GW - 52

REPORTS

YEAR(S):

1992

R-48-09-2-003H

FINAL REPORT

MONITOR WELL INSTALLATION

TRANSWESTERN PIPELINE COMPANY

COMPRESSOR STATION NO. 9

ROSWELL, NEW MEXICO

PREPARED BY

HALLIBURTON NUS ENVIRONMENTAL CORPORATION

ENVIRONMENTAL SERVICES

SOUTHWEST REGION

OCTOBER 1992

HALLIBURTON NUS PROJECT NUMBER 6250

HALLIBURTON NUS
Environmental Corporation

HALLIBURTON NUS
Environmental Corporation

Environmental Technologies Group
16360 PARK TEN PLACE
SUITE 300
HOUSTON, TEXAS 77084
(713) 492-1888
(713) 492-0504 FAX

R-48-09-2-003H

FINAL REPORT

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SOUTHWEST REGION

OCTOBER 1992

HALLIBURTON NUS PROJECT NUMBER 6250

PREPARED BY:

Susanne Richard

SUSANNE RICHARD, R.E.P.
PROJECT MANAGER

REVIEWED AND APPROVED BY:

D R Brenneman

DONALD R. BRENNEMAN
VICE PRESIDENT
HALLIBURTON SERVICES DIVISION
SOUTHWEST REGION

QA REPRESENTATIVE CHECK:

Burt Lee

BURT LEE, P.E.
QA MANAGER

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1.0 BACKGROUND REVIEW

HALLIBURTON NUS Environmental Corporation (HALLIBURTON NUS) was requested by Transwestern Pipeline Company (Transwestern) to install one monitor well at Transwestern Compressor Station No. 9 located in Roswell, New Mexico. The facility is an active natural gas pipeline compressor station located on the north side of the city of Roswell. The location of the site is shown in Figure 1-1.

The well was installed within an area that contained three abandoned pits used to collect pipeline and other liquid wastes. Through time, the liquid wastes were deposited, burned, and then backfilled repeatedly in the pits. The pits were taken out of service in 1986.

A previous investigation (Metric Corporation, 1991) determined that the pit area was situated above a natural topographic basin. The basin contains a perched liquid zone within alluvial deposits of sands and gravels. The perched water zone is contained within red clay layers which act as an aquitard. The major source of liquids comprising the perched zone is from the introduction of natural gas pipeline liquids which are removed from the transporation of natural gas. Based upon the Metric Corporation (Metric) investigation, groundwater conditions were not impacted.

This investigation also concluded that the subsurface soils within the basin have been impacted by the pipeline liquid waste pit activities.

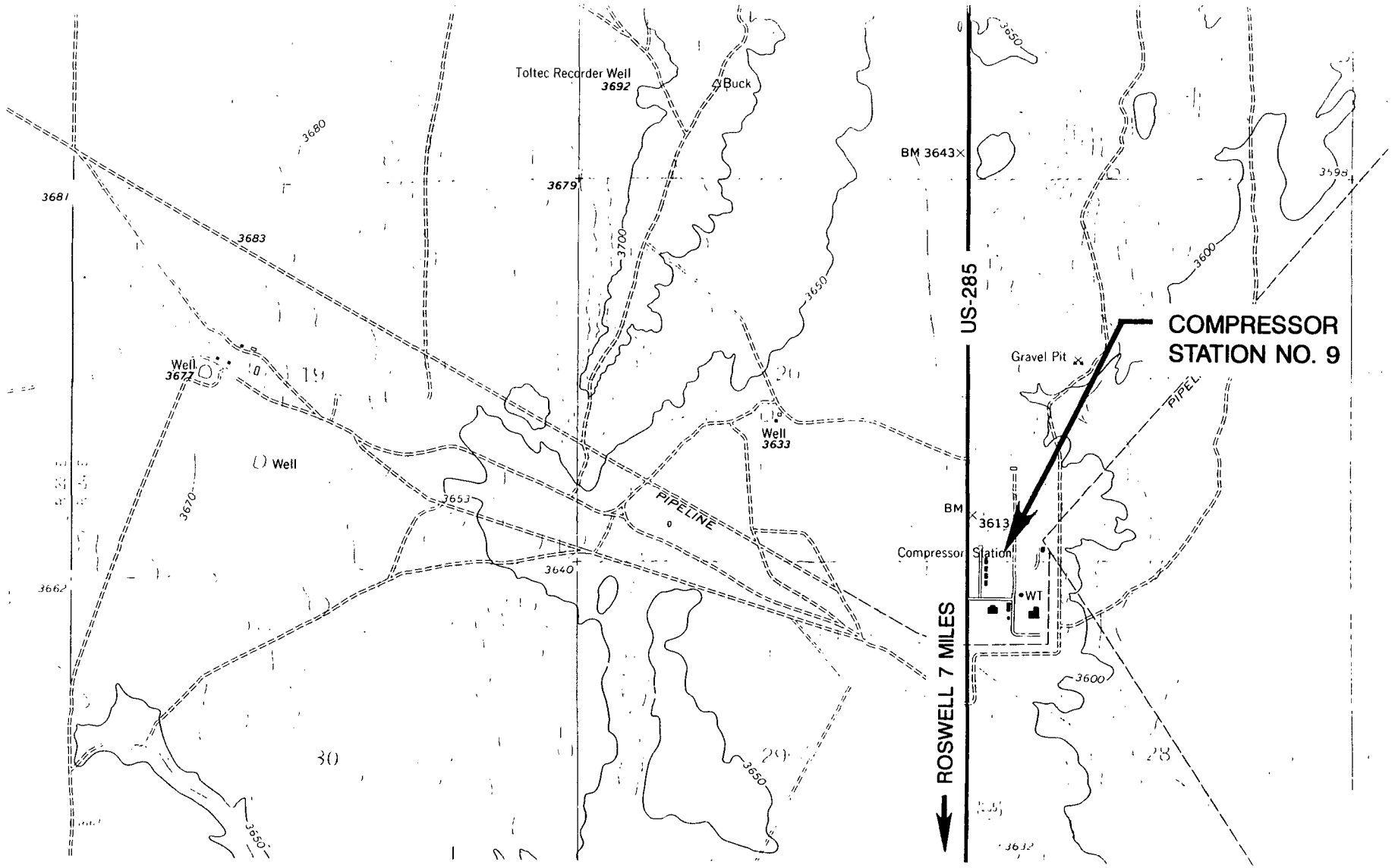

FIGURE 1-1

SCALE: 1" = 2000'
REFERENCE:
USGS MAP 7.5 MINUTE SERIES
PANTHER HILL QUADRANGLE

DRAWN BY	J. ATKINSON
DATE:	10-19-92
ENGINEER	S. RICHARD
DATE:	10-19-92
CAD DWG. NO.	N.A.

