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**Leaking Underground Storage Tank
Site Characterization Report**

Tonasket Public School District #404

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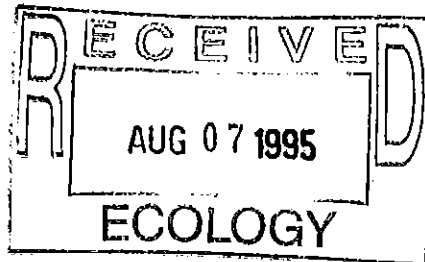
July 1995

Prepared for:

Tonasket Public School #404
District Office
P.O. Box 468
Tonasket, Washington 98855
(509) 486-2126

Prepared by:

Bison Environmental Resources, Inc.
S. 107 Cedar
Spokane, Washington 99204
(509) 624-4341



Authorized by:

A handwritten signature in dark ink, appearing to read "R. David Enos".

Date:

7/27/95

R. David Enos, R.P.G.
Project Manager, Bison Environmental Resources Inc.

Reviewed by:

A handwritten signature in dark ink, appearing to read "Donald J. Hurst".

Date:

7/27/95

Donald J. Hurst, R.P.G.
President, Bison Environmental Resources Inc.



Executive Summary

In May, 1995, four underground storage tanks (USTs) were removed at the Tonasket School District (TSD) campus located in Tonasket, Washington. These tanks included one 10,000 gallon P.S. 300/#2 fuel oil UST (UST #1), one 300 gallon #2 fuel oil UST (UST #2), one 500 gallon gasoline UST (UST #3), and one 1,000 gallon gasoline UST (UST #4). Note that UST numbers 1, 2, 3, and 4 in this report correspond to Washington State Department of Ecology UST numbers 3, 4, 2, and 1 respectively.

Results of analyses collected during UST removal indicated that UST #1, UST #2, and UST #4 leaked. Consequently, limited over-excavation was performed in an attempt to remediate impacted soil at all three release sites. Excavation was stopped when it became apparent that the integrity of nearby building structures were threatened if over-excavation continued. Results of samples obtained at the limit of over-excavation boundaries indicates that remediation is incomplete. For complete description of tank removal activities and conclusions, see *UST Removal Report, Tonasket Public School District #404, June 1995* by Bison Environmental Resources, Inc. (Bison).

On June 21, 1995 Bison installed two soil borings to determine the vertical limit of hydrocarbon contamination. One of the soil borings was installed at the location of deepest documented contamination at the UST #1 and UST #2 site. This soil boring was installed to 34 ft below ground surface (bgs). The other soil boring was installed at the former location of the UST #4 leak, and was completed to 44 feet bgs. Both soil borings were installed to 15 ft beyond the deepest interval of contamination as determined through field analysis of soil samples. Groundwater was not encountered in either soil boring.

During drilling, soil samples were collected at five foot intervals in both soil borings. Soil samples were submitted for laboratory analysis for hydrocarbons. Results were compared to applicable Washington State Department of Ecology's Model Toxics Control Act soil cleanup levels. Results indicate that approximately 17.5 cubic yards of impacted soil remains below the former UST #1/UST #2 site between 19 ft and 23 ft below the ground surface. In addition, approximately 9.5 cubic yards remain below the former UST #4 site between 8.5 and 17 ft below the ground surface.

Both impacted areas present a low threat to human health and the environment given the chemical composition of the contaminants, depth of the contaminants, and depth to groundwater in the vicinity. Bison recommends that Tonasket School District manage both impacted areas in-place.



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1.0 INTRODUCTION

In May, 1995, four underground storage tanks (USTs) were removed at the Tonasket School District (TSD) campus located in Tonasket, Washington. These tanks included one 10,000 gallon P.S. 300/#2 fuel oil UST (UST #1), one 300 gallon #2 fuel oil UST (UST #2), one 500 gallon gasoline UST (UST #3), and one 1,000 gallon gasoline UST (UST #4). Note that UST numbers 1, 2, 3, and 4 in this report correspond to Washington State Department of Ecology UST numbers 3, 4, 2, and 1 respectively.

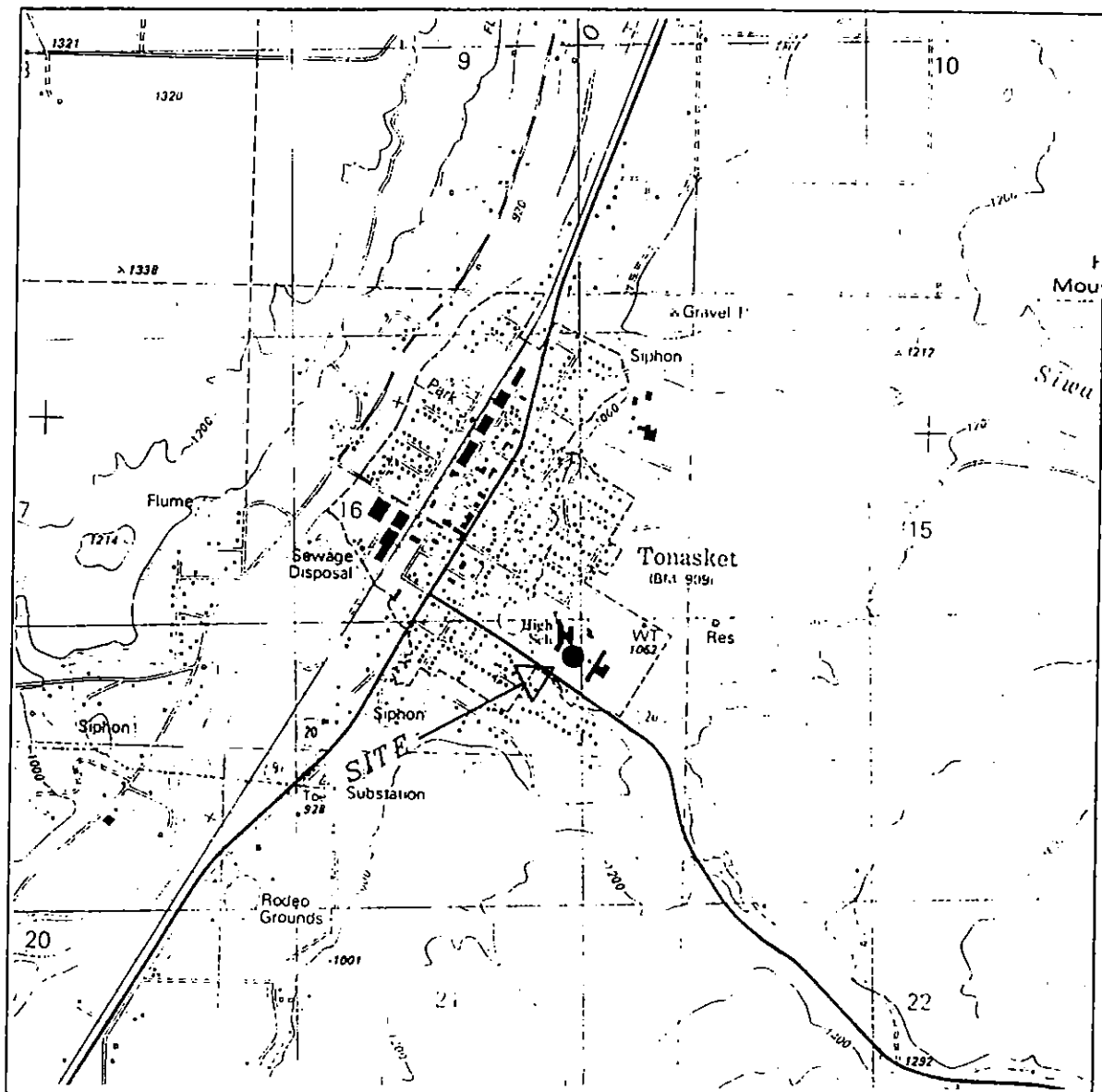
UST #1 and UST #2 were located within a single excavation east of the school campus boiler room. UST #2 was located approximately 2 feet from the south end of UST #1, with its long axis perpendicular to UST #1's long axis. UST #3 and UST #4 were located between bus garages at the school district's bus storage and maintenance facility. Both of these tanks were installed end-to-end in a single excavation. See Figure 3 for UST #1 and UST #2 location, and Figure 4 for UST #3 and UST #4 location.

During removal, Bison Environmental Resources, Inc. (Bison) collected soil samples from around the boundaries of each tank excavation for both field and laboratory analysis. Results of analyses indicated that UST #1, UST #2, and UST #4 leaked. UST #1 appeared to have leaked from a vent line fitting at the south end of the UST. UST #2 was found to have several seam holes located at the bottom of the tank, although direct evidence of release into soils was obscured by the larger UST #1 release. UST #4 appeared to have leaked at the tank's distribution line fitting.

