. At this time, the doorway into the facility had been locked, indicating that a Brewster Heights Packing representative had inspected the system. No ammonia odor was observed during this site visit.

Drum Inspection

The following observations were made while onsite:

- Twenty-four drums were identified as having unknown contents. Seven empty drums were observed but not assigned container identification numbers. Twenty-eight 5-gallon plastic jugs were observed to contain unknown liquids.
- Stacks of bagged hydrated lime were observed on the west and south side of the building. The bags were in poor condition and hydrated lime dust was observed across the site. The reported estimate of 98 tons of hydrated lime appears accurate as indicated by EPA representative Jack Boller.
- Surface water catch basins were observed onsite. The drains appeared to connect to city storm sewer lines and then to the Okanogan River, located approximately 1/2 mile to the northeast at its closest point.
- Drum-1 (55-gallon drum) contained yellow oil and water and was approximately 40 percent full; PID reading at the opening was 0 ppm (0 ppm background).
- Drum-2 (55-gallon drum) contained yellow oil and water and was approximately 60 percent full; PID reading at the opening was 1 ppm (0 ppm background).
- Drum-3 (55-gallon drum) contained a clear liquid and was approximately 25 percent full; PID reading at the opening was 160 ppm (0 ppm background).
- Drum-4 (55-gallon drum) was upside down with the opening on the bottom. The drum was not sampled since gaining access would

potentially cause a release. The drum was approximately 5 percent full; PID reading near the opening was 0 ppm (0 ppm background).

- Drum-5 (55-gallon drum) contained a clear yellow liquid and was approximately 3 percent full; PID reading at the opening was 6.6 ppm (0 ppm background).
- Drum-6 (55-gallon drum) contained a clear yellow liquid and was approximately 25 percent full; PID reading at the opening was 6 ppm (0 ppm background).
- Drum-7 (55-gallon drum) contained brown oil and water and was approximately 75 percent full; PID reading at the opening was 19 ppm (0 ppm background).
- Drum-8 (55-gallon drum) contained a yellow liquid and was approximately 90 percent full; PID reading at the opening was 320 ppm (0 ppm background).
- Drum-9 (55-gallon drum) was empty; PID reading at the opening was 0 ppm (0 ppm background).
- Drum-10 (55-gallon drum) contained a clear liquid and was approximately 80 percent full; PID reading at the opening was 32 ppm (0 ppm background).
- Drum-11 (55-gallon drum) contained a yellow liquid and was approximately 25 percent full; PID reading at the opening was 50 ppm (0 ppm background).
- Drum-12 (55-gallon drum) contained a yellow liquid and was approximately 75 percent full; PID reading at the opening was 2 ppm (0 ppm background).
- Drum-13 (55-gallon drum) contained a yellow liquid and water and was approximately 60 percent full; PID reading at the opening was 30 ppm (0 ppm background).
- Drum-14 (55-gallon drum) contained dark oil and water and was approximately 30 percent full; PID reading at the opening was 114 ppm (0 ppm background).
- Drum-15 (55-gallon drum) contained a yellow liquid and water and was approximately 3 percent full; PID reading at the opening was 1 ppm (0 ppm background).
- Drum-16 (55-gallon drum) had less than 1/2 inch of dark sludge; PID reading at the opening was 0 ppm (0 ppm background).

- Drum-17 (55-gallon drum) was empty; PID reading at the opening was 0 ppm (0 ppm background).
- Drum-18 (55-gallon drum) contained a pasty white liquid and was 100 percent full; PID reading at the opening was 14 ppm (0 ppm background).
- Drum-19 (55-gallon drum) contained dark oil and water and was 30 percent full; PID reading at the opening was 0 ppm (0 ppm background).
- Drum-20 (55-gallon drum) contained dark oil and water and was 25 percent full; PID reading at the opening was 2 ppm (0 ppm background).
- Drum-21 (55-gallon drum) contained dark brown liquid and was 100 percent full; PID reading at the opening was 375 ppm (0 ppm background).
- Drum-22 (55-gallon drum) contained yellow oil and water and was 50 percent full; PID reading at the opening was 4 ppm (0 ppm background).
- Drum-23 (55-gallon drum) contained black oil and water and was 25 percent full; PID reading at the opening was 30 ppm (0 ppm background).
- Containers 24 through 28 represented twenty-seven 5-gallon jugs of the apple preservative diphenylamine (DPA). The jugs were in various conditions and stacked in apple crates near the drums.
- Container-29 was a 5-gallon blue plastic jug that contained oil and water.
- Drum-30 (55-gallon drum) was empty; PID reading at the opening was 0 ppm (0 ppm background).

Table 8. Summary of containers observed at the Brewster Heights Site located on the Colville Indian Reservation, Washington.

Type of Containers	Total Number of Containers	Total Number Assigned Identification Numbers
55-gallon drums with unknown contents	21	21
Empty 55-gallon drums	10	3
5-gallon plastic containers	28	6
Stacks of hydrated lime	98 tons	None

Procedure and Results

Samples were collected from drums and containers using dedicated glass drum thieves. Samples were placed in pre-labeled glass sample jars and stored on ice until hazard categorization analysis was conducted. Hazard categorization documentation is provided in Appendix C. Samples were collected and analyzed in accordance with the Herrera START SQAP for the Colville Drum Sites, August 2002. A total of 59 containers were inspected. Of these, 12 were sampled for field hazard categorization. Based on hazard categorization results, nine samples

representing individual waste streams were delivered to Severn Trent Services in Tacoma, Washington, for confirmation laboratory analysis. The following analyses were conducted on select samples based on field hazard categorization results: flash by EPA 1020, halogenated volatile organics by EPA method 5035/8260B, PAHs by EPA method 8270C, VOCs by EPA method 8260B, SVOCs by EPA method 8270C, anions by EPA method 300A, and pH by EPA method 9040B. In addition, one sediment sample was analyzed for pH and total calcium by EPA method 6010. Table 9 summarizes the field hazard categorization results and detected constituents from laboratory analysis. Data Validation and Laboratory Reports with a complete list of laboratory analytical results for product samples are provided in Appendix B.

Table 9. Hazard categorization and analytical results for Brewster Heights Packing, Omak, Washington.

Container ID (Sample ID)	Hazard Categorization Result	Laboratory Analytical Results – detected constituents			Material Designation
Drum-1 (BHPS1)	Combustible Liquid (oil with water)	Chloromethane Flash	1390 >200	ug/Kg °F	Combustible oil- water mixture
Drum-2 (BHPS2)	Oil water mixture	Naphthalene 2-Methylnaphthalene Acenaphthene Fluorene Phenanthrene Pyrene Flash	341000 1170000 48500 82200 159000 45700 >200	ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg ug/Kg °F	Combustible oil- water mixture
Drum-3 (BHPS3)	Corrosive (acid)	pH	<1	pH units	Corrosive material
Drum-6	Inorganic Liquid	NA			Water mixture
Drum-7	Combustible Liquid (oil with water)	NA			Combustible oil- water mixture
Drum-8 (BHPS8)	Organic Liquid	bis(2-Ethylhexyl)phthalate Flash	4500 70-100	U ug/L °F	Flammable material
Drum-10 (BHPS10)	Organic Liquid (soap)	bis(2-Ethylhexyl)phthalate pH	56300 10.85	B ug/Kg pH units	Water mixture
Drum-13 (BHPS13)	Organic Liquid	Trichlorofluoromethane bis(2-Ethylhexyl)phthalate pH	79200 66700 5.65	J JB ug/L ug/Kg pH units	Water mixture
Drum-14 (BHPS14)	Organic Liquid	Flash	>200	°F	Combustible oil- water mixture
Drum-21	Flammable Combustible Liquid	NA			Combustible oil- water mixture
Drum-28 (BHPS28)	Organic Liquid	Fluorene	270	ug/L	Water mixture
Drum-29 (BHPS29)	Inorganic Salt	Chloride Nitrate as N Sulfate Nitrate\Nitrite pH	11100 8.3 45.6 8.3 10.27	mg/L mg/L mg/L mg/L pH units	Water mixture

NA Not available. Either laboratory analysis was not requested for the sample or no constituents were detected.

J The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.

U The material was analyzed for, but was not detected. The associated numerical value is the practical quantitation limit.

UJ The material was analyzed for, but was not detected. The reported detection limit is estimated because quality control criteria were not met.

B Detection concentration is between instrument detection limit and the practical quantitation limit.

The sediment sample collected from the asphalt parking area near a stormwater catch basin had a total calcium content of 46,400 mg/Kg and sediment pH of 7.64.

Conclusion

The START conducted fieldwork activities at Brewster Heights Packing on Friday, July 12, 2002, and Sunday, July 14, 2002. Samples were collected for hazard categorization and laboratory analysis, and site conditions were documented with logbooks and 35mm camera. Twenty-four drums were identified as having unknown contents and twenty-eight 5-gallon plastic jugs were observed that contained unknown liquids. In general, the drums were unsecured, did not have any secondary containment, and were accessible by the general public. Stacks of bagged hydrated lime were observed on the west and south side of the building. The bags were in poor condition and hydrated lime dust was observed across the site. In addition, START observed a release of ammonia from the facility cooling system. Table 10 summarizes estimated material types and quantities at the site.