SITE LOCATION MAP
COMPRESSOR STATION NO. 9
TRANSWESTERN PIPELINE COMPANY
ROSWELL, NEW MEXICO

SCALE: 1" = 2000' | NUS DWG. NO. 1552-2A11 | REV. 0

HALLIBURTON NUS
Environmental Corporation

2.0 FIELD ACTIVITIES

This section describes the field activities undertaken on July 21, 22, and September 21, 1992, by HALLIBURTON NUS. A monitor well, Station 9 Pit, was installed and developed. Prior to mobilization, a Site-Specific Health and Safety Plan, presented in Appendix A, was developed.

The location of the well was selected by Transwestern personnel and was near a previous boring location (Metric, 1991).

The drilling was completed using a CME-55 drill rig. The boring was drilled with 6-5/8 in. O.D. hollow-stem augers to 60 feet without sampling. Beginning at 60 feet, continuous samples were collected, using split-spoon samplers, until reaching the red clay aquitard containing very hard white sulfate lenses at 68 feet. The boring was then overdrilled with 10-inch O.D. hollow-stem augers to install the well. The perched liquid level was measured at 35 feet below the ground surface within the sands and gravels of the perched zone. (See boring log contained in Appendix B for additional details.) A 3-inch PVC bailer was used to develop the well. Development of the well produced 110 gallons of perched liquids, which were collected in two drums.

The well, consisting of 28 feet of Schedule 40 PVC riser and 40 feet of 0.010 slotted Schedule 40 PVC screen, was installed inside the augers. The screen was set between 68 feet and 28 feet below ground surface. The filter pack consisted of 12/20 grade packsand and installed to 25.2 feet below the surface. A layer of one-half inch bentonite pellets was added to 24.4 feet below the surface. A cement mixture of Portland cement and Super Gel X was used to grout the well from the top of the bentonite seal to the ground surface.

The Station 9 Pit monitor well was purged and sampled on September 21, 1992. The static perched liquid level was measured at 26.08 feet below the ground surface. A 3-inch teflon bailer was used to purge the well. An oil layer was encountered when purging the well. The oil layer vanished prior to withdrawing the first well volume. After purging, the perched liquid was sampled with a 2-inch teflon bailer. The sample log sheet presented in Appendix C includes additional information. The perched liquid sample was placed in sample bottles and

stored on ice in a cooler prior to shipping to HALLIBURTON NUS Environmental Laboratory in Houston, Texas. The chain-of-custody form is included in Appendix D.

3.0 ANALYTICAL RESULTS

The sample obtained on September 21, 1992, was analyzed for Appendix IX volatile and semivolatile organics, total petroleum hydrocarbons (TPH), and total metals. EPA Methods 624/SW 8240, 625/SW 8270, and 418.1 for organics, and SW Test Method 846/7000 series for the metals, respectively, were utilized for those analyses. The analytical results are presented in Tables 3-1 through 3-4. The analytical laboratory reports and associated quality control reports are contained in Appendix E.

The perched liquid in the Station 9 Pit monitor well was found to contain aromatic hydrocarbons, halogenated hydrocarbons, and methyl ethyl ketone (MEK) as well as a few semivolatile organic constituents. Table 3-1 presents analytical results for volatile organic analyses. The following positive detections were reported:

benzene	0.370 ppm
toluene	0.061 ppm
ethylbenzene	0.110 ppm
total xylenes	0.940 ppm
1,1,1 - Trichloroethane	0.180 ppm
1,1 - Dichloroethane	0.560 ppm
2 - Butanone (MEK)	0.220 ppm

Table 3-2 presents analytical results for semivolatile organic analyses. The following positive detections were reported:

2 - Methylnaphthalene	0.051 ppm
4 - Methylphenol	0.250 ppm
naphthalene	0.034 ppm

TPH concentration, as shown on Table 3-3, was detected at 37 ppm in the perched liquid sample.

Arsenic, barium, and chromium, as presented in Table 3-4, were also detected in the sample. The inorganic analytes were detected in concentrations of 0.19 ppm, 4.4 ppm, and 0.01 ppm, respectively.

TABLE 3-1

VOLATILE ORGANICS
ANALYTICAL DATA IN μG/L
TRANSWESTERN COMPRESSOR STATION NO. 9
ROSWELL, NEW MEXICO

ANALYTE	RESULT
1,1,1-Trichloroethane	180
1,1,2,2-Tetrachloroethane	< 30
1,1,2-Trichloroethane	< 30
1,1-Dichloroethane	560
1,1-Dichloroethene	< 30
1,2,3-Trichloropropane	< 30
1,2-Dichloroethane	< 30
1,2-Dichloropropane	< 30
1,4-Dichloro-2-butene	< 60
2-Butanone (MEK)	220
2-Chloroethylvinyl Ether	< 60
2-Hexanone	< 60
4-Methyl-2-Pentanone (MIBK)	< 60
Acetone	< 60
Acrolein	< 600
Acrylonitrile	< 600
Benzene	370
Bromodichloromethane	< 30
Bromoform	< 30
Bromomethane	< 60
Carbon disulfide	< 30
Carbon tetrachloride	< 30
Chlorobenzene	< 30
Chlorodibromomethane	< 30
Chloroethane	< 60

TABLE 3-1 (Continued)
VOLATILE ORGANICS
ANALYTICAL DATA IN µg/L
TRANSWESTERN COMPRESSOR STATION NO. 9
ROSWELL, NEW MEXICO

ANALYTE	RESULT
Chloroform	< 30
Chloromethane	< 60
Dibromomethane	< 30
Dichlorodifluoromethane	< 120
Ethanol	*
Ethyl methacrylate	< 60
Ethylbenzene	110
Iodomethane (Methyl iodide)	< 60
Methylene chloride	< 60
P/M xylene	820
Styrene	< 30
Tetrachloroethene	< 30
Toluene	61
Trichloroethene	< 30
Trichlorofluoromethane	< 30
Vinyl acetate	< 60
Vinyl chloride	< 60
cis-1,2-Dichloroethene	< 30
cis-1,3-Dichloropropane	< 30
o-Xylene	120
trans-1,2-Dichloroethene	< 30
trans-1,3-Dichloropropene	< 30

NOTE: * This analyte was not detected by a computerized search of the chromatogram.