Following UST removal, limited over-excavation was performed in an attempt to remediate impacted soil at all three release sites. Excavation was stopped when it became apparent that the integrity of nearby building structures were threatened if over-excavation continued. Results of samples obtained at the limit of over-excavation boundaries indicated that remediation is incomplete. For complete description of tank removal activities and conclusions, see Bison's report *UST Removal Report, Tonasket Public School District #404, June 1995*.

Consequently, a subsurface investigation was initiated to characterize the extent of contaminated soil. This report presents findings and methodology of this subsurface investigation. See Figure 1 for Site Location Map, and Figures 2 and 3 for soil boring locations.





TONASKET SCHOOL DISTRICT UST REMOVAL PROJECT



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Figure 1.
Site Location Map

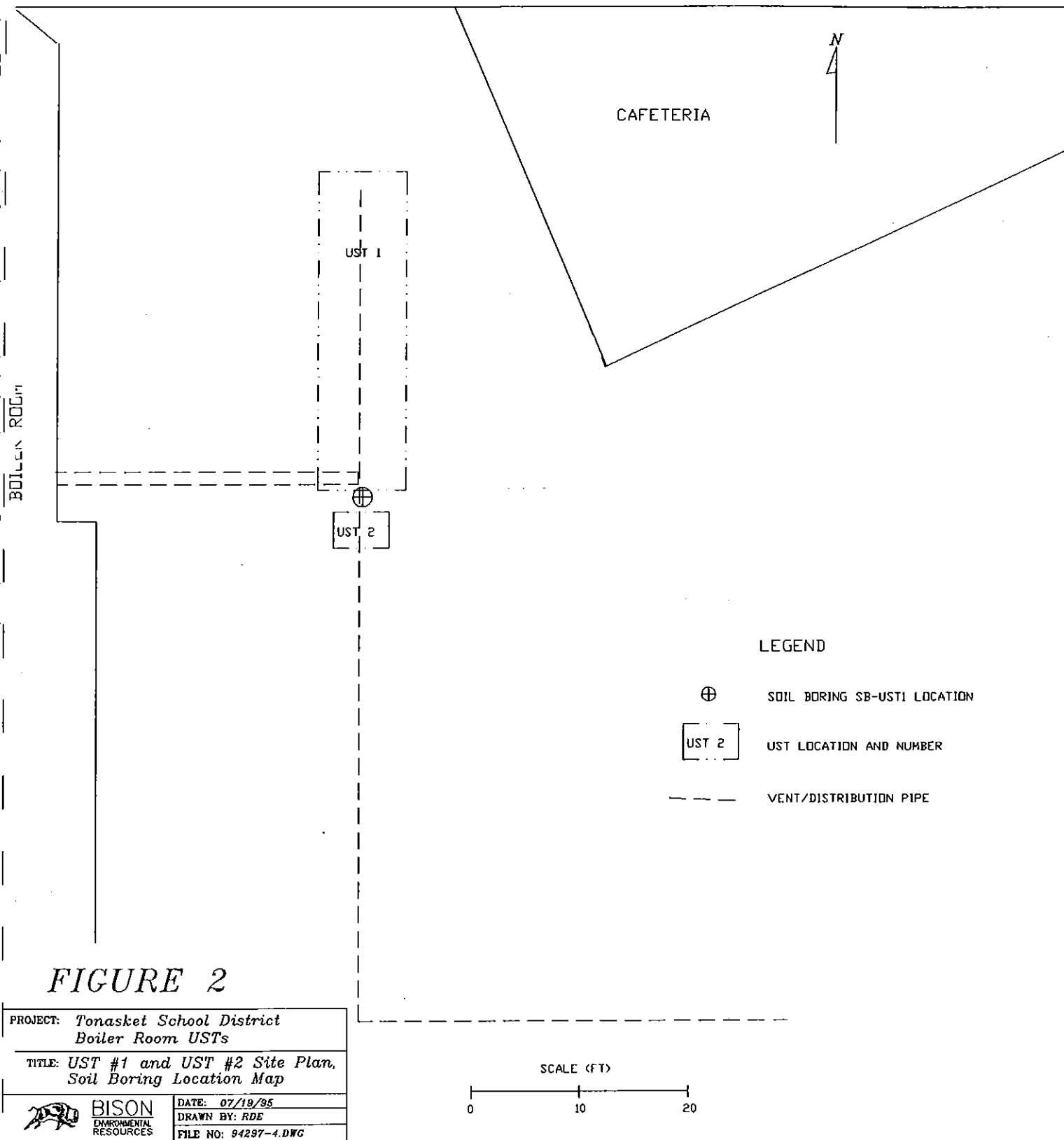


FIGURE 2

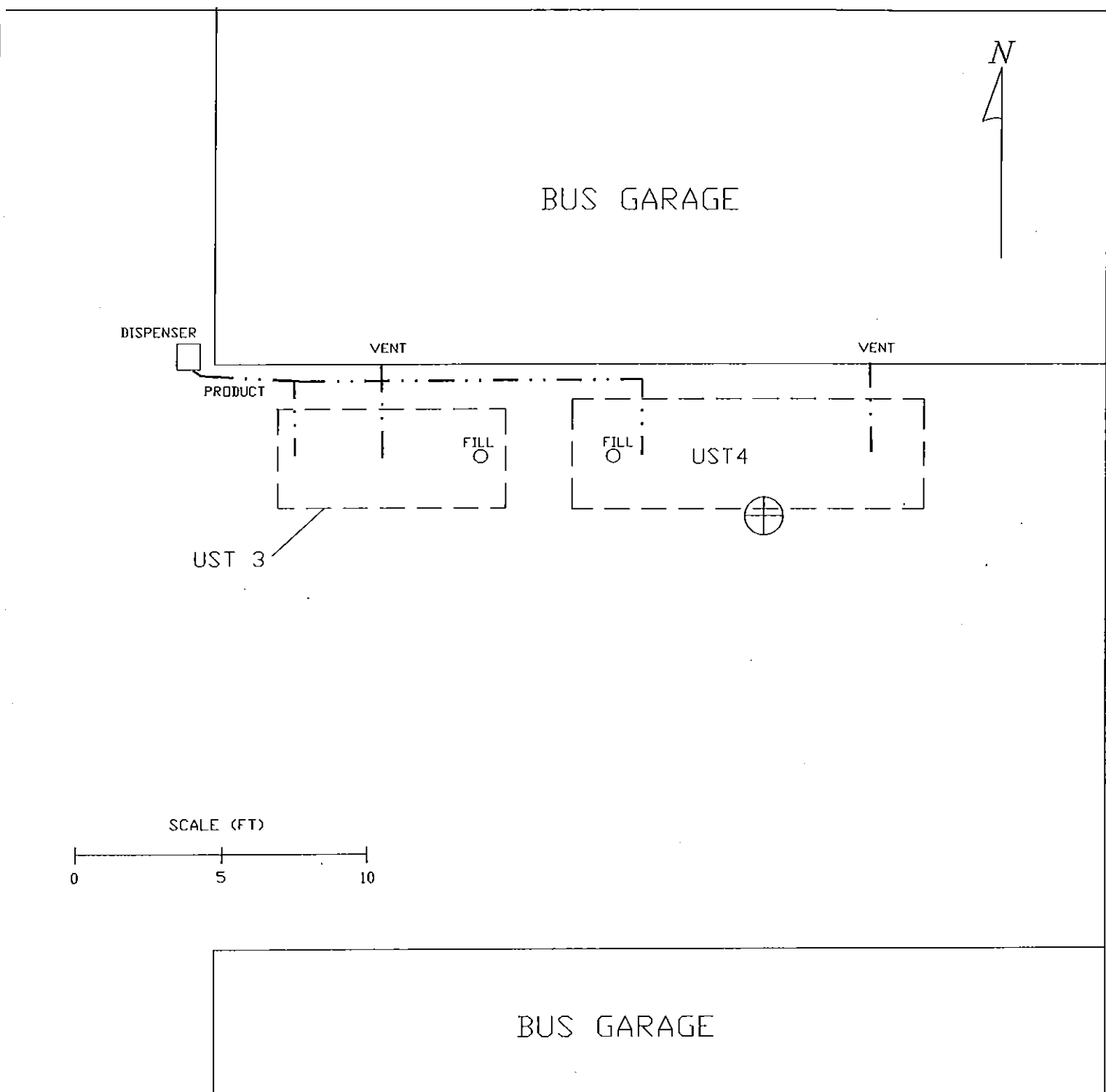






FIGURE 3

PROJECT: <i>Tonasket School District Boiler Room USTs</i>	
TITLE: <i>UST #4 Site Plan, Soil Boring Location Map</i>	
 BISON ENVIRONMENTAL RESOURCES	DATE: 07/19/95
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- 
 SOIL BORING SB-UST4 LOCATION
- 
 FORMER UST LOCATION
- 
 VENT/DISTRIBUTION PIPING (REMOVED)

2.0 FIELD INVESTIGATION

On June 21, 1994, Environmental West Exploration installed 2 soil borings at the Tonasket School District site. Bison personnel performed geologic interpretation, environmental sampling, and health and safety monitoring during drilling. Both borings were installed consistent with WAC-173-360.