Table 10. Potential chemical hazards at Brewster Heights Packing, Omak, Washington.

Type of Material	Description	Estimated Quantity ^a	Potential Hazard
Combustible oil-water mixtures	Oil water mixtures located in 55-gallon drums potentially contain toxic substances.	220 gallons	Human and environmental exposure to petroleum products
Flammable and hazardous material	Waste oil located in 55- gallon drums potentially contain toxic substance	110 gallons	Human and environmental exposure to hazardous materials
Corrosive	55-gallon drum labeled acetic acid	13 gallons	Human and environmental exposure to corrosives
Organic liquid	55 gallons drum containing suspected soap	40 gallons	Release to the environment, water quality degradation
Diphenylamine (DPA)	5-gallon jugs of apple preservative	145 gallons	Release to the environment, water quality degradation

^a Volumes were estimated by grouping drum and container contents that had similar properties and PID results and assigning a material type based on field and laboratory analyses of similar materials in these groups.

Material designation was based on field hazard categorization and laboratory analysis results. Materials were grouped into similar waste streams based on physical properties and photo-ionization detection (PID) instrument readings. Representative samples from these waste streams were analyzed with field hazard categorization analysis and laboratory analysis. Based on these results, waste streams were assigned a likely material designation. When field results were inconsistent with laboratory results (e.g., flash point), material designation was based on laboratory results. Material volumes were calculated based on waste streams with similar material designations and estimated drum and container volumes.

These containers have the potential to release hazardous materials to the environment, due to drum deterioration over time. Currently, there are no known parties likely to actively manage the materials. The cost to transport and properly dispose these materials is estimated, based on cost rates from Philips Services of Tacoma, at \$5,170 to \$6,150 (see Appendix D).

APPENDIX A

Photographic Documentation

Colville Drum Removal Site Evaluation Photographic Log

Photo Number	Date	Time	Direction	By	Description
Paschal Sherman Indian School					
1	7/12/02	1505	W	MO	Drum #1 in firehouse garage with unknown contents.
2	7/12/02	1508	SE	MO	Drums #2, 3, and 4 located on the west side of the firehouse garage.
3	7/12/02	1510	NE	MO	Drums identified as Safety Kleen drums, located on the southwest side of the firehouse garage.
4	7/12/02	1515	N	MO	Two empty drums located on the south end of the firehouse garage.
5	7/12/02	1520	N	MO	Drums and containers to be picked up by Safety Kleen; note staining on ground.
6	7/12/02	1525	SE	MO	Drums #5, 6, 7, and 8 containing waste oil from an unknown source. Safety Kleen would not accept the drums for disposal.
7	7/12/02	1530	E	MO	Drum #9 and 8 batteries located on a pallet in the east scrap area near the diesel AST.
8	7/12/02	1540	W	MO	Drum #10 and an empty drum located in the east scrap area near the diesel AST.
9	7/12/02	1543	SE	MO	Empty containers located near drum #10 in the east scrap area.
10	7/12/02	1545	E	MO	Diesel above ground storage tanks located in the east scrap area. Tank nozzle has lock on it and the tank appears to be empty.
11	7/12/02	1658	S	MO	A site view of the firehouse garage and drums located on west side of the building.
12	7/12/02	1702	SE	MO	A site view of the south side of the firehouse garage and the east scrap area.
Tribal Fish and Wildlife Department					
13	7/13/02	0748	NW	MO	A view of Drum #1 and two empty drums located at the southwest corner of the logging warehouses.
14	7/13/02	0752	N	MO	Drum #2 and numerous 5 gallon plastic buckets (including containers #3 and 4) located south of the logging warehouses.
15	7/13/02	0755	N	MO	Drum #5 located on the south side of the logging warehouses.
16	7/13/02	0805	NE	MO	Drums #6 through 41 located on the south side of the logging warehouses.
17	7/13/02	0806	N	MO	Drums # 32, 33, 34, and 35 contain oily soil and sludge and have open tops.
18	7/13/02	0820	N	MO	Drum #42 has an open top and contains sludge at the bottom.
19	7/13/02	0830	SW	MO	Drums #43 through 67 located northeast of the fish and wildlife building.
20	7/13/02	0835	NW	MO	Drum # 43 through 67 and drums #1 through 42 in background.
21	7/13/02	0915	SE	MO	Drums # 68, 69, and 70 located east of the fish and wildlife building.
22	7/13/02	0920	W	MO	Drum # 71 located east of the fish and wildlife building.
23	7/13/02	0928	N	MO	Drums # 72 through 94 located on the east end of the logging warehouse. Note staining observed under some drums (75 and 78).
24	7/13/02	0945	W	MO	Stained soil observed around drums #75 and 78.
25	7/13/02	1000	E	MO	Open drum observed east of the logging warehouse.

Removal Site Evaluation—Colville and Makah Tribal Drum Sites

Photo Number	Date	Time	Direction	By	Description
26	7/13/02	1130	NE	MO	Miscellaneous containers of lab materials and paint located inside the fish and wildlife building.
27	7/13/02	1131	NW	MO	Formaldehyde drum located in the fish and wildlife building.
28	7/13/02	1138	E	MO	Segregating lab materials for hazard categorization.
29	7/13/02	1138	N	MO	Segregating lab materials for hazard categorization.
30	7/13/02	1140	NW	MO	Drum # 95, batteries, and paint related material located in the pole shed southeast of the fish and wildlife building.
31	7/13/02	1145	S	MO	Four 5-gallon containers with unknown liquids located on the north side of the pole shed.
32	7/13/02	1630	NW	MO	Drum #96 with miscellaneous debris, grease, oil and water with an open top located on the south side of the pole shed.
33	7/13/02	1631	E	MO	Drum #97 located in the pole shed lying on its side. The drum appeared to contain grease.
34	7/13/02	1633	S	MO	PRM, fast drying sealer, and eggshell enamel located in the pole shed.
35	7/13/02	1635	NE	MO	Discarded grease gun and batteries located on the south side of the pole shed.
36	7/13/02	1640	SW	MO	Drums # 98 and 99 located on the east end of the pole shed.
37	7/13/02	1720	SE	MO	Drums #100 and 101 and other empty drums located on the south east side of the site.
38	7/13/02	1720	SE	MO	Drums #102 through 112 located on the southeast side of the site.
39	7/13/02	1721	NW	MO	Drums #111 and 112 located on the southeast side of the site. Note stained soil near Drum #112.
40	7/13/02	1722	SE	MO	Drums #113 through 117 located on the southeast side of the site.
41	7/13/02	1725	SE	MO	Drums #118 through 124 located on the southeast side of the site.
42	7/13/02	1726	E	MO	Five-gallon containers located on the southeast side of the site. Note staining on pallets and containers.
43	7/13/02	1927	W	MO	Five-gallon containers located on the southeast side of the site. Note staining on pallets and containers.
44	7/13/02	1930	W	MO	Lab chemicals located in the fish and wildlife building segregated after hazard categorization.
45	7/13/02	1930	W	MO	Lab chemicals located in the fish and wildlife building segregated after hazard categorization. (Photo missing)
46	7/13/02	1935	NW	MO	EPA OSC conducting hazard categorization of drum and container samples.
47	7/13/02	1940	S	MO	Panoramic view of site with southeast drums in background.
48	7/13/02	1940	SW	MO	Panoramic view of site with pole shed in background.
49	7/13/02	1940	SW	MO	Panoramic view of site with pole building and fish and wildlife building in background.
50	7/13/02	1940	W	MO	Panoramic view of site with fish and wildlife building and logging warehouse in background.
51	7/13/02	1940	NW	MO	Panoramic view of site with logging warehouse in background.
52	7/13/02	1940	NW	MO	Panoramic view of site with logging warehouse in background.
53	7/13/02	1940	NW	MO	Panoramic view of site with logging warehouse and bone yard in background.
54	7/13/02	1940	N	MO	Panoramic view of site with bone yard in the background.

Photo Number	Date	Time	Direction	By	Description
Brewster Heights Packing					
55	7/12/02	1915	N	MO	Ammonia being released from the vent pipe above the Brewster Heights office building.
56	7/14/02	0835	NE	MO	Drums #1 through #24 and Drum # 29 located on the east end of the Brewster Heights facility.
57	7/14/02	0836	NW	MO	Drums #1 through #24 and Drum #29 located east of the building. Note empty drums in the background near the loading docks.
58	7/14/02	0837	N	MO	The east end of the Brewster Heights facility with view of drainage catch basin (location of sediment sample), stacks of hydrated lime, and drums.
59	7/14/02	0837	W	MO	A view of the south side of the facility with stacks of hydrated lime in the background and location of a drainage catch basin.
60	7/14/02	0840	NE	MO	Five gallons pails of apple preservative; containers #24, #25, and #28.
61	7/14/02	0840	E	MO	Five gallons pails of apple preservative; containers #26, and #27.
62	7/14/02	0845	Down	MO	Container # 29 located amongst containers #1 through #24.
63	7/14/02	1130	NW	MO	Closed door observed with lock at location of ammonia vent pipe.
64	7/14/02	0830	N	PF	The location of the ammonia release. Note condition of vent pipe and closed door.
65	7/14/02	0830	NW	PF	The location of the ammonia release. Note condition of vent pipe and closed door.

