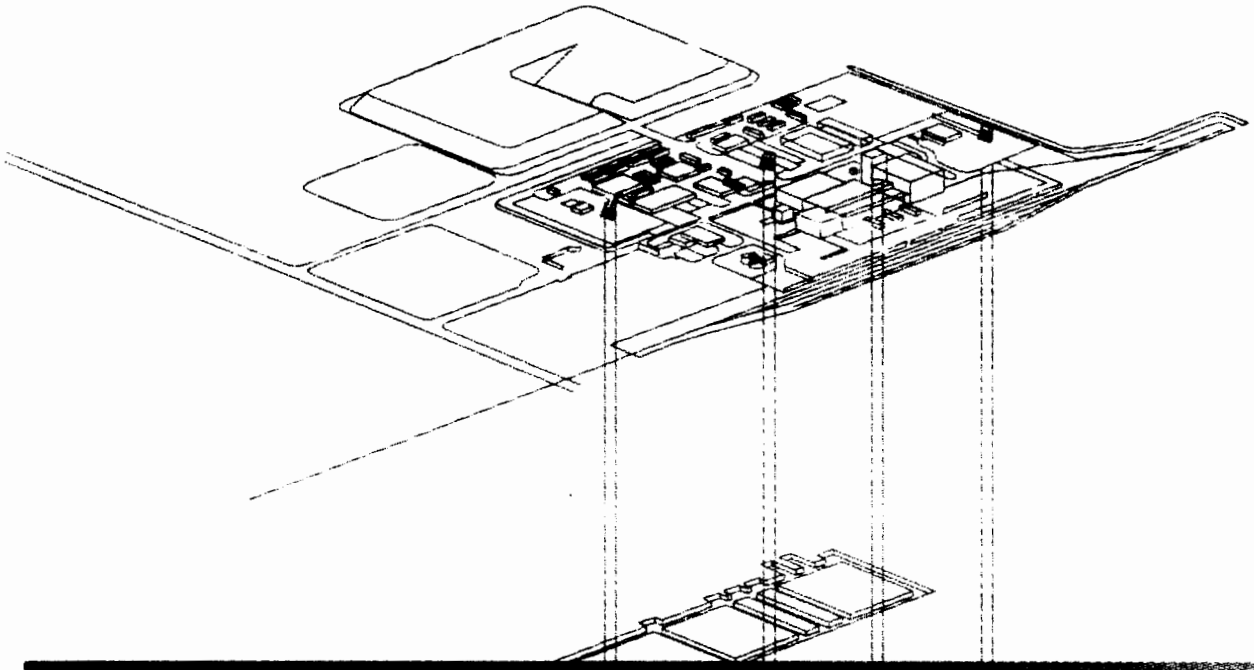
Composition and Origin of Nonindigenous Brine and Water in the Vicinity of the Exhaust Shaft, Waste Isolation Pilot Plant, New Mexico



February 1997

IT

970218

DOE/WIPP 97-2226

COMPOSITION AND ORIGIN OF NONINDIGENOUS BRINE AND WATER IN THE VICINITY OF THE EXHAUST SHAFT, WASTE ISOLATION PILOT PLANT, NEW MEXICO

Prepared for:

Westinghouse Electric Corporation
Waste Isolation Division
P.O. Box 2078
Carlsbad, NM 88220

Prepared by:

IT Corporation
5301 Central Avenue NE, Suite 700
Albuquerque, New Mexico 87108

February 1997

Processing and final preparation of this report were performed by IT Corporation for the Westinghouse Electric Corporation's Waste Isolation Division, the management and operating contract for the Waste Isolation Pilot Plant, under U.S. Department of Energy contract DE-AC04-86AL31950.

Table of Contents

List of Tables ii
List of Figures iii
1.0 Introduction 1
2.0 Sampling Locations 2
3.0 Analytical Results 5
4.0 Origin of Brine Compositions 14
5.0 Conclusions 28
6.0 References 29

Appendix A—Analytical Results
Appendix B—Validation of Analytical Results for Brine Samples

List of Tables

Table	Title
1	Underground Sampling Locations and Analytical Parameters
2	Summary of Brine Composition for Exhaust Shaft Basin Wastren Analyses from June 1996 through December 1996
3	Summary of Brine Composition for Borehole MWS8 Wastren Analyses from June 1996 through December 1996
4	Summary of Brine Composition for Borehole OH225 Wastren Analyses from June 1996 through December 1996
5	Summary of Brine Composition for Waste Shaft Sump Wastren Analyses from June 1996 through December 1996
6	Summary of Brine Composition for Salt Shaft Sump Wastren Analyses from June 1996 through December 1996
7	Summary of Brine Composition for Borehole EEP37B Wastren Analyses from June 1996 through December 1996
8	Summary of Brine Composition for Borehole OH63 Wastren Analyses from June 1996 through December 1996
9	Summary of Brine Composition for Perched Water Wastren Analyses from June 1996 through December 1996

List of Figures

Figure	Title
1	Brine Sampling Locations at WIPP's Underground Facility
2	Variation of (a) Sodium/Potassium Versus Calcium/Magnesium and (b) Sulfate/Total Inorganic Carbon Versus Chloride/Bromide for Brine and Water Samples
3	Variation of (a) Bromide Versus Boron and (b) Nitrate Versus Ammonium for Brine and Water Samples
4	Variation of (a) Total Inorganic Carbon Versus pH and (b) Total Organic Carbon Versus pH for Brine and Water Samples
5	Solubility Curves for (a) Halite and (b) Anhydrite Relative to Plotted Brine and Water Samples
6	Variation of (a) Sodium/Potassium Versus Total Dissolved Solids and (b) Chloride/Bromide Versus Total Dissolved Solids for Brine and Water Samples
7	Temporal Variation of (a) Lead and (b) Zinc for Brine and Water Samples
8	Temporal Variation of Collected Brine Volume and Lead Concentrations for (a) the Exhaust Shaft Basin and (b) Borehole OH225

1.0 Introduction

In the spring of 1995, lead concentrations near the nonhazardous limit of 5 milligrams per liter (mg/L) were discovered in sodium-chloride brine recovered from the base of the Exhaust Shaft (ES) and the Waste Shaft (WS) and boreholes located along the S-400 drift between the two shafts. The lead concentrations were monitored quarterly until the spring of 1996, at which time the Waste Isolation Pilot Plant Exhaust Shaft Water and Lead Working Group was formed to investigate, among other things, analytical uncertainty in the reported lead results and the source of the lead in the brine. From June of 1996 through November of 1996, the ES was sampled on a weekly basis, if brine was present, and other locations were sampled monthly. Current sampling of underground brine locations is on a monthly basis.

The source of the sodium chloride brine in and around the ES and the WS is not indigenous Salado Formation brine. Water seeping through the ES liner and condensation of water in the ES during humid months serve as the fluid sources, with halite (sodium chloride) dust and rock surfaces in the shafts providing additional sodium and chloride ions to the fluid. The source of lead in the brine has been traced to corrosion of galvanized chain-link fencing (IT, 1996), which is used for ground control in the salt section of the shafts.

As part of the investigation into fluid sources for the brine, water samples were collected from water seeping through the ES liner at a depth of about 70 feet (ft) below the ground surface and from four surface boreholes adjacent to the ES. Three of four boreholes were completed as wells in a saturated zone located in the lower Santa Rosa Formation and upper Dewey Lake Formation (i.e., the Santa Rosa/Dewey Lake formational contact), approximately 55 to 65 ft below ground surface (Intera, 1997). Additionally, during maintenance operations carried out to remove muck in the Salt Shaft (SS) sump, a limited amount of brine was discovered and sampled. Fluids from these sample locations have lead concentrations well below the nonhazardous limit.

This report summarizes analytical results obtained through December 1996 and presents a detailed interpretation of the origin and evolution of brine samples collected from underground locations. The discussion of analytical results focuses on the precision and accuracy of analyses carried out on high-ionic strength brines, with emphasis on distinguishing quantitative results from semiquantitative measurements. Presentation of quantitative results is accompanied by a geochemical discussion that elucidates the origin and evolution of the brines recovered from the underground locations.

The principal conclusion of this report is that underground brines collected at the base of the ES and boreholes between the ES and the WS have compositions that reflect the interaction of Santa Rosa/Dewey Lake formational water and ES water condensate with constructional materials (concrete and galvanized chain-link fencing) and naturally occurring rock minerals (e.g., halite, anhydrite, and dolomite) in the ES. Water condensate in the WS and in the SS may provide a limited volume of fluid to the sumps of these shafts.

2.0 Sampling Locations

Since the May 1995 inception of sampling related to lead issues, brine samples have been collected from 26 underground locations (Figure 1). Brine samples collected from 13 of the 26 locations were characterized for hazardous metals only (i.e., arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver), and samples from the remaining 13 locations were characterized for major, minor, and trace elements as well as hazardous metals. Table 1 provides a summary for sample locations and analytical parameters.

Most locations listed in Table 1 were sampled a single time to establish the areal distribution of lead in underground brine. Based on the reported analytical results (Appendix A), which are discussed further in Chapter 4.0, the area of elevated lead concentrations (i.e., greater than 0.5 mg/L) is restricted to the ES catch basin (hereinafter referred to as the ES basin), the WS sump, and boreholes between the two shafts (MWS8 and OH225) that lie in the S-400 drift (Figure 1). Therefore, the sampling program has focused on monitoring lead levels in the impacted area at the ES basin, the WS sump, and borehole OH225. Additionally, a background location (i.e., indigenous Salado Formation brine) at borehole EEP37B is routinely sampled. Currently, the four locations noted above are sampled on a monthly basis.

In addition to obtaining brine samples at the underground locations listed in Table 1, salt muck and debris samples were obtained from the floor of the ES, the WS, and the SS sumps; Room L4; and various drums containing muck and debris. Figure 1 shows the nondrum sampling locations. Solid samples were obtained to determine whether muck and debris are potential lead sources and to assess their ability to serve as sinks for the lead in the brine. The solid samples were subjected to the toxicity characteristic leaching procedure (TCLP) to determine whether these samples were hazardous. All tested samples were nonhazardous (i.e., all analyzed leachate was below the hazardous lead level of 5 mg/L). Appendix A provides and Chapters 3.0 and 4.0 discuss analytical results.

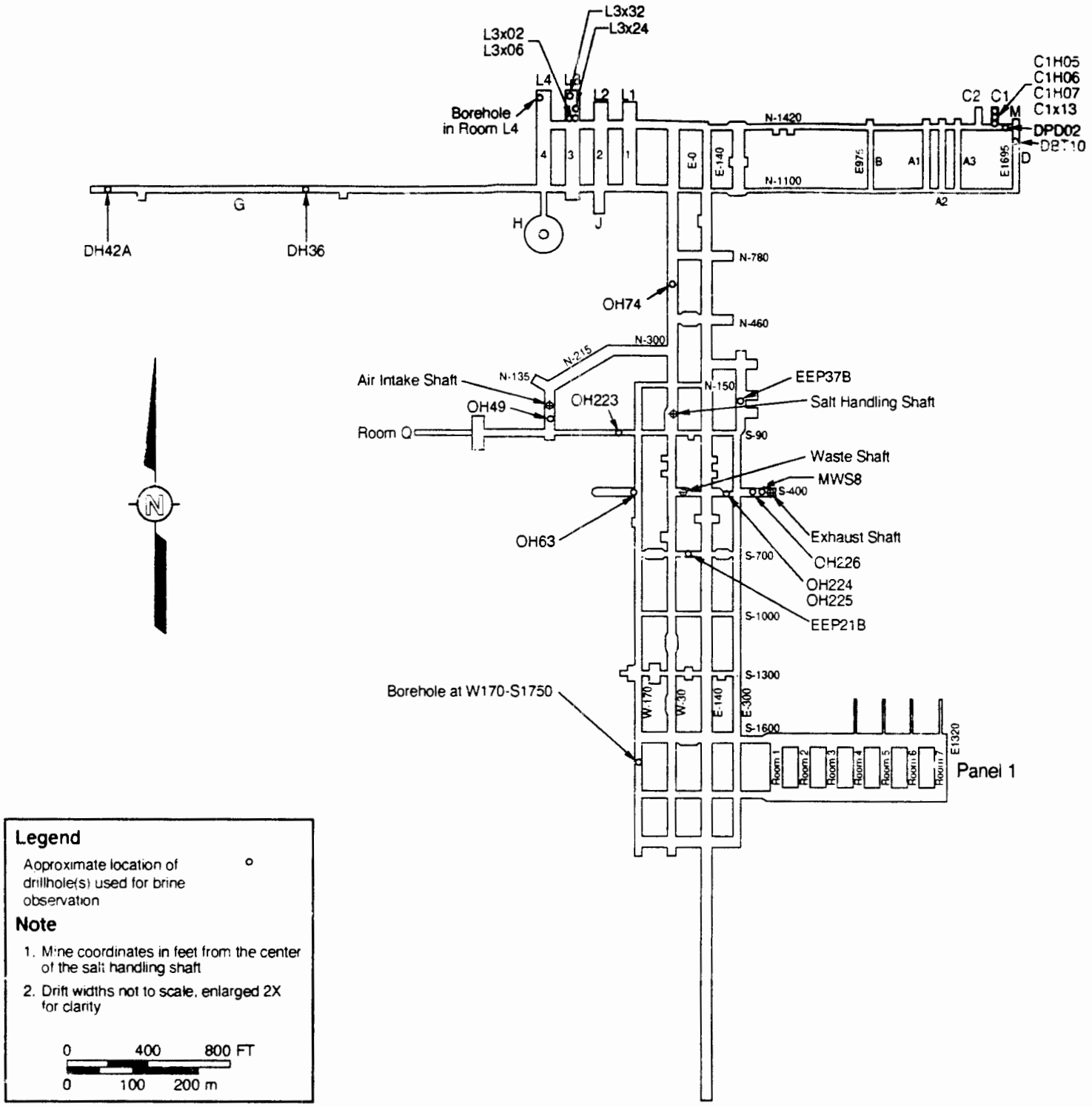


Figure 1

Brine Sampling Locations at WIPP's Underground Facility

Table 1
Underground Sampling Locations and Analytical Parameters

Underground Location	Analytical Parameters
Borehole C1H05, Room C1	pH, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver
Borehole C1H06, Room C1	
Borehole C1H07, Room C1	
Borehole C1X13, Room C1	
Borehole DBT10, Room D	
Borehole DPD02, Room D	
Borehole L3X02	
Borehole L3X06	
Borehole L3X24	
Borehole L3X32	
Borehole in Room L4	
Borehole in Drift W-170	
Borehole near W-620, S-90, E-310	
Borehole DH36	pH, specific gravity, total dissolved solids, chloride, bromide, sulfate, nitrate, ammonium, total organic carbon, total inorganic carbon, boron, calcium, potassium, magnesium, sodium, iron, zinc, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver
Borehole DH42A	
Borehole EEP21B	
Borehole EEP37B	
Borehole OH224	
Borehole OH225	
Borehole OH226	
Borehole OH49	
Borehole OH63	
Borehole OH74	
Exhaust Shaft Basin	
Salt Shaft Sump	
Waste Shaft Sump	

Near-surface sampling locations include the seepage water entering the ES at a depth of approximately 70 ft below the collar and four shallow boreholes adjacent to the ES. The wells encountered water-saturated sediments in an interval that is approximately 55 to 65 ft below ground surface, which coincides with the lower Santa Rosa Formation and the upper Dewey Lake Formation. The seepage water in the ES was sampled in January and July 1996, and the four boreholes were sampled in late September and early October 1996. Analysis of July 1996 samples from the ES seepage were limited to hazardous metals; all other near-surface water samples were analyzed for major, minor, and trace elements as well as hazardous metals. Appendix A provides information on sampling dates and analytical results.

3.0 Analytical Results

Appendix A provides analytical results for unfiltered fluid samples collected since May 1995. A charge-balance calculation is provided for samples that have major-ion analyses. This calculation gives a quick check on the quality of the analysis. The analysis is considered to pass the initial quality assurance/quality control (QA/QC) screening if the charge balance lies between −5 and +5 percent. In general, charge-balance values less than −5 or greater than +5 indicate problems with the analytical measurement of major ions. Analytical results that fall outside the recommended charge-balance range should not be used when interpreting results and making decisions. Using this criterion, this report draws interpretations and conclusions entirely from data received between June 1996 through December 1996 from Wastren's analytical laboratory in Grand Junction, Colorado. Tables 2 through 9 summarize sample statistics for the Wastren analytical results by sampling location.

Other QA/QC problems associated with the analysis of high-ionic strength brines (e.g., saturated sodium-chloride brines) are sample dilution factors, recovery of matrix spike, and attainment of acceptable precision and accuracy measurements. The measurement of analyte concentrations in saturated sodium-chloride brines is a difficult analytical problem, primarily because of high loads of total dissolved solids (TDS). High TDS values commonly require that large sample dilution factors are needed prior to analysis. Large dilution factors may increase detection limits above regulatory levels (e.g., above TCLP hazardous waste limits), which results in unusable data for determining whether the brine is nonhazardous material. Other potential problems with saturated sodium-chloride brines occur when the addition of matrix spike results in precipitation of solids. These problems may lead to unacceptable spike recoveries (i.e., poor accuracy) and poor agreement among duplicate analyses (i.e., poor precision), which may result in the reporting of analytical data that do not

Table 2

Summary of Brine Composition for Exhaust Shaft Basin Wastren Analyses from June 1996 through December 1996[a]

Analyte	Statistical Summary				
	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
pH	6.8	0.6	6.0	7.4	22
Total dissolved solids (mg/L)	350000	206000	79000	672000	22
Chloride (mg/L)	173000	92500	42400	303000	22
Sulfate (mg/L)	1160	773	156	2290	22
Bromide (mg/L)	648	607	52.6	1670	22
Nitrate (mg/L)	266	139	89	499	22
Total inorganic carbon (mg/L)	35.9	10.4	23.4	68.8	20
Total organic carbon (mg/L)	704	576	50.8	1610	22
Ammonium (mg/L)	33.9	26.2	2.8	72.5	22
Sodium (mg/L)	29200	15300	10700	54400	22
Potassium (mg/L)	10400	11000	168	26700	22
Magnesium (mg/L)	29500	24400	4380	65900	22
Calcium (mg/L)	22100	15200	5070	46600	22
Boron (mg/L)	314	326	8.4	863	22
Lead (mg/L)	17.5	18.1	0.14	48.1	22
Zinc (mg/L)	2300	2530	8.68	6470	22

[a]See Appendix A for Wastren analyses.

Table 3

Summary of Brine Composition for Borehole MWS8 Wastren Analyses from June 1996 through December 1996[a]

Analyte	Statistical Summary				
	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
pH	6.0	0.1	5.9	6.2	2
Total dissolved solids (mg/L)	448000	18000	435000	460000	2
Chloride (mg/L)	233000	1000	232000	234000	2
Sulfate (mg/L)	333	22	317	348	2
Bromide (mg/L)	1270	10	1260	1280	2
Nitrate (mg/L)	223	19	209	236	2
Total inorganic carbon (mg/L)	7.3	0.4	7.0	7.5	2
Total organic carbon (mg/L)	1460	10	1450	1470	2
Ammonium (mg/L)	78.8	11.5	70.6	86.9	2
Sodium (mg/L)	41800	1400	40800	42800	2
Potassium (mg/L)	21500	500	21100	21800	2
Magnesium (mg/L)	29400	400	29100	29700	2
Calcium (mg/L)	36900	1900	35500	38200	2
Boron (mg/L)	295	41	266	324	2
Lead (mg/L)	17.5	1.2	16.6	18.3	2
Zinc (mg/L)	753	19	739	766	2

[a]See Appendix A for Wastren analyses.

Table 4

Summary of Brine Composition for Borehole OH225 Wastren Analyses from June 1996 through December 1996[a]

Analyte	Statistical Summary				
	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
pH	6.7	0.1	6.4	7.0	22
Total dissolved solids (mg/L)	413000	20000	365000	439000	22
Chloride (mg/L)	218000	6000	204000	227000	22
Sulfate (mg/L)	357	47	327	540	22
Bromide (mg/L)	820	78	693	924	22
Nitrate (mg/L)	249	17	209	267	22
Total inorganic carbon (mg/L)	10.3	1.0	8.9	13.0	20
Total organic carbon (mg/L)	832	61	705	918	22
Ammonium (mg/L)	72.5	17.4	45.8	106	22
Sodium (mg/L)	55400	3400	50200	62400	22
Potassium (mg/L)	11700	1100	10200	13200	22
Magnesium (mg/L)	28400	1600	24000	30400	22
Calcium (mg/L)	24900	1300	21500	26500	22
Boron (mg/L)	262	23	231	306	22
Lead (mg/L)	15.6	2.9	11.0	20.2	22
Zinc (mg/L)	1550	160	1090	1690	22

[a]See Appendix A for Wastren analyses.

Table 5

Summary of Brine Composition for Waste Shaft Sump Wastren Analyses from June 1996 through December 1996[a]

Analyte	Statistical Summary				
	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
pH	7.1	0.1	7.1	7.2	9
Total dissolved solids (mg/L)	462000	36000	414000	503000	9
Chloride (mg/L)	233000	5000	227000	240000	9
Sulfate (mg/L)	213	11	185	221	9
Bromide (mg/L)	1650	81	1500	1740	9
Nitrate (mg/L)	121	8	105	130	9
Total inorganic carbon (mg/L)	12.9	2.1	8.3	14.4	7
Total organic carbon (mg/L)	1840	90	1620	1930	9
Ammonium (mg/L)	74.9	14.2	44.2	90.2	9
Sodium (mg/L)	41200	2900	38300	47400	9
Potassium (mg/L)	21600	900	19900	22600	9
Magnesium (mg/L)	12300	2700	10400	17100	9
Calcium (mg/L)	68200	3000	64000	72000	9
Boron (mg/L)	155	9	140	170	9
Lead (mg/L)	0.922	0.601	0.302	2.26	9
Zinc (mg/L)	413	214	142	667	9

[a]See Appendix A for Wastren analyses.

Table 6

Summary of Brine Composition for Salt Shaft Sump Wastren Analyses from June 1996 through December 1996[a]

Analyte	Statistical Summary				
	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
pH	6.9	0.0	6.9	6.9	2
Total dissolved solids (mg/L)	380000	1000	379000	380000	2
Chloride (mg/L)	209000	2000	207000	210000	2
Sulfate (mg/L)	8540	90	8470	8600	2
Bromide (mg/L)	1450	10	1440	1450	2
Nitrate (mg/L)	13.5	0.2	13.3	13.6	2
Total inorganic carbon (mg/L)	24.6	1.1	23.8	25.4	2
Total organic carbon (mg/L)	847	33	824	870	2
Ammonium (mg/L)	121	0	121	121	2
Sodium (mg/L)	80700	200	80500	80800	2
Potassium (mg/L)	19000	900	18300	19600	2
Magnesium (mg/L)	24300	200	24100	24400	2
Calcium (mg/L)	934	48	900	968	2
Boron (mg/L)	398	4	395	400	2
Lead (mg/L)	0.101	0.001	0.100	0.101	2
Zinc (mg/L)	479	4	476	482	2

[a]See Appendix A for Wastren analyses.

Table 7

Summary of Brine Composition for Borehole EEP37B Wastren Analyses from June 1996 through December 1996[a]

Analyte	Statistical Summary				
	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
pH	6.0	0.1	5.9	6.1	9
Total dissolved solids (mg/L)	383000	17000	351000	396000	9
Chloride (mg/L)	196000	5000	190000	201000	9
Sulfate (mg/L)	16100	300	15600	16300	9
Bromide (mg/L)	1550	30	1510	1590	9
Nitrate (mg/L)	1.4	0.2	1.1	1.6	5
Total inorganic carbon (mg/L)	1.3	0.3	0.9	1.8	7
Total organic carbon (mg/L)	4.3	3.3	1.9	10.5	6
Ammonium (mg/L)	180	31	141	216	7
Sodium (mg/L)	79900	2700	76400	84900	9
Potassium (mg/L)	16600	400	15900	17300	9
Magnesium (mg/L)	23900	500	23100	24800	9
Calcium (mg/L)	303	43	257	404	9
Boron (mg/L)	1580	40	1530	1640	9
Lead (mg/L)	0.0362	0.0326	0.0125	0.100	9
Zinc (mg/L)	0.276	0.124	0.134	0.430	9

[a]See Appendix A for Wastren analyses.

Table 8

Summary of Brine Composition for Borehole OH63 Wastren Analyses from June 1996 through December 1996[a]

Analyte	Statistical Summary				
	Mean	Standard Deviation	Minimum	Maximum	Number of observations
pH	6.1	0.1	6.1	6.2	2
Total dissolved solids (mg/L)	394000	4000	391000	396000	2
Chloride (mg/L)	204000	0	204000	204000	2
Sulfate (mg/L)	17300	100	17200	17300	2
Bromide (mg/L)	1630	0	1630	1630	2
Nitrate (mg/L)	1.4	NA	1.4	1.4	1
Total inorganic carbon (mg/L)	0.5	0.1	0.5	0.6	2
Total organic carbon (mg/L)	NA	NA	NA	NA	0
Ammonium (mg/L)	200	1	199	200	2
Sodium (mg/L)	78300	0	78300	78300	2
Potassium (mg/L)	18200	100	18100	18200	2
Magnesium (mg/L)	23900	0	23900	23900	2
Calcium (mg/L)	327	6	322	331	2
Boron (mg/L)	1580	0	1580	1580	2
Lead (mg/L)	0.001	0.000	0.001	0.001	2
Zinc (mg/L)	0.449	0.008	0.443	0.454	2

[a]See Appendix A for Wastren analyses.

Table 9

Summary of Brine Composition for Perched Water Wastren Analyses from June 1996 through December 1996[a]

Analyte	Statistical Summary				
	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
pH	7.5	0.1	7.3	7.7	10
Total dissolved solids (mg/L)	7400	3000	4000	11500	10
Chloride (mg/L)	3130	1690	1160	5400	10
Sulfate (mg/L)	929	65	852	994	10
Bromide (mg/L)	9.5	0.5	9.0	10.2	10
Nitrate (mg/L)	15.5	3.3	9.5	18.2	10
Total inorganic carbon (mg/L)	49.5	6.0	39.9	58.0	10
Total organic carbon (mg/L)	7.7	1.4	5.6	10.5	10
Ammonium (mg/L)	0.25	0.17	0.05	0.5	10
Sodium (mg/L)	858	552	268	1660	10
Potassium (mg/L)	25.3	9.4	11.9	36.7	10
Magnesium (mg/L)	554	164	340	744	10
Calcium (mg/L)	706	225	446	1010	10
Boron (mg/L)	0.30	0.32	0.18	1.20	10
Lead (mg/L)	0.00165	0.00069	0.00076	0.00300	10
Zinc (mg/L)	0.0139	0.0103	0.0047	0.0309	8

[a]See Appendix A for Wastren analyses.

meet established limits for accuracy and precision. Therefore, analytical results received on brine samples were reviewed in detail to determine whether the data represent semiquantitative or quantitative results. The principal conclusion from this review is that analytical results received from the NUS analytical laboratory are considered semiquantitative results, and they are not presented in the interpretations and conclusions reached in this report. However, this finding has no bearing on past waste management practices, because all brine collected from impacted underground locations has been handled, stored, and shipped as hazardous waste. Appendix B provides a summary of the data review.

4.0 Origin of Brine Compositions

Major Elements. Tables 2 through 9 and Figures 2, 3, and 4 summarize the major-element composition of brine collected from underground locations and perched water collected from the Santa Rosa/Dewey Lake formational contact in the vicinity of the ES. Additionally, Figures 2, 3, and 4 plot the corrosion-test (CT) brine used in the corrosion testing of galvanized chain-link fence samples (IT, 1996) to illustrate the position of a saturated sodium-chloride brine formed by the dissolution of Salado Formation salt in deionized water. The CT brine was prepared using Salado salt mined near Room 1 of Panel 1 (Figure 1).

Figures 2, 3, and 4 reveal distinct fields for indigenous Salado Formation brine (locations EEP37B and OH63) relative to nonindigenous brines present in the underground workings (the ES basin, the WS sump, the SS sump, OH225, and MWS8), CT brine, and perched water. The origin of these distinct compositions is tied to dissolution and precipitation of halite and anhydrite, fluid interaction with concrete, and the mixing of nonindigenous brine with perched water and Salado brine.