One soil boring, SB-UST1, was installed between the former location of UST #1 and UST #2 at the location of previously documented deepest contamination. The other soil boring, SB-UST4, was installed at the location of the UST #4 leak. Both soil borings were installed by 8-inch hollow stem-auger using a Schram Drill Rig. Total depth of SB-UST1 was 34 ft below ground surface (bgs), total depth of SB-UST4 was 44 ft bgs. Both borings were abandoned with bentonite chips installed as the augers were removed from the borehole. Bentonite was hydrated every five feet with potable water. See Figure 3 and Figure 4 for soil boring locations.

2.1 Sampling Methodology

Samples were collected every five feet during soil boring SB-UST1 and SB-UST4 installation. Soil samples were collected using a decontaminated 2-ft long, 2-inch diameter split-spoon sampler. A standard 140 lb. hammer was used to drive the sampler into undisturbed soil ahead of the lead auger flight. Blow counts were recorded during the installation of both soil borings.

Once the sampler had been driven to the desired sampling depth, the sampler was retrieved. The sampler was slowly opened on a core table by a Bison geologist. Soil from the center of the split-spoon was immediately transferred into a labeled borosilicate glass sample container and packaged on ice. Soil samples were later hand delivered to North Creek Analytical in Spokane, Washington. Soil samples from SB-UST1 were analyzed for Washington State Total Petroleum Hydrocarbons for Gasoline and Diesel (WTPH-G and WTPH-D), and Benzene, Ethylbenzene, Toluene, and Xylenes (BETX). Soil samples from SB-UST4 were analyzed for Washington State Total Petroleum Hydrocarbons for Diesel and Heavy Oil (WTPH-D and WTPH-D Extended). Section 3.2 summarizes sample analytical results from SB-UST1, Section 4.2 summarize sample analytical from SB-UST4.

Samples were also collected for field analysis. Field analysis included testing for headspace, odor, sheen, and visual assessment. Headspace analysis was performed by placing soil samples into a one quart plastic bag, kneading to expose maximum soil surface to the air in the bag, and measuring the trapped air with a photoionization detector. The odor test consisted of smelling the soil for the presence of hydrocarbon odors. Sheen test consisted of placing a small sample of soil into a disposable plastic bowl containing water while examining for a characteristic rainbow hydrocarbon sheen. Visual inspection entailed examining the soil for unusual characteristics that would indicate soil contamination. Section 3.1 summarizes the results of field analysis from SB-UST1 and Section 4.1 summarizes results of field analysis for SB-UST4.



Each soil sample was also classified by Bison's geologist using the Unified Soil Classification System. Soil borelogs present results of classification and are presented in Appendix B, SB-UST1 and SB-UST4 Soil Borelogs.

3.0 FINDINGS OF UST #1 AND UST #2 SOIL BORING INVESTIGATION

Soil boring SB-UST1 was installed at the location where the UST #1 and UST #2 release was found to extend to depth during initial remediation. Soil samples were obtained at 5 ft intervals beginning at 19 ft bgs, with a 17 ft bgs sample obtained to verify correct placement of soil boring. Nineteen feet below ground surface is the maximum depth of remedial excavation performed during tank removal activities (note that due to grading of the site, the datum used during tank removal activities was 4 ft higher than the datum used during this sub-surface investigation).

Soils encountered during drilling were primarily sands and gravelly sands. Total depth of SB-UST1 was 34 ft bgs. No groundwater or confining layers were found during drilling. Complete soil boring logs are presented in Appendix A. The following sub-sections present results of both field and laboratory analysis of samples obtained during SB-UST1 installation.

3.1 Soil Boring SB-UST1 Field Analysis Results

All samples obtained during SB-UST1 installation were field analyzed for the presence of hydrocarbons, except for the 17 ft sample which was examined to verify non-native material at depth. Field analysis of contaminated samples was consistent with P.S. 300 fuel oil type contamination. No data was collected suggesting additional contaminant types. The following table presents results of field analysis.

Table 1
UST #1 and UST #2 Soil Boring Field Analysis Results

Sample Number	Location	Field Analysis Results			
		Headspace (ppm)	Odor	Sheen	Visual
SBUST-1/17	Soil boring SB-UST1, 17 ft bgs at the former location of leaking USTs #1 and #2	NA	NA	NA	None
SBUST-1/19	Soil boring SB-UST1, 19 ft bgs at the former location of leaking USTs #1 and #2	33	Strong	Strong	Contaminated
SBUST-1/24	Soil boring SB-UST1, 24 ft bgs at the former location of leaking USTs #1 and #2	0.4	None	None	None
SBUST-1/29	Soil boring SB-UST1, 29 ft bgs at the former location of leaking USTs #1 and #2	0.8	None	None	None
SBUST-1/34	Soil boring SB-UST1, 34 ft bgs at the former location of leaking USTs #1 and #2	1.0	None	None	None



3.2 Soil Boring SB-UST1 Analytical Results

Following completion of field activities, soil samples for analytical analysis were hand delivered to North Creek Analytical in Spokane, Washington for analysis. Analytical results indicate the sample collected at the 19 ft depth at the SB-UST1 location exceeded the Washington State Department of Ecology's Model Toxics Control Act (MTCA) Method A soil cleanup level of 200 ppm for diesel range and heavy oil range total petroleum hydrocarbons. Samples collected at 24 ft, 29 ft and 34 ft at the SB-UST1 location did not have detectable levels of diesel or heavy oil range hydrocarbons. Conclusions of soil boring investigation are presented in Section 6.1. See Table 2 for summary of sample number, location, and analytical results.

Table 2
UST #1 and UST #2 Soil Boring Analytical Results

SAMPLE NUMBER	LOCATION	CONCENTRATION IN PPM	MTCA METHOD A SOIL CLEANUP LEVEL, IN PPM
SBUST-1/19	Soil boring SB-UST1, 19 ft bgs at the former location of leaking USTs #1 and #2.	WTPH-D: 13,000 WTPH-D EXT: 22,000	200
SBUST-1/24	Soil boring SB-UST1, 24 ft bgs at the former location of leaking USTs #1 and #2	WTPH-D: < 10 WTPH-D EXT: < 25	200
SBUST-1/29	Soil boring SB-UST1, 29 ft bgs at the former location of leaking USTs #1 and #2	WTPH-D: < 10 WTPH-D EXT: < 25	200
SBUST-1/34	Soil boring SB-UST1, 34 ft bgs at the former location of leaking USTs #1 and #2	WTPH-D: < 10 WTPH-D EXT: < 25	200

Note: MTCA Exceedances shown in bold type

4.0 FINDINGS OF UST #4 SOIL BORING INVESTIGATION

Soil boring SB-UST4 was installed at the location where the UST #4 release was found to extend to depth during initial remediation. Soil samples were obtained at 5 ft intervals beginning at 8.5 ft bgs. Eight and one half feet below ground surface is the maximum depth of remedial excavation performed during tank removal activities.

Soils encountered during drilling were primarily sands and gravelly sands. Total depth of SB-UST4 was 44 ft bgs. No groundwater was found during drilling. At about 25 ft bgs, a dipping 3/4-inch interbed of silty clay was observed. Dip of this bed appeared to approximately 45 degrees. These dipping interbeds were also seen in the 35 ft bgs sample. Complete soil boring logs are presented in Appendix A. The following sub-sections present results of both field and laboratory analysis of samples obtained during SB-UST1 installation.



4.1 Soil Boring SB-UST4 Field Analysis Results

All samples obtained during soil boring SB-UST4 installation were field analyzed for the presence of hydrocarbons. Field analysis of contaminated samples was consistent with weathered gasoline type contamination. No data was collected suggesting additional contaminant types. The following table presents results of field analysis.

