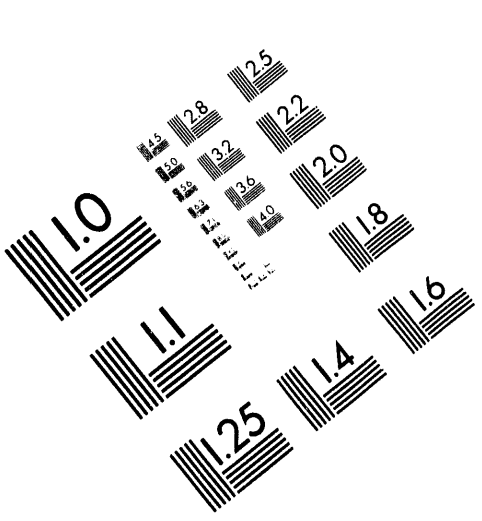



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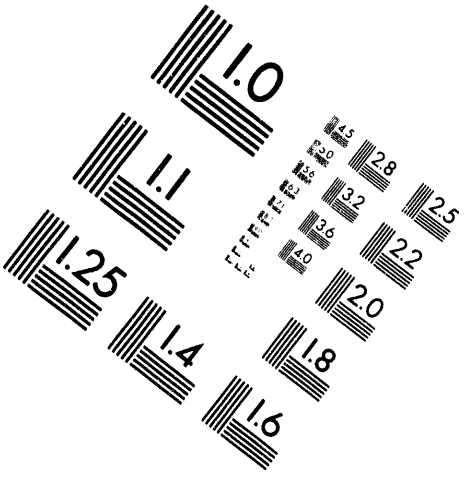

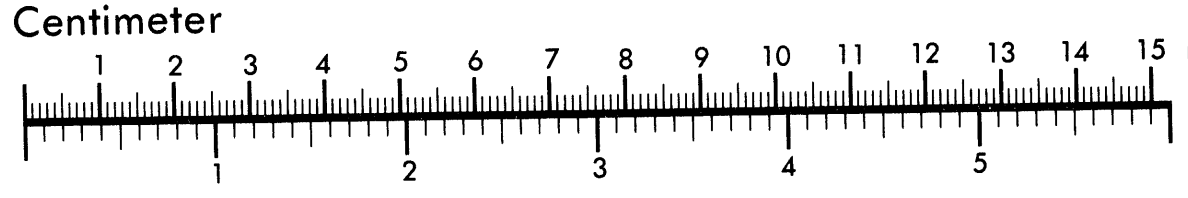


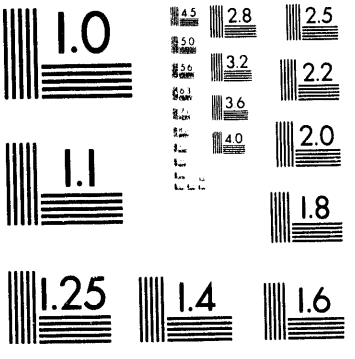

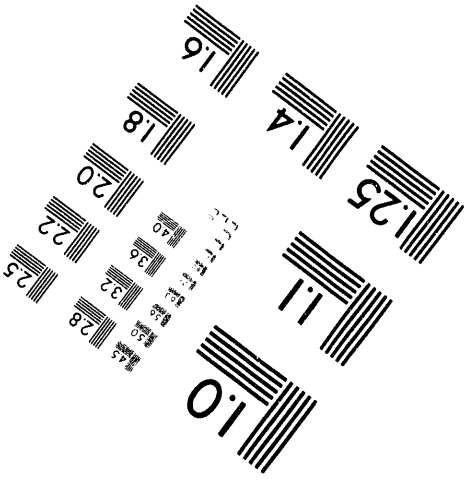

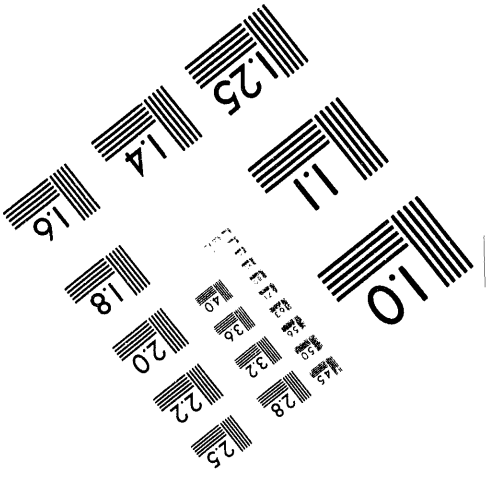

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# SAMPLING AND ANALYSES REPORT FOR THE SEPTEMBER 1989 POSTBURN SAMPLING AT THE RM1 UCG SITE, HANNA, WYOMING

By
Scott E. Crader

September, 1989

Work Performed Under DOE Cooperative Agreement
DE-FC21-86MC11076, DOE Grant No. DE-FG21-88MC25038,
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For
U.S. Department of Energy
Office of Fossil Energy
Morgantown Energy Technology Center
Laramie Projects Office
Laramie, Wyoming

and
Gas Research Institute
8600 West Bryn Mawr Avenue
Chicago, Illinois

By
Western Research Institute
Laramie, Wyoming

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## INTRODUCTION

Between September 14, 1989 and September 19, 1989, Western Research Institute (WRI) completed the third quarterly Rocky Mountain 1 (RM1) groundwater monitoring for the year 1989. This quarterly sample outing represents the first sampling since the completion of the second RM1 groundwater restoration in August 1989.

Background material and the sampling and analytical procedures associated with this task are described in the "Rocky Mountain 1 Postburn Groundwater Monitoring Quality Assurance Plan," prepared by Western Research Institute for the Gas Research Institute and the U.S. Department of Energy.

## SAMPLING ACTIVITIES

A summary of the sampling activities performed by WRI at the RM1 site during the September 1989 quarterly sampling period are presented in Table 1. This table shows a list of the wells sampled, sampling date, sampling method, the sample parameter suite, and observations made during sampling.

A total of 22 monitoring wells were sampled during the third quarterly postburn sampling of 1989. This included 16 wells completed in the coal seam, 2 wells completed in the unit A overburden, 2 wells completed in the unit C overburden, 1 well completed in the ELW cavity, and 1 well completed in the CRIP cavity. The inner-ring coal seam wells were sampled for the limited suite (LS) of parameters plus volatile organic acids (VOA). The inner-ring overburden wells and all the outer-ring wells were sampled for the limited suite of parameters only. The cavity wells were sampled for the full suite (FS) of parameters. Limited suite and full suite refer to those parameters sampled for as designated by the "Rocky Mountain 1 Postburn Groundwater Monitoring Quality Assurance Plan." The VOA analyses on the inner-ring coal seam wells represent a modification to the sampling plan as requested by the Wyoming Department of Environmental Quality (WDEQ) and agreed upon by the RM1 Sponsored Management Committee (SMC).

Wells EMW-2 and EMW-8 have very low permeability and historically have not recharged sufficiently to sample with a portable pump. These two wells were sampled with a Teflon bailer.

Well EMW-6 has a two inch diameter casing that has become bent or twisted. WRI is not able to obtain a representative sample from this well, therefore, this well was not sampled.

All of the other wells have sufficient recharge and were pumped and sampled using the Bennett pump system.

Table 1. RMI Sampling Summary for September 1989

| Well Name | Date Sampled | Sample Method | Parameter Suite | Comments |
|---|---|---|---|---|
| EMW-1 | 09/18/89 | Bennett pump | LS + VOA | Strong sulfur odor. Water was dark discolored. |
| EMW-2 | 09/18/89 | Teflon bailer | LS | Bailed sample. |
| EMW-3 | 09/17/89 | Bennett pump | LS + VOA | Slight sulfur odor to water. Water is clear. |
| EMW-4 | 09/17/89 | Bennett pump | LS | Colorless, odorless water. |
| EMW-8 | 09/16/89 | Teflon bailer | LS | Bailed sample. Water was murky, odorless. |
| EMW-9 | 09/16/89 | Bennett pump | LS + VOA | Colorless, odorless water. |
| EMW-10 | 09/16/89 | Bennett pump | LS | Colorless, odorless water. |
| EMW-11a | 09/18/89 | Bennett pump | LS + VOA | Colorless, odorless water. |
| TW-2 | 09/17/89 | Bennett pump | LS + VOA | Colorless, odorless water. |
| TW-3 | 09/17/89 | Bennett pump | LS + VOA | Colorless, odorless water. |
| TW-4 | 09/16/89 | Bennett pump | LS + VOA | Colorless, odorless water. |
| TW-5 | 09/16/89 | Bennett pump | LS + VOA | Colorless, odorless water. |
| TW-11 | 09/15/89 | Bennett pump | LS | Slight sulfur odor to water. Colorless water. |
| TW-12 | 09/15/89 | Bennett pump | LS | Colorless, odorless water. |

Table 1. RM1 Sampling Summary for September 1989 (continued)

| Well Name | Date Sampled | Sample Method | Parameter Suite | Comments |
|---|---|---|---|---|
| TW-13 | 09/15/89 | Bennett pump | LS | Gray muddy silt in water. Slight carbon smell. |
| TW-14a | 09/16/89 | Bennett pump | LS | Colorless, odorless water. |
| TW-15 | 09/14/89 | Bennett pump | LS | Colorless, odorless water. |
| TW-16 | 09/14/89 | Bennett pump | LS | Colorless, odorless water. |
| TW-17 | 09/17/89 | Bennett pump | LS | Colorless, odorless water. |
| TW-18 | 09/17/89 | Bennett pump | LS | Slight sulfur odor to water. Water is clear. |
| VIW-1 | 09/19/89 | Bennett pump | FS | Colorless, odorless water. |
| CPW-2 | 09/19/89 | Bennett pump | FS | Slight sulfur odor to water. Water is clear. Coal fines in discharge bath. |

Well purging procedures precede sample collection to ensure that the sample is obtained from the hydrostratigraphic unit and not from the wellbore. Purging data (purge time, temperature, conductivity, pH, Eh, water level, and pump discharge rate) are recorded during the well purging process. Stabilization of the purging parameters is used to indicate formation water recovery. Well purging data collected for each well requiring sample purging are included in Appendix A of this report. Stabilized purging parameter data, water level measurements, field alkalinity titration data, and other data are compiled for each well and are entered on the WRI Groundwater Sampling Record form. These forms correspond to each well sampled at the RM1 site and are also included in Appendix A.

## DISCUSSION OF RESULTS AND ANALYSES

The results of the analyses performed on inner-ring and outer-ring wells are presented in Table 2. Table 3 presents the results of samples taken from the two cavity wells. Both tables contain laboratory and field analyses taken at each well. The inner-ring coal seam wells were sampled for organics but only benzene is presented in Table 2 and Table 3. The results of all organic analyses is presented in Appendix B.

As in previous sampling efforts, the wells in the west and southwest areas of the RM1 site, (TW-2, EMW-11a, TW-18, and TW-17), are continuing to show elevated concentrations of some constituents after the groundwater restoration. Overburden-process conditions communications are also suggested by the data collected for Unit A, but not for Unit C.

Coal seam wells EMW-3 and TW-3 have boron levels of .039 mg/L and .044 mg/L, respectively, above the highest baseline concentration of .037 mg/L. The cavity wells VIW-1 and CPW-2 have concentrations of .130 mg/L and .708 mg/L, respectively, showing boron contamination in the cavities, however, at much lower concentrations than before. Boron concentrations did increase in wells EMW-11a and TW-11, but did not exceed highest baseline concentration.

Highest baseline concentration for total dissolved solids (TDS), 2750 mg/L, was exceeded in wells TW-2 and TW-18. The concentrations in these wells were 3570 mg/L and 3530 mg/L, respectively. TDS levels in these wells has been consistently high.

Outer-ring well TW-18 had an ammonia concentration of 8.9 mg/L. This exceeds 7.9 mg/L which is the highest baseline concentration.

Overburden well EMW-2 had a concentration of phenolics at .035 mg/L. Phenolics were below analytical detection limits during baseline sampling.

Phenolics were discovered in well TW-16 at .0.34 mg/L. This well, located in the northwest corner of the RM1 site, is closest to the old Hanna I UCG burn. As a result of the restoration effort at RM1, it is believed groundwater with concentrations of phenol were pulled from the old Hanna I site and were picked up in well TW-16.

Six wells exceeded the highest baseline concentration for total organic carbon (TOC). These were EMW-1, EMW-11A, TW-2, TW-17, TW-18, and EMW-4. The first five wells are all coal seam wells and recorded concentrations above 45 mg/L which is the highest baseline concentrations. The levels in these wells were 49, 49, 71, 62, and 76 mg/L, respectively. The level in Unit C overburden well EMW-4, 17 mg/L, was greater than the highest baseline concentration of 10 mg/L.

Benzene was only detected in the cavity wells. Cavity well VIW-1 had a concentration of 31 $\mu$g/L while cavity well CPW-2 showed 23 $\mu$g/L.