Figures 2a and 2b plot the major cation and anion molar ratios, respectively. On Figure 2a, indigenous Salado Formation brines cluster near a sodium/potassium (Na/K) molar ratio of 10 and a calcium/magnesium (Ca/Mg) molar ratio of 0.01, with all other samples having higher calcium/magnesium ratios. Figure 2b reveals that indigenous Salado brines occupy a distinct space where the molar ratio for sulfate/total inorganic carbon (SO_4/TIC) is above 1,000 and chlorine/bromine (Cl/Br) is approximately 300. Figures 2a and 2b also show that the plotted fields for the WS sump, the SS sump, OH225, and MWS8 are well defined

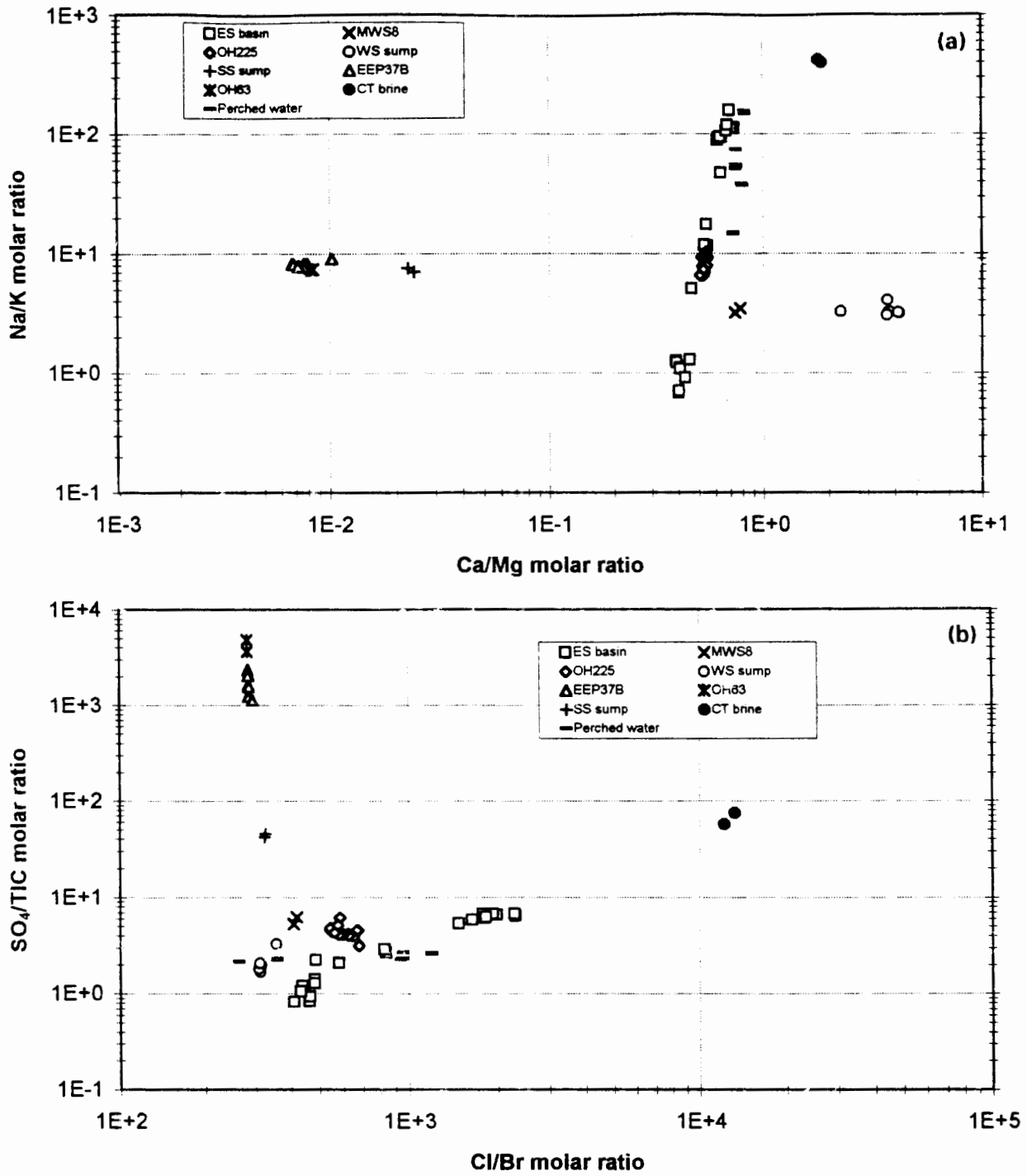


Figure 2
Variation of (a) Sodium/Potassium Versus Calcium/Magnesium and (b) Sulfate/Total Inorganic Carbon Versus Chloride/Bromide for Brine and Water Samples

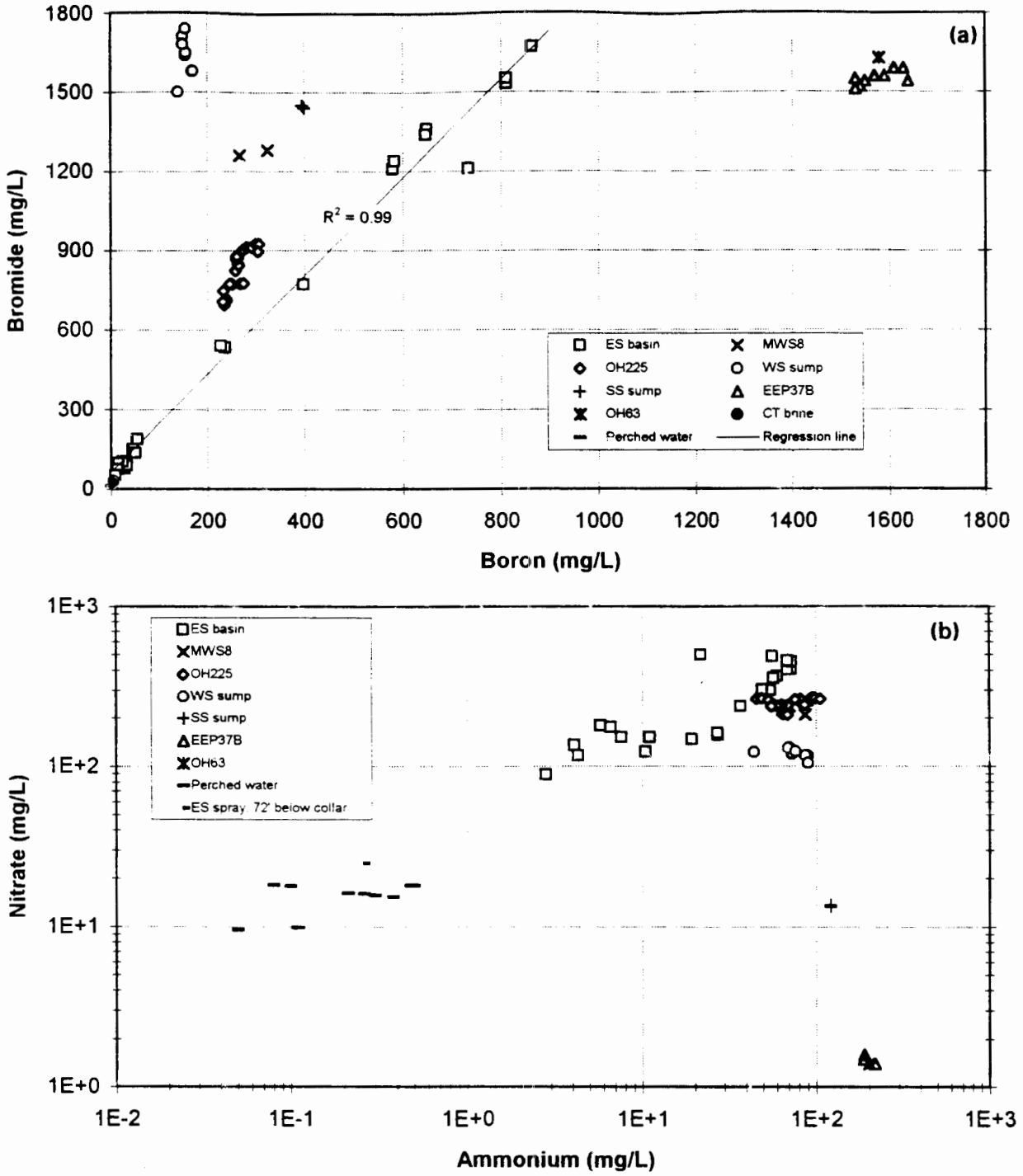


Figure 3
Variation of (a) Bromide Versus Boron and
(b) Nitrate Versus Ammonium for Brine and Water Samples

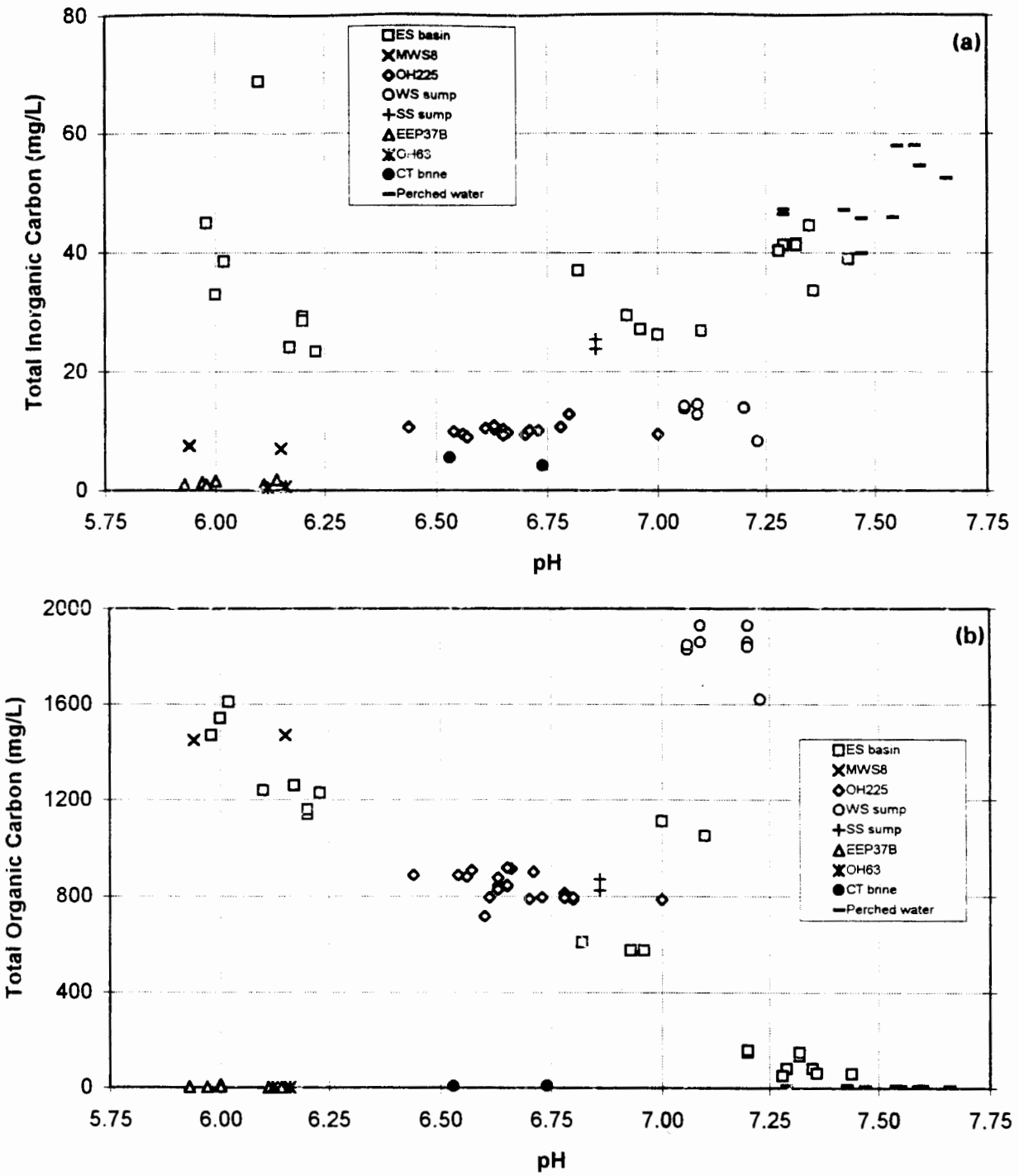


Figure 4

Variation of (a) Total Inorganic Carbon Versus pH and (b) Total Organic Carbon Versus pH for Brine and Water Samples

relative to samples from the ES basin and perched water locations. Samples from the SS sump plot between the Salado brine and nonindigenous brines. The highest sodium/potassium and chlorine/bromine molar ratios are associated with CT brine—a saturated sodium-chloride brine that has not experienced evaporation.

Figure 3a plots bromine versus boron and shows all sampling locations are defined by a close cluster of sampling points, except samples from the ES basin. Samples from the ES basin display an excellent positive trend ($R^2 = 0.99$) and are anchored at low values of bromine and boron by the CT brine samples. To the right of the regression line, high boron concentrations separate Salado brine from nonindigenous samples. The range in bromine concentration is greater than that observed for boron variance at the ES basin, OH225, and the WS sump locations.

Figure 3b summarizes the nitrogen system. Again, sampling locations are well clustered with the exception of the ES basin brines and perched water samples. The CT brine samples are absent from the plot because there was no detectable nitrate (NO_3^-) in these samples. The scatter in ammonium (NH_4^+) concentration for the perched water samples is caused by the ammonium measurements being within an order of magnitude of the instrument detection limit (0.05 mg/L). Salado brines are well defined by high ammonium concentrations and by low nitrate concentrations. Brine samples from the SS sump lie between Salado brines and nonindigenous brine samples, similar to observations on Figure 2.

Figure 4 summarizes pH measurements versus TIC and total organic carbon (TOC). Samples with pH above 7.25 (perched water and some ES basin brine) show a positive correlation with TIC (Figure 4a), indicating bicarbonate ion (HCO_3^-) buffers the pH in these samples. There is no strong indication of dependent behavior for TIC in the remaining brine samples. However, on Figure 4b most samples fall along a trend of increasing TOC as pH decreases. Salado brines occupy a distinct space on the TOC/pH plot, having both low pH and TOC concentrations. At very low TOC values, the pH of CT brine falls between Salado brines and perched water. In contrast, brine from the WS sump has the highest TOC concentrations and moderately high pH values.

Based on the brine and brackish water compositions depicted on Figures 2, 3, and 4, several hypotheses are proposed to account for the observed compositions of nonindigenous fluids:

1. Dissolution of halite, anhydrite, and associated evaporite minerals in the Salado Formation and mined salt dust resulting from condensation of moisture; accompanied by small fluid inputs seeping through concrete liners in the shafts.

2. Dissolution of halite, anhydrite, and associated evaporite minerals in the surface salt piles by rain and subsequent infiltration of surface runoff to form a perched water body at the Santa Rosa/Dewey Lake formational contact.

3. Minor dissolution of carbonate minerals (e.g., calcite and dolomite) and/or leaching of calcium from the cementitious construction materials (e.g., liner and grout spillage) in the ES, the WS, and the SS.

4. Strong evaporation of brine present in the ES basin, with varying lesser amounts of evaporation experienced by samples obtained from the WS sump, the SS sump, OH225, and MWS8.

5. Precipitation of halite and anhydrite from brine undergoing intense evaporation in the ES basin.

6. Introduction of TOC and nitrogen compounds from diesel exhaust in the ES, the WS, and the SS.

7. Introduction of TOC from grease and oil present on cables and equipment in the WS and the SS.

3. Mixing of Salado brine and nonindigenous brine at the SS sump.

Hypothesis 1 is supported by the fluid compositions reported for the ES basin, the WS sump, the SS sump, OH225, and MWS8 (Appendix A and Tables 2 through 6). These fluid compositions were used to construct solubility plots for halite and anhydrite (Figure 5). Figure 5 shows the solubility curve for halite (Figure 5a) and anhydrite (Figure 5b), as calculated with the EQ3NR geochemical code (Wolery, September 1992) using the Pitzer equations for high-ionic strength brines and the thermodynamic database of Harvie et al. (1984). Figure 5a illustrates that the calculated halite solubility curve parallels the trend of plotted samples from boreholes that tap indigenous Salado brine (EEP37B and OH63) and nonindigenous locations, exceptions being some samples from the ES basin and all perched water samples. Also note that CT brine lies at the high end of the halite solubility curve. On Figure 5b, all samples, with the exception of the perched water samples and CT brine, plot very near or on the anhydrite solubility curve. The good agreement between the predicted solubility curves and observed sample trends is strong evidence that the bulk of nonindigenous brine samples are in equilibrium with halite and anhydrite.

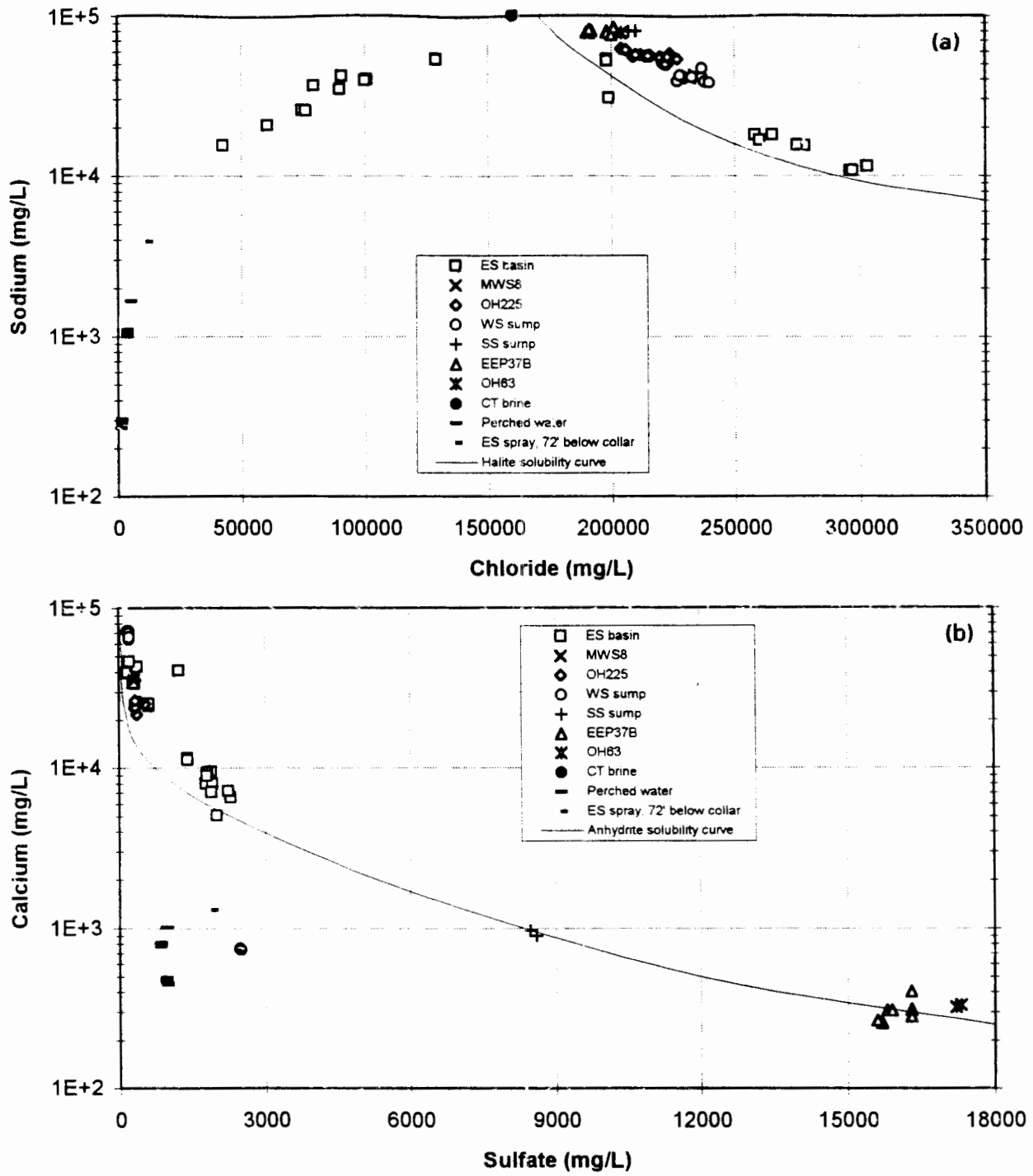


Figure 5
Solubility Curves for (a) Halite and (b) Anhydrite Relative to Plotted Brine and Water Samples

Evidence to support Hypothesis 2 is found in the fluid compositions reported for perched water (Appendix A and Table 9) and on Figures 2 and 6. Table 9 summarizes the simple statistics for 10 perched water samples and shows that the increase in total dissolved solids (TDS) is largely attributed to an increase in the sodium and chlorine concentrations, which is indicative of halite dissolution. This is reflected on Figure 6, where an increase in the sodium/potassium (Figure 6a) and chlorine/bromine (Figure 6b) molar ratios is accompanied by an increase in TDS. Figure 2 also reveals the dissolution of halite in the scatter of the sodium/potassium and chlorine/bromine molar ratios, both of which increase as halite dissolution proceeds (i.e., sodium and chlorine are added to solution while other ions remain relatively constant). Similar arguments can be made with calcium and sulfate ions to show that anhydrite and/or gypsum dissolution has occurred.

Hypothesis 3 is needed to account for the TIC concentrations in nonindigenous brine and perched water samples, as well as calcium/magnesium molar ratios near one (Figure 2a). Dissolution of dolomite ($CaMg[CO_3]_2$) would yield a solution with a calcium/magnesium molar ratio near one and elevated TIC concentrations (e.g., greater than 20 mg/L). Additionally, dissolution of carbonate waters will buffer the pH of the fluid between 7 and 8. These conditions appear to be met for perched water samples and some samples from the ES basin (Figures 2a and 4a). However, brine samples from the WS sump have calcium/magnesium molar ratios of about 4, which suggests addition of calcium from cementitious materials in the WS. In contrast, brine samples from the SS sump have calcium/magnesium molar ratios of about 0.015, which may indicate a component of indigenous Salado brine (discussed under Hypothesis 8).

Evaporation (Hypothesis 4) is indicated by the linear trend of ES basin samples on Figures 3a, 3b, and 5a. On Figure 3a, bromine and boron concentrations exhibit an excellent positive correlation ($R^2 = 0.99$), which is evidence for an evaporation process because both of these elements tend to be conserved in the residual brine. In contrast to bromine and boron being conserved in a brine undergoing evaporation, calcium, sulfate, sodium, and chlorine may be removed from a brine undergoing evaporation by the precipitation of anhydrite and halite. Note that the CT brine samples anchor the low end of the ES basin evaporation trend because this prepared brine was kept in a sealed container. Figure 3b reveals similar evaporation behavior for nitrate and ammonium, which are also conserved constituents in a brine undergoing evaporation. Finally, the increasing linear trend observed on Figure 5a

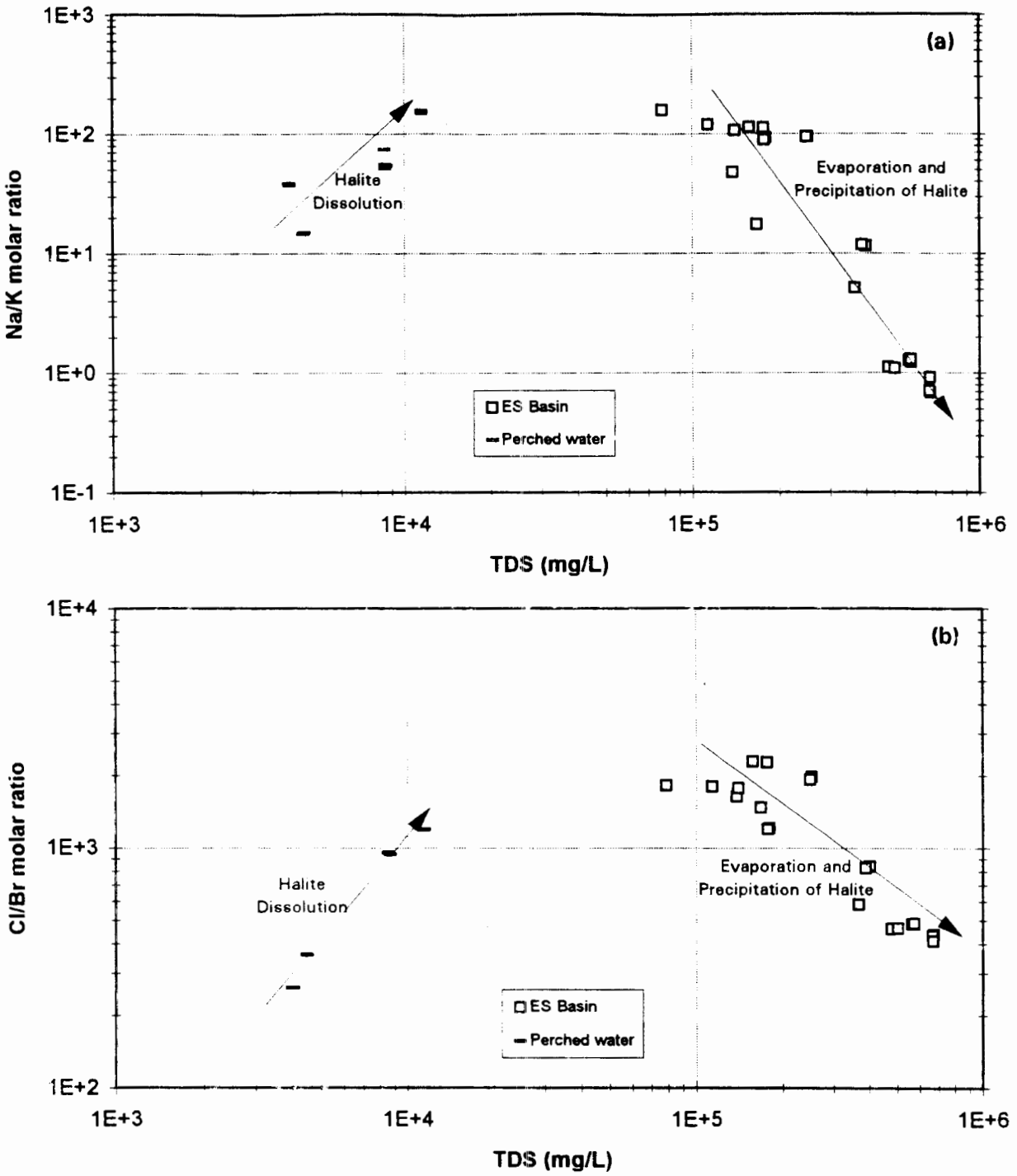


Figure 6
Variation of (a) Sodium/Potassium Versus Total Dissolved Solids and (b) Chloride/Bromide Versus Total Dissolved Solids for Brine and Water Samples

moves toward the halite solubility curve as evaporation proceeds; and once the brine is saturated with halite, it follows the solubility curve.

Figures 2, 5, and 6 support precipitation of halite and anhydrite from ES basin brine undergoing evaporation (Hypothesis 5). Figure 2 shows the large spread in sodium/potassium and chlorine/bromine molar ratios, indicative of halite dissolution or precipitation. The CT brine samples represent dissolution of halite only, whereas halite dissolution and precipitation is suggested by ES basin samples that exhibit variation in sodium/potassium and chlorine/bromine ratios. On Figure 6, the decrease in sodium/potassium and chlorine/bromine as TDS increases is conclusive evidence of evaporation in ES brine samples. Evaporation increases TDS and concentrates sodium and chlorine ions until halite saturation is reached (Figure 5). Upon reaching halite saturation, sodium and chlorine will be removed from the brine and the sodium/potassium and chlorine/bromine ratios fall as halite is precipitated (Figure 6). Compare this negative trend to the positive trend observed for perched water samples that have dissolved halite (Figure 6). A decrease in the calcium/magnesium and sulfate/TIC molar ratios for ES basin samples (Figure 2) is subtle but indicates anhydrite precipitation is also occurring.

Hypothesis 6 is supported by analytical data on brine samples (Appendix A and Tables 2 through 6), the presence of nitrogen compounds in diesel exhaust (U.S. Department of the Interior, 1992), and Figures 3b and 4b. Prior to placing the catch basin at the base of the ES in April 1996, fluids accumulating at the base of the ES where delivered to MWS8 and OH225 via fractures in the drift floor. Therefore, samples collected at MWS8 and OH225 also show elevated TOC and nitrate values. Nitrate salts have not been identified in the Salado Formation, which rules out the evaporite minerals as a source. Salado formation brine has high concentrations of ammonium but little to no detectable nitrate (Figure 3b) and TOC (Figure 4b), ruling out Salado brine as the nitrogen or TOC source for nonindigenous brines. However, some nitrogen may be derived from Salado brine for samples obtained from the SS sump (Hypothesis 8). Finally, analyses of diesel exhaust identify nitrogen compounds that can be washed out of the ventilation air by condensation in the shafts.