Table 3
UST #4 Soil Boring Field Analysis Results

Sample Number	Location	Field Analysis Results			
		Headspace (ppm)	Odor	Sheen	Visual
SB-UST4/9	Soil boring SB-UST4, 9 ft bgs at the former location of leaking UST #4	30	Moderate	Slight	None
SB UST4-1/14	Soil boring SB-UST4, 14 ft bgs at the former location of leaking UST #4	500	Strong	Strong	Contaminated
SB-UST41/19	Soil boring SB-UST4, 19 ft bgs at the former location of leaking UST #4	12	Slight	Slight	None
UST41/24	Soil boring SB-UST4, 24 ft bgs at the former location of leaking UST #4	5	Moderate to Slight	Slight	None
SBUST4-1/29	Soil boring SB-UST4, 29 ft bgs at the former location of leaking UST #4	1.6	None to Slight	None to Slight	None
UST4-1/34	Soil boring SB-UST4, 34 ft bgs at the former location of leaking UST #4	1.4	None	None	None
UST4-1/40	Soil boring SB-UST4, 40 ft bgs at the former location of leaking UST #4	0.5	None	None	None
UST4-1/44	Soil boring SB-UST4, 44 ft bgs at the former location of leaking UST #4	0.2	None	None	None

4.2 Soil Boring SB-UST4 Analytical Results

Following completion of field activities, soil samples for analytical analysis were hand delivered to North Creek Analytical in Spokane, Washington for analysis. Analytical results indicate only the sample collected at the 14 ft depth at the SB-UST4 location exceeded the Washington State Department of Ecology's Model Toxics Control Act (MTCA) Method A total petroleum soil cleanup level of 100 ppm for gasoline range and 200 ppm for diesel range total petroleum hydrocarbons. All other samples from SB-UST1 were below MTCA cleanup levels. See Section 6.2 for conclusions of UST-4 soil boring investigation. See Table 4 for summary of sample number, location, and analytical results.



Table 4
UST #4 Soil Boring Analytical Results

SAMPLE NUMBER	LOCATION	CONCENTRATION IN PPM	MTCA METHOD A SOIL CLEANUP LEVEL, IN PPM
SB-UST4/9	Soil boring SB-UST4, 9 ft bgs at the former location of leaking UST #4.	WTPH-G: 23 WTPH-D: 160 Benzene: < 0.05 Ethylbenzene: < 0.05 Toluene: < 0.05 Xylenes: < 0.10	100 200 0.5 20.0 40.0 20.0
SB UST4-1/14	Soil boring SB-UST4, 14 ft bgs at the former location of leaking UST #4.	WTPH-G: 580 WTPH-D: 1,600 Benzene: < 0.05 Ethylbenzene: < 0.05 Toluene: 0.19 Xylenes: 6.9	100 200 0.5 20.0 40.0 20.0
SB-UST41/19	Soil boring SB-UST4, 19 ft bgs at the former location of leaking UST #4.	WTPH-G: 2.2 WTPH-D: < 10 Benzene: < 0.05 Ethylbenzene: < 0.05 Toluene: < 0.05 Xylenes: < 0.10	100 200 0.5 20.0 40.0 20.0
UST41/24	Soil boring SB-UST4, 24 ft bgs at the former location of leaking UST #4.	WTPH-G: 1.6 WTPH-D: < 10 Benzene: < 0.05 Ethylbenzene: < 0.05 Toluene: < 0.05 Xylenes: < 0.10	100 200 0.5 20.0 40.0 20.0
SBUST4-1/29	Soil boring SB-UST4, 29 ft bgs at the former location of leaking UST #4.	WTPH-G: < 1.0 WTPH-D: < 10 Benzene: < 0.05 Ethylbenzene: < 0.05 Toluene: < 0.05 Xylenes: < 0.10	100 200 0.5 20.0 40.0 20.0
UST4-1/34	Soil boring SB-UST4, 34 ft bgs at the former location of leaking UST #4.	WTPH-G: 1.2 WTPH-D: < 10 Benzene: < 0.05 Ethylbenzene: < 0.05 Toluene: < 0.05 Xylenes: < 0.10	100 200 0.5 20.0 40.0 20.0
UST4-1/40	Soil boring SB-UST4, 40 ft bgs at the former location of leaking UST #4.	WTPH-G: < 1.0 WTPH-D: < 10 Benzene: < 0.05 Ethylbenzene: < 0.05 Toluene: < 0.05 Xylenes: < 0.10	100 200 0.5 20.0 40.0 20.0
UST4-1/44	Soil boring SB-UST4, 44 ft bgs at the former location of leaking UST #4.	WTPH-G: < 1.0 WTPH-D: < 10 Benzene: < 0.05 Ethylbenzene: < 0.05 Toluene: < 0.05 Xylenes: < 0.10	100 200 0.5 20.0 40.0 20.0

Note: MTCA Exceedances shown in bold type



5.0 INVESTIGATIVE WASTE DISPOSAL

Investigative solid waste, included soil boring cuttings, sampling supplies, and plastic sheeting, was disposed at the Wenatchee Regional Landfill in Wenatchee, Washington. Investigative liquid waste included decontamination rinsate. Decontamination rinsate was sampled for total petroleum hydrocarbons and BETX concentrations. Results indicated that concentrations were below levels requiring treatment, therefore liquids were land applied on-site near the UST #4 site. See Table 6 for summary of rinsate laboratory analysis, and Appendix A for laboratory report. Table 5 presents investigative wastes generated and disposed during this investigation:

Table 5
Rinsate Water Laboratory Results

Sample Number	Concentration (ppm)	Technical Standard (ppm) ¹
UST1-UST4	WTPH-G: 0.066	1.0
	BETX: < 0.0025	0.10
	Benzene: < 0.0005	0.005
	WTPH-D: 8.4	10

¹ Technical Standards for short-term treated effluent discharge of 60 days or less as endorsed by WDOE's joint Water Quality/Toxics Cleanup Management Team, in memo dated June 15, 1992.

Table 6
Investigative Waste Disposal Summary

Quantity	Waste Description	Disposal Facility
3 drums	Petroleum contaminated soil	Wenatchee Regional Landfill
1 drum	Decontamination supplies, plastic sheeting, used sampling supplies	Wenatchee Regional Landfill
1 drum	Decontamination rinsate water	Land applied on-site

6.0 CONCLUSIONS

6.1 UST #1 and UST #2

Vertical and horizontal extent of contamination is adequately defined based upon field and laboratory data. This is supported by the following:

1. Laboratory and field analysis of soil obtained immediately below the location of the UST #1 and UST #2 leak indicates that soil with concentrations of hydrocarbons above the MTCA cleanup level does not extent deeper than approximately 23 ft bgs.



2. Horizontal contaminant migration through capillary forces is not expected to be substantial given the site soil types (sands and gravels). No other lithologic structures were observed that may enhance or accelerate horizontal migration of the plume. Since the contaminant plume was about eight feet in diameter at the release area of about 8 ft bgs, and assuming 1 ft in 10 ft horizontal dispersion, a plume diameter of 11 ft is projected at the maximum extent of vertical migration (21 ft).
3. No water-table aquifer was present in alluvium underlying the site from ground surface to at least 35 ft below the site. Therefore, there is a very low probability that migration of fuel oil off-site has occurred.

The contaminant plume is believed to be a mixture of #2 fuel oil and P.S. 300. Extent of impact is thought to be limited by the thick, viscous nature of the P.S. 300 released from the UST #1 system. Similarly, observed vertical migration of P.S. 300 has probably been enhanced by the #2 fuel oil released from UST #2. Since the source of contamination has been removed, contaminant plume is not expected to migrate substantially in either a vertical or horizontal direction.

The majority of the most heavily impacted soil was removed concurrent with UST removal. Impacted soil immediately below the UST was excavated to approximately 19 ft bgs. Remaining impacted soil is thought to exist in a roughly cylindrical shaped plume with a 11 ft radius from approximately 19 ft bgs to approximately 23 ft bgs immediately below the former USTs. This plume shape is consistent with unsaturated dispersion characteristics of fuel oil and sandy/gravelly soil, and laboratory analysis of site soil samples. Given these dimensions, approximately 17.5 cubic yards of impacted soil above MTCA cleanup standards remain at the UST #1/UST #2 site.

The current threat to human health and the environment of the remaining contaminated soil is low for the following reasons:

1. Fuel oil has relatively low toxicity.
2. The source and the majority of impacted soil has been removed, and remaining impacted soil is well below the ground surface at approximately 19 ft to 23 ft. Total volume of remaining impacted soil is estimated to be 17.5 cubic yards.
3. Contaminant plume is at least 14 ft above any groundwater aquifer and is possibly greater than 57 ft above groundwater (assuming constant groundwater elevation between this site and UST #4 site).
4. The ground surface above impacted soil is scheduled to be covered by a building in late 1995, thus eliminating precipitation infiltration as a possible source driving future migration.