N North
 S South
 E East
 W West
 DN Down
 MO Mike Olson
 PF Paula Fedirchuck
 NA Not available
 AST Aboveground Storage Tank

APPENDIX B

Data Validation and Laboratory Reports

Herrera Environmental Consultants, Inc.

Memorandum

To Project File C00-01732-027
cc Michael Olson, Herrera Environmental Consultants
From Diana Phelan and Rob Zisette, Herrera Environmental Consultants
Date September 10, 2002
Subject Anions Data Validation for Colville Drum Sites, TDD #02-06-0007

Introduction

This memorandum presents a review of product data collected from the Colville Drum Sites located on the Colville Indian Reservation, Washington. Product sample BHPS29 was collected on July 14, 2002. Severn Trent Services of Tacoma, Washington analyzed the sample for seven anions (fluoride, chloride, bromide, nitrite, nitrate, phosphate, and sulfate) using U.S. EPA Method 300.0.

Sample Data Reviewed

Sample ID	Laboratory Sample ID	Date/Time Sampled
BHPS29	107385-23	7/14/02; 09:25

The laboratory's performance was reviewed in accordance with quality control (QC) specifications outlined in the *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (Guidance for Removal Activities) (USEPA 1990) and the specified analytical method. Data quality objectives (DQOs), project detection limits, and quality control (QC) sample frequencies are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

Quality control and raw laboratory data submitted by the laboratory were reviewed. Data validation results are summarized below. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by a summary of laboratory communications and definitions of data qualifiers.

Data Validation

Custody, Preservation, Holding Times, and Completeness—Acceptable

Sample custody was properly maintained from sample collection to receipt at the laboratory. The sample was properly preserved and received intact at the laboratory. The sample was analyzed within the required holding time. The laboratory data package is complete and contains test results for the sample listed on the chain-of-custody (COC).

Laboratory Reporting Limit—Acceptable with Discussion

The SQAP does not list practical quantitation limits for anions.

Blank Analysis—Acceptable

A method blank was analyzed with sample BHPS29. The method blank did not contain reportable levels of anions and no data have been qualified.

Surrogate Analysis—Not Applicable

Laboratory Control Sample Analysis—Acceptable

One blank spike (1728) was analyzed with sample BHPS29. The percent recovery values are within the laboratory control limits.

Matrix Spike Analysis—Acceptable with Discussion

Sample BHPS29 was analyzed as the matrix spike. The percent recovery values of fluoride (79 percent) and phosphate (49 percent) in the matrix spike analysis of sample BHPS29 were below laboratory control limits (80 to 120 percent). Fluoride and phosphate results for sample BHPS29 were qualified as estimated detection limits (UJ) because neither fluoride nor phosphate was detected in sample BHPS29.

Sample ID	Analyte	Criteria	Qualifier
BHPS29	Fluoride	Low matrix spike recovery and undetected in the sample	UJ
BHPS29	Phosphate	Low matrix spike recovery and undetected in the sample	UJ

The percent recovery value of chloride (211 percent) in the matrix spike analysis of sample BHPS29 exceeded laboratory control limits because of the high concentrations of the analyte in the product sample. However, control limits are not applicable because the sample concentration was greater than four times the spike concentration, and no data were qualified in accordance with Functional Guidelines.

Duplicate Analysis—Acceptable

Sample BHPS29 was analyzed in duplicate for anions. All RPD values are within the laboratory control limits and Functional Guidelines criteria (i.e., RPD less than 20 percent for results greater than five times the practical quantitation limit, or within two practical quantitation limits for results less than five times the practical quantitation limit).

Overall Assessment of Data Quality

The anion results met the data quality objectives established in the SQAP. Upon consideration of the information presented here, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

Laboratory Communications

The laboratory was not contacted regarding the metals analyses.

Definition of Data Qualifiers

The following data validation qualifiers were used in the review of this data set. With the exception of the R qualifier, these qualifiers are from the *Sampling and Quality Assurance Plan* (SQAP) *Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

- J** The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quantity control criteria were not met.
- U** The material was analyzed for, but was not detected. The associated numerical value is the sample detection limit or the adjusted sample detection limit.
- UJ** The material was analyzed for, but was not detected. The reported detection limit is estimated because quality control criteria were not met.
- B** Detection concentration is between instrument detection limit and the practical quantitation limit.
- H** High bias.
- K** Unknown bias.
- L** Low bias

References

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Herrera Environmental Consultants, Inc.

Memorandum

To Project File C00-01732-027
cc Michael Olson, Herrera Environmental Consultants
From Diana Phelan and Rob Zisette, Herrera Environmental Consultants
Date September 10, 2002
Subject Ignitability (Flash Point) Data Validation for Colville Drum Sites,
TDD #02-06-0007

Introduction

This memorandum presents a review of product data collected from the Colville Drum Sites located on the Colville Indian Reservation, Washington. Sixteen product samples were collected between July 12 and 14, 2002. Severn Trent Services of Tacoma, Washington analyzed the samples for ignitability (flash point) using U.S. EPA Method 1020.

Sample Data Reviewed

Sample ID	Laboratory Sample ID	Date/Time Sampled
PSPS1	107385-1	7/12/02; 16:05
PSPS7	107385-2	7/12/02; 16:30
TFPS14	107385-3	7/13/02; 14:20
TFPS37	107385-5	7/13/02; 14:45
TFPS50	107385-6	7/13/02; 15:19
TFPS54	107385-7	7/13/02; 15:25
TFPS56	107385-8	7/13/02; 15:29
TFPS71	107385-9	7/13/02; 15:44
TFPS72	107385-10	7/13/02; 15:46
TFPS100	107385-12	7/13/02; 17:35
TFPS111	107385-13	7/13/02; 17:56
TFPS116	107385-14	7/13/02; 18:20
BHPS1	107385-15	7/14/02; 08:45
BHPS8	107385-18	7/14/02; 08:55
BHPS14	107385-20	7/14/02; 09:07
BHPS2	107385-21	7/14/02; 09:15

The laboratory's performance was reviewed in accordance with quality control (QC) specifications outlined in the specified analytical method. Data quality objectives (DQOs), project detection limits, and quality control (QC) sample frequencies are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

Quality control and raw laboratory data submitted by the laboratory were reviewed. Data validation results are summarized below. No data qualifiers (flags) were added to the sample results in the laboratory reports.

Data Validation

Custody, Preservation, Holding Times, and Completeness—Acceptable with Discussion

Sample custody was properly maintained from sample collection to receipt at the laboratory. The samples were properly preserved and received intact at the laboratory. There is no required holding time for analyzing the samples according to the method. The laboratory data package is complete and contains test results for all samples listed on the chain-of-custody (COC).

Laboratory Reporting Limit—Acceptable with Discussion

The SQAP does not list a practical quantitation limit for flash point.

The flash point results are reported in degrees Fahrenheit. The SQAP requires units of degrees Celsius. Data qualifiers are not required.

Blank Analysis—Not Applicable

Laboratory Quality Control Check—Acceptable

Two laboratory quality control check samples (xylene) were analyzed with the samples, and the results were within laboratory criteria (between 82° and 86° F).

Surrogate Analysis—Not Applicable

Matrix Spike Analysis—Not Applicable

Duplicate Analysis—Acceptable

Two duplicate analyses were performed and there was no difference in the duplicate results.

Overall Assessment of Data Quality

The flash point results met the data quality objectives established in the SQAP. Upon consideration of the information presented here, the data are acceptable without qualification.

References

Herrera. 2002. Sampling and Quality Assurance Plan, Colville Drum Sites, Colville Indian Reservation, Washington. Prepared for U. S. Environmental Protection Agency – Region 10 Superfund Technical Assessment & Response Team (START). Herrera Environmental Consultants, Inc. of Seattle, Washington. July 2002.

USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 Third Edition, Updates I, II, IIA, IIB, and III. Office of Solid Waste and Emergency Response. U.S. Environmental Protection Agency, Washington, D.C. December 1996.

Herrera Environmental Consultants, Inc.

Memorandum

To Project File C00-01732-027
cc Michael Olson, Herrera Environmental Consultants
From Diana Phelan and Rob Zisette, Herrera Environmental Consultants
Tom Cammarata, TJC Scientific Services
Date September 10, 2002
Subject Glycol Data Validation for Colville Drum Sites, TDD #02-06-0007

This memorandum presents a review of product data collected from the Colville Drum Sites located within the Colville Indian Reservation, Washington. Product sample TFPS56 was collected on July 13, 2002. Severn Trent Services, Inc. of Tacoma, Washington analyzed the sample for glycols using EPA Method 8015 Modified (USEPA 1996).