The addition of TOC to the nonindigenous brine samples from greased and oiled cables present in the WS and in the SS is suggested by comparing Figures 3b and 4b. On Figure 3b, nitrate concentrations in samples from the WS sump are similar to the lowest nitrate concentrations in the ES basin samples, yet TOC concentrations in the WS sump

samples are greater than those in the ES basin samples (Figure 4b). In contrast, samples from the SS sump have lower nitrate concentrations relative to samples from the ES basin (Figure 3b) but similar TOC concentrations (Figure 4b). This is thought to indicate that TOC in brines obtained from the WS and the SS sumps is not derived solely from diesel exhaust.

Hypothesis 8 proposes that the brine composition represented by samples recovered from the SS sump represents mixing between Salado brine and nonindigenous brine. Figures 2 and 3 support this hypothesis. If a mixing line is drawn from the cluster of EEP37B samples through the samples collected at the SS sump, the endpoint of this projection lies at or near the samples obtained from the WS sump and from MWS8. On Figures 2b and 3b, the SS sump samples are located approximately midway between EEP37B and the WS sump samples. However, on Figure 3a the SS sump samples fall closer to EEP37B samples, and on Figure 4a they are closer to the WS sump samples. If mixing is a viable hypothesis, then Figure 3a indicates that calcium has been removed or magnesium has been added to the mixture (i.e., the calcium/magnesium ratio is lower than expected for a 50/50 mixture indicated on Figures 2b and 3b). A reasonable conclusion is that calcium has been removed by precipitation of anhydrite. In a similar fashion, one must account for the removal of boron from the SS sump samples to account for the lower-than-expected boron concentrations in a 50/50 mixture of EEP37B and the WS sump brines (Figure 3a). A possible explanation would be removal of boron by adsorption onto anhydrite or clay minerals present in the Salado Formation, which may also account for the relatively low boron concentrations at OH225, MWS8, and the WS sump (Figure 3a). However, the adsorption process remains equivocal, and further investigation will be required to resolve the issue.

Lead and Zinc Concentrations. Lead and zinc have been introduced into the nonindigenous brines through corrosion of the galvanized chain-link mesh that is present in the ES and the WS (IT, 1996). Figure 7 summarizes lead and zinc concentrations at seven underground locations for Wastren analytical results received since July 1996. Solid symbols indicate the initial sample collected and open symbols indicate a duplicate (if taken). The relative degree of overlap between the solid and open symbols on a given date indicates the precision of the analysis (e.g., precision is excellent if the open symbol completely covers the solid symbol).

On Figure 7a, all samples collected at OH225 and most samples collected at the ES basin have lead concentrations above the nonhazardous limit. The sample collected on October 22

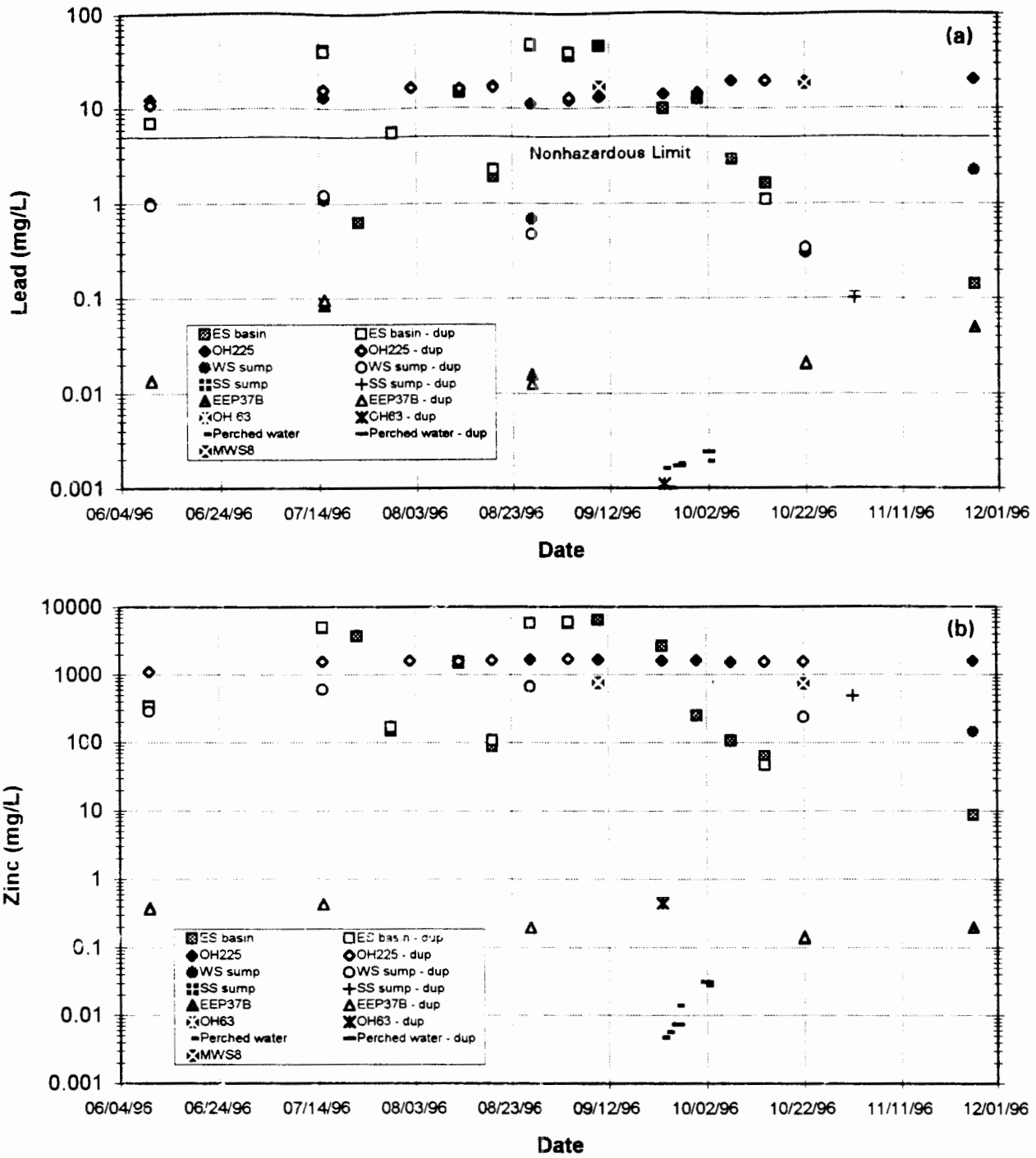


Figure 7

Temporal Variation of (a) Lead and (b) Zinc for Brine and Water Samples

from MWS8 is also above the nonhazardous limit. Samples collected from the WS and the SS sumps, EEP37B, and OH63, and perched groundwater at the Santa Rosa/Dewey Lake formational contact have lead concentrations below the nonhazardous limit. EEP37B and OH63 sample indigenous Salado Formation brine, and lead concentrations in samples from these boreholes indicate ambient background levels for lead in the range of 0.001 to 0.1 mg/L. All other Resource Conservation Recovery Act (RCRA) metals are well below nonhazardous limits (Appendix A).

Temporal variation of zinc is summarized on Figure 7b. In general, zinc concentrations are about 1,000 times greater than lead concentrations for brine samples recovered from the SS sump; 100 times greater than lead levels in brines from the ES basin, MWS8, OH225, and the WS sump; and approximately 10 times greater than lead values in the Salado brine (EEP37B) and perched water. Zinc values generally rise and fall with lead concentrations, as expected if galvanized material is the source for these metals. However, exceptions include July 22 and September 23 for the ES basin samples and November 26 for the WS sump samples. On the indicated dates for the ES basin samples, lead values decreased relatively more than zinc, as estimated by extrapolating between previous and successive analytical results. As analytical results for lead on these dates are good quantitative numbers (Appendix A), decreasing lead concentrations suggest that lead has been removed from the brine by precipitation of a solid (e.g., $PbCO_3$). For the WS sump, the November 26 sample had higher lead and lower zinc concentrations relative to the previous sample. Again, analytical results for the metals are validated as good quantitative numbers (Appendix A). This suggests that some particulate lead was present in this unfiltered sample to elevate the lead concentration.

The fluctuation of lead concentrations, and major elements, in the ES basin samples has been suggested to be related to the volume of brine recovered from the catch basin on a weekly basis. The hypothesis is that a sampling event that occurs when there is a large volume of brine in the catch basin will yield a more dilute sample relative to samples obtained when the volume of brine in the basin is small. Figure 8a plots the weekly volume of brine removed from the catch basin along with lead concentrations reported for the brine sample collected on the given date. The highest lead concentrations were recorded for samples obtained from the ES basin on July 15, August 27, September 4, and September 10, 1996. Corresponding brine volumes removed from the basin were approximately 2,000 L on July 15; 1,500 L on August 27; and none on September 10. There is no record for brine removal to correspond

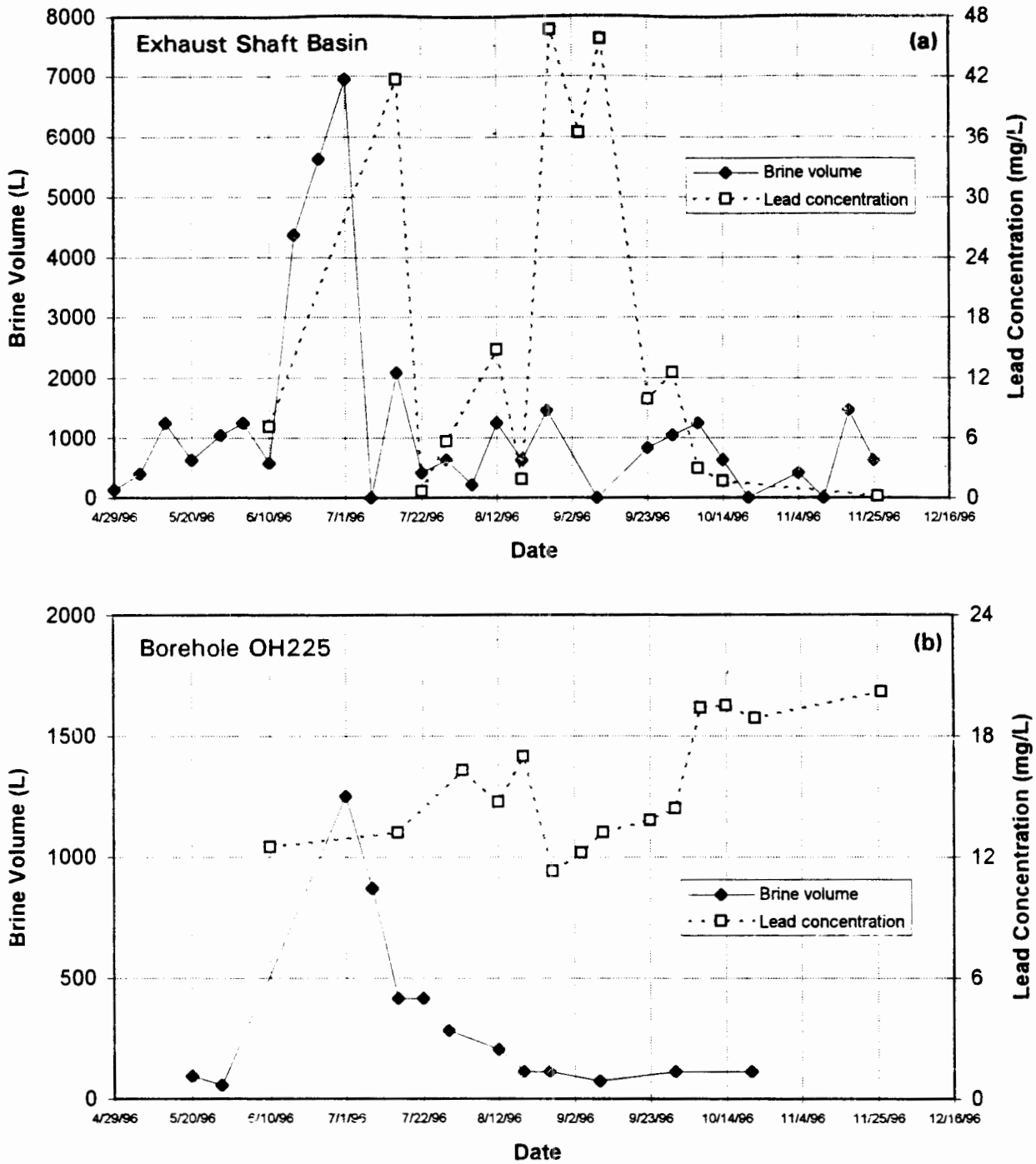


Figure 8
Temporal Variation of Collected Brine Volume and Lead Concentrations for (a) the Exhaust Shaft Basin and (b) Borehole OH225

to the September 4 date. The lowest lead concentrations correspond to brine removal of 400 L (July 22) and 600 L (August 19, October 14, and November 25). What is apparent from this tabulated data is that there is no clear correlation between the volume of brine removed and the lead concentration when samples are taken on a weekly basis.

Because of the large volume of air that passes over the ES basin daily, significant evaporation can take place on a daily basis. Therefore, fluid that enters the basin the day prior to sampling is likely to be more dilute relative to fluid that enters the basin the day after sampling and resides in the basin six days prior to the next sampling event. For this hypothesis, the weekly volume of brine removed from the basin is not critical, but the timing of when the majority of fluid enters the basin is. Testing of this hypothesis would involve daily sampling and emptying of the ES basin, which is not planned at this time.

Additional information on brine removal was collected at OH225, and Figure 8b charts the trend of lead concentrations and brine volume removed from this location. Unlike the ES basin, OH225 is covered, and evaporation of the brine is minimal. However, as noted for the ES basin, there is no clear correlation of lead concentration with the volume of brine removed from OH225. Lead concentrations from the end of August through October 22 range from 11 to 19 mg/L, yet the volume recovered from the borehole was relatively constant at about 100 L.

5.0 Conclusions

Since the May 1995 inception of sampling related to water and lead issues in the vicinity of the ES, brine samples have been collected from 26 underground locations. This report focused on brine samples with major-element analyses that were collected from 7 of the 26 underground locations and brackish water samples collected from the Santa Rosa/Dewey Lake formational contact in the vicinity of the ES. Based on the reported analytical results, the area of elevated lead concentrations (i.e., those greater than 0.5 mg/L) is restricted to the ES basin, the WS sump, MWS8, and OH225. Currently, these four locations and the background location at EEP37B are sampled on a monthly basis, if brine is present.

QA/QC problems associated with the analysis of high-ionic strength brines are sample dilution factors, recovery of matrix spike, and attainment of acceptable precision and accuracy measurements. Other potential problems with saturated sodium-chloride brines occur when the addition of matrix spike results in precipitation of solids. These problems may lead to

unacceptable spike recoveries (i.e., poor accuracy) and poor agreement among duplicate analyses (i.e., poor precision), which may result in the reporting of analytical data that do not meet established limits for accuracy and precision. Therefore, as a precautionary measure, all brine collected from underground locations with elevated lead concentrations has been handled, stored, and shipped as hazardous waste.

Indigenous Salado Formation brine is readily distinguished from nonindigenous brine and brackish water samples recovered from underground locations and from wells placed at the Santa Rosa/Dewey Lake formational contact in the vicinity of the ES. Salado Formation brine is easily recognized by high boron and sulfate concentrations, low calcium concentrations, and very low nitrate, lead, TIC, and TOC concentrations.

The origin of the nonindigenous brine and water samples is complicated and is hypothesized to arise from a variety of processes. These processes include: 1) dissolution of halite, anhydrite, and associated evaporite minerals found in the Salado Formation by fluid derived from condensation and seepage in the ES, the WS, and the SS; 2) dissolution of halite, anhydrite, and associated evaporite minerals from the surface salt piles by rain and subsequent infiltration; 3) evaporation and precipitation of halite and anhydrite at sample locations prone to evaporation; 4) minor dissolution of dolomite and calcite associated with the Santa Rosa and Dewey Lake Formations; 5) minor interaction of fluids with cementitious materials in the ES and the WS; 6) the addition of nitrogen and organic carbon compounds from diesel exhaust; 7) the addition of organic carbon compounds from grease and oil present in the WS and the SS; and 8) mixing of Salado brine and nonindigenous brine to form brine at the SS sump.

Lead and zinc concentrations above the ambient background levels defined by Salado Formation brine have been introduced from corrosion of galvanized chain-link mesh that is present in the ES, the WS, and the SS. The concentration of lead is above the nonhazardous level of 5 mg/L in nonindigenous brines sampled at the ES basin, MWS8, and OH225. All other toxic metals are below their respective nonhazardous levels.

6.0 References

Harvie, C. E., N. Moller, and J. H. Weare, 1984, "The Prediction of Mineral Solubilities in Natural Waters: The Na-K-Mg-Ca-H-Cl-SO_4-OH-HCO_3-CO_3-CO_2-H_2O System to High Ionic Strengths at 25°C," *Geochimica et Cosmochimica Acta*, Vol. 48, pp. 723–751.

Intera, 1997, "Exhaust Shaft Hydraulic Assessment Data Report," DOE/WIPP 97-2219, Westinghouse Waste Isolation Division, Carlsbad, New Mexico.

IT, see IT Corporation.

IT Corporation (IT), 1996, "Analysis of Corrosion Testing Results for Galvanized Mesh Material Obtained from the Waste Isolation Pilot Plant, New Mexico," IT Corporation, Albuquerque, New Mexico.

U.S. Department of the Interior, 1992, "Diesels in Underground Mines: Measurement and Control of Particulate Emissions," *Proceedings from the Bureau of Mines Information and Technology Transfer Seminar*, Information Circular 9324, 132 pp.

Wolery, T. J., September 1992, "EQ3NR, A Computer Program for Geochemical Aqueous Speciation-Solubility Calculations: Theoretical Manual, User's Guide, and Related Documentation (Version 7.0)," Lawrence Livermore National Laboratory, *UCRL-MA-110662 PT III.*

APPENDIX A
ANALYTICAL RESULTS

Abbreviation List

Ag	silver
As	arsenic
B	boron
Ba	barium
Br	bromine
Ca	calcium
Cd	cadmium
Cl	chlorine
Cr	chromium
Fe	iron
Hg	mercury
I	iodine
K	potassium
Mg	magnesium
mg/L	milligrams/liter
NA	no analysis
Na	sodium
NH_4	ammonium
NO_3	nitrate
Pb	lead
pH	negative logarithm of the hydrogen ion concentration
PW	perched water in the vicinity of the exhaust shaft
Se	selenium
SG	specific gravity
SO_4	sulfate
TDS	total dissolved solids
TIC	total inorganic carbon
TOC	total organic carbon
Zn	zinc

APPENDIX A
ANALYTICAL RESULTS

Analytical results reported in this appendix were received from Haliburton NUS Analytical Laboratory (hereinafter referred to as NUS) between June 1995 and July 1996 and from Wastren Analytical Laboratory (hereinafter referred to as Wastren) between June 1996 and December 1996. Wastren is the current laboratory contractor providing analytical services for the brine samples.

Presentation of Results. Analytical results are presented with row and column headers repeated on each page. The database is printed across and then down, yielding a completely reported analysis every five pages. Successive samples are listed on pages 6, 11, 16, 21, 26, 31, 36, 41, 46, and 51 of the database. The last entry for each analysis containing major elements is a charge-balance calculation. An analysis is initially considered satisfactory if the charge-balance calculation falls between −5 and +5 percent.

Quality Assurance/Quality Control Qualifiers. Data qualifiers are alpha-numeric characters that follow the reported analytical result to inform the user of the data that a variance to the accepted protocol has occurred. The following data qualifiers appear in the appendix:

- B The reported value is an estimated value that is less than the required detection limit but greater than the established detection limit.
- E The reported value is estimated because the inductively coupled plasma serial dilution is not within control limits (possible presence of interfering elements).
- N The spiked sample recovery is not within control limits.
- U The analyte was not detected. The reported value is the established detection limit.

All of the above qualifiers are routinely assigned to analytical data received from Wastren, but only the U qualifier appeared on analytical reports received from NUS. Based on a quality assurance/quality control (QA/QC) review of NUS analytical reports (Appendix B), the above qualifiers should have been applied to the analytical data released by NUS. As

noted in Appendix B, analytical data received from NUS are considered semiquantitative because of the lack of QA/QC reporting requirements.

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
Wastren	WST96362/363	9/10/96	Borehole @ MWS8	< 0.0004	UN	<.00056	UN	5.78	BE	0.0027	BN	0.0355	EN
Wastren	WST96460/461	10/22/96	Borehole @ MWS8	<0.001	U	<0.0022	U	5.66	B	<0.01	U	0.0564	
NUS	WST96052/053	1/23/96	Borehole OH63	<0.0001	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST95234	8/25/95	Borehole C1H05 Room C1	<0.0002	U	5		0.16		<0.05	U	<0.2	U
NUS	WST95236	8/25/95	Borehole C1H06 Room C1	<0.0002	U	4		0.24		<0.05	U	<0.2	U
NUS	WST95235	8/25/95	Borehole C1H07 Room C1	<0.0002	U	5		0.14		<0.05	U	<0.2	U
NUS	WST95253	8/30/95	Borehole C1X13 Room C1	NA		4		NA		NA		NA	
NUS	WST95255	8/30/95	Borehole C1X13 Room C1	NA		3.7		NA		NA		NA	
NUS	WST96042/043	1/23/96	Borehole DH36	<0.0001	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST96044/045	1/23/96	Borehole DH36	0.0003		<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST96046/047	1/23/96	Borehole DH36	<0.0005	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST96032/033	1/23/96	Borehole DH42A	<0.0001	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST96034/035	1/23/96	Borehole DH42A	<0.0002	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST96036/037	1/23/96	Borehole DH42A	<0.0002	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST95249	8/30/95	Borehole DPD02	NA		3.6		NA		NA		NA	
NUS	WST95251	8/30/95	Borehole DPD02	NA		3.6		NA		NA		NA	
NUS	WST96026/054	1/22/96	Borehole EEP21B	<0.0001	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST95332	12/27/95	Borehole EEP37B	<0.0001	U	<5	U	<0.2	U	<0.2	U	<1	U
NUS	WST96024/025	1/22/96	Borehole EEP37B	<0.0001	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST96202/206	6/10/96	Borehole EEP37B	0.009		<0.3	U	<0.5	U	<0.5	U	<2	U
NUS	WST96203/207	6/10/96	Borehole EEP37B	<0.001	U	<0.3	U	<0.5	U	<0.5	U	<2	U
NUS	WST96249/253	7/15/96	Borehole EEP37B	<0.001	U	<1	U	<0.5	U	<0.5	U	<2.0	U
NUS	WST96250/254	7/15/96	Borehole EEP37B	<0.001	U	<1	U	0.045		<0.2	U	<1.0	U
Wastren	WST96360/361	9/10/96	Borehole EEP21B	<0.0002	UN	0.0174	BN	0.0524	BE	0.0199	N	0.0264	EN
Wastren	WST96204/208	6/10/96	Borehole EEP37B	0.0002		0.0107		0.0405		0.0771		0.0562	
Wastren	WST96205	6/10/96	Borehole EEP37B	0.0002		0.0116		0.0387		0.0805		0.0658	

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG		TDS		pH
				mg/l		mg/l		mg/l		mg/l		mg/L		
Wastren	WST96362/363	9/10/96	Borehole @ MWS8	16.6		0.0191	BN	0.0039	BN	1.26		460000		6.2
Wastren	WST96460/461	10/22/96	Borehole @ MWS8	18.3		0.0236	B	0.0036	B	1.25		435000		5.9
NUS	WST96052/053	1/23/96	Borehole OH63	<0.2	U	<0.8	U	<0.5	U	1.23		330000		6.2
NUS	WST95234	8/25/95	Borehole C1H05 Room C1	<0.5	U	<1	U	<0.1	U	NA		NA		6.1
NUS	WST95236	8/25/95	Borehole C1H06 Room C1	<0.5	U	<1	U	<0.1	U	NA		NA		6.1
NUS	WST95235	8/25/95	Borehole C1H07 Room C1	<0.5	U	<1	U	<0.1	U	NA		NA		6.1
NUS	WST95253	8/30/95	Borehole C1X13 Room C1	<0.5	U	NA		NA		NA		NA		NA
NUS	WST95255	8/30/95	Borehole C1X13 Room C1	<0.05	U	NA		NA		NA		NA		NA
NUS	WST96042/043	1/23/96	Borehole DH36	<0.2	U	<0.8	U	<0.5	U	1.23		310000		6.2
NUS	WST96044/045	1/23/96	Borehole DH36	<0.2	U	<0.8	U	<0.5	U	1.23		280000		6.2
NUS	WST96046/047	1/23/96	Borehole DH36	<0.2	U	<0.8	U	<0.5	U	1.23		310000		6.2
NUS	WST96032/033	1/23/96	Borehole DH42A	<0.2	U	<0.8	U	<0.5	U	1.23		260000		6.3
NUS	WST96034/035	1/23/96	Borehole DH42A	<0.2	U	<0.8	U	<0.5	U	1.23		250000		6.3
NUS	WST96036/037	1/23/96	Borehole DH42A	<0.2	U	<0.8	U	<0.5	U	1.23		260000		6.3
NUS	WST95249	8/30/95	Borehole DPD02	<0.5	U	NA		NA		NA		NA		NA
NUS	WST95251	8/30/95	Borehole DPD02	<0.5	U	NA		NA		NA		NA		NA
NUS	WST96026/054	1/22/96	Borehole EEP21B	0.2		<0.08	U	<0.5	U	1.23		260000		6.2
NUS	WST95332	12/27/95	Borehole EEP37B	<2	U	<0.8	U	<0.5	U	NA		NA		7.5
NUS	WST96024/025	1/22/96	Borehole EEP37B	<0.2	U	<0.8	U	<0.5	U	1.23		280000		6.2
NUS	WST96202/206	6/10/96	Borehole EEP37B	<0.2	U	<0.8	U	<1	U	1.23		230000		6.0
NUS	WST96203/207	6/10/96	Borehole EEP37B	<0.2	U	<0.8	U	<1	U	1.23		230000		6.0
NUS	WST96249/253	7/15/96	Borehole EEP37B	<1	U	<0.8	U	<1	U	1.23		360000		6.0
NUS	WST96250/254	7/15/96	Borehole EEP37B	<0.3	U	<0.8	U	<0.5	U	1.23		350000		6.1
Wastren	WST96360/361	9/10/96	Borehole EEP21B	0.003	B	<.00044	UN	<0.00033	UN	1.23		414000		6.1
Wastren	WST96204/208	6/10/96	Borehole EEP37B	0.0137		0.00023		0.0047		1.20		357000		6.0
Wastren	WST96205	6/10/96	Borehole EEP37B	0.0134		0.00022		6		1.20		351000		6.0

