## PIT REMEDIATION PLAN AND CLOSURE REPORT



E. Clinton Suite 102 Hobbs, New Mexico 88240 505/397-0510 Fax 505/393-4388

1RO54

### Safety & Environmental Solutions, Inc.

February 28, 2003

Mr. Wayne Price New Mexico Oil Conservation Division 1220 S. St. Francis Drive Santa Fe. New Mexico 87505

RE: Plugging of Chevron Texaco Naomi Keenan Monitor Wells

Dear Wayne:

The following is a description of how the Chevron Texaco Naomi Keenan Monitor wells were plugged.

In November of 1998 Safety & Environmental Solutions, Inc. (SESI) installed three (3) ground monitor at the Naomi Keenan Site located in Unit O of Section 14, Township 21S, Range 37E, in Lea county New Mexico. The monitor wells were sampled for a period of almost two years. The samples reveled that the monitor wells had no BTEX and the Chlorides level was minimal. The results did not appear to indicate any appreciable increase in Chloride concentration. A letter dated March 30, 2001 was sent to you requesting that the site receive final closure and the monitor wells be plugged. That request was approved on June 27, 2002.

On February 3, 2003 SESI arrived on the site to plug all three monitor wells. The casing in each well was cut off at a depth of 5 feet below ground surface and the monitor well pads and risers were excavated. The bottom of each well was filled with 50 lbs. of Betonite and 46.3 lbs. of cement and then backfilled to normal grade. The monitor well pads and risers were transported to Lea County Landfill in Eunice, New Mexico.

If you should have any questions regarding this matter or if I may be of further service please contact me at 505-397-0510.

Thank you.

Bob Allen, CHMM, REM, CET, CES

President

BA/jl

### Price, Wayne

From:

Price. Wavne

Sent:

Thursday, June 27, 2002 2:44 PM

To:

'mriw@chevron.com' 'ballen@sesi-nm.com'

Cc:

Subject:

Chevron USA Naomi Keenan OCD Case # 1R0054

Contacts:

R.W. (Rick) Massey

### Dear Mr. Massey:

The OCD is in receipt of the final report dated March 30, 2001 submitted by Safety & Environmental Solutions, Inc. OCD herby approves of the closure of this site. Please provide a monitor well plugging report by September 10, 2002.

Please be advised that NMOCD approval of this plan does not relieve Chevron of liability should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve Chevron of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Sincerely:

Wayne Price

New Mexico Oil Conservation Division

1220 S. Saint Francis Drive

Santa Fe, NM 87505

app Pai

505-476-3487

505-476-3462 fax:

E-mail: WPRICE@state.nm.us



P.O. Box 1613 703 E. Clinton Suite 102 Hobbs, New Mexico 88240 505/397-0510 Fax 505/393-4388 www.sesi-nm.com

### Safety & Environmental Solutions, Inc.

March 30, 2001

Mr. Wayne Price Mr. Bill Olson New Mexico Oil Conservation Division 1220 S. St. Francis Drive Santa Fe, New Mexico 87505 APR 4 2001

1RO054

Dear Wayne and Bill:

This letter is being written on behalf of Chevron USA regarding the Naomi Keenan Leak Site. We have sampled the monitor wells onsite for a period of almost two years. I have enclosed a graph and table of sample results for that period for your information. As you can see, the monitor wells have no BTEX and the Chloride level is minimal. The water in up gradient well contains the highest level of Chlorides and this has been the case since the installation. The results do not appear to indicate any appreciable increase in Chloride concentration.

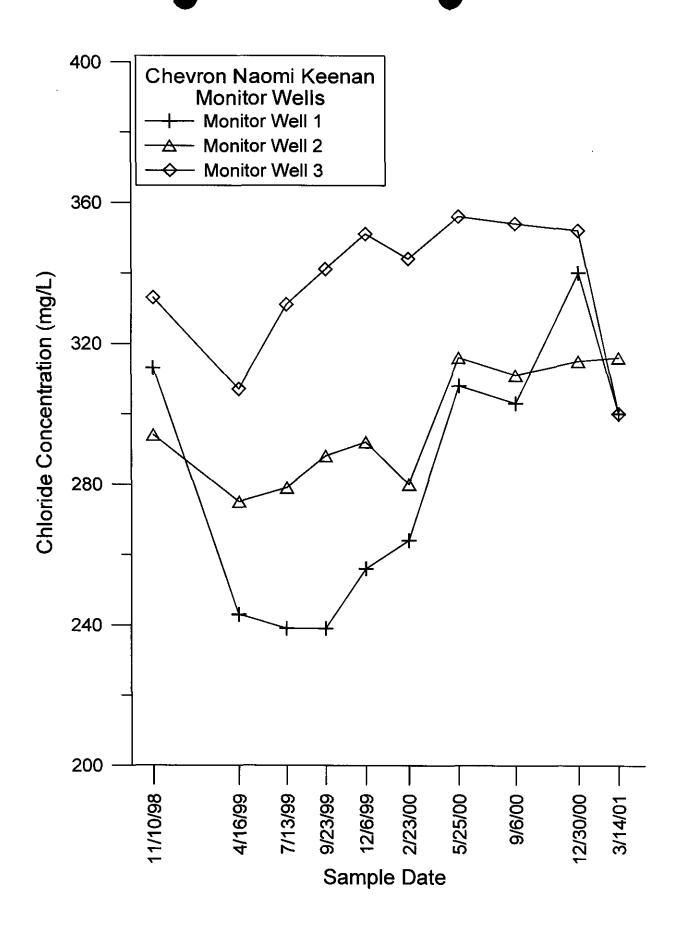
In light of these sampling results, we would request that this site receive final closure and the monitor wells be plugged.

If you have any questions, or I can be of further assistance please contact me at (505) 397-0510.

Sincerely,

Bob Allen CHMM, REM, CET, CES

President



## Monitor Well 1

	TPH (mg/L)		·	88.9	<2.5	<10	<1.00	<1.00	<1.00	<1.00	2.00	<1.00	6.90	N/A
	Total Xylenes	(mg/L)		0.027	<0.006	<0.006	>0.006	<0.006	<0.006	>0.006	<0.006	<0.006	<0.006	0.62
	E. Benzene	(mg/L)		0.016	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.75
	Toluene (mg/L)			0.023	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.75
	Benzene	(mg/L)		0.008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.01
	TDS (mg/L)			1,045	996	896	896	971	1,017	948	1,215	1,177	1,139	1,000
	Selenium	(mg/L)		80.0	<.05	<.05	<:05	<.05	0.057	<0.05	<0.05	<0.05	0.063	0.05
	Chloride	(mg/L)		313	243	239	239	256	264	308	303	340	300	250
	Date			36109	36266	36354	36426	36500	36579	36671	36775	36890	36964	
Monitor Well 1	Contaminant:		Date:	11/10/98	4/16/99	7/13/99	9/23/99	12/6/99	2/23/00	5/25/00	00/9/6	12/30/00	3/14/01	WQCC Standard

## Monitor Well 2

Monitor Well 2		:							
Contaminant:	Date	Chloride (mg/L)	Selenium (mg/L)	TDS (mg/L)	Benzene (mg/L)	Toluene (mg/L)	E. Benzene (mg/L)	Total Xylenes (mg/L)	TPH (mg/L)
Date:		) }	) )						
11/10/98	36109	294	0.12	1,030	0.007	0.024	0.021	0.039	64.9
4/16/99	36266	275	<0.05	1,068	<.002	<.002	<:002	900'>	<2.5
7/13/99	36354	279	<0.05	1,073	<.002	<:002	<:002	> 9000	<10
9/23/99	36426	288	<0.05	1,060	<.002	<.002	<.002	900'>	44.1
12/6/99	36500	292	<0.05	1,055	<.002	<.002	<:002	>000	<1.0
2/23/00	36579	280	<0.05	1,066	<.002	<:002	<:002	900'>	<1.0
5/25/00	36671	316	<0.05	1,022	<.002	<.002	<:002	900'>	1.52
00/9/6	36775	311	<0.05	1,151	<.002	<:002	<.002	>000	1.45
12/30/00	36890	315	<0.05	1,064	<.002	<.002	<.002	>000	<1.0
3/14/01	36964	316	0.092	1,154	<.002	<.002	<.002	>:000	1.53
			;						
WQCC Standard		250	0.05	1,000	0.01	0.75	0.75	0.62	N/A

## Monitor Well 3

Chloride (mg/L)		Selenium (mg/L)	TDS (mg/L)	Benzene (mg/L)	Toluene (mg/L)	E. Benzene (mg/L)	Total Xylenes (mg/L)	TPH (mg/L)
333		0.13	1118	900 0	0.002	0.019	0.034	28.4
307		<0.05	1,162	<0.002	<0.002	<0.002	<0.006	<2.5
331		<0.05	1,230	<0.002	<0.002	<0.002	00.00	<10
341		<0.05	1,169	<0.002	<0.002	<0.002	<0.006	3.55
351	1	<0.05	1,170	<0.002	<0.002	<0.002	>0.006	<1.0
344		<0.05	1,174	<0.002	<0.002	<0.002	<0.006	<1.0
356	1	<0.05	1,169	<0.002	<0.002	<0.002	>0.006	<1.0
354	1	<0.05	1,226	<0.002	<0.002	<0.002	>00.006	1.72
352		<0.05	1,169	<0.002	<0.002	<0.002	>0.006	<1.0
300		0.064	1,180	<0.002	<0.002	<0.002	900'0>	<1.0
250		0.05	1,000	0.01	0.75	0.75	0.62	N/A



April 14, 1999

### CERTIFIED MAIL RETURN RECEIPT NO. P 288 259 120

Mr. Curtis Blake Chevron USA P.O. Box 1949 Eunice, NM 88231

Re:

Chevron Naomi Keenan (old pit)

UL O Sec 14-Ts21s-R37e

The New Mexico Oil Conservation Division (NMOCD) is in receipt of Chevron USA's (CUSA) two documents "Naomi Keenan Monitor Well Report dated November 10, 1998 and Naomi Keenan Closure Report" dated December 15, 1998 submitted by Safety & Environmental Solutions, Inc. for the above referenced facility. The NMOCD has the following comments and request:

- 1. The closure report indicated there will be continued monitoring for the next 18 months.

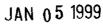
  Therefore NMOCD will defer comments on closure until the final monitoring is completed.
- 2. The groundwater data reflects Chlorides, TDS and Selenium were in exceedence of the WQCC groundwater standards. Therefore CUSA will be required to install additional monitor well(s) to determine the extent of the contamination.
- 3. The report did not have the final bottom and sidewall analytical results nor were the BTEX or Chlorides levels for the remediated soils that were placed back in the hole included in the report. Please provide at time of closure.
- 4. At time of closure CUSA shall install a permanent marker to be located in the center of the pit area to provide for future protection of the liner system. CUSA shall submit to NMOCD for approval the design of the permanent marker system.

If you require any further information or assistance please do not hesitate to write or call me at (505-827-7155). SENDER: I also wish to receive the ■ Complete items 1 and/or 2 for additional services ■ Complete items 3, 4a, and 4b. following services (for an Sincerely Yours, extra fee): your name and address on the reverse of this form so that we can return this card to you.

Attach this form to the front of the mailpiece, or on the back if space does not Service 1. Addressee's Address permit.

Write "Return Receipt Requested" on the mailpiece below the article number. 2. Restricted Delivery ■ The Return Receipt will show to whom the article was delivered and the date Consult postmaster for fee. Receipt ۶ 3. Article Addressed to: Article Number 288 259 120 Wayne Price-Pet, Engr. Si completed Return CHEVRON USA Environmental Bureau 4b. Service Type P.O. BOX 1949 Registered using ☐ Express Mail ☐ Insured RETURN ADDRESS OCD Hobbs Offic CC: EUNICE NM 88231 ☐ Return Receipt for Merchandise ☐ COD 7. Date of Delivery you for ALL: NR. BLAKE 5. Received By: (Print Name) 8. Addressee's Address and fee'is paid! if requested 6. Signature: (Addressee or Agent) PS Form 3811, December 1994 Domestic Return Receipt





Environmental Bureau Oil Conservation Division P.O. Box 1613 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 505/397-0510 fax 505/393-4388

Safety & Environmental Solutions, Inc.

December 31, 1998

Mr. Wayne Price New Mexico Oil Conservation Division 2040 S. Pacheco Santa Fe, New Mexico 87505

Dear Wayne:

Please find enclosed both the Naomi Keenan Monitor Well Report and the Closure Report for Chevron USA in Lea County, New Mexico.

If you have any questions, please feel free to contact my office. Thank you.

Sincerely,

Bob Allen REM, CET, CES

mus R. Allan

President

BA/baa

enclosures



### NEW MEXICO ENERGY, MINERALS & NATURAL RESOURCES DEPARTMENT



Jennifer A. Salisbury

September 16, 1998

Mr. Curtis Blake Chevron USA (CUSA) P.O. Box 1949 Eunice, NM 88231

Re:

Chevron Naomi Keenan (old pit)

Sec 14-Ts21s-R37e

Dear Mr. Blake:

New Mexico Oil Conservation Division (NMOCD) is in receipt of the Work Plan for the above referenced site submitted by Safety & Environmental Solutions. Inc. The plan is hereby approved and subject to the following conditions:

- 1. An NMOCD pit closure report form shall be submitted at the end of the project.
- 2. The first round of groundwater sampling shall also include WQCC metals.
- 3. Pursuant to NMOCD Rule 116 CUSA shall notify the NMOCD upon discovery of groundwater contamination.
- 4. NMOCD shall be given a 48 hour notification before work commences or any significate event, such as monitor well drilling or sampling, bottom hole sampling, etc.
- 5. All monitor well closures must receive NMOCD approval prior to closing.
- All waste disposed of off-site must receive NMOCD approval.
- All future submittals shall include the Unit Letter in the legal description.
- 8. CUSA shall commence work on or before October 15, 1998. Extensions may be granted upon written request for a good cause shown.

Please be advised that NMOCD approval of this plan does not relieve CUSA of liability should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD District I approval does not relieve CUSA of responsibility for compliance with any other federal, state, or local laws and/or regulations.

If you require any further information or assistance please do not hesitate to call (505-393-6161) or write this office.

Sincerely Yours,

Wayne Price-Environmental Engineer

cc: Chris Williams-NMOCD District I Supervisor

Bill Olson-Environmental Bureau, Santa Fe, NM

attachments-pit closure form



### NEW MEXICO ENERGY, MINERALS & NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION DISTRICT I HOBBS PO BOX 1980, Hobbs, NM 88241 (505) 393-6161 FAX (505) 393-0720

Jennifer A. Salisbury CABINET SECRETARY January 8, 1998

Mr. Curtis Blake Operations Supervisor Chevron U.S.A. P.O. Box 1949 Eunice, NM 88231

Re:

Texas-NM Pipeline spill/Chevron pit Eunice Area(Keenan)-Bill Stevans property.

Subject:

Listing of action items generated during meeting.

Dear Mr. Curtis Blake and Donald Griffin:

Pursuant to the meeting held in the NMOCD Hobbs, NM office on January 7, 1998 concerning the above referenced site the NMOCD has the following action items that were agreed upon in the meeting, these are as follows:

- 1. Chevron will perform an environmental site assessment and delineate the vertical and horizontal extent of the contaminates in the pit area. The findings of the investigation will be submitted to the NMOCD on March 4, 1998 which was the agreed next scheduled meeting.
- 2. New Mexico Oil Conservation Division (NMOCD) agreed to supply Chevron information pertaining to NMOCD's legal authority in conducting such activities. Please find enclosed in part a copy of the New Mexico Statutes 1978 Annotated Chapter 70 Oil and Gas Act 70-2-12 Enumeration of powers primarily item B.(21).

Please note any further legal questions concerning this matter should be directed to the NMOCD legal department Mr. Rand Carroll located at NMOCD, 2040 S. Pacheco, Santa Fe, NM 887505.

The NMOCD wants to personally thank both parties in their wiliness to cooperate on a voluntary basis and achieve a proper closure for the above referenced site.

If you require any further information or assistance please do not hesitate to call (505-393-6161) or write this office.

Sincerely Yours,

Wayne Price-Environmental Engineer

cc: Chris Williams-NMOCD District I Supervisor

Roger Anderson-Environmental Bureau Chief

Rand Carroll- NMOCD Legal Bureau, Santa Fe, NM.

Tony Savoie- TNMPL

attachments: NMOCD Oil & Gas Act in part.

### NEWMEXICO STATUTES 1978

ANNOTATED

Chapter 70 Oil and Gast

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Law reviews. — For comment on Continental Oil Co. v. Oil Conservation Comm'n, 70 N.M. 310, 373 P.2d 809 (1962), see 3 Nat. Resources J. 178 (1963).

Am. Jur. 2d, A.L.R. and C.J.S. references. — 38 Am. Jur. 2d Gas and Oil §§ 145 to 148, 157. 58 C.J.S. Mines and Minerals §§ 229, 234.

### 70-2-12. Enumeration of powers.

A. Included in the power given to the oil conservation division is the authority to collect data; to make investigations and inspections; to examine properties, leases, papers, books and records; to examine, check, test and gauge oil and gas wells, tanks, plants, refineries and all means and modes of transportation and equipment; to hold hearings; to provide for the keeping of records and the making of reports and for the checking of the accuracy of the records and reports; to limit and prorate production of crude petroleum oil or natural gas or both as provided in the Oil and Gas Act [this article]; to require either generally or in particular areas certificates of clearance or tenders in connection with the transportation of crude petroleum oil or natural gas or any products of either or both oil and products or both natural gas and products.