TABLE 3-2

SEMI-VOLATILE ORGANICS
ANALYTICAL DATA IN μG/L
TRANSWESTERN COMPRESSOR STATION NO. 9
ROSWELL, NEW MEXICO

ANALYTE	RESULT
1,2,4-Trichlorobenzene	< 33
1,2-Dichlorobenzene	< 33
1,3-Dichlorobenzene	< 33
1,4-Dichlorobenzene	< 33
2,4,5-Trichlorophenol	< 66
2,4,6-Trichlorophenol	< 33
2,4-Dichlorophenol	< 33
2,4-Dimethylphenol	< 33
2,4-Dinitrophenol	< 160
2,4-Dinitrotoluene	< 33
2,6-Dinitrotoluene	< 33
2-Chloronaphthalene	< 33
2-Chlorophenol	< 33
2-Methylnaphthalene	51
2-Methylphenol (o-Cresol)	< 33
2-Nitroaniline	< 160
2-Nitrophenol	< 33
3,3'-Dichlorobenzidine	< 66
3-Methylphenol	< 33
3-Nitroaniline	< 160
4,6-Dinitro-2-methylphenol	< 160
4-Bromophenyl phenyl ether	< 33
4-Chloro-3-methylphenol	< 33
4-Chloroaniline	< 33
4-Chlorophenyl phenyl ether	< 33

TABLE 3-2 (Continued)
SEMI-VOLATILE ORGANICS
ANALYTICAL DATA IN μG/L
TRANSWESTERN COMPRESSOR STATION NO. 9
ROSWELL, NEW MEXICO

ANALYTE	RESULT
4-Methylphenol	250
4-Nitroaniline	< 160
4-Nitrophenol	< 160
Acenaphthene	< 33
Acenaphthylene	< 33
Acetophenone	< 33
Aniline	< 33
Anthracene	< 160
Benzidine	< 33
Benzo(a)anthracene	< 33
Benzo(a)pyrene	< 33
Benzo(b)fluoranthene	< 33
Benzo(ghi)perylene	< 33
Benzo(k)fluoranthene	< 160
Benzoic Acid	< 33
Benzyl alcohol	< 33
Benzyl butyl phthalate	< 33
Bis(2-Chloroethoxy)methane	< 33
Bis(2-Chloroethyl)ether	< 33
Bis(2-Chloroisopropyl)ether	< 33
Bis(2-Ethylhexyl)phthalate	< 33
Chrysene	< 33
Di-n-butyl phthalate	< 33
Di-n-octyl phthalate	< 33
Dibenzofuran	< 33

TABLE 3-2 (Continued)
SEMI-VOLATILE ORGANICS
ANALYTICAL DATA IN μG/L
TRANSWESTERN COMPRESSOR STATION NO. 9
ROSWELL, NEW MEXICO

ANALYTE	RESULT
Diethyl phthalate	< 33
Dimethyl phthalate	< 33
Fluoranthene	< 33
Fluorene	< 33
Hexachlorobenzene	< 33
Hexachlorobutadiene	< 33
Hexachlorocyclopentadiene	< 33
Hexachloroethane	< 33
Indeno(1,2,3-cd)pyrene	< 33
Isophorone	< 33
N-Nitrosodimethylamine	< 33
N-Nitrosodiphenylamine	< 33
Naphthalene	34
Nitrobenzene	< 33
Pentachlorophenol	< 160
Phenanthrene	< 33
Phenol	< 33
Pyrene	< 33
Pyridine	< 66
n-Nitroso-di-n-propylamine	< 33

TABLE 3-3

TOTAL PETROLEUM HYDROCARBONS
ANALYTICAL DATA IN MG/L
TRANSWESTERN COMPRESSOR STATION NO. 9
ROSWELL, NEW MEXICO

ANALYTE	RESULT
Total Petroleum Hydrocarbons	37

TABLE 3-4

METALS
ANALYTICAL DATA IN MG/L
TRANSWESTERN COMPRESSOR STATION NO. 9
ROSWELL, NEW MEXICO

ANALYTE	RESULT
Arsenic	0.19
Barium	4.4
Cadmium	< 0.005
Chromium	0.01
Mercury	< 0.0002
Silver	< 0.01
Lead	< 0.05
Selenium	< 0.003

APPENDIX A

HEALTH AND SAFETY PLAN

R-48-10-2-011H

SITE-SPECIFIC

HEALTH AND SAFETY PLAN

PREPARED FOR

TRANSWESTERN GAS PIPELINE COMPANY

COMPRESSOR STATION NO. 9, ROSWELL, NEW MEXICO

PREPARED BY

HALLIBURTON NUS ENVIRONMENTAL CORPORATION

ENVIRONMENTAL SERVICES

SOUTHWEST REGION

JULY 1992

HALLIBURTON NUS PROJECT NUMBER 6250

HALLIBURTON NUS
Environmental Corporation

Project Name: Well Installation and Subsurface Investigations Project No.: 6250

Scope of Work and Purpose of Visit:

Roswell Compressor Station No. 9 - Install 4-in. monitor well in the backfilled pipeline liquids pit. Well is to be used as an extraction well at a later time.

Site Visit Personnel:	Responsibility:
Larry Basilio	Geologist & SSO

Other Contacts:	Phone Nos.:
S. Richard - HALLIBURTON Project Manager	(713) 492-1888
Larry Campbell - Transwestern Env. Affairs Manager	(505) 625-8022
Earl Chandly - Transwestern NM Operation Man	(505) 625-8031
Dave Tanner - SH&B Drilling Manager	(505) 884-0950

Emergency Information: Roswell Compressor Station No. 9; Roswell, New Mexico

Type	Name	Phone Nos.
Sheriff		911
Ambulance		911
Hospital	Eastern New Mexico Medical Center North	(505) 622-8170
Rescue Service		911
Poison Control Center		1-800-432-6866
Site Manager	Susanne Richard	(713) 492-1888
PMHS	Tom Samson	713-561-1564

Hospital Route:

Eastern New Mexico Medical Center North

405 W. Country Club Rd.

Roswell, New Mexico

Directions from the Site:

Take HWY 285 south (left) to Country Club Rd. (4-5 miles), turn right (go west) 1/2 - 1 mile.

Inclement Weather Procedures:

No working during electrical storm, extremely high ambient heat loads, or other extreme weather conditions as determined by the SSO.