6.2 UST #4

Vertical and horizontal extent of contamination are adequately defined based upon field and laboratory data. This is supported by the following:

1. Laboratory and field analysis of soil obtained immediately below the former location of the leaking UST indicates that soil with concentrations of hydrocarbons above MTCA cleanup levels does not extend deeper than approximately 17 ft bgs.
2. Horizontal contaminant migration through capillary forces is not expected to be substantial given the site soil types (sands and gravels). Dipping beds observed during drilling were found about 8 ft below the maximum extent of contamination as determined through analytical analysis and are unlikely to have influenced the plume. Since the contaminant plume was about 4 feet in diameter at the release area (bottom of the UST) at about 6 ft bgs, and assuming 1 ft in 10 ft horizontal dispersion, the plume would have a diameter of 6.2 ft at the maximum extent of vertical migration (17 ft).
3. No water-table aquifer was present in alluvium underlying the site from ground surface to 45 ft below the site. No evidence was present that contamination intersected dipping interbeds first observed approximately 8 ft below bottom of the maximum vertical extent of plume. Therefore, there is a very low probability that migration of gasoline off-site has occurred.

The majority of the most heavily impacted soil was removed concurrent with UST removal. Impacted soil immediately below the UST was excavated to approximately 8.5 ft bgs. Remaining impacted soil is thought to exist in a roughly cylindrical shaped plume extending from 8.5 ft bgs to about 17 ft bgs. Diameter of this plume is thought to be approximately 4.5 ft at 8.5 ft bgs, spreading to about 6.2 ft at 17 ft bgs immediately below the former UST. Given these dimensions, approximately 9.5 cubic yards of soil impacted above MTCA cleanup levels remains at the site.

The current threat to human health and the environment of the remaining contaminated soil is low for the following reasons:

1. BETX and lead compounds are not present in concentrations considered to be a significant health risk based upon MTCA risk assessment methods.
2. The source and the majority of impacted soil has been removed and only a small amount of impacted soil remains at a depth unlikely to be disturbed through human activity. Remaining impacted soil is thought to be limited to approximately 8.5 ft to 17 ft below ground surface at the former UST #4 location. Total volume of remaining impacted soil is approximately 9.5 cubic yards.
3. Contaminant plume is at least 28 ft above any groundwater aquifer.



7.0 RECOMMENDATIONS

There are two primary options to address soil remaining in-place at both locations. The first option would be to remove the soil and treat or dispose to an appropriate facility, the second option would be to manage or treat the soil in-place.

Soil Removal

UST #1 and #2

Removal of the soil would require special engineering considerations. Excavation would not be possible unless sidewall shoring methods were utilized to preserve the structural integrity of adjacent buildings. Once shoring is in place, excavation could be possible with a clam shell bucket used with crane. Also, excavation would have to be performed prior to scheduled construction of new high school building over the release site. Finally, compaction of fill following excavation would have to be performed to structural fill standards. Costs to engineer and excavate soil would greatly out-weigh the threat to human health and the environment posed by the remaining contamination. Therefore, Bison recommends managing this contaminant plume in-place.

UST #4

Removal of the contaminated soil remaining at this site would also require shoring to retain structural integrity of the nearby bus garages, although it may be possible that only the two sidewalls adjacent to the bus garages would require shoring. Once shoring was in-place, excavation could be performed using standard excavation equipment. However, since the threat to human health and the environment is low at this site, treating or managing the soil in-place may be less costly and equally beneficial to the environment. Therefore, Bison recommends managing this contaminant plume in-place.

Management In-Place

UST #1 and #2

Since removal of the impacted soil would require major engineering considerations, cost of remediation does not appear to be warranted given the current low threat to human health and the environment. In addition, biological treatment would likely be ineffective given results of prior treatability study performed on the impacted soil (see Bison's report *UST Removal Report, Tonasket Public School District #404, June 1995*). Therefore, we recommend management of the soil in-place as the desired option.

This option would require the following:



1. Engineering controls to reduce the threat to human health and the environment. This could include such measures as installation of an impermeable cap over the impacted area to prevent infiltration. High school building scheduled for construction over the affected area could operate in such a capacity as long as no stormwater or septic infiltration points are installed within 25 ft of the area.
2. Institutional controls to prevent future threat to human health and the environment. This would entail placing a restrictive deed covenant on record with the local County Register of Deeds warning of the buried hazard.

UST #4

Because excavation would require special engineering considerations, in-place treatment or management may be TSD's most cost effective options. In-place treatment could be performed utilizing soil vapor extraction or bio-venting or a combination of both. Further study would be required to design either type of remedial system.

Management of the impacted soil in-place would require the following:

1. Engineering controls to reduce the threat to human health and the environment. This could include installation of an impermeable cap over the impacted area to prevent infiltration. This cap could be asphalt or concrete paving.
2. Institutional controls to prevent future threat to human health and the environment. This would entail placing a restrictive deed covenant on record with the local County Register of Deeds warning of the buried hazard.