B. Apart from any authority, express or implied, elsewhere given to or existing in the oil conservation division by virtue of the Oil and Gas Act or the statutes of this state, the division is authorized to make rules, regulations and orders for the purposes and with respect to the subject matter stated in this subsection:

(1) to require dry or abandoned wells to be plugged in a way to confine the crude petroleum oil, natural gas or water in the strata in which it is found and to prevent it from escaping into other strata; the division shall require a cash or surety bond in a sum not to exceed fifty thousand dollars (\$50,000) conditioned for the performance of such regulations;

(2) to prevent crude petroleum oil, natural gas or water from escaping from strata in which it is found into other strata;

(3) to require reports showing locations of all oil or gas wells and for the filing of logs and drilling records or reports;

(4) to prevent the drowning by water of any stratum or part thereof capable of producing oil or gas or both oil and gas in paying quantities and to prevent the premature and irregular encroachment of water or any other kind of water encroachment which reduces or tends to reduce the total ultimate recovery of crude petroleum oil or gas or both oil and gas from any pool;

(5) to prevent fires;

(6) to prevent "blow-ups" and "caving" in the sense that the conditions indicated by such terms are generally understood in the oil and gas business;

(7) to require wells to be drilled, operated and produced in such manner as to prevent injury to neighboring leases or properties;

(8) to identify the ownership of oil or gas producing leases, properties, wells, tanks, refineries, pipelines, plants, structures and all transportation equipment and facilities;

(9) to require the operation of wells with efficient gas-oil ratios and to fix such ratios;

(10) to fix the spacing of wells;

(11) to determine whether a particular well or pool is a gas or oil well or a gas or oil pool, as the case may be, and from time to time to classify and reclassify wells and pools accordingly;

(12) to determine the limits of any pool producing crude petroleum oil or natural gas or both and from time to time redetermine the limits;

(13) to regulate the methods and devices employed for storage in this state of oil or natural gas or any product of either, including subsurface storage;

(14) to permit the injection of natural gas or of any other substance into any pool in this state for the purpose of repressuring, cycling, pressure maintenance, secondary or any other enhanced recovery operations;

(15) to regulate the disposition of water produced or used in connection with the drilling for or producing of oil or gas or both and to direct surface or subsurface disposal of the water in a manner that will afford reasonable protection against contamination of fresh water supplies designated by the state engineer;

- (16) to determine the limits of any area containing commercial potash deposits and from time to time redetermine the limits;
- (17) to regulate and, where necessary, prohibit drilling or producing operations for oil or gas within any area containing commercial deposits of potash where the operations would have the effect unduly to reduce the total quantity of the commercial deposits of potash which may reasonably be recovered in commercial quantities or where the operations would interfere unduly with the orderly commercial development of the potash deposits;
- (18) to spend the oil and gas reclamation fund and do all acts necessary and proper to plug dry and abandoned oil and gas wells in accordance with the provisions of the Oil and Gas Act and the Procurement Code, including disposing of salvageable equipment and material removed from oil and gas wells being plugged by the state;
- (19) to make well price category determinations pursuant to the provisions of the Natural Gas Policy Act of 1978 or any successor act and, by regulation, to adopt fees for such determinations, which fees shall not exceed twenty-five dollars (\$25.00) per filing. Such fees shall be credited to the account of the oil conservation division by the state treasurer and may be expended as authorized by the legislature;
- (20) to regulate the construction and operation of oil treating plants and to require the posting of bonds for the reclamation of treating plant sites after cessation of operations;
- (21) to regulate the disposition of nondomestic wastes resulting from the exploration, development, production or storage of crude oil or natural gas to protect public health and the environment; and
- (22) to regulate the disposition of nondomestic wastes resulting from the oil field service industry, the transportation of crude oil or natural gas, the treatment of natural gas or the refinement of crude oil to protect public health and the environment including administering the Water Quality Act [Chapter 74, Article 6 NMSA 1978] as provided in Subsection E of Section 74-6-4 NMSA 1978.

History: 1953 Comp., § 65-3-11, enacted by Laws 1978, ch. 71, § 1; 1986, ch. 76, § 1; 1987, ch. 234, § 61; 1989, ch. 289, § 1.

Cross references. — For filing rules and regulations, see 14-4-3 NMSA 1978. For public utilities commission's lack of power to regulate sale price at wellhead, see 62-6-4 NMSA 1978.

Repeals and reenactments. — Laws 1978, ch. 71, § 1, repealed 65-3-11, 1953 Comp. (former 70-2-12 NMSA 1978), relating to enumeration of powers, and enacted a new 70-2-12 NMSA 1978.

The 1986 amendment, effective May 21, 1986, substituted "oil conservation division" for "division" in Subsection A and in the introductory paragraph of Subsection B; substituted "provided in the Oil and Gas Act" for "in this act provided" in Subsection A; substituted "the Oil and Gas Act" for "this act" in the introductory paragraph of Subsection B; substituted "cash or surety bond" for "corporate surety bond" in Subsection B(1); added Subsection B(19), and made minor stylistic changes throughout the section.

The 1987 amendment, effective July 1, 1987, in Subsection B(18), substituted "Procurement Code" for "Public Purchases Act"; added Subsection B(20);

and made minor changes in language and punctuation throughout the section.

The 1989 amendment, effective June 16, 1989, added Subsections B(21) and B(22).

Procurement Code. — See 13-1-28 NMSA 1978 and notes thereto.

Natural Gas Policy Act. — The federal Natural Gas Policy Act of 1978, referred to in Paragraph B(19), appears as 15 U.S.C. § 3301 et seq.

Powers pertaining to oil well fires. — The lawmakers intended commission not only to seek fire prevention to conserve oil, but also to conserve other property and lives of persons peculiarly subject to hazard of oil well fires. Continental Oil Co. v. Brack, 381 F.2d 682 (10th Cir. 1967).

The terms "spacing unit" and "proration unit" are not synonymous and commission has power to fix spacing units without first creating proration units. Rutter & Wilbanks Corp. v. Oil Conservation Comm'n, 87 N.M. 286, 532 P.2d 582 (1975).

Am. Jur. 2d, A.L.R. and C.J.S. references. — 38 Am. Jur. 2d Gas and Oil §§ 145 to 163. 58 C.J.S. Mines and Minerals §§ 229 to 243.

### 70-2-13. Additional powers of commission or division; hearings before examiner; hearings de novo.

In addition to the powers and authority, either express or implied, granted to the oil conservation commission or division by virtue of the statutes of the state of New Mexico, the division is hereby authorized and empowered in prescribing its rules of order or procedure in connection with hearings or other proceedings before the division to provide for the appointment of one or more examiners to be members of the staff of the division to conduct hearings with respect to matters properly coming before the division and to make reports



### Safety & Environmental

Solutions, Inc.

### **Chevron USA**



### Naomi Keenan Closure Report Lea County, New Mexico

Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 (505) 397-0510

### I. Physical Description

The subject site is an area approximately 106' X 70' situated immediately west of the Naomi Keenan tank battery located in Unit O of Section 14 Township 21 S Range 37 E in Lea County, New Mexico. (Vicinity Map) The land is privately owned.

### II. Background

The subject site was discovered after crude oil was released from the adjacent Texas New Mexico Pipeline Company line in July 1997. The crude oil spread over the site during the leak. The underlying contamination discovered at the subject site appeared to be historical. Safety & Environmental Solutions, Inc. (SES) was engaged on January 8, 1998 to perform a site assessment of an area. This assessment was performed in response to the letter from the New Mexico Oil Conservation Division District Office dated January 8, 1997. The release appeared to travel north following the lease road and then west over the subject area. The subject area had previously been plowed and fertilized to a depth of approximately 24" by Chevron USA. There was no evidence of past historical leaks along the pipeline.

The results of the assessment have been reported previously in the document entitled "Chevron USA Site Assessment, Section 14 Township 21 S Range 37 E, Lea County, New Mexico."

The New Mexico Oil Conservation Division (NMOCD), Chevron USA, and Texas and New Mexico Pipeline Company agreed that Texas and New Mexico Pipeline would remove and dispose of the top 6' to 8' of contaminated soil over the area suspected of being an abandoned pit.

On September 16, 1998, Chevron USA received approval, with conditions, of the Work Plan submitted to the NMOCD on September 1, 1998.

### III. Work Performed

The implementation of the approved work plan commenced on September 23, 1998. After excavation to the originally approved depth of 15', the soils still evidenced a strong hydrocarbon odor and visual contamination. Excavation was continued to a total depth of 42'. The final excavation area was 102' by 84' at surface with an inner hole at a 10' depth of 82' by 74'. The excavated soils were left to aerate and dry.

The work plan was amended at this time to address the limitations set forth by the final excavation depth. The close proximity of three pipelines surrounding the site did not allow the excavation to be opened to the width prescribed by the OSHA excavation standard. Placement of workers in the excavation at this time was deemed to be unlawful

and dangerous. The liner to be placed in the bottom of the excavation could not be installed without endangering personnel. The amended work plan was submitted and approved on October 7, 1998.

Upon approval of the amended work plan, the excavated area was backfilled with 8' of clean soil. The pit area was then backfilled with 6' of dry and stabilized excavated soils having a field Total Petroleum Hydrocarbon (TPH) reading of 6326.4 ppm. The next 6' of excavation was backfilled with stabilized soils that had a field TPH reading of 12506.4 ppm. The next 5' of stabilized soil backfilled into the excavation had a field TPH reading of 9000 ppm. The next 7' of excavation was backfilled with stabilized soils that had a field TPH reading of 8986.6 ppm. The next 5' of excavated area was backfilled with stabilized soils that had a field TPH reading of 9947.4 ppm. This soil was domed at the center of the excavation for an additional 2'. The domed area was then covered with a liner as approved in the work plan. The remaining excavated area was then backfilled to grade with clean soil and seeded.

Installation of three monitor wells was completed as per the work plan and is detailed in the Monitor Well Report. The three monitor wells were initially tested for WQCC Metals, Major Cations & Anions, TPH and Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX). The initial test results indicate slightly elevated levels of Chlorides, Total Dissolved Solids (TDS) and Selenium. (Laboratory Analyticals)

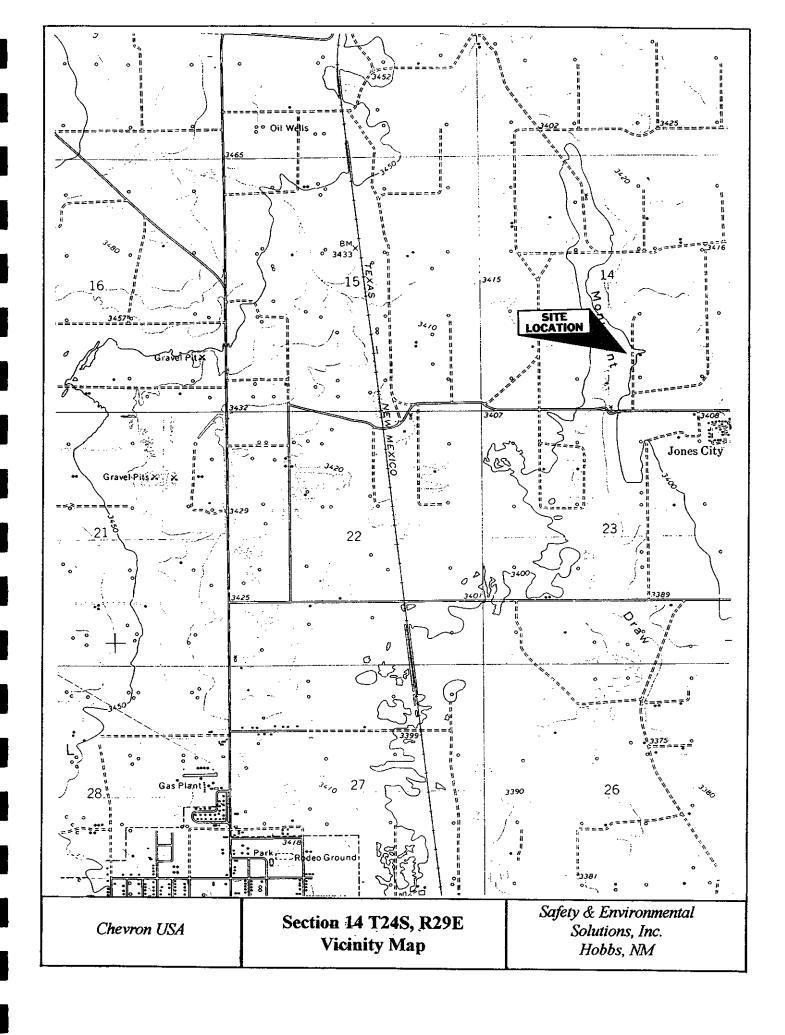
### IV. Conclusion

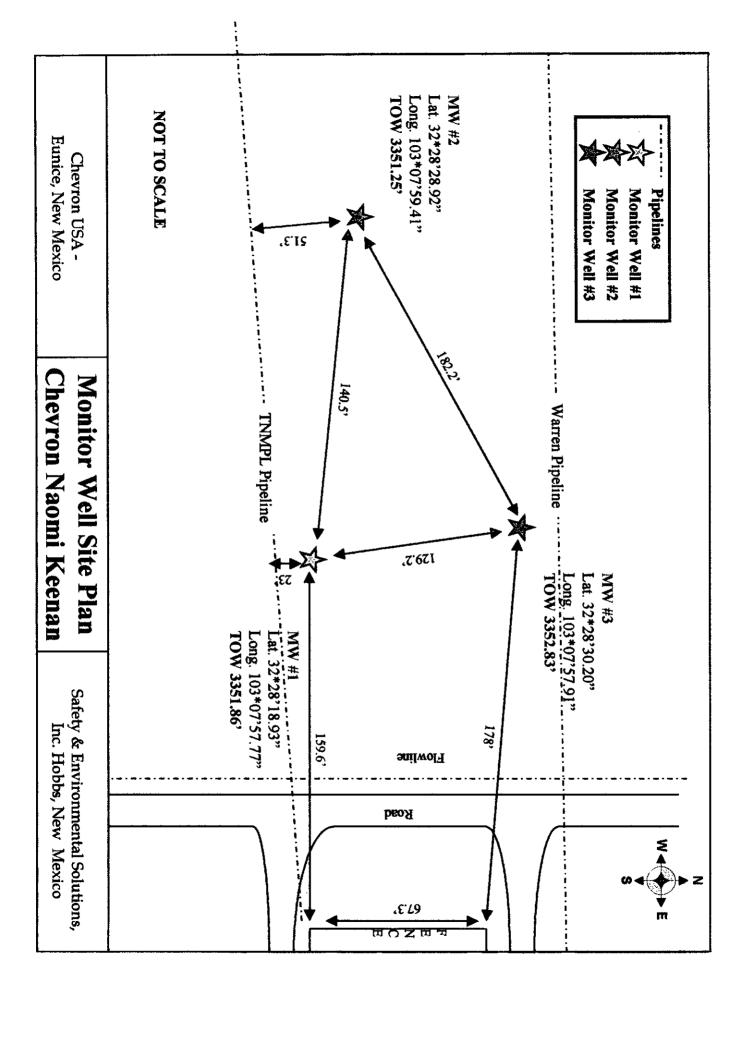
All worked completed at this site conformed to the Work Plan as amended. The levels of chlorides, TDS and Selenium were elevated in all three monitor wells. The TDS, chlorides and Selenium in monitor well #3, the up-gradient well, were 1118 ppm, 333 ppm and 0.13 ppm respectively. These levels represent the greatest extent of contamination of the three wells for those contaminants. The TPH level in monitor well #1, the southern most well, was 88.9 ppm which was the highest levels of the three wells for that contaminant. These levels of contamination are in excess of WQCC standards for those contaminants, however, the levels are only slightly above limits. In light of these findings, Chevron USA will continue to monitor these wells as prescribed in the approved work plan, sampling quarterly, for the identified contaminants over the next eighteen months.

 $i \in [n]$ 

### V. Maps and Figures

Vicinity Map
Site Plan
Laboratory Analyticals







CARDINAL LABS

PHONE (915) 673-7001 - 2111 BEECHWOOD - ABILENE, TX 79603

PHONE (505) 393-2326 · 101 E MARLAND · HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC. ATTN: DYKE BROWNING 703 W. CLINTON ST. SUITE 103 HOBBS, NM 88240 FAX TO:

Receiving Date: 11/10/98 Reporting Date: 11/17/98 Project Number, NOT GIVEN ... Project Name: NAOMI KEENAN

Project Location: EUNICE, NM

Sampling Date: 11/10/98

Sample Type: GROUNDWATER Sample Condition: COOL AND INTACT

Sample Received By: AH

Analyzed By: AH

		Na	Ca.	Mg	К	Conductivity	T-Alkalinity
LAB NUMBER	SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(u mhos/cm)	(mgCaCO <sub>3</sub> /L)
ANALYSIS DAT	TE:	11/12/98	11/12/98	11/12/98	11/12/98	11/12/98	11/12/98
H3920-1	WELL#1	184	69	36	14.10		168
H3920-2	WELL#2	125	85	47	8.35	1814	144
H3920-3	WELL #3	136	91	49	10.11	1969	140
Quality Control	The second secon	NRI	48	46:	4.96	1402	NR:
True Value QC		NR	50	50!	5.00		NR
% Recovery		NR	96	92	99	99.2	NR
Relative Percer	t Difference	NR	0	12.0	_	0.1	NR
METHODS:		SMS	3500-Ca-D	3500-Mg E	8049	120.1	310.1
		cr	SO <sub>4</sub>	CO₃	НСО₃	рH	TDS
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
ANALYSIS DAT	re:	11/12/98	11/12/98	11/12/98	11/12/98	11/12/98	11/12/98
H3920-1	WELL#1	313	124	0	205	7.74	1045
H3920-2	WELL #2	294	124	0	176	7.69	1030
H3920-3	WELL#3	333	123	0	171	7.91	1118
Quality Control		1301	48.64	112	221	6.96	NR
True Value QC		1319	50.00	124	259	7,00	NR
% Recovery		98.6	97.3	90.3	85.4	99	NR
Relative Percer	it Difference	0.2	0.6		_	0.1	0.7
METHODS:		SM4500-CI-B	375.4	310.1	310.1	150.1	160.1
			1			L	



PHONE (915) 673-700: • 2111 BEECHWOOD • ABILENE. TX 79603

PHONE (505) 393-2328 . 101 E. MARLAND . HOBBS, NM 88240

ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DYKE BROWNING

703 W. CLINTON ST. SUITE 103

HOBBS, NM 88240

FAX TO:

Receiving Date: 11/10/98

Reporting Date: 11/18/98

Project Number: NOT GIVEN

Project Name: NAOMI KEENAN

HAR Cashe

Project Location: EUNICE, NM

Sampling Date: 11/10/98

Sample Type: GROUNDWATER

Sample Condition: COOL AND INTACT

Sample Received By: AH

Analyzed By: BC

LAB NO.	SAMPLE ID "	TPH (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS	DATE:	11/17/98	11/11/98	11/11/98	11/11/98	11/11/98
H3920-1	WELL #1	88.9	0.008	0.023	0.016	0.027
H3920-2	WELL #2	64.9	0.007	0.024	0.021	0.039
H3920-3	WELL #3	28.4	0.006	0.022	0.019	0.034
			,,,,,,,			
Quality Con	itroi	154	0.091	0.097	0.096	: 0.291
True Value		150	0.100	0.100	0.100	0,300
% Recovery	Y	103	91.3	97.3	95.7	97.0
Relative Pe	rcent Difference	2.5	8.7	4.7	2.5	3.8

METHODS: TRPHC - EPA 600/7-79-020, 418.1; BTEX - EPA SW846-8020, 8260

Date

H3920-4.XLS



PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC. ATTN: DYKE BROWNING 703 W. CLINTON ST. SUITE 103 HOBBS, NM 88240 FAX TO:

Receiving Date: 11/10/98
Reporting Date: 11/19/98
Project Number: NOT GIVEN
Project Name: NAOMI KEENAN
Project Location: EUNICE, NM

Sampling Date: 11/10/98
Sample Type: GROUNDWATER
Sample Condition: COOL AND INTACT

Sample Received By: AH Analyzed By: AH

### RCRA METALS

LAB NUMBER SAMPLE ID	. ". As	Ag	Ba	Cd	Cr	Pb	Hg	Se
	ppm	ppm	mqq	ppm	ppm	ppm	ppm	ppm
ANALYSIS DATE:	11/17/98	11/17/98	11/17/98	11/17/98	11/17/98	11/17/98	11/17/98	11/17/98
H3920-1 WELL#1	<0.1	<0.05	<0.1	<0.01	<0.05	<0.05	<0.002	0.08
H3920-2 WELL #2	<0.1	<0.05	<1	<0.01	<0.05	<0.05	<0.002	0.12
H3920-3 WELL #3	<0.1	<0.05	<1	<0.01	<0.05	<0.05	<0.002	0.13
Quality Control	0.049	4.40	4.80	0.450	2.23	4.75	0.0082	0.0089
True Value QC	0.050	5.00	5.00	0.500	2.50		0.0082	0.0100
% Recovery	98	88	96	90	89	95	82	0.0100
Relative Percent Difference	7.27	2.5	0.9	3.2	4.7	3.4	2.0	0.3
METHODS: EPA 600/4-79-020	208.2	272.1	208.1	.213.1	218.1	239.1	245.1	270.2
METHODS: SW-846	7060A	7760A	7080A	7130	7190	7420	7470A	7740

Chémist Off Othe

Date

H3920-2.XL8



Receiving Date: 11/10/98

Reporting Date: 11/19/98

Project Number: NOT GIVEN

Project Name: NAOMI KEENAN

Project Location: EUNICE, NM

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DYKE BROWNING

703 W. CLINTON ST. SUITE 103

**HOBBS, NM 88240** 

FAX TO:

Sampling Date: 11/10/98

Sample Type: GROUNDWATER
Sample Condition: COOL AND INTACT

Sample Received By: AH

Analyzed By: AH

### TOTAL METALS

LAB NUMBER SAMPLE ID	Al	Co	Cu	Fe
	(ppm)	(ppm)	(ppm)	(ppm)
ANALYSIS DATE:	11/17/98	11/17/98	11/17/98	11/17/98
H3920-1 WELL #1	<5	<0.05	< 0.05	<1
H3920-2 WELL #2	<5	<0.05	<0.05	1
H3920-3 WELL #3	<5	<0.05	<0.05	<1
Quality Control	2.88	0.243	1.00	0.490
True Value QC	3.00	0.250	1.00	0.500
% Recovery	96	97	100	98
Relative Percent Difference	1.0	3.0	1.5	1.9
METHODS: EPA 600/04-79-020	202.1	219,1	220.1	236.1
•				
·	Mn	Мо	NI	Zn
	Mn (ppm)	Mo (ppm)	NI (ppm)	
ANALYSIS DATE:			(ppm)	(ppm)
ANALYSIS DATE: H3920-1 WELL #1	(ppm)	(ppm)	(ppm)	(ppm) 11/17/98
	(ppm)	(ppm)	(ppm) 11/17/98	(ppm) 11/17/98 <1
H3920-1 WELL #1	(ppm) 11/17/98 <0.2	(ppm) 11/17/98 <0.05	(ppm) 11/17/98 <0.05	(ppm) 11/17/98 <1 <1
H3920-1 WELL #1 H3920-2 WELL #2 H3920-3 WELL #3	(ppm) 11/17/98 <0.2 <0.2 <0.2 <0.2	(ppm) 11/17/98 <0.05 <0.05 <0.05	(ppm) 11/17/98 <0.05 <0.05 <0.05	(ppm) 11/17/98 <1 <1
H3920-1 WELL #1 H3920-2 WELL #2 H3920-3 WELL #3 Quality Control	(ppm) 11/17/98 <0.2 <0.2 <0.2 <0.2 0.098	(ppm) 11/17/98 <0.05 <0.05	(ppm) 11/17/98 <0.05 <0.05	<1 <1
H3920-1 WELL #1 H3920-2 WELL #2 H3920-3 WELL #3	(ppm) 11/17/98 <0.2 <0.2 <0.2 <0.2	(ppm) 11/17/98 <0.05 <0.05 <0.05 0.294	(ppm) 11/17/98 <0.05 <0.05 <0.05	(ppm) 11/17/98 <1 <1 <1
H3920-1 WELL #1 H3920-2 WELL #2 H3920-3 WELL #3  Quality Control True Value QC	(ppm) 11/17/98 <0.2 <0.2 <0.2 <0.2 0.098 0.100	(ppm) 11/17/98 <0.05 <0.05 <0.05  0.294 0.300	(ppm) 11/17/98 <0.05 <0.05 <0.05 2.43 2.50	(ppm) 11/17/98 <1 <1 <1 0.240 0.250

Chemist

Date

H3920-1,XLS

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page\_\_\_of\_\_\_

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s, INC.	70803
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LA	7000
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2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240	(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476
2111 Beechwood, Abilene, TX 79603	(915) 673-7001 Fax (915) 673-7020

Company Name:	AMS TAC		ANALYSIS REQUEST	
1		BILTO PO#:		
Address: 707 &	E. CHUTON, SUITE 103	Company:		
CHY: MORBS	State: NYZIP: 46740	Attn:		
# O	9	Address:		
		city:		
Project #:	Project Owner:	State: Zip:	(מי	
Project Name: $ extstyle \mathcal{N}_{\ell}$	Naomi Keenan	Phone #:	>u;	
Project Location:	EUNICC	Fax #:	-	
FOR LAB USE ONLY	MATRIX	PRES. SAMPLING		
	ЯЗТ		H	
LAB I.D.	TAWE	700		
•	SEADS OIL SOIL GROUI # CON	ACID: OTHER OTHER	TIME	
H3920-1	×	X	7 / 9211	
7-	X - 7 + 113(N)	X   11   10   1	1.35 / /	
-3	X   \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	11 01/11	// // 55/	
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enables. At others including those for service, in no event shall Cardinal be for	nabes, at dams handing these for nagions are any other cause whatever will be deemed varved (pless much to writing and received by Cardinal within 30 days after computed on the aspect of dams in writing and received by Cardinal within 30 days after computed on the aspect of dams in a server that Cardinal be table for hardinast or consequented campone, including without intalkings having the product of the cardinal dams are consequented campone, including without intalkings having the substitution.	verting and received by Cardeal within 30 days eithe completion of the applicable semplation, less of use, or lose of prefix incurred by client, the absolutesies,	ploutie	at chain of involve,
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Delivered By: (Circle One) Sampler - UPS - Bus - Other	Circle One) Sample Condition Cool Intact Cool Intact Yes Z Yes Z Yes No Yes Z Yes	CHECKED BY: (Initials)	54.5-1.50	
+ Cardinal can	↑ Cardinal cannot accept verbal changes. Please fax written chang	es to 915-673-7020.		

## MONITOR WELL REPORTS



### Safety & Environmental

Solutions, Inc.



### **Chevron USA**

### Naomi Keenan Monitor Well Report Lea County, New Mexico

Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 (505) 397-0510

### TABLE OF CONTENTS

I. Background	2
II.Work Performed	2
III. Monitor Well Installation	3
IV. Analytical Results	4
V. Conclusion	5
VI. Maps and Figures	4

### I. Background

Safety & Environmental Solutions, Inc. (SESI) was engaged on January 8, 1998 to perform a site assessment of an area contaminated by a hydrocarbon release from a pipeline owned by Texas New Mexico Pipeline in July 1997. (See Vicinity Map) This assessment was performed in response to the letter from the New Mexico Oil Conservation Division District Office dated January 8, 1997. The subject area is located in Unit O of Section 14 Township 21 S Range 37 E in Lea County, New Mexico. The release appeared to travel north following the lease road and then west over the subject area, which had previously been plowed and fertilized, to a depth of approximately 24" by Chevron USA.

### II. Work Performed

SESI contracted Atkins Engineering & Associates from Roswell, New Mexico to perform drilling services for this project. Cardinal Laboratories of Hobbs, New Mexico was also contracted to perform the laboratory analytical testing required for this project. Atkins Engineering used a hollow stem auger rig for the drilling and a split spoon for sampling. Three monitor wells were drilled on the subject site to the depth of the water table. (See Monitor Well Site Plan)

SES sampled the boreholes of the monitor wells at intervals of ten (10) feet and performed field analytical tests to determine the extent of contamination of each sample. The field analytical tests performed were Total Petroleum Hydrocarbons (TPH) (EPA Method 418.1) using a Mega TPH Analyzer, and Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) using headspace analysis with a Photovac Microtip MP 100 Photoionization Detector (PID) Serial # NA89005 calibrated with 100 ppm Isobutylene. Soil sampling was performed on soils from each test hole using SOPs found in Environmental Protection Agency, 1984, Characterization of Hazardous Waste Site - A Methods Manual: Vol II. Following is a breakdown of the field tests results for each well:

### **Monitor Well #1**

Depth	TPH	BTEX
10'	50 ppm	7.4 ppm
20°	67 ppm	2.0 ppm
30'	24 ppm	2.0 ppm
40'	52 ppm	4.4 ppm
50'	79 ppm	16.0 ppm
54'	62 ppm	12.0 ppm
60'	54 ppm	15.0 ppm
70'	54 ppm	4.7 ppm

### **Monitor Well #2**

Depth	ТРИ	BTEX		
10'	0 ppm	0 ppm		
20'	50 ppm	0 ppm		
30°	60 ppm	0 ppm		
40'	47 ppm	1.7 ppm		
50'	57 ppm	0 ppm		

### Monitor Well #3

Depth	TPH	BTEX
10'	50 ppm	0 ppm
20'	67 ppm	0 ppm
30'	62 ppm	0 ppm
40'	43 ppm	0 ppm

SESI contracted Basin Surveys to conduct a survey of the monitor wells to determine the mean sea level elevation of the tops of casing of each monitor well. (See Survey Plat)

SESI measured the distance from the top of casing of each monitor well to the top of water using a Solinst #2222 Water Level Indicator. The measurements are summarized as follows:

Well Number	TOC Elevation	Distance to TOW	TOW
1	3402.18'	50.32'	3351.86'
2	3399.58'	48.33'	3351.25'
3	3402.19°	49.36'	3352,83°

The measurements indicate a groundwater flow from northeast to southwest under the subject site.

### III. Monitor Well Installation

The monitor wells were installed according to the NMOCD approved work plan. A summary of each monitor well lithology is attached. (See Logs of Boring) Upon completion, samples were collected from the water table in each monitor well. The samples were preserved on ice and delivered along with Chain of Custody to Cardinal Laboratories for testing. The samples were analyzed for Total Petroleum Hydrocarbons (EPA Method 600/4-79-020, 418.1) and BTEX (EPA Method SW-846-8260), Cations and Anions, WQCC Metals, and Chlorides (EPA Method 600/4-79-020 325.3).

### IV. Analytical Results

The analysis of the groundwater samples performed by Cardinal Laboratories are summarized as follows:

Contaminant	WQCC	Monitor	Monitor	Monitor	
	Standard	Well #1	Well #2	Well #3	
Aluminum	5.0 ppm	<5.0 ppm	<5.0 ppm	<5.0 ppm	
Arsenic	0.1 ppm	<0.1 ppm	<0.1 ppm	<0.1 ppm	
Barium	1.0 ppm	<0.1 ppm	<1.0 ppm	<1.0 ppm	
Cadmium	0.01 ppm	<0.01 ppm	<0.01 ppm	<0.01 ppm	
Chloride	250.0 ppm	313 ppm	294 ppm	333 ppm	
Chromium	0.05 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm	
Cobalt	0.05 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm	
Copper	1.0 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm	
Iron	1.0 ppm	<1.0 ppm	1.0 ppm	<1.0 ppm	
Lead	0.05 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm	
Manganese	0.2 ppm	<0.2 ppm	<0.2 ppm	<0.2 ppm	
Mercury	0.002 ppm	<0.002 ppm	<0.002 ppm	<0.002 ppm	
Molybdenum	1.0 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm	
Nickel	0.2 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm	
Selenium	0.05 ppm	0.08 ppm	0.12 ppm	0.13 ppm	
Silver	0.05 ppm	<0.05 ppm	<0.05 ppm	<0.05 ppm	
Sulfate	600 ppm	124 ppm	124 ppm	123 ppm	
Zinc	10.0 ppm	<1.0 ppm	<1.0 ppm	<1.0 ppm	
TDS	1000.0 ppm	1045 ppm	1030 ppm	1118 ppm	
PH	>6&<9	7.74	7.69	7.91	
Benzene	0.01 ppm	0.008 ppm	0.007 ppm	0.006 ppm	
Toluene	0.75 ppm	0.023 ppm	0.024 ppm	0.022 ppm	
Ethyl Benzene	0.75 ppm	0.016 ppm	0.021 ppm	0.019 ppm	
Total Xylenes	0.62 ppm	0.027 ppm	0.039 ppm	0.034 ppm	
TPH		88.9 ppm	64.9 ppm	28.4 ppm	

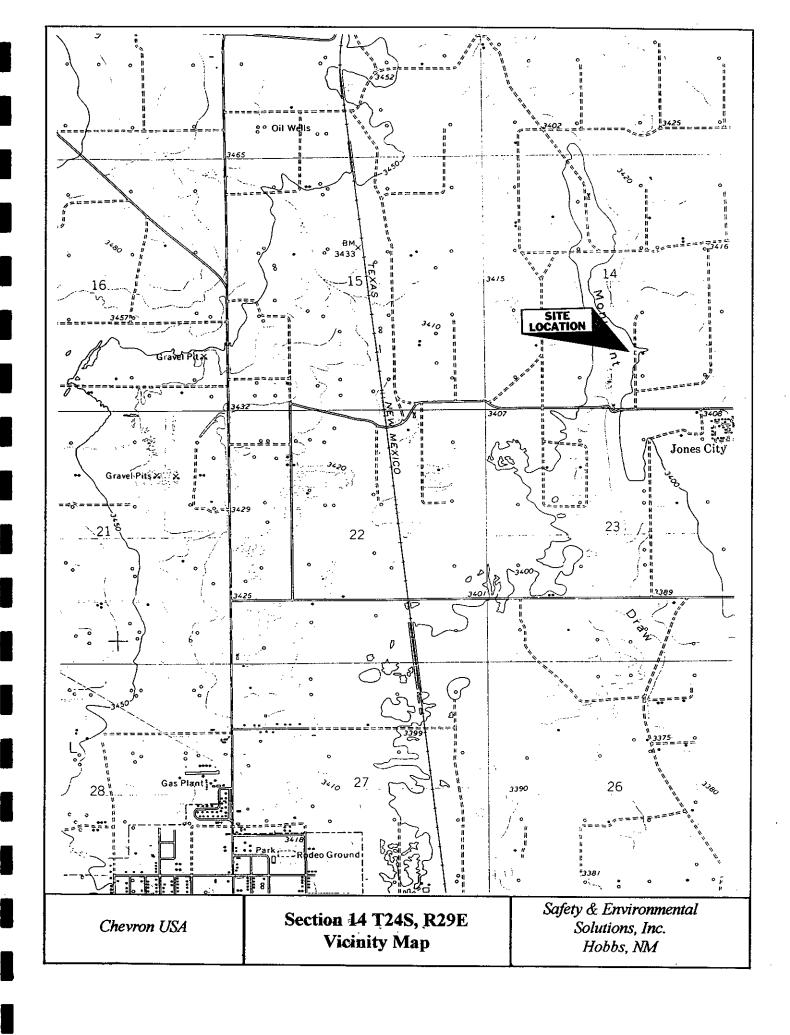
These tests showed slightly elevated levels of Total Dissolved Solids, Chlorides and Selenium above the WQCC limits in all three monitor wells. There were also readings for Total Petroleum Hydrocarbons in each monitor well. (See Attached Analytical Results)

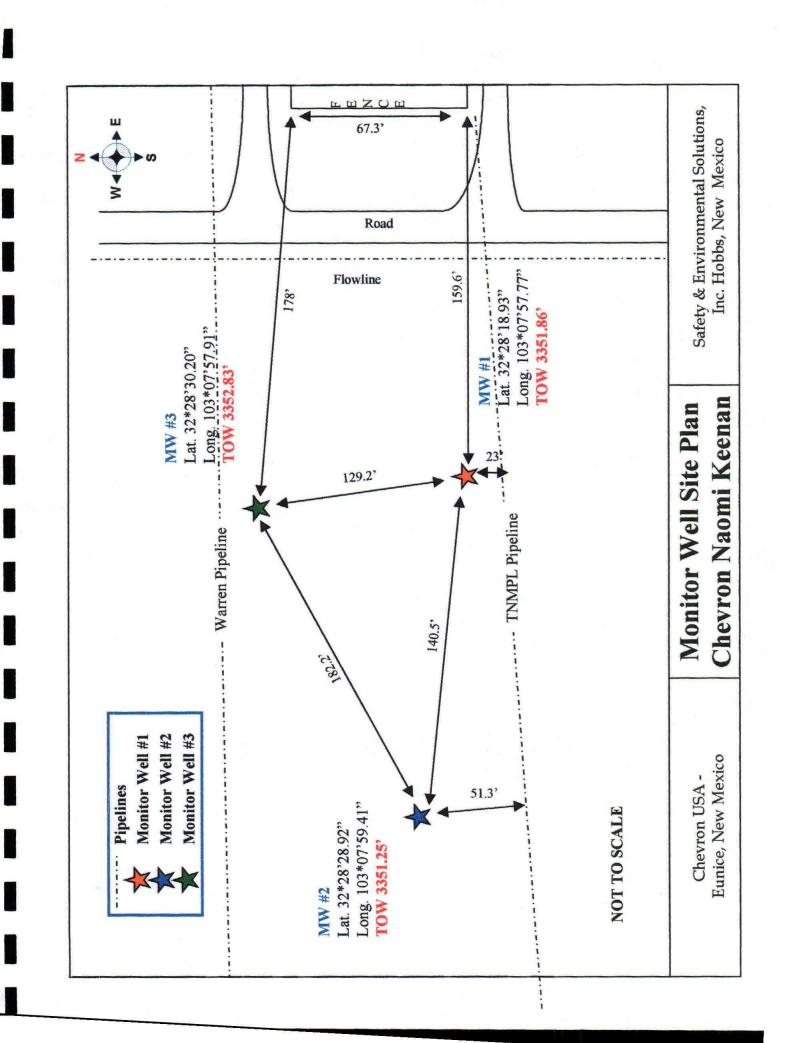
### V. Conclusion

The analytical results reported by Cardinal Laboratories indicates that there is elevated levels of TPH, TDS, Chlorides and Selenium in all three monitor well installed during this project. The occurrence of contaminants in monitor well # 3, the up-gradient well, indicate the presence of these in this area has occurred from sources other than the subject site. It must be noted that the highest levels of TDS, Chlorides, and Selenium occur in the up-gradient well. However, it must also be noted that the highest level of TPH (88.9 ppm) was found in the southern most well. The fact that the levels BTEX in all groundwater samples are below WQCC levels is also noteworthy. Chevron USA will continue to monitor the groundwater in these wells on a quarterly basis for a proposed period of 18 months. At the end of the monitoring period a re-evaluation of the contamination will be performed.