Site Background/Overall Information:

Roswell Compressor Station No. 9 - Site was a backfilled burn pit. Previous investigations have determined that the pit lies above a natural subsurface depression which contains perched groundwater. Activities associated with pit usage have impacted underlying sediments. This well will be used to monitor contamination and may in the future be used as an extraction well.

WT-1 - Carlsbad Compressor Station - Previous investigations have determined that activities associated with the former oil pit, burn pit, and trash pit had impacted the sediments below these structures. Soils in borings were found impacted by total petroleum hydrocarbons (TPH) down to 30 feet, TD of borings.

WT-2 - Kermit Compressor Station - Site has not been investigated. Facility houses a compressor station and a dehydrator. Pits have not been used for a number of years. Drums may have been dumped in trash pits.

Hazard Assessment:

Hazards expected to be present include:

1. - Fire and explosion from flammable/combustible materials
2. - Moving machinery
3. - Animal hazards - i.e., snakes, and ticks
5. - Manual lifting and slip/trip hazards
6. - Heat stress
7. - Underground utilities, underground gas pipelines

Standard Operating Procedures: (i.e., basic hygiene, buddy system, no hand-to-mouth activities when working on site, etc.)

Other: SSO will perform air monitoring during drilling and sampling activities.

PPE Requirements: Level D

Minimum - Steel toe/shank shoes or boots, standard field clothes. (If hard hats and safety glasses not worn, indicate why.)

Other: Hard hat and safety glass to be worn in vicinity of drilling operations. Rubber gloves to be worn during sampling activities.
Modified Level CPPE will be available on site and used if so determined by the SSO.

PPE Selection Criteria:

Upgrade to modified Level C PPE if HNU reading in the breathing zone is greater than 60 ppm.

PPE Decon/Disposal (if applicable):

Inspection - generated waste will be placed in plastic bags and disposed of properly.

Monitoring Equipment and Calibration Information:

HNU - Calibrate daily with known calibration gas.
OVA - Factor calibrated. Check for positive response with a marking pen.

Monitoring Equipment Selection Criteria:

HNU - 10.2 eV probe to scan for organic and inorganic vapor concentrations.

OVA - Used to monitor organic vapor concentrations.

Action Levels for Upgrading of PPE and/or Site Withdrawal:

Begin work in Level D and upgrade PPE as site conditions warrant.

Level D - <60 ppm reading on HNU in breathing zone.

Modified Level C - >60 ppm reading on HNU/OVA in breathing zone or if workers are affected by vapors.

Note:

Incident Report, Site Safety Follow-up Report, and Site Map must be attached.

APPENDIX B

BORING LOG

HALLIBURTON NUS
Environmental Corporation

BORING/WELL NUMBER **MW-1** SHEET **1** OF **1**

PROJECT **Transwestern Pipeline Company**

LOCATION **Roswell, New Mexico**

COORDINATES

PROJECT NUMBER **6250**

SURFACE ELEVATION DATUM

LOGGED BY **L. Basilio** DATE DRILLED **7/21/92**

ELEVATION FEET	SOIL DESCRIPTION	STRATA	SAMPLE INFORMATION: Depth Feet	Sample Type	Sample ID	Inches Adv. / Inches Rec.	Penetrometer Blow Counts	PID/FID (ppm)	WELL CONSTRUCTION DETAIL & REMARKS
	GROUND SURFACE								T.O.C. Elev.
	Auger to 60 feet BLS prior to sampling		5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55						
	CLAY - red, sandy, firm, occasional gravel less than 1/4-inch, saturated red sand in top 6 inches, most likely hole slough, sanitary sewer odor		60	SPT		18/18			
	CLAY - red, sandy to silty, moderately firm, moist, hole slough at top is saturated, sanitary sewer odor		65	SPT		18/18			
	CLAY - brick red to brownish, firm to occasionally hard, silty to sandy, gypsum at base			SPT		18/ 0			
	CLAY - red with hard gypsum nodules			SPT		18/ 0			
				SPT		12/12			
				SPT		12 12			

DRILLING CONTRACTOR: **SH & B**

DRILLER: **Ed Adams**

DRILLING METHOD: **Hollow Stem Auger**

DRILLING EQUIPMENT: **CME-55**

DIAMETER, TYPE & INTERVAL OF CASING: **4-inch Schedule 40 PVC**

WELL SCREEN/INTERVAL: **0.010 slot/28-68 ft BLS**

FILTER PACK-INTERVAL/QUANTITY: **25.2-68 ft BLS/22 sacks**

WELL SEAL-INTERVAL/QUANTITY: **24.4-25.2 ft BLS**

APPENDIX C

GROUNDWATER SAMPLE LOG SHEET

GROUND WATER
SAMPLE LOG SHEET

HALLIBURTON NUS
Environmental Corporation

☒ MONITORING WELL DATA
☐ DOMESTIC WELL DATA
☐ OTHER

PROJECT NAME Transwestern, Roswell New Mexico PROJECT NUMBER 6250

NUS SAMPLE NO. ST.9 PIT SOURCE Monitor Well Station 9 Pit

TOTAL WELL DEPTH: 68.16	
WELL CASING SIZE & DEPTH: 4 inch casing (0.66) 68.16	
STATIC WATER LEVEL: 25.42	
ONE CASING VOLUME: 28.2	
START PURGE (HRS.): 1300	
END PURGE (HRS.): 1350	
TOTAL PURGE TIME (MIN.): 50 min	
TOTAL AMOUNT PURGED (GAL.): 84.2	
MONITOR READING:	
PURGE METHOD: Hand Bailed	
SAMPLE METHOD:	
DEPTH METHOD:	
SAMPLE DATE & TIME: 09/21/92 1405	
SAMPLED BY: John Altieri	
SIGNATURE(S):	

PURGE DATA

VOLUME	PH	S.C.	TEMP.(°C)	TDS	COLOR & TURBIDITY

SAMPLE DATA

PH	S.C.	TEMP.(°C)	TDS	COLOR & TURBIDITY
6.92		21 c		Cloudy Yellow Low Turbidity

TYPE OF SAMPLE

☐ LOW CONCENTRATION
☐ HIGH CONCENTRATION
☒ GRAB
☐ COMPOSITE
☐ GRAB - COMPOSITE

ANALYSIS:	PRESERVATIVE

OBSERVATIONS/NOTES:

Upon measuring water it was observed to have a heavy oil layer. During the purge of this well the oil layer was evacuated before the first volume was taken. For the rest of the purge the water had low turbidity with a cloudy blackish yellow color and a strong petroleum odor.