APPENDIX A
SOIL BORING SB-UST1 AND SB-UST4 BORELOGS



BISON ENVIRONMENTAL RESOURCES, INC BORING NO. SB-UST4-1

DATE DRILLED 06/21/95
METHOD HOLLOW-STEM AUGER
DRILLING CONTRACTOR ENVIRONMENTAL WEST

CONTRACT NO. 94297-2
LOCATION BTWN BUS GARAGE
GROUND ELEV. NA
BOREHOLE DIA. 8 IN.
ABANDONED W/ BENTONITE

PROJECT TONASKET SCHOOL DISTRICT
GEOLOGIST D. ENOS
TOTAL DEPTH 45 FT
PAGE # 1 OF 1

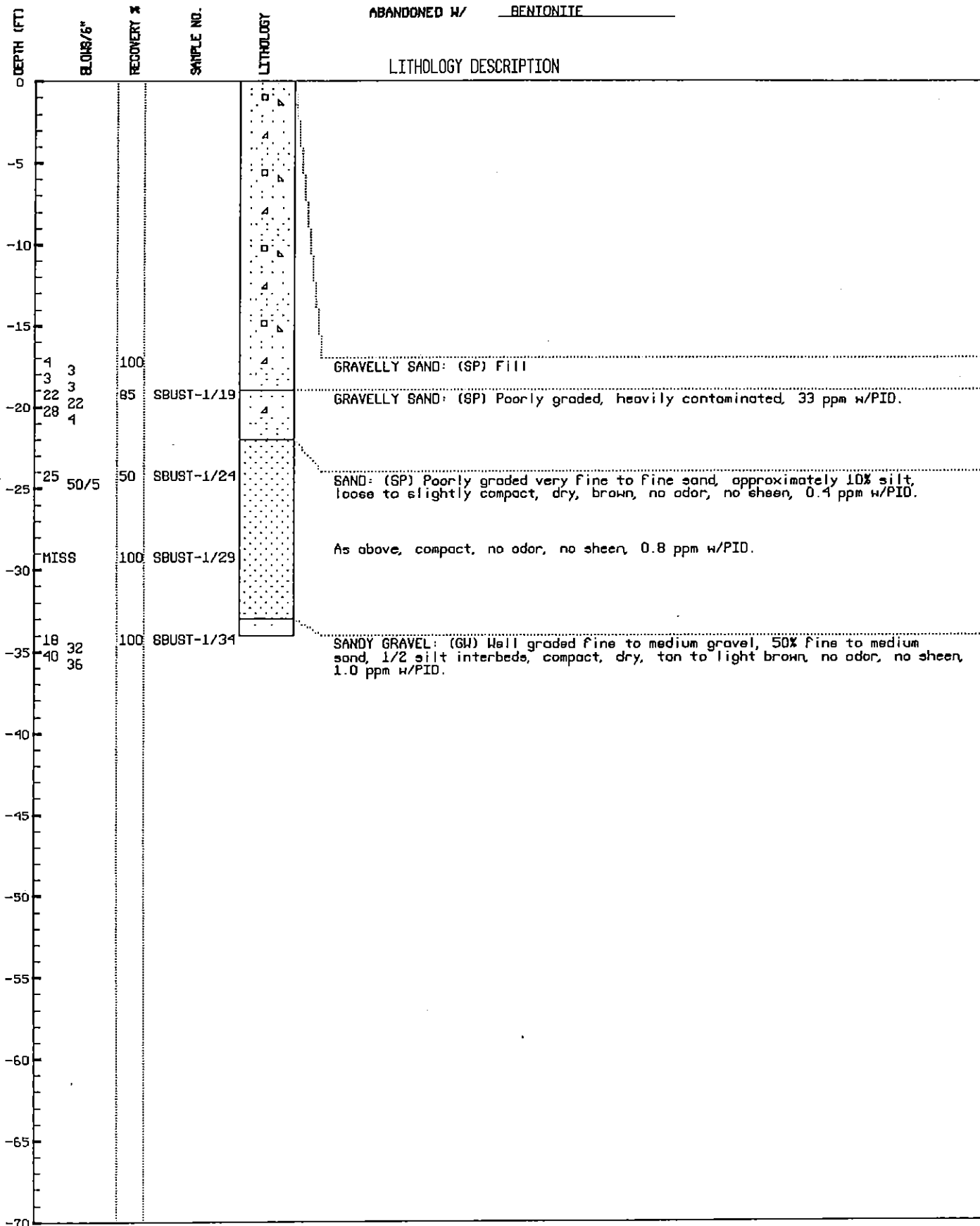
DEPTH (FT)	BLOGS/5"	RECOVERY %	SAMPLE NO.	LITHOLOGY	LITHOLOGY DESCRIPTION
-5					GRAVELLY SAND: (SP) Fill
-7	10	75	SBUST4/9		GRAVELLY SAND: (SP) Poorly graded granular fine sand, approximately 25% pea-gravel, loose, dry, light brown, moderate odor, possible slight sheen, 30 ppm w/PID.
-10	10				
-15	8	85	SB-UST4-1/14		GRAVELLY SAND: (SP) Well graded medium to coarse sand, small to medium gravel, loose, slightly damp, brown, zones of heavy contamination, strong odor, strong sheen, 500 ppm w/PID.
-18	16				
-20	9	90	SB-UST41/19		As above, slight odor, slight sheen, 12 ppm w/PID.
-25	13	100	UST41/24		SAND: (SP) Poorly graded fine to medium sand, loose, dry, tan to light brown, 3/4 inch silty clay layer in shoe with possible 45 degree dip, medium to slight odor, slight sheen, 5 ppm w/PID.
-25	25				
-30	14	100	SBUST4-1/29		As above, less medium sand, no odor, no sheen, 1.6 ppm w/PID.
-30	45				
-35	15	100	UST4-1/34		As above, with 45 degree silty clay layers as at 25 ft, no odor, no sheen, 1.4 ppm w/PID.
-35	47				
-40	13	50	UST4-1/40		SILTY SAND: (SP) Poorly graded very fine sand and silt, loose to slightly compact, dry, flat lying beds, no odor, no sheen, 0.5 ppm w/PID.
-40	50/5				
-45	31	25	UST4-1/44		SANDY GRAVEL: (GP) 50% poorly graded medium sand and 50% fine to medium gravel, loose, dry to slightly damp, dark brown, no odor, no sheen, 0.2 ppm w/PID.
-45	50/5				
-50					
-55					
-60					
-65					
-70					

BISON ENVIRONMENTAL RESOURCES, INC BORING NO. SB-UST1-1

DATES DRILLED 06/21/95
METHOD HOLLOW-STEM AUGER
DRILLING CONTRACTOR ENVIRONMENTAL WEST

CONTRACT NO. 94297-2
LOCATION NEAR BOILER ROOM
GROUND ELEV. NA
BOREHOLE DIA. 8 IN.
ABANDONED W/ BENTONITE

PROJECT TONASKET SCHOOL DISTRICT
GEOLOGIST D. ENOS
TOTAL DEPTH 34 FT
PAGE * 1 OF 1



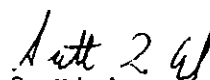
APPENDIX B
LABORATORY ANALYTICAL REPORT



Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave EnosProject Name: TONASKET S.O. UST
Client Project #: None Given
NCA Project #: S506074Received: Jun 22, 1995
Reported: Jun 30, 1995**PROJECT SUMMARY PAGE**

Laboratory Sample Number	Sample Description	Sample Matrix	Date Sampled
S506074-01	UST1/UST4	Water	6/21/95
S506074-02	SBUST-1/19	Soil	6/21/95
S506074-03	SBUST-1/24	Soil	6/21/95
S506074-04	SBUST-1/29	Soil	6/21/95
S506074-05	SBUST1/34	Soil	6/21/95
S506074-06	SB-UST4/9	Soil	6/21/95
S506074-07	SB UST4-1/14'	Soil	6/21/95
S506074-08	SB-UST41/19	Soil	6/21/95
S506074-09	UST41/24	Soil	6/21/95
S506074-10	SBUST4-1/29	Soil	6/21/95
S506074-11	UST4-1/34	Soil	6/21/95

The results in this report apply to the samples analyzed in accordance with the chain of custody document.
This analytical report must be reproduced in its entirety.

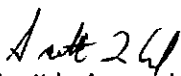
NORTH CREEK ANALYTICAL Inc.
Scott L. Armand
Laboratory Manager

506074.BIS <1>

Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave EnosProject Name: TONASKET S.O. UST
Client Project #: None Given
NCA Project #: S506074Received: Jun 22, 1995
Reported: Jun 30, 1995**PROJECT SUMMARY PAGE**

Laboratory Sample Number	Sample Description	Sample Matrix	Date Sampled
S506074-12	UST4-1/40	Soil	6/21/95
S506074-13	UST4-1/44	Soil	6/21/95

The results in this report apply to the samples analyzed in accordance with the chain of custody document.
This analytical report must be reproduced in its entirety.

NORTH CREEK ANALYTICAL Inc.
Scott L. Armand
Laboratory Manager

506074.BIS <2>

Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave Enos

Client Project ID: TONASKET S.O. UST
Sample Matrix: Soil
First Sample #: S506074-02

Received: Jun 22, 1995
Reported: Jun 30, 1995

TOTAL SOLIDS & MOISTURE CONTENT REPORT

Sample Number	Sample Description	Total Solids %	Moisture Content %
S506074-02	SBUST-1/19	92	8.0
S506074-03	SBUST-1/24	93	7.0
S506074-04	SBUST-1/29	92	8.0
S506074-05	SBUST1/34	92	8.0
S506074-06	SB-UST4/9	93	7.0
S506074-07	SB UST4-1/14'	97	3.0
S506074-08	SB-UST41/19	98	2.0
S506074-09	UST41/24	93	7.0
S506074-10	SBUST4-1/29	97	3.0
S506074-11	UST4-1/34	92	8.0
S506074-12	UST4-1/40	97	3.0

The enclosed analytical results for soils, sediments and sludges have been converted to a DRY WEIGHT reporting basis.
To attain the wet weight "as received" equivalent, multiply the dry weight result by the decimal fraction of percent Total Solids.

NORTH CREEK ANALYTICAL Inc.

Scott L. Armand
Scott L. Armand
Laboratory Manager

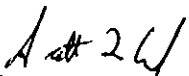
506074.BIS <3>

Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave EnosClient Project ID: TONASKET S.O. UST
Sample Matrix: Soil
First Sample #: S506074-13Received: Jun 22, 1995
Reported: Jun 30, 1995**TOTAL SOLIDS & MOISTURE CONTENT REPORT**

Sample Number	Sample Description	Total Solids %	Moisture Content %
S506074-13	UST4-1/44	92	8.0

The enclosed analytical results for soils, sediments and sludges have been converted to a DRY WEIGHT reporting basis.
To attain the wet weight "as received" equivalent, multiply the dry weight result by the decimal fraction of percent Total Solids.

NORTH CREEK ANALYTICAL Inc.


Scott L. Armand
Laboratory Manager

506074.BIS <4>

Blson Environmental Resources	Client Project ID: TONASKET S.O. UST	Sampled: Jun 21, 1995
107 South Cedar St.	Sample Matrix: Water	Received: Jun 22, 1995
Spokane, WA 99204-0625	Analysis Method: WTPH-G	Analyzed: Jun 26, 1995
Attention: Dave Enos	First Sample #: S506074-01	Reported: Jun 30, 1995

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

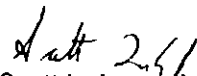
Sample Number	Sample Description	Sample Result $\mu\text{g/L}$ (ppb)	Surrogate Recovery %
S506074-01	UST1-UST4	66	110
BLK50626A	Method Blank	N.D.	78

Reporting Limit:	50
-------------------------	-----------

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.

Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.
Scott L. Armahd
Laboratory Manager

506074.BIS <5>

Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave Enos

Client Project ID: TONASKET S.O. UST
Sample Matrix: Water
Analysis Method: WTPH-G
Units: $\mu\text{g/L}$ (ppb)

Analyst: G. Holte

Analyzed: Jun 26, 1995
Reported: Jun 30, 1995

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

Gasoline

Spike Conc.
Added: 2000

Spike
Result: 2050

%
Recovery: 103

Upper Control
Limit %: 114

Lower Control
Limit %: 55

PRECISION ASSESSMENT Sample Duplicate

Gasoline Range
Organics

Sample
Number: S506081-01

Original
Result: 181

Duplicate
Result: 182

Relative
% Difference Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.

Maximum
RPD: 38

NORTH CREEK ANALYTICAL Inc.


Scott L. Armand
Laboratory Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result} - \text{Duplicate Result}}{(\text{Original Result} + \text{Duplicate Result}) / 2} \times 100$

506074.BIS <6>

Bison Environmental Resources	Client Project ID: TONASKET S.O. UST	Sampled: Jun 21, 1995
107 South Cedar St.	Sample Matrix: Water	Received: Jun 22, 1995
Spokane, WA 99204-0625	Analysis Method: EPA 8020	Analyzed: Jun 26, 1995
Attention: Dave Enos	First Sample #: S506074-01	Reported: Jun 30, 1995

BTEX DISTINCTION

Sample Number	Sample Description	Benzene $\mu\text{g/L}$ (ppb)	Toluene $\mu\text{g/L}$ (ppb)	Ethyl Benzene $\mu\text{g/L}$ (ppb)	Xylenes $\mu\text{g/L}$ (ppb)	Surrogate Recovery %
S506074-01	UST1-UST4	N.D.	N.D.	N.D.	N.D.	76
BLK50626A	Method Blank	N.D.	N.D.	N.D.	N.D.	78

Reporting Limits:	0.50	0.50	0.50	1.0
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4-Bromofluorobenzene surrogate recovery control limits are 55 - 144 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Scott L. Armand
Scott L. Armand
Laboratory Manager

506074.BIS <7>

Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave Enos

Client Project ID: TONASKET S.O. UST

Sample Matrix: Water
Analysis Method: EPA 8020
Units: µg/L (ppb)
QC Sample #: S506081-01

Analyst: G. Holte

Analyzed: Jun 26, 1995
Reported: Jun 30, 1995

MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	1.55	N.D.	N.D.	0.54
Spike Conc. Added:	10.0	10.0	10.0	30.0
Spike Result:	11.8	8.31	8.61	26.3
Spike % Recovery:	103%	83%	86%	86%
Spike Dup. Result:	12.0	8.36	8.67	26.5
Spike Duplicate % Recovery:	105%	84%	87%	87%
Upper Control Limit %:	138	121	126	130
Lower Control Limit %:	57	78	83	77
Relative % Difference:	1.7%	0.6%	0.7%	0.8%
Maximum RPD:	9.0	9.0	13	20

NORTH CREEK ANALYTICAL Inc.

% Recovery:	$\frac{\text{Spike Result} - \text{Sample Result}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Spike Result} - \text{Spike Dup. Result}}{(\text{Spike Result} + \text{Spike Dup. Result}) / 2} \times 100$

Set 2.4
Scott L. Armand
Laboratory Manager

Bison Environmental Resources	Client Project ID: TONASKET S.O. UST	Sampled: Jun 21, 1995
107 South Cedar St.	Sample Matrix: Water	Received: Jun 22, 1995
Spokane, WA 99204-0625	Analysis Method: WTPH-D Extended	Extracted: Jun 28, 1995
Attention: Dave Enos	First Sample #: S506074-01	Analyzed: Jun 29, 1995
		Reported: Jun 30, 1995

TOTAL PETROLEUM HYDROCARBONS - DIESEL RANGE EXTENDED

Sample Number	Sample Description	Diesel Result mg/L (ppm)	Heavy Oil Result mg/L (ppm)	Surrogate Recovery %
S506074-01	UST1-UST4	4.3	4.1	110
BLK50628B	Method Blank	N.D.	N.D.	120

Reporting Limit:	0.25	0.75
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2-Fluorobiphenyl surrogate recovery control limits are 50 - 150%.

Extractable Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24) and Heavy Oil Range Organics (>C24).

Analytes reported as N.D. were not detected above the stated Reporting Limit.

NORTH CREEK ANALYTICAL Inc.

Scott L. Armand
Scott L. Armand
Laboratory Manager

506074.BIS <9>

Blson Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave Enos

Client Project ID: TONASKET S.O. UST
Sample Matrix: Water
Analysis Method: WTPH-D
Units: mg/L (ppm)

Analyst: D. Risk

Extracted: Jun 28, 1995
Analyzed: Jun 29, 1995
Reported: Jun 30, 1995

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

Diesel

PRECISION ASSESSMENT Sample Duplicate

Diesel Range
Organics

Spike Conc.
Added: 5.00

Spike
Result: 4.49

%
Recovery: 89.8

Upper Control
Limit %: 119

Lower Control
Limit %: 74

Sample
Number: S506089-01

Original
Result: 3.82

Duplicate
Result: 3.40

Relative
% Difference 11.6

Maximum
RPD: 44

NORTH CREEK ANALYTICAL Inc.

Scott L. Armand
Scott L. Armand
Laboratory Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result} - \text{Duplicate Result}}{(\text{Original Result} + \text{Duplicate Result}) / 2} \times 100$

506074.B1S <10>

Bison Environmental Resources	Client Project ID: TONASKET S.O. UST	Sampled: Jun 21, 1995
107 South Cedar St.	Sample Matrix: Soil	Received: Jun 22, 1995
Spokane, WA 99204-0625	Analysis Method: WTPH-G	Analyzed: Jun 25, 1995
Attention: Dave Enos	First Sample #: S506074-06	Reported: Jun 30, 1995

TOTAL PETROLEUM HYDROCARBONS-GASOLINE RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
S506074-06	SB-UST4/9	23	130
S506074-07	SB UST4-1/14'	580 G-2	S-2
S506074-08	SB-UST41/19	2.2	99
S506074-09	UST41/24	1.6	96
S506074-10	SBUST4-1/29	N.D.	84
S506074-11	UST4-1/34	1.2	81
S506074-12	UST4-1/40	N.D.	83
S506074-13	UST4-1/44	N.D.	86
BLK50625A	Method Blank	N.D.	120

Reporting Limits

1.0

4-Bromofluorobenzene surrogate recovery control limits are 50 - 150 %.

Volatile Total Petroleum Hydrocarbons are quantitated as Gasoline Range Organics (toluene - dodecane).

Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc. Please Note:

G-2 = The chromatogram for this sample does not resemble a typical gasoline pattern.

S-2 = The Surrogate Recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.

Att 2 61
Scott L. Armand
Laboratory Manager

506074.BIS <11>

Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave Enos

Client Project ID: TONASKET S.O. UST
Sample Matrix: Soil
Analysis Method: WTPH-G
Units: mg/kg (ppm)

Analyst: G. Holte

Analyzed: Jun 25, 1995

Reported: Jun 30, 1995

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

Gasoline

Spike Conc.
Added: 2.00

Spike
Result: 2.04

%
Recovery: 102

Upper Control
Limit %: 118

Lower Control
Limit %: 47

PRECISION ASSESSMENT Sample Duplicate

Gasoline Range
Hydrocarbons

Sample
Number: S506074-13

Original
Result: N.D.

Duplicate
Result: 1.30

Relative % Difference Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.

Maximum
RPD: 62

NORTH CREEK ANALYTICAL Inc.

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result} - \text{Duplicate Result}}{(\text{Original Result} + \text{Duplicate Result}) / 2} \times 100$
Auth 261
Scott L. Armand
Laboratory Manager

506074.BIS <12>

Bison Environmental Resources	Client Project ID: TONASKET S.O. UST	Sampled: Jun 21, 1995
107 South Cedar St.	Sample Matrix: Soil	Received: Jun 22, 1995
Spokane, WA 99204-0625	Analysis Method: EPA 8020	Analyzed: Jun 25, 1995
Attention: Dave Enos	First Sample #: S506074-06	Reported: Jun 30, 1995

BTEX DISTINCTION

Sample Number	Sample Description	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)	Surrogate Recovery %
S506074-06	SB-UST4/9	N.D.	N.D.	N.D.	N.D.	74
S506074-07	SB UST4-1/14'	N.D.	N.D.	0.19	6.9	S-2
S506074-08	SB-UST41/19	N.D.	N.D.	N.D.	N.D.	59
S506074-09	UST41/24	N.D.	N.D.	N.D.	N.D.	62
S506074-10	SBUST4-1/29	N.D.	N.D.	N.D.	N.D.	54
S506074-11	UST4-1/34	N.D.	N.D.	N.D.	N.D.	53
S506074-12	UST4-1/40	N.D.	N.D.	N.D.	N.D.	55
S506074-13	UST4-1/44	N.D.	N.D.	N.D.	N.D.	58
BLK50625A	Method Blank	N.D.	N.D.	N.D.	N.D.	75

Reporting Limits:	0.050	0.050	0.050	0.10
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4-Bromofluorobenzene surrogate recovery control limits are 49 - 136 %.
Analytes reported as N.D. were not detected above the stated Reporting Limit.
The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc.