Sample Data Reviewed

Sample ID	Laboratory Sample ID	Date/Time Sampled
TFPS56	107385-8	7/13/02; 15:29

The laboratory's performance was reviewed in accordance with quality control (QC) specifications outlined in the *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (Guidance for Removal Activities) (USEPA 1990), the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (Functional Guidelines) (USEPA 1999), and the specified analytical method. Data quality objectives (DQOs), project detection limits, and quality control (QC) sample frequencies are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

Quality control and raw laboratory data submitted by the laboratory were reviewed. No data qualifiers (flags) were added to the sample results in the laboratory reports.

Data Validation

Custody, Preservation, Holding Times, and Completeness—Acceptable

Sample custody was properly maintained from sample collection to receipt at the laboratory. The sample was properly preserved and received intact at the laboratory. The sample was analyzed within the required holding time of 14 days from collection of the product sample. The

laboratory data package is complete and contains test results for the sample listed on the chain-of-custody (COC).

Initial Calibration—Acceptable

Initial calibrations were analyzed at the required frequency. Initial calibration criteria (i.e., correlation coefficients greater than or equal to 0.99) established by the Ecology methods were met for all target compounds.

Continuing Calibration—Acceptable

Continuing calibration verification (CCV) standards were analyzed at the required frequency. Continuing calibration criteria (i.e., percent difference values less than or equal to 15 percent) established by the Guidance for Removal Activities were met for all target compounds.

Blank Analysis—Acceptable

A method blank was extracted and analyzed with the sample. The method blank did not contain reportable levels of ethylene glycol and no data have been qualified. No field blanks were collected.

Surrogate Analysis—Acceptable with Discussion

One surrogate compound was analyzed with the sample and blank in accordance with the method. Surrogate recovery values are within the method criteria (50 to 150 percent) except for product sample TFPS56, when dilution prevented accurate quantitation of the surrogate.

Matrix Spike Analysis—Acceptable with Discussion

The laboratory reported matrix spike/matrix spike duplicate (MS/MSD) results for glycol analyses as required by the method.

The percent recovery and the relative percent difference (RPD) values for the glycol MS/MSD analysis of sample TFPS56 are above laboratory control limits because of the high analyte concentrations detected in the sample. However, control limits are not applicable because the sample concentration was greater than four times the spike concentration, and no data were qualified in accordance with Functional Guidelines.

Duplicate Analysis—Acceptable

Duplicate analyses were reported as required for EPA Method 8015 Modified. The ethylene glycol RPD value (3.8 percent) for the Method 8015 Modified duplicate analysis of sample

TFPS56 is within the laboratory control limits (0 to 26 percent), and no data required qualification. Field duplicate samples were not collected.

Laboratory Control Sample Analysis—Acceptable

One blank spike/blank spike duplicate was extracted and analyzed with the glycol analyses. All recovery and RPD values are within laboratory control limits.

Laboratory Reporting Limits—Acceptable with Discussion

The SQAP does not list a practical quantitation limit specifically for ethylene glycol. Sample TFPS56 had a high PQL (9,870 mg/kg) due to the analysis at a dilution factor of 1,000 fold.

Overall Assessment of Data Quality

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable without qualification.

References

Herrera. 2002. Sampling and Quality Assurance Plan, Colville Drum Sites, Colville Indian Reservation, Washington. Prepared for U. S. Environmental Protection Agency – Region 10 Superfund Technical Assessment & Response Team (START). Herrera Environmental Consultants, Inc. of Seattle, Washington. July 2002.

USEPA. 1990. Quality Assurance/Quality Control Guidance for Removal Activities. Sampling QA/QC Plan and Data Validation Procedures. Interim Final. U.S. Environmental Protection Agency, Environmental Response Team, Emergency Response Division, Office of Emergency and Remedial Response. Washington, D.C. EPA/540/G-90-004. April 1990.

USEPA. 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. U.S. Environmental Protection Agency, Washington, D.C. EPA 540/R-94-012. October 1999.

USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 Third Edition, Updates I, II, IIA, IIB, and III. Office of Solid Waste and Emergency Response. U.S. Environmental Protection Agency, Washington, D.C. December 1996.

Herrera Environmental Consultants, Inc.

Memorandum

To Project File C00-01732-027

cc Michael Olson, Herrera Environmental Consultants

From Diana Phelan and Rob Zisette, Herrera Environmental Consultants
Tom Cammarata, TJC Scientific Services

Date September 10, 2002

Subject Metallic Inorganic Data Validation for Colville Drum Sites, TDD #02-06-0007

Introduction

This memorandum presents a review of product and soil data collected from the Colville Drum Sites located on the Colville Indian Reservation, Washington. One product sample (TFPS98) was collected on July 13, 2002 and one soil sample (BHSS1) was collected on July 14, 2002. Severn Trent Services of Tacoma, Washington analyzed product sample TFPS98 for potassium and sodium, and analyzed soil sample BHSS1 for calcium using U.S. EPA Method 6010 (USEPA 1996).

Sample Data Reviewed

Sample ID	Laboratory Sample ID	Matrix	Analytes	Date/Time Sampled
TFPS98	107385-11	Product	Potassium and sodium	7/13/02; 17:20
BHSS1	107385-24	Soil	Calcium	7/14/02; 09:50

The laboratory's performance was reviewed in accordance with quality control (QC) specifications outlined in the *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (Guidance for Removal Activities) (USEPA 1990), the *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (Functional Guidelines) (USEPA 1994), and the specified analytical method. Data quality objectives (DQOs), project detection limits, and quality control (QC) sample frequencies are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

Quality control and raw laboratory data submitted by the laboratory were reviewed. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by a summary of laboratory communications and definitions of data qualifiers.

Data Validation

Custody, Preservation, Holding Times, and Completeness—Acceptable

Sample custody was properly maintained from sample collection to receipt at the laboratory. Both samples were properly preserved and received intact at the laboratory. Each sample was analyzed within the required holding time of 180 days from sample collection. The laboratory data package is complete and contains test results for both samples listed on the chain-of-custody (COC).

Initial Calibration—Acceptable

Initial calibrations were analyzed at the required frequency. Initial calibration verification criteria (i.e., 90 to 110 percent recovery) established by Functional Guidelines were met.

Continuing Calibration—Acceptable

Continuing calibration standards were analyzed at the required frequency. Continuing calibration verification criteria (i.e., 90 to 110 percent recovery) established by the Guidance for Removal Activities were met for all target compounds.

Blank Analysis—Acceptable

Method blanks were digested and analyzed at the required frequency. The method blanks did not contain reportable levels of metals and no data have been qualified. No field blanks were collected.

ICP Interference Check Sample Analysis—Acceptable

ICP interference check samples were analyzed at the required frequency. All percent recovery values are within Guidance for Removal Activities criteria (80 to 120 percent recovery).

Matrix Spike Analysis—Acceptable

The laboratory reported matrix spike results for samples TFPS98 and BHSS1. The recovery values are within the Functional Guidelines criteria (75 to 125 percent recovery).

Duplicate Analysis—Acceptable

The laboratory reported duplicate analysis results for samples TFPS98 and BHSS1. All RPD values are within Functional Guidelines criteria. The product and soil criterion is RPD values less than 35 percent when the results are greater than five times the reporting limit (practical

quantitation limit). For results less than 5 times the reporting limit, the results must be within two reporting limits of each other.

Field duplicate samples were not collected.

Laboratory Control Sample Analysis—Acceptable

One laboratory control sample was analyzed with each analytical batch as required. All recovery values are within the Functional Guidelines criteria of 80 to 120 percent for the target metals.

Laboratory Reporting Limit—Acceptable with Qualifications

The SQAP did not establish practical quantitation limits for potassium, sodium, and calcium.

The method detection limit and the practical quantitation limit represent different levels of accuracy. Positive results less than the practical quantitation limit are considered estimates and have been qualified as B to identify the results as below the practical quantitation limit.

Sample ID	Analyte	Criteria	Qualifier
TFPS98	Potassium	Reported result less than the PQL	B
TFPS98	Sodium	Reported result less than the PQL	B

Overall Assessment of Data Quality

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

Laboratory Communications

The laboratory was not contacted regarding the metals analyses.

Definition of Data Qualifiers

The following data validation qualifiers were used in the review of this data set. With the exception of the R qualifier, these qualifiers are from the *Sampling and Quality Assurance Plan* (SQAP) *Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

- J** The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quantity control criteria were not met.
- U** The material was analyzed for, but was not detected. The associated numerical value is the sample detection limit or the adjusted sample detection limit.
- UJ** The material was analyzed for, but was not detected. The reported detection limit is estimated because quality control criteria were not met.
- B** Detection concentration is between instrument detection limit and the practical quantitation limit.
- H** High bias.
- K** Unknown bias.
- L** Low bias

References

Herrera. 2002. Sampling and Quality Assurance Plan, Colville Drum Sites, Colville Indian Reservation, Washington. Prepared for U. S. Environmental Protection Agency – Region 10 Superfund Technical Assessment & Response Team (START). Herrera Environmental Consultants, Inc. of Seattle, Washington. July 2002.