**Table 2. Analyses for Samples Obtained from Coal and Overburden Monitoring Wells#**

| Well Name | EMW-1 | EMW-2 | EMW-3 | EMW-4 | EMW-8 | EMW-9 | EMW-10 | EMW-11a | TW-2 | TW-3 | TW-4 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | | | | | | | | | | |
| Phenolics, mg/L | <.02 | .035 | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 | <.02 |
| Ammonia, mg/L | 4.4 | 9.7 | 2.7 | 4.0 | 4.2 | 3.1 | 3.9 | 3.9 | 6.1 | 2.7 | 2.6 |
| Nitrite, mg/L | <.03 | <.03 | <.03 | <.03 | .11 | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| Nitrate, mg/L | <.03 | .07 | <.03 | <.03 | .11 | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| Total Kjeldahl Nitrogen, mg/L | 6.1 | 9.7 | 3.0 | 4.4 | 4.8 | 4.1 | 4.1 | 5.2 | 8.2 | 3.4 | 3.6 |
| Total Organic Carbon, mg/L | 49 | 25 | 35 | 17 | 22 | 37 | <10 | 49 | 71 | 33 | 38 |
| Sulfide, mg/L | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Alkalinity (lab), meq $CaCO_3$ | 595 | 1260 | 700 | 690 | 1250 | 630 | 440 | 730 | 580 | 650 | 700 |
| Bicarbonate, meq $CaCO_3$ | 590 | 720 | 700 | 680 | 1180 | 630 | 440 | 720 | 570 | 650 | 700 |
| Fluoride, mg/L | 1.5 | 1.4 | 1.2 | <.5 | 1.7 | 1.5 | <.5 | 1.4 | <.5 | 1.3 | 1.8 |
| pH (lab) | 7.8 | 9.8 | 7.7 | 7.5 | 8.8 | 7.8 | 7.2 | 7.7 | 7.6 | 7.9 | 7.9 |
| Sulfate, mg/L | 1350 | 15 | 530 | 140 | 120 | 740 | 77 | 940 | 1940 | 590 | 460 |
| Total Dissolved Solids, mg/L | 2640 | 1410 | 1580 | 980 | 1480 | 1900 | 530 | 2220 | 3570 | 1590 | 1510 |
| Arsenic, mg/L | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 |
| Boron, mg/L | .032 | .065 | .039 | .066 | .062 | <.02 | .042 | .028 | .024 | .044 | .036 |
| Manganese, mg/L | .006 | .003 | <.003 | .014 | <.003 | .004 | .055 | .006 | .013 | <.003 | <.003 |
| Sodium, mg/L | 860 | 544 | 555 | 357 | 561 | 630 | 113 | 732 | 1020 | 556 | 552 |
| Benzene, lg/L | <5.0 | * | <5.0 | * | * | <5.0 | * | <5.0 | <5.0 | <5.0 | <5.0 |
| Sample Temperature, °C | 10.2 | 10.2 | 12.7 | 9.3 | 11.3 | 11.4 | 12.7 | 10.4 | 10.4 | 16.5 | 13.1 |
| Corrected Conductivity, mmhos/cm (field) | 3140 | 2030 | 1920 | 1270 | 1780 | 2320 | 750 | 2670 | 3860 | 1970 | 1880 |
| pH (field) | 7.89 | 9.40 | 7.77 | 7.55 | 8.63 | 8.30 | 7.00 | 7.90 | 8.05 | 7.98 | 7.87 |
| Eh, mV (field)[b] | 41.6 | -35.4 | 88.1 | 88.5 | 21.7 | 139.0 | 114.7 | 77.5 | 44.7 | 26.9 | 91.8 |
| Sample Discharge Rate, gpm | .52 | Z | .33 | .60 | Z | .60 | .33 | .52 | .38 | .42 | .40 |
| Alkalinity (field), meq $CaCO_3$ | 627 | 1193 | 711 | 679 | 1056 | 639 | 482 | 719 | 566 | 655 | 715 |

[b] Corrected to Standard $H^+$ Electrode
Z Bailed sample--Sample Discharge Rate not available
* Value not available
# Cyanide values were not determined

Table 2. Analyses for Samples Obtained from Coal and Overburden Monitoring Wells (continued)#

| Well Name | TW-5 | TW-11 | TW-12 | TW-13 | TW-14a | TW-15 | TW-16 | TW-17 | TW-18 |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | | | | | | | | | |
| Phenolics, mg/L | <.02 | .02 | <.02 | <.02 | <.02 | <.02 | .034 | <.02 | <.02 |
| Ammonia, mg/L | 3.9 | 2.8 | 2.8 | 2.3 | 2.4 | 2.3 | 2.5 | 2.1 | 8.9 |
| Nitrite, mg/L | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| Nitrate, mg/L | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 | <.03 |
| Total Kjeldahl Nitrogen, mg/L | 4.8 | 3.7 | 3.1 | 2.7 | 3.3 | 3.2 | 3.5 | 4.2 | 11 |
| Total Organic Carbon, mg/L | 40 | 33 | 24 | 43 | 31 | 34 | 32 | 62 | 76 |
| Sulfide, mg/L | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Alkalinity (lab), meq $CaCO_3$ | 600 | 840 | 710 | 660 | 830 | 880 | 770 | 790 | 650 |
| Bicarbonate, meq $CaCO_3$ | 590 | 840 | 700 | 660 | 820 | 870 | 760 | 780 | 640 |
| Fluoride, mg/L | 1.4 | 1.3 | 1.8 | 1.8 | 2.0 | 2.0 | 1.8 | 1.4 | <.5 |
| pH (lab) | 7.9 | 7.8 | 7.8 | 8.0 | 8.1 | 8.0 | 7.9 | 8.2 | 7.9 |
| Sulfate, mg/L | 1130 | 350 | 530 | 430 | 280 | 200 | 370 | 630 | 1810 |
| Total Dissolved Solids, mg/L | 2270 | 1470 | 1600 | 1440 | 1420 | 1320 | 1470 | 1870 | 3530 |
| Arsenic, mg/L | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 | <.005 |
| Boron, mg/L | .034 | .03 | <.02 | .028 | .03 | .025 | .029 | <.02 | .021 |
| Manganese, mg/L | .005 | <.003 | <.003 | .004 | .004 | .008 | <.003 | <.003 | .029 |
| Sodium, mg/L | 757 | 524 | 570 | 511 | 506 | 489 | 526 | 627 | 880 |
| Benzene, lg/L | <5.0 | * | * | * | * | * | * | * | * |
| Sample Temperature, °C | 11.6 | 11.3 | 11.1 | 11.1 | 12.5 | 11.4 | 10.7 | 11.4 | 12.4 |
| Corrected Conductivity, mmhos/cm (field) | 2710 | 1850 | 1855 | 1650 | 1600 | 1630 | 1760 | 2220 | 3640 |
| pH (field) | 7.95 | 7.97 | 8.11 | 8.29 | 8.48 | 8.08 | 8.12 | 7.79 | 7.55 |
| Eh, mV (field)[b] | 61.8 | 42.2 | 82.2 | 54.2 | 101.2 | 65.8 | 75.9 | 107.2 | 38.8 |
| Sample Discharge Rate, gpm | .41 | .42 | .63 | .50 | .25 | .20 | .66 | .58 | .40 |
| Alkalinity (field), meq $CaCO_3$ | 610 | 803 | 703 | 663 | 819 | * | * | 763 | 655 |

[b] Corrected to Standard $H^+$ Electrode

* Value not available

\# Cyanide values were not determined

Table 3. Analyses for Samples Obtained from the Two Cavity Wells

| Well Name | VIW-1 | CPW-2 |
|---|---|---|
| Parameter | | |
| Phenolics, mg/L | <.02 | <.02 |
| Chemical Oxygen Demand, mg/L | 58 | <50 |
| Ammonia, mg/L | 2.8 | 3.7 |
| Nitrite, mg/L | <.03 | <.03 |
| Nitrate, mg/L | <.03 | <.03 |
| Total Kjeldahl Nitrogen, mg/L | 3.4 | 5.0 |
| Total Organic Carbon, mg/L | 24 | 20 |
| Sulfide, mg/L | <1 | <1 |
| Cyanide, mg/L | <.02 | <.02 |
| Alkalinity (lab), meq $CaCO_3$ | 720 | 475 |
| Bicarbonate, meq $CaCO_3$ | 710 | 470 |
| Bromide, mg/L | <5 | <5 |
| Carbonate, meq $CaCO_3$ | 10 | 5 |
| Chloride, mg/L | 8.6 | 19 |
| Fluoride, mg/L | 2.1 | 3.9 |
| pH (lab) | 7.7 | 7.7 |
| Sulfate, mg/L | 580 | 1080 |
| Total Dissolved Solids, mg/L | 1670 | 2250 |
| Thiocyanate, mg/L | <.5 | <.5 |
| Total Suspended Solids, mg/L | <10 | 17 |
| Aluminum, mg/L | .045 | <.045 |
| Arsenic, mg/L | .011 | .024 |
| Barium, mg/L | .015 | .026 |
| Boron, mg/L | .130 | .708 |
| Cadmium, mg/L | <.01 | <.01 |
| Calcium, mg/L | 28 | 70.1 |
| Chromium, mg/L | <.008 | <.008 |
| Copper, mg/L | <.006 | <.006 |
| Iron, mg/L | .826 | .123 |
| Lead, mg/L | <.005 | <.005 |
| Lithium, mg/L | .125 | .290 |
| Magnesium, mg/L | 6.09 | 16.4 |
| Manganese, mg/L | .076 | .257 |
| Mercury, mg/L | <.0002 | <.0002 |
| Molybdenum, mg/L | <.01 | .044 |
| Nickel, mg/L | <.02 | <.02 |
| Potassium, mg/L | 17.3 | 49.7 |
| Selenium, mg/L | <.005 | <.005 |
| Silver, mg/L | <.007 | .009 |
| Sodium, mg/L | 553 | 610 |
| Vanadium, mg/L | <.008 | .011 |
| Zinc, mg/L | <.003 | <.003 |
| Benzene, µg/L | 31 | 23 |
| Sample Temperature, °C | 17.5 | 38.1 |
| Corrected Conductivity, mmhos/cm (field) | 2090 | 2810 |
| pH (field) | 7.76 | 7.52 |
| Eh, mV (field)[b] | 8.75 | -4.19 |
| Sample Discharge Rate, gpm | .75 | .95 |
| Alkalinity, meq $CaCO_3$ (field) | 687 | 474 |

[b] Corrected to Standard $H^+$ Electrode

It is important to point out that the TOC levels increased in 18 of the 22 wells sampled when compared to the last sample outing in June 1989. Also, there is a trend of higher concentrations of ammonia and sulfate coupled with higher amounts of total dissolved solids in the groundwater found at the RM1 site.

The September 1989 quarterly sampling concluded approximately one month after completion of a restoration effort where the cavities were pumped empty. Groundwater was still reinvading the areas of the cavities. For this reason comparisons made between data obtained in June 1989 and September 1989 were used to note only current developments. Comparisons to highest baseline concentrations were used to point out changes over a broader scale.

## QUALITY ASSURANCE AND QUALITY CONTROL

Concentrated stock solutions were supplied by the WRI Quality Assurance/Quality Control (QA/QC) officer, diluted in the field, and submitted as field standard samples. Field standards are designed to check analytical accuracy. Standards of each element or compound to be analyzed were diluted in the field with distilled-deionized water and submitted anonymously as a regular sample set. The sample preparation procedures were supplied by the QA/QC officer.

A field duplicate sample was collected from well TW-2 which has a history as one of the most contaminated wells at the RM1 site. The regular and duplicate samples were prepared and preserved in an identical manner. The duplicate sample was submitted anonymously using a predetermined name. Field duplicates are designed to check analytical accuracy and consistency.

Quality assurance and quality control rinsate samples were generated using the sampling pump, local tap water, and Type 1 water. Rinsate sampling is intended to simulate the rinsing which occurs while purging each well before sampling. For this reason, the amount of rinsate water pumped through the sampling system for rinsate sampling represents an average amount of water pumped from each well.

Fifty gallons of local tap water was pumped through the sampling system. The line was then evacuated using compressed air. Finally, ten gallons of Type 1 water was pumped through the line and sampled.

Type 1 water is high purity deionized, distilled water prepared in WRI's analytical laboratory using distilled water as a feedstock and processed through a Millipore water purification system. The Millipore system recirculates water through 4 cartridges (1 carbon adsorption, 1 particulate trap, and 2 ion exchanges) and has a conductivity of less than 2 $\mu$m hos/cm. The Type 1 water is thus assumed to be blank, and any levels of the compliance suite parameters detected in the rinsate water are assumed to be the result of cross-contamination from the sample pump and line.

Table 4 shows the results of the QA/QC standard, duplicate, and rinsate samples. Also included in the table are the expected results for each sample as determined by WRI's QA/QC officer. The expected results for the duplicate sample are the results obtained from the regular sample of well TW-2.