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl	SO4	Br	I	NO3		NH4
				mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
Wastren	WST96362/363	9/10/96	Borehole @ MWS8	234000	348	1260	NA	236		70.6
Wastren	WST96460/461	10/22/96	Borehole @ MWS8	232000	317	1280	NA	209		86.9
NUS	WST96052/053	1/23/96	Borehole OH63	200000	16000	1600	16	<0.44		126.2142
NUS	WST95234	8/25/95	Borehole C1H05 Room C1	NA	NA	NA	NA	NA		NA
NUS	WST95236	8/25/95	Borehole C1H06 Room C1	NA	NA	NA	NA	NA		NA
NUS	WST95235	8/25/95	Borehole C1H07 Room C1	NA	NA	NA	NA	NA		NA
NUS	WST95253	8/30/95	Borehole C1X13 Room C1	NA	NA	NA	NA	NA		NA
NUS	WST95255	8/30/95	Borehole C1X13 Room C1	NA	NA	NA	NA	NA		NA
NUS	WST96042/043	1/23/96	Borehole DH36	200000	16000	1500	17	<0.44		141.669
NUS	WST96044/045	1/23/96	Borehole DH36	210000	17000	18	17	<0.44		180.306
NUS	WST96046/047	1/23/96	Borehole DH36	200000	18000	1600	17	<0.44		154.548
NUS	WST96032/033	1/23/96	Borehole DH42A	200000	16000	1500	17	<0.44		1.54548
NUS	WST96034/035	1/23/96	Borehole DH42A	210000	16000	1500	17	0.88532		206.064
NUS	WST96036/037	1/23/96	Borehole DH42A	210000	15000	1300	18	<0.44		167.427
NUS	WST95249	8/30/95	Borehole DPD02	NA	NA	NA	NA	NA		NA
NUS	WST95251	8/30/95	Borehole DPD02	NA	NA	NA	NA	NA		NA
NUS	WST96026/054	1/22/96	Borehole EEP21B	200000	NA	1600	16	<0.44		154.548
NUS	WST95332	12/27/95	Borehole EEP37B	NA	NA	NA	NA	NA		NA
NUS	WST96024/025	1/22/96	Borehole EEP37B	190000	16000	1500	18	<0.44		87.5772
NUS	WST96202/206	6/10/96	Borehole EEP37B	210000	19000	1300	1300	<0.44		103.032
NUS	WST96203/207	6/10/96	Borehole EEP37B	210000	17000	1300	17	<0.44		113.3352
NUS	WST96249/253	7/15/96	Borehole EEP37B	190000	19000	1700	25	<2.2		108.1836
NUS	WST96250/254	7/15/96	Borehole EEP37B	200000	12000	1600	24	<2.2		128.79
Wastren	WST96360/361	9/10/96	Borehole EEP21B	202000	16700	1590	NA	2.2	B	196
Wastren	WST96204/208	6/10/96	Borehole EEP37B	190000	15800	1540	NA	1.1		142
Wastren	WST96205	6/10/96	Borehole EEP37B	191000	15900	1550	NA	NA		NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC		TOC		Na	Mg	K	B
				mg/L		mg/L		mg/L	mg/L	mg/L	mg/L
Wastren	WST96362/363	9/10/96	Borehole @ MWS8	7.0		1470		42800	29700	21100	266
Wastren	WST96460/461	10/22/96	Borehole @ MWS8	7.5		1450		40800	29100	21800	324
NUS	WST96052/053	1/23/96	Borehole OH63	NA		NA		40000	20000	16000	1100
NUS	WST95234	8/25/95	Borehole C1H05 Room C1	NA		NA		NA	NA	NA	NA
NUS	WST95236	8/25/95	Borehole C1H06 Room C1	NA		NA		NA	NA	NA	NA
NUS	WST95235	8/25/95	Borehole C1H07 Room C1	NA		NA		NA	NA	NA	NA
NUS	WST95253	8/30/95	Borehole C1X13 Room C1	NA		NA		NA	NA	NA	NA
NUS	WST95255	8/30/95	Borehole C1X13 Room C1	NA		NA		NA	NA	NA	NA
NUS	WST96042/043	1/23/96	Borehole DH36	NA		NA		38000	17000	16000	1080
NUS	WST96044/045	1/23/96	Borehole DH36	NA		NA		35000	16000	15000	1200
NUS	WST96046/047	1/23/96	Borehole DH36	NA		NA		36000	16000	15000	1100
NUS	WST96032/033	1/23/96	Borehole DH42A	NA		NA		33000	15000	15000	1070
NUS	WST96034/035	1/23/96	Borehole DH42A	NA		NA		45000	17000	18000	1100
NUS	WST96036/037	1/23/96	Borehole DH42A	NA		NA		44000	16000	17000	1100
NUS	WST95249	8/30/95	Borehole DPD02	NA		NA		NA	NA	NA	NA
NUS	WST95251	8/30/95	Borehole DPD02	NA		NA		NA	NA	NA	NA
NUS	WST96026/054	1/22/96	Borehole EEP21B	NA		NA		28000	19000	14000	1000
NUS	WST95332	12/27/95	Borehole EEP37B	NA		NA		NA	NA	NA	NA
NUS	WST96024/025	1/22/96	Borehole EEP37B	NA		NA		27000	20000	14000	1000
NUS	WST96202/206	6/10/96	Borehole EEP37B	NA		2		85000	24000	17000	1400
NUS	WST96203/207	6/10/96	Borehole EEP37B	NA		1		85000	24000	18000	1400
NUS	WST96249/253	7/15/96	Borehole EEP37B	<5		42		77000	22000	16000	1400
NUS	WST96250/254	7/15/96	Borehole EEP37B	<5		<20		78000	22000	16000	1400
Wastren	WST96360/361	9/10/96	Borehole EEP21B	2.5		9.7	B	80700	24100	17000	1500
Wastren	WST96204/208	6/10/96	Borehole EEP37B	NA		3.9		79300	23600	16400	1550
Wastren	WST96205	6/10/96	Borehole EEP37B	NA		2.3		78400	23400	16200	1530

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca		Fe		Zn		Sum	Sum	charge balance
				mg/L		mg/L		mg/L		Cations	Anions	percent
Wastren	WST96362/363	9/10/96	Borehole @ MWS8	38200		1.54	B	766		6776	6624	1.14
Wastren	WST96460/461	10/22/96	Borehole @ MWS8	35500		2.39	N	739		6528	6567	-0.30
NUS	WST96052/053	1/23/96	Borehole OH63	300		NA		<0.5		3912	5994	-21.03
NUS	WST95234	8/25/95	Borehole C1H05 Room C1	NA		NA		NA		NA	NA	NA
NUS	WST95236	8/25/95	Borehole C1H06 Room C1	NA		NA		NA		NA	NA	NA
NUS	WST95235	8/25/95	Borehole C1H07 Room C1	NA		NA		NA		NA	NA	NA
NUS	WST95253	8/30/95	Borehole C1X13 Room C1	NA		NA		NA		NA	NA	NA
NUS	WST95255	8/30/95	Borehole C1X13 Room C1	NA		NA		NA		NA	NA	NA
NUS	WST96042/043	1/23/96	Borehole DH36	280		NA		<0.5		3575	5993	-25.27
NUS	WST96044/045	1/23/96	Borehole DH36	270		NA		0.65		3347	6278	-30.45
NUS	WST96046/047	1/23/96	Borehole DH36	270		NA		0.5		3381	6036	-28.19
NUS	WST96032/033	1/23/96	Borehole DH42A	280		NA		<0.5		3166	5993	-30.86
NUS	WST96034/035	1/23/96	Borehole DH42A	300		NA		<0.5		3933	6275	-22.94
NUS	WST96036/037	1/23/96	Borehole DH42A	300		NA		<0.5		3782	6252	-24.62
NUS	WST95249	8/30/95	Borehole DPD02	NA		NA		NA		NA	NA	NA
NUS	WST95251	8/30/95	Borehole DPD02	NA		NA		NA		NA	NA	NA
NUS	WST96026/054	1/22/96	Borehole EEP21B	350		NA		<0.5		3249	5661	-27.07
NUS	WST95332	12/27/95	Borehole EEP37B	NA		NA		NA		NA	NA	NA
NUS	WST96024/025	1/22/96	Borehole EEP37B	520		NA		<0.5		3297	5711	-26.80
NUS	WST96202/206	6/10/96	Borehole EEP37B	460		NA		<1		6259	6335	-0.60
NUS	WST96203/207	6/10/96	Borehole EEP37B	450		NA		<1		6284	6294	-0.07
NUS	WST96249/253	7/15/96	Borehole EEP37B	360		4		2		5716	5776	-0.52
NUS	WST96250/254	7/15/96	Borehole EEP37B	340		2.3		<0.5		5759	5911	-1.31
Wastren	WST96360/361	9/10/96	Borehole EEP21B	368	B	9.850	B	0.197		6085	6065	0.16
Wastren	WST96204/208	6/10/96	Borehole EEP37B	307		NA		0.388		5969	5707	2.24
Wastren	WST96205	6/10/96	Borehole EEP37B	308		NA		0.363		5907	5738	1.45

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
Wastren	WST96251/255	7/15/96	Borehole EEP37B	<0.0002	U	0.0062	BN	0.0537	B	0.00092	BN	0.0402	E
Wastren	WST96252/256	7/15/96	Borehole EEP37B	<0.0002	U	0.0064	BN	0.0467	B	0.0009	BN	0.0561	E
Wastren	WST96334/335	8/27/96	Borehole EEP37B	<0.0002	UN	0.0064	BN	0.0345	BE	<0.00044	UN	0.0323	
Wastren	WST96336/337	8/27/96	Borehole EEP37B	<0.0002	UN	0.0078	BN	0.0334	BE	<0.00044	UN	0.0445	
Wastren	WST96456/457	10/22/96	Borehole EEP37B	<0.001	U	0.0036	B	0.0370	B	<0.010	U	0.0445	
Wastren	WST96458/459	10/22/96	Borehole EEP37B	<0.001	U	<0.0022	U	0.0365	B	<0.010	U	0.0627	
Wastren	WST96494/495	11/26/96	Borehole EEP37B	<0.001	U	<0.004	U	0.0716	B	<0.010	U	0.0871	B
NUS	WST95299	12/12/95	Borehole L3X02	<0.0004	U	<0.3	U	<0.5	U	<0.5	U	<2	U
NUS	WST95293	12/12/95	Borehole L3X06	<0.0001	U	<0.3	U	0.6		<0.5	U	<2	U
NUS	WST95296	12/12/95	Borehole L3X06	<0.0001	U	<0.3	U	0.6		<0.5	U	<2	U
NUS	WST95308	12/12/95	Borehole L3X24	<0.0004	U	<0.8	U	0.13		<0.005	U	<0.02	U
NUS	WST95290	12/12/95	Borehole L3X32	<0.0004	U	<0.8	U	<0.5	U	<0.5	U	<2	U
NUS	WST96012/013	1/22/96	Borehole OH224	<0.0001	U	<0.2	U	2.4		<0.2	U	<1	U
NUS	WST96014/015	1/22/96	Borehole OH224	<0.0001	U	<0.2	U	2.5		<0.2	U	<1	U
NUS	WST96016/017	1/22/96	Borehole OH224	<0.0001	U	<0.2	U	2.6		<0.2	U	<1	U
NUS	WST95119	6/28/95	Borehole OH225	<0.0002	U	0.6		3.9		<0.005	U	<0.02	U
NUS	WST95243	8/30/95	Borehole OH225	NA		3		NA		NA		NA	
NUS	WST95287	12/11/95	Borehole OH225	<0.0001	U	<2	U	4.6		<0.6	U	<2	U
NUS	WST95288	12/11/95	Borehole OH225	<0.0001	U	<2	U	4.8		<0.6	U	<2	U
NUS	WST95289	12/11/95	Borehole OH225	<0.0001	U	<2	U	4.4		<0.6	U	<2	U
NUS	WST96018/019	1/22/96	Borehole OH225	<0.0001	U	<0.2	U	3.4		<0.5	U	<2	U
NUS	WST96133	4/22/96	Borehole OH225	<0.002	U	<2	U	2.5		<0.2	U	<1	U
NUS	WST96161	5/21/96	Borehole OH225	<0.0005	U	<0.6	U	2.7		<0.5	U	<2	U
NUS	WST96193/197	6/10/96	Borehole OH225	<0.001	U	<0.3	U	3		<0.2	U	<1	U
NUS	WST96194/198	6/10/96	Borehole OH225	<0.001	U	<0.3	U	3		<0.5	U	<2	U
NUS	WST96240/244	7/15/96	Borehole OH225	<0.001	U	<0.6	U	4.7		<0.5	U	<2.0	U

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG	TDS	pH
				mg/l		mg/l		mg/l		mg/l	mg/L	
Wastren	WST96251/255	7/15/96	Borehole EEP37B	0.0839		0.0012	B	0.0012	B	1.20	396000	6.0
Wastren	WST96252/256	7/15/96	Borehole EEP37B	0.0955		<0.0011	U	0.149		1.20	394000	6.0
Wastren	WST96334/335	8/27/96	Borehole EEP37B	0.0158		0.00047	B	<0.00033	UN	1.23	390000	6.1
Wastren	WST96336/337	8/27/96	Borehole EEP37B	0.0125		0.00069	B	<0.00033	UN	1.23	382000	6.0
Wastren	WST96456/457	10/22/96	Borehole EEP37B	0.0202	B	<0.0022	U	0.0014	B	1.23	388000	6.0
Wastren	WST96458/459	10/22/96	Borehole EEP37B	0.0207	B	<0.0022	U	0.0022	B	1.23	392000	5.9
Wastren	WST96494/495	11/26/96	Borehole EEP37B	0.0499		<0.004	U	<0.010	U	1.22	393000	6.1
NUS	WST95299	12/12/95	Borehole L3X02	<5	U	<0.8	U	<1	U	NA	NA	6.3
NUS	WST95293	12/12/95	Borehole L3X06	<5	U	<1	U	<1	U	NA	NA	7.4
NUS	WST95296	12/12/95	Borehole L3X06	<5	U	<0.4	U	<1	U	NA	NA	7.3
NUS	WST95308	12/12/95	Borehole L3X24	<0.05	U	<0.4	U	<0.01	U	NA	NA	4.9
NUS	WST95290	12/12/95	Borehole L3X32	<5	U	<1	U	<1	U	NA	NA	6.3
NUS	WST96012/013	1/22/96	Borehole OH224	11		<0.8	U	<0.5	U	1.23	230000	6.9
NUS	WST96014/015	1/22/96	Borehole OH224	12		<0.8	U	<0.5	U	1.23	240000	6.9
NUS	WST96016/017	1/22/96	Borehole OH224	12		<0.8	U	<0.5	U	1.23	240000	6.9
NUS	WST95119	6/28/95	Borehole OH225	7.1		0.2		0.03		NA	NA	6.4
NUS	WST95243	8/30/95	Borehole OH225	31		NA		NA		NA	NA	NA
NUS	WST95287	12/11/95	Borehole OH225	23		<0.8	U	<1	U	NA	NA	7.0
NUS	WST95288	12/11/95	Borehole OH225	22		<0.8	U	<1	U	NA	NA	7.0
NUS	WST95289	12/11/95	Borehole OH225	21		<0.8	U	<1	U	NA	NA	6.9
NUS	WST96018/019	1/22/96	Borehole OH225	20		<0.8	U	<1	U	1.25	270000	6.6
NUS	WST96133	4/22/96	Borehole OH225	19		<0.8	U	<0.5	U	NA	NA	6.6
NUS	WST96161	5/21/96	Borehole OH225	0.69		<0.8	U	<1	U	NA	NA	6.5
NUS	WST96193/197	6/10/96	Borehole OH225	9		<0.8	U	<.5	U	1.23	140000	6.5
NUS	WST96194/198	6/10/96	Borehole OH225	10		<0.8	U	<1	U	1.23	130000	6.5
NUS	WST96240/244	7/15/96	Borehole OH225	15		<0.8	U	<1	U	1.23	350000	6.7

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl	SO4	Br	I	NO3		NH4
				mg/L	mg/L	mg/L	mg/L	mg/L		mg/L
Wastren	WST96251/255	7/15/96	Borehole EEP37B	192000	15700	1520	NA	1.4	B	216
Wastren	WST96252/256	7/15/96	Borehole EEP37B	191000	15600	1510	NA	1.5	B	216
Wastren	WST96334/335	8/27/96	Borehole EEP37B	198000	16300	1560	NA	1.6	B	188
Wastren	WST96336/337	8/27/96	Borehole EEP37B	198000	16300	1560	NA	1.5	B	187
Wastren	WST96456/457	10/22/96	Borehole EEP37B	200000	16300	1590	NA			NA
Wastren	WST96458/459	10/22/96	Borehole EEP37B	200000	16300	1590	NA	<0.20	U	141
Wastren	WST96494/495	11/26/96	Borehole EEP37B	201000	16300	1540	NA	<0.10	U	169
NUS	WST95299	12/12/95	Borehole L3X02	NA	NA	NA	NA	NA		NA
NUS	WST95293	12/12/95	Borehole L3X06	NA	NA	NA	NA	NA		NA
NUS	WST95296	12/12/95	Borehole L3X06	NA	NA	NA	NA	NA		NA
NUS	WST95308	12/12/95	Borehole L3X24	NA	NA	NA	NA	NA		NA
NUS	WST95290	12/12/95	Borehole L3X32	NA	NA	NA	NA	NA		NA
NUS	WST96012/013	1/22/96	Borehole OH224	220000	380	920	10	141.6512		20.6064
NUS	WST96014/015	1/22/96	Borehole OH224	220000	380	550	9	159.3576		15.4548
NUS	WST96016/017	1/22/96	Borehole OH224	220000	380	810	10	159.3576		19.3185
NUS	WST95119	6/28/95	Borehole OH225	NA	NA	NA	NA	NA		NA
NUS	WST95243	8/30/95	Borehole OH225	NA	NA	NA	NA	NA		NA
NUS	WST95287	12/11/95	Borehole OH225	NA	NA	NA	NA	NA		NA
NUS	WST95288	12/11/95	Borehole OH225	NA	NA	NA	NA	NA		NA
NUS	WST95289	12/11/95	Borehole OH225	NA	NA	NA	NA	NA		NA
NUS	WST96018/019	1/22/96	Borehole OH225	220000	250	1100	12	239.0364		20.6064
NUS	WST96133	4/22/96	Borehole OH225	NA	NA	NA	NA	NA		NA
NUS	WST96161	5/21/96	Borehole OH225	NA	NA	NA	NA	NA		NA
NUS	WST96193/197	6/10/96	Borehole OH225	230000	420	650	8	92.9586		27.0459
NUS	WST96194/198	6/10/96	Borehole OH225	210000	360	<2	8	79.6788		27.0459
NUS	WST96240/244	7/15/96	Borehole OH225	210000	440	740	8	208.0502		27.0459

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC		TOC		Na	Mg	K	B
				mg/L		mg/L		mg/L	mg/L	mg/L	mg/L
Wastren	WST96251/255	7/15/96	Borehole EEP37B	1.6		10.5		81100	23100	16900	1540
Wastren	WST96252/256	7/15/96	Borehole EEP37B	1.2		5.4	B	82400	23600	17100	1530
Wastren	WST96334/335	8/27/96	Borehole EEP37B	1	B	<1.0	U	80500	24800	16700	1590
Wastren	WST96336/337	8/27/96	Borehole EEP37B	1.3	B	1.9	B	79100	24600	17300	1570
Wastren	WST96456/457	10/22/96	Borehole EEP37B	0.86	B			76400	23800	16600	1630
Wastren	WST96458/459	10/22/96	Borehole EEP37B	1.0		2	B	76800	23800	16700	1610
Wastren	WST96494/495	11/26/96	Borehole EEP37B	1.8		<1.0	U	84900	24000	15900	1640
NUS	WST95299	12/12/95	Borehole L3X02	NA		NA		NA	NA	NA	NA
NUS	WST95293	12/12/95	Borehole L3X06	NA		NA		NA	NA	NA	NA
NUS	WST95296	12/12/95	Borehole L3X06	NA		NA		NA	NA	NA	NA
NUS	WST95308	12/12/95	Borehole L3X24	NA		NA		NA	NA	NA	NA
NUS	WST95290	12/12/95	Borehole L3X32	NA		NA		NA	NA	NA	NA
NUS	WST96012/013	1/22/96	Borehole OH224	NA		NA		66000	22000	8000	170
NUS	WST96014/015	1/22/96	Borehole OH224	NA		NA		67000	19000	7000	170
NUS	WST96016/017	1/22/96	Borehole OH224	NA		NA		68000	21000	7800	190
NUS	WST95119	6/28/95	Borehole OH225	NA		NA		NA	NA	NA	NA
NUS	WST95243	8/30/95	Borehole OH225	NA		NA		NA	NA	NA	NA
NUS	WST95287	12/11/95	Borehole OH225	NA		NA		NA	NA	NA	NA
NUS	WST95288	12/11/95	Borehole OH225	NA		NA		NA	NA	NA	NA
NUS	WST95289	12/11/95	Borehole OH225	NA		NA		NA	NA	NA	NA
NUS	WST96018/019	1/22/96	Borehole OH225	NA		NA		48000	30000	12000	200
NUS	WST96133	4/22/96	Borehole OH225	NA		NA		NA	NA	NA	NA
NUS	WST96161	5/21/96	Borehole OH225	NA		NA		NA	NA	NA	NA
NUS	WST96193/197	6/10/96	Borehole OH225	NA		210		66000	25000	11000	260
NUS	WST96194/198	6/10/96	Borehole OH225	NA		260		65000	24000	11000	260
NUS	WST96240/244	7/15/96	Borehole OH225	10		610		53000	26000	10000	220

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca		Fe		Zn		Sum	Sum	charge balance
				mg/L		mg/L		mg/L		Cations	Anions	percent
Wastren	WST96251/255	7/15/96	Borehole EEP37B	257		3.09	N	0.428		6016	5762	2.16
Wastren	WST96252/256	7/15/96	Borehole EEP37B	266		3.59	N	0.43		6118	5731	3.27
Wastren	WST96334/335	8/27/96	Borehole EEP37B	313		0.429	BN	0.197		6132	5944	1.56
Wastren	WST96336/337	8/27/96	Borehole EEP37B	310		0.545	BN	0.196		6068	5944	1.03
Wastren	WST96456/457	10/22/96	Borehole EEP37B	284	B	0.221	BN	0.134	B	5871	6001	-1.09
Wastren	WST96458/459	10/22/96	Borehole EEP37B	281	B	0.177	BN	0.146	B	5889	6001	-0.94
Wastren	WST96494/495	11/26/96	Borehole EEP37B	404		0.787		0.201	B	6246	6028	1.78
NUS	WST95299	12/12/95	Borehole L3X02	NA		NA		NA		NA	NA	NA
NUS	WST95293	12/12/95	Borehole L3X06	NA		NA		NA		NA	NA	NA
NUS	WST95296	12/12/95	Borehole L3X06	NA		NA		NA		NA	NA	NA
NUS	WST95308	12/12/95	Borehole L3X24	NA		NA		NA		NA	NA	NA
NUS	WST95290	12/12/95	Borehole L3X32	NA		NA		NA		NA	NA	NA
NUS	WST96012/013	1/22/96	Borehole OH224	20000		NA		910		5899	6225	-2.68
NUS	WST96014/015	1/22/96	Borehole OH224	18000		NA		940		5571	6220	-5.51
NUS	WST96016/017	1/22/96	Borehole OH224	19000		NA		1000		5851	6223	-3.08
NUS	WST95119	6/28/95	Borehole OH225	NA		NA		NA		NA	NA	NA
NUS	WST95243	8/30/95	Borehole OH225	NA		NA		NA		NA	NA	NA
NUS	WST95287	12/11/95	Borehole OH225	NA		NA		NA		NA	NA	NA
NUS	WST95288	12/11/95	Borehole OH225	NA		NA		NA		NA	NA	NA
NUS	WST95289	12/11/95	Borehole OH225	NA		NA		NA		NA	NA	NA
NUS	WST96018/019	1/22/96	Borehole OH225	26000		NA		1900		6179	6224	-0.36
NUS	WST96133	4/22/96	Borehole OH225	NA		NA		1000		NA	NA	NA
NUS	WST96161	5/21/96	Borehole OH225	NA		NA		1200		NA	NA	NA
NUS	WST96193/197	6/10/96	Borehole OH225	23000		NA		1100		6381	6504	-0.96
NUS	WST96194/198	6/10/96	Borehole OH225	22000		NA		1100		6205	5931	2.26
NUS	WST96240/244	7/15/96	Borehole OH225	25000		2		1400		5968	5943	0.22

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST96241/245	7/15/96	Borehole OH225	<0.001	U	<0.6	U	4.7		<0.5	U	<2.0	U
Wastren	WST96195/199	6/10/96	Borehole OH225	0.001		0.00022		2.71		0.006		0.0749	
Wastren	WST96196/200	6/10/96	Borehole OH225	0.001		0.00022		2.70		0.0048		0.078	
Wastren	WST96242/246	7/15/96	Borehole OH225	<0.002	U	<0.0011	UN	4.81	B	0.0113	N	0.0532	E
Wastren	WST96243/247	7/15/96	Borehole OH225	<0.002	U	<0.0011	UN	4.71	B	0.0081	BN	0.053	E
Wastren	WST96278/279	8/5/96	Borehole OH225	<0.0004	U	<0.0011	UN	4.10	B	<0.00044	U	0.0209	B
Wastren	WST96280/281	8/5/96	Borehole OH225	<0.0004	U	<0.0011	UN	4.04	B	0.0033	BN	0.032	
Wastren	WST96298/299	8/12/96	Borehole OH225	<0.0004	UN	<.00056	UN	4.04	B	0.0037	BN	0.0310	E
Wastren	WST96300/301	8/12/96	Borehole OH225	<0.0004	UN	<.00056	UN	4.01	B	0.0072	N	0.0320	E
Wastren	WST96306/307	8/19/96	Borehole OH225	<0.0004	UN	<.00056	UN	4.07	B	0.0030	BN	0.0341	E
Wastren	WST96308/309	8/19/96	Borehole OH225	<0.0004	UN	<.00056	UN	3.98	B	0.0059	N	0.0370	E
Wastren	WST96332/333	8/27/96	Borehole OH225	<0.0004	UN	<0.00056	UN	3.91	BE	0.0018	BN	0.0427	
Wastren	WST96344/345	9/4/96	Borehole OH225	<0.0004	UN	<0.00056	UN	3.49	BE	0.0038	BN	0.0420	EN
Wastren	WST96346/347	9/4/96	Borehole OH225	<0.0004	UN	<0.00056	UN	3.80	BE	0.0032	BN	0.0280	EN
Wastren	WST96358/359	9/10/96	Borehole OH225	<0.0004	UN	<0.00056	UN	4.01	BE	0.0032	BN	0.0260	EN
Wastren	WST96366/367	9/23/96	Borehole OH225	<0.0004	UN	<0.00056	UN	3.74	B	0.0014	B	0.0188	E
Wastren	WST96398/399	9/30/96	Borehole OH225	<0.0004	UN	<0.00056	BN	3.70	B	0.0010	B	0.0286	E
Wastren	WST96428/429	10/7/96	Borehole OH225	<0.0010	U	<0.0022	U	3.60	B	<0.0011	U	0.0168	
Wastren	WST96434/435	10/14/96	Borehole OH225	<0.0010	U	<0.0022	U	3.55	B	<0.0011	U	0.0186	
Wastren	WST96436/437	10/14/96	Borehole OH225	<0.0010	U	<0.0022	U	3.59	B	<0.0011	U	0.0226	
Wastren	WST96448/449	10/22/96	Borehole OH225	<0.0010	U	<0.0022	B	3.43	B	<0.0011	U	0.0240	
Wastren	WST96450/451	10/22/96	Borehole OH225	<0.0010	U	<0.0022	U	3.43	B	<0.0011	U	0.0268	
Wastren	WST96496/497	11/26/96	Borehole OH225	<0.0010	U	<0.004	U	3.42		<0.010	U	0.0944	B
NUS	WST96227	7/2/96	Borehole OH225 (drums)	<0.001	U	<0.3	U	4		<0.2	U	1	
NUS	WST95118	6/28/95	Borehole OH226	<0.0002	U	0.8		3.9		0.008		<0.1	U
NUS	WST96022/023	1/22/96	Borehole OH226	<0.0001	U	<0.2	U	2.5		<0.2	U	<1	U