USEPA. 1990. Quality Assurance/Quality Control Guidance for Removal Activities. Sampling QA/QC Plan and Data Validation Procedures. Interim Final. U.S. Environmental Protection Agency, Environmental Response Team, Emergency Response Division, Office of Emergency and Remedial Response. Washington, D.C. EPA/540/G-90-004. April 1990.

USEPA. 1994. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. U.S. Environmental Protection Agency, Washington, D.C. EPA 540/R-94-013. February 1994.

USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 Third Edition, Updates I, II, IIA, IIB, and III. Office of Solid Waste and Emergency Response. U.S. Environmental Protection Agency, Washington, D.C. December 1996.

Herrera Environmental Consultants, Inc.

Memorandum

To Project File C00-01732-027
cc Michael Olson, Herrera Environmental Consultants
From Diana Phelan and Rob Zisette, Herrera Environmental Consultants
Date September 10, 2002
Subject Corrosivity (pH) Data Validation for Colville Drum Sites, TDD #02-06-0007

Introduction

This memorandum presents a review of product data collected from the Colville Drum Sites located on the Colville Indian Reservation, Washington. Six product samples and one soil sample were collected on July 13 and 14, 2002. Severn Trent Services of Tacoma, Washington analyzed the samples for corrosivity (pH) using U.S. EPA Method 9040B (liquid) and Method 9045C (soil).

Sample Data Reviewed

Sample ID	Laboratory Sample ID	Matrix	Date/Time Sampled
TFPS20	107385-4	Product	7/13/02; 14:28
TFPS98	107385-11	Product	7/13/02; 17:20
BHPS3	107385-16	Product	7/14/02; 08:50
BHPS10	107385-17	Product	7/14/02; 08:58
BHPS13	107385-19	Product	7/14/02; 09:05
BHPS29	107385-23	Product	7/14/02; 09:25
BHSS1	107385-24	Soil	7/14/02; 09:50

The laboratory's performance was reviewed in accordance with quality control (QC) specifications outlined in the *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (Guidance for Removal Activities) (USEPA 1990) and the specified analytical method. Data quality objectives (DQOs), project detection limits, and quality control (QC) sample frequencies are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

Quality control and raw laboratory data submitted by the laboratory were reviewed. Data validation results are summarized below. No data qualifiers (flags) were added to the sample results in the laboratory reports.

Data Validation

Custody, Preservation, Holding Times, and Completeness—Acceptable with Discussion

Sample custody was properly maintained from sample collection to receipt at the laboratory. The samples were properly preserved and received intact at the laboratory. The samples were not analyzed immediately upon laboratory receipt on July 18, 2002 as required by the method. No data were qualified because the pH of the product would have equilibrated during storage and the sample pH would not have changed between sampling and analysis. The laboratory data package is complete and contains test results for all samples listed on the chain-of-custody (COC).

Laboratory Reporting Limit—Acceptable with Discussion

The SQAP does not list a practical quantitation limit for pH.

Blank Analysis—Not Applicable

Laboratory Quality Control Check—Acceptable

Calibration buffers 4.00 and 9.00 were analyzed as laboratory quality control check samples at the required frequency. The buffer readings were within method criteria (i.e., within 0.05 pH units of the buffer's true value).

Surrogate Analysis—Not Applicable

Matrix Spike Analysis—Not Applicable

Duplicate Analysis—Acceptable with Discussion

Samples TFPS20 and BHSS1 were analyzed in duplicate. Duplicate results were within method criteria (i.e., difference within 0.1 pH unit).

Overall Assessment of Data Quality

The pH results met the data quality objectives established in the SQAP. Upon consideration of the information presented here, the data are acceptable without qualification.

References

Herrera. 2002. Sampling and Quality Assurance Plan, Colville Drum Sites, Colville Indian Reservation, Washington. Prepared for U. S. Environmental Protection Agency – Region 10 Superfund Technical Assessment & Response Team (START). Herrera Environmental Consultants, Inc. of Seattle, Washington. July 2002.

USEPA. 1990. Quality Assurance/Quality Control Guidance for Removal Activities. Sampling QA/QC Plan and Data Validation Procedures. Interim Final. U.S. Environmental Protection Agency, Environmental Response Team, Emergency Response Division, Office of Emergency and Remedial Response. Washington, D.C. EPA/540/G-90-004. April 1990.

USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 Third Edition, Updates I, II, IIA, IIB, and III. Office of Solid Waste and Emergency Response. U.S. Environmental Protection Agency, Washington, D.C. December 1996.

Herrera Environmental Consultants, Inc.

Memorandum

To Project File C00-01732-027

cc Michael Olson, Herrera Environmental Consultants

From Diana Phelan and Rob Zisette, Herrera Environmental Consultants
Tom Cammarata, TJC Scientific Services

Date September 10, 2002

Subject Semi-Volatile Organic Compounds and Polynuclear Aromatic Hydrocarbons Data
Validation for Colville Drum Sites, TDD #02-06-0007

Introduction

This memorandum presents a review of product data collected from the Colville Drum Sites located on the Colville Indian Reservation, Washington. A total of 22 product samples were collected between July 12 and 14, 2002. Severn Trent Services of Tacoma, Washington analyzed 9 samples for semi-volatile organic compounds (SVOCs) using U.S. EPA Method 8270C and 13 samples for polynuclear aromatic hydrocarbons (PAHs) using U.S. EPA Method 8270 (USEPA 1996).

The laboratory's performance was reviewed in accordance with quality control (QC) specifications outlined in the *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (Guidance for Removal Activities) (USEPA 1990), the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (Functional Guidelines) (USEPA 1999), and the specified analytical method. Data quality objectives (DQOs), project detection limits, and quality control (QC) sample frequencies are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

Quality control and raw laboratory data submitted by the laboratory were reviewed. Data qualifiers (flags) were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by a summary of laboratory communications and definitions of data qualifiers.

Sample Data Reviewed

Sample ID	Laboratory Sample ID	Analysis	Date/Time Sampled
PSPS1	107385-1	PAHs	7/12/02; 16:05
PSPS7	107385-2	PAHs	7/12/02; 16:30
TFPS14	107385-3	PAHs	7/13/02; 14:20
TFPS20	107385-4	SVOCs	7/13/02; 14:28
TFPS37	107385-5	PAHs	7/13/02; 14:45
TFPS50	107385-6	SVOCs	7/13/02; 15:19
TFPS54	107385-7	PAHs	7/13/02; 15:25
TFPS56	107385-8	PAHs	7/13/02; 15:29
TFPS71	107385-9	PAHs	7/13/02; 15:44
TFPS72	107385-10	SVOCs	7/13/02; 15:46
TFPS98	107385-11	SVOCs	7/13/02; 17:20
TFPS100	107385-12	PAHs	7/13/02; 17:35
TFPS111	107385-13	PAHs	7/13/02; 17:56
TFPS116	107385-14	PAHs	7/13/02; 18:20
BHPS1	107385-15	PAHs	7/14/02; 08:45
BHPS10	107385-17	SVOCs	7/14/02; 08:58
BHPS8	107385-18	SVOCs	7/14/02; 08:55
BHPS13	107385-19	SVOCs	7/14/02; 09:05
BHPS14	107385-20	SVOCs	7/14/02; 09:07
BHPS2	107385-21	PAHs	7/14/02; 09:15
BHPS28	107385-22	PAHs	7/14/02; 09:20
BHPS29	107385-23	SVOCs	7/14/02; 09:25

Data Validation

Custody, Preservation, Holding Times, and Completeness—Acceptable

Sample custody was properly maintained from sample collection to receipt at the laboratory. The samples were properly preserved and received intact at the laboratory. The samples were extracted and analyzed within the required holding times. The laboratory data package is complete and contains test results for all samples listed on the chain-of-custody (COC).

Instrument Tuning and Mass Calibration

The tuning compound decafluorotriphenylphosphine (DFTPP) was analyzed at the required frequency and all relative abundance values are acceptable.

Initial Calibration—Acceptable with Discussion

Initial calibrations were analyzed at the required frequency. Initial calibration criteria (i.e., percent relative standard deviation [RSD] values less than or equal to 30 percent and relative response factors [RRFs] greater than 0.05) established by the Guidance for Removal Activities were met for all target compounds with the exception 4,6-dinitro-2-methyphenol. For the initial calibration performed on August 7, 2002, the relative standard deviation (%RSD) for 4,6-dinitro-2-methyphenol (31.76%) was outside the initial calibration criterion.