### VI. Maps and Figures

Vicinity Map
Monitor Well Site Plan
Logs of Boring
Survey Plat
Third Party Analytical Results





Atkin	s Er	ngin P	eerir	ng Associates, Inc. ox 3156	LOG	OF BORIN	IG Che	evron USA, I	nc. MW #1
				Mexico 88202					(Page 1 of 2)
Safety Environmental Solutions P.O. Box 1613 Hobbs, NM 88241 Contact: Mr. Dyke Browning			ox 1613 IM 88241	Date Drill Start Drill End	: 11-9-98 : 8:45 A.M. : 1:00 P.M.		Site Location Auger Type Logged by	: Section 14, T21S, R37E. : Hollowstern : Mort Bates	
	Job #98340.00				Boring Location	: South of Pit			·
							Well: M	W-1	
Depth in feet	GRAPHIC	nscs	Samples	DES	CRIPTION		Elev.:	- 4" x 4" x 5' Well Co	over
0-				Silty Clay w/Caliche, Tan,	Loose Dry				
-		CL			o.			- Concrete Cap	
5-									
   		SM		Silty Sand, Tan, Loose, D	у				
10 -			[1]	Silty Clayey Sand, Tan, Lo	ose, Dry				
		sc							
15		SM		Silty Sand w/Caliche, Tan	, Loose, Damp				
}		-		Sand, Red, Loose, Damp	<del></del>			— Grout	
20 -			2					Glock	
]									
-		SP							
25	<u> </u>	Sr.							
30				015					
			3	Sand, Tan, Loose, Damp		•			
	::.  ::::	SP							
<b>3</b> 5									
~	·			Silty Clayey Sand, Tan, L	rose Damn				
	//	sc		yy	reso, parip				
40	7:7	SP	<u> </u>	Sand, Tan to Red, Loose,	Damp		l NN	- Bentonite Seal	
								<u> </u>	

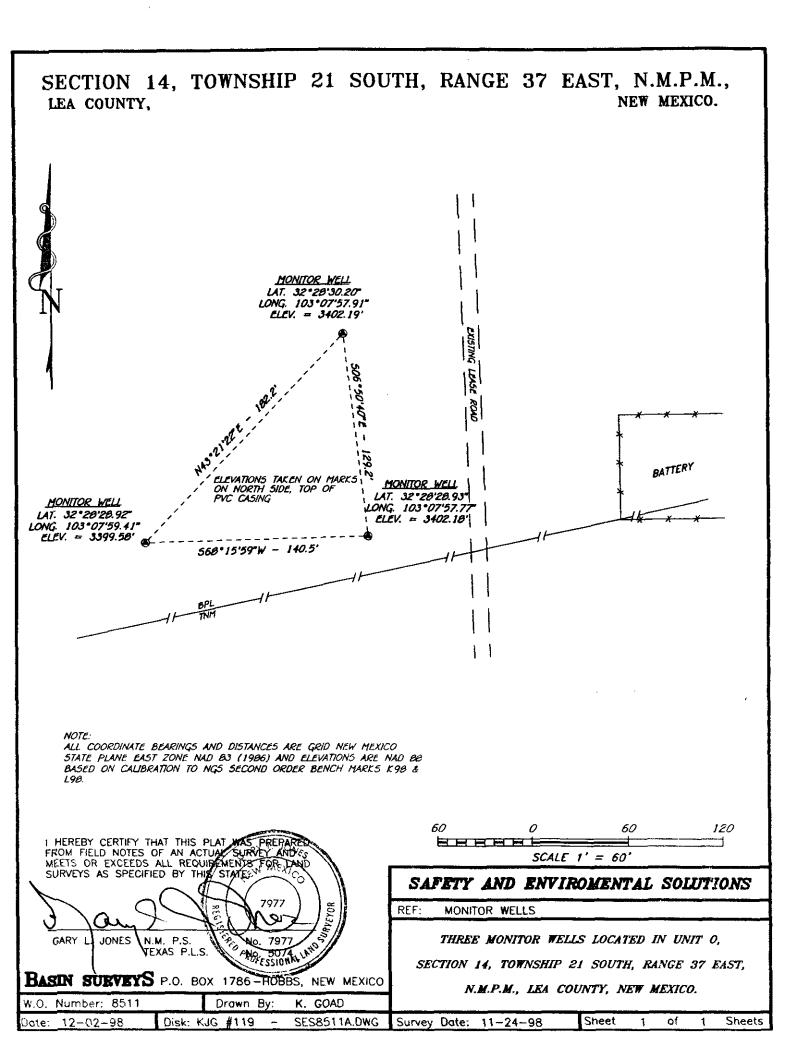
Atkins Engineering Associates, Inc. P.O. Box 3156 Roswell, New Mexico 88202									(Page 2 of 2)
	Safety Environmental Solutions P.O. Box 1613 Hobbs, NM 88241 Contact: Mr. Dyke Browning			ox 1613 NM 88241 Dyke Browning	Date Drill Start Drill End Boring Location	: 11-9-98 : 8:45 A.M. : 1:00 P.M. : South of Pit		Site Location Auger Type Logged by	: Section 14, T21S, R37 : Hollowstern : Mort Bates
	Job #98340.00				Covering Education	, Soull of Fit			<del></del>
Depth in feet	GRAPHIC	uscs	Samples	DES	SCRIPTION		Well: MV Elev.:	<b>V-1</b>	
40 -	:::1		4						•
-		SP							
45 -				Clay, Red, Stiff, Damp					
50 -		CL	5	WL @ 50 ft.			<b>V</b>	-8/16" Sand Pack	
55 - -		sc		Clayey Sand, Red, Soft, M	<b>Noist</b>			-2" PVC .020 Slot :	Screen
60 -		SP	6	Sand, Red, Soft, Saturate	d	·			
- 65 - - -		sc		Clayey Sand, Red, Stiff, V	Vet			- Backfill	
70 - - -	<i>/</i>			TD = 70 ft.					
- 75 - - -							-		
-							4 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		

	Ro	swel	l, New	ng Associates, Inc. ox 3156 Mexico 88202				evron USA, I	(Page 1 of 2)
		Ho ntact	P.O. B bbs, N :: Mr. 1	nental Solutions ox 1613 IM 88241 Dyke Browning	Date Drill Start Drill End Boring Location	: 11-9-98 : 1:25 P.M. : 5:30 P.M. : Southwest of I	Pit	Site Location Auger Type Logged by	: Section 14, T21S, R37E. : Hollowstern : Mort Bates
		• •	Job#9	8340.00	<u></u>				
Depth in feet	GRAPHIC	nscs	Samples	DES	SCRIPTION		Well: M Elev.:	1W-2 — 4" x 4" x 5' We∛l Co	over
0 -		CL		Silty Clay w/Caliche, Tan,	Loose, Dry			Concrete Cap	
5 ·				Caliche, White, Loose, Dr	у				
10	26.90 26.90	SP	1	Silty Sand w/Caliche, Tan	, Loose, Dry				
15				Sand, Reddish-Tan, Loos	e, Damp			— Grout	
20			2						
25 ·		SP	3					,	
35								—Bentonite Seal	
40								-8/16" Sand Pack	

				Mexico 88202					(Page 2 of 2)
		Ho	P.O. B obbs, N t: Mr.	mental Solutions lox 1613 NM 88241 Dyke Browning	Date Drill Start Drill End Boring Location	: 11-9-98 : 1:25 P.M. : 5:30 P.M. : Southwest of	ſ Pit	Site Location Auger Type Logged by	: Section 14, T21S, R378 : Hollowstern : Mort Bates
Depth in feet	GRAPHIC	uscs	Samples 6	8340.00 DES	SCRIPTION		Well: MV Elev.:	V-2	
40 -		sp	4	Clayey Sand, Reddish-Tal WL @ 43.80 ft.	n, Stiff, Damp		▼		
50 - - - -		sc	5	Clayey Sand, Red, Firm, N	Moist			-2" PVC .020 Slot : -8/16" Sand Pack	Screen
55 - - - - - -		SP		Sand, Red, Soft, Saturate					
- - - 65 -		sc		Clayey Sand, Red, Stiff, V	Vet			- Backfill	
- - - 70 - -						:			
75 -									
- - - 80									

	Re	oswel	l, New	ng Associates, Inc. ox 3156 Mexico 88202	200	OF BOININ			nc. MW #3 (Page 1 of 2)
	Safety Environmental Solutions P.O. Box 1613 Hobbs, NM 88241 Contact: Mr. Dyke Browning Job #98340.00		Date : 11-10-98 Drill Start : 6:55 A.M. Drill End : 12:30 P.M. Boring Location : North of Pit			Site Location Auger Type Logged by	: Section 14, T21S, R37E. : Hollowstem : Mort Bates		
Depth in feet	GRAPHIC	nscs	Samples	DES	SCRIPTION		Well: M	W-3 _ 4" x 4" x 5' Well Co	over
0 -				Silty Clay w/Caliche, Tan,	Loose, Dry		dh	Concrete Cap	
5 -		Cr		. 1				- Contrate Cap	
10 - - -			1	Silty Sand, Tan, Loose, D	ry				
15 - - - -		SM						Grout	
20 -			2						
25 - -				Sand, Tan, Loose, Damp					
30 -		SP	3						
35 - -				Clayey Sand, Tan, Loose	, Damp			- Bentonite Seal	
		sc			•	·		8/16" Sand Pack	

Atkin				ng Associates, Inc. ox 3156 Mexico 88202	LOG	OF BORII	ING Chevron USA, Inc. MW #3
	Safe	ety Er F Ho Intact	nvironi P.O. B bbs, N :: Mr.	mental Solutions lox 1613 NM 88241 Dyke Browning	Date Drill Start Drill End Boring Location	: 11-10-98 : 6:55 A.M. : 12:30 P.M. : North of Pit	
(Depth in feet	GRAPHIC	nscs	Samples	DES	SCRIPTION		Well: MW-3 Elev.:
40 - 45 - 50 - 55 - 60 - 70 -		SC SP SC SP	4	Sand, Reddish-Tan, Firm, M. Clayey Sand, Red, Firm, M. WL @ 48 ft.  Sand, Red, Soft, Saturate  TD = 60 ft.	.v. Moist		2" PVC .020 Slot Screen -8/16" Sand Pack





PHONE (915) 673-7901 - 2111 BEECHWOOD - ABILENE, TX 79603

PHONE (505) 393-2326 . 101 E MARLAND . HOBBS, NM 88240

ANALYTICAL RESULTS FOR
SAFETY & ENVIRONMENTAL SOLUTIONS, INC.
ATTN: DYKE BROWNING
703 W. CLINTON ST. SUITE 103
HOBBS, NM 88240
FAX TO:

Receiving Date: 11/10/98
Reporting Date: 11/17/98
Project Number: NOT GIVEN
Project Name: NAOMI KEENAN
Project Location: EUNICE, NM

Sampling Date: 11/10/98

Sample Type: GROUNDWATER
Sample Condition: COOL AND INTACT

Sample Received By: AH

Analyzed By: AH

	Na	Ca	Mg	к	Conductivity	T-Alkalinity
LAB NUMBER SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(u mhos/cm)	(mgCaCO <sub>3</sub> /L)
ANALYSIS DATE:	11/12/98	11/12/98	11/12/98	11/12/98	11/12/98	11/12/98
H3920-1 WELL #1	184	69	36	14.10	1805	168
H3920-2 WELL #2	125	85	47	8.35	1814	144
H3920-3 WELL#3	136	91	49	10.11	1969	140
Quality Control	NRI	48	46:	4.96	1402	NR
True Value QC	NR	50	50	5.00	1413	NR
% Recovery	NR	96	92	99	99.2	NR
Relative Percent Difference	NR	0	12.0		0.1	NR
METHODS:	SM3	3500-Ca-D	3500-Mg E	8049	120,1	310.1
	cr	SO <sub>4</sub>	CO₃	HCO <sub>3</sub>	pН	TDS
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
ANALYSIS DATE:	11/12/98	11/12/98	11/12/98	11/12/98	11/12/98	11/12/98
H3920-1 WELL#1	313	124	0	205	7.74	1045
H3920-2 WELL #2	294	124	0	176	7.69	1030
H3920-3 WELL#3	333	123	0	171	7.91	1118
Quality Control	1301	48.64	112	221	6.96	NR
True Value QC	1319	50.00	124	259	7,00	NR
% Recovery	98.6	97.3	90.3	85.4		NR
Relative Percent Difference	0.2	0.6		-	0.1	0.7

Chemist Halbah



PHONE (915) 673-7001 - 2111 BEECHWOOD - ABILENE, TX 79603

PHONE (505) 383-2328 · 101 E. MARLAND · HOBBS, NM 88240

ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DYKE BROWNING

703 W. CLINTON ST. SUITE 103

HOBBS, NM 88240

FAX TO:

Receiving Date: 11/10/98

Reporting Date: 11/18/98

Project Number: NOT GIVEN

Project Name: NAOMi KEENAN

Project Location: EUNICE, NM

Sampling Date: 11/10/98

Sample Type: GROUNDWATER

Sample Condition: COOL AND INTACT

Sample Received By: AH

Analyzed By: BC

LAB NO.	SAMPLE ID "	TPH (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS	DATE:	11/17/98	11/11/98	11/11/98	11/11/98	11/11/98
H3920-1	WELL #1	88.9	0.008	0.023	0.016	0.027
H3920-2	WELL #2	64.9	0.007	0.024	0.021	0.039
H3920-3	WELL #3	28.4	0.006	0.022	0.019	0.034
Quality Control		: 154	0.091	0.097	0.096	0.291
True Value QC		150	0.100	0.100	0.100	0.300
% Recovery		103	91.3	97.3	95.7	97.0
Relative Percent Difference		2.5	8,7	4.7	2.5	3,8

METHODS: TRPHC - EPA 600/7-79-020, 418.1; BTEX - EPA SW846-8020, 8260

Date

H3920-4.XLS



PHONE (505) 393-2328 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC. ATTN: DYKE BROWNING 703 W. CLINTON ST. SUITE 103 HOBBS, NM 88240 FAX TO:

Receiving Date: 11/10/98
Reporting Date: 11/19/98
Project Number: NOT GIVEN
Project Name: NAOMI KEENAN

Project Location: EUNICE, NM

Sampling Date: 11/10/98
Sample Type: GROUNDWATER
Sample Condition: COOL AND INTACT
Sample Received By: AH

Analyzed By: AH

### **RCRA METALS**

LAB NUMBER SAME	LE ID	As	, Ag	8a	Cd	Cr	₽b	Hg	Se
		ppm							
ANALYSIS DATE:		11/17/98	11/17/98	11/17/98	11/17/98	11/17/98	11/17/98	11/17/98	11/17/98
H3920-1 WELL	. #1	<0.1	<0.05	<0.1	<0.01	<0.05	<0.05	<0.002	0.08
H3920-2 WELL	#2	<0.1	<0.05	<1	<0.01	<0.05	<0.05	<0.002	0.12
H3920-3 WELL	#3	<0.1	<0.05	<1	<0.01	<0.05	<0.05	<0.002	0.13
Outside Control		0.046						0.000	0.0000
Quality Control		0.049	4.40	4.80	0.450	2.23	4.75	0.0082	0.0089
True Value QC		0.050	5.00	5.00	0.500	2.50	5.00	0.0100	0.0100
% Recovery		98	88	96	90	89	95	82	89
Relative Percent Diffe	rence	7.27	2.5	0.9	3.2	4.7	3.4	2,0	0.3
METHODS: EPA 600	0/4-79-020	206,2	272.1	208.1	213.1	218.1	239.1	245.1	270,2
METHODS:	SW-846	7060A		7080A	7130	7190		7470A	7740

Chémist Olff Cosh

Date

H3920-2 XLS



Receiving Date: 11/10/98

Reporting Date: 11/19/98

Project Number: NOT GIVEN

Project Name: NAOMI KEENAN

Project Location: EUNICE, NM

PHONE (916) 673-7001 . 2111 BEECHWOOD . ABILENE, TX 79603

PHONE (505) 383-2326 + 101 E. MARLAND + HOBBS, NM 88240

ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DYKE BROWNING

703 W. CLINTON ST. SUITE 103

HOBBS, NM 88240

FAX TO:

Sampling Date: 11/10/98

Sample Type: GROUNDWATER

Sample Condition: COOL AND INTACT

Sample Received By: AH

Analyzed By: AH

### **TOTAL METALS**

LAB NUMBER SAMPLE ID	Al	Co	Cu	Fe
	(ppm)	(ppm)	(ppm)	(ppm)
		. " '		• • •
ANALYSIS DATE:	11/17/98	11/17/98	11/17/98	11/17/98
H3920-1 WELL#1	<5	<0.05	<0.05	<1
H3920-2 WELL #2	<5	<0.05	<0.05	1
H3920-3 WELL #3	<5	<0.05	<0.05	<1
Quality Control	2.88	0.243	1.00	0.490
True Value QC	3.00	0.250	1.00	0.500
% Recovery	96	. 97	100	98
Relative Percent Difference	1.0	3.0	1.5	1.9
METHODS: EPA 600/04-79-020	202.1	219,1	220.1	236.1
	Mn	Mo	NI	Zn
	(ppm)	(ppm)	(ppm)	(ppm)
ANALYSIS DATE:	11/17/98	11/17/98	11/17/98	11/17/98
H3920-1 WELL #1	<0.2	<0.05	<0.05	. 4
110000 0				<1
H3920-2 WELL #2	<0.2	<0.05	<0.05	<1 <1
H3920-3 WELL #3	<0.2 <0.2			<1
H3920-3 WELL #3		<0.05	<0.05	<1
H3920-3 WELL #3 Quality Control		<0.05	<0.05	<1
H3920-3 WELL #3  Quality Control  True Value QC	<0.2	<0.05 <0.05	<0.05 <0.05	<1 <1 0.240
H3920-3 WELL #3 Quality Control	<0.2 0.098	<0.05 <0.05 0.294	<0.05 <0.05 2.43	<1 <1 0.240
H3920-3 WELL #3  Quality Control  True Value QC	0.098 0.100	<0.05 <0.05 0.294 0.300	<0.05 <0.05 2.43 2.50	<1 <1 0.240 0.250

Chemis Chemis

Date

H3920-1.XLS

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

ō

A ARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Mariand, Hobbs, NM 88240 (915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

where are you? Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of involce, and all codes of collections, including atterney's fees. but REOUEST ر محر ANALYSIS O No Additional Fax #: There you 3954-598 ved by Cardinal within 30 days after completion of the applicable HOI bove stried resease or otherwise.

| Phone Result: | Yes | Fax Result: | Yes | REMARKS: bes of use, or loss of profits incurred by ollent, its aubsidaries, 54,11 11,25 TIME SAMPLING #04 OITH 0 <u>0</u> ō Zip: DATE CHECKED BY: (Initials) : A3HTO Company: PRES Address: CE / COOF Phone #: Received By: (Lab Staff State: Fax#: CID: Attn: ë ë : ЯЭНТО Cool Intact MATRD **TIOS** State: NYZip: 477790 **WASTEWATER** BROWN ALLINGE E. CLINTON, SUITE 105 9 (G)AAB OR (C)OMP. Time: Project Owner: Time: PLEASE HOTE: Usady and Dunages. Cardina's babilty and dest's enotes Keena Sample I.D. 101 井3 C# 112/7 t) 5775 100 Sampler - UPS - Bus - Other: Delivered By: (Circle One) 397-0510 Naomi for. In the event shall Cardinal be Batte A NorgBS Project Manager: Company Name: Address: 70 3 Project Location: Relinguished By: FOR LAB USE ONLY Project Name: LAB I.D. 4 H3920 -Project #: Phone #: Fax#: Clty:

<sup>†</sup> Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.



# Safety & Environmental

Solutions, Inc.



# Chevron USA

# Naomi Keenan Monitor Well Report

Lea County, New Mexico

**RECEIVED** 

June 28, 1999

JUL 2 6 1999

ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 (505) 397-0510

## TABLE OF CONTENTS

L Background	2
II.Work Performed	2
III. Analytical Results	2
IV. Figures and Appendices	3

### I. Background

The subject property is located in Unit O of Section 14, Township 21S Range37E in Lea County, New Mexico. Safety & Environmental Solutions, Inc. (SESI) performed sampling and data collection on the three (3) ground water monitor wells previously installed in November 1998 at the site (See Vicinity Map). The casing size in all wells is 2".

### II. Work Performed

On April 16, 1999, SESI environmental technician W. Dee Whatley arrived at the site. Ground water samples were taken from each well after a hand bailer was used to develop the wells. Three to five casing volumes of water were removed from each well until pH and temperature of the water were stabilized. The samples were obtained and placed in appropriate containers, preserved and transported under chain of custody to Cardinal Laboratories of Hobbs, New Mexico for analysis of the contaminants identified in the initial sampling of November 1998. (See Analytical Data)

In addition to the sampling, SESI also measured the depth to the top of the water table and the total depth of each well. The depth to the top of ground water was measured using a Solinst water level indicator. The total depth of each well was measured in order to compute the proper casing volumes. A summary of this data follows:

ID	Date	Depth to Water	Water Z Elevation	Free Product Thickness
MW - 1	4/16/99	50.18'	67.88'	0.00
MW – 2	4/16/99	48.12'	56.33'	0.00
MW - 3	4/16/99	49.26'	59.11'	0.00

### III. Analytical Results

The analysis of the groundwater samples performed by Cardinal Laboratories are summarized as follows:

Contaminant	WQCC Standard	MW #1	MW #2	MW #3
Chloride	250.0 ppm	243ppm	275ppm	307ppm
Selenium	0.05 ppm	<.05ppm	<.05ppm	<.05ppm
TDS	1000 ppm	966ppm	1068ppm	1162ppm
Benzene	0.01 ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	<.002ppm	<.002ppm	<.002ppm
Ethyl Benzene	0.75 ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	<2.5ppm	<2.5ppm	<2.5ppm

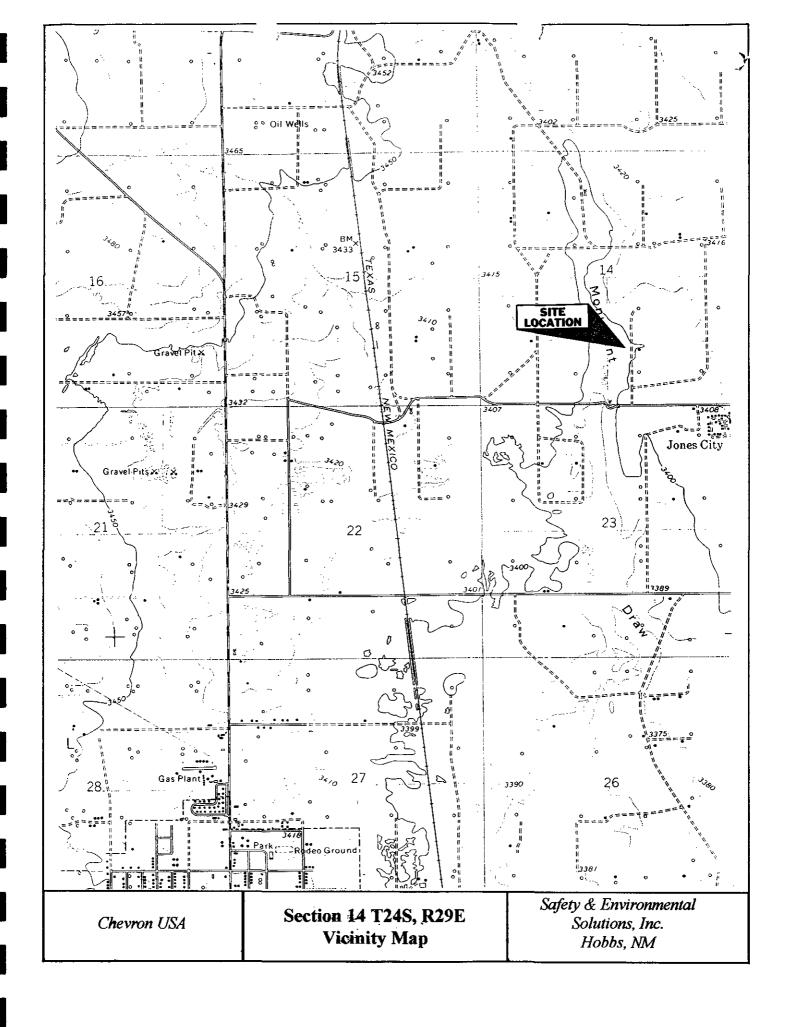
### IV. Figures and Appendices

Figures:

Vicinity Map

**Appendices:** Analytical Results

Figure 1 Vicinity Map



# Appendix A Analytical Results



PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC. ATTN: DEE WHATLEY 701 E. CLINTON. SUITE 103

HOBBS, NM 88240

FAX TO:

Receiving Date: 04/16/99

Reporting Date: 04/22/99 Project Owner: CHEVRON

Project Name: CHEVRON STEVENS MONITOR WELLS

Project Location: NAOMI KEENAN (CHEVRON)

Sampling Date: 04/16/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: GP Analyzed By: AH/GP

LAB NUMBER SAMPLE ID	TDS	CI	Se
	(mg/L)	(mg/L)	(mg/L)

ANALYSIS E	DATE	04/20/99	04/19/99	04/21/99
H4106-1	MW-#1	966	243	<0.05
H4106-2	MW-#2	1068	275	<0.05
H4106-3	MW-#3	1162	307	<0.05
Quality Cont	rol	NR	1255	0.051
True Value C	QC .	NR	1319	0.05
% Accuracy		NR	95	102
Relative Per	cent Difference	1.2	1.0	4.6

METHODS: EPA 600/4-79-020 160.1 325.3 270.2

Buy 44 Rathe

Date

H4106B.XLS



PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC. ATTN: DEE WHATLEY 701 E. CLINTON, SUITE 103 HOBBS, NM 88240

FAX TO:

Receiving Date: 04/16/99

Reporting Date: 04/17/99

Project Owner: CHEVRON
Project Name: CHEVRON STEVENS MONITOR WELLS

Project Location: NAOMI KEENAN (CHEVRON)

Sampling Date: 04/16/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: GP

Analyzed By: BC

					ETHYL	TOTAL
LAB NO.	SAMPLE ID	TPH	BENZENE	TOLUENE	BENZENE	XYLENES
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
•						

ANALYSIS I	DATE:	04/16/99	04/16/99	04/16/99	04/16/99	04/16/99
H4106-1	MW-#1	<2.5	<0.002	<0.002	< 0.002	<0.006
H4106-2	MW-#2	<2.5	<0.002	<0.002	< 0.002	<0.006
H4106-3	MW-#3	<2.5	<0.002	<0.002	<0.002	<0.006
Quality Con	trol	3070	0.090	0.099	0.097	0.290
True Value	QC	3000	0.100	0.100	0.100	0.300
% Recovery		102	89.5	99.3	97.3	96.6
Relative Per	cent Difference	2.2	2.3	0.5	5.1	3.3

METHODS: TRPHC - EPA SW-846 8015 M; BTEX - EPA SW-846 8260

Chemis

Date

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240

ARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of involve, and all costs of collections, including attomay's less. ا Page\_ ANALYSIS REQUEST ☐ No Additional Fax #: wer shall be deemed walved uniess made in writing and received by Cardinal within 30 days after completion of the applicable Phone Result 🗀 Yes Fax Result: 🗀 Yes In no evert shall Cardhai be fable for incidental or consequental changes, including without stritetion, business interruptions, toss of use, or loss of profits incursed by client, its subsidence, LEASE NOTE: LIBIDITY and Danagae. Cardnai's stablity and dear's anchaive remedy for any claim analog whether based in contract or loci, shall be similar to the amount paid by the clear for the services herwarder by Cardhal, regardess of whether each claim is based upon any of the above stated reasons or otherwise. Dates: // \_\_\_\_\_ | Phone Result © Yes Fax Result: REMARKS: TIME (505) 393-2326 Fax (505) 393-2476 SAMPLING BILL TO PO#: 16131 Zlp: DATE <u>-</u> ₹ : A3HTO PRES. Company: ICE / COOF Address: Max, to 16/1/5 Phone #: Received By: (Lab Staff State: Fax #: √CID: Attn: ĊţĊ : ЯЭНТО Cool Intact ( □ Yes □ Yes □ No □ No STADGE MATRIX Sample 7110S (915) 673-7001 Fax (915) 673-7020 **MASTEWATER SEQUINDWATER** 166/1/ 4800 M # CONTAINERS (G)AAB OR (C)OMP Project Owner: Zlp: Stevens Time: Time Sample I.D. State: 1 12 -Ħ ħ Sampler - UPS - Bus - Other: Delivered By: (Circle One) くさんじ 357.0510 393-438 Project Manager: Project Location: Company Name: FOR LAB USE ONLY Relinquished By: Project Name: LAB I.D. ーのそろ Phone #: Project #: Address: Fax #: CRY:

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.



# Safety & Environmental

Solutions, Inc.



AUG 03 1999
Environmental Bureau
Oil Conservation Division



# Chevron USA

Naomi Keenan Monitor Well Report Lea County, New Mexico

July 28, 1999

Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 (505) 397-0510

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I. Background	2
II.Work Performed	2
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### I. Background

The subject property is located in Unit O of Section 14, Township 21S Range37E in Lea County, New Mexico. Safety & Environmental Solutions, Inc. (SESI) performed sampling and data collection on the three (3) ground water monitor wells previously installed in November 1998 at the site (See Vicinity Map). The casing size in all wells is 2".

### II. Work Performed

On July 13, 1999, SESI environmental technician W. Dee Whatley arrived at the site. Ground water samples were taken from each well after a hand bailer was used to develop the wells. Three to five casing volumes of water were removed from each well until pH and temperature of the water were stabilized. The water that was removed was placed in appropriate drums for disposal. The samples were obtained and placed in appropriate containers, preserved and transported under chain of custody to Cardinal Laboratories of Hobbs, New Mexico for analysis of the contaminants identified in the initial sampling of November 1998. (See Analytical Data)

In addition to the sampling, SESI also measured the depth to the top of the water table and the total depth of each well. The depth to the top of ground water was measured using a Solinst water level indicator. The total depth of each well was measured in order to compute the proper casing volumes.

A summary of this data follows:

† ID	Date	Depth to Water	Total Well  Depth	Free Product Thickness
MW-1	7/13/99	50.38'	67.88'	0.00
MW-2	7/13/99	48.32'	56.33'	0.00
MW-3	7/13/99	49.46'	59.11'	0.00

### III. Analytical Results

The analysis of the groundwater samples performed by Cardinal Laboratories are summarized as follows:

Contaminant	WQCC	MW	MW	MW'
	Standard	#1	# <b>2</b>	#3
Chloride	250.0 ppm	239ppm	279ppm	331ppm
Selenium	0.05 ppm	<.05ppm	<.05ppm	<.05ppm
TDS	1000 ppm	968ppm	1073ppm	1230ppm
Benzene	0.01 ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	<.002ppm	<.002ppm	<.002ppm

Ethyl Benzene	0.75 ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	<10ppm	<10ppm	<10ppm

### IV. Figures and Appendices

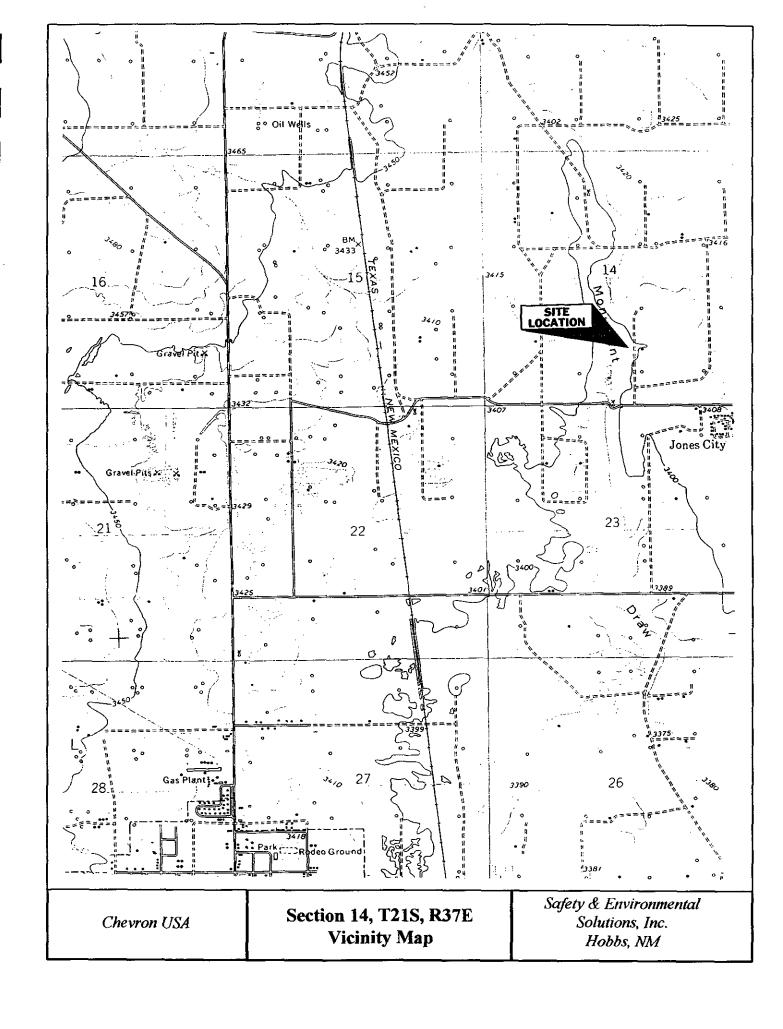
Figures:

Vicinity Map

Appendices:

Analytical Results

# Figure 1 Vicinity Map



# Appendix A Analytical Results



PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY

703 E. CLINTON, SUITE 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 07/13/99

Reporting Date: 07/14/99 Project Owner: NOT GIVEN

Project Name: NOT GIVEN

**Project Location: CHEVRON STEVENS** 

Sampling Date: 07/13/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: BC Analyzed By: AH/GP

LAB NUMBER SAMPLE ID	CI	TDS	Se
	(mg/L)	(mg/L)	(mg/L)
ANALYSIS DATE	07/13/99	07/13/99	07/13/99

ANALYSIS DATE	07/13/99	07/13/99	07/13/99
H4230-1 MW-1	239	968	<0.05
H4230-2 MW-2	279	1073	<0.05
H4230-3 MW-3	331	1230	<0.05
Quality Control	1295	NR	0.0451
True Value QC	1319	NR	0.0500
% Recovery	98.2	NR	90.2
Relative Percent Difference	2.3	0.4	2.3

		<u></u>	
METHODS: EPA 600/4-79-020	4500-CIB*	160.1	270.2

\*Std. Methods

Sayle Art

Chemist/

07/14/99 Date



### PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY 703 E. CLINTON, SUITE 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 07/13/99
Reporting Date: 07/14/99
Project Owner: NOT GIVEN

Project Name: NOT GIVEN

Project Location: CHEVRON STEVENS

Sampling Date: 07/13/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: BC

Analyzed By: BC

LAB NUMBER SAMPLE ID	GRO (C6-C10) (mg/L)	DRO (>C10-C28) (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE:	07/13/99	07/13/99	07/13/99	07/13/99	07/13/99	07/13/99
H4230-1 MW-1	<5.0	<5.0	<0.002	< 0.002	<0.002	<0.006
H4230-2 MW-2	<5.0	<5.0	<0.002	< 0.002	<0.002	<0.006
H4230-3 MW-3	<5.0	<5.0	<0.002	<0.002	<0.002	<0.006
Quality Control	56.4	55.5	0.086	0.098	0.098	0.299
True Value QC	60.0	60.0	0.100	0.100	0.100	0.300
% Recovery	93.9	92.5	86.3	98.4	98.3	99.7
Relative Percent Difference	4.8	11.5	1.5	4.2	6.5	4.3

METHODS: TPH(GRO & DRO) - EPA SW-846 8015 M; BTEX/MTBE-EPA SW-846 8260

Burgess J. A. Cooke. Ph. D.