Some comments included with the analytical data need to be considered when reviewing the data. Matrices caused slight negative interference on nitrite/nitrate analyses and fluoride recoveries contained interferences.

Western Research Institute's QA/QC cfficer reviewed the analytical results for the September 1989 RM1 groundwater sampling test. His report stated that, "The standards for phenols, ammonia, TOC, alkalinity, bicarbonate, fluoride, pH, sulfate, TDS, arsenic, boron, manganese, and sodium were found to be within acceptable limits. Standards for nitrite, nitrate, TKN, and sulfide were determined to be outside acceptable limits. Efforts are being made to determine if analyses were correct or if further steps need to be taken. Progress on these analyses will be updated."

## ACKNOWLEDGEMENT

The authors express thanks and appreciation to the United States Department of Energy for funding of this work under Cooperative Agreement Number DE-FC21-86MC11076 and Grant Number DE-FG21-88MC25038 and the Gas Research Institute under Contract No. 5087-253-1619.

## DISCLAIMER

Mention of specific brand names or models of equipment is for information only and does not imply endorsement of any particular brand.

Table 4. Analyses for Quality Assurance/Quality Control Samples.*

| | Field Standard | | Field Duplicate | | System Rinsate | |
|---|---|---|---|---|---|---|
| | Actual | Expected | Actual | Expected | Actual | Expected |
| Phenol | .140 | .141 | <.02 | <.02 | <.02 | 0 |
| Ammonia | 2.8 | 2.5 | 6.1 | 6.1 | <.2 | 0 |
| Nitrite | .35 | 6.4 | <.03 | <.03 | <.03 | 0 |
| Nitrate | 2.1 | 1.006 | <.03 | <.03 | <.03 | 0 |
| TKN | 4.4 | 3.0 | 8.4 | 8.2 | <.2 | 0 |
| TOC | 35 | 38 | 67 | 71 | <10 | 0 |
| Sulfide | 25 | 38 | <1 | <1 | <1 | 0 |
| Alkalinity | 66 | 56.3 | 580 | 580 | <10 | 0 |
| Bicarbonate | 62 | 56.3 | 570 | 570 | <10 | 0 |
| Fluoride | 2.9 | 3.5 | <.5 | <.5 | 0.8 | 0 |
| pH | 8.8 | 9.1 | 7.7 | 7.6 | 4.6 | A |
| Sulfate | 77 | 78.3 | 1970 | 1940 | <5 | 0 |
| TDS | 430 | 438 | 3540 | 3570 | <10 | 0 |
| Arsenic | .052 | .050 | <.005 | <.005 | <.005 | 0 |
| Boron | 2.54 | 2.5 | .026 | .024 | <.020 | 0 |
| Manganese | .050 | .050 | .013 | .013 | <.003 | 0 |
| Sodium | 2.70 | 2.5 | 1020 | 1020 | .069 | 0 |

* All values are in mg/L
A No expected value

## APPENDIX A

## Sampling Record and Purging Data

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name EMW-1

Date 18 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1640 | 10.4 | 1970 | 8.12 | -150 | 303.5 | 0.6 |
| 1700 | 10.2 | 1860 | 8.22 | -184.1 | 311.05 | 0.63 |
| 1720 | 10.2 | 1850 | 8.21 | -191.9 | 313.1 | 0.5 |
| 1740 | 9.9 | 1890 | 8.14 | -197.6 | 313.35 | 0.42 |
| 1800 | 10.0 | 3180 | 7.91 | -173.3 | 313.85 | 0.6 |
| 1820 | 10.2 | 3140 | 7.89 | -168.2 | 313.65 | 0.52 |
| | | | | | | |
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## COMMENTS

1650 - Water is dark colored with strong sulfur odor

1750 - Water has cleared up. Sulfur odor still present.
- Note conductivity change

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name Emw-1

Date 18 SEPT 89 Field Crew Crader, Huntington

Weather Overcast, Light breeze Air Temperature 70 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 303.5' Depth of Sampling Device 350'

## Field Analyses at Time of Sampling

Temperature 10.2 (°C)
Corrected Conductivity 3140 (µmhos/cm at 25°C)
pH 7.89
Eh -168.2 (mV, Field Electrode)
Eh 41.62 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.52 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.97
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 15.6 ml
Normality of HCl .102008 N
Total Alkalinity 626.50 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| 0560-41-16-Emw1 -A; 1 dup | VOA | A6835; A6836 |
| -B | BNA | |
| 0560-41-16-Emw1 -C | Total Phenols | A6837 |
| 0560-91-16-Emw1 -D | TKN, $NH_3$, TOC, COD, $NO_3$, $NO_2$ | A6838 |
| 0560-91-16-Emw1 -E | Sulfide | A6839 |
| -F | Cyanide | |
| 0560-91-16-Emw1 -G | Sulfate, TDS, Br, Cl, F, $HCO_3$, $CO_3$, ALK, pH | A6840 |
| 0560-41-16-Emw1 -H | Metals, SCN | A6841 |
| -J | TSS | |

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Project RM-1 Well Name EMW-2

Date 18 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1720 | 10.2 | 2030 | 9.40 | -245.2 | 228.55 | Bailed |
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## COMMENTS

Low transmissivity well. Bailed

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name EMW-2

Date 18 SEPT 89 Field Crew Crader, Huntington

Weather mostly cloudy, breezy Air Temperature 57 (F°)

Measuring Point TOC Sampling Device Teflon bailer

Depth to Water 228.55' Depth of Sampling Device 300'

## Field Analyses at Time of Sampling

Temperature 10.2 (°C)
Corrected Conductivity 2030 (μmhos/cm at 25°C)
pH 9.40
Eh -245.2 (mV, Field Electrode)
Eh -35.38 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate Bailed (gallons/min)

Alkalinity Titration
Filtered Sample pH 9.51
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 29.7 ml
Normality of HCl .02008 N
Total Alkalinity 1192.75 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| -A | VOA | |
| -B | BNA | |
| 0560-89-16-EMW2-C | (Total Phenols) | A6830 |
| 0560-89-16-EMW2-D | (TKN) (NH3), (TOC), COD, (NO3) (NO2) | A6831 |
| 0560-89-16-EMW2-E | (Sulfide) | A6832 |
| -F | Cyanide | |
| 0560-89-16-EMW2-G | (Sulfate) (TDS), Br, Cl, (F), (HCO3), CO3, (ALK) (pH) | A6833 |
| 0560-89-16-EMW2-H | (Metals) SCN | A6834 |
| -J | TSS | |

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Project RM-1 Well Name EMW-3

Date 17 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1540 | 13.7 | 1670 | 7.68 | -117.6 | 316.4 | 0.44 |
| 1600 | 13.2 | 1620 | 7.67 | -116.7 | 326.75 | 0.55 |
| 1620 | 12.9 | 1680 | 7.66 | -109.6 | 329.9 | 0.40 |
| 1640 | 12.5 | 1660 | 7.62 | -107.4 | 331.5 | 0.35 |
| 1700 | 12.7 | 1920 | 7.77 | -119.5 | 331.75 | 0.33 |
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## COMMENTS

1610 - Water is clear with slight sulfur odor

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RMI-1 Well Name EMW-3

Date 17 SEPT 89 Field Crew Crocker, Huntington

Weather Windy, 20% cloud cover Air Temperature 75 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 316.4' Depth of Sampling Device 340'

## Field Analyses at Time of Sampling

Temperature 12.7 (°C)
Corrected Conductivity 1920 (µmhos/cm at 25°C)
pH 7.77
Eh -119.5 (mV, Field Electrode)
Eh 88.07 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.33 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.82
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 17.7 ml
Normality of HCl .02008 N
Total Alkalinity 710.83 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| 0560-83-16-EMW3 -A; Adup | (VOA) | A6801; A6802 |
| -B | BNA | |
| 0560-83-16-EMW3 -C | Total Phenols | A6803 |
| 0560-83-16-EMW3 -D | (TKN) ($NH_3$) (TOC) COD, ($NO_3$), ($NO_2$) | A6804 |
| 0560-83-16-EMW3 -E | (Sulfide) | A6805 |
| -F | Cyanide | |
| 0560-83-16-EMW3 -G | (Sulfate) (TDS) Br, Cl, (F) ($HCO_3$), $CO_3$, (ALK) (pH) | A6806 |
| 0560-83-16-EMW3 -H | (Metals) SCN | A6807 |
| -J | TSS | |

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Project RM-1 Well Name EMW-4

Date 17SEPT89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of VALVE) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 0745 | not measured - standardizing probes | | | | 114.15 | 0.8 |
| 0805 | 9.3 | 1300 | 7.50 | -132.7 | 124.25 | 0.7 |
| 0825 | 9.1 | 1290 | 7.55 | -130.1 | 127.4 | 0.7 |
| 0845 | 9.2 | 1290 | 7.54 | -122.9 | 129.4 | 0.6 |
| 0905 | 9.3 | 1270 | 7.55 | -122.1 | 130.0 | 0.6 |
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## COMMENTS

pH probe and meter standardized on pH 7 and 10
Eh = 237.2 (Zobell standard)
conductivity = 1760 (standard = 2000)

Water is clear and colorless

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name EMW-4

Date 17SEPT89 Field Crew Crader, Huntington

Weather 20% cloud cover, Moderate Breeze Air Temperature 65° (F°)

Measuring Point TOV Sampling Device Bennett Pump

Depth to Water 114.15' Depth of Sampling Device 150'

## Field Analyses at Time of Sampling

Temperature 9.3 (°C)
Corrected Conductivity 1270 (µmhos/cm at 25°C)
pH 7.55
Eh -122.1 (mV, Field Electrode)
Eh 88.53 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.6 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.65
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 16.9 ml
Normality of HCl .02008 N
Total Alkalinity 678.70 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| | -A | VOA | |
| | -B | BNA | |
| 0560-75-16-Emw4 | -C | (Total Phenols) | A7648 |
| 0560-75-16-Emw4 | -D | (TKN) (NH3) (TOC) COD, (NO3), (NO2) | A7649 |
| 0560-75-16-Emw4 | -E | (Sulfide) | A7650 |
| | -F | Cyanide | |
| 0560-75-16-Emw4 | -G | (Sulfate) (TDS) Br, Cl (F) (HCO3), CO3, (ALK) (pH) | A7698 |
| 0560-75-16-Emw4 | -H | (Metals) SCN | A7699 |
| | -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name EMW-8

Date 16 SEPT 89

Power Requirements

Phase

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1230 | 11.3 | 1780 | 8.63 | -187.1 | 277.6 | Bailed |
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## COMMENTS

Low transmissivity well. Bailed water was murky, odorless.

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name EMW-8

Date 16 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Windy Air Temperature 74 (F°)

Measuring Point TOC Sampling Device Teflon Bailer

Depth to Water 277.6' Depth of Sampling Device 325'

## Field Analyses at Time of Sampling

Temperature 11.3 (°C)
Corrected Conductivity 1780 (µmhos/cm at 25°C)
pH 8.63
Eh -187.1 (mV, Field Electrode)
Eh 21.73 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate Bailed (gallons/min)

Alkalinity Titration
Filtered Sample pH 8.52
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 26.3 ml
Normality of HCl .02008 N
Total Alkalinity 1056.21 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| -A | VOA | |
| -B | BNA | |
| 0560-69-16-EMW8 -C | (Total Phenols) | #7535 |
| 0560-69-16-EMW8 -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | #7536 |
| 0560-69-16-EMW8 -E | (Sulfide) | #7537 |
| -F | Cyanide | |
| 0560-69-16-EMW8 -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK) (4) | #7538 |
| 0560-69-16-EMW8 -H | (Metals), SCN | #7539 |
| -J | TSS | |
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Project RM-1 Well Name EMW-9

Date 16 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1000 | 12.1 | 2130 | 8.18 | -60 | 281.0 | 0.7 |
| 1020 | 10.6 | 2180 | 8.36 | -94.5 | 293.0 | 0.6 |
| 1040 | 10.8 | 2130 | 8.32 | -89.2 | 297.0 | 0.6 |
| 1100 | 11.1 | 2320 | 8.35 | -79.5 | 298.9 | 0.66 |
| 1120 | 11.4 | 2320 | 8.30 | -69.7 | 299.8 | 0.6 |
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## COMMENTS

1010 - water is murky and odorless

1020 - water is clear

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# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name EMW-9

Date 16 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Breezy Air Temperature 65 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 281.0' Depth of Sampling Device 360'

## Field Analyses at Time of Sampling

Temperature 11.4 (°C)
Corrected Conductivity 2320 (μmhos/cm at 25°C)
pH 8.30
Eh -69.7 (mV, Field Electrode)
Eh 139.04 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.6 (gallons/min)