APPENDIX D

CHAIN-OF-CUSTODY FORM

FROM. HALLIBURTON NUS CLEAR LAKE LAB 7010 ;10-19-92 10:43AM ; 10.19.1992 10:42 P. 2

CHAIN OF CUSTODY

HALLIBURTON NUS
Environmental Corporation

GEMINI AVENUE, CLEAR LAKE CITY
STON, TEXAS 77058-2786
488-4810

REPORT TO		INVOICE TO		
COMPANY Transwestern		COMPANY		☐ CHECK BOX IF INVOICE TO ADDRESS AND REPORT TO ADDRESS ARE SAME
ADDRESS 3381 N. Main		ADDRESS		
CITY Roswell STATE NM ZIP 882[illegible]		CITY STATE ZIP		P.O. # 6250DA
ATT.	PHONE #	ATT.	PHONE #	RELEASE #

PROJECT NAME/SITE NAME	CLIENT COMMENTS	HALLIBURTON NUS COMMENTS & SAMPLE #'S
Park Ten monitor well Resample	Attn. D. Meyers for analytical parameters	ly. J. Altieri

WARRANTY AND LIMITATION OF LIABILITY

service or work performed by HALLIBURTON NUS ENVIRONMENTAL CORPORATION is expressly subject to the following provision and HALLIBURTON NUS does not agree to any provision that is in conflict.

LIBURTON NUS warrants that work will be performed in accordance with sound laboratory practice and accepted analytical procedures, but makes no other warranty, express or implied. HALLIBURTON NUS is solely responsible for rmance of this contract, and no affiliated company, director, officer, employee, agent or subcontractor of HALLIBURTON NUS shall have any legal responsibility hereunder, whether in contract or tort, or otherwise. Liability for injury or age to persons or property arising out of this work (other than for professional errors, omissions, or other professional negligence, which are covered by the next sentence) shall be limited to the amount covered by the general comprehensive ance carried by HALLIBURTON NUS. In the event of error, omission, or other professional negligence or any breach of the above warranty, the sole and exclusive responsibility of HALLIBURTON NUS shall be to reperform the deficient at its own expense, and HALLIBURTON NUS shall have no other liability whatsoever. In no event shall HALLIBURTON NUS be liable, whether in contract or tort, or otherwise for any incidental consequential or special damages including ot limited to, damages in any way connected with the use or interpretation of information or analysis provided by HALLIBURTON NUS or with action related to such use of interpretation.

DATE	TIME	COMPOSITE	GRAB	SAMPLE SOURCE & DESCRIPTION	NUMBER CONTAINERS	VOCS (2 sets)	gallon [illegible]	metals [illegible]	REMARKS
[illegible]/92	1405		X	monitor well "Hill"	8	X	X	X	Ice applied to samples (yes) no [initials]

RELINQUISHED BY: SIGN	DATE/TIME	RECEIVED BY: SIGN	RELINQUISHED BY: SIGN
[signature]	9-21-92 1540	[signature]	

RELINQUISHED BY: SIGN

APPENDIX E

ANALYTICAL LABORATORY REPORTS

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 01, 1992
Report No.: 00020808
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: ENRON GAS PIPELINE/TRANSWESTERN
ADDRESS: P.O. BOX 1717
ROSWELL, NM 88201-
ATTENTION: LARRY CAMPBELL

NUS CLIENT NO: 0065 0044
WORK ORDER NO: 55680
VENDOR NO:

SAMPLE ID: STATION 9 - PIT
NUS SAMPLE NO: H0219130
P.O. NO.: E51201

DATE SAMPLED: 21-SEP-92
DATE RECEIVED: 22-SEP-92
APPROVED BY: L Beyer

LN	TEST CODE	DETERMINATION	RESULT	UNIT
1	OSVIXW	APPENDIX IX SEMIVOLATILES IN WATER		
		1,2,4-Trichlorobenzene	< 33	ug/L
		1,2-Dichlorobenzene	< 33	ug/L
		1,3-Dichlorobenzene	< 33	ug/L
		1,4-Dichlorobenzene	< 33	ug/L
		2,4,5-Trichlorophenol	< 66	ug/L
		2,4,6-Trichlorophenol	< 33	ug/L
		2,4-Dichlorophenol	< 33	ug/L
		2,4-Dimethylphenol	< 33	ug/L
		2,4-Dinitrophenol	< 160	ug/L
		2,4-Dinitrotoluene	< 33	ug/L
		2,6-Dinitrotoluene	< 33	ug/L
		2-Chloronaphthalene	< 33	ug/L
		2-Chlorophenol	< 33	ug/L
		2-Methylnaphthalene	51	ug/L
		2-Methylphenol (o-Cresol)	< 33	ug/L
		2-Nitroaniline	< 160	ug/L
		2-Nitrophenol	< 33	ug/L
		3,3'-Dichlorobenzidine	< 66	ug/L
		3-Methylphenol	< 33	ug/L
		3-Nitroaniline	< 160	ug/L
		4,6-Dinitro-2-methylphenol	< 160	ug/L
		4-Bromophenyl phenyl ether	< 33	ug/L
		4-Chloro-3-methylphenol	< 33	ug/L
		4-Chloroaniline	< 33	ug/L
		4-Chlorophenyl phenyl ether	< 33	ug/L
		4-Methylphenol	250	ug/L
		4-Nitroaniline	< 160	ug/L
		4-Nitrophenol	< 160	ug/L
		Acenaphthene	< 33	ug/L
		Acenaphthylene	< 33	ug/L