Date

H4230A.XLS

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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2111 Beechwood, Abilene, TX 79603 101 East Mariand, Hobbs, NM 88240 (915) 873-7001 Fax (915) 873-7020 (505) 393-2328 Fax (505) 393-2476

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<sup>†</sup> Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.



# Safety & Environmental

Solutions, Inc.



# Chevron USA

Naomi Keenan Monitor Well Report Lea County, New Mexico



**September 28, 1999** 



Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 (505) 397-0510

## TABLE OF CONTENTS

L. Background	2
II.Work Performed	2
III. Analytical Results	
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IV. Figures and Appendices	3

### I. Background

The subject property is located in Unit O of Section 14, Township 21S Range37E in Lea County, New Mexico. Safety & Environmental Solutions, Inc. (SESI) performed sampling and data collection on the three (3) ground water monitor wells previously installed in November 1998 at the site (See Vicinity Map). The casing size in all wells is 2".

### II. Work Performed

On September 23, 1999, SESI environmental technician W. Dee Whatley arrived at the site. Ground water samples were taken from each well after a hand bailer was used to develop the wells. Three to five casing volumes of water were removed from each well until pH and temperature of the water were stabilized. The water that was removed was placed in appropriate drums for disposal. The samples were obtained and placed in appropriate containers, preserved and transported under chain of custody to Cardinal Laboratories of Hobbs, New Mexico for analysis of the Major Cations & Anions, and Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX). (See Analytical Data)

In addition to the sampling, SESI also measured the depth to the top of the water table and the total depth of each well. The depth to the top of ground water was measured using a Solinst water level indicator. The total depth of each well was measured in order to compute the proper casing volumes.

A summary of this data follows:

1D	Date	Depth to Water	Total Well Depth	Free Product Thickness
MW - 1	9/23/99	50.19'	67.88'	0.00
MW – 2	9/23/99	48.13'	56.33'	0.00
MW - 3	9/23/99	49.29'	59.11'	0.00

### III. Analytical Results

The analysis of the groundwater samples performed by Cardinal Laboratories are summarized as follows:

Contaminant	WQCC	MW	MW	MW
	Standard	#1	#2	#3
Chloride	250.0 ppm	243ppm	288ppm	341ppm
Selenium	0.05 ppm	<.05ppm	<.05ppm	<.05ppm
TDS	1000 ppm	958ppm	1060ppm	1169ppm
Benzene	0.01 ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	<.002ppm	<.002ppm	<.002ppm

Ethyl Benzene	0.75 ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	<1.0ppm	44.1ppm	3.55ppm

SAMPLE	Na	Ca	Mg	К	$CO_3$	$SO_4$	$HCO_3$
11)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
MW - 1	150	94	32	6.91	0	176	215
MW – 2	170	102	31	5.12	0	200	176
MW – 3	181	109	39	6.0	0	197	181

### IV. Figures and Appendices

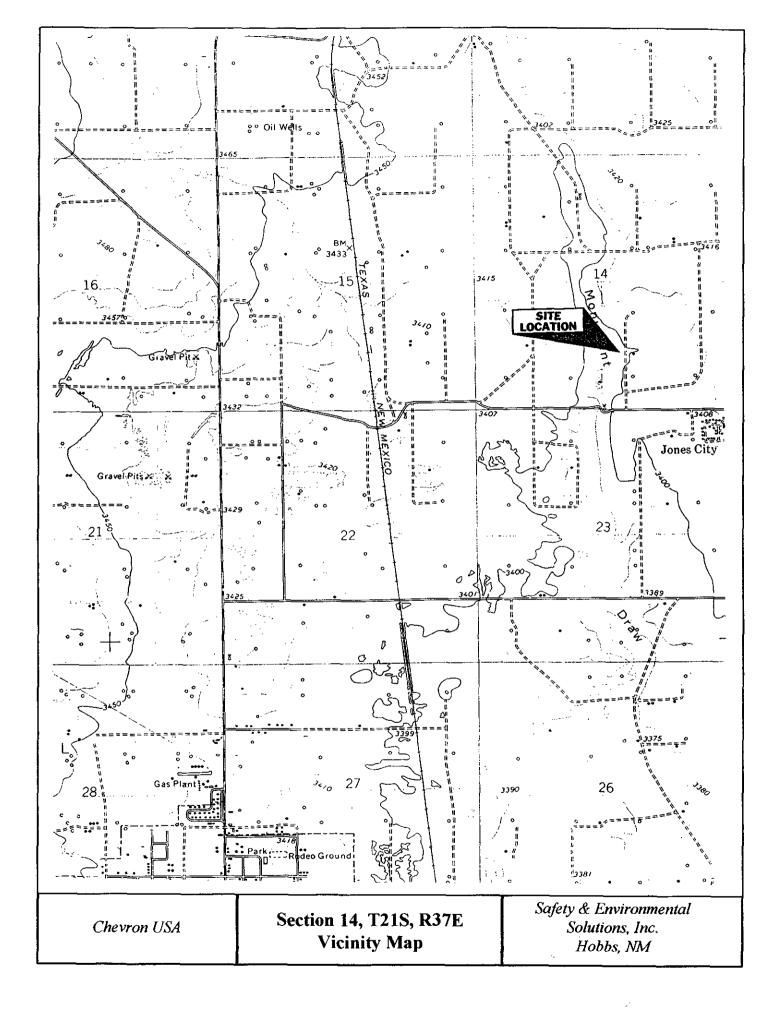
### Figures:

Vicinity Map
Potentiometric Map

### Appendices:

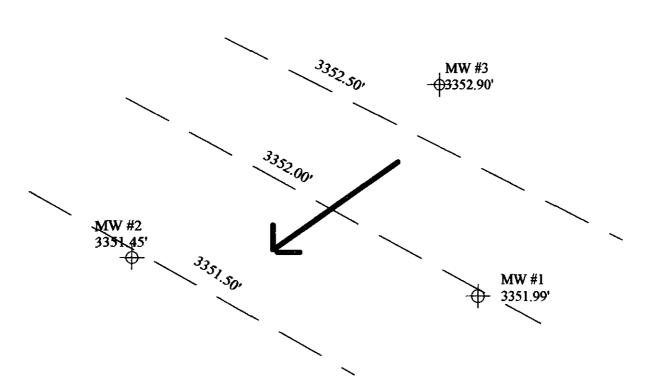
Cumulative Well Data Analytical Results

# Figure 1 Vicinity Map



# Figure 2 Potentiometric Map





Naomi Keenan Site Lea County, New Mexico

September 28, 1999

Scale: 1" = 50'

# Appendix A Cumulative Well Data

Contaminant	WQCC	11/10/98	4/16/99	7/13/99	9/23/99
	Standard	Initial	Quarterly	Quarterly	Quarterly
		test	Test	Test	Test
Chloride	250.0 ppm	313ppm	243ppm	239ppm	239ppm
Selenium	0.05 ppm	0.08ppm	<.05ppm	<.05ppm	<.05ppm
TDS	1000 ppm	1045ppm	966ppm	968ppm	968ppm
Benzene	0.01 ppm	0.008ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	0.023ppm	<.002ppm	<.002ppm	<.002ppm
E. Benzene	0.75 ppm	0.016ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	0.027ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	88.9ppm	<2.5ppm	<10ppm	<1.0ppm
Sodium	N/A	184ppm			150ppm
Calcium	N/A	69ppm			94ppm
Magnesium	N/A	36ppm			32ppm
Potassium	N/A	14.10ppm			6.91ppm
Conductivity	N/A	1805ppm			1410ppm
T-Alkalinity	N/A	168ppm			176ppm
CO <sub>3</sub>	N/A	0ppm			0ppm
HCO <sub>3</sub>	N/A	205ppm			215ppm
pН	>6-9<	7.74ppm			7.47
Sulfate	600 ppm	124ppm			176ppm

Contaminant	WQCC	11/10/98	4/16/99	7/13/99	9/23/99
	Standard	Initial	Quarterly	Quarterly	Quarterly
		Test	Test	Test	Test
Chloride	250.0 ppm	294ppm	275ppm	279ppm	288ppm
Selenium	0.05 ppm	0.12ppm	<.05ppm	<.05ppm	<.05ppm
TDS	1000 ppm	1030ppm	1068ppm	1073ppm	1060ppm
Benzene	0.01 ppm	0.007ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	0.024ppm	<.002ppm	<.002ppm	<.002ppm
E. Benzene	0.75 ppm	0.021ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	0.039ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	64.9ppm	<2.5ppm	<10ppm	44.1ppm
Sodium	N/A	125ppm			170ppm
Calcium	N/A	85ppm			102ppm
Magnesium	N/A	47ppm			31ppm
Potassium	N/A	8.35ppm			5.12ppm
Conductivity	N/A	1814ppm			1541ppm
T-Alkalinity	N/A	144ppm			144ppm
CO <sub>3</sub>	N/A	0ppm			0ppm
HCO <sub>3</sub>	N/A	176ppm			176ppm
pН	>6-9<	7.69			7.53
Sulfate	600 ppm	124ppm			200ppm

Contaminant	WQCC	E1/10/98	4/16/99	7/13/99	9/23/99
	Standard	Initial	Quarterly	Quarterly	Quarterly
		Test	Test	Test	Test
Chloride	250.0 ppm	333ppm	307ppm	331ppm	341ppm
Selenium	0.05 ppm	0.13ppm	<.05ppm	<.05ppm	<.05ppm
TDS	1000 ppm	1118ppm	1162ppm	1230ppm	1169ppm
Benzene	0.01 ppm	0.006ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	0.022ppm	<.002ppm	<.002ppm	<.002ppm
E. Benzene	0.75 ppm	0.019ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	0.034ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	28.4ppm	<2.5ppm	<10ppm	3.55ppm
Sodium	N/A	136ppm			181ppm
Calcium	N/A	91ppm			109ppm
Magnesium	N/A	49ppm			39ppm
Potassium	N/A	10.11ppm			6.00ppm
Conductivity	uctivity N/A				1635ppm
T-Alkalinity	N/A	140ppm			148ppm
CO <sub>3</sub>	N/A	0ppm			0ppm
HCO <sub>3</sub>	N/A	205ppm			181ppm
pН	>6-9<	7.74ppm			7.50
Sulfate	600 ppm	124ppm			197ppm

# Appendix B Analytical Results





ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY 703 E. CLINTON, SUITE 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 09/23/99

Reporting Date: 09/29/99

Project Number: NOT GIVEN Project Name: STEVENS

Project Location: NAOMI KEENAN

Analysis Date: 09/28/99

Sampling Date: 09/23/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: AH

Analyzed By: GP

LAB NUMBER	SAMPLE ID	Se (ppm)
H4358-1	MW #1	<0.05
H4358-2	MW #2	<0.05
H4358-3	MW #3	<0.05
Quality Control		0.050
True Value QC		0.050
% Recovery		100
Relative Percent D	Difference	7.1

METHOD: EPA 600/4-79-020

270.2

Chemist

Date



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY 703 E. CLINTON, SUITE 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 09/23/99

Reporting Date: 09/28/99

Project Number: NOT GIVEN Project Name: STEVENS

Project Location: NAOMI KEENAN

Sampling Date: 09/23/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: AH Analyzed By: BC/GP/JP

LAB NO.	SAMPLE ID	TPH (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS	DATE:	09/27/99	09/23/99	09/23/99	09/23/99	09/23/99
H4358-1	MW #1	<1.0	<0.002	<0.002	<0.002	<0.006
H4358-2	MW #2	44.1	<0.002	<0.002	<0.002	<0.006
H4358-3	MW #3	3.55	<0.002	<0.002	<0.002	<0.006
Quality Cor	ntrol	41.3	0.095	0.094	0.093	0.288
True Value	QC	40.0	0.100	0.100	0.100	0.300
% Recover	y	103	94.8	94.3	92.9	96.0
	ercent Difference	0.6	2.9	6.0	6.7	4.5

METHODS: TRPHC - EPA 600/4-79-020, 418.1; BTEX - EPA SW-846 8260

Run ju Again

Date



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY

703 E. CLINTON, SUITE 103

HOBBS, NM 88240

FAX TO: (505) 393-4388

Sampling Date: 09/23/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: AH

Analyzed By: AH

Receiving Date: 09/23/99
Reporting Date: 09/27/99
Project Number: NOT GIVEN
Project Name: STEVENS

Project Location: NAOMI KEENAN

		Na	Ca	Mg	K	Conductivity	T-Alkalinity
LAB NUMBE	R SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(u mhos/cm)	(mgCaCO <sub>3</sub> /L)
ANALYSIS D	ATE:	09/24/99	09/24/99	09/24/99	09/24/99	09/24/99	09/24/99
H4358-1	MW #1	150	94	32	€.91	1410	176
H4358-2	MW #2	170	102	31	5.12	1541	144
H4358-3	MW #3	181	109	39	6.00	1635	148
Cuality Cant		NR	48	49	4.96	1443	ND
Quality Contr							NR
True Value C	10	NR	50	50	5.00		NR
% Accuracy		NR NR	96	98	99	102	NR
Relative Perc	ent Difference	NR	6.3	5.1	0	0.4	NR
METHODS:		SM	3500-Ca-D	3500-Mg E	8049	120.1	310.1

		CI <sup>-</sup>	SO <sub>4</sub>	CO <sub>3</sub>	HCO <sub>3</sub>	pН	TDS
	•	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
ANALYSIS D	ATE:	09/24/99	09/24/99	09/24/99	09/24/99	09/24/99	09/25/99
H4358-1	MW #1	243	176	0	215	7.47	958
H4358-2	MW #2	288	200	0	176	7.53	1060
H4358-3	MW #3	341	197	0	181	7.50	1169
Quality Contr	rol	973	47.47	112	221	7.00	NR
True Value C	ic_	1000	50.00	124	259	7.00	NR
% Accuracy		97	94.9	90.3	85.4	100	NR
Relative Perc	ent Difference	5.2	5.2	_	-	1.4	NR
METHODS:		SM4500-CI-B	375.4	310.1	310.1	150.1	160.1

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09/29/99 Date

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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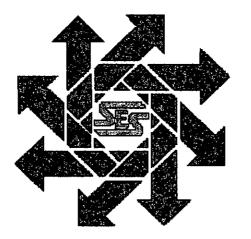
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ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION



# Chevron USA

# Naomi Keenan Monitor Well Report

Lea County, New Mexico

For Year Ending December 31, 1999

Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240

## TABLE OF CONTENTS

I. Background	2
II. Work Performed	2
III. Summary	2
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### I. Background

The subject property is located in Unit O of Section 14, Township 21S Range37E in Lea County, New Mexico. Safety & Environmental Solutions, Inc. (SESI) performed sampling and data collection on the three (3) ground water monitor wells previously installed in November 1998 at the site (See Vicinity Map). The casing size in all wells is 2".

### II Work Performed

Beginning in April of 1999, SESI personnel performed monitor well sampling at the site on a quarterly basis. Ground water samples were taken from each well after a hand bailer was used to develop the wells. Three to five casing volumes of water were removed from each well until pH and temperature of the water were stabilized. The water that was removed was placed in appropriate drums for disposal. The samples were obtained and placed in appropriate containers, preserved and transported under chain of custody to Cardinal Laboratories of Hobbs, New Mexico. The samples were analyzed for Total Petroleum Hydrocarbons (TPH), Selenium, Major Cations & Anions, and Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX) based upon the initial well sampling results when the wells were installed. (See Analytical Data)

In addition to the sampling, SESI also measured the depth to the top of the water table and the total depth of each well. The depth to the top of ground water was measured using a Solinst water level indicator. The total depth of each well was measured in order to compute the proper casing volumes. (See Cumulative Water Elevation Data)

### III. Summary

The analysis of the groundwater samples performed by Cardinal Laboratories throughout the test period indicate only elevated levels of Total Dissolved Solids (TDS) and Chlorides in Monitor Wells #2 and #3 for the entire test period. Testing in the fourth quarter of 1999 also indicated slightly elevated levels of Chloride in Monitor Well #1, 256ppm with a limit of 250ppm allowable. No evidence of other contaminates tested for from the initial sampling was found.

The ground water elevations indicate flow to be in the southwesterly direction throughout the test period.