The initial calibration demonstrates that instrument is capable of acceptable performance in the beginning of analytical run and producing a linear calibration curve. Because of the elevated %RSD, positive results for 4,6-dinitro-2-methyphenol are considered estimates and have been qualified as J, while non-detect results are qualified as UJ.

Sample ID	Analyte	Criteria	Qualifier
TFPS98	4,6-dinitro-2-methyphenol	Initial calibration %RSD was outside criterion	J, UJ
BHPS10	4,6-dinitro-2-methyphenol	Initial calibration %RSD was outside criterion	J, UJ
BHPS8	4,6-dinitro-2-methyphenol	Initial calibration %RSD was outside criterion	J, UJ
BHPS13	4,6-dinitro-2-methyphenol	Initial calibration %RSD was outside criterion	J, UJ

Continuing Calibration—Acceptable with Qualifications

Continuing calibration verification (CCV) standards were analyzed at the required frequency. Continuing calibration criteria (i.e., percent difference values less than or equal to 25 percent and RRFs greater than 0.05) established by the Guidance for Removal Activities were met for all target compounds with the exception of 2,4-dinitrophenol, anthracene, 3-nitroaniline, and 4-chloroaniline. For the CCV performed on August 6, 2002, the percent differences (%D) for 2,4-dinitrophenol and anthracene (40.6% and 32.1%, respectively) were outside the CCV criterion. For the CCV performed on August 8, 2002, the percent differences (%D), 3-nitroaniline and 4-chloroaniline (33.9% and 34.4%, respectively) were outside the CCV criterion.

The %D between the initial and continuing calibration reflects the performance of the instrument over time for specific analyte. Because of the elevated %Ds, positive results for 2,4-dinitrophenol, anthracene, 3-nitroaniline, and 4-chloroaniline are considered estimates and have been qualified as J, while non-detect results are qualified as UJ.

Sample ID	Analyte	Criteria	Qualifier
PSPS1	anthracene	Continuing calibration %D was outside criterion	J, UJ
PSPS7	anthracene	Continuing calibration %D was outside criterion	J, UJ
TFPS14	anthracene	Continuing calibration %D was outside criterion	J, UJ
TFPS20	3-nitroaniline and 4-chloroaniline	Continuing calibration %D was outside criterion	J, UJ
TFPS37	anthracene	Continuing calibration %D was outside criterion	J, UJ
TFPS50	Anthracene and 2,4-dinitrophenol	Continuing calibration %D was outside criterion	J, UJ
TFPS54	anthracene	Continuing calibration %D was outside criterion	J, UJ
TFPS71	anthracene	Continuing calibration %D was outside criterion	J, UJ
BHPS10	3-nitroaniline and 4-chloroaniline	Continuing calibration %D was outside criterion	J, UJ
BHPS8	3-nitroaniline and 4-chloroaniline	Continuing calibration %D was outside criterion	J, UJ
BHPS13	3-nitroaniline and 4-chloroaniline	Continuing calibration %D was outside criterion	J, UJ
BHPS14	3-nitroaniline and 4-chloroaniline	Continuing calibration %D was outside criterion	J, UJ
BHPS28	3-nitroaniline and 4-chloroaniline	Continuing calibration %D was outside criterion	J, UJ
BHPS29	3-nitroaniline and 4-chloroaniline	Continuing calibration %D was outside criterion	J, UJ

Blank Analysis—Acceptable with Qualifications

Method blanks were extracted and analyzed at the required frequency. With one exception, the method blanks did not contain reportable levels of semi-volatile organic compounds. No field blanks were collected.

Bis(2-ethylhexyl)phthalate was detected in the SVOC method blank SW0411 at a level above the method detection limit (2,160 µg/L). Guidance for Removal Activities requires that associated sample concentrations less than the ten times the blank level are qualified as undetected (U) at the reported value. Samples TFPS20 and BHPS8 contain bis(2-ethylhexyl)phthalate (308 µg/L and 4,500 µg/L, respectively), with each level less than ten times the blank level, and therefore, the results have been qualified as undetected (U) at the reported value. Samples TFPS72, TFPS98, BHPS10, and BHPS13 contain bis(2-ethylhexyl)phthalate at levels greater than ten times the blank level, and the results have been qualified as estimated (J) at the reported values.

Sample ID	Analyte	Criteria	Qualifier
TFPS20	Bis(2-ethylhexyl)phthalate	Result less than 10 times the method blank level	U
TFPS72	Bis(2-ethylhexyl)phthalate	Result greater than 10 times the method blank level	J
TFPS98	Bis(2-ethylhexyl)phthalate	Result greater than 10 times the method blank level	J
BHPS10	Bis(2-ethylhexyl)phthalate	Result greater than 10 times the method blank level	J
BHPS8	Bis(2-ethylhexyl)phthalate	Result less than 10 times the method blank level	U
BHPS13	Bis(2-ethylhexyl)phthalate	Result greater than 10 times the method blank level	J

Surrogate Analysis—Acceptable with Qualifications

Six surrogate compounds (three acid and 3 base/neutral) were analyzed with each sample and blank in accordance with the method. Except as noted below, all surrogate recovery values are within the laboratory control limits.

The phenol-d5 surrogate recovery values for sample TFPS20 (99.5 percent) and matrix spike TFPS20 (94.4 percent) are above the laboratory control limits (10 to 90 percent) because of matrix interferences. Data qualifiers are not required because the Guidance for Removal Activities allows one surrogate per fraction to exceed criteria without qualification.

The 2-fluorophenol (453 percent) and phenol-d5 (243 percent) surrogate recovery values for sample TFPS98 are above laboratory control limits (10 to 117 percent for 2-fluorophenol and 10 to 90 percent for phenol-d5) because of matrix interferences. The Guidance for Removal Activities requires qualifying data when two or more surrogate recovery values in the same fraction (base/neutral or acid) are outside criteria. Therefore, the acid analytes were qualified as estimated detection limit with a high bias (UJH) as shown on the following table.

Sample ID	Analyte	Criteria	Qualifier
TFPS98	All acid analytes	Two acid surrogate recoveries above control limits	UJH

The 2-fluorobiphenyl (4.46 percent) surrogate recovery value for sample TFPS98 is below the laboratory control limits (50 to 130 percent) because of matrix interferences. Data qualifiers are not required for base/neutral analytes because the Guidance for Removal Activities allows one surrogate per fraction to exceed criteria without qualification.

The p-terphenyl-d14 surrogate recovery value (537 percent) for sample BHPS8 is above the laboratory control limits (54 to 139 percent) because of matrix interferences. Data qualifiers are not required because the Guidance for Removal Activities allows one surrogate per fraction to exceed criteria without qualification.

Internal Standard Evaluation—Acceptable with Discussion

Six internal standards were added to all samples, blanks, and QC samples as required. The response and retention time criteria established by the Guidance for Removal Activities were met with the exceptions noted below.

Internal standard area counts ensure that the GC/MS sensitivity and response are stable during every analytical run. The area count for the internal standard perylene-d₁₂ was outside the response criterion for sample TFPS98. Non-detect sample results for those analytes associated errant internal standard are estimates and have been qualified as UJ.

Sample ID	Analyte	Criteria	Qualifier
TFPS98	Di-n-octyl-phthalate, Benzo (b) fluoranthene, Benzo (k) fluoranthene, Benzo (a) pyrene Indeno (1,2,3-cd)- pyrene, Dibenz (a,h)-anthracene, Benzo (g,h,i) perylene	Area count outside criterion	UJ

Matrix Spike Analysis—Acceptable with Discussion

Matrix spike/matrix spike duplicates (MS/MSDs) were analyzed at the required frequency.

Sample BHPS10 was analyzed as the solid product matrix spike/matrix spike duplicate (MS/MSD). The percent recovery values for ten of the eleven compounds in the MS/MSD analysis associated with sample BHPS10 exceeded the quality control limits. Although matrix interferences are indicated by these results, qualification is not required because all of the other QC criteria were met and action is not taken on MS/MSD data alone.

Sample TFPS20 was analyzed as the aqueous product MS/MSD. The percent recovery values of anthracene in the MS/MSD analysis associated with sample TFPS20 exceeded the quality control limits (72 to 125 percent). Although matrix interferences are indicated by these results, qualification is not required because all of the other QC criteria were met and action is not taken on MS/MSD data alone.

Duplicate Analysis—Acceptable with Discussion

Sample BHPS10 was analyzed as the solid product matrix spike/matrix spike duplicate (MS/MSD). All relative percent difference (RPD) values are within laboratory control limits (0 to 60 percent) and no data were qualified.

Sample TFPS20 was analyzed as the aqueous product MS/MSD. The RPD values for seven of the sixteen compounds in the MS/MSD analysis associated with sample TFPS20 exceeded quality control limits. Although matrix interferences are indicated by these results, qualification is not required because all of the other QC criteria were met and action is not taken on MS/MSD data alone.

Field duplicate samples were not collected.