HALLIBURTON NUS
Environmental Corporation
Environmental Laboratories

5350 Campbells Run Road
Pittsburgh, PA 15205

900 Gemini Avenue
Houston, TX 77058

October 01, 1992
Report No.: 00020808

LABORATORY ANALYSIS REPORT

CLIENT NAME: ENRON GAS PIPELINE/TRANSWESTERN
SAMPLE ID: STATION 9 - PIT
NUS SAMPLE NO: H0219130

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		Acetophenone	< 33	ug/L
		Aniline	< 33	ug/L
		Anthracene	< 33	ug/L
		Benzidine	< 160	ug/L
		Benzo(a)anthracene	< 33	ug/L
		Benzo(a)pyrene	< 33	ug/L
		Benzo(b)fluoranthene	< 33	ug/L
		Benzo(ghi)perylene	< 33	ug/L
		Benzo(k)fluoranthene	< 33	ug/L
		Benzoic Acid	< 160	ug/L
		Benzyl alcohol	< 33	ug/L
		Benzyl butyl phthalate	< 33	ug/L
		Bis(2-Chloroethoxy)methane	< 33	ug/L
		Bis(2-Chloroethyl)ether	< 33	ug/L
		Bis(2-Chloroisopropyl)ether	< 33	ug/L
		Bis(2-Ethylhexyl)phthalate	< 33	ug/L
		Chrysene	< 33	ug/L
		Di-n-buthyl phthalate	< 33	ug/L
		Di-n-octyl phthalate	< 33	ug/L
		Dibenzofuran	< 33	ug/L
		Diethyl phthalate	< 33	ug/L
		Dimethyl phthalate	< 33	ug/L
		Fluoranthene	< 33	ug/L
		Fluorene	< 33	ug/L
		Hexachlorobenzene	< 33	ug/L
		Hexachlorobutadiene	< 33	ug/L
		Hexachlorocyclopentadiene	< 33	ug/L
		Hexachloroethane	< 33	ug/L
		Indeno(1,2,3-cd)pyrene	< 33	ug/L
		Isophorone	< 33	ug/L
		N-Nitrosodimethylamine	< 33	ug/L
		N-Nitrosodiphenylamine	< 33	ug/L
		Naphthalene	34	ug/L
		Nitrobenzene	< 33	ug/L
		Pentachlorophenol	< 160	ug/L
		Phenanthrene	< 33	ug/L
		Phenol	< 33	ug/L
		Pyrene	< 33	ug/L
		Pyridine	< 66	ug/L

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LABORATORY ANALYSIS REPORT

CLIENT NAME: ENRON GAS PIPELINE/TRANSWESTERN
SAMPLE ID: STATION 9 - PIT
NUS SAMPLE NO: H0219130

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		n-Nitroso-di-n-propylamine	< 33	ug/L
3	OVIXW	APPENDIX IX VOLATILES IN WATER		
		1,1,1-Trichloroethane	180	ug/L
		1,1,2,2-Tetrachloroethane	< 30	ug/L
		1,1,2-Trichloroethane	< 30	ug/L
		1,1-Dichloroethane	560	ug/L
		1,1-Dichloroethene	< 30	ug/L
		1,2,3-Trichloropropane	< 30	ug/L
		1,2-Dichloroethane	< 30	ug/L
		1,2-Dichloropropane	< 30	ug/L
		1,4-Dichloro-2-butene	< 60	ug/L
		2-Butanone (MEK)	220	ug/L
		2-Chloroethylvinyl Ether	< 60	ug/L
		2-Hexanone	< 60	ug/L
		4-Methyl-2-Pentanone (MIBK)	< 60	ug/L
		Acetone	< 60	ug/L
		Acrolein	< 600	ug/L
		Acrylonitrile	< 600	ug/L
		Benzene	370	ug/L
		Bromodichloromethane	< 30	ug/L
		Bromoform	< 30	ug/L
		Bromomethane	< 60	ug/L
		Carbon disulfide	< 30	ug/L
		Carbon tetrachloride	< 30	ug/L
		Chlorobenzene	< 30	ug/L
		Chlorodibromomethane	< 30	ug/L
		Chloroethane	< 60	ug/L
		Chloroform	< 30	ug/L
		Chloromethane	< 60	ug/L
		Dibromomethane	< 30	ug/L
		Dichlorodifluoromethane	< 120	ug/L
		Ethanol	*	ug/L
		Ethyl methacrylate	< 60	ug/L
		Ethylbenzene	110	ug/L
		Iodomethane (Methyl Iodide)	< 60	ug/L
		Methylene chloride	< 30	ug/L
		P/M Xylene	820	ug/L
		Styrene	< 30	ug/L
		Tetrachloroethene	< 30	ug/L

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LABORATORY ANALYSIS REPORT

CLIENT NAME: ENRON GAS PIPELINE/TRANSWESTERN
SAMPLE ID: STATION 9 - PIT
NUS SAMPLE NO: H0219130

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		Toluene	61	ug/L
		Trichloroethene	< 30	ug/L
		Trichlorofluoromethane	< 30	ug/L
		Vinyl acetate	< 60	ug/L
		Vinyl chloride	< 60	ug/L
		cis-1,2-Dichloroethene	< 30	ug/L
		cis-1,3-Dichloropropene	< 30	ug/L
		o-Xylene	120	ug/L
		trans-1,2-Dichloroethene	< 30	ug/L
		trans-1,3-Dichloropropene	< 30	ug/L
5	AASW	Arsenic, Total (As)	0.19	mg/L
6	ABAW	Barium, Total (Ba)	4.4	mg/L
7	ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
8	ACRW	Chromium, Total (Cr)	0.01	mg/L
9	AHGW	Mercury, Total (Hg)	< 0.0002	mg/L
10	AAGW	Silver, Total (Ag)	< 0.01	mg/L
11	APBW	Lead, Total (Pb)	< 0.05	mg/L
12	ASEW	Selenium, Total (Se)	< 0.003	mg/L
13	I685	Petroleum Hydrocarbons	37	mg/L

COMMENTS: * This analyte was not detected by a computerized search of the chromatogram.

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QUALITY CONTROL REPORT
SUPPLEMENTAL INFORMATION

		SAMPLE PREPARATION			SAMPLE ANALYSIS			
N	TEST CODE	PREP BATCH	LR-METHOD	DATE/TIME ANALYST	LR-METHOD	DATE/TIME ANALYST	ANLS BATCH	INSTRUMENT
SAMPLE ID: STATION 9 - PIT						NUS SAMPLE NO: H0219130		
	OSVIXW	26261	19-3520	23-SEP-92 0400 RDQ	19-8270	25-SEP-92 1205 GMW	26145	GCMST
	OVIXW	26366	NA		19-8240	25-SEP-92 1615 GBF	26278	GCMSQ
	AASW	26313	19-7060	23-SEP-92 0930 TM	19-7060	24-SEP-92 2224 CMG		405MET
	ABAW	26312	19-3010		19-6010	24-SEP-92 1215 JSP		400MET
	ACDW	26312	19-3010	23-SEP-92 0900 TM	19-7130	24-SEP-92 1942 PBA		300MET
	ACRW	26312	19-3010		19-6010	24-SEP-92 1405 JSP		400MET
	AHGW	26333	NA		19-7470	24-SEP-92 1000 RAS		124MAT
0	AAGW	26313	19-7060		19-7760	26-SEP-92 1004 CMG		300MET
1	APBW	26312	19-3010		19-6010	24-SEP-92 1405 JSP		400MET
2	ASEW	26313	19-7740		19-7740	24-SEP-92 1837 CMG		305MET
3	I685	26286	02-418.1		02-418.1	22-SEP-92 1159 LJH		302MAT