Please Note:

S-2 = The Surrogate Recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
Reporting limit for benzene and toluene is 0.10 ppm for sample #S506074-07.

Att 26
Scott L. Armand
Laboratory Manager

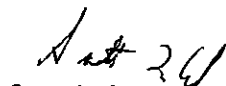
506074.BIG <13>

Bison Environmental Resources 107 South Cedar St. Spokane, WA 99204-0625 Attention: Dave Enos	Client Project ID: TONASKET S.O. UST Sample Matrix: Soil Analysis Method: EPA 8020 Units: mg/kg (ppm) QC Sample #: S506074-13	Analyst: G. Holte Analyzed: Jun 25, 1995 Reported: Jun 30, 1995
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MATRIX SPIKE QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Sample Result:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.50	0.50	0.50	1.50
Spike Result:	0.38	0.41	0.45	1.36
Spike % Recovery:	76%	82%	90%	91%
Spike Dup. Result:	0.40	0.42	0.45	1.40
Spike Duplicate % Recovery:	80%	84%	90%	93%
Upper Control Limit %:	108	111	123	122
Lower Control Limit %:	62	68	71	72
Relative % Difference:	5.3%	2.4%	0.0%	2.9%
Maximum RPD:	14	13	16	15

NORTH CREEK ANALYTICAL Inc.


Scott L. Armand
Laboratory Manager

% Recovery:	$\frac{\text{Spike Result} - \text{Sample Result}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Spike Result} - \text{Spike Dup. Result}}{(\text{Spike Result} + \text{Spike Dup. Result}) / 2} \times 100$

506074.BIS <14>

Bison Environmental Resources 107 South Cedar St. Spokane, WA 99204-0625 Attention: Dave Enos	Client Project ID: TONASKET S.O. UST Sample Matrix: Soil Analysis Method: WTPH-D First Sample #: S506074-06	Sampled: Jun 21, 1995 Received: Jun 22, 1995 Extracted: Jun 27, 1995 Analyzed: Jun 27/28, 1995 Reported: Jun 30, 1995
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TOTAL PETROLEUM HYDROCARBONS-DIESEL RANGE

Sample Number	Sample Description	Sample Result mg/kg (ppm)	Surrogate Recovery %
S506074-06	SB-UST4/9	160	150
S506074-07	SB UST4-1/14'	1,600 D-1	S-2
S506074-08	SB-UST41/19	N.D.	110
S506074-09	UST41/29	N.D.	120
S506074-10	SBUST4-1/24	N.D.	100
S506074-11	UST4-1/34	N.D.	130
S506074-12	UST4-1/40	N.D.	120
S506074-13	UST4-1/44	N.D.	110
BLK50627B	Method Blank	N.D.	120

Reporting Limit:	10
-------------------------	-----------

2-Fluorobiphenyl surrogate recovery control limits are 50 - 150 %.

Extractable Total Petroleum Hydrocarbons are quantitated as Diesel Range Organics (C12 - C24).

Analytes reported as N.D. were not detected above the stated Reporting Limit. The results reported above are on a dry weight basis.

NORTH CREEK ANALYTICAL Inc. Please Note:

D-1 = This sample appears to contain volatile gasoline range organics.

S-2 = The Surrogate Recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.

Scott L. Armand
Scott L. Armand
Laboratory Manager

S506074.BIS <15>

Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave Enos

Client Project ID: TONASKET S.O. UST
Sample Matrix: Soil
Analysis Method: WTPH-D
Units: mg/kg (ppm)

Analyst: D.Risk

Extracted: Jun 27, 1995
Analyzed: Jun 28, 1995
Reported: Jun 30, 1995

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

Diesel

Spike Conc.
Added: 167

Spike
Result: 175

%
Recovery: 105

Upper Control
Limit %: 125

Lower Control
Limit %: 72

PRECISION ASSESSMENT Sample Duplicate

Diesel Range
Hydrocarbons

Sample
Number: S506074-13

Original
Result: N.D.

Duplicate
Result: N.D.

Relative % Difference Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.

Maximum
RPD: 42

NORTH CREEK ANALYTICAL Inc


Scott L. Armand
Laboratory Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result} - \text{Duplicate Result}}{(\text{Original Result} + \text{Duplicate Result}) / 2} \times 100$

506074.BIS < 16 >

Bison Environmental Resources
107 South Cedar St.
Spokane, WA 99204-0625
Attention: Dave Enos

Client Project ID: TONASKET S.O. UST
Sample Matrix: Soil
Analysis Method: WTPH-D
Units: mg/kg (ppm)

Analyst: D.Risk

Extracted: Jun 27, 1995
Analyzed: Jun 28, 1995
Reported: Jun 30, 1995

HYDROCARBON QUALITY CONTROL DATA REPORT

ACCURACY ASSESSMENT Laboratory Control Sample

Diesel

Spike Conc.
Added: 167

Spike
Result: 175

%
Recovery: 105

Upper Control
Limit %: 125

Lower Control
Limit %: 72

PRECISION ASSESSMENT Sample Duplicate

Diesel Range
Hydrocarbons

Sample
Number: S506074-13

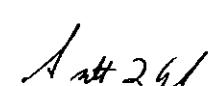
Original
Result: N.D.

Duplicate
Result: N.D.

Relative % Difference Relative Percent Difference values are not reported at sample concentration levels less than 10 times the Detection Limit.

Maximum
RPD: 42

NORTH CREEK ANALYTICAL Inc


Scott L. Armand
Laboratory Manager

% Recovery: $\frac{\text{Spike Result}}{\text{Spike Concentration Added}} \times 100$

Relative % Difference: $\frac{\text{Original Result} - \text{Duplicate Result}}{(\text{Original Result} + \text{Duplicate Result}) / 2} \times 100$

506074.B1S <18>

CHAIN OF CUSTODY REPORT

CLIENT: <u>BISON/TONASKET SCHOOL DIST.</u>				REPORT TO: <u>BISON</u>	
ADDRESS: <u>S. 107 Cedar</u> <u>Spokane WA 99204</u>				BILLING TO: <u>TONASKET S.D.</u>	
PHONE: <u>624-4341</u> FAX: <u>624-4358</u>				P.O. NUMBER:	
PROJECT NAME: <u>TONASKET S.D. UST</u>				NCA QUOTE #:	
PROJECT NUMBER:				Analysis	
SAMPLED BY: <u>D. ENOS</u>				Request:	
SAMPLE IDENTIFICATION: (NUMBER OR DESCRIPTION)	SAMPLING DATE / TIME	MATRIX (W.S.O)	# OF CONT.		
1. <u>UST1/UST4</u>	<u>6-21-5/14:30</u>	<u>W</u>	<u>48</u>	<u>WTPH-D-67</u>	<u>WTPH-6/EXT</u>
2. <u>SBUST-1/19</u>	<u>6-21-5/12:00</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
3. <u>SBUST-1/24</u>	<u>" / 12:15</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
4. <u>SBUST-1/29</u>	<u>" / 12:29</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
5. <u>SBUST1/34</u>	<u>/12:39</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
6. <u>SB-UST4/9</u>	<u>/08:08</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
7. <u>SBUST4-1/14'</u>	<u>/08:20</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
8. <u>SB-UST41/19</u>	<u>/08:43</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
9. <u>UST41/24</u>	<u>/08:55</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
10. <u>SBUST4-1/29</u>	<u>/09:12</u>	<u>S</u>	<u>1</u>	<u>X</u>	<u>X</u>
RELINQUISHED BY: <u>624-4341</u>				DATE: <u>6-22-01</u>	
PRINT NAME: <u>TONASKET S.D.</u>				FIRM: <u>BISON</u>	
RELINQUISHED BY:				DATE:	
PRINT NAME:				FIRM:	
ADDITIONAL REMARKS:					

TURNAROUND REQUEST in Business Days *

COC Rev 6. 10/94