Alkalinity Titration
Filtered Sample pH 8.29
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 15.9 ml
Normality of HCl .02008 N
Total Alkalinity 638.54 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| 0560-65-16-EMW9 | -A; Adup | (VOA) | A5891; A5892 |
| | -B | BNA | |
| 0560-65-16-EMW9 | -C | (Total Phenols) | A5893 |
| 0560-65-16-EMW9 | -D | (TKN) (NH3) (TOC) COD, (NO3) (NO2) | A5894 |
| 0560-65-16-EMW9 | -E | (Sulfide) | A5895 |
| | -F | Cyanide | |
| 0560-65-16-EMW9 | -G | (Sulfate) (TDS) Br, Cl (F) (HCO3) CO3, (ALK) (pH) | A5896 |
| 0560-65-16-EMW9 | -H | (Metals) SCN | A5897 |
| | -J | TSS | |

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Project RM-1 Well Name EMW-10

Date 16 SEPT 89

Power Requirements _____

Phase _____

## FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1150 | 13.4 | 2310 | 7.78 | +15.6 | 95.15 | 0.8 |
| 1210 | 10.1 | 740 | 7.05 | +6.8 | 116.35 | 0.85 |
| 1230 | 10.2 | 730 | 7.1 | -67.0 | 129.2 | 0.90 |
| 1250 | 10.6 | 730 | 7.1 | -87.8 | 138.1 | N/A |
| 1310 | 11.0 | 740 | 7.0 | -88.3 | 143.3 | 0.33 |
| 1330 | 12.7 | 750 | 7.0 | -92.9 | 141.2 | 0.33 |
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## COMMENTS

1155 - Water is clear and odorless

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name EMW-10

Date 16 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Still breeze Air Temperature 72 (F°)

Measuring Point TOC Sampling Device Bennett Pump

Depth to Water 95.15' Depth of Sampling Device 150'

## Field Analyses at Time of Sampling

Temperature 12.7 (°C)
Corrected Conductivity 750 (µmhos/cm at 25°C)
pH 7.00
Eh -92.9 (mV, Field Electrode)
Eh 114.67 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.33 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.0
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 12.0 ml
Normality of HCl .020008 N
Total Alkalinity 481.92 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| -A | VOA | |
| -B | BNA | |
| 0560-67-16-EMW10 -C | (Total Phenols) | A5898 |
| 0560-67-16-EMW10 -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A5899 |
| 0560-67-16-EMW10 -E | (Sulfide) | A5900 |
| -F | Cyanide | |
| 0560-67-16-EMW10 -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK), (pH) | A7533 |
| 0560-67-16-EMW10 -H | (Metals), SCN | A7534 |
| -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name EMW-11a

Date 18 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1450 | 12.1 | 3000 | 7.89 | -116.4 | 297.05 | 0.66 |
| 1510 | 10.0 | 2650 | 7.97 | -145.5 | 303.65 | 0.63 |
| 1530 | 10.2 | 2690 | 7.99 | -144.0 | 304.8 | 0.63 |
| 1550 | 10.2 | 2620 | 7.89 | -139.9 | 305.2 | 0.52 |
| 1610 | 10.4 | 2670 | 7.90 | -132.1 | 305.3 | 0.52 |
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## COMMENTS

Water is clear and odor free

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name EMW-11a

Date 18 SEPT 89 Field Crew Crader, Huntington

Weather mostly cloudy, windy Air Temperature 61 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 297.05' Depth of Sampling Device 345'

## Field Analyses at Time of Sampling

Temperature 10.4 (°C)
Corrected Conductivity 2670 (µmhos/cm at 25°C)
pH 7.90
Eh -132.1 (mV, Field Electrode)
Eh 77.54 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.52 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.94
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 17.9 ml
Normality of HCl .02008 N
Total Alkalinity 718.86 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| 0560-87-16-EMW11a-A ; 1 dup | (VOA) | A6823 ; A6824 |
| -B | BNA | |
| 0560-87-16-EMW11a-C | (Total Phenols) | A6825 |
| 0560-87-16-EMW11a-D | (TKN) (NH3) (TOC) COD, (NO3), (NO2) | A6826 |
| 0560-87-16-EMW11a-E | (Sulfide) | A6827 |
| -F | Cyanide | |
| 0560-87-16-EMW11a-G | (Sulfate) (TDS) Br, Cl, (F) ($HCO_3$), $CO_3$, (ALK) (pH) | A6828 |
| 0560-87-16-EMW11a-H | (Metals), (SCN) | A6829 |
| -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-2

Date 12 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1230 | unit uncalibrated - standardizing probes | | | | 306.4 | 0.6 |
| 1250 | 10.4 | 3560 | 8.57 | -138.7 | 314.45 | 0.44 |
| 1310 | 10.4 | 3720 | 8.32 | -182.5 | 316.3 | 0.33 |
| 1330 | 10.2 | 3930 | 8.08 | -170.8 | 318.3 | 0.55 |
| 1350 | 10.2 | 3680 | 8.25 | -187.3 | 320.4 | 0.50 |
| 1400 | 10.4 | 3860 | 8.05 | -164.9 | 319.9 | 0.38 |
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## COMMENTS

Conductivity = 1700 @ 17.3°C (Standard = 2000 @ 25°C)
Eh = 230.8 @ 13.0°C (Standard = Zobell)
pH probe and meter standardized on pH 7 & 10

Water is clear and odorless
Duplicate taken at this well.

1350 - reduced flow rate

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-2

Date 17 SEPT 89 Field Crew Cradler, Huntington

Weather 30% cloud cover, breezy Air Temperature 60 (F°)

Measuring Point TOV Sampling Device Bennett pump

Depth to Water 306.4' Depth of Sampling Device 340'

## Field Analyses at Time of Sampling

Temperature 10.4 (°C)
Corrected Conductivity 3860 (µmhos/cm at 25°C)
pH 8.05
Eh -164.9 (mV, Field Electrode)
Eh 44.74 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.38 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.91
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 14.1 ml
Normality of HCl .102008 N
Total Alkalinity 566.26 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| 0560-85-16-TW2 | -A ;dup | (VOA) | A6813; A6814 |
| | -B | BNA | |
| 0560-85-16-TW2 | -C | (Total Phenols) | A6808 |
| 0560-85-16-TW2 | -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A6809 |
| 0560-85-16-TW2 | -E | (Sulfide) | A6810 |
| | -F | Cyanide | |
| 0560-85-16-TW2 | -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK), (PO4) | A6811 |
| 0560-85-16-TW2 | -H | (Metals), SCN | A6812 |
| | -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-3

Date 17 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1330 | 16.9 | 1630 | 8.09 | -165.6 | 309.6 | 0.63 |
| 1350 | 17.4 | 1740 | 8.12 | -174.6 | 319.75 | 0.5 |
| 1410 | 17.8 | 1670 | 8.13 | -178.4 | 323.1 | 0.52 |
| 1430 | 18.0 | 1820 | 7.93 | -173.1 | 324.25 | 0.5 |
| 1450 | 16.5 | 1970 | 7.98 | -177.3 | 324.75 | 0.42 |
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## COMMENTS

Water is clear and odor free.

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-3

Date 17 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Windy Air Temperature 70 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 309.6' Depth of Sampling Device 340'

## Field Analyses at Time of Sampling

Temperature 16.5 (°C)

Corrected Conductivity 1970 (µmhos/cm at 25°C)

pH 7.98

Eh -177.3 (mV, Field Electrode)

Eh 26.85 (mV, Corrected to Standard Hydrogen Electrode)

Discharge Rate 0.42 (gallons/min)

Alkalinity Titration

Filtered Sample pH 8.02

mls of Sample Tested 25 ml

mls of HCl Added to Reach pH 4.5 16.3 ml

Normality of HCl .02008 N

Total Alkalinity 654.61 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| 0560-81-16-TW3 | -A; Adup | (VOA) | A7839; A7840 |
| | -B | BNA | |
| 0560-81-16-TW3 | -C | (Total Phenols) | A7841 |
| 0560-81-16-TW3 | -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A7842 |
| 0560-81-16-TW3 | -E | (Sulfide) | A7843 |
| | -F | Cyanide | |
| 0560-81-16-TW3 | -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), ($CO_3$), (ALK), (pH) | A7844 |
| 0560-81-16-TW3 | -H | (Metals), SCN | A7845 |
| | -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-4

Date 16 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1600 | 13.7 | 1630 | 7.80 | -94.7 | 288.55 | 0.44 |
| 1620 | 13.9 | 1650 | 7.82 | -118.0 | 298.55 | 0.52 |
| 1640 | 13.5 | 1840 | 7.85 | -124.2 | 300.45 | 0.40 |
| 1700 | 13.3 | 1870 | 7.89 | -119.8 | 301.35 | 0.46 |
| 1720 | 13.1 | 1880 | 7.87 | -115.4 | 301.25 | 0.4 |
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## COMMENTS

Water is clear and odorless

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-4

Date 16 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Light Breeze Air Temperature 77 (F°)

Measuring Point TOC Sampling Device Bennett Pump

Depth to Water 288.55' Depth of Sampling Device 365'

## Field Analyses at Time of Sampling

Temperature 13.1 (°C)
Corrected Conductivity 1880 (µmhos/cm at 25°C)
pH 7.87
Eh -115.4 (mV, Field Electrode)
Eh 91.81 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.4 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.91
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 17.8 ml
Normality of HCl 1.02008 N
Total Alkalinity 714.85 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| 0560-73-16-TW4 | -A ; Mdup | (VOA) | A7547 ; A7548 |
| | -B | BNA | |
| 0560-73-16-TW4 | -C | (Total Phenols) | A7549 |
| 0560-73-16-TW4 | -D | (TKN) (NH3) (TOC) COD, (NO3), (NO2) | A7550 |
| 0560-73-16-TW4 | -E | (Sulfide) | A7645 |
| | -F | Cyanide | |
| 0560-73-16-TW4 | -G | (Sulfate) (TDS) Br, Cl, (F) (HCO3), CO3, (ALK) pH | A7646 |
| 0560-73-16-TW4 | -H | (Metals) SCN | A7647 |
| | -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-5

Date 16SEPT89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1405 | 13.7 | 2600 | 7.54 | -138.6 | 286.55 | 0.55 |
| 1425 | 11.4 | 2820 | 7.83 | -143.3 | 296.25 | 0.55 |
| 1445 | 11.3 | 2740 | 7.94 | -154.7 | 300.4 | 0.58 |
| 1505 | 11.3 | 2730 | 7.89 | -150.6 | 301.8 | 0.41 |
| 1525 | 11.6 | 2710 | 7.95 | -146.8 | 302.45 | 0.41 |
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## COMMENTS

Water is clear and odorless

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-5

Date 16 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Calm Air Temperature 72 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 286.55' Depth of Sampling Device 355'

## Field Analyses at Time of Sampling

Temperature 11.6 (°C)
Corrected Conductivity 2710 (µmhos/cm at 25°C)
pH 7.95
Eh -146.8 (mV, Field Electrode)
Eh 61.76 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.41 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.92
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 15.2 ml
Normality of HCl .02008 N
Total Alkalinity 610.43 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| 0560-71-16-TW5 -A; Adup | (VOA) | A7540; A7541 |
| -B | BNA | |
| 0560-71-16-TW5 -C | (Total Phenols) | A7542 |
| 0560-71-16-TW5 -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A7543 |
| 0560-71-16-TW5 -E | (Sulfide) | A7544 |
| -F | Cyanide | |
| 0560-71-16-TW5 -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK), (pH) | A7545 |
| 0560-71-16-TW5 -H | (Metals), SCN | A7546 |
| -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-11

Date 15SEPT89

Power Requirements

Phase

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1150 | not measured - standardizing probes | | | | 297.7 | 0.55 |
| 1210 | 11.2 | 1759 | 7.89 | -124.4 | 305.8 | 0.55 |
| 1230 | 11.0 | 1707 | 7.42 | -143.9 | 308.7 | 0.55 |
| 1250 | 11.0 | 1780 | 7.97 | -160.9 | 309.6 | 0.55 |
| 1310 | 11.3 | 1850 | 7.97 | -166.6 | 309.9 | 0.42 |
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## COMMENTS

Conductivity = 1720 (standard = 2000)
Eh = 243.4 (standard = Zobell)
pH probe and meter standardized on pH 7 and 10

1210 - water is clear with slight sulfur odor

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-11

Date 15 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Moderate Wind Air Temperature 68 (F°)

Measuring Point TOC Sampling Device Bennett Pump

Depth to Water 297.7' Depth of Sampling Device 331'

## Field Analyses at Time of Sampling

Temperature 11.3 (°C)
Corrected Conductivity 1850 (µmhos/cm at 25°C)
pH 7.97
Eh -166.6 (mV, Field Electrode)
Eh 42.23 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.42 (gallons/min)