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG		TDS		pH
				mg/l		mg/l		mg/l		mg/l		mg/L		
NUS	WST96241/245	7/15/96	Borehole OH225	13		<0.8	U	<1	U	1.23		340000		6.7
Wastren	WST96195/199	6/10/96	Borehole OH225	12.5		0.078		0.003		1.20		365000		6.6
Wastren	WST96196/200	6/10/96	Borehole OH225	11		0.0823		0.003		1.20		365000		6.6
Wastren	WST96242/246	7/15/96	Borehole OH225	13.2		0.134		0.006	B	1.20		426000		6.8
Wastren	WST96243/247	7/15/96	Borehole OH225	15.7		0.135		0.0055	B	1.20		419000		6.8
Wastren	WST96278/279	8/5/96	Borehole OH225	16.3		0.0623	N	0.0043	BN	1.20		416000		6.7
Wastren	WST96280/281	8/5/96	Borehole OH225	16.5		0.0619	N	0.0040	BN	1.20		425000		7.0
Wastren	WST96298/299	8/12/96	Borehole OH225	14.7		0.140		0.0030	BN	1.24		434000		6.78
Wastren	WST96300/301	8/12/96	Borehole OH225	15.9		0.141		0.0030	BN	1.24		422000		6.78
Wastren	WST96306/307	8/19/96	Borehole OH225	17.0		0.131		0.0032	UN	1.22		431000		6.73
Wastren	WST96308/309	8/19/96	Borehole OH225	16.4		0.137		0.0034	BN	1.23		438000		6.61
Wastren	WST96332/333	8/27/96	Borehole OH225	11.3		0.104		0.0033	BN	1.23		391000		6.7
Wastren	WST96344/345	9/4/96	Borehole OH225	12.2		0.0721	N	0.0044	BN	1.23		417000		6.7
Wastren	WST96346/347	9/4/96	Borehole OH225	12.9		0.0712	N	0.0043	BN	1.23		424000		6.6
Wastren	WST96358/359	9/10/96	Borehole OH225	13.2		0.0721	N	0.0004	BN	1.24		439000		6.6
Wastren	WST96366/367	9/23/96	Borehole OH225	13.8		0.0681	N	0.0035	BN	1.22		415000		6.6
Wastren	WST96398/399	9/30/96	Borehole OH225	14.4		0.0801	N	0.0032	BN	1.23		410000		6.4
Wastren	WST96428/429	10/7/96	Borehole OH225	19.4		0.0982	B	0.0027	B	1.23		411000		6.7
Wastren	WST96434/435	10/14/96	Borehole OH225	19.5		0.108	B	0.0027	B	1.23		404000		6.7
Wastren	WST96436/437	10/14/96	Borehole OH225	19.7		0.107	B	0.0030	B	1.24		403000		6.7
Wastren	WST96448/449	10/22/96	Borehole OH225	18.9		0.104	B	0.0028	B	1.24		412000		6.6
Wastren	WST96450/451	10/22/96	Borehole OH225	19.0		0.0984	B	0.0030	B	1.23		414000		6.6
Wastren	WST96496/497	11/26/96	Borehole OH225	20.2		0.064	B	<0.010	U	1.23		402000		6.5
NUS	WST96227	7/2/96	Borehole OH225 (drums)	6.4		<0.8	U	<0.5	U	NA		NA		6.8
NUS	WST95118	6/28/95	Borehole OH226	11		<0.1	U	0.04		NA		NA		6.8
NUS	WST96022/023	1/22/96	Borehole OH226	13		<0.8	U	<0.5	U	1.22		250000		7.2

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl	SO4	Br	I	NO3	NH4
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST96241/245	7/15/96	Borehole OH225	220000	420	720	9	194.7704	24.4701
Wastren	WST96195/199	6/10/96	Borehole OH225	204000	366	774	NA	211	64.9
Wastren	WST96196/200	6/10/96	Borehole OH225	206000	370	776	NA	209	68.9
Wastren	WST96242/246	7/15/96	Borehole OH225	216000	332	720	NA	262	45.8
Wastren	WST96243/247	7/15/96	Borehole OH225	209000	327	693	NA	264	49.2
Wastren	WST96278/279	8/5/96	Borehole OH225	212000	338	711	NA	257	93.9
Wastren	WST96280/281	8/5/96	Borehole OH225	210000	341	708	NA	251	81.5
Wastren	WST96298/299	8/12/96	Borehole OH225	216000	333	750	NA	263	92.7
Wastren	WST96300/301	8/12/96	Borehole OH225	216000	334	749	NA	262	81.5
Wastren	WST96306/307	8/19/96	Borehole OH225	214000	336	773	NA	261	75.9
Wastren	WST96308/309	8/19/96	Borehole OH225	215000	335	775	NA	261	75.9
Wastren	WST96332/333	8/27/96	Borehole OH225	220000	333	824	NA	266	95.1
Wastren	WST96344/345	9/4/96	Borehole OH225	221000	366	850	NA	267	98.7
Wastren	WST96346/347	9/4/96	Borehole OH225	220000	350	844	NA	262	106
Wastren	WST96358/359	9/10/96	Borehole OH225	224000	345	869	NA	258	53.9
Wastren	WST96366/367	9/23/96	Borehole OH225	227000	540	873	NA	240	68.8
Wastren	WST96398/399	9/30/96	Borehole OH225	224000	436	878	NA	241	86.2
Wastren	WST96428/429	10/7/96	Borehole OH225	223000	360	901	NA	244	57.2
Wastren	WST96434/435	10/14/96	Borehole OH225	222000	342	911	NA	241	63.7
Wastren	WST96436/437	10/14/96	Borehole OH225	221000	338	911	NA	238	63.4
Wastren	WST96448/449	10/22/96	Borehole OH225	223000	351	924	NA	238	59.9
Wastren	WST96450/451	10/22/96	Borehole OH225	222000	339	923	NA	238	55.7
Wastren	WST96496/497	11/26/96	Borehole OH225	223000	343	896	NA	236	55.9
NUS	WST96227	7/2/96	Borehole OH225 (drums)	NA	NA	NA	NA	NA	NA
NUS	WST95118	6/28/95	Borehole OH226	NA	NA	NA	NA	NA	NA
NUS	WST96022/023	1/22/96	Borehole OH226	220000	460	680	8	123.9448	15.4548

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC	TOC	Na	Mg	K	B
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST96241/245	7/15/96	Borehole OH225	10	560	53000	26000	10000	220
Wastren	WST96195/199	6/10/96	Borehole OH225	NA	716	62400	24000	10400	266
Wastren	WST96196/200	6/10/96	Borehole OH225	NA	705	61600	24000	10600	274
Wastren	WST96242/246	7/15/96	Borehole OH225	12.8	785	56300	27500	10300	238
Wastren	WST96243/247	7/15/96	Borehole OH225	13	794	55800	27100	10300	235
Wastren	WST96278/279	8/5/96	Borehole OH225	9.35	789	57500	28000	10600	239
Wastren	WST96280/281	8/5/96	Borehole OH225	9.44	785	57400	27800	10200	231
Wastren	WST96298/299	8/12/96	Borehole OH225	10.6	812	57100	28600	10600	233
Wastren	WST96300/301	8/12/96	Borehole OH225	10.7	793	57200	28100	10600	233
Wastren	WST96306/307	8/19/96	Borehole OH225	10.1	794	56200	28900	10700	251
Wastren	WST96308/309	8/19/96	Borehole OH225	10.4	794	56600	29400	10800	246
Wastren	WST96332/333	8/27/96	Borehole OH225	10.2	841	55700	29500	11700	258
Wastren	WST96344/345	9/4/96	Borehole OH225	10.3	845	54400	29400	12100	263
Wastren	WST96346/347	9/4/96	Borehole OH225	10.3	843	54800	29400	11900	264
Wastren	WST96358/359	9/10/96	Borehole OH225	10.5	828	55000	29500	12100	260
Wastren	WST96366/367	9/23/96	Borehole OH225	10.9	877	54000	28800	12900	262
Wastren	WST96398/399	9/30/96	Borehole OH225	10.6	888	58500	28800	12600	260
Wastren	WST96428/429	10/7/96	Borehole OH225	10.1	901	50200	28600	13000	273
Wastren	WST96434/435	10/14/96	Borehole OH225	9.7	915	50400	28900	12800	280
Wastren	WST96436/437	10/14/96	Borehole OH225	9.3	918	50600	29300	13200	290
Wastren	WST96448/449	10/22/96	Borehole OH225	9.5	880	50800	29000	13200	299
Wastren	WST96450/451	10/22/96	Borehole OH225	8.9	908	50300	28900	13000	306
Wastren	WST96496/497	11/26/96	Borehole OH225	9.9	888	55700	30400	12800	304
NUS	WST96227	7/2/96	Borehole OH225 (drums)	NA	NA	NA	NA	NA	NA
NUS	WST95118	6/28/95	Borehole OH226	NA	NA	NA	NA	NA	NA
NUS	WST96022/023	1/22/96	Borehole OH226	NA	NA	66000	18000	5100	110

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca mg/L		Fe mg/L		Zn mg/L		Sum Cations	Sum Anions	charge balance percent
NUS	WST96241/245	7/15/96	Borehole OH225	24000		<2		1400		5919	6224	-2.52
Wastren	WST96195/199	6/10/96	Borehole OH225	21500		NA		1090		6053	5771	2.38
Wastren	WST96196/200	6/10/96	Borehole OH225	21700		NA		1110		6034	5828	1.73
Wastren	WST96242/246	7/15/96	Borehole OH225	23600		1.29	BN	1560		6175	6110	0.53
Wastren	WST96243/247	7/15/96	Borehole OH225	23700		1.47	BN	1540		6125	5912	1.77
Wastren	WST96278/279	8/5/96	Borehole OH225	25400		0.262	N	1610		6366	5996	2.99
Wastren	WST96280/281	8/5/96	Borehole OH225	24700		0.27	N	1590		6299	5940	2.93
Wastren	WST96298/299	8/12/96	Borehole OH225	25600		0.042	BEN	1570		6407	6110	2.38
Wastren	WST96300/301	8/12/96	Borehole OH225	25600		0.039	BEN	1570		6370	6110	2.09
Wastren	WST96306/307	8/19/96	Borehole OH225	25600		0.304	EN	1620		6397	6054	2.76
Wastren	WST96308/309	8/19/96	Borehole OH225	25900		0.109	BEN	1640		6473	6082	3.11
Wastren	WST96332/333	8/27/96	Borehole OH225	25900		0.0872	BN	1670		6466	6223	1.91
Wastren	WST96344/345	9/4/96	Borehole OH225	25600		0.5310	B	1690		6397	6253	1.14
Wastren	WST96346/347	9/4/96	Borehole OH225	25400		0.0908	B	1690		6399	6224	1.39
Wastren	WST96358/359	9/10/96	Borehole OH225	25700		0.0712	B	1670		6436	6337	0.77
Wastren	WST96366/367	9/23/96	Borehole OH225	25400		2.220	EN	1600		6340	6426	-0.67
Wastren	WST96398/399	9/30/96	Borehole OH225	26000		2.830	EN	1610		6558	6339	1.70
Wastren	WST96428/429	10/7/96	Borehole OH225	25000		1.240	N	1520		6142	6310	-1.34
Wastren	WST96434/435	10/14/96	Borehole OH225	25200		0.283	BN	1520		6181	6281	-0.80
Wastren	WST96436/437	10/14/96	Borehole OH225	25100		0.310	BN	1540		6229	6253	-0.19
Wastren	WST96448/449	10/22/96	Borehole OH225	24500		0.449	BN	1540		6184	6310	-1.01
Wastren	WST96450/451	10/22/96	Borehole OH225	24200		0.060	BN	1540		6134	6281	-1.18
Wastren	WST96496/497	11/26/96	Borehole OH225	26500		2.580		1580		6602	6309	2.27
NUS	WST96227	7/2/96	Borehole OH225 (drums)	NA		NA		1200		NA	NA	NA
NUS	WST95118	6/28/95	Borehole OH226	NA		NA		NA		NA	NA	NA
NUS	WST96022/023	1/22/96	Borehole OH226	18000		NA		760		5391	6223	-7.17

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST95273	11/21/95	Borehole OH49	<0.0001	U	<3	U	<0.2	U	<0.2	U	<1	U
NUS	WST95274	11/21/95	Borehole OH49	<0.0001	U	<3	U	<0.2	U	<0.2	U	<1	U
NUS	WST95275	11/21/95	Borehole OH49	<0.0001	U	<3	U	<0.1	U	<0.1	U	<0.5	U
NUS	WST95277	11/21/95	Borehole OH49	<0.0001	U	<3	U	<0.1	U	<0.1	U	<0.5	U
NUS	WST95278	11/21/95	Borehole OH49	<0.0001	U	<3	U	<0.5	U	<0.5	U	<2	U
NUS	WST96050/051	1/23/96	Borehole OH49	<0.0001	U	<0.2	U	<0.2	U	<0.2	U	<1	U
Wastren	WST96372/373	9/23/96	Borehole OH63	<0.0004	UN	0.0042	BN	0.0273	B	0.0191		0.0298	E
Wastren	WST96374/375	9/23/96	Borehole OH63	<0.0004	UN	0.0042	BN	0.0271	B	0.0190		0.0337	E
NUS	WST96048/049	1/23/96	Borehole OH74	<0.0001	U	<0.2	U	<0.2	U	<0.2	U	<1	U
NUS	WST96005	1/10/96	Borehole Room L-4	<0.0001	U	<0.3	U	<0.5	U	<0.5	U	<2	U
NUS	WST95133	7/5/95	Borehole Water - AIS	0.0004		0.4		0.27		0.01		<0.02	U
NUS	WST95199	8/7/95	Borehole DBT 10 Room D	<0.0008	U	5		0.17		<0.05	U	<0.2	U
NUS	WST95200	8/7/95	Borehole DBT 10 Room D	<0.0008	U	5		0.17		<0.05	U	<0.2	U
NUS	WST95134	7/5/95	Borehole Water W170	0.0003		0.5		0.24		<0.005	U	<0.1	U
NUS	WST95281	11/21/95	Borehole Water OH223	<0.0001	U	<3	U	<0.5	U	<0.5	U	<2	U
Wastren	WST96276	8/1/96	Corrosion Test Brine	<0.001	U	0.0052	B	0.163	B	<0.01	U	0.0551	B
Wastren	WST96277	8/1/96	Corrosion Test Brine	<0.001	U	<0.004	U	0.181	B	<0.01	U	0.0490	B
Wastren	WST96400/401	9/30/96	Drums #96-420 & 96-421	<0.0002	UN	0.0011	BN	22.4		0.0129		0.0866	E
Wastren	WST96402/403	9/30/96	Drums #96-420 & 96-421	<0.0002	UN	<0.0010	UN	21.4		0.0194		0.1370	E
NUS	WST96105	3/18/96	Exhaust Shaft Basin	<0.0001	U	<0.3	U	1.8		0.015		0.18	
NUS	WST96134	4/22/96	Exhaust Shaft Basin	<0.002	U	<0.6	U	6.2		<0.5	U	<2	U
NUS	WST96177/181	6/10/96	Exhaust Shaft Basin	<0.001	U	<0.3	U	1.8		<0.2	U	<0.5	U
NUS	WST96178/182	6/10/96	Exhaust Shaft Basin	<0.001	U	<0.3	U	1.9		0.25		<0.5	U
NUS	WST96228/230	7/10/96	Exhaust Shaft Basin	<0.0002	U	<0.3	U	3		<0.1	U	<0.4	U
NUS	WST96229/231	7/10/96	Exhaust Shaft Basin	<0.0002	U	<0.3	U	2.9		<0.1	U	<0.4	U
NUS	WST96232/236	7/15/96	Exhaust Shaft Basin	<0.001	U	<0.3	U	10		<2.0	U	<10.0	U

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG		TDS		pH
				mg/l		mg/l		mg/l		mg/l		mg/L		
NUS	WST95273	11/21/95	Borehole OH49	<2	U	<2	U	<0.5	U	NA		NA		6.7
NUS	WST95274	11/21/95	Borehole OH49	<2	U	<1	U	<0.5	U	NA		NA		6.7
NUS	WST95275	11/21/95	Borehole OH49	<1	U	<1	U	<0.2	U	NA		NA		6.7
NUS	WST95277	11/21/95	Borehole OH49	<1	U	<1	U	<0.2	U	NA		NA		6.8
NUS	WST95278	11/21/95	Borehole OH49	<5	U	<1	U	<1	U	NA		NA		7.1
NUS	WST96050/051	1/23/96	Borehole OH49	<0.2	U	<0.8	U	<0.5	U	1.23		350000		6.7
Wastren	WST96372/373	9/23/96	Borehole OH63	0.001	B	0.0004	BN	0.0015	BN	1.22		396000		6.1
Wastren	WST96374/375	9/23/96	Borehole OH63	0.001	B	0.0004	BN	0.0023	BN	1.22		391000		6.2
NUS	WST96048/049	1/23/96	Borehole OH74	0.2		<0.8	U	<0.5	U	1.23		260000		6.3
NUS	WST96005	1/10/96	Borehole Room L-4	0.28		<1	U	<1	U	NA		NA		6.9
NUS	WST95133	7/5/95	Borehole Water - AIS	<0.05	U	0.2		0.03		NA		NA		6.4
NUS	WST95199	8/7/95	Borehole DBT 10 Room D	<0.5	U	<1	U	<0.1	U	NA		NA		6.5
NUS	WST95200	8/7/95	Borehole DBT 10 Room D	<0.5	U	<1	U	<0.1	U	NA		NA		6.5
NUS	WST95134	7/5/95	Borehole Water W170	<0.05	U	<0.1	U	<.01	U	NA		NA		NA
NUS	WST95281	11/21/95	Borehole Water OH223	<3	U	<1	U	<1	U	NA		NA		6.6
Wastren	WST96276	8/1/96	Corrosion Test Brine	0.0619		<0.004	U	<0.01	U	1.18		272000		6.7
Wastren	WST96277	8/1/96	Corrosion Test Brine	0.0544		<0.004	U	<0.01	U	1.18		273000		6.5
Wastren	WST96400/401	9/30/96	Drums #96-420 & 96-421	1.21		0.0300	BN	0.0025	BN	1.33		670000		5.2
Wastren	WST96402/403	9/30/96	Drums #96-420 & 96-421	1.17		0.0303	BN	0.0027	BN	1.33		686000		5.0
NUS	WST96105	3/18/96	Exhaust Shaft Basin	0.5		<0.4	U	0.008		NA		NA		6.9
NUS	WST96134	4/22/96	Exhaust Shaft Basin	<0.9	U	<0.8	U	<1	U	NA		NA		5.4
NUS	WST96177/181	6/10/96	Exhaust Shaft Basin	5		<0.4	U	<0.5	U	1.12		140000		7.1
NUS	WST96178/182	6/10/96	Exhaust Shaft Basin	6.6		<0.4	U	<0.5	U	1.12		140000		7.2
NUS	WST96228/230	7/10/96	Exhaust Shaft Basin	5.6		<0.4	U	<0.2	U	1.13		170000		7.1
NUS	WST96229/231	7/10/96	Exhaust Shaft Basin	5.4		<0.4	U	<0.2	U	1.12		170000		7.1
NUS	WST96232/236	7/15/96	Exhaust Shaft Basin	3.9		<0.8	U	<5	U	1.28		410000		6.1

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl		SO4		Br		I		NO3		NH4	
				mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
NUS	WST95273	11/21/95	Borehole OH49	NA		NA		NA		NA		NA		NA	
NUS	WST95274	11/21/95	Borehole OH49	NA		NA		NA		NA		NA		NA	
NUS	WST95275	11/21/95	Borehole OH49	NA		NA		NA		NA		NA		NA	
NUS	WST95277	11/21/95	Borehole OH49	NA		NA		NA		NA		NA		NA	
NUS	WST95278	11/21/95	Borehole OH49	NA		NA		NA		NA		NA		NA	
NUS	WST96050/051	1/23/96	Borehole OH49	200000		19000		690		6		<0.44		69.5466	
Wastren	WST96372/373	9/23/96	Borehole OH63	204000		17200		1630		NA		1.40	B	200	
Wastren	WST96374/375	9/23/96	Borehole OH63	204000		17300		1630		NA		<1.0	U	199	
NUS	WST96048/049	1/23/96	Borehole OH74	200000		16000		1300		13		<0.44		100.4562	
NUS	WST96005	1/10/96	Borehole Room L-4	NA		NA		NA		NA		NA		NA	
NUS	WST95133	7/5/95	Borehole Water - AIS	NA		NA		NA		NA		NA		NA	
NUS	WST95199	8/7/95	Borehole DBT 10 Room D	NA		NA		NA		NA		NA		NA	
NUS	WST95200	8/7/95	Borehole DBT 10 Room D	NA		NA		NA		NA		NA		NA	
NUS	WST95134	7/5/95	Borehole Water W170	NA		NA		NA		NA		NA		NA	
NUS	WST95281	11/21/95	Borehole Water OH223	NA		NA		NA		NA		NA		NA	
Wastren	WST96276	8/1/96	Corrosion Test Brine	160000		2470		27.2	B	NA		<0.1	U	1.0	
Wastren	WST96277	8/1/96	Corrosion Test Brine	160000		2490		29.4	B	NA		<0.1	U	1.0	
Wastren	WST96400/401	9/30/96	Drums #96-420 & 96-421	319000		105	B	6040		NA		247		98.5	
Wastren	WST96402/403	9/30/96	Drums #96-420 & 96-421	325000		90	B	6180		NA		247		102	
NUS	WST96105	3/18/96	Exhaust Shaft Basin	NA		NA		NA		NA		NA		NA	
NUS	WST96134	4/22/96	Exhaust Shaft Basin	NA		NA		NA		NA		NA		NA	
NUS	WST96177/181	6/10/96	Exhaust Shaft Basin	110000		1900		81		3		106.2384		4.37886	
NUS	WST96178/182	6/10/96	Exhaust Shaft Basin	110000		1900		100		3		88.452		4.37886	
NUS	WST96228/230	7/10/96	Exhaust Shaft Basin	100000		1900		130		3		123.9448		5.1516	
NUS	WST96229/231	7/10/96	Exhaust Shaft Basin	110000		1500		270		3		132.798		5.53797	
NUS	WST96232/236	7/15/96	Exhaust Shaft Basin	270000		160		1300		12		225.7566		23.1822	

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC mg/L		TOC mg/L		Na mg/L		Mg mg/L		K mg/L		B mg/L	
NUS	WST95273	11/21/95	Borehole OH49	NA		NA		69000		10000		12000		330	
NUS	WST95274	11/21/95	Borehole OH49	NA		NA		63000		10000		12000		320	
NUS	WST95275	11/21/95	Borehole OH49	NA		NA		58000		13000		13000		630	
NUS	WST95277	11/21/95	Borehole OH49	NA		NA		47000		9800		11000		320	
NUS	WST95278	11/21/95	Borehole OH49	NA		NA		65000		8500		10000		250	
NUS	WST96050/051	1/23/96	Borehole OH49	NA		NA		54000		9300		10000		280	
Wastren	WST96372/373	9/23/96	Borehole OH63	0.45	B	<10	U	78300		23900		18200		1580	
Wastren	WST96374/375	9/23/96	Borehole OH63	0.60	B	<10	U	78300		23900		18100		1580	
NUS	WST96048/049	1/23/96	Borehole OH74	NA		NA		28000		16000		13000		930	
NUS	WST96005	1/10/96	Borehole Room L-4	NA		NA		NA		NA		NA		NA	
NUS	WST95133	7/5/95	Borehole Water - AIS	NA		NA		NA		NA		NA		NA	
NUS	WST95199	8/7/95	Borehole DBT 10 Room D	NA		NA		NA		NA		NA		NA	
NUS	WST95200	8/7/95	Borehole DBT 10 Room D	NA		NA		NA		NA		NA		NA	
NUS	WST95134	7/5/95	Borehole Water W170	NA		NA		NA		NA		NA		NA	
NUS	WST95281	11/21/95	Borehole Water OH223	NA		NA		32000		33000		25000		870	
Wastren	WST96276	8/1/96	Corrosion Test Brine	4.2		8.1	B	104000		241	B	444	B	5.2	B
Wastren	WST96277	8/1/96	Corrosion Test Brine	5.5		7.6	B	101000		246	B	405	B	5.2	B
Wastren	WST96400/401	9/30/96	Drums #96-420 & 96-421	13.8		4040		7690	B	61000		6860	B	270	
Wastren	WST96402/403	9/30/96	Drums #96-420 & 96-421	13.7		3970		5290	B	59900		6800	B	264	
NUS	WST96105	3/18/96	Exhaust Shaft Basin	NA		NA		NA		NA		NA		NA	
NUS	WST96134	4/22/96	Exhaust Shaft Basin	NA		NA		NA		NA		NA		NA	
NUS	WST96177/181	6/10/96	Exhaust Shaft Basin	NA		66		48000		8800		780		50	
NUS	WST96178/182	6/10/96	Exhaust Shaft Basin	NA		69		49000		9700		860		55	
NUS	WST96228/230	7/10/96	Exhaust Shaft Basin	150		130		36000		9900		1500		57	
NUS	WST96229/231	7/10/96	Exhaust Shaft Basin	150		140		34000		9400		1500		55	
NUS	WST96232/236	7/15/96	Exhaust Shaft Basin	20		780		18000		53000		24000		510	

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca		Fe		Zn		Sum	Sum	charge balance
				mg/L		mg/L		mg/L		Cations	Anions	percent
NUS	WST95273	11/21/95	Borehole OH49	310		NA		NA		NA	NA	NA
NUS	WST95274	11/21/95	Borehole OH49	300		NA		NA		NA	NA	NA
NUS	WST95275	11/21/95	Borehole OH49	380		NA		NA		NA	NA	NA
NUS	WST95277	11/21/95	Borehole OH49	310		NA		NA		NA	NA	NA
NUS	WST95278	11/21/95	Borehole OH49	320		NA		NA		NA	NA	NA
NUS	WST96050/051	1/23/96	Borehole OH49	310		NA		<0.5		3411	6045	-27.86
Wastren	WST96372/373	9/23/96	Borehole OH63	322	B	0.249	BEN	0.454		6000	6133	-1.09
Wastren	WST96374/375	9/23/96	Borehole OH63	331	B	0.274	BEN	0.443		5998	6135	-1.13
NUS	WST96048/049	1/23/96	Borehole OH74	260		NA		2.2		2966	5991	-33.77
NUS	WST96005	1/10/96	Borehole Room L-4	NA		NA		NA		NA	NA	NA
NUS	WST95133	7/5/95	Borehole Water - AIS	NA		NA		NA		NA	NA	NA
NUS	WST95199	8/7/95	Borehole DBT 10 Room D	NA		NA		NA		NA	NA	NA
NUS	WST95200	8/7/95	Borehole DBT 10 Room D	NA		NA		NA		NA	NA	NA
NUS	WST95134	7/5/95	Borehole Water W170	NA		NA		NA		NA	NA	NA
NUS	WST95281	11/21/95	Borehole Water OH223	46		NA		NA		NA	NA	NA
Wastren	WST96276	8/1/96	Corrosion Test Brine	745		0.637		1.38		4593	4565	0.30
Wastren	WST96277	8/1/96	Corrosion Test Brine	738		1.01		1.39		4461	4566	-1.16
Wastren	WST96400/401	9/30/96	Drums #96-420 & 96-421	78500		1.170	EN	163		9472	9077	2.13
Wastren	WST96402/403	9/30/96	Drums #96-420 & 96-421	77100		1.030	EN	161		9205	9247	-0.23
NUS	WST96105	3/18/96	Exhaust Shaft Basin	NA		NA		NA		NA	NA	NA
NUS	WST96134	4/22/96	Exhaust Shaft Basin	NA		NA		180		NA	NA	NA
NUS	WST96177/181	6/10/96	Exhaust Shaft Basin	9400		NA		310		3306	3143	2.52
NUS	WST96178/182	6/10/96	Exhaust Shaft Basin	10000		NA		340		3456	3144	4.73
NUS	WST96228/230	7/10/96	Exhaust Shaft Basin	10000		<0.4		340		2923	2874	0.84
NUS	WST96229/231	7/10/96	Exhaust Shaft Basin	9600		<0.4		330		2775	3150	-6.33
NUS	WST96232/236	7/15/96	Exhaust Shaft Basin	36000		<10		4700		7602	7637	-0.23