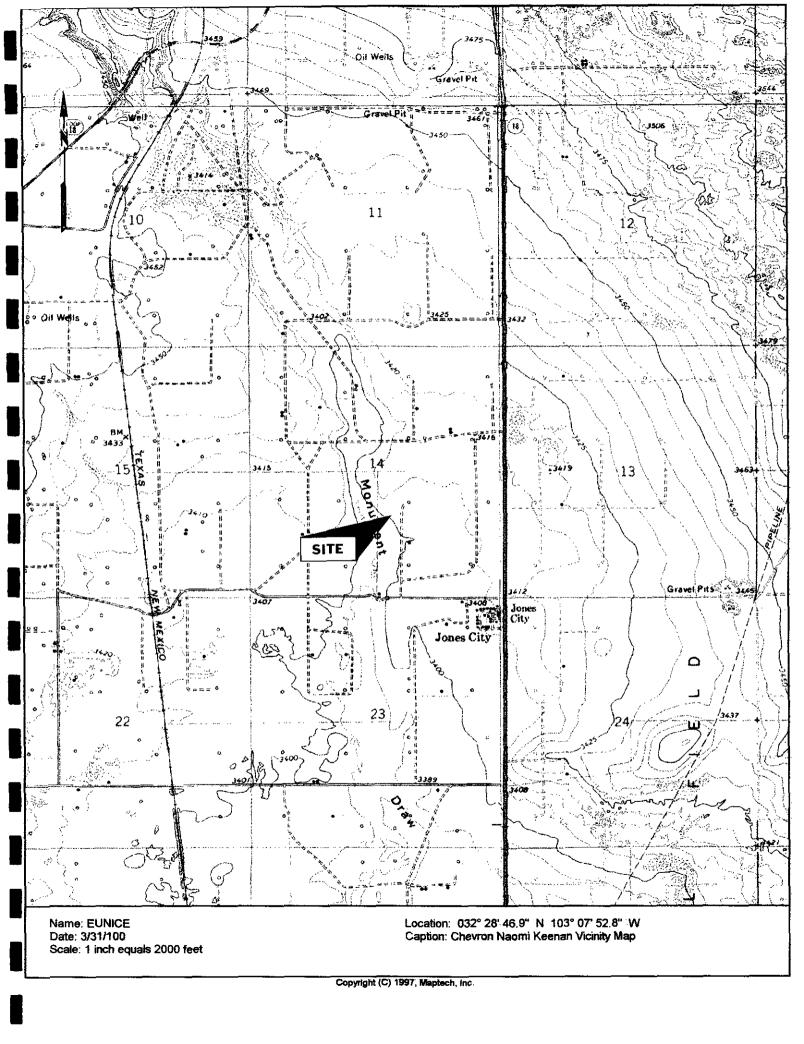
### IV. Figures and Appendices

Figures:

Vicinity Map
Potentiometric Maps

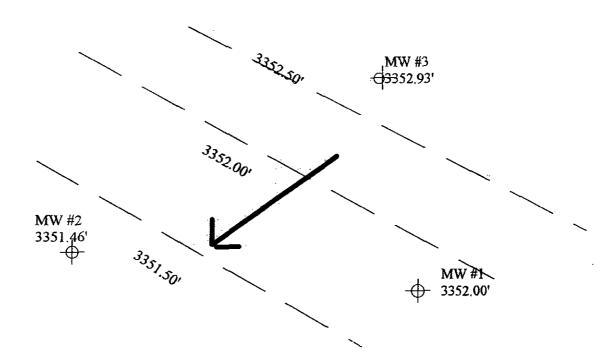
**Appendices:** 

Cumulative Water Elevation Data Cumulative Well Data Analytical Results Figure 1 Vicinity Map



# Figure 2 Potentiometric Maps



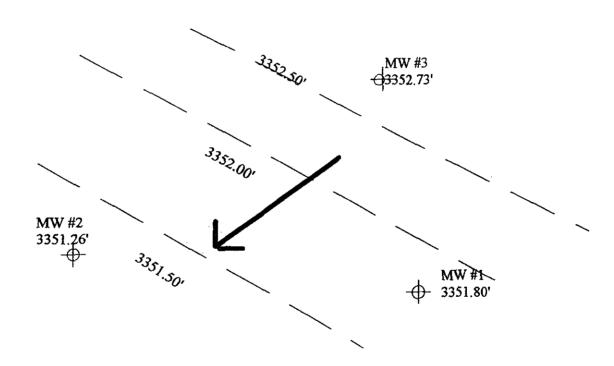


Naomi Keenan Site Lea County, New Mexico

April 16, 1999

Scale: 1" = 50'



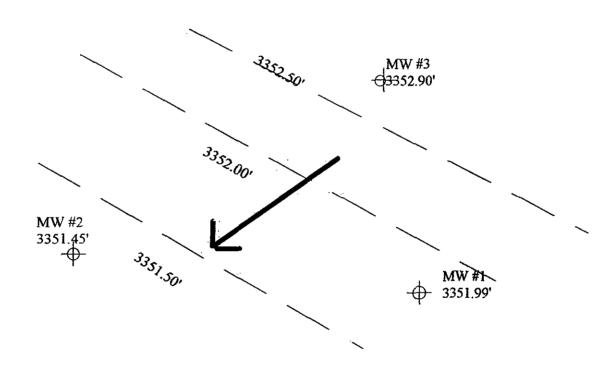


Naomi Keenan Site Lea County, New Mexico

July 13, 1999

Scale: 1" = 50'



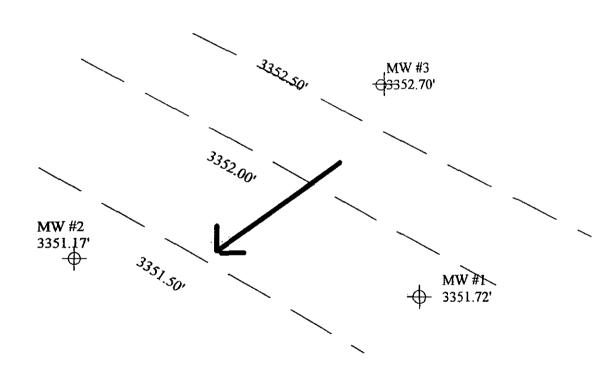


Naomi Keenan Site Lea County, New Mexico

**September 28, 1999** 

Scale: 1'' = 50'





Naomi Keenan Site Lea County, New Mexico

December 6, 1999

Scale: 1" = 50'

# Appendix A Cumulative Water Elevation Data

## Naomi Keenan Cumulative Water Elevation Data

Monitor		Elevation		Elevation	Elevation
Well	Elevation	4/16/99	7/13/99	9/23/99	12/6/99
#1	3402.18	3352.0°	3351.80°	3351.99	3351.72
#2	3399,58'	3351.46'	3351.26'	3351.45'	3351.17'
#3	3402.19'	3352.93	3352.73°	3352.90°	3352.70°

# Appendix B Cumulative Well Data

## Naomi Keenan Cumulative Monitor Well Data

Contaminant	WQCC	11/10/98	4/16/99	7/13/99	9/23/99	12/6/99
	Standard	Initial	Quarterly	Quarterly	Quarterly	Quarterly
		test	Test	Test	Test	Test
Chloride	250.0 ppm	313ppm	243ppm	239ppm	239ppm	256ppm
Selenium	0.05 ppm	0.08ppm	<.05ppm	< 05ppm	< 05ppm	< 05ppm
TĐS	1000 ppm	1045ppm	966ppm :	968ppm	968ppm	971ppm
Benzene	0.01 ppm	0.008ppm	<.002ppm	<:002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	0.023ppm	<.002ppm	<.002ppm	<.002ppm	.<.002ppm
E. Benzene	· 0.75 ppm·	0.016ppm	<.002ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	0.027ppm	<.006ppm	<:006ppm	<:006ppm	<.006ppm
TPH	N/A	88.9ppm	<2.5ppm	<10ppm	<1.0ppm	<1.0ppm
Sodium	N/A	184ppm		:	150ppm	87ppm
Calcium	N/A	69ppm		:	94ppm_	96ppm
Magnesium	N/A	36ppm		-	32ppm	34ppm
Potassium	N/A	14.10ppm			6.91ppm	8ppm
Conductivity	N/A	1805ppm			1410ppm	1478ppm
T-Alkalinity	N/A	168ppm			176ppm	172ppm
CO <sub>3</sub>	N/A	0ppm		-	0ppm	0ppm
HCO <sub>3</sub>	N/A	205ppm		:.	215ppm	210ppm
рН	>6-9<	7.74ppm			7.47	7.50
Sulfate	600 ppm	124ppm			176ppm	45ppm

Contaminant	WQCC	11/10/98	4/16/99	7/13/99	9/23/99	12/6/99
	Standard	. Initial	Quarterly	Quarterly	Quarterly	Quarterly
		Test	Test	Test	Test	Test
Chloride	250.0 ppm	294ppm	275ppm	279ppm	288ppm	292ppm
Selenium	0.05 ppm	0.12ppm	<.05ppm	<.05ppm	<.05ppm	< .05ppm
TDS_	1000 ppm	: 1030ppm	1068ppm	10 <b>7</b> 3ppm	1060ppm	1055ppm
Benzene	0.01 ppm	0.007ppm	<.002ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	0.024ppm	<.002ppm	<.002ppm	<.002ppm	<.002ppm
E. Benzene	0.75 ppm	0.021ppm	<.002ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	0.039ppm	<.006ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	64.9ppm	<2.5ppm	<10ppm	44.1ppm	<1.0ppm
Sodium	N/A	125ppm			1 <b>7</b> 0ppm	104ppm
Calcium	· N/A	85ppm			102ppm	112ppm
Magnesium	N/A	47ppm			31ppm	39ppm
Potassium	N/A	8.35ppm			5.12ppm	7ppm
Conductivity	N/A	1814ppm		•	1541ppm	1576ppm
T-Alkalinity	N/A	144ppm		-	144ppm	148ppm
CO <sub>3</sub>	N/A	0ppm		·	0 <del>ppm</del>	0ppm_
HCO <sub>3</sub>	N/A	176ppm			176ppm	181ppm
pН	>6-9<	7.69			7.53	7.68
Sulfate	600 ppm	124ppm			200ppm -	52ppm

Monitor Well #3

Contaminant	WQCC	11/10/98	4/16/99	7/13/99	9/23/99	12/6/99
	Standard	Initial	Quarterly	Quarterly	Quarterly	Quarterly
		Test	Test	Test	Test	Test
Chloride	250.0 ppm	333ppm	307ppm	331ppm_	341ppm	351ppm
Selenium	0.05 ppm	0.13ppm	<.05ppm	<.05ppm	<.05ppm	<.05ppm
TDS	1000 ppm	1118ppm	1162ppm	1230ppm	1169ppm	1170ppm
Benzene	0.01 ppm	0.006ppm	<.002ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	0.022ppm	< 002ppm	<.002ppm	<.002ppm	<.002ppm
E. Benzene	0.75 ppm	0.019ppm	<.002ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	0.034ppm	<.006ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	28.4ppm	<2.5ppm	<10ppm	3.55ppm	<1.0ppm
Sodium	N/A	136ppm		:	181ppm	104ppm
Calcium	N/A	91ppm	,	-	109ppm	120ppm
Magnesium	N/A	49ppm			39ppm	37ppm
Potassium	N/A	10.11ppm			6.00ppm	8ppm
Conductivity	N/A	1969ppm			1635ppm	1724ppm
T-Alkalinity	N/A	140ppm			148ppm	140ppm
CO <sub>3</sub>	N/A	0ppm	·		0ppm	0ppm
HCO <sub>3</sub>	N/A	205ppm			1 <b>81ppm</b>	171ppm
рН	>6-9<	7.74ppm			7.50	7.62
Sulfate	600 ppm	124ppm			19 <b>7ppm</b>	52ppm

Appendix C Analytical Results



ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY 701 E. CLINTON, SUITE 103

HOBBS, NM 88240

FAX TO:

Receiving Date: 04/16/99

Reporting Date: 04/22/99

Project Owner: CHEVRON
Project Name: CHEVRON STEVENS MONITOR WELLS

Project Location: NAOMI KEENAN (CHEVRON)

Sampling Date: 04/16/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: GP Analyzed By: AH/GP

LAB NUMBER SAMPLE ID TDS

TDS CI Se (mg/L) (mg/L) (mg/L)

ANALYSIS DATE	04/20/99	04/19/99	04/21/99
H4106-1 MW-#1	966	243	<0.05
H4106-2 MW-#2	1068	275	<0.05
H4106-3 MW-#3	1162	307	<0.05
Quality Control	NR	1255	0.051
True Value QC	NR	1319	0.05
% Accuracy	NR	95	102
Relative Percent Difference	1.2	1.0	4.6

METHODS: EPA 600/4-79-020 160.1 325.3 270.2

Chemist Coffee

Date

H4106B.XLS





ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY

701 E. CLINTON, SUITE 103

**HOBBS, NM 88240** 

FAX TO:

Receiving Date: 04/16/99

Reporting Date: 04/17/99

Project Owner: CHEVRON

**Quality Control** 

True Value QC

Relative Percent Difference

% Recovery

Project Name: CHEVRON STEVENS MONITOR WELLS Project Location: NAOMI KEENAN (CHEVRON)

Sampling Date: 04/16/99

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

**ETHYL** 

0.097

0.100

97.3

5.1

TOTAL

0.290

0.300

96.6

3.3

Sample Received By: GP

Analyzed By: BC

0.099

0.100

99.3

0.5

LAB NO.	SAMPLE ID	TPH (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	BENZENE (mg/L)	XYLENES (mg/L)
ANALYSIS	DATE:	04/16/99	04/16/99	04/16/99	04/16/99	04/16/99
H4106-1	MW-#1	<2.5	<0.002	< 0.002	<0.002	<0.006
H4106-2	MW-#2	<2.5	<0.002	<0.002	<0.002	<0.006
H4106-3	MW-#3	<2.5	<0.002	<0.002	<0.002	<0.006
	·		T			1

0.090

0.100

89.5

2.3

METHODS: TRPHC - EPA SW-846 8015 M; BTEX - EPA SW-846 8260

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<sup>†</sup> Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.



ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC. ATTN: DEE WHATLEY

703 E. CLINTON, SUITE 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 07/13/99 Reporting Date: 07/14/99 Project Owner: NOT GIVEN

Project Name: NOT GIVEN

**Project Location: CHEVRON STEVENS** 

Sampling Date: 07/13/99

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

Sample Received By: BC Analyzed By: AH/GP

LAB NUMBER SAMPLE ID	CI (mg/L)	TDS (mg/L)	Se (mg/L)
ANALYSIS DATE	07/13/99	07/13/99	07/13/99
H4230-1 MW-1	239	968	<0.05
H4230-2 MW-2	279	1073	<0.05
H4230-3 MW-3	331	1230	<0.05
Quality Control	1295	NR	0.0451
True Value QC	1319	NR	0.0500
% Recovery	98.2	NR	90.2
Relative Percent Difference	2.3	0.4	2.3
METHODS: EPA 600/4-79-020	4500-CI'B*	160.1	270.2

\*Std. Methods

sayle AVIL

07/14/99 Date



### PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY 703 E. CLINTON, SUITE 103 HOBBS, NM 88240

FAX TO: (505) 393-4388

Receiving Date: 07/13/99 Reporting Date: 07/14/99 Project Owner: NOT GIVEN

Project Name: NOT GIVEN

Project Location: CHEVRON STEVENS

Sampling Date: 07/13/99

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

Sample Received By: BC

Analyzed By: BC

LAB NUMBER SAMPLE ID	GRO (C6-C10) (mg/L)	DRO (>C10-C28) (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS DATE:	07/13/99	07/13/99	07/13/99	07/13/99	07/13/99	07/13/99
H4230-1 MW-1	<5.0	<5.0	<0.002	<0.002	< 0.002	<0.006
H4230-2 MW-2	<5.0	<5.0	<0.002	< 0.002	< 0.002	<0.006
H4230-3 MW-3	<5.0	<5.0	<0.002	<0.002	<0.002	<0.006
Quality Control	56.4	55.5	0.086	0.098	0.098	0.299
True Value QC	60.0	60.0	0.100	0.100	0.100	0.300
% Recovery	93.9	92.5	86.3	98.4	98.3	99.7
Relative Percent Difference	48	11.5	1.5	42	65	4.3

TPH(GRO & DRO) - EPA SW-846 8015 M; BTEX/MTBE-EPA SW-846 8260 METHODS:

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↑ Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.





ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY 703 E. CLINTON, SUITE 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 09/23/99

Reporting Date: 09/29/99

Project Number: NOT GIVEN Project Name: STEVENS

Project Location: NAOMI KEENAN

Analysis Date: 09/28/99

Sampling Date: 09/23/99

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

Sample Received By: AH

Analyzed By: GP

LAB NUMBER	SAMPLE ID	Se (ppm)
H4358-1	MW #1	<0.05
H4358-2	MW #2	<0.05
H4358-3	MW #3	<0.05
Quality Control		0.050
True Value QC		0.050
% Recovery		100
Relative Percent D	Difference	- 7.1

METHOD: EPA 600/4-79-020

270.2

Chemist

Date





ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY

703 E. CLINTON, SUITE 103

HOBBS, NM 88240

FAX TO: (505) 393-4388

Receiving Date: 09/23/99

Reporting Date: 09/28/99

Project Number: NOT GIVEN

Project Location: NACMUL

Project Location: NAOMI KEENAN

Sampling Date: 09/23/99

Sample Type: GROUNDWATER

Sample Condition: COOL & INTACT

Sample Received By: AH Analyzed By: BC/GP/JP

					ETHYL	TOTAL
LAB NO.	SAMPLE ID	TPH	BENZENE	TOLUENE	BENZENE	XYLENES
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)

ANALYSIS DATE:	09/27/99	09/23/99	09/23/99	09/23/99	09/23/99
H4358-1 MW #1	<1.0	<0.002	<0.002	<0.002	<0.006
H4358-2 MW #2	44.1	<0.002	<0.002	<0.002	< 0.006
H4358-3 MW #3	3.55	<0.002	<0.002	<0.002	<0.006
Quality Control	41.3	0.095	0.094	0.093	0.288
True Value QC	40.0	0.100	0.100	0.100	0.300
% Recovery	103	94.8	94.3	92.9	96.0
Relative Percent Difference	0.6	2.9	6.0	6.7	4.5

METHODS: TRPHC - EPA 600/4-79-020, 418.1; BTEX - EPA SW-846 8260

Chemis

Date





ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY

703 E. CLINTON, SUITE 103 Sampling Date: 09/23/99

HOBBS, NM 88240 Sample Type: GROUNDWATER FAX TO: (505) 393-4388 Sample Condition: COOL & INTACT

Sample Received By: AH

Analyzed By: AH

Project Number: NOT GIVEN Project Name: STEVENS Project Location: NAOMI KEENAN

Receiving Date: 09/23/99

Reporting Date: 09/27/99

		Na	Ca	Mg	K	Conductivity	T-Alkalinity
LAB NUMBE	R SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(u mhos/cm)	(mgCaCO <sub>3</sub> /L)
ANALYSIS D	ATE:	09/24/99	09/24/99	09/24/99	09/24/99	09/24/99	09/24/99
H4358-1	MW #1	150	94	32	6.91	1410	176
H4358-2	MW #2	170	102	31	5.12	1541	144
H4358-3	MW #3	181	109	39	6.00	1635	148
Quality Conti		NR	48	49	4.96	1443	NR
True Value C		NR NR	50	50	5.00	<u> </u>	NR
% Accuracy		NR	96	98	99	-	NR
Relative Perc	ent Difference	NR	6.3	5.1	0	0.4	NR
METHODS:		SM	3500-Ca-D	3500-Mg E	8049	120.1	310.1

		CI_	SO <sub>4</sub>	CO₃	HCO <sub>3</sub>	pН	TDS
	•	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
ANALYSIS [	DATE;	09/24/99	09/24/99	09/24/99	09/24/99	09/24/99	09/25/99
H4358-1	MW #1	243	176	0	215	7.47	958
H4358-2	MW #2	288	200	0	176	7.53	1060
H4358-3	MW #3	341	197	0	181	7.50	1169
Quality Cont	<u>trol</u>	973	47.47	112	221	7.00	NR
True Value (	QC	1000	50.00	124	259	7.00	NR
% Accuracy		97	94.9	90.3	85.4	100	NR
Relative Per	cent Difference	5.2	5.2	-	-	1.4	NR
METHODS:		SM4500-CI-B	375.4	310.1	310.1	150.1	160.1

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

7

Page

101 East Marland, Hobbs, NM 88240

2111 Beechwood, Abilene, TX 79603

(915) 673-7001 Fax (915) 673-7020

A ARDINAL LABORATORIES, INC.