Alkalinity Titration
Filtered Sample pH 8.14
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 20 ml
Normality of HCl .02008 N
Total Alkalinity 803.2 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| | -A | VOA | |
| | -B | BNA | |
| 0560-57-16-TW11 | -C | (Total Phenols) | A5871 |
| 0560-57-16-TW11 | -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A5872 |
| 0560-57-16-TW11 | -E | (Sulfide) | A5873 |
| | -F | Cyanide | |
| 0560-57-16-TW11 | -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK), (pH) | A5874 |
| 0560-57-16-TW11 | -H | (Metals), SCN | A5875 |
| | -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-12

Date 15 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1350 | 15.1 | 1790 | 7.68 | -137.1 | 273.1 | 0.6 |
| 1410 | 11.1 | 1600 | NA | -124.7 | 283.3 | NA |
| 1430 | 11.1 | 1610 | 7.95 | -135.2 | 285.0 | NA |
| 1450 | 11.3 | 1790 | 8.05 | -141.7 | 285.4 | 0.6 |
| 1510 | 11.1 | 1855 | 8.11 | -126.8 | 286.3 | 0.63 |
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## COMMENTS

Water is clear and odorless

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-12

Date 15 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Windy Air Temperature 72 (F°)

Measuring Point TOC Sampling Device Bennett Pump

Depth to Water 273.1' Depth of Sampling Device 340'

## Field Analyses at Time of Sampling

Temperature 11.1 (°C)
Corrected Conductivity 1855 (µmhos/cm at 25°C)
pH 8.11
Eh -126.8 (mV, Field Electrode)
Eh 82.21 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.63 (gallons/min)

Alkalinity Titration
Filtered Sample pH 8.16
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 17.5 ml
Normality of HCl .02008 N
Total Alkalinity 702.8 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| | -A | VOA | |
| | -B | BNA | |
| 560-59-16-TW12 | -C | (Total Phenols) | A5876 |
| 560-59-16-TW12 | -D | (TKN) (NH3) (TOC) COD, (NO3) (NO2) | A5877 |
| 560-59-16-TW12 | -E | (Sulfide) | A5878 |
| | -F | Cyanide | |
| 560-59-16-TW12 | -G | (Sulfate) (TDS) Br, Cl (F) (HCO3) CO3 (ALK) (pH) | A5879 |
| 560-59-16-TW12 | -H | (Metals) SCN | A5880 |
| | -J | TSS | |

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Project RM-1 Well Name TW-13

Date 15 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1550 | 12.0 | 1640 | 9.00 | -152.9 | 272.15 | 0.75 |
| 1610 | 10.9 | 1780 | 9.05 | -176.0 | 284.4 | 0.63 |
| 1630 | 11.2 | 1760 | 9.05 | -185.9 | 288.75 | 0.63 |
| 1650 | 10.7 | 1690 | 8.68 | -165.0 | 291.4 | 0.52 |
| 1710 | 11.1 | 1700 | 8.47 | -166.6 | 293.1 | 0.50 |
| 1730 | 11.1 | 1650 | 8.29 | -154.8 | 294.1 | 0.50 |
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## COMMENTS

1555 - water is clear and odorless

1625 - water is clear; slight carbon smell

1640 - water is murky, gray colored

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-13

Date 15 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Moderate wind Air Temperature 70 (F°)

Measuring Point TOC Sampling Device Bennett Pump

Depth to Water 272.15' Depth of Sampling Device 355'

## Field Analyses at Time of Sampling

Temperature 11.1 (°C)
Corrected Conductivity 1650 (µmhos/cm at 25°C)
pH 8.29
Eh -154.8 (mV, Field Electrode)
Eh 54.21 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.50 (gallons/min)

Alkalinity Titration
Filtered Sample pH 8.36
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 16.5 ml
Normality of HCl .102008 N
Total Alkalinity 662.64 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| | -A | VOA | |
| | -B | BNA | |
| 0560-61-16-TW13 | -C | (Total Phenols) | A5881 |
| 0560-61-16-TW13 | -D | (TKN), ($NH_3$), (TOC), COD, ($NO_2$), ($NO_3$) | A5882 |
| 0560-61-16-TW13 | -E | (Sulfide) | A5883 |
| | -F | Cyanide | |
| 0560-61-16-TW13 | -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), ($CO_3$), (ALK), (pH) | A5884 |
| 0560-61-16-TW13 | -H | (Metals), SCN | A5885 |
| | -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-14a

Date 16 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 0740 | not measured - standardizing probes | | | | 277.65 | 0.52 |
| 0800 | 9.9 | 1750 | 8.27 | -165.6 | 292.3 | 0.6 |
| 0820 | 9.7 | 1500 | 8.40 | -167.8 | 303.25 | 0.6 |
| 0840 | 10.2 | 1580 | 8.5 | -157.2 | 312.2 | 0.6 |
| 0900 | 10.6 | 1740 | 8.5 | -141.6 | 318.6 | 0.5 |
| 0920 | 12.5 | 1600 | 8.48 | -106.6 | 318.9 | 0.25 |
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## COMMENTS

Conductivity = 1790 (standard = 2000)
Eh = 243.9 (Zobell standard)
pH probe and meter standardized on pH 7 and 10
water is clear and odorless
0900 - reduced flow rate

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-14a

Date 16 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Light Breeze Air Temperature 65 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 277.65' Depth of Sampling Device 380'

## Field Analyses at Time of Sampling

Temperature 12.5 (°C)
Corrected Conductivity 1600 (µmhos/cm at 25°C)
pH 8.48
Eh -106.6 (mV, Field Electrode)
Eh 101.15 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.25 (gallons/min)

Alkalinity Titration
Filtered Sample pH 8.36
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 20.4 ml
Normality of HCl .02008 N
Total Alkalinity 819.26 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| | -A | VOA | |
| | -B | BNA | |
| 0560-63-16-TW14a | -C | (Total Phenols) | A5886 |
| 0560-63-16-TW14a | -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A5887 |
| 0560-63-16-TW14a | -E | (Sulfide) | A5888 |
| | -F | Cyanide | |
| 0560-63-16-TW14a | -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK), (pH) | A5889 |
| 0560-63-16-TW14a | -H | (Metals), SCN | A5890 |
| | -J | TSS | |
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Project RM-1 Well Name TW-15

Date 14 SEPT 89

Power Requirements

Phase

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1345 | not measured - standardizing probes | | | | 285.25 | 0.55 |
| 1405 | n.m. | 1640 | 7.05 | -98.2 | 304.3 | 0.55 |
| 1425 | 10.9 | 1610 | 7.06 | -136.3 | 311.4 | 0.40 |
| 1445 | 11.4 | 1620 | 8.08 | -141.6 | 317.6 | 0.40 |
| 1505 | 11.4 | 1600 | 8.08 | -144.0 | 322.5 | 0.40 |
| 1515 | 11.4 | 1630 | 8.08 | -142.9 | 323.4 | 0.20 |
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## COMMENTS

pH probe and meter standardized on pH 7
Eh = 253.5 (Zobell standard)
Conductivity = 1540 (standard = 2000)

Water is clear and odor free
1445 - changed prl probe
1505 - reduced flow rate

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-15

Date 14 SEPT 89 Field Crew Crader, Hart

Weather Sunny, Warm Air Temperature 62 (F°)

Measuring Point TOC Sampling Device Bennett Pump

Depth to Water 288.4' Depth of Sampling Device 398'

## Field Analyses at Time of Sampling

Temperature 11.4 (°C)
Corrected Conductivity 1630 (µmhos/cm at 25°C)
pH 8.08
Eh -142.9 (mV, Field Electrode)
Eh 65.84 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.20 (gallons/min)
Alkalinity Titration - Not measured in field
Filtered Sample pH
mls of Sample Tested ml
mls of HCl Added to Reach pH 4.5 ml
Normality of HCl N
Total Alkalinity (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| | -A | VOA | |
| | -B | BNA | |
| 0560-53-16-TW15 | -C | (Total Phenols) | A5861 |
| 0560-53-16-TW15 | -D | (TKN) (NH3) (TOC) COD, (NO3), (NO2) | A5862 |
| 0560-53-16-TW15 | -E | (Sulfide) | A5863 |
| | -F | Cyanide | |
| 0560-53-16-TW15 | -G | (Sulfate) (TDS) Br, Cl, (F) (HCO3) CO3, (ALK) (pH) | A5864 |
| 0560-53-16-TW15 | -H | (Metals) (SCN) | A5865 |
| | -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-16

Date 14SEPT89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1605 | 12.7 | 1680 | 7.96 | -103.6 | 295.3 | 0.70 |
| 1625 | 10.6 | 1810 | 8.12 | -144.2 | 305.4 | 0.63 |
| 1645 | 10.5 | 1820 | 8.13 | -139.3 | 307.8 | 0.63 |
| 1705 | 10.4 | 1810 | 8.07 | -136.3 | 308.4 | 0.55 |
| 1725 | 10.7 | 1760 | 8.12 | -133.5 | 308.8 | 0.66 |
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## COMMENTS

1610 - water is clear and odor free.

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-16

Date 14 SEPT 89 Field Crew Crader, Hart

Weather Sunny, Warm Air Temperature 68 (F°)

Measuring Point TOC Sampling Device Bennett Pump

Depth to Water 298.9' Depth of Sampling Device 395'

## Field Analyses at Time of Sampling

Temperature 10.7 (°C)

Corrected Conductivity 1760 (µmhos/cm at 25°C)

pH 8.12

Eh -133.5 (mV, Field Electrode)

Eh 75.87 (mV, Corrected to Standard Hydrogen Electrode)

Discharge Rate 0.66 (gallons/min)

Alkalinity Titration: not measured in field

~~Filtered~~ Sample pH

mls of Sample ~~Tested~~ ml

mls of HCl Added to Reach ~~pH 4.5~~ ml

Normality of ~~HCl~~ N

~~Total~~ Alkalinity (mg/L Equiv. ~~$CaCO_3$~~)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| -A | VOA | |
| -B | BNA | |
| 560-55-16-TW16 -C | (Total Phenols) | A5866 |
| 560-55-16-TW16 -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A5867 |
| 560-55-16-TW16 -E | (Sulfide) | A5868 |
| -F | Cyanide | |
| 560-55-16-TW16 -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK), (pH) | A5869 |
| 560-55-16-TW16 -H | (Metals) SCN | A5870 |
| -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-17

Date 17 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 0940 | 12.1 | 1260 | 7.24 | -119.4 | 284.75 | 0.63 |
| 1000 | 11.2 | 1710 | 7.64 | -127.2 | 289.8 | 0.46 |
| 1020 | 11.1 | 1740 | 7.59 | -112.0 | 291.05 | 0.55 |
| 1040 | 11.2 | 2020 | 7.76 | -105.7 | 291.6 | 0.6 |
| 1100 | 11.4 | 2220 | 7.79 | -101.5 | 291.85 | 0.58 |
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## COMMENTS

0945 - water is clear and odorfree

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name TW-17

Date 17 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Windy Air Temperature 64 (F°)

Measuring Point TOC Sampling Device Bennett Pump

Depth to Water 284.75' Depth of Sampling Device 325'

## Field Analyses at Time of Sampling

Temperature 11.4 (°C)
Corrected Conductivity 2220 (µmhos/cm at 25°C)
pH 7.79
Eh -111.5 (mV, Field Electrode)
Eh 102.24 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.58 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.79
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 19.0 ml
Normality of HCl .02008 N
Total Alkalinity 763.04 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| | VOA | |
| | BNA | |
| 0560-77-16-TW17 -C | (Total Phenols) | A7697 |
| 0560-77-16-TW17 -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A7700 |
| 0560-77-16-TW17 -E | (Sulfide) | A7831 |
| -F | Cyanide | |
| 0560-77-16-TW17 -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK) (pW) | A7832 |
| 0560-77-16-TW17 -H | (Metals), SCN | A7833 |
| -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name TW-18

Date 17 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 1130 | 14.0 | 1850 | 7.56 | -108.8 | 280.35 | 0.52 |
| 1150 | 11.4 | 1790 | 7.59 | -143.7 | 286.85 | 0.46 |
| 1210 | 11.6 | 2600 | 7.55 | -175.7 | 287.95 | 0.46 |
| 1230 | 12.5 | 3210 | 7.57 | -156.1 | 288.25 | 0.55 |
| 1250 | 12.4 | 3600 | 7.55 | -170.4 | 288.0 | 0.46 |
| 1300 | 12.4 | 3640 | 7.55 | -169.0 | 288.0 | 0.40 |
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## COMMENTS

1140 - Water is clear and odor free

1235 - Slight sulfur odor

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project Rm-1 Well Name TW-18

Date 17 SEPT 89 Field Crew Crader, Huntington

Weather Sunny, Windy, 10% cloud cover Air Temperature 72 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 280.35' Depth of Sampling Device 288'

## Field Analyses at Time of Sampling

Temperature 12.4 (°C)
Corrected Conductivity 3640 (µmhos/cm at 25°C)
pH 7.55
Eh -169.0 (mV, Field Electrode)
Eh 38.84 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.40 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.61
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 16.3 ml
Normality of HCl .02008 N
Total Alkalinity 654.61 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | | Analysis Requested | Tag Numbers |
|---|---|---|---|
| | -A | VOA | |
| | -B | BNA | |
| 0560-79-16-TW18 | -C | (Total Phenols) | A7834 |
| 0560-79-16-TW18 | -D | (TKN), ($NH_3$), (TOC), COD, ($NO_3$), ($NO_2$) | A7835 |
| 0560-79-16-TW18 | -E | (Sulfide) | A7836 |
| | -F | Cyanide | |
| 0560-79-16-TW18 | -G | (Sulfate), (TDS), Br, Cl, (F), ($HCO_3$), $CO_3$, (ALK), (pH) | A7837 |
| 0560-79-16-TW18 | -H | (Metals), SCN | A7838 |
| | -J | TSS | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name epw-2

Date 19SEPT89

Power Requirements

Phase

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 0935 | 15.9 | 2300 | 7.78 | -136.3 | 317.1 | 1.0 |
| 0955 | 37.2 | 2700 | 7.37 | -166.0 | 317.1 | 0.85 |
| 1015 | 39.4 | 2770 | 7.53 | -192.0 | 317.1 | 1.0 |
| 1035 | 38.1 | 2810 | 7.52 | -188.4 | 317.1 | 0.95 |
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## COMMENTS

0945 - Water is clear with slight sulfur smell.