R Method Literature Reference
2 EPA-Methods for Chemical Analysis of Water & Wastes, 1984.
9 EPA-Test Methods for Evaluating Solid Waste, 3rd ed, Nov. 1986

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Section C Page 1

QUALITY CONTROL REPORT
SURROGATE STANDARD RECOVERY

LN	TEST CODE	SURROGATE COMPOUND	PERCENT RECOVERY	ACCEPTANCE LIMITS	REF LN
SAMPLE ID:	STATION 9 - PIT		NUS SAMPLE NO:	H0219130	
2	$BNAW	GC/MS BNA SURROGATES			1
		2,4,6-Tribromophenol	83	-	
		2-Fluorobiphenyl	87	-	
		2-Fluorophenol	28	-	
		Nitrobenzene-d5	53	-	
		Phenol-d5	28	-	
		p-Terphenyl-d14	53	-	
4	$VOAW	GC/MS VOLATILES SURROGATES			3
		1,2-Dichloroethane-d4	102	-	
		4-Bromofluorobenzene	109	-	
		Toluene-d8	98	-	

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QUALITY CONTROL REPORT
LABORATORY CONTROL SAMPLE RECOVERY

TEST CODE	DETERMINATION	PERCENT RECOVERY	ACCEPTANCE LIMITS
BATCH: 26286	SAMPLE ID: Lab Control Sample		NUS SAMPLE NO: H0219864
I685	Petroleum Hydrocarbons	94.0	-
I685	Petroleum Hydrocarbons	94.0	-
BATCH: 26312	SAMPLE ID: Lab Control Sample		NUS SAMPLE NO: H0219893
ABAW	Barium, Total (Ba)	90.0	-
ACDW	Cadmium, Total (Cd)	106.0	-
ACRW	Chromium, Total (Cr)	95.0	-
APBW	Lead, Total (Pb)	96.0	-
BATCH: 26313	SAMPLE ID: Lab Control Sample		NUS SAMPLE NO: H0219895
AAGW	Silver, Total (Ag)	105.0	-
AASW	Arsenic, Total (As)	115.0	-
ASEW	Selenium, Total (Se)	110.0	-
BATCH: 26333	SAMPLE ID: Lab Control Sample		NUS SAMPLE NO: H0219924
AHGW	Mercury, Total (Hg)	95.0	-

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QUALITY CONTROL REPORT
METHOD BLANK DATA

TEST CODE	Determination	RESULT	UNITS
BATCH: 26261	SAMPLE ID: Method Blank	NUS SAMPLE NO:	H0219836
OSVIXW	APPENDIX IX SEMIVOLATILES IN WATER		
	Di-n-buthyl phthalate	< 10	ug/L
	Di-n-octyl phthalate	< 10	ug/L
	Dibenzofuran	< 10	ug/L
	Diethyl phthalate	< 10	ug/L
	Dimethyl phthalate	< 10	ug/L
	Fluoranthene	< 10	ug/L
	Fluorene	< 10	ug/L
	Hexachlorobenzene	< 10	ug/L
	Hexachlorobutadiene	< 10	ug/L
	Hexachlorocyclopentadiene	< 10	ug/L
	Hexachloroethane	< 10	ug/L
	Indeno(1,2,3-cd)pyrene	< 10	ug/L
	1,2,4-Trichlorobenzene	< 10	ug/L
	1,2-Dichlorobenzene	< 10	ug/L
	1,3-Dichlorobenzene	< 10	ug/L
	1,4-Dichlorobenzene	< 10	ug/L
	2,4,5-Trichlorophenol	< 50	ug/L
	2,4,6-Trichlorophenol	< 10	ug/L
	2,4-Dichlorophenol	< 10	ug/L
	2,4-Dimethylphenol	< 10	ug/L
	2,4-Dinitrophenol	< 50	ug/L
	2,4-Dinitrotoluene	< 10	ug/L
	2,6-Dinitrotoluene	< 10	ug/L
	2-Chloronaphthalene	< 10	ug/L
	2-Chlorophenol	< 10	ug/L
	2-Methylnaphthalene	< 10	ug/L
	2-Methylphenol (o-Cresol)	< 10	ug/L
	2-Nitroaniline	< 50	ug/L
	2-Nitrophenol	< 10	ug/L
	4-Methylphenol	< 10	ug/L
	3,3'-Dichlorobenzidine	< 20	ug/L
	3-Nitroaniline	< 50	ug/L
	4,6-Dinitro-2-methylphenol	< 50	ug/L
	4-Bromophenyl phenyl ether	< 10	ug/L
	4-Chloro-3-methylphenol	< 10	ug/L
	Isophorone	< 10	ug/L
	N-Nitrosodimethylamine	< 10	ug/L
	N-Nitrosodiphenylamine	< 10	ug/L
	Naphthalene	< 10	ug/L

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METHOD BLANK DATA

TEST CODE	Determination	RESULT	UNITS
	Nitrobenzene	< 10	ug/L
	Pentachlorophenol	< 50	ug/L
	Phenanthrene	< 10	ug/L
	Phenol	< 10	ug/L
	Pyrene	< 10	ug/L
	Pyridine	< 20	ug/L
	n-Nitroso-di-n-propylamine	< 10	ug/L
	3-Methylphenol	< 10	ug/L
	4-Chloroaniline	< 10	ug/L
	4-Chlorophenyl phenyl ether	< 10	ug/L
	4-Nitroaniline	< 50	ug/L
	4-Nitrophenol	< 50	ug/L
	Acenaphthene	< 10	ug/L
	Acenaphthylene	< 10	ug/L
	Acetophenone	< 10	ug/L
	Aniline	< 10	ug/L
	Anthracene	< 10	ug/L
	Benzidine	< 50	ug/L
	Benzo(a)anthracene	< 10	ug/L
	Benzo(a)pyrene	< 10	ug/L
	Benzo(b)fluoranthene	< 10	ug/L
	Benzo(ghi)perylene	< 10	ug/L
	Benzo(k)fluoranthene	< 10	ug/L
	Benzoic Acid	< 50	ug/L
	Benzyl alcohol	< 10	ug/L
	Benzyl butyl phthalate	< 10	ug/L
	Bis(2-Chloroethoxy)methane	< 10	ug/L
	Bis(2-Chloroethyl)ether	< 10	ug/L
	Bis(2-Chloroisopropyl)ether	< 10	ug/L
	Bis(2-Ethylhexyl)phthalate	< 10	ug/L
	Chrysene	< 10	ug/L
BATCH: 26286	SAMPLE ID: Method Blank	NUS SAMPLE NO:	H0219865
I685	Petroleum Hydrocarbons	< 0.2	mg/L
I685	Petroleum Hydrocarbons	< 0.2	mg/L
BATCH: 26312	SAMPLE ID: Method Blank	NUS SAMPLE NO:	H0219894
ABAW	Barium, Total (Ba)	< 0.1	mg/L
ACDW	Cadmium, Total (Cd)	< 0.005	mg/L
ACRW	Chromium, Total (Cr)	< 0.01	mg/L
APBW	Lead, Total (Pb)	< 0.05	mg/L