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST96233/237	7/15/96	Exhaust Shaft Basin	0.0002		<0.3	U	10		<2	U	<10	U
Wastren	WST96179/183	6/10/96	Exhaust Shaft Basin	<0.0002	U	0.0003		1.81		0.0166		0.0326	
Wastren	WST96180/184	6/10/96	Exhaust Shaft Basin	<.0002	U	<0.0002	U	1.75		0.0149		0.0293	
Wastren	WST96234/238	7/15/96	Exhaust Shaft Basin	<0.002	U	<0.0011	UN	11.7	B	0.0172	N	0.0665	E
Wastren	WST96235/239	7/15/96	Exhaust Shaft Basin	<0.002	U	<0.0011	UN	11.3	B	0.016	N	0.082	E
Wastren	WST96267/268	7/22/96	Exhaust Shaft Basin	<0.002	U	<0.0011	UN	12.3	B	<0.0044	U	0.17	E
Wastren	WST96269/271	7/29/96	Exhaust Shaft Basin	<0.0004	U	0.0023	B	2.11		0.0153	N	0.0465	EN
Wastren	WST96270/272	7/29/96	Exhaust Shaft Basin	<0.0004	U	0.0019	B	2.11		0.0151	N	0.0482	EN
Wastren	WST96294/295	8/12/96	Exhaust Shaft Basin	<0.0004	UN	0.0006	BN	5.42	B	0.0125	UN	0.0240	E
Wastren	WST96296/297	8/12/96	Exhaust Shaft Basin	<0.0004	UN	<0.00056	UN	5.39	B	0.0106	N	0.0306	E
Wastren	WST96302/303	8/19/96	Exhaust Shaft Basin	<0.0002	UN	0.0026	EN	1.11		0.009	N	0.0315	E
Wastren	WST96304/305	8/19/96	Exhaust Shaft Basin	<0.0002	UN	0.0029	BN	1.27		0.0121	N	0.0292	E
Wastren	WST96328/329	8/27/96	Exhaust Shaft Basin	<0.0004	UN	<0.00056	UN	10.8	BE	0.0103	N	0.0459	
Wastren	WST96330/331	8/27/96	Exhaust Shaft Basin	0.00068	BN	<0.00056	UN	11.5	BE	0.0123	N	0.0513	
Wastren	WST96340/341	9/4/96	Exhaust Shaft Basin	<0.0004	UN	<0.00056	UN	11.2	BE	0.0023	BN	0.0644	EN
Wastren	WST96342/343	9/4/96	Exhaust Shaft Basin	<0.0004	UN	0.00072	BN	11.8	BE	0.0029	BN	0.1590	EN
Wastren	WST96364/365	9/10/96	Exhaust Shaft Basin	<0.0004	UN	0.00061	BN	13.1	BE	0.0039	BN	0.0502	EN
Wastren	WST96368/369	9/23/96	Exhaust Shaft Basin	<0.0004	UN	<0.00056	UN	6.85	B	0.0093		0.0244	E
Wastren	WST96396/397	9/30/96	Exhaust Shaft Basin	<0.0004	UN	0.00056	BN	1.43	B	0.0149		0.0108	BE
Wastren	WST96426/427	10/7/96	Exhaust Shaft Basin	<0.001	B	<0.0022	U	1.27	B	0.0111		0.0135	
Wastren	WST96430/431	10/14/96	Exhaust Shaft Basin	<0.001	U	<0.0022	U	1.32	B	0.0045	B	0.0091	B
Wastren	WST96432/433	10/14/96	Exhaust Shaft Basin	<0.0011	U	<0.0022	U	1.01	B	0.0035	B	0.0078	B
Wastren	WST96489/490	11/26/96	Exhaust Shaft Basin	<0.001	U	<0.004	U	0.658		<0.010	U	0.0312	B
NUS	WST96147	5/14/96	Exhaust Shaft Basin (drums)	<0.001	U	<0.6	U	7.8		<1	U	<4	U
NUS	WST96153	5/14/96	Exhaust Shaft Basin (drums)	<0.001	U	<0.6	U	9.4		<1	U	<4	U
NUS	WST96154	5/14/96	Exhaust Shaft Basin (drums)	<0.001	U	<0.6	U	9.4		<1	U	<4	U

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG		TDS		pH
				mg/l		mg/l		mg/l		mg/l		mg/L		
NUS	WST96233/237	7/15/96	Exhaust Shaft Basin	2.8		<0.8	U	<5	U	1.28		420000		6.1
Wastren	WST96179/183	6/10/96	Exhaust Shaft Basin	7.08		0.144		0.0044		1.10		180000		7.2
Wastren	WST96180/184	6/10/96	Exhaust Shaft Basin	7.02		0.148		0.0042		1.10		178000		7.2
Wastren	WST96234/238	7/15/96	Exhaust Shaft Basin	41.7		0.0812		0.0077	B	1.30		564000		6.2
Wastren	WST96235/239	7/15/96	Exhaust Shaft Basin	40.2		0.0858		0.009	B	1.30		572000		6.2
Wastren	WST96267/268	7/22/96	Exhaust Shaft Basin	0.633		0.287		0.005	B	1.30		572000		6.1
Wastren	WST96269/271	7/29/96	Exhaust Shaft Basin	5.59		0.144	N	0.0049	BN	1.10		252000		7.1
Wastren	WST96270/272	7/29/96	Exhaust Shaft Basin	5.54		0.146	N	0.0046	BN	1.10		249000		7.0
Wastren	WST96294/295	8/12/96	Exhaust Shaft Basin	14.8		0.311		0.0059	BN	1.22		401000		6.93
Wastren	WST96296/297	8/12/96	Exhaust Shaft Basin	14.6		0.306		0.0043	BN	1.22		389000		6.96
Wastren	WST96302/303	8/19/96	Exhaust Shaft Basin	1.87		0.207		0.0034	BN	1.09		158000		7.35
Wastren	WST96304/305	8/19/96	Exhaust Shaft Basin	2.26		0.214		0.0038	BN	1.10		177000		7.32
Wastren	WST96328/329	8/27/96	Exhaust Shaft Basin	46.7		0.087		0.0057	BN	1.29		477000		6.2
Wastren	WST96330/331	8/27/96	Exhaust Shaft Basin	48.1		0.0933		0.0061	BN	1.29		503000		6.2
Wastren	WST96340/341	9/4/96	Exhaust Shaft Basin	36.4		0.0716	N	0.0059	BN	1.31		672000		6.0
Wastren	WST96342/343	9/4/96	Exhaust Shaft Basin	39.1		0.0653	N	0.0064	BN	1.31		667000		6.0
Wastren	WST96364/365	9/10/96	Exhaust Shaft Basin	45.7		0.0706	N	0.0086	BN	1.32		670000		6.0
Wastren	WST96368/369	9/23/96	Exhaust Shaft Basin	9.83		0.1850	N	0.1060	N	1.20		367000		6.8
Wastren	WST96396/397	9/30/96	Exhaust Shaft Basin	12.5		0.2000	N	0.0038	BN	1.10		168000		7.3
Wastren	WST96426/427	10/7/96	Exhaust Shaft Basin	2.89		0.239		0.0033	B	1.09		139000		7.3
Wastren	WST96430/431	10/14/96	Exhaust Shaft Basin	1.62		0.264		0.0030	B	1.09		141000		7.4
Wastren	WST96432/433	10/14/96	Exhaust Shaft Basin	1.09		0.238		0.0022	B	1.07		114000		7.4
Wastren	WST96489/490	11/26/96	Exhaust Shaft Basin	0.141		0.138		<0.010	U	1.07		79000		7.3
NUS	WST96147	5/14/96	Exhaust Shaft Basin (drums)	1.2		<0.8	U	<2	U	NA		NA		5.7
NUS	WST96153	5/14/96	Exhaust Shaft Basin (drums)	8.4		<0.8	U	<2	U	NA		NA		6.1
NUS	WST96154	5/14/96	Exhaust Shaft Basin (drums)	8.8		<0.8	U	<2	U	NA		NA		5.9

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl		SO4		Br		I		NO3		NH4	
				mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
NUS	WST96233/237	7/15/96	Exhaust Shaft Basin	270000		160		1200		14		296.5822		20.6064	
Wastren	WST96179/183	6/10/96	Exhaust Shaft Basin	101000		1890		189		NA		151		7.6	
Wastren	WST96180/184	6/10/96	Exhaust Shaft Basin	100000		1820		189		NA		151		11	
Wastren	WST96234/238	7/15/96	Exhaust Shaft Basin	258000		330		1210		NA		368		60.2	
Wastren	WST96235/239	7/15/96	Exhaust Shaft Basin	265000		292		1240		NA		357		57.6	
Wastren	WST96267/268	7/22/96	Exhaust Shaft Basin	260000		1230		1210		NA		486		56.6	
Wastren	WST96269/271	7/29/96	Exhaust Shaft Basin	129000		1410		147	B	NA		178		5.8	
Wastren	WST96270/272	7/29/96	Exhaust Shaft Basin	129000		1410		151	B	NA		175		6.6	
Wastren	WST96294/295	8/12/96	Exhaust Shaft Basin	198000		630		534		NA		300		54.9	
Wastren	WST96296/297	8/12/96	Exhaust Shaft Basin	198000		626		540		NA		301		49.6	
Wastren	WST96302/303	8/19/96	Exhaust Shaft Basin	79200		2290		77.9	B	NA		89		2.8	
Wastren	WST96304/305	8/19/96	Exhaust Shaft Basin	90700		2240		89.8	B	NA		117		4.3	
Wastren	WST96328/329	8/27/96	Exhaust Shaft Basin	278000		156	B	1360		NA		404		72.5	
Wastren	WST96330/331	8/27/96	Exhaust Shaft Basin	275000		180	B	1340		NA		402		68.7	
Wastren	WST96340/341	9/4/96	Exhaust Shaft Basin	296000		370		1530		NA		451		72.5	
Wastren	WST96342/343	9/4/96	Exhaust Shaft Basin	297000		378		1550		NA		458		68.9	
Wastren	WST96364/365	9/10/96	Exhaust Shaft Basin	303000		216	B	1670		NA		499		21.6	
Wastren	WST96368/369	9/23/96	Exhaust Shaft Basin	199000		619		772		NA		236		37.1	
Wastren	WST96396/397	9/30/96	Exhaust Shaft Basin	89800		1770		138		NA		135		4.1	
Wastren	WST96426/427	10/7/96	Exhaust Shaft Basin	74600		1920		103		NA		156		27.5	
Wastren	WST96430/431	10/14/96	Exhaust Shaft Basin	76100		1800		96.8		NA		161		27.2	
Wastren	WST96432/433	10/14/96	Exhaust Shaft Basin	60500		1900		75.8		NA		148		19.2	
Wastren	WST96489/490	11/26/96	Exhaust Shaft Basin	42400		2000		52.6	B	NA		123		10.4	
NUS	WST96147	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		NA		NA		NA		NA	
NUS	WST96153	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		NA		NA		NA		NA	
NUS	WST96154	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		NA		NA		NA		NA	

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC		TOC		Na		Mg		K		B	
				mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
NUS	WST96233/237	7/15/96	Exhaust Shaft Basin	12		770		18000		52000		23000		500	
Wastren	WST96179/183	6/10/96	Exhaust Shaft Basin	NA		151		39900		9270		736		53.7	
Wastren	WST96180/184	6/10/96	Exhaust Shaft Basin	NA		159		39300		9230		752		54.9	
Wastren	WST96234/238	7/15/96	Exhaust Shaft Basin	29.2		1140		17900		52500		24000		580	
Wastren	WST96235/239	7/15/96	Exhaust Shaft Basin	28.5		1160		18000		52900		24900		583	
Wastren	WST96267/268	7/22/96	Exhaust Shaft Basin	68.8		1240		16600		54800		22000		734	
Wastren	WST96269/271	7/29/96	Exhaust Shaft Basin	26.8		1050		54400		10800		982		45.3	B
Wastren	WST96270/272	7/29/96	Exhaust Shaft Basin	26.2		1110		54000		10700		976		45.6	B
Wastren	WST96294/295	8/12/96	Exhaust Shaft Basin	29.4		573		53600		27600		7940		236	
Wastren	WST96296/297	8/12/96	Exhaust Shaft Basin	27.1		573		52500		27700		7620		227	
Wastren	WST96302/303	8/19/96	Exhaust Shaft Basin	44.5		81.1		36600		5380		551		28.1	B
Wastren	WST96304/305	8/19/96	Exhaust Shaft Basin	41.4		134		42000		6100		639		32.6	B
Wastren	WST96328/329	8/27/96	Exhaust Shaft Basin	23.4		1230		15400		58800		23600		649	
Wastren	WST96330/331	8/27/96	Exhaust Shaft Basin	24.2		1260		15500		59200		24200		647	
Wastren	WST96340/341	9/4/96	Exhaust Shaft Basin	38.5		1610		10700		65600		26700		811	
Wastren	WST96342/343	9/4/96	Exhaust Shaft Basin	44.9		1470		10800		64900		25900		811	
Wastren	WST96364/365	9/10/96	Exhaust Shaft Basin	32.9		1540		11500		65900		21500		863	
Wastren	WST96368/369	9/23/96	Exhaust Shaft Basin	37.0		608		30800		33200		10200		397	
Wastren	WST96396/397	9/30/96	Exhaust Shaft Basin	41.2		150		34700		8860		3390	B	49.8	B
Wastren	WST96426/427	10/7/96	Exhaust Shaft Basin	41.2		81.6		25700		7630		929		24.1	
Wastren	WST96430/431	10/14/96	Exhaust Shaft Basin	33.5		62.9		25500		7970		406	B	15.8	
Wastren	WST96432/433	10/14/96	Exhaust Shaft Basin	38.9		59.5		20800		6280		299	B	13.3	
Wastren	WST96489/490	11/26/96	Exhaust Shaft Basin	40.3		50.8		15600		4380	B	168		8.4	
NUS	WST96147	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		NA		NA		NA		NA	
NUS	WST96153	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		NA		NA		NA		NA	
NUS	WST96154	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		NA		NA		NA		NA	

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca		Fe		Zn		Sum	Sum	charge balance
				mg/L		mg/L		mg/L		Cations	Anions	percent
NUS	WST96233/237	7/15/96	Exhaust Shaft Basin	35000		<10		4600		7443	7635	-1.27
Wastren	WST96179/183	6/10/96	Exhaust Shaft Basin	9510		NA		339		2997	2891	1.80
Wastren	WST96180/184	6/10/96	Exhaust Shaft Basin	9380		NA		334		2961	2861	1.73
Wastren	WST96234/238	7/15/96	Exhaust Shaft Basin	33700		3	N	4930		7448	7302	0.99
Wastren	WST96235/239	7/15/96	Exhaust Shaft Basin	34000		2.86	N	4990		7523	7499	0.16
Wastren	WST96267/268	7/22/96	Exhaust Shaft Basin	40800		20.7	E	3720		7898	7380	3.39
Wastren	WST96269/271	7/29/96	Exhaust Shaft Basin	11500		1.09	EN	149		3858	3672	2.47
Wastren	WST96270/272	7/29/96	Exhaust Shaft Basin	11200		1.16	EN	169		3817	3672	1.94
Wastren	WST96294/295	8/12/96	Exhaust Shaft Basin	25000		0.327	EN	1510		6075	5607	4.01
Wastren	WST96296/297	8/12/96	Exhaust Shaft Basin	24300		0.329	EN	1460		5991	5607	3.32
Wastren	WST96302/303	8/19/96	Exhaust Shaft Basin	6540		5.63	EN	86.5		2378	2286	1.96
Wastren	WST96304/305	8/19/96	Exhaust Shaft Basin	7180		5.12	EN	108		2706	2610	1.82
Wastren	WST96328/329	8/27/96	Exhaust Shaft Basin	39400		0.384	BN	5720		8138	7864	1.72
Wastren	WST96330/331	8/27/96	Exhaust Shaft Basin	39600		0.792	BN	5760		8200	7779	2.64
Wastren	WST96340/341	9/4/96	Exhaust Shaft Basin	43300		10.70	B	5770		8782	8379	2.35
Wastren	WST96342/343	9/4/96	Exhaust Shaft Basin	42900		59.20		5930		8688	8408	1.64
Wastren	WST96364/365	9/10/96	Exhaust Shaft Basin	46600		2.420		6470		8878	8575	1.74
Wastren	WST96368/369	9/23/96	Exhaust Shaft Basin	25300		0.015	BEN	2650		5632	5639	-0.06
Wastren	WST96396/397	9/30/96	Exhaust Shaft Basin	7970		0.210	BEN	248		2727	2575	2.88
Wastren	WST96426/427	10/7/96	Exhaust Shaft Basin	8010		2.24	N	105		2171	2149	0.52
Wastren	WST96430/431	10/14/96	Exhaust Shaft Basin	8930	B	0.168	BN	62.6		2222	2188	0.78
Wastren	WST96432/433	10/14/96	Exhaust Shaft Basin	7090		0.217	BN	46.8		1784	1750	0.96
Wastren	WST96489/490	11/26/96	Exhaust Shaft Basin	5070		0.414		8.68		1297	1242	2.18
NUS	WST96147	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		300		NA	NA	NA
NUS	WST96153	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		2100		NA	NA	NA
NUS	WST96154	5/14/96	Exhaust Shaft Basin (drums)	NA		NA		2100		NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST96215	6/28/96	Exhaust Shaft Basin (drums)	<0.002	u	<0.6	u	4.6		<0.2	u	<1	u
NUS	WST96216	6/28/96	Exhaust Shaft Basin (drums)	<0.002	u	<0.6	u	7.2		<0.5	u	<2	u
NUS	WST96217	6/28/96	Exhaust Shaft Basin (drums)	<0.002	u	<0.6	u	10		<0.2	u	<1	u
NUS	WST96218/219	6/28/96	Exhaust Shaft Basin (drums)	<0.002	u	<0.6	u	11		<1	u	<4	u
NUS	WST96221	6/28/96	Exhaust Shaft Basin (drums)	<0.002	u	<0.6	u	7.3		<0.5	u	<2	u
NUS	WST96222	6/28/96	Exhaust Shaft Basin (drums)	<0.002	u	<0.6	u	10		<1	u	<4	u
NUS	WST96223	6/28/96	Exhaust Shaft Basin (drums)	<0.002	u	<0.6	u	10		<1	u	<4	u
NUS	WST96224	6/28/96	Exhaust Shaft Basin (drums)	<0.002	u	<0.6	u	7.2		<0.5	u	<2	u
NUS	WST96225	7/2/96	Exhaust Shaft Basin (drums)	<0.001	u	<0.3	u	5.9		<0.5	u	<2	u
NUS	WST96226	7/2/96	Exhaust Shaft Basin (drums)	<0.001	u	<0.3	u	4.8		<0.2	u	<1	u
NUS	WST96220	6/28/96	Exhaust Shaft Basin Sludge	<0.0001	u	<0.03	u	0.3		0.016		<0.04	u
NUS	WST95227	7/24/96	Exhaust Shaft Collar	<0.0002	u	0.4		0.21		0.005		<0.02	u
NUS	WST95230	7/24/96	Exhaust Shaft Collar	0.001		0.4		0.2		<0.005	u	<0.02	u
NUS	WST96029/030	1/22/96	Exhaust Shaft Collar	<0.0001	u	<0.03	u	0.42		<0.05	u	<0.2	u
NUS	WST96108	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.15		<0.05	u	<0.2	u
NUS	WST96109	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.18		<0.005	u	0.03	
NUS	WST96110	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.34		<0.05	u	<0.2	u
NUS	WST96111	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.81		<0.05	u	<0.2	u
NUS	WST96112	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.47		<0.05	u	<0.2	u
NUS	WST96113	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.31		<0.05	u	<0.2	u
NUS	WST96114	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.43		<0.05	u	<0.2	u
NUS	WST96115	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.44		<0.05	u	<0.2	u
NUS	WST96116	3/26/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.29		<0.04	u	<0.2	u
NUS	WST96117	3/27/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.76		<0.05	u	<0.2	u
NUS	WST96118	3/27/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.29		<0.05	u	<0.2	u
NUS	WST96119	3/27/96	Exhaust Shaft Debris	<0.0001	u	<0.2	u	0.78		<0.05	u	<0.2	u

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG		TDS		pH
				mg/l		mg/l		mg/l		mg/l		mg/L		
NUS	WST96215	6/28/96	Exhaust Shaft Basin (drums)	7.6		<0.8	U	<0.5	U	NA		NA		6.8
NUS	WST96216	6/28/96	Exhaust Shaft Basin (drums)	16		<0.8	U	<1	U	NA		NA		6.6
NUS	WST96217	6/28/96	Exhaust Shaft Basin (drums)	31		<0.8	U	<0.5	U	NA		NA		6.4
NUS	WST96218/219	6/28/96	Exhaust Shaft Basin (drums)	71		<0.8	U	<2	U	NA		NA		6.3
NUS	WST96221	6/28/96	Exhaust Shaft Basin (drums)	21		<0.8	U	<1	U	NA		NA		6.9
NUS	WST96222	6/28/96	Exhaust Shaft Basin (drums)	64		<0.8	U	<2	U	NA		NA		6.4
NUS	WST96223	6/28/96	Exhaust Shaft Basin (drums)	24		<0.8	U	<2	U	NA		NA		6.1
NUS	WST96224	6/28/96	Exhaust Shaft Basin (drums)	0.48		<0.8	U	<1	U	NA		NA		6.3
NUS	WST96225	7/2/96	Exhaust Shaft Basin (drums)	14		<0.8	U	<1	U	NA		NA		6.8
NUS	WST96226	7/2/96	Exhaust Shaft Basin (drums)	8.1		<0.8	U	<0.5	U	NA		NA		7.1
NUS	WST96220	6/28/96	Exhaust Shaft Basin Sludge	1.2		<0.004	U	<0.02	U	NA		NA		5.5
NUS	WST95227	7/24/96	Exhaust Shaft Collar	<0.05	U	<0.1	U	<0.01	U	NA		NA		NA
NUS	WST95230	7/24/96	Exhaust Shaft Collar	0.14		<0.1	U	<0.01	U	NA		NA		NA
NUS	WST96029/030	1/22/96	Exhaust Shaft Collar	<0.02	U	<1	U	<0.1	U	1.01		46000		7.4
NUS	WST96108	3/26/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		5.5
NUS	WST96109	3/26/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.01	U	NA		NA		5.1
NUS	WST96110	3/26/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		7.0
NUS	WST96111	3/26/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		9.1
NUS	WST96112	3/26/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		9.1
NUS	WST96113	3/26/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		5.7
NUS	WST96114	3/26/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		7.2
NUS	WST96115	3/26/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		7.0
NUS	WST96116	3/26/96	Exhaust Shaft Debris	1.2		<0.2	U	<0.1	U	NA		NA		4.9
NUS	WST96117	3/27/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		5.3
NUS	WST96118	3/27/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		6.7
NUS	WST96119	3/27/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		6.9

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl	SO4	Br	I	NO3	NH4
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST96215	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96216	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96217	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96218/219	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96221	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96222	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96223	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96224	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96225	7/2/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96226	7/2/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96220	6/28/96	Exhaust Shaft Basin Sludge	NA	NA	NA	NA	NA	NA
NUS	WST95227	7/24/96	Exhaust Shaft Collar	NA	NA	NA	NA	NA	NA
NUS	WST95230	7/24/96	Exhaust Shaft Collar	NA	NA	NA	NA	NA	NA
NUS	WST96029/030	1/22/96	Exhaust Shaft Collar	12000	1900	10	<2	24.78896	0.25758
NUS	WST96108	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96109	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96110	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96111	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96112	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96113	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96114	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96115	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96116	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96117	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96118	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96119	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC	TOC	Na	Mg	K	B
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST96215	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96216	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96217	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96218/219	6/28/96	Exhaust Shaft Basin (drums)	NA	520	NA	NA	NA	NA
NUS	WST96221	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96222	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96223	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96224	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96225	7/2/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96226	7/2/96	Exhaust Shaft Basin (drums)	NA	NA	NA	NA	NA	NA
NUS	WST96220	6/28/96	Exhaust Shaft Basin Sludge	NA	NA	NA	NA	NA	NA
NUS	WST95227	7/24/96	Exhaust Shaft Collar	NA	NA	NA	NA	NA	NA
NUS	WST95230	7/24/96	Exhaust Shaft Collar	NA	NA	NA	NA	NA	NA
NUS	WST96029/030	1/22/96	Exhaust Shaft Collar	NA	NA	3900	900	27	<0.3
NUS	WST96108	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96109	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96110	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96111	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96112	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96113	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96114	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96115	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96116	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96117	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96118	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96119	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca mg/L	Fe mg/L	Zn mg/L	Sum Cations	Sum Anions	charge balance percent
NUS	WST96215	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	460	NA	NA	NA
NUS	WST96216	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	1200	NA	NA	NA
NUS	WST96217	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	3500	NA	NA	NA
NUS	WST96218/219	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	4100	NA	NA	NA
NUS	WST96221	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	2300	NA	NA	NA
NUS	WST96222	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	4200	NA	NA	NA
NUS	WST96223	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	2000	NA	NA	NA
NUS	WST96224	6/28/96	Exhaust Shaft Basin (drums)	NA	NA	260	NA	NA	NA
NUS	WST96225	7/2/96	Exhaust Shaft Basin (drums)	NA	NA	1500	NA	NA	NA
NUS	WST96226	7/2/96	Exhaust Shaft Basin (drums)	NA	NA	1200	NA	NA	NA
NUS	WST96220	6/28/96	Exhaust Shaft Basin Sludge	NA	NA	38	NA	NA	NA
NUS	WST95227	7/24/96	Exhaust Shaft Collar	NA	NA	NA	NA	NA	NA
NUS	WST95230	7/24/96	Exhaust Shaft Collar	NA	NA	NA	NA	NA	NA
NUS	WST96029/030	1/22/96	Exhaust Shaft Collar	1300	NA	2.1	309	378	-10.02
NUS	WST96108	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96109	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96110	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96111	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96112	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96113	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96114	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96115	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96116	3/26/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96117	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96118	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96119	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST96120	3/27/96	Exhaust Shaft Debris	<0.0001	U	<0.2	U	0.69		<0.05	U	<0.2	U
NUS	WST96121	3/27/96	Exhaust Shaft Debris	<0.0001	U	<0.2	U	0.68		<0.05	U	<0.2	U
NUS	WST96122	3/27/96	Exhaust Shaft Debris	<0.0001	U	<0.2	U	0.4		<0.05	U	<0.2	U
NUS	WST96091	3/1/96	Exhaust Shaft Muck	0.0002		0.5		0.4		<0.01	U	<0.04	U
NUS	WST96092	3/1/96	Exhaust Shaft Muck	<0.0001	U	0.3		0.28		<0.01	U	<0.04	U
NUS	WST96093	3/1/96	Exhaust Shaft Muck	0.0002		0.3		0.38		<0.01	U	<0.04	U
NUS	WST96094	3/1/96	Exhaust Shaft Muck	<0.0001	U	0.5		0.38		<0.02	U	<0.1	U
NUS	WST96097	3/1/96	Exhaust Shaft Muck	<0.0001	U	0.5		0.5		<0.01	U	<0.04	U
NUS	WST95313	12/18/95	Exhaust Shaft Sump	<0.0001	U	<2	U	0.7		<0.1	U	<0.5	U
NUS	WST96020/021	1/22/96	Exhaust Shaft Sump	<0.0001	U	<0.2	U	0.7		<0.05	U	<0.2	U
NUS	WST96007	1/19/96	Exhaust Shaft Sump Muck	<0.0001	U	<0.02	U	0.35		<0.02	U	<0.1	U
NUS	WST96008	1/19/96	Exhaust Shaft Sump Muck	<0.0001	U	<0.03	U	0.32		<0.02	U	<0.1	U
NUS	WST96027/028	1/22/96	Fire Hydrant Water, W of ES	<0.0001	U	<0.03	U	0.36		<0.005	U	<0.02	U
NUS	WST96002	1/10/96	Room L-4 Salt Debris	<0.0001	U	1		0.26		0.29		<0.2	U
NUS	WST95061	2/8/95	Salt Debris Drum 95-007 860 Fan	0.0004		0.5		0.53		0.052		<0.01	U
NUS	WST95062	2/8/95	Salt Debris Drum 95-007 860 Fan	0.0004		0.4		1.2		0.027		<0.01	U
Wastren	WST96470/471	11/1/96	Salt Shaft Sump	<0.001	U	<0.004	U	0.113	B	<0.01	U	0.101	
Wastren	WST96472/473	11/1/96	Salt Shaft Sump	<0.001	U	<0.004	U	0.119	B	<0.01	U	0.145	
Wastren	WST96465	11/4/96	Salt Shaft Sump Muck	<0.002	U	0.1100	U	0.273	B	0.1360	B	0.0211	B
Wastren	WST96468	11/4/96	Salt Shaft Sump Muck	<0.002	U	<0.058	U	0.198	B	0.0260	B	0.0200	B
NUS	WST96055/056	1/23/96	Surface Domestic Water Safety Bldg.	<0.0001	U	<0.2	U	0.35		<0.005	U	<0.02	U
NUS	WST95083	5/16/95	Waste Shaft Sump	<0.0002	U	1.4		4.4		<0.005	U	<0.02	U
NUS	WST95084	5/16/95	Waste Shaft Sump	<0.0002	U	0.7		4.6		<0.005	U	<0.02	U
NUS	WST95103	6/16/95	Waste Shaft Sump	<0.0008	U	0.6		7		0.005		<0.02	U
NUS	WST95104	6/16/95	Waste Shaft Sump	<0.0008	U	0.6		6.3		<0.005	U	0.06	
NUS	WST95116	6/28/95	Waste Shaft Sump	<0.0002	U	0.7		4.7		<0.02	U	<0.05	U