1015 - Coal fines in discharge bath

WRI WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name CPW-2

Date 19 SEPT 89 Field Crew Crader, Huntington

Weather Clear, calm Air Temperature 69 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 317.11' Depth of Sampling Device 325'

## Field Analyses at Time of Sampling

Temperature 38.1 (°C)
Corrected Conductivity 2810 (µmhos/cm at 25°C)
pH 7.52
Eh -188.4 (mV, Field Electrode)
Eh -4.19 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.95 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.64
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 11.8 ml
Normality of HCl .02008 N
Total Alkalinity 473.89 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| 0560-95-16-CPW 2 -A; Adup | VOA | #7451; #7452 |
| 0560-95-16-CPW 2 -B | BNA | #7453 |
| 0560-95-16-CPW 2 -C | Total Phenols | #7454 |
| 0560-95-16-CPW 2 -D | TKN, $NH_3$, TOC, COD, $NO_3$, $NO_2$ | #7455 |
| 0560-95-16-CPW 2 -E | Sulfide | #7456 |
| 0560-95-16-CPW 2 -F | Cyanide | #7457 |
| 0560-95-16-CPW 2 -G | Sulfate, TDS, Br, Cl, F, $HCO_3$, $CO_3$, ALK, pH | #7458 |
| 0560-95-16-CPW 2 -H | Metals, SCN | #7459 |
| 0560-95-16-CPW 2 -J | TSS | #7460 |
| | | |
| | | |

WESTERN RESEARCH INSTITUTE

Project RM-1 Well Name VIW-1

Date 19 SEPT 89

Power Requirements _____

Phase _____

# FIELD MEASUREMENTS DURING WELL PURGING

| Time | Temp., °C | Corrected Conductivity, µmhos/cm | pH | Eh, mV | Water Level, (feet below top of casing) | Pump Rate, gpm |
|---|---|---|---|---|---|---|
| 0740 | 16.9 | 1580 | 7.79 | -199.3 | 286.85 | 0.85 |
| 0800 | 17.7 | 2120 | 7.73 | -203.9 | 286.85 | 0.85 |
| 0820 | 17.6 | 2080 | 7.75 | -196.3 | 286.85 | 0.75 |
| 0840 | 17.6 | 2060 | 7.72 | -195.9 | 286.85 | 0.85 |
| 0900 | 17.5 | 2090 | 7.76 | -194.5 | 286.80 | 0.75 |
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## COMMENTS

Conductivity = 1690 (standard = 2000)

Eh = 233.1 @ 15.9°C (standard = Zobell)

pH probe and meter standardized on pH 7 & 10

0800 - water is clear and odorless

WESTERN RESEARCH INSTITUTE

# WRI GROUNDWATER SAMPLING RECORD

Project RM-1 Well Name VIW-1

Date 19SEPT89 Field Crew Crader, Huntington

Weather 30% cloud cover, calm Air Temperature 60 (F°)

Measuring Point TOC Sampling Device Bennett pump

Depth to Water 286.85' Depth of Sampling Device 375'

## Field Analyses at Time of Sampling

Temperature 17.5 (°C)
Corrected Conductivity 2090 (µmhos/cm at 25°C)
pH 7.76
Eh -194.5 (mV, Field Electrode)
Eh 8.75 (mV, Corrected to Standard Hydrogen Electrode)
Discharge Rate 0.75 (gallons/min)

Alkalinity Titration
Filtered Sample pH 7.86
mls of Sample Tested 25 ml
mls of HCl Added to Reach pH 4.5 17.1 ml
Normality of HCl .102008 N
Total Alkalinity 686.74 (mg/L Equiv. $CaCO_3$)

| Analytical Submissions | Analysis Requested | Tag Numbers |
|---|---|---|
| 0560-93-16-VIW1-A; Aduplicate | VOA | A6842; A7846 |
| 0560-93-16-VIW1-B | BNA | A6844 |
| 0560-93-16-VIW1-C | Total Phenols | A6843 |
| 0560-93-16-VIW1-D | TKN, $NH_3$, TOC, COD, $NO_3$, $NO_2$ | A6845 |
| 0560-93-16-VIW1-E | Sulfide | A6846 |
| 0560-93-16-VIW1-F | Cyanide | A6847 |
| 0560-93-16-VIW1-G | Sulfate, TDS, Br, Cl, F, $HCO_3$, $CO_3$, ALK, pH | A6848 |
| 0560-93-16-VIW1-H | Metals, SCN | A6849 |
| 0560-93-16-VIW1-J | TSS | A6850 |

# APPENDIX B

## Organic Analytical Results for Inner Ring Coal Seam Wells and Two Cavity Wells

| Sample Number |
|---|
| 1560-91-16-DMW1-A1 |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: >RM159::03
Sample Matrix: WATER
Data release Authorized by: LeighAnne Merchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
RCN Number : 30410
Date Sample Received: 9/19/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 21:19
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | ug/l or ug/Kg (Circle One) | C.A.S. Number | | ug/l or ug/Kg (Circle One) |
|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. U | 7 -87-5 | 1,2-Dichloropropane | 5. U |
| 74-83-9 | Bromomethane | 10. U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. U |
| 75-01-4 | Vinyl Chloride | 10. U | 79-01-6 | Trichloroethene | 5. U |
| 75-00-3 | Chloroethane | 10. U | 124-48-1 | Dibromochloromethane | 5. U |
| 75-09-2 | Methylene Chloride | 5. U | 79-00-5 | 1,1,2-Trichloroethane | 5. U |
| 67-64-1 | Acetone | 10. U | 71-43-2 | Benzene | 3. J |
| 75-15-0 | Carbon Disulfide | 5. U | 10061-01-5 | cis-1,3-Dichloropropene | 5. U |
| 75-35-4 | 1,1-Dichloroethene | 5. U | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. U | 75-25-2 | Bromoform | 5. U |
| 156-60-5 | 1,2-Dichloroethene | 5. U | 108-10-1 | 4-Methyl-2-Pentanone | 10. U |
| 67-66-3 | Chloroform | 5. U | 591-78-6 | 2-Hexanone | 10. U |
| 107-02-2 | 1,2-Dichloroethane | 5. U | 127-18-4 | Tetrachloroethene | 5. U |
| 78-93-3 | 2-Butanone | 10. U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. U | 108-88-3 | Toluene | 5. U |
| 56-23-6 | Carbon Tetrachloride | 5. U | 108-90-7 | Chlorobenzene | 5. U |
| 108-05-4 | Vinyl Acetate | 10. U | 100-41-4 | Ethylbenzene | 5. U |
| 75-27-4 | Bromodichloromethane | 5. U | 100-42-5 | Styrene | 5. U |
| | | | | Total Xylenes | 5. U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimun detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimun attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration File.

| Sample Number |
|---|
| 1560-83-16-EMW3-A1 |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: >RM154::03
Sample Matrix: WATER
Data release Authorized by: Leigh Anne Marchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
ACM Number : 30273
Date Sample Received: 9/18/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 17:48
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | (ug/L) or ug/Kg (Circle One) | | C.A.S. Number | | (ug/L) or ug/Kg (Circle One) | |
|---|---|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. | U | 7 -87-5 | 1,2-Dichloropropane | 5. | U |
| 74-83-9 | Bromomethane | 10. | U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. | U |
| 75-01-4 | Vinyl Chloride | 10. | U | 79-01-6 | Trichloroethene | 5. | U |
| 75-00-3 | Chloroethane | 10. | U | 124-48-1 | Dibromochloromethane | 5. | U |
| 75-09-2 | Methylene Chloride | 2. | JB | 79-00-5 | 1,1,2-Trichloroethane | 5. | U |
| 67-64-1 | Acetone | 10. | U | 71-43-2 | Benzene | 5. | U |
| 75-15-0 | Carbon Disulfide | 5. | U | 10061-01-5 | cis-1,3-Dichloropropene | 5. | U |
| 75-35-4 | 1,1-Dichloroethene | 5. | U | | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. | U | 75-25-2 | Bromoform | 5. | U |
| 156-60-5 | 1,2-Dichloroethene | 5. | U | 108-10-1 | 4-Methyl-2-Pentanone | 10. | U |
| 67-66-3 | Chloroform | 5. | U | 591-78-6 | 2-Hexanone | 10. | U |
| 107-02-2 | 1,2-Dichloroethane | 5. | U | 127-18-4 | Tetrachloroethene | 5. | U |
| 78-93-3 | 2-Butanone | 10. | U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. | U | 108-88-3 | Toluene | 5. | U |
| 56-23-6 | Carbon Tetrachloride | 5. | U | 108-90-7 | Chlorobenzene | 5. | U |
| 108-05-4 | Vinyl Acetate | 10. | U | 100-41-4 | Ethylbenzene | 5. | U |
| 75-27-4 | Bromodichloromethane | 5. | U | 100-42-5 | Styrene | 5. | U |
| | | | | | Total Xylenes | 5. | U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration File.

| Sample Number |
|---|
| 1560-65-16-EMW9-A1 |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: >RM150::03
Sample Matrix: WATER
Data release Authorized by: Leigh Anne Marchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
ACN Number : 30269
Date Sample Received: 9/18/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 15:09
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | ug/l or ug/Kg (Circle One) | | C.A.S. Number | | ug/l or ug/Kg (Circle One) | |
|---|---|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. | U | 7 -87-5 | 1,2-Dichloropropane | 5. | U |
| 74-83-9 | Bromomethane | 10. | U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. | U |
| 75-01-4 | Vinyl Chloride | 10. | U | 79-01-6 | Trichloroethene | 5. | U |
| 75-00-3 | Chloroethane | 10. | U | 124-48-1 | Dibromochloromethane | 5. | U |
| 75-09-2 | Methylene Chloride | 3. | JB | 79-00-5 | 1,1,2-Trichloroethane | 5. | U |
| 67-64-1 | Acetone | 10. | U | 71-43-2 | Benzene | 5. | U |
| 75-15-0 | Carbon Disulfide | 5. | U | 10061-01-5 | cis-1,3-Dichloropropene | 5. | U |
| 75-35-4 | 1,1-Dichloroethene | 5. | U | | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. | U | 75-25-2 | Bromoform | 5. | U |
| 156-60-5 | 1,2-Dichloroethene | 5. | U | 108-10-1 | 4-Methyl-2-Pentanone | 10. | U |
| 67-66-3 | Chloroform | 5. | U | 591-78-6 | 2-Hexanone | 10. | U |
| 107-02-2 | 1,2-Dichloroethane | 5. | U | 127-18-4 | Tetrachloroethene | 5. | U |
| 78-93-3 | 2-Butanone | 10. | U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. | U | 108-88-3 | Toluene | 5. | U |
| 56-23-6 | Carbon Tetrachloride | 5. | U | 108-90-7 | Chlorobenzene | 5. | U |
| 108-05-4 | Vinyl Acetate | 10. | U | 100-41-4 | Ethylbenzene | 5. | U |
| 75-27-4 | Bromodichloromethane | 5. | U | 100-42-5 | Styrene | 5. | U |
| | | | | | Total Xylenes | 5. | U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration File.