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QUALITY CONTROL REPORT
METHOD BLANK DATA

	TEST CODE	Determination	RESULT	UNITS
BATCH: 26313	SAMPLE ID: Method Blank		NUS SAMPLE NO: H0219896	
	AAGW	Silver, Total (Ag)	< 0.01	mg/L
	AASW	Arsenic, Total (As)	< 0.003	mg/L
	ASEW	Selenium, Total (Se)	< 0.003	mg/L
BATCH: 26366	SAMPLE ID: Method Blank		NUS SAMPLE NO: H0219963	
	OVIXW	APPENDIX IX VOLATILES IN WATER		
		1,1,1-Trichloroethane	< 5	ug/L
		1,1,2,2-Tetrachloroethane	< 5	ug/L
		1,1,2-Trichloroethane	< 5	ug/L
		1,1-Dichloroethane	< 5	ug/L
		1,1-Dichloroethene	< 5	ug/L
		1,2,3-Trichloropropane	< 5	ug/L
		1,2-Dichloroethane	< 5	ug/L
		1,2-Dichloropropane	< 5	ug/L
		1,4-Dichloro-2-butene	< 10	ug/L
		2-Butanone (MEK)	< 10	ug/L
		2-Chloroethylvinyl Ether	< 10	ug/L
		2-Hexanone	< 10	ug/L
		4-Methyl-2-Pentanone (MIBK)	< 10	ug/L
		Acetone	< 10	ug/L
		Acrolein	< 100	ug/L
		Acrylonitrile	< 100	ug/L
		Benzene	< 5	ug/L
		Bromodichloromethane	< 5	ug/L
		Bromoform	< 5	ug/L
		Bromomethane	< 10	ug/L
		Carbon disulfide	< 5	ug/L
		Carbon tetrachloride	< 5	ug/L
		Chlorobenzene	< 5	ug/L
		Chlorodibromomethane	< 5	ug/L
		Chloroethane	< 10	ug/L
		Chloroform	< 5	ug/L
		Chloromethane	< 10	ug/L
		Dibromomethane	< 5	ug/L
		Dichlorodifluoromethane	< 20	ug/L
		Ethanol	*	ug/L
		Ethyl methacrylate	< 10	ug/L
		Ethylbenzene	< 5	ug/L
		Iodomethane (Methyl Iodide)	< 10	ug/L

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QUALITY CONTROL REPORT
METHOD BLANK DATA

TEST CODE	Determination	RESULT	UNITS
	Methylene chloride	< 5	ug/L
	P/M Xylene	< 5	ug/L
	Styrene	< 5	ug/L
	Tetrachloroethene	< 5	ug/L
	Toluene	< 5	ug/L
	Trichloroethene	< 5	ug/L
	Trichlorofluoromethane	< 5	ug/L
	Vinyl acetate	< 10	ug/L
	Vinyl chloride	< 10	ug/L
	cis-1,2-Dichloroethene	< 5	ug/L
	cis-1,3-Dichloropropene	< 5	ug/L
	o-Xylene	< 5	ug/L
	trans-1,2-Dichloroethene	< 5	ug/L
	trans-1,3-Dichloropropene	< 5	ug/L

* This analyte was not detected by a computerized search of the chromatogram.

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QUALITY CONTROL REPORT
DUPLICATE AND MATRIX SPIKE DATA

BATCH: 26313 NUS SAMPLE NO: H0219130

TEST	DETERMINATION	ORIGINAL RESULT	DUPLICATE RESULT	UNITS	RANGE / RPD	UNITS	MS RESULT	MS % RCVRY
AASW	Arsenic, Total (As)	0.19	0.20	mg/L	5.1	mg/L	0.20	— *
* The concentration of the analyte prevented accurate determination of the matrix spike recovery.								
AAGW	Silver, Total (Ag)	< 0.01	< 0.01	mg/L	—	mg/L	0.04	20.0
* Recovery of the spike indicates the presence of a matrix interference. This should be considered in evaluating the data.								
ASEW	Selenium, Total (Se)	< 0.003	< 0.003	mg/L	—	mg/L	< 0.003*	—
* Recovery of the spike indicates the presence of a matrix interference. This should be considered in evaluating the data.								

BATCH: 26312 NUS SAMPLE NO: H0219127

TEST	DETERMINATION	ORIGINAL RESULT	DUPLICATE RESULT	UNITS	RANGE / RPD	UNITS	MS RESULT	MS % RCVRY
ABAW	Barium, Total (Ba)	< 0.1	< 0.1	mg/L	—	mg/L	1.9	95.0
ACDW	Cadmium, Total (Cd)	< 0.005	< 0.005	mg/L	—	mg/L	0.027 *	54.0
* Recovery of the spike indicates the presence of a matrix interference. This should be considered in evaluating the data.								
ACRW	Chromium, Total (Cr)	0.01	0.01	mg/L	0.0	mg/L	0.20	95.0
APBW	Lead, Total (Pb)	< 0.05	< 0.05	mg/L	—	mg/L	0.48	96.0

BATCH: 26333 NUS SAMPLE NO: H0219127

TEST	DETERMINATION	ORIGINAL RESULT	DUPLICATE RESULT	UNITS	RANGE / RPD	UNITS	MS RESULT	MS % RCVRY
AHGW	Mercury, Total (Hg)	< 0.0002	< 0.0002	mg/L	—	mg/L	0.0037	92.5