Laboratory Control Sample Analysis—Acceptable with Discussion

One blank spike/blank spike duplicate (sample SS0575) was analyzed with the product samples for solid SVOC analysis and one blank spike/blank spike duplicate (sample SW0411) was analyzed with the product samples for aqueous SVOC analysis. All percent recovery and RPD values are within the laboratory control limits, with the exceptions noted below.

The percent recovery value of anthracene in the blank spike/blank spike duplicate analysis associated with sample SW0411 exceeded the quality control limits. Data qualification is not required for anthracene because the bias is high and anthracene was not detected in the product samples.

Laboratory Reporting Limits—Acceptable with Discussion

The product practical quantitation limits for samples analyzed for SVOCs (10 to 483,000 µg/kg) and for PAHs (100 to 19,800 µg/kg) are generally above the SQAP practical quantitation limit range (13 to 667 µg/kg). The samples had high PQLs due to the high analyte concentrations present in these samples.

The method detection limit and the practical quantitation limit represent different levels of accuracy. Positive values less than the practical quantitation limit are considered estimates and have been qualified B to identify the results as below the practical quantitation limit.

Sample ID	Analyte	Criteria	Qualifier
PSPS1	Pyrene	Reported result less than the PQL	B
PSPS7	Anthracene	Reported result less than the PQL	B
TFPS72	bis(2-ethylhexyl)phthalate	Reported result less than the PQL	B
TFPS98	bis(2-ethylhexyl)phthalate	Reported result less than the PQL	B
BHPS10	bis(2-ethylhexyl)phthalate	Reported result less than the PQL	B
BHPS13	bis(2-ethylhexyl)phthalate	Reported result less than the PQL	B

Tentatively Identified Compounds

Tentatively identified compound reporting is not required for this project.

Overall Assessment of Data Quality

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

Laboratory Communications

The laboratory was not contacted regarding the SVOC/PAH analyses.

Definition of Data Qualifiers

The following data validation qualifiers were used in the review of this data set. With the exception of the R qualifier, these qualifiers are from the *Sampling and Quality Assurance Plan* (SQAP) *Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

- J** The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quantity control criteria were not met.
- U** The material was analyzed for, but was not detected. The associated numerical value is the sample detection limit or the adjusted sample detection limit.
- UJ** The material was analyzed for, but was not detected. The reported detection limit is estimated because quality control criteria were not met.
- B** Detection concentration is between instrument detection limit and the practical quantitation limit.
- H** High bias.
- K** Unknown bias.
- L** Low bias

References

- Herrera. 2002. Sampling and Quality Assurance Plan, Colville Drum Sites, Colville Indian Reservation, Washington. Prepared for U. S. Environmental Protection Agency – Region 10 Superfund Technical Assessment & Response Team. Herrera Environmental Consultants, Seattle, Washington. July 2002.
- USEPA. 1990. Quality Assurance/Quality Control Guidance for Removal Activities. Sampling QA/QC Plan and Data Validation Procedures. Interim Final. U.S. Environmental Protection Agency, Environmental Response Team, Emergency Response Division, Office of Emergency and Remedial Response. Washington, D.C. EPA/540/G-90-004. April 1990.
- USEPA. 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. U.S. Environmental Protection Agency, Washington, D.C. EPA 540/R-94-012. October 1999.
- USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 Third Edition, Updates I, II, IIA, IIB, and III. Office of Solid Waste and Emergency Response. U.S. Environmental Protection Agency, Washington, D.C. December 1996.

Herrera Environmental Consultants, Inc.

Memorandum

To Project File C00-01732-027
cc Michael Olson, Herrera Environmental Consultants
From Diana Phelan and Rob Zisette, Herrera Environmental Consultants
Date September 10, 2002
Subject Total Phosphorus Data Validation for Colville Drum Sites, TDD #02-06-0007

Introduction

This memorandum presents a review of product data collected from the Colville Drum Sites located on the Colville Indian Reservation, Washington. Product sample TFPS98 was collected on July 13, 2002. Severn Trent Services of Tacoma, Washington analyzed the sample for total phosphorus using U.S. EPA Method 365.1.

Sample Data Reviewed

Sample ID	Laboratory Sample ID	Date/Time Sampled
TFPS98	107385-11	7/13/02; 17:20

The laboratory's performance was reviewed in accordance with quality control (QC) specifications outlined in the *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (Guidance for Removal Activities) (USEPA 1990), the *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (Functional Guidelines) (USEPA 1994), and the specified analytical method. Data quality objectives (DQOs), project detection limits, and quality control (QC) sample frequencies are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

Quality control and raw laboratory data submitted by the laboratory were reviewed. Data validation results are summarized below. No data qualifiers (flags) were added to the sample results in the laboratory reports.

Data Validation

Custody, Preservation, Holding Times, and Completeness—Acceptable

Sample custody was properly maintained from sample collection to receipt at the laboratory. The sample was properly preserved and received intact at the laboratory. The sample was analyzed within the required holding time (28 days). The laboratory data package is complete and contains test results for the sample listed on the chain-of-custody (COC).

The sample temperature at the time of laboratory receipt was documented as 3.7 degrees Celsius, which is acceptable and no data have been qualified.

Laboratory Reporting Limit—Acceptable with Discussion

The SQAP does not list a practical quantitation limit for total phosphorus.

Blank Analysis—Acceptable

A method blank was analyzed with sample TFPS98. The method blank did not contain a reportable level of total phosphorus and no data have been qualified.

Laboratory Quality Control Check—Not Analyzed

Laboratory quality control check samples are not required by the method.

Surrogate Analysis—Not Applicable

Laboratory Control Sample Analysis—Acceptable

One blank spike (R3234) was analyzed with sample TFPS98. The percent recovery value is within the laboratory control limits.

Matrix Spike Analysis—Acceptable with Discussion

A non-project sample (laboratory ID 107573-1) was analyzed as the total phosphorus matrix spike. The percent recovery value (-500 percent) exceeded the laboratory control limits (90 to 110 percent) because of high target analyte concentrations in the sample. However, control limits are not applicable because the sample concentration was greater than four times the spike concentration, and no data were qualified in accordance with Functional Guidelines.

Duplicate Analysis—Acceptable

A non-project sample (laboratory ID 107573-1) was analyzed in duplicate for total phosphorus. The RPD value (9.0 percent) is within the laboratory control limits and no data have been qualified.

Overall Assessment of Data Quality

The total phosphorus results met the data quality objectives established in the SQAP. Upon consideration of the information presented here, the data are acceptable without qualification.

References

Herrera. 2002. Sampling and Quality Assurance Plan, Colville Drum Sites, Colville Indian Reservation, Washington. Prepared for U. S. Environmental Protection Agency – Region 10 Superfund Technical Assessment & Response Team (START). Herrera Environmental Consultants, Inc. of Seattle, Washington. July 2002.

USEPA. 1990. Quality Assurance/Quality Control Guidance for Removal Activities. Sampling QA/QC Plan and Data Validation Procedures. Interim Final. U.S. Environmental Protection Agency, Environmental Response Team, Emergency Response Division, Office of Emergency and Remedial Response. Washington, D.C. EPA/540/G-90-004. April 1990.

USEPA. 1994. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. U.S. Environmental Protection Agency, Washington, D.C. EPA 540/R-94-013. February 1994.

USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 Third Edition, Updates I, II, IIA, IIB, and III. Office of Solid Waste and Emergency Response. U.S. Environmental Protection Agency, Washington, D.C. December 1996.

Herrera Environmental Consultants, Inc.

Memorandum

To Project File C00-01732-027

cc Michael Olson, Herrera Environmental Consultants

From Diana Phelan and Rob Zisette, Herrera Environmental Consultants
Tom Cammarata, TJC Scientific Services

Date September 10, 2002

Subject Halogenated Volatile Organic Compounds and Volatile Organic Compounds
Data Validation for Colville Drum Sites, TDD #02-06-0007

Introduction

This memorandum presents a review of product data collected from the Colville Drum Sites located on the Colville Indian Reservation, Washington. Sixteen product samples were collected between July 12 and 14, 2002. Severn Trent Services of Tacoma, Washington analyzed 12 samples for halogenated volatile organic compounds (HVOCs) using U.S. EPA Method 8260 and 4 samples for volatile organic compounds (VOCs) using U.S. EPA Method 8260B Modified (USEPA 1996).