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG		TDS		pH
				mg/l		mg/l		mg/l		mg/l		mg/L		
NUS	WST96120	3/27/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		7.1
NUS	WST96121	3/27/96	Exhaust Shaft Debris	<1	U	<0.2	U	<0.1	U	NA		NA		4.9
NUS	WST96122	3/27/96	Exhaust Shaft Debris	<0.1	U	<0.2	U	<0.1	U	NA		NA		6.6
NUS	WST96091	3/1/96	Exhaust Shaft Muck	0.33		<0.2	U	<0.02	U	NA		NA		5.4
NUS	WST96092	3/1/96	Exhaust Shaft Muck	<0.1	U	<0.2	U	<0.02	U	NA		NA		7.0
NUS	WST96093	3/1/96	Exhaust Shaft Muck	<0.1	U	<0.2	U	<0.02	U	NA		NA		6.6
NUS	WST96094	3/1/96	Exhaust Shaft Muck	<0.2	U	<0.5	U	<0.05	U	NA		NA		7.1
NUS	WST96097	3/1/96	Exhaust Shaft Muck	<0.1	U	<0.2	U	<0.02	U	NA		NA		6.7
NUS	WST95313	12/18/95	Exhaust Shaft Sump	<1	U	<2	U	<0.2	U	NA		NA		7.5
NUS	WST96020/021	1/22/96	Exhaust Shaft Sump	0.03		<1	U	<0.1	U	1.03		54000		7.6
NUS	WST96007	1/19/96	Exhaust Shaft Sump Muck	1.9		<0.5	U	<0.05	U	NA		NA		5.8
NUS	WST96008	1/19/96	Exhaust Shaft Sump Muck	0.72		<0.5	U	<0.05	U	NA		NA		5.2
NUS	WST96027/028	1/22/96	Fire Hydrant Water, W of ES	<0.02	U	<0.1	U	<0.01	U	1.00		2020		8.2
NUS	WST96002	1/10/96	Room L-4 Salt Debris	<0.5	U	<1	U	<0.1	U	NA		NA		5.1
NUS	WST95061	2/8/95	Salt Debris Drum 95-007 860 Fan	1.3		<0.1	U	<0.01	U	NA		NA		NA
NUS	WST95062	2/8/95	Salt Debris Drum 95-007 860 Fan	1.1		<0.1	U	0.01		NA		NA		NA
Wastren	WST96470/471	11/1/96	Salt Shaft Sump	0.101		0.0102	B	0.0125	B	1.23		380000		6.9
Wastren	WST96472/473	11/1/96	Salt Shaft Sump	0.100		0.004	B	<0.01	U	1.23		379000		6.9
Wastren	WST96465	11/4/96	Salt Shaft Sump Muck	0.0464	B	0.0431	B	0.0028	B	NA		NA		NA
Wastren	WST96468	11/4/96	Salt Shaft Sump Muck	0.0222	U	0.0646	B	0.0490	B	NA		NA		NA
NUS	WST96055/056	1/23/96	Surface Domestic Water Safety Bldg.	<0.02	U	<0.1	U	<0.01	U	1.00		2100		8.1
NUS	WST95083	5/16/95	Waste Shaft Sump	3.9		0.1		<.05	U	NA		NA		NA
NUS	WST95084	5/16/95	Waste Shaft Sump	4.7		<0.1	U	<.05	U	NA		NA		NA
NUS	WST95103	6/16/95	Waste Shaft Sump	8.1		0.3		0.06		NA		NA		6.7
NUS	WST95104	6/16/95	Waste Shaft Sump	6.1		0.1		0.03		NA		NA		6.6
NUS	WST95116	6/28/95	Waste Shaft Sump	6.7		<0.1	U	0.05		NA		NA		6.9

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl	SO4	Br	I	NO3	NH4
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST96120	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96121	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96122	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96091	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST96092	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST96093	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST96094	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST96097	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST95313	12/18/95	Exhaust Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96020/021	1/22/96	Exhaust Shaft Sump	30000	1300	50	<2	75.2522	15.4548
NUS	WST96007	1/19/96	Exhaust Shaft Sump Muck	NA	NA	NA	NA	NA	NA
NUS	WST96008	1/19/96	Exhaust Shaft Sump Muck	NA	NA	NA	NA	NA	NA
NUS	WST96027/028	1/22/96	Fire Hydrant Water, W of ES	40	NA	<2	<2	12.39448	<0.26
NUS	WST96002	1/10/96	Room L-4 Salt Debris	NA	NA	NA	NA	NA	NA
NUS	WST95061	2/8/95	Salt Debris Drum 95-007 860 Fan	NA	NA	NA	NA	NA	NA
NUS	WST95062	2/8/95	Salt Debris Drum 95-007 860 Fan	NA	NA	NA	NA	NA	NA
Wastren	WST96470/471	11/1/96	Salt Shaft Sump	210000	8600	1450	NA	13.3	121
Wastren	WST96472/473	11/1/96	Salt Shaft Sump	207000	8470	1440	NA	13.6	121
Wastren	WST96465	11/4/96	Salt Shaft Sump Muck	NA	NA	NA	NA	NA	NA
Wastren	WST96468	11/4/96	Salt Shaft Sump Muck	NA	NA	NA	NA	NA	NA
NUS	WST96055/056	1/23/96	Surface Domestic Water Safety Bldg.	38	38	<2	<2	11.0665	<0.26
NUS	WST95083	5/16/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95084	5/16/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95103	6/16/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95104	6/16/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95116	6/28/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC	TOC	Na	Mg	K	B
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST96120	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96121	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96122	3/27/96	Exhaust Shaft Debris	NA	NA	NA	NA	NA	NA
NUS	WST96091	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST96092	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST96093	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST96094	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST96097	3/1/96	Exhaust Shaft Muck	NA	NA	NA	NA	NA	NA
NUS	WST95313	12/18/95	Exhaust Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96020/021	1/22/96	Exhaust Shaft Sump	NA	NA	9500	3200	140	3
NUS	WST96007	1/19/96	Exhaust Shaft Sump Muck	NA	NA	NA	NA	NA	NA
NUS	WST96008	1/19/96	Exhaust Shaft Sump Muck	NA	NA	NA	NA	NA	NA
NUS	WST96027/028	1/22/96	Fire Hydrant Water, W of ES	NA	NA	36	12	4.1	0.21
NUS	WST96002	1/10/96	Room L-4 Salt Debris	NA	NA	NA	NA	NA	NA
NUS	WST95061	2/8/95	Salt Debris Drum 95-007 860 Fan	NA	NA	NA	NA	NA	NA
NUS	WST95062	2/8/95	Salt Debris Drum 95-007 860 Fan	NA	NA	NA	NA	NA	NA
Wastren	WST96470/471	11/1/96	Salt Shaft Sump	23.8	870	80800	24100	18300	395
Wastren	WST96472/473	11/1/96	Salt Shaft Sump	25.4	824	80500	24400	19600	400
Wastren	WST96465	11/4/96	Salt Shaft Sump Muck	NA	NA	NA	NA	NA	NA
Wastren	WST96468	11/4/96	Salt Shaft Sump Muck	NA	NA	NA	NA	NA	NA
NUS	WST96055/056	1/23/96	Surface Domestic Water Safety Bldg.	NA	NA	74	22	11	0.87
NUS	WST95083	5/16/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95084	5/16/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95103	6/16/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95104	6/16/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95116	6/28/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca		Fe		Zn		Sum	Sum	charge balance
				mg/L		mg/L		mg/L		Cations	Anions	percent
NUS	WST96120	3/27/96	Exhaust Shaft Debris	NA		NA		NA		NA	NA	NA
NUS	WST96121	3/27/96	Exhaust Shaft Debris	NA		NA		NA		NA	NA	NA
NUS	WST96122	3/27/96	Exhaust Shaft Debris	NA		NA		NA		NA	NA	NA
NUS	WST96091	3/1/96	Exhaust Shaft Muck	NA		NA		NA		NA	NA	NA
NUS	WST96092	3/1/96	Exhaust Shaft Muck	NA		NA		NA		NA	NA	NA
NUS	WST96093	3/1/96	Exhaust Shaft Muck	NA		NA		NA		NA	NA	NA
NUS	WST96094	3/1/96	Exhaust Shaft Muck	NA		NA		NA		NA	NA	NA
NUS	WST96097	3/1/96	Exhaust Shaft Muck	NA		NA		NA		NA	NA	NA
NUS	WST95313	12/18/95	Exhaust Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST96020/021	1/22/96	Exhaust Shaft Sump	4000		NA		10		880	874	0.35
NUS	WST96007	1/19/96	Exhaust Shaft Sump Muck	NA		NA		5.2		NA	NA	NA
NUS	WST96008	1/19/96	Exhaust Shaft Sump Muck	NA		NA		NA		NA	NA	NA
NUS	WST96027/028	1/22/96	Fire Hydrant Water, W of ES	36		NA		0.03		4	1	59.72
NUS	WST96002	1/10/96	Room L-4 Salt Debris	NA		NA		NA		NA	NA	NA
NUS	WST95061	2/8/95	Salt Debris Drum 95-007 860 Fan	NA		NA		NA		NA	NA	NA
NUS	WST95062	2/8/95	Salt Debris Drum 95-007 860 Fan	NA		NA		NA		NA	NA	NA
Wastren	WST96470/471	11/1/96	Salt Shaft Sump	900	B	35.5		476		6047	6123	-0.62
Wastren	WST96472/473	11/1/96	Salt Shaft Sump	968	B	33.3		482		6096	6035	0.50
Wastren	WST96465	11/4/96	Salt Shaft Sump Muck	NA		NA		NA		NA	NA	NA
Wastren	WST96468	11/4/96	Salt Shaft Sump Muck	NA		NA		NA		NA	NA	NA
NUS	WST96055/056	1/23/96	Surface Domestic Water Safety Bldg.	46		NA		0.02		8	2	60.98
NUS	WST95083	5/16/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95084	5/16/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95103	6/16/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95104	6/16/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95116	6/28/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST95117	6/28/95	Waste Shaft Sump	<0.0002	u	0.7		4.7		<0.005	u	<0.1	u
NUS	WST95149	7/20/95	Waste Shaft Sump	0.0003		4		5.7		0.06		0.3	
NUS	WST95150	7/20/95	Waste Shaft Sump	<0.0002	u	3		7.2		<0.05	u	0.1	
NUS	WST95151	7/20/95	Waste Shaft Sump	<0.0002	u	3		7.3		<0.05	u	<0.2	u
NUS	WST95152	7/20/95	Waste Shaft Sump	<0.0002	u	4		7.5		<0.05	u	0.2	
NUS	WST95156	7/21/95	Waste Shaft Sump	<0.0002	u	3		10		0.05		<0.2	u
NUS	WST95157	7/21/95	Waste Shaft Sump	<0.0002	u	4		5.7		0.06		<0.2	u
NUS	WST95161	7/26/95	Waste Shaft Sump	<0.0004	u	4		5.7		<0.05	u	<0.2	u
NUS	WST95162	7/26/95	Waste Shaft Sump	<0.0004	u	3		5.7		<0.05	u	<0.2	u
NUS	WST95163	7/26/95	Waste Shaft Sump	<0.0008	u	3		5.8		<0.05	u	<0.2	u
NUS	WST95164	7/26/95	Waste Shaft Sump	<0.0008	u	3		5.6		<0.05	u	<0.4	u
NUS	WST95165	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.9		<0.05	u	<0.2	u
NUS	WST95166	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.7		<0.05	u	<0.2	u
NUS	WST95167	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.7		<0.05	u	<0.2	u
NUS	WST95168	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.7		0.07		<0.2	u
NUS	WST95169	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.7		0.05		<0.2	u
NUS	WST95170	7/26/95	Waste Shaft Sump	<0.0004	u	3		5.7		<0.05	u	<0.2	u
NUS	WST95171	7/26/95	Waste Shaft Sump	<0.0004	u	2		5.6		0.08		<0.2	u
NUS	WST95172	7/26/95	Waste Shaft Sump	<0.0004	u	3		5.8		0.05		<0.2	u
NUS	WST95173	7/26/95	Waste Shaft Sump	<0.0004	u	3		5.7		<0.05	u	<0.2	u
NUS	WST95174	7/26/95	Waste Shaft Sump	<0.0004	u	3		5.6		<0.05	u	<0.2	u
NUS	WST95175	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.8		<0.1	u	<0.2	u
NUS	WST95176	7/26/95	Waste Shaft Sump	<0.0004	u	3		5.9		<0.05	u	<0.2	u
NUS	WST95177	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.8		0.07		<0.2	u
NUS	WST95178	7/26/95	Waste Shaft Sump	<0.0008	u	3		5.8		<0.05	u	<0.2	u
NUS	WST95179	7/26/95	Waste Shaft Sump	<0.0008	u	4		7.7		<0.05	u	<0.2	u

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG	TDS	pH
				mg/l		mg/l		mg/l		mg/l	mg/L	
NUS	WST95117	6/28/95	Waste Shaft Sump	7.3		0.1		0.04		NA	NA	6.8
NUS	WST95149	7/20/95	Waste Shaft Sump	12		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95150	7/20/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.4
NUS	WST95151	7/20/95	Waste Shaft Sump	11		<1	u	<0.1	u	NA	NA	6.4
NUS	WST95152	7/20/95	Waste Shaft Sump	11		<1	u	<0.1	u	NA	NA	6.4
NUS	WST95156	7/21/95	Waste Shaft Sump	11		<1	u	<0.1	u	NA	NA	6.3
NUS	WST95157	7/21/95	Waste Shaft Sump	11		<1	u	<0.1	u	NA	NA	6.5
NUS	WST95161	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95162	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.5
NUS	WST95163	7/26/95	Waste Shaft Sump	12		<1	u	0.1		NA	NA	6.5
NUS	WST95164	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95165	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95166	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95167	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95168	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95169	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95170	7/26/95	Waste Shaft Sump	12		<1	u	2		NA	NA	6.6
NUS	WST95171	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95172	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95173	7/26/95	Waste Shaft Sump	12		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95174	7/26/95	Waste Shaft Sump	12		1		0.2		NA	NA	6.6
NUS	WST95175	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95176	7/26/95	Waste Shaft Sump	12		<1	u	0.2		NA	NA	6.6
NUS	WST95177	7/26/95	Waste Shaft Sump	11		<1	u	0.1		NA	NA	6.5
NUS	WST95178	7/26/95	Waste Shaft Sump	11		<1	u	0.2		NA	NA	6.5
NUS	WST95179	7/26/95	Waste Shaft Sump	10		<1	u	0.2		NA	NA	6.5

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl	SO4	Br	I	NO3	NH4
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST95117	6/28/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95149	7/20/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95150	7/20/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95151	7/20/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95152	7/20/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95156	7/21/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95157	7/21/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95161	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95162	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95163	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95164	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95165	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95166	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95167	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95168	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95169	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95170	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95171	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95172	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95173	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95174	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95175	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95176	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95177	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95178	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95179	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC	TOC	Na	Mg	K	B
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST95117	6/28/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95149	7/20/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95150	7/20/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95151	7/20/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95152	7/20/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95156	7/21/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95157	7/21/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95161	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95162	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95163	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95164	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95165	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95166	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95167	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95168	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95169	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95170	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95171	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95172	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95173	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95174	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95175	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95176	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95177	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95178	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95179	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca		Fe		Zn		Sum	Sum	charge balance
				mg/L		mg/L		mg/L		Cations	Anions	percent
NUS	WST95117	6/28/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95149	7/20/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95150	7/20/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95151	7/20/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95152	7/20/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95156	7/21/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95157	7/21/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95161	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95162	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95163	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95164	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95165	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95166	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95167	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95168	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95169	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95170	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95171	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95172	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95173	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95174	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95175	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95176	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95177	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95178	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST95179	7/26/95	Waste Shaft Sump	NA		NA		NA		NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST95180	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.8		<0.05	u	<0.2	u
NUS	WST95181	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.9		<0.05	u	<0.2	u
NUS	WST95182	7/26/95	Waste Shaft Sump	<0.0008	u	4		7.5		<0.05	u	<0.2	u
NUS	WST95183	7/26/95	Waste Shaft Sump	<0.0008	u	4		5.8		0.05		<0.2	u
NUS	WST95184	7/26/95	Waste Shaft Sump	<0.0008	u	4		7.9		<0.05	u	<0.2	u
NUS	WST95185	7/26/95	Waste Shaft Sump	<0.0008	u	4		7.8		<0.05	u	<0.2	u
NUS	WST95186	7/26/95	Waste Shaft Sump	<0.0008	u	4		7.4		<0.05	u	<0.2	u
NUS	WST95187	7/26/95	Waste Shaft Sump	<0.0008	u	5		7.5		<0.05	u	<0.2	u
NUS	WST95188	7/26/95	Waste Shaft Sump	<0.0008	u	3		7.7		0.07		<0.2	u
NUS	WST95189	7/26/95	Waste Shaft Sump	<0.0008	u	4		7.7		<0.05	u	<0.2	u
NUS	WST95190	7/26/95	Waste Shaft Sump	<0.0008	u	4		7.7		0.06		<0.2	u
NUS	WST95191	7/26/95	Waste Shaft Sump	<0.0008	u	4		7.7		<0.05	u	<0.2	u
NUS	WST95202	8/15/95	Waste Shaft Sump	<0.002	u	4		5.5		<0.05	u	<0.2	u
NUS	WST95203	8/15/95	Waste Shaft Sump	<0.002	u	4		5.6		<0.05	u	<0.2	u
NUS	WST95204	8/15/95	Waste Shaft Sump	<0.002	u	4		5.5		<0.05	u	<0.2	u
NUS	WST95205	8/15/95	Waste Shaft Sump	<0.002	u	4		5.6		<0.05	u	<0.2	u
NUS	WST95206	8/15/95	Waste Shaft Sump	<0.002	u	4		5.5		<0.05	u	<0.2	u
NUS	WST95207	8/15/95	Waste Shaft Sump	<0.002	u	3		5.4		<0.05	u	<0.2	u
NUS	WST95208	8/15/95	Waste Shaft Sump	<0.002	u	4		5.5		<0.05	u	<0.2	u
NUS	WST95209	8/15/95	Waste Shaft Sump	<0.0002	u	<1	u	0.24		<0.1	u	<0.4	u
NUS	WST95211	8/15/95	Waste Shaft Sump	<0.0002	u	<1	u	0.38		<0.05	u	<0.2	u
NUS	WST95237	8/30/95	Waste Shaft Sump	NA		3.8		NA		NA		NA	
NUS	WST95239	8/30/95	Waste Shaft Sump	NA		3.1		NA		NA		NA	
NUS	WST95241	8/30/95	Waste Shaft Sump	NA		2.4		NA		NA		NA	
NUS	WST95267	9/15/95	Waste Shaft Sump	<0.0008	u	0.4		0.62		<0.005	u	<0.02	u
NUS	WST96010/011	1/22/96	Waste Shaft Sump	<0.0002	u	<0.2	u	5		<0.2	u	<1	u

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG	TDS	pH
				mg/l		mg/l		mg/l		mg/l	mg/L	
NUS	WST95180	7/26/95	Waste Shaft Sump	11		<1	u	0.1		NA	NA	6.5
NUS	WST95181	7/26/95	Waste Shaft Sump	11		<1	u	0.1		NA	NA	6.5
NUS	WST95182	7/26/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.5
NUS	WST95183	7/26/95	Waste Shaft Sump	11		<1	u	<0.1	u	NA	NA	6.5
NUS	WST95184	7/26/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.4
NUS	WST95185	7/26/95	Waste Shaft Sump	10		<1	u	0.1		NA	NA	6.5
NUS	WST95186	7/26/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.4
NUS	WST95187	7/26/95	Waste Shaft Sump	9.6		1		0.1		NA	NA	6.3
NUS	WST95188	7/26/95	Waste Shaft Sump	10		<1	u	0.1		NA	NA	6.3
NUS	WST95189	7/26/95	Waste Shaft Sump	10		<1	u	0.1		NA	NA	6.3
NUS	WST95190	7/26/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.3
NUS	WST95191	7/26/95	Waste Shaft Sump	10		<1	u	0.1		NA	NA	6.3
NUS	WST95202	8/15/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95203	8/15/95	Waste Shaft Sump	11		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95204	8/15/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95205	8/15/95	Waste Shaft Sump	11		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95206	8/15/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95207	8/15/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95208	8/15/95	Waste Shaft Sump	10		<1	u	<0.1	u	NA	NA	6.6
NUS	WST95209	8/15/95	Waste Shaft Sump	1.9		<1	u	<0.1	u	NA	NA	4.5
NUS	WST95211	8/15/95	Waste Shaft Sump	<0.5	u	<1	u	<0.1	u	NA	NA	8.2
NUS	WST95237	8/30/95	Waste Shaft Sump	10.4		NA		NA		NA	NA	NA
NUS	WST95239	8/30/95	Waste Shaft Sump	1.3		NA		NA		NA	NA	NA
NUS	WST95241	8/30/95	Waste Shaft Sump	30		NA		NA		NA	NA	NA
NUS	WST95267	9/15/95	Waste Shaft Sump	0.93		<0.1	u	<0.01	u	NA	NA	6.9
NUS	WST96010/011	1/22/96	Waste Shaft Sump	12		<0.8	u	<0.5	u	1.25	260000	6.8

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl	SO4	Br	I	NO3	NH4
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST95180	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95181	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95182	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95183	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95184	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95185	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95186	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95187	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95188	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95189	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95190	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95191	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95202	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95203	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95204	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95205	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95206	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95207	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95208	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95209	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95211	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95237	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95239	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95241	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95267	9/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96010/011	1/22/96	Waste Shaft Sump	250000	210	1400	9	177.064	64.395

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC mg/L	TOC mg/L	Na mg/L	Mg mg/L	K mg/L	B mg/L
NUS	WST95180	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95181	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95182	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95183	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95184	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95185	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95186	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95187	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95188	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95189	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95190	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95191	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95202	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95203	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95204	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95205	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95206	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95207	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95208	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95209	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95211	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95237	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95239	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95241	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95267	9/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96010/011	1/22/96	Waste Shaft Sump	NA	NA	46000	24000	18000	190

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca	Fe	Zn	Sum	Sum	charge balance
				mg/L	mg/L	mg/L	Cations	Anions	percent
NUS	WST95180	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95181	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95182	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95183	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95184	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95185	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95186	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95187	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95188	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95189	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95190	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95191	7/26/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95202	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95203	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95204	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95205	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95206	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95207	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95208	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95209	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95211	8/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95237	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95239	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95241	8/30/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST95267	9/15/95	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96010/011	1/22/96	Waste Shaft Sump	42000	NA	870	6550	7073	-3.85

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST96060	2/7/96	Waste Shaft Sump	0.0004		<0.3	U	5.2		<0.5	U	<2	U
NUS	WST96067	2/20/96	Waste Shaft Sump	<0.0004	U	<0.3	U	5.6		<0.5	U	<2	U
NUS	WST96068	2/20/96	Waste Shaft Sump	<0.0004	U	<1	U	1.6		<0.05	U	<0.2	U
NUS	WST96069	2/20/96	Waste Shaft Sump	<0.0004	U	<0.3	U	3.5		<0.5	U	<2	U
NUS	WST96070	2/20/96	Waste Shaft Sump	<0.0004	U	<0.3	U	6.4		<0.5	U	<2	U
NUS	WST96071	2/20/96	Waste Shaft Sump	<0.0004	U	<0.3	U	8.6		<0.5	U	<2	U
NUS	WST96135	4/23/96	Waste Shaft Sump	<0.002	U	<0.6	U	7.3		<0.5	U	<2	U
NUS	WST96160	5/21/96	Waste Shaft Sump	<0.0005	U	<0.6	U	9.3		<2	U	<2	U
NUS	WST96185/189	6/10/96	Waste Shaft Sump	<0.001	U	<0.6	U	12		<2	U	<2	U
NUS	WST96186/190	6/10/96	Waste Shaft Sump	<0.001	U	<0.6	U	9		<0.5	U	<2	U
NUS	WST96257/261	7/16/96	Waste Shaft Sump	<0.001	U	<0.8	U	9.2		<0.5	U	<2.0	U
NUS	WST96258/262	7/16/96	Waste Shaft Sump	<0.001	U	<0.8	U	9.5		<0.5	U	<2.0	U
Wastren	WST96187/191	6/10/96	Waste Shaft Sump	<.002	U	0.0126		8.54		0.0102		0.0607	
Wastren	WST96188/192	6/10/96	Waste Shaft Sump	<.002	U	0.0123		8.18		0.0224		0.0761	
Wastren	WST96259/263	7/16/96	Waste Shaft Sump	<0.002	U	<0.0011	UN	9.46	B	0.0024	BN	0.0578	E
Wastren	WST96260/264	7/16/96	Waste Shaft Sump	<0.002	U	<0.0011	UN	9.57	B	0.0022	BN	0.0646	E
Wastren	WST96324/325	8/27/96	Waste Shaft Sump	<0.0004	UN	0.0012	BN	9.81	BE	0.0014	BN	0.0185	
Wastren	WST96326/327	8/27/96	Waste Shaft Sump	<0.0004	UN	<0.00056	UN	9.74	BE	0.0025	BN	0.0373	
Wastren	WST96452/453	10/22/96	Waste Shaft Sump	<0.0010	U	<0.0022	U	9.50	B	<0.01	U	1.04	
Wastren	WST96454/455	10/22/96	Waste Shaft Sump	<0.0010	U	<0.0022	U	9.35	B	<0.01	U	1.05	
Wastren	WST96498/499	11/26/96	Waste Shaft Sump	<0.001	U	<0.004	U	9.99		<0.010	U	0.0999	B
NUS	WST96142	5/2/96	Waste Shaft Sump (D93)	<0.001	U	<0.6	U	7.7		<0.5	U	<2	U
NUS	WST96143	5/2/96	Waste Shaft Sump (D93)	0.001		<0.6	U	7.9		<0.5	U	<2	U
NUS	WST96059	2/7/96	Waste Shaft Sump Muck	<0.0001	U	0.4		0.35		<0.01	U	<0.04	U
NUS	WST96073	2/21/96	Waste Shaft Sump Muck	<0.0004	U	0.5		0.45		0.018		<0.04	U
NUS	WST96076	2/21/96	Waste Shaft Sump Muck	<0.0004	U	0.4		0.45		0.014		<0.04	U

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG	TDS	pH
				mg/l		mg/l		mg/l		mg/l	mg/L	
NUS	WST96060	2/7/96	Waste Shaft Sump	5		<0.5	U	<1	U	NA	NA	7.4
NUS	WST96067	2/20/96	Waste Shaft Sump	6		<0.8	U	<1	U	NA	NA	7.5
NUS	WST96068	2/20/96	Waste Shaft Sump	0.7		<1	U	<0.1	U	NA	NA	7.4
NUS	WST96069	2/20/96	Waste Shaft Sump	14		<0.8	U	<1	U	NA	NA	7.1
NUS	WST96070	2/20/96	Waste Shaft Sump	11		<0.8	U	<1	U	NA	NA	7.1
NUS	WST96071	2/20/96	Waste Shaft Sump	8		<0.8	U	<1	U	NA	NA	7.4
NUS	WST96135	4/23/96	Waste Shaft Sump	1.4		<0.8	U	<1	U	NA	NA	6.9
NUS	WST96160	5/21/96	Waste Shaft Sump	0.02		<0.8	U	<1	U	NA	NA	7.3
NUS	WST96185/189	6/10/96	Waste Shaft Sump	<0.3	U	<0.4	U	<1	U	1.27	100000	7.2
NUS	WST96186/190	6/10/96	Waste Shaft Sump	0.5		<0.8	U	<1	U	1.27	150000	7.1
NUS	WST96257/261	7/16/96	Waste Shaft Sump	<1	U	<0.8	U	<1	U	1.26	390000	7.0
NUS	WST96258/262	7/16/96	Waste Shaft Sump	<1	U	<0.8	U	<1	U	1.26	400000	7.0
Wastren	WST96187/191	6/10/96	Waste Shaft Sump	1.01		0.0055		<1	U	1.30	414000	7.2
Wastren	WST96188/192	6/10/96	Waste Shaft Sump	0.946		0.0044		<.0022	U	1.30	415000	7.2
Wastren	WST96259/263	7/16/96	Waste Shaft Sump	1.08		0.0129	B	0.0973		1.30	500000	7.2
Wastren	WST96260/264	7/16/96	Waste Shaft Sump	1.21		0.0123	B	0.112		1.30	497000	7.2
Wastren	WST96324/325	8/27/96	Waste Shaft Sump	0.678		0.0061	B	0.004	BN	1.26	442000	7.1
Wastren	WST96326/327	8/27/96	Waste Shaft Sump	0.473		0.0055	B	0.0015	BN	1.26	440000	7.1
Wastren	WST96452/453	10/22/96	Waste Shaft Sump	0.302		0.0107	B	0.0014	B	1.27	476000	7.1
Wastren	WST96454/455	10/22/96	Waste Shaft Sump	0.338		0.0082	B	0.0015	B	1.26	473000	7.1
Wastren	WST96498/499	11/26/96	Waste Shaft Sump	2.26		0.010	B	<0.010	U	1.25	503000	7.2
NUS	WST96142	5/2/96	Waste Shaft Sump (D93)	1.8		<0.8	U	<1	U	NA	NA	7.9
NUS	WST96143	5/2/96	Waste Shaft Sump (D93)	2.3		<0.4	U	<1	U	NA	NA	7.8
NUS	WST96059	2/7/96	Waste Shaft Sump Muck	<0.1	U	<0.2	U	<0.02	U	NA	NA	7.5
NUS	WST96073	2/21/96	Waste Shaft Sump Muck	0.12		<0.2	U	<0.02	U	NA	NA	6.7
NUS	WST96076	2/21/96	Waste Shaft Sump Muck	<0.1	U	<0.2	U	<0.02	U	NA	NA	6.7