| Sample Number |
|---|
| 1560-87-16-EMU11A1 |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: >RM158::03
Sample Matrix: WATER
Data release Authorized by: Leigh Anne Marchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
ACN Number : 30409
Date Sample Received: 9/19/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 20:22
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | ug/l or ug/Kg (Circle One) | C.A.S. Number | | ug/l or ug/Kg (Circle One) |
|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. U | 7 -87-5 | 1,2-Dichloropropane | 5. U |
| 74-83-9 | Bromomethane | 10. U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. U |
| 75-01-4 | Vinyl Chloride | 10. U | 79-01-6 | Trichloroethene | 5. U |
| 75-00-3 | Chloroethane | 10. U | 124-48-1 | Dibromochloromethane | 5. U |
| 75-09-2 | Methylene Chloride | 5. U | 79-00-5 | 1,1,2-Trichloroethane | 5. U |
| 67-64-1 | Acetone | 10. U | 71-43-2 | Benzene | 5. U |
| 75-15-0 | Carbon Disulfide | 5. U | 10061-01-5 | cis-1,3-Dichloropropene | 5. U |
| 75-35-4 | 1,1-Dichloroethene | 5. U | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. U | 75-25-2 | Bromoform | 5. U |
| 156-60-5 | 1,2-Dichloroethene | 5. U | 108-10-1 | 4-Methyl-2-Pentanone | 10. U |
| 67-66-3 | Chloroform | 5. U | 591-78-6 | 2-Hexanone | 10. U |
| 107-02-2 | 1,2-Dichloroethane | 5. U | 127-18-4 | Tetrachloroethene | 5. U |
| 78-93-3 | 2-Butanone | 10. U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. U | 108-88-3 | Toluene | 5. U |
| 56-23-6 | Carbon Tetrachloride | 5. U | 108-90-7 | Chlorobenzene | 5. U |
| 108-05-4 | Vinyl Acetate | 10. U | 100-41-4 | Ethylbenzene | 5. U |
| 75-27-4 | Bromodichloromethane | 5. U | 100-42-5 | Styrene | 5. U |
| | | | | Total Xylenes | 5. U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration file.

| Sample Number |
|---|
| 1560-85-16-TW2-A |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: )RM157::03
Sample Matrix: WATER
Data release Authorized by: Leigh Anne Marchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
ACN Number : 30408
Date Sample Received: 9/19/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 19:40
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | (ug/l) or ug/Kg (Circle One) | C.A.S. Number | | (ug/l) or ug/Kg (Circle One) |
|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. U | 7 -87-5 | 1,2-Dichloropropane | 5. U |
| 74-83-9 | Bromomethane | 10. U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. U |
| 75-01-4 | Vinyl Chloride | 10. U | 79-01-6 | Trichloroethene | 5. U |
| 75-00-3 | Chloroethane | 10. U | 124-48-1 | Dibromochloromethane | 5. U |
| 75-09-2 | Methylene Chloride | 5. U | 79-00-5 | 1,1,2-Trichloroethane | 5. U |
| 67-64-1 | Acetone | 10. U | 71-43-2 | Benzene | 5. U |
| 75-15-0 | Carbon Disulfide | 5. U | 10061-01-5 | cis-1,3-Dichloropropene | 5. U |
| 75-35-4 | 1,1-Dichloroethene | 5. U | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. U | 75-25-2 | Bromoform | 5. U |
| 156-60-5 | 1,2-Dichloroethene | 5. U | 108-10-1 | 4-Methyl-2-Pentanone | 10. U |
| 67-66-3 | Chloroform | 5. U | 591-78-6 | 2-Hexanone | 10. U |
| 107-02-2 | 1,2-Dichloroethane | 5. U | 127-18-4 | Tetrachloroethene | 5. U |
| 78-93-3 | 2-Butanone | 10. U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. U | 108-88-3 | Toluene | 5. U |
| 56-23-6 | Carbon Tetrachloride | 5. U | 108-90-7 | Chlorobenzene | 5. U |
| 108-05-4 | Vinyl Acetate | 10. U | 100-41-4 | Ethylbenzene | 5. U |
| 75-27-4 | Bromodichloromethane | 5. U | 100-42-5 | Styrene | 5. U |
| | | | | Total Xylenes | 5. U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration File.

| Sample Number |
|---|
| 1560-81-16-IW3-A |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: )RM153::03
Sample Matrix: WATER
Data release Authorized by: Leigh Anne Marchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
ACN Number : 30272
Date Sample Received: 9/18/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 17:08
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | (ug/l) or ug/Kg (Circle One) | C.A.S. Number | | (ug/l) or ug/Kg (Circle One) |
|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. U | 7 -87-5 | 1,2-Dichloropropane | 5. U |
| 74-83-9 | Bromomethane | 10. U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. U |
| 75-01-4 | Vinyl Chloride | 10. U | 79-01-6 | Trichloroethene | 5. U |
| 75-00-3 | Chloroethane | 10. U | 124-48-1 | Dibromochloromethane | 5. U |
| 75-09-2 | Methylene Chloride | 5. U | 79-00-5 | 1,1,2-Trichloroethane | 5. U |
| 67-64-1 | Acetone | 10. U | 71-43-2 | Benzene | 1. J |
| 75-15-0 | Carbon Disulfide | 5. U | 10061-01-5 | cis-1,3-Dichloropropene | 5. U |
| 75-35-4 | 1,1-Dichloroethene | 5. U | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. U | 75-25-2 | Bromoform | 5. U |
| 156-60-5 | 1,2-Dichloroethene | 5. U | 108-10-1 | 4-Methyl-2-Pentanone | 10. U |
| 67-66-3 | Chloroform | 5. U | 591-78-6 | 2-Hexanone | 10. U |
| 107-02-2 | 1,2-Dichloroethane | 5. U | 127-18-4 | Tetrachloroethene | 5. U |
| 78-93-3 | 2-Butanone | 10. U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. U | 108-88-3 | Toluene | 5. U |
| 56-23-6 | Carbon Tetrachloride | 5. U | 108-90-7 | Chlorobenzene | 5. U |
| 108-05-4 | Vinyl Acetate | 10. U | 100-41-4 | Ethylbenzene | 5. U |
| 75-27-4 | Bromodichloromethane | 5. U | 100-42-5 | Styrene | 5. U |
| | | | | Total Xylenes | 5. U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration File.

| Sample Number |
|---|
| 1560-73-16-TW4-A |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: >RM1S2::00
Sample Matrix: WATER
Data release Authorized by: Leigh Anne Marchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
ACN Number : 30271
Date Sample Received: 9/18/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 16:30
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | (ug/l) or ug/Kg (Circle One) | C.A.S. Number | | (ug/l) or ug/Kg (Circle One) |
|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. U | 7 -87-5 | 1,2-Dichloropropane | 5. U |
| 74-83-9 | Bromomethane | 10. U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. U |
| 75-01-4 | Vinyl Chloride | 10. U | 79-01-6 | Trichloroethene | 5. U |
| 75-00-3 | Chloroethane | 10. U | 124-48-1 | Dibromochloromethane | 5. U |
| 75-09-2 | Methylene Chloride | 1. JB | 79-00-5 | 1,1,2-Trichloroethane | 5. U |
| 67-64-1 | Acetone | 10. U | 71-43-2 | Benzene | 5. U |
| 75-15-0 | Carbon Disulfide | 5. U | 10061-01-5 | cis-1,3-Dichloropropene | 5. U |
| 75-35-4 | 1,1-Dichloroethene | 5. U | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. U | 75-25-2 | Bromoform | 5. U |
| 156-60-5 | 1,2-Dichloroethene | 5. U | 108-10-1 | 4-Methyl-2-Pentanone | 10. U |
| 67-66-3 | Chloroform | 5. U | 591-78-6 | 2-Hexanone | 10. U |
| 107-02-2 | 1,2-Dichloroethane | 5. U | 127-18-4 | Tetrachloroethene | 5. U |
| 78-93-3 | 2-Butanone | 10. U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. U | 108-88-3 | Toluene | 5. U |
| 56-23-6 | Carbon Tetrachloride | 5. U | 108-90-7 | Chlorobenzene | 5. U |
| 108-05-4 | Vinyl Acetate | 10. U | 100-41-4 | Ethylbenzene | 5. U |
| 75-27-4 | Bromodichloromethane | 5. U | 100-42-5 | Styrene | 5. U |
| | | | | Total Xylenes | 5. U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

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OPTIONAL FLAGS

N - Compound not present in Calibration File.

| Sample Number |
|---|
| 1560-71-16-1W5-A |

# Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: >RM151::03
Sample Matrix: WATER
Data release Authorized by: Leigh Anne Merchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
ACN Number : 30270
Date Sample Received: 9/18/89

## Volatile Compounds

Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 15:53
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | (ug/l) or ug/Kg (Circle One) | C.A.S. Number | | (ug/l) or ug/Kg (Circle One) |
|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. U | 7 -87-5 | 1,2-Dichloropropane | 5. U |
| 74-83-9 | Bromomethane | 10. U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. U |
| 75-01-4 | Vinyl Chloride | 10. U | 79-01-6 | Trichloroethene | 5. U |
| 75-00-3 | Chloroethane | 10. U | 124-48-1 | Dibromochloromethane | 5. U |
| 75-09-2 | Methylene Chloride | 2. JB | 79-00-5 | 1,1,2-Trichloroethane | 5. U |
| 67-64-1 | Acetone | 8. J | 71-43-2 | Benzene | 5. U |
| 75-15-0 | Carbon Disulfide | 5. U | 10061-01-5 | cis-1,3-Dichloropropene | 5. U |
| 75-35-4 | 1,1-Dichloroethene | 5. U | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. U | 75-25-2 | Bromoform | 5. U |
| 156-60-5 | 1,2-Dichloroethene | 5. U | 108-10-1 | 4-Methyl-2-Pentanone | 10. U |
| 67-66-3 | Chloroform | 5. U | 591-78-6 | 2-Hexanone | 10. U |
| 107-02-2 | 1,2-Dichloroethane | 5. U | 127-18-4 | Tetrachloroethene | 5. U |
| 78-93-3 | 2-Butanone | 10. U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. U | 108-88-3 | Toluene | 5. U |
| 56-23-6 | Carbon Tetrachloride | 5. U | 108-90-7 | Chlorobenzene | 5. U |
| 108-05-4 | Vinyl Acetate | 10. U | 100-41-4 | Ethylbenzene | 5. U |
| 75-27-4 | Bromodichloromethane | 5. U | 100-42-5 | Styrene | 5. U |
| | | | | Total Xylenes | 5. U |

## Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

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B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration file.

| Sample Number |
|---|
| 560-95-16-CPW2-AI |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: >RM162::03
Sample Matrix: WATER
Data release Authorized by: Leigh Ann Marchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
RCN Number : 30412
Date Sample Received: 9/19/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 23:17
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | ug/l or ug/Kg (Circle One) | C.A.S. Number | | ug/l or ug/Kg (Circle One) |
|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. U | 7 -87-5 | 1,2-Dichloropropane | 5. U |
| 74-83-9 | Bromomethane | 10. U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. U |
| 75-01-4 | Vinyl Chloride | 10. U | 79-01-6 | Trichloroethene | 5. U |
| 75-00-3 | Chloroethane | 10. U | 124-48-1 | Dibromochloromethane | 5. U |
| 75-09-2 | Methylene Chloride | 5. U | 79-00-5 | 1,1,2-Trichloroethane | 5. U |
| 67-64-1 | Acetone | 10. U | 71-43-2 | Benzene | 23. |
| 75-15-0 | Carbon Disulfide | 5. U | 10061-01-5 | cis-1,3-Dichloropropene | 5. U |
| 75-35-4 | 1,1-Dichloroethene | 5. U | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. U | 75-25-2 | Bromoform | 5. U |
| 156-60-5 | 1,2-Dichloroethene | 5. U | 108-10-1 | 4-Methyl-2-Pentanone | 10. U |
| 67-66-3 | Chloroform | 5. U | 591-78-6 | 2-Hexanone | 10. U |
| 107-02-2 | 1,2-Dichloroethane | 5. U | 127-18-4 | Tetrachloroethene | 5. U |
| 78-93-3 | 2-Butanone | 10. U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. U | 108-88-3 | Toluene | 5. U |
| 56-23-6 | Carbon Tetrachloride | 5. U | 108-90-7 | Chlorobenzene | 5. U |
| 108-05-4 | Vinyl Acetate | 10. U | 100-41-4 | Ethylbenzene | 5. U |
| 75-27-4 | Bromodichloromethane | 5. U | 100-42-5 | Styrene | 5. U |
| | | | | Total Xylenes | 5. U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration file.