Sample Data Reviewed

Sample ID	Laboratory Sample ID	Analysis	Date/Time Sampled
PSPS1	107385-1	HVOCs	7/12/02; 16:05
PSPS7	107385-2	HVOCs	7/12/02; 16:30
TFPS14	107385-3	HVOCs	7/13/02; 14:20
TFPS20	107385-4	VOCs	7/13/02; 14:28
TFPS37	107385-5	HVOCs	7/13/02; 14:45
TFPS50	107385-6	VOCs	7/13/02; 15:19
TFPS54	107385-7	HVOCs	7/13/02; 15:25
TFPS56	107385-8	VOCs	7/13/02; 15:29
TFPS71	107385-9	HVOCs	7/13/02; 15:44
TFPS72	107385-10	VOCs	7/13/02; 15:46
TFPS100	107385-12	HVOCs	7/13/02; 17:35
TFPS111	107385-13	HVOCs	7/13/02; 17:56
TFPS116	107385-14	HVOCs	7/13/02; 18:20
BHPS1	107385-15	HVOCs	7/14/02; 08:45
BHPS13	107385-19	VOCs	7/14/02; 09:05
BHPS2	107385-21	VOCs	7/14/02; 09:15

The laboratory's performance was reviewed in accordance with quality control (QC) specifications outlined in the *Quality Assurance/Quality Control Guidance for Removal Activities, Sampling QA/QC Plan and Data Validation Procedures* (Guidance for Removal Activities) (USEPA 1990), the *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (Functional Guidelines) (USEPA 1999), and the specified analytical method. Data quality objectives (DQOs), project detection limits, and quality control (QC) sample frequencies are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

Quality control data submitted by the laboratory were reviewed; raw laboratory data were not reviewed. Data qualifiers flags were added to the sample results in the laboratory reports. Data validation results are summarized below, followed by a summary of laboratory communications and definitions of data qualifiers.

Data Validation

Custody, Preservation, Holding Times, and Completeness—Acceptable with Qualifications

Sample custody was properly maintained from sample collection to receipt at the laboratory. The samples were properly preserved and received intact at the laboratory. Five of the 16 samples were analyzed within the required holding time of 14 days from collection for product samples. The reanalysis of samples TFPS20, TFPS50, TFPS56, TFPS71, BHPS13, and BHPS2 were performed 5 to 7 days beyond the method required holding time. Previous analysis attempts on these samples failed because of foaming issues of other samples associated with this batch. Positive results in samples TFPS20, TFPS50, TFPS56, TFPS71, BHPS13, and BHPS2 are qualified as estimated (J) and non-detected analytes qualified as UJ as shown in the following table.

The laboratory data package is complete and contains test results for all samples listed on the chain-of-custody (COC). On the COC, HVOC analysis was requested for sample TFPS56 (laboratory ID 107385-08) but the laboratory analyzed the sample for VOCs instead.

The sample temperature at the time of laboratory receipt was documented as 3.7 degrees Celsius, which is acceptable and no data have been qualified.

Sample ID	Analyte	Criteria	Qualifier
TFPS20	all VOC analytes	Sample holding time exceeded	J, UJ
TFPS50	all VOC analytes	Sample holding time exceeded	J, UJ
TFPS56	all VOC analytes	Sample holding time exceeded	J, UJ
TFPS71	all HVOC analytes	Sample holding time exceeded	J, UJ
BHPS13	all VOC analytes	Sample holding time exceeded	J, UJ
BHPS2	all VOC analytes	Sample holding time exceeded	J, UJ

Instrument Tuning and Mass Calibration—Acceptable

The tuning compound 4-bromofluorobenzene was analyzed at the required frequency and all relative abundance values are acceptable.

Initial Calibration—Acceptable

Initial calibrations were analyzed at the required frequency. Initial calibration criteria (i.e., percent relative standard deviation [RSD] values less than or equal to 30 percent and relative response factors [RRFs] greater than 0.05) established by the Guidance for Removal Activities were met for all target compounds.

Continuing Calibration—Acceptable with Discussion

Continuing calibration verification (CCV) standards were analyzed at the required frequency. Continuing calibration criteria (i.e., percent difference values less than or equal to 25 percent and RRFs greater than 0.05) established by the Guidance for Removal Activities were met for all target compounds with the exception of bromomethane. For the CCV performed on July 23, 2002, the percent difference (%D) for bromomethane (34%) was outside the CCV criterion.

The %D between the initial and continuing calibration reflects the performance of the instrument over time for specific analyte. Because of the elevated %D, positive results for bromomethane are considered estimates and have been qualified as J, while non-detect results are qualified as UJ.

Sample ID	Analyte	Criteria	Qualifier
PSPS1	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
PSPS7	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
TFPS37	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
TFPS50	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
TFPS54	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
TFPS71	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
TFPS72	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
TFPS100	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
TFPS111	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
TFPS116	Bromomethane	Continuing calibration %D was outside criterion	J, UJ
BHPS1	Bromomethane	Continuing calibration %D was outside criterion	J, UJ

Blank Analysis—Acceptable

Method blanks were analyzed at the required frequency. The method blanks do not contain reportable levels of volatile organic compounds and no data have been qualified.

Surrogate Analysis—Acceptable

Five surrogate compounds were analyzed with each sample and blank in accordance with the method. All surrogate recovery values are within the laboratory control limits.

Internal Standard Evaluation—Acceptable

Internal standards were added to all samples, blanks, and QC samples as required. The response and retention time criteria established by the Guidance for Removal Activities were met.

Matrix Spike Analysis—Acceptable with Discussion

Product matrix spike analyses were not performed. Data qualifiers are not required because the blank spike/blank spike duplicate demonstrates that the analytical system is in-control.

Duplicate Analysis—Acceptable with Discussion

Product MS/MSD analyses were not performed. Data qualifiers are not required because the blank spike/blank spike duplicate demonstrates that the analytical system is in-control.

Field duplicate samples were not collected.

Laboratory Control Sample Analysis—Acceptable

One blank spike/blank spike duplicate (sample ITS1666) was analyzed with the product samples for VOC analysis and one blank spike/blank spike duplicate (sample HP0472) was analyzed with the product samples for aqueous VOC analysis. All percent recovery and RPD values are within the laboratory control limits.

Laboratory Reporting Limits—Acceptable with Discussion

Practical quantitation limits (PQLs) listed in the SQAP (250 to 500 µg/kg) were met in two of the 16 product samples (100 to 200 µg/kg; samples TFPS20 and TFPS56) analyzed for volatile organic compounds and halogenated volatile organic compounds. The 14 remaining samples had high PQLs due to analysis of each sample at a dilution factor ranging from 10 to 10,000 fold.

The method reporting limit (MRL) and the practical quantitation limit (PQL) represent different levels of accuracy. Positive values less than the practical quantitation limit but above the method reporting limit are considered estimates and have been qualified as B to identify the results as below the practical quantitation limit.

Sample ID	Analyte	Criteria	Qualifier
PSPS1	Chloromethane	Reported result less than the PQL but above the MRL	B
TFPS50	Benzene	Reported result less than the PQL but above the MRL	B
TFPS50	1,2,4-Trimethylbenzene	Reported result less than the PQL but above the MRL	B
107385X06	4-Isopropyltoluene	Reported result less than the PQL but above the MRL	B
TFPS54	Chloromethane	Reported result less than the PQL but above the MRL	B
TFPS116	Chloromethane	Reported result less than the PQL but above the MRL	B

Tentatively Identified Compounds

Tentatively identified compound reporting is not required for this project.

Overall Assessment of Data Quality

The useability of the data is based on the guidance documents listed above. Upon consideration of the information presented here, the data are acceptable except where flagged with data qualifiers that modify the usefulness of the individual values.

Laboratory Communications

The laboratory was not contacted regarding the VOC/HVOC analyses.

Definition of Data Qualifiers

The following data validation qualifiers were used in the review of this data set. With the exception of the R qualifier, these qualifiers are from the *Sampling and Quality Assurance Plan (SQAP) Colville Drum Sites, Colville Indian Reservation, Washington* (Herrera 2002).

- J** The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quantity control criteria were not met.
- U** The material was analyzed for, but was not detected. The associated numerical value is the sample detection limit or the adjusted sample detection limit.
- UJ** The material was analyzed for, but was not detected. The reported detection limit is estimated because quality control criteria were not met.
- B** Detection concentration is between instrument detection limit and the practical quantitation limit.

- H** High bias.
- K** Unknown bias.
- L** Low bias

References

Herrera. 2002. Sampling and Quality Assurance Plan, Colville Drum Sites, Colville Indian Reservation, Washington. Prepared for U. S. Environmental Protection Agency – Region 10 Superfund Technical Assessment & Response Team (START). Herrera Environmental Consultants, Inc. of Seattle, Washington. July 2002.

USEPA. 1990. Quality Assurance/Quality Control Guidance for Removal Activities. Sampling QA/QC Plan and Data Validation Procedures. Interim Final. U.S. Environmental Protection Agency, Environmental Response Team, Emergency Response Division, Office of Emergency and Remedial Response. Washington, D.C. EPA/540/G-90-004. April 1990.

USEPA. 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review. U.S. Environmental Protection Agency, Washington, D.C. EPA 540/R-94-012. October 1999.

USEPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW-846 Third Edition, Updates I, II, IIA, IIB, and III. Office of Solid Waste and Emergency Response. U.S. Environmental Protection Agency, Washington, D.C. December 1996.

APPENDIX C

Hazard Categorization Sheets

APPENDIX D

Cost Estimates for Removal Activities

APPENDIX E

Removal Decision Form