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl		SO4		Br		I		NO3		NH4	
				mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
NUS	WST96060	2/7/96	Waste Shaft Sump	NA		NA		NA		NA		NA		NA	
NUS	WST96067	2/20/96	Waste Shaft Sump	NA		NA		NA		NA		NA		NA	
NUS	WST96068	2/20/96	Waste Shaft Sump	NA		NA		NA		NA		NA		NA	
NUS	WST96069	2/20/96	Waste Shaft Sump	NA		NA		NA		NA		NA		NA	
NUS	WST96070	2/20/96	Waste Shaft Sump	NA		NA		NA		NA		NA		NA	
NUS	WST96071	2/20/96	Waste Shaft Sump	NA		NA		NA		NA		NA		NA	
NUS	WST96135	4/23/96	Waste Shaft Sump	NA		NA		NA		NA		NA		NA	
NUS	WST96160	5/21/96	Waste Shaft Sump	NA		NA		NA		NA		NA		NA	
NUS	WST96185/189	6/10/96	Waste Shaft Sump	240000		420		1100		9		61.9724		68.2587	
NUS	WST96186/190	6/10/96	Waste Shaft Sump	220000		220		22		10		29.21556		68.2587	
NUS	WST96257/261	7/16/96	Waste Shaft Sump	220000		290		1700		9		75.2522		73.4103	
NUS	WST96258/262	7/16/96	Waste Shaft Sump	230000		290		1800		10		101.8118		72.1224	
Wastren	WST96187/191	6/10/96	Waste Shaft Sump	227000		215		1580		NA		117		90	
Wastren	WST96188/192	6/10/96	Waste Shaft Sump	227000		221		1580		NA		117		87	
Wastren	WST96259/263	7/16/96	Waste Shaft Sump	229000		219	B	1640		NA		119		72.8	
Wastren	WST96260/264	7/16/96	Waste Shaft Sump	228000		218	B	1650		NA		120		73.6	
Wastren	WST96324/325	8/27/96	Waste Shaft Sump	237000		185	B	1710		NA		130		70.8	
Wastren	WST96326/327	8/27/96	Waste Shaft Sump	233000		221	B	1680		NA		130		69.4	
Wastren	WST96452/453	10/22/96	Waste Shaft Sump	238000		209		1740		NA		124		76.4	
Wastren	WST96454/455	10/22/96	Waste Shaft Sump	240000		210		1740		NA		123		44.2	
Wastren	WST96498/499	11/26/96	Waste Shaft Sump	237000		217	B	1500		NA		105		90.2	
NUS	WST96142	5/2/96	Waste Shaft Sump (D93)	NA		NA		NA		NA		NA		NA	
NUS	WST96143	5/2/96	Waste Shaft Sump (D93)	NA		NA		NA		NA		NA		NA	
NUS	WST96059	2/7/96	Waste Shaft Sump Muck	NA		NA		NA		NA		NA		NA	
NUS	WST96073	2/21/96	Waste Shaft Sump Muck	NA		NA		NA		NA		NA		NA	
NUS	WST96076	2/21/96	Waste Shaft Sump Muck	NA		NA		NA		NA		NA		NA	

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC	TOC	Na	Mg	K	B
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST96060	2/7/96	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96067	2/20/96	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96068	2/20/96	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96069	2/20/96	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96070	2/20/96	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96071	2/20/96	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96135	4/23/96	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96160	5/21/96	Waste Shaft Sump	NA	NA	NA	NA	NA	NA
NUS	WST96185/189	6/10/96	Waste Shaft Sump	NA	610	43000	19000	29000	220
NUS	WST96186/190	6/10/96	Waste Shaft Sump	NA	620	39000	17000	23000	180
NUS	WST96257/261	7/16/96	Waste Shaft Sump	12	1400	37000	10000	20000	150
NUS	WST96258/262	7/16/96	Waste Shaft Sump	13	1400	37000	10000	20000	150
Wastren	WST96187/191	6/10/96	Waste Shaft Sump	NA	1930	39200	17100	20600	169
Wastren	WST96188/192	6/10/96	Waste Shaft Sump	NA	1830	39000	16900	21100	170
Wastren	WST96259/263	7/16/96	Waste Shaft Sump	13.9	1860	42000	10900	22300	155
Wastren	WST96260/264	7/16/96	Waste Shaft Sump	13.1	1840	42500	10900	22500	156
Wastren	WST96324/325	8/27/96	Waste Shaft Sump	13.7	1830	41700	10400	22600	149
Wastren	WST96326/327	8/27/96	Waste Shaft Sump	14.2	1850	41700	10500	22400	150
Wastren	WST96452/453	10/22/96	Waste Shaft Sump	14.4	1930	38700	11500	21500	155
Wastren	WST96454/455	10/22/96	Waste Shaft Sump	12.7	1860	38300	11400	21500	155
Wastren	WST96498/499	11/26/96	Waste Shaft Sump	8.3	1620	47400	10800	19900	140
NUS	WST96142	5/2/96	Waste Shaft Sump (D93)	NA	NA	NA	NA	NA	NA
NUS	WST96143	5/2/96	Waste Shaft Sump (D93)	NA	NA	NA	NA	NA	NA
NUS	WST96059	2/7/96	Waste Shaft Sump Muck	NA	NA	NA	NA	NA	NA
NUS	WST96073	2/21/96	Waste Shaft Sump Muck	NA	NA	NA	NA	NA	NA
NUS	WST96076	2/21/96	Waste Shaft Sump Muck	NA	NA	NA	NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca		Fe		Zn		Sum	Sum	charge balance
				mg/L		mg/L		mg/L		Cations	Anions	percent
NUS	WST96060	2/7/96	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST96067	2/20/96	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST96068	2/20/96	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST96069	2/20/96	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST96070	2/20/96	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST96071	2/20/96	Waste Shaft Sump	NA		NA		NA		NA	NA	NA
NUS	WST96135	4/23/96	Waste Shaft Sump	NA		NA		510		NA	NA	NA
NUS	WST96160	5/21/96	Waste Shaft Sump	NA		NA		160		NA	NA	NA
NUS	WST96185/189	6/10/96	Waste Shaft Sump	89000		NA		240		8637	6792	11.96
NUS	WST96186/190	6/10/96	Waste Shaft Sump	70000		NA		270		7193	6210	7.33
NUS	WST96257/261	7/16/96	Waste Shaft Sump	67000		4		580		6301	6234	0.54
NUS	WST96258/262	7/16/96	Waste Shaft Sump	67000		4		580		6301	6517	-1.69
Wastren	WST96187/191	6/10/96	Waste Shaft Sump	64100		NA		285		6853	6427	3.21
Wastren	WST96188/192	6/10/96	Waste Shaft Sump	64000		NA		288		6836	6427	3.08
Wastren	WST96259/263	7/16/96	Waste Shaft Sump	67600		2.29	N	596		6682	6485	1.49
Wastren	WST96260/264	7/16/96	Waste Shaft Sump	68400		2.12	BN	603		6749	6457	2.21
Wastren	WST96324/325	8/27/96	Waste Shaft Sump	72000		1.81	N	667		6854	6711	1.05
Wastren	WST96326/327	8/27/96	Waste Shaft Sump	72000		2.07	N	665		6857	6599	1.92
Wastren	WST96452/453	10/22/96	Waste Shaft Sump	70100		4.47	N	237		6692	6740	-0.36
Wastren	WST96454/455	10/22/96	Waste Shaft Sump	69400		2.22	N	237		6631	6797	-1.23
Wastren	WST96498/499	11/26/96	Waste Shaft Sump	66000		0.339		142		6766	6709	0.42
NUS	WST96142	5/2/96	Waste Shaft Sump (D93)	NA		NA		22		NA	NA	NA
NUS	WST96143	5/2/96	Waste Shaft Sump (D93)	NA		NA		22		NA	NA	NA
NUS	WST96059	2/7/96	Waste Shaft Sump Muck	NA		NA		NA		NA	NA	NA
NUS	WST96073	2/21/96	Waste Shaft Sump Muck	NA		NA		NA		NA	NA	NA
NUS	WST96076	2/21/96	Waste Shaft Sump Muck	NA		NA		NA		NA	NA	NA

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Hg		As		Ba		Cd		Cr	
				mg/l		mg/l		mg/l		mg/l		mg/l	
NUS	WST96078	2/22/96	Waste Shaft Sump Muck	<0.0004	U	0.4		0.41		<0.01	U	<0.04	U
Wastren	WST96376/377	9/23/96	PW-C2505-51.4	<0.0002	UN	0.00043	BN	0.0982	B	<0.00056	U	0.0048	BE
Wastren	WST96378/379	9/23/96	PW-C2505-51.4	<0.0002	UN	0.00042	BN	0.0957	B	<0.00056	U	0.0018	E
Wastren	WST96380/381	9/24/96	PW-C2505-65	<0.0002	UN	0.0012	BN	0.0941	B	<0.00056	U	0.0089	BE
Wastren	WST96382/383	9/24/96	PW-C2505-65	<0.0002	UN	0.00099	BN	0.0945	B	<0.00056	U	0.0034	BE
Wastren	WST96388/389	9/26/96	PW-C2506-43.5	<0.0002	UN	0.0015	BN	0.234		<0.00056	U	0.0128	E
Wastren	WST96390/391	9/26/96	PW-C2506-43.5	<0.0002	UN	0.0014	BN	0.235		<0.00056	U	0.0061	BE
Wastren	WST96414/415	10/2/96	PW-C2507	<0.0002	UN	0.0018	BN	0.122	B	<0.00056	U	0.0076	BE
Wastren	WST96417/418	10/2/96	PW-C2507	<0.0002	UN	0.0021	BN	0.159	B	<0.00056	U	0.0101	BE
Wastren	WST96420/421	10/2/96	PW-ES001	<0.0002	UN	0.00067	BN	0.112	B	<0.00056	U	0.0128	E
Wastren	WST96423/424	10/2/96	PW-ES001	<0.0002	U	0.00040	B	0.0743	B	<0.00056	U	0.0053	B

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Pb		Se		Ag		SG		TDS		pH
				mg/l		mg/l		mg/l		mg/l		mg/L		
NUS	WST96078	2/22/96	Waste Shaft Sump Muck	<0.1	U	<0.2	U	<0.02	U	NA		NA		7.7
Wastren	WST96376/377	9/23/96	PW-C2505-51.4	0.0016	B	0.0636	N	0.00036	BN	1.00		8550		7.5
Wastren	WST96378/379	9/23/96	PW-C2505-51.4	0.0010	B	0.0605	N	0.00059	BN	1.00		8530		7.5
Wastren	WST96380/381	9/24/96	PW-C2505-65	0.00076	B	0.0635	N	<0.00022	UN	1.00		8580		7.5
Wastren	WST96382/383	9/24/96	PW-C2505-65	0.0010	B	0.0672	N	<0.00022	UN	1.00		8690		7.4
Wastren	WST96388/389	9/26/96	PW-C2506-43.5	0.0018	B	0.0821	N	<0.00022	UN	1.00		11500		7.3
Wastren	WST96390/391	9/26/96	PW-C2506-43.5	0.0017	B	0.0808	N	0.00024	BN	1.00		11500		7.3
Wastren	WST96414/415	10/2/96	PW-C2507	0.0019	B	0.0334	N	<0.00022	UN	1.00		4000		7.6
Wastren	WST96417/418	10/2/96	PW-C2507	0.0024	B	0.0338	N	<0.00022	UN	1.00		4020		7.6
Wastren	WST96420/421	10/2/96	PW-ES001	0.0030	B	0.0311	N	<0.00022	UN	1.00		4510		7.6
Wastren	WST96423/424	10/2/96	PW-ES001	0.0013	B	0.0808	N	<0.00022	N	1.00		4480		7.7

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Cl	SO4	Br	I	NO3	NH4
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
NUS	WST96078	2/22/96	Waste Shaft Sump Muck	NA	NA	NA	NA	NA	NA
Wastren	WST96376/377	9/23/96	PW-C2505-51.4	3810	853	9.0	NA	15.6	0.30
Wastren	WST96378/379	9/23/96	PW-C2505-51.4	3800	852	9.0	NA	15.3	0.38
Wastren	WST96380/381	9/24/96	PW-C2505-65	3830	853	9.1	NA	16.0	0.26
Wastren	WST96382/383	9/24/96	PW-C2505-65	3830	856	9.2	NA	16.1	0.21
Wastren	WST96388/389	9/26/96	PW-C2506-43.5	5390	973	10.2	NA	17.9	0.10
Wastren	WST96390/391	9/26/96	PW-C2506-43.5	5400	978	10.2	NA	18.2	0.08
Wastren	WST96414/415	10/2/96	PW-C2507	1170	994	10.1	NA	9.5	0.05
Wastren	WST96417/418	10/2/96	PW-C2507	1160	989	10.0	NA	9.8	0.11
Wastren	WST96420/421	10/2/96	PW-ES001	1440	970	9.1	NA	18.1	0.48
Wastren	WST96423/424	10/2/96	PW-ES001	1450	973	9.1	NA	18.0	0.50

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	TIC		TOC		Na		Mg		K		B	
				mg/L		mg/L		mg/L		mg/L		mg/L		mg/L	
NUS	WST96078	2/22/96	Waste Shaft Sump Muck	NA		NA		NA		NA		NA		NA	
Wastren	WST96376/377	9/23/96	PW-C2505-51.4	45.8		9.2		1100		641		36.7	B	1.2	
Wastren	WST96378/379	9/23/96	PW-C2505-51.4	39.9		6.4		1040		625		23.9	B	0.2	B
Wastren	WST96380/381	9/24/96	PW-C2505-65	45.7		7.3		996		653		30.9	B	0.19	B
Wastren	WST96382/383	9/24/96	PW-C2505-65	47.1		10.5		996		653		31.4	B	0.19	B
Wastren	WST96388/389	9/26/96	PW-C2506-43.5	47.2		6.8		1660		744		18.3	B	0.18	B
Wastren	WST96390/391	9/26/96	PW-C2506-43.5	46.4		8.5		1660		742		19.1	B	0.18	B
Wastren	WST96414/415	10/2/96	PW-C2507	57.9		5.6		268		340		11.9	B	0.23	B
Wastren	WST96417/418	10/2/96	PW-C2507	58		7.0		270		341		12.4	B	0.22	B
Wastren	WST96420/421	10/2/96	PW-ES001	54.6		7.8		305		411		35.0	B	0.22	B
Wastren	WST96423/424	10/2/96	PW-ES001	52.5		7.7		289		389		33.6	B	0.20	B

WIPP Exhaust Shaft Water and Lead Working Group - Brine and Water Database

Lab	Sample ID	Date	Location	Ca		Fe		Zn		Sum	Sum	charge balance
				mg/L		mg/L		mg/L		Cations	Anions	percent
NUS	WST96078	2/22/96	Waste Shaft Sump Muck	NA		NA		NA		NA	NA	NA
Wastren	WST96376/377	9/23/96	PW-C2505-51.4	789		0.0146	BEN	<0.0033	U	141	129	4.39
Wastren	WST96378/379	9/23/96	PW-C2505-51.4	772		0.0937	BEN	0.0047	B	136	128	2.82
Wastren	WST96380/381	9/24/96	PW-C2505-65	809		0.0353	BEN	<0.0033	U	138	130	3.18
Wastren	WST96382/383	9/24/96	PW-C2505-65	812		0.0098	BEN	0.0056	B	138	130	3.17
Wastren	WST96388/389	9/26/96	PW-C2506-43.5	1010		0.717	EN	0.0138	B	184	176	2.21
Wastren	WST96390/391	9/26/96	PW-C2506-43.5	1010		0.860	EN	0.0073	B	184	177	2.08
Wastren	WST96414/415	10/2/96	PW-C2507	446		4.16	EN	0.0272		62	59	2.96
Wastren	WST96417/418	10/2/96	PW-C2507	451		4.73	EN	0.0309		63	58	3.62
Wastren	WST96420/421	10/2/96	PW-ES001	492		4.95	EN	0.0162	B	73	65	5.13
Wastren	WST96423/424	10/2/96	PW-ES001	465		1.12		0.0055	B	69	66	2.25

APPENDIX B

VALIDATION OF ANALYTICAL RESULTS FOR BRINE SAMPLES

APPENDIX B
VALIDATION OF ANALYTICAL RESULTS FOR BRINE SAMPLES

The measurement of analyte concentrations in high-ionic strength brines (e.g., saturated sodium-chloride brines) is a difficult analytical problem, primarily because of high loads of total dissolved solids which require large dilution factors prior to analysis. Large dilution factors may increase detection limits above regulatory levels (e.g., above toxicity characteristic leaching procedure hazardous waste limits), which results in unusable data for determining whether the brine is nonhazardous material. Other potential problems with saturated sodium-chloride brines occur when the addition of matrix spike (MS) results in precipitation of solids. These problems may lead to unacceptable spike recoveries and poor agreement among duplicate analyses, which produces analytical results that do not meet established limits for accuracy and precision. Therefore, the analytical data received on brine samples was reviewed in detail to determine whether the analytical results represent semiquantitative or quantitative results. A summary of this review is provided below, beginning with a discussion of MSs, in-house standards, and blind duplicates followed by specific results reported by individual analytical laboratories.

B.1 Matrix Spike and Matrix Spike Duplicate Samples

Analytical laboratories spike some submitted samples to determine precision and accuracy for the analytes of interest in the sample matrix. Precision is a measurement of the operator and instrument error associated with reproducing analytical results for a sample and its duplicate, and is reported as relative percent difference (RPD) between the MS and matrix spike duplicate (MSD) results. Accuracy is a measurement of how close the analytical result comes to the true concentration of the sample (reported as percent spike recovered from MS and MSD samples), and reflects the errors associated with pipetting the spike volume into the sample and analytical interference caused by elements in the sample matrix. Both measurements must be present in the analytical report to assess the quality assurance/quality control (QA/QC) performance of personnel and instruments in the analytical laboratory.

The sample matrix for most Waste Isolation Pilot Plant (WIPP) brines consists of a saturated sodium-chloride solution which commonly contains high concentrations of potassium (K), magnesium (Mg), and sulfate (SO_4). In the vicinity of the mine shafts, the interaction of water with concrete can also produce brine samples with high calcium (Ca) concentrations. Because the WIPP brine samples are saturated with halite (sodium chloride) and commonly

anhydrite ($CaSO_4$), the addition of sodium, chlorine, calcium, or sulfate to the brine may result in precipitation of halite or anhydrite. Therefore, spiking of WIPP brine samples must be limited to analytes that are not saturated in the brine. Based on experience gained during the 1989 to 1994 WIPP Brine Sampling and Evaluation Program, spike solutions should contain only the following analytes: ammonium (NH_4), boron (B), bromide (Br), nitrate (NO_3), arsenic (As), cadmium (Cd), chromium (Cr), lead (Pb), and selenium (Se). Although barium (Ba), mercury (Hg), and silver (Ag) are commonly added with the other heavy metals in a single spike, acceptable recovery of the barium, mercury, and silver spike is generally not achieved, probably because of precipitation of barium sulfate, mercury chloride, and silver chloride.

B.2 In-House Standards

Analytical laboratories have "in-house" standards that are routinely run as laboratory control samples to assess operator and system performance. However, most laboratory control samples are dilute aqueous samples, which are not representative of the sodium-chloride matrix in WIPP brines (i.e., dilute laboratory control samples do not reflect operator and system performance for saturated sodium-chloride brine samples). Therefore, dilute in-house standards cannot be used to assess the quality of analytical data obtained on the WIPP high-ionic strength brine samples. To overcome this limitation, an "in-house" laboratory brine standard must be developed to obtain quantitative analyses of WIPP brine samples. For example, the accuracy of major analytes (i.e., chlorine, sulfate, sodium, magnesium, and potassium) can only be assessed through analysis of an "in-house" standard because a major-element spike cannot be added to the brine samples (Section B.1).

An "in-house" brine standard suitable for the current WIPP brine investigation should have the following approximate composition: chlorine = 150,000 milligrams per liter (mg/L); sodium = 60,000 mg/L; magnesium = 15,000 mg/L; potassium = 10,000 mg/L; calcium = 10,000 mg/L; sulfate = 2,000 mg/L; bromine = 1,500 mg/L; boron = 1,000 mg/L; zinc = 500 mg/L; and lead = 5 mg/L. An "in-house" brine standard was used by only one of the three laboratories contracted to perform brine analyses. Specific laboratory results are discussed below.

B.3 Blind Duplicates

Blind duplicates are sent with every group of submitted brine samples to assess the precision of the laboratory analyses. These duplicates are unknown to the laboratory and allow the user

of the analytical data to assess the laboratory precision independently from the laboratory results reported for MS and MSD. This independent assessment is required for the brine samples because the precision of major-element analyses cannot be obtained with MS and MSD results, because of the saturated state of the brine samples (Section B.1).

B.4 Analytical Results from NUS Haliburton Laboratory

The Haliburton NUS Analytical Laboratory (hereinafter referred to as NUS) laboratory data reports for brine samples obtained in May 1995 through June 1996 contain a significant number of results for RPD, MS recovery, and MSD recovery that are outside of acceptable limits (acceptable limits are ± 20 percent for RPD and 80 to 120 percent for MS and MSD recovery). The essence of this finding is that much of the analytical data are not considered rigorous quantitative numbers, but they may be used as semiquantitative results with the appropriate qualifier. Details on the QA/QC review and use of results follows.

MS and MSD Samples. Most spike recoveries reported for trace elements (i.e., less than 100 mg/L; e.g., lead and barium) are unacceptable. The principal reason for these unacceptable spike recoveries is that dilution of the brine samples prior to analysis lowers the spike concentration of individual trace elements below their detectable level. For example, if the detection limit for lead is 0.05 mg/L and a sample containing 1 mg/L lead is spiked with an additional 0.5 mg/L lead (total lead is 1.5 mg/L), diluting the sample by a factor of 100 prior to analysis lowers the lead concentration to 0.015 mg/L, which is below the detection limit. Although large dilution factors are required for major-element analysis, dilution should be minimized for trace-element analysis to ensure that trace-element concentrations remain above the element detection limits.

A less significant finding for the NUS results deals with the occasional unacceptable precision result obtained for MS and MSD samples. In this case, the problem should be corrected by rerunning the MS and MSD samples until an acceptable precision result is obtained.

Although significant problems are identified for the laboratory MS and MSD samples, all QA requirements for the WIPP Site Effluent and Hazardous Materials Sampling Plan have been met. That is, all sample collection, chain-of-custody, request-for-analysis, and shipment records are in order to demonstrate the integrity of the samples collected and received by the laboratory. Additionally, it is noted here that the complexity and difficulty associated with

the analysis of high-ionic strength brines must be understood by the laboratory prior to analysis if quantitative results are to be obtained.

Laboratory Control Samples. Analytical laboratories have "in-house" standards that are routinely run as laboratory control samples to assess operator and system performance. The laboratory control samples for NUS indicate that the operator and system were performing according to specifications for dilute aqueous samples. However, these dilute laboratory control samples do not reflect operator and system performance for saturated sodium chloride brine samples. Therefore, they cannot be used to assess the quality of analytical data obtained on the WIPP high-ionic strength brine samples. To overcome this limitation , an "in-house" laboratory brine standard can be developed. Such a standard is used by the Wastren Laboratory (Wastren), and their results are discussed under Section 3.6

Use of NUS Haliburton Analytical Results. Analytical results for MS and MSD samples run by NUS indicate that most results for hazardous metals are outside of the accepted range of 80 to 120 percent for spike recovery, and the data are to be treated as semiquantitative results. This is interpreted to mean that the detection of an analyte in the brine is acknowledged but the concentration of the analyte has not been quantified to a level acceptable to U.S. Environmental Protection Agency (EPA) SW 846 protocols. The semiquantitative nature of the NUS results is also evident in charge-balance calculations, which show charge imbalances outside of the generally accepted range of −5 to +5 percent.

When June 1996 analytical results on duplicate splits sent to NUS and Wastren are compared, NUS results for lead are 20 to 60 percent lower than Wastren results (e.g., Waste Shaft Sump lead results: NUS = 0.4 mg/L, Wastren = 0.98 mg/L (Appendix A). In a similar comparison, NUS calcium results were up to 50 percent higher than Wastren results. A high degree of confidence is placed in the Wastren data because past use of the Wastren laboratory for the WIPP Brine Sampling and Evaluation program showed most MS and MSD samples to be acceptable with respect to established EPA SW 846 protocols. Based on the NUS QA/QC results, it is recommended that NUS data be considered semiquantitative rather than quantitative.

B.6 Analytical Results from Wastren Laboratory

A QA/QC review of the Wastren data reports for brine samples obtained in June of 1996 through October 1996 indicates analytical results are acceptable for ammonium, bromide,

chloride, nitrate, sulfate, calcium, magnesium, potassium, sodium, arsenic, barium, lead, and selenium; whereas results for cadmium, chromium, mercury, and silver should be considered semiquantitative. Recommendations have been made to Wastren to resolve analytical issues associated with the semi-quantitative results, and details follow on these recommendations and the QA/QC review.

Laboratory Control Sample. The Wastren "in-house" brine sample (LCB06) is a sodium-chloride brine that is similar to submitted brine samples for the analytes bromide, chloride, sulfate, calcium, magnesium, potassium, sodium, and lead. Analysis of this sample indicates that laboratory personnel and instrument systems are operating properly and reported concentrations for the listed constituents are within the specified QA/QC range for accuracy. However, the concentrations of boron and zinc in this control sample are one to two orders of magnitude below reported concentrations in submitted brine samples. Therefore, as MS and MSD samples were not prepared for boron and zinc (discussed below), only limited confidence can be placed in the accuracy of reported boron and zinc concentrations.

As recommended to Wastren, the solution to this problem will be to prepare a new laboratory control sample with higher boron and zinc concentrations. Laboratory control sample LCB06 will be modified to create an acceptable control sample by increasing boron and zinc concentrations to 1,000 mg/L. This new laboratory control sample will be used to assess the accuracy of analytical results for major constituents in the brine sample. It is recommended that all analytical laboratories contracted for brine analyses prepare a similar 'in-house' control sample to allow a proper assessment of accuracy to be made.

MS and MSD Samples. Although the MS and MSD samples are traditionally used for assessing the accuracy of analytical results, spiking saturated brines with major constituents may result in precipitation of solids (e.g., halite or anhydrite). Therefore, the saturated character of WIPP brines precludes the use of MS and MSD samples to assess the accuracy of major constituents in the brines, and relevant laboratory control samples must be prepared (as noted above). However, preparation of MS and MSD samples for trace constituents (i.e., less than 100 mg/L; e.g., barium, cadmium, lead, etc) will continue.

Reported MS and MSD recoveries for cadmium, chromium, mercury, and silver are unacceptable. There are several reasons for these unacceptable spike recoveries: (1) dilution of the brine samples prior to analysis lowers the spike concentration of individual trace

elements below their detection level, (2) the concentration of spike added to the sample was two to three orders of magnitude lower than the concentration of the analyte in the sample, and (3) addition of the spike to the brine resulted in precipitation of a metal-containing phase (e.g., silver chloride). In Case 2, the spike concentration is simply analytical noise relative to the much larger analyte concentration in the sample. Based on recommendations submitted to Wastren, the recoveries will be improved by changing the dilution factors and increasing the spike concentrations.

Although some lead spike levels were too low to produce a significant measurement in the MS and MSD samples, the lead analytical results for the laboratory control brine sample LCB06 were within 5 percent of the true value of 3 mg/L (±20 percent is acceptable). As the concentration of lead in this control sample is similar to measured concentrations in most brine samples (i.e., 1 to 7 mg/L), the results for the laboratory control sample can be used to assess the accuracy of analytical results for lead. Therefore, all reported lead results are validated as acceptable within the established QA/QC protocol.