Lab Name : WESTERN RESEARCH INST
Case No : RM-1

| Sample Number |
| --- |
| ACM:30414 |

ORGANICS ANALYSIS DATA SHEET
(Page 2)

0560-95-16-C PW2-B

Semivolatile Compounds

Concentration: Low
Date Extracted: 09/20/89
Date Analyzed: 890929 19:25
Conc/Dil Factor: 1.00000
Percent Moisture: 0.0

GPC Cleanup __ Yes XX No
Separatory Funnel Extraction __ Yes
Continuous Liquid-Liquid Extraction X Yes

| C.A.S Number | | UG/L | |
| --- | --- | --- | --- |
| 108-95-2 | Phenol | 10 | U |
| 111-44-4 | bis(2-Chloroethyl)ether | 10 | U |
| 95-57-8 | 2-Chlorophenol | 10 | U |
| 541-73-1 | 1,3-Dichlorobenzene | 10 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 10 | U |
| 100-51-6 | Benzyl Alcohol | 10 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 10 | U |
| 95-48-7 | 2-Methylphenol | 10 | U |
| 39638-32-9 | bis(2-chloroisopropyl)Ether | 10 | U |
| 106-44-5 | 4-Methylphenol | 10 | U |
| 621-64-7 | N-Nitroso-Di-n-Propylamine | 10 | U |
| 67-72-1 | Hexachloroethane | 10 | U |
| 98-95-3 | Nitrobenzene | 10 | U |
| 78-59-1 | Isophorone | 10 | U |
| 88-75-5 | 2-Nitrophenol | 10 | U |
| 105-67-9 | 2,4-Dimethylphenol | 10 | U |
| 65-85-0 | Benzoic Acid | 50 | U |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10 | U |
| 120-83-2 | 2,4-Dichlorophenol | 10 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 10 | U |
| 91-20-3 | Naphthalene | 10 | U |
| 106-47-8 | 4-Chloroaniline | 10 | U |
| 87-68-3 | Hexachlorobutadiene | 10 | U |
| 59-50-7 | 4-Chloro-3-Methylphenol | 10 | U |
| 91-57-6 | 2-Methylnaphthalene | 10 | U |
| 77-47-4 | Hexachlorocyclopentadiene | 10 | U |
| 88-06-2 | 2,4,6-Trichlorophenol | 10 | U |
| 95-95-4 | 2,4,5-Trichlorophenol | 50 | U |
| 91-58-7 | 2-Chloronaphthalene | 10 | U |
| 88-74-4 | 2-Nitroaniline | 50 | U |
| 131-11-3 | Dimethylphthalate | 10 | U |
| 208-96-8 | Acenaphthylene | 10 | U |

| C.A.S. Number | | UG/L | |
| --- | --- | --- | --- |
| 99-09-2 | 3-Nitroaniline | 50 | U |
| 83-32-9 | Acenaphthene | 10 | U |
| 51-28-5 | 2,4-Dinitrophenol | 50 | U |
| 100-02-7 | 4-Nitrophenol | 50 | U |
| 132-64-9 | Dibenzofuran | 10 | U |
| 121-14-2 | 2,4-Dinitrotoluene | 10 | U |
| 606-20-2 | 2,6-Dinitrotoluene | 10 | U |
| 84-66-2 | Diethylphthalate | 10 | U |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 10 | U |
| 86-73-7 | Fluorene | 10 | U |
| 100-01-6 | 4-Nitroaniline | 50 | U |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 10 | U |
| 86-30-6 | N-Nitrosodiphenylamine (1) | 50 | U |
| 101-55-3 | 4-Bromophenyl-phenylether | 10 | U |
| 118-74-1 | Hexachlorobenzene | 10 | U |
| 87-86-5 | Pentachlorophenol | 50 | U |
| 85-01-8 | Phenanthrene | 10 | U |
| 120-12-7 | Anthracene | 10 | U |
| 84-74-2 | Di-n-Butylphthalate | 10 | U |
| 206-44-0 | Fluoranthene | 10 | U |
| 129-00-0 | Pyrene | 10 | U |
| 85-68-7 | Butylbenzylphthalate | 10 | U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 20 | U |
| 56-55-3 | Benzo(a)Anthracene | 10 | U |
| 117-81-7 | bis(2-Ethylhexyl)Phthalate | 10 | U |
| 218-01-9 | Chrysene | 10 | U |
| 117-84-0 | Di-n-Octylphthalate | 13 | B |
| 205-99-2 | Benzo(b)fluoranthene | 10 | U |
| 207-08-9 | Benzo(k)fluoranthene | 10 | U |
| 50-32-8 | Benzo(a)Pyrene | 10 | U |
| 193-39-5 | Indeno(1,2,3-cd)Pyrene | 10 | U |
| 53-70-3 | Dibenz(a,h)Anthracene | 10 | U |
| 191-24-2 | Benzo(g,h,i)Perylene | 10 | U |

(1)-Cannot be separated from diphenylamine

| Sample Number |
|---|
| 1560-93-16-UIW1-A1 |

Organics Analysis Data Sheet
(Page 1)

Laboratory Name: WESTERN RESEARCH INST
Lab Sample ID: >RM161::03
Sample Matrix: WATER
Data release Authorized by: LeighAnne Marchant

Case No.: RM-1 POST BURN MONITORING
QC Report No.: 1
ACN Number : 30411
Date Sample Received: 9/19/89

Volatile Compounds
Concentration: (Low) Medium (Circle One)
Date Extracted: -------
Date Analyzed: 9/20/89 22:36
Conc/Dil factor: 1.0 pH : --
Percent Moisture: (Not Decanted) --

| C.A.S. Number | | ug/l or ug/Kg (Circle One) | | C.A.S. Number | | ug/l or ug/Kg (Circle One) | |
|---|---|---|---|---|---|---|---|
| 74-87-3 | Chloromethane | 10. | U | 7 -87-5 | 1,2-Dichloropropane | 5. | U |
| 74-83-9 | Bromomethane | 10. | U | 10061-02-6 | Trans-1,3-Dichloropropene | 5. | U |
| 75-01-4 | Vinyl Chloride | 10. | U | 79-01-6 | Trichloroethene | 5. | U |
| 75-00-3 | Chloroethane | 10. | U | 124-48-1 | Dibromochloromethane | 5. | U |
| 75-09-2 | Methylene Chloride | 2. | JB | 79-00-5 | 1,1,2-Trichloroethane | 5. | U |
| 67-64-1 | Acetone | 10. | U | 71-43-2 | Benzene | 31. | |
| 75-15-0 | Carbon Disulfide | 5. | U | 10061-01-5 | cis-1,3-Dichloropropene | 5. | U |
| 75-35-4 | 1,1-Dichloroethene | 5. | U | | | | |
| 75-34-3 | 1,1-Dichloroethane | 5. | U | 75-25-2 | Bromoform | 5. | U |
| 156-60-5 | 1,2-Dichloroethene | 5. | U | 108-10-1 | 4-Methyl-2-Pentanone | 10. | U |
| 67-66-3 | Chloroform | 5. | U | 591-78-6 | 2-Hexanone | 10. | U |
| 107-02-2 | 1,2-Dichloroethane | 5. | U | 127-18-4 | Tetrachloroethene | 5. | U |
| 78-93-3 | 2-Butanone | 10. | U | 79-34-5 | 1,1,2,2-Tetrachloroethane | 5. | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5. | U | 108-88-3 | Toluene | 5. | U |
| 56-23-6 | Carbon Tetrachloride | 5. | U | 108-90-7 | Chlorobenzene | 5. | U |
| 108-05-4 | Vinyl Acetate | 10. | U | 100-41-4 | Ethylbenzene | 5. | U |
| 75-27-4 | Bromodichloromethane | 5. | U | 100-42-5 | Styrene | 5. | U |
| | | | | | Total Xylenes | 5. | U |

Data Reporting Qualifiers

For reporting results to EPA the following results qualifiers are used. Additional flags or footnotes explaining results are encouraged. However the definition of each flag must be explicit.

Value - If the result is a value greater than or equal to the detection limit, report the value.

U - Indicates compound was analyzed for but not detected. Report the minimum detection limit for the sample with the U (e.g. 10U) based on necessary concentration/dilution action (This is not necessarily the instrument detection limit). The footnote should read: U-Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicated the presence of a compound that meets the identification criteria but the result is < than the specified detection limit but > than zero (e.g. 10J). If limit of detection is 10 ug/L and a conentration of 3.0 ug/L is calculated, report as 3J.

C - This flag applies to pesticide parameters where the identification has been confirmed by GC/MS. Single component pesticides >= 10 ng/uL in the final extract should be confirmed by GC/MS.

B - This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable blank contamination and warns data the user to take appropriate action.

Other - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the data summary report

OPTIONAL FLAGS

N - Compound not present in Calibration File.

Lab Name : WESTERN RESEARCH INST
Case No : RM1

| Sample Number |
| --- |
| ACN:30413 |

ORGANICS ANALYSIS DATA SHEET
(Page 2)

0560-43-16 - VIW1-B

Semivolatile Compounds

Concentration: Low
Date Extracted: 09/20/89
Date Analyzed: 890929 18:29
Conc/Dil Factor: 1.00000
Percent Moisture: 0.0

GPC Cleanup __ Yes XX No
Separatory Funnel Extraction __ Yes
Continuous Liquid-Liquid Extraction X Yes

| C.A.S Number | | UG/L | |
| --- | --- | --- | --- |
| 108-95-2 | Phenol | 10 | U |
| 111-44-4 | bis(2-Chloroethyl)ether | 10 | U |
| 95-57-8 | 2-Chlorophenol | 10 | U |
| 541-73-1 | 1,3-Dichlorobenzene | 10 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 10 | U |
| 100-51-6 | Benzyl Alcohol | 10 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 10 | U |
| 95-48-7 | 2-Methylphenol | 10 | U |
| 39638-32-9 | bis(2-chloroisopropyl)Ether | 10 | U |
| 106-44-5 | 4-Methylphenol | 10 | U |
| 621-64-7 | N-Nitroso-Di-n-Propylamine | 10 | U |
| 67-72-1 | Hexachloroethane | 10 | U |
| 98-95-3 | Nitrobenzene | 10 | U |
| 78-59-1 | Isophorone | 10 | U |
| 88-75-5 | 2-Nitrophenol | 10 | U |
| 105-67-9 | 2,4-Dimethylphenol | 10 | U |
| 65-85-0 | Benzoic Acid | 50 | U |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10 | U |
| 120-83-2 | 2,4-Dichlorophenol | 10 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 10 | U |
| 91-20-3 | Naphthalene | 2 | J |
| 106-47-8 | 4-Chloroaniline | 10 | U |
| 87-68-3 | Hexachlorobutadiene | 10 | U |
| 59-50-7 | 4-Chloro-3-Methylphenol | 10 | U |
| 91-57-6 | 2-Methylnaphthalene | 10 | U |
| 77-47-4 | Hexachlorocyclopentadiene | 10 | U |
| 88-06-2 | 2,4,6-Trichlorophenol | 10 | U |
| 95-95-4 | 2,4,5-Trichlorophenol | 50 | U |
| 91-58-7 | 2-Chloronaphthalene | 10 | U |
| 88-74-4 | 2-Nitroaniline | 50 | U |
| 131-11-3 | Dimethylphthalate | 10 | U |
| 208-96-8 | Acenaphthylene | 10 | U |

| C.A.S. Number | | UG/L | |
| --- | --- | --- | --- |
| 99-09-2 | 3-Nitroaniline | 50 | U |
| 83-32-9 | Acenapnthene | 10 | U |
| 51-28-5 | 2,4-Dinitrophenol | 50 | U |
| 100-02-7 | 4-Nitrophenol | 50 | U |
| 132-64-9 | Dibenzofuran | 10 | U |
| 121-14-2 | 2,4-Dinitrotoluene | 10 | U |
| 606-20-2 | 2,6-Dinitrotoluene | 10 | U |
| 84-66-2 | Diethylphthalate | 10 | U |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 10 | U |
| 86-73-7 | Fluorene | 10 | U |
| 100-01-6 | 4-Nitroaniline | 50 | U |
| 534-52-1 | 4,6-Dinitro-2-methylphenol | 10 | U |
| 86-30-6 | N-Nitrososdiphenylamine (1) | 50 | U |
| 101-55-3 | 4-Bromophenyl-phenylether | 10 | U |
| 118-74-1 | Hexachlorobenzene | 10 | U |
| 87-86-5 | Pentachlorophenol | 50 | U |
| 85-01-8 | Phenanthrene | 10 | U |
| 120-12-7 | Anthracene | 10 | U |
| 84-74-2 | Di-n-Butylphthalate | 10 | U |
| 206-44-0 | Fluoranthene | 10 | U |
| 129-00-0 | Pyrene | 10 | U |
| 85-68-7 | Butylbenzylphthalate | 10 | U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 20 | U |
| 56-55-3 | Benzo(a)Anthracene | 10 | U |
| 117-81-7 | bis(2-Ethylhexyl)Phthalate | 10 | U |
| 218-01-9 | Chrysene | 10 | U |
| 117-84-0 | Di-n-Octylphthalate | 7 | J B |
| 205-99-2 | Benzo(b)fluoranthene | 10 | U |
| 207-08-9 | Benzo(k)fluoranthene | 10 | U |
| 50-32-8 | Benzo(a)Pyrene | 10 | U |
| 193-39-5 | Indeno(1,2,3-cd)Pyrene | 10 | U |
| 53-70-3 | Dibenz(a,h)Anthracene | 10 | U |
| 191-24-2 | Benzo(g,h,i)Perylene | 10 | U |

(1)-Cannot be separated from diphenylamine

DATE
FILMED
8/11/94

END