(505) 393-2326 Fax (505) 393-2476

Terms and Conditions: litterat will be charged on at account more than 3.0 days past due at the rate of 34% per arman front the original due of throstoe, and at oosts of oodections, broading attorney's foss: REOUEST ANALYSIS O No Additional Fax# 7 dalm striky, whybre based in softent or hot, shall be limited is the smoots paid by the olert for the med wahred unless made in witing and received by Cardnal within 50 days siter compellon of the applicable thought instructed, business known stored and so, or has of profits incurred by clear, its subsidantes. TIME SAMPLING BILL TO PO#: -23.99 9.234 DATE z Z 9-23-99 SAME CHECKED BY: (Initials) : A3HTO PRES. Company: ICE / COOF Address: Phone #: Received By: (Lab Star State: Fax #: /CID: Attn: City: : ЯЭНТО STUDGE MATRIX **BOS NASTEWATER SECUNDINATER** State: NM Zip: 88240 Time: 35pm ٨ SABNIATNOO ! ゞ 9.23-99 (G) BAB OR (C)OMP. service. In no event shall Cardinal be Jabbe for incidental or consequental demagne, I 1. EASS NOTE: Usbity and Damages. Cardna's 1sbity and cleat's exclusive re-Project Owner: CLINTON, #103 Sample I.D. Stevens 7 Yaon, Phone #: (505) 397-0510 Sampler - UPS - Bus - Other: (505) 393-4388 Delivered By: (Circle One) SEST Sampler Relinguished Address: 703 E. Project Manager: Company Name: Project Location: FOR LAB USE ONLY 74358~ Relinquished By: LAB I.D. Project Name: city: HOBBS Project #: Fax#:

<sup>†</sup> Cardinal cannot accept verbal changes. Please fax written changes to 915-873-7020.



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BETH ALDRICH 703 E. CLINTON, STE 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 12/06/99

Reporting Date: 12/08/99

Project Number: NOT GIVEN

Project Name: CHEVRON STEVENS

Project Location: EAST OF EUNICE

Analysis Date: 12/08/99

Sampling Date: 12/06/99

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

Sample Received By: BC

Analyzed By: AH

LAB NUMBER	SAMPLE ID	Se (mg/L)
H4494-1	MW #1	<0.05
H4494-2	MW #2	<0.05
H4494-3	MW #3	<0.05
Quality Control		0.409
		0.198
True Value QC		0.200
% Recovery		99
Relative Percent D	Difference	4.5

METHOD: EPA 600/4-79-020 270.2

Dayle Aft

12/08/99



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BETH ALDRICH

**703 E. CLINTON, SUITE #103** 

HOBBS, NM 88240

FAX TO: (505) 393-4388

Receiving Date: 12/06/99

Reporting Date: 12/08/99

Project Number: NOT GIVEN

Project Name: CHEVRON STEVENS

Project Location: EAST OF EUNICE

(estfaloshi

Sampling Date: 12/06/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: BC

Analyzed By: BC

LAB NO.	SAMPLE ID	TPH (mg/kg)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)
ANALYSIS	DATE:	12/07/99	12/07/99	12/07/99	12/07/99	12/07/99
H4494-1	MW #1	<1.0	<0.002	<0.002	<0.002	<0.006
H4494-2	MW #2	<1.0	<0.002	<0.002	<0.002	<0.006
H4494-3	MW #3	<1.0	<0.002	<0.002	<0.002	<0.006
Quality Cor	ntrol	3.93	0.087	0.094	0.094	0.290
True Value	QC	4.00	0.100	0.100	0.100	0.300
% Recover	у	98.1	86.9	94.4	94.2	96.6
Relative Pe	rcent Difference	5.6	1.3	6.2	<0.1	0.8

METHODS: TRPHC - EPA 600/4-79-020, 418.1; BTEX - EPA SW-846 8260

Date



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BETH ALDRICH 703 E. CLINTON, SUITE #103

**HOBBS, NM 88240** 

FAX TO: (505) 393-4388

Sampling Date: 12/06/99

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: BC

Analyzed By: AH

Receiving Date: 12/06/99
Reporting Date: 12/08/99
Project Number: NOT GIVEN

Project Name: CHEVRON STEVENS Project Location: EAST OF EUNICE

	Na	Ca	Mg	K	Conductivity	T-Alkalinity
LAB NUMBER SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(u mhos/cm)	(mgCaCO <sub>3</sub> /L)
ANALYSIS DATE:	12/07/99	12/07/99	12/06/99	12/06/99	12/07/99	12/06/99
H4494-1 MW #1	87	96	34	8	1478	172
H4494-2 MW #2	76	112	39	7	1576	148
H4494-3 MW #3	104	120	37	8	1724	140
Quality Control	NR	48	49	4.96	1443	NR
True Value QC	NR	50	50	5.00	1413	NR
% Accuracy	NR	96	98	99	102	NR
Relative Percent Difference	NR	6.3	5.1	0	0.4	NR
METHODS:	SM	3500-Ca-D	3500-Mg E	8049	120.1	310.1

		сг	SO <sub>4</sub>	CO <sub>3</sub>	HCO <sub>3</sub>	pН	TDS
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
ANALYSIS DA	NTE:	12/07/99	12/07/99	12/06/99	12/06/99	12/07/99	12/08/99
H4494-1	MW #1	256	45	0	210	7.50	971
H4494-2	MW #2	292	52	0	181	7.68	1055
H4494-3	MW #3	351	52	0	171	7.62	1170
Quality Contro	ol	978	50.06	112	221	7.02	NR
True Value Q	C	1000	50.00	124	259	7.00	NR
% Accuracy		98	100	90	85	100	NR
	***************************************	2.2	5.2	-	-	0.1	NR
METHODS:		SM4500-CI-B	375.4	310.1	310.1	150.1	160.1

Gayle A. Potter, Chemist

12/08/99 Date

# CHAIN-OF. CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240 (505) 393-2328 Fax (505) 393-2476

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ARDINAL LABORATORIES, INC. 2111 Beechwood, Abilene, TX 78603

(915) 673-7001 Fax (915) 673-7020

# Chevron USA

# Naomi Keenan Monitor Well Report

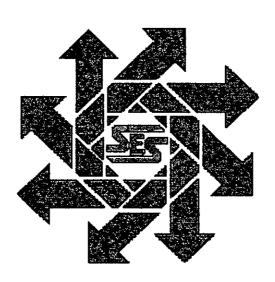
Lea County, New Mexico

March 31, 2000

RECEIVED

MAY 24 2000

ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION



Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 (505) 397-0510

# TABLE OF CONTENTS

I. Background	2
II. Work Performed	2
III. Analytical Results	2
IV. Figures and Appendices	3

## I. Background

The subject property is located in Unit O of Section 14, Township 21S Range37E in Lea County, New Mexico. Safety & Environmental Solutions, Inc. (SESI) performed sampling and data collection on the three (3) ground water monitor wells previously installed in November 1998 at the site (See Vicinity Map). The casing size in all wells is 2".

### II. Work Performed

On February 23, 2000, SESI environmental technician Sergio Contreras Jr. arrived at the site. Ground water samples were taken from each well after a hand bailer was used to develop the wells. Three to five casing volumes of water were removed from each well until pH and temperature of the water were stabilized. The water that was removed was placed in appropriate drums for disposal. The samples were obtained and placed in appropriate containers, preserved and transported under chain of custody to Cardinal Laboratories of Hobbs, New Mexico for analysis of the Total Petroleum Hydrocarbons (TPH), Selenium, Major Cations & Anions, and Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX). (See Analytical Data)

In addition to the sampling, SESI also measured the depth to the top of the water table and the total depth of each well. The depth to the top of ground water was measured using a Solinst water level indicator. The total depth of each well was measured in order to compute the proper casing volumes.

A summary of this data follows:

ID.	Date	Top of Casing Elevation	Depth to Water	Potentiometric Elevation	Total Well Depth	Free Product Thickness
MW - 1	2/23/00	3402.18'	50.54'	3351.64'	67.88'	0.00
MW – 2	2/23/00	3399.58'	48.51'	3351.07'	56.33'	0.00
MW - 3	2/23/00	3402.19'	49.58'	3352.61'	59.11'	0.00

### III. Analytical Results

The analysis of the groundwater samples performed by Cardinal Laboratories are summarized as follows:

Contaminant	WQCC Standard	<b>MW</b> #1	MW #2	MW #3
Chloride	250.0 ppm	264 ppm	280 ppm	, 344 ppm 🕞
Selenium	0.05 ppm	0.057 ppm	<.05 ppm	<.05 ppm
TDS	1000 ppm	1017 ppm	1066 ppm	1174 ppm 😩
Benzene	0.01 ppm	<.002ppm	<.002ppm	<.002ppm
Toluene	0.75 ppm	<.002ppm	<.002ppm	<.002ppm
Ethyl Benzene	0.75 ppm	<.002ppm	<.002ppm	<.002ppm
Total Xylenes	0.62 ppm	<.006ppm	<.006ppm	<.006ppm
TPH	N/A	<1.0ppm	<1.0ppm	<1.0ppm

SAMPLE	Na	Ca	Mg	K	CO <sub>3</sub> .	$SO_4$	$HCO_3$
, ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
MW-1	79	99	37	8.5	0	40.6	205
MW – 2	82	99	36	6.7	0	46.6	171
MW – 3	106	106	43	7.4	0	44.2	185

# IV. Figures and Appendices

# Figures:

Vicinity Map

Potentiometric Map

# Appendices:

Cumulative Well Data Analytical Results Figure 1 Vicinity Map

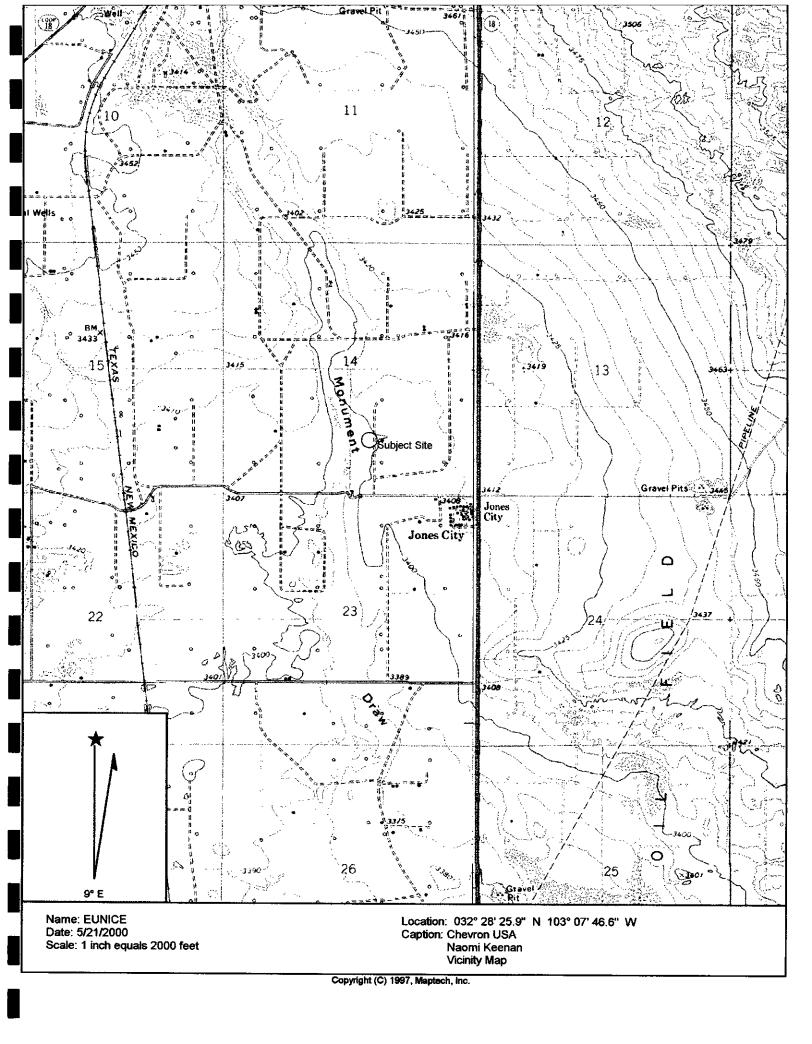
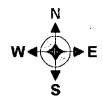
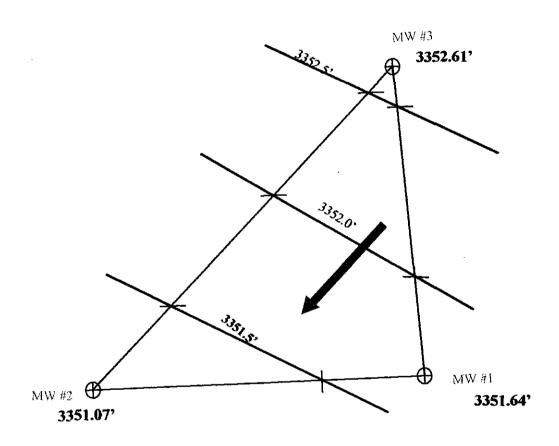


Figure 2
Potentiometric Map





Unit O Section 14, Township 21 South Range 37 East

Scale 1"= 40'
Contour Interval 0.5'

**Chevron USA** 

Potentiometric Surface Map Naomi Keenan February 23, 2000

Safety & Environmental Solutions, Inc. Hobbs, New Mexico

# Appendix A Cumulative Well Data

# Naomi Keenan Cumulative Monitor Well Data

Contaminant	WQCC	11/10/98	2-23-00		
	Standard	Initial	Quarterly		
		test	Test		
Chloride	250.0 ppm	313ppm	264 ppm		
Selenium	0.05 ppm	0.08ppm	0.057 ppm		
TDS	1000 ppm	1045ppm	1017 ppm		
Benzene	0.01 ppm	0.008ppm	<0.002		
			ppm		
Toluene	0.75 ppm	0.023ppm	<.002ppm		
E. Benzene	0.75 ppm	0.016ppm	<.002ppm		
Total Xylenes	0.62 ppm	0.027ppm	<.006ppm		
TPH	N/A	88.9ppm	<1.0ppm		
Sodium	N/A	184ppm	79ppm		
Calcium	N/A	69ppm	99ppm		
Magnesium	N/A	36ррт	37ppm		
Potassium	N/A	14.10ppm	8.5ppm		
Conductivity	N/A	1805ppm	1684ppm		
T-Alkalinity	N/A	168ppm	168ppm		
CO <sub>3</sub>	N/A	0ppm	0ppm		
HCO <sub>3</sub>	N/A	205ppm	205ppm		
pН	>6-9<	7.74ppm	7.33ppm		
Sulfate	600 ppm	124ppm	40.6ppm		

Contaminant	WQCC	11/10/98	2-23-00		
	Standard	Initial	Quarterly	•	
		Test	Test		
Chloride	250.0 ppm	294ppm	280		
Selenium	0.05 ppm	0.12ppm	<.05ppm		
TDS	1000 ppm	1030ppm	1066ppm		
Benzene	0.01 ppm	0.007ppm	<.002ppm		
Toluene	0.75 ppm	0.024ppm	<.002ppm		
E. Benzene	0.75 ppm	0.021ppm	<.002ppm		
Total Xylenes	0.62 ppm	0.039ppm	<.006ppm		
TPH	N/A	64.9ppm	<1.0ppm		
Sodium	N/A	125ppm	82ррт		
Calcium	N/A	85ppm	99ppm		
Magnesium	N/A	47ppm	36ppm		
Potassium	N/A	8.35ppm	6.7ppm		
Conductivity	N/A	1814ppm	1774ppm		
T-Alkalinity	N/A	144ppm	140ppm		
CO <sub>3</sub>	N/A	0ppm	0ppm		
HCO <sub>3</sub>	N/A	176ppm	171ppm		
pН	>6-9<	7.69	7.34ppm		
Sulfate	600 ppm	124ppm	46.6ppm		

Contaminant	WQCC	11/10/98	2-23-00	
	Standard	Initial	Quarterly	·
		Test	Test	
Chloride	250.0 ppm	333ppm	344	
Selenium	0.05 ppm	0.13ppm	<.05ppm	
TDS	1000 ppm	1118ppm	1174ppm 🐇	
Benzene	0.01 ppm	0.006ppm	<.002ppm	
Toluene	0.75 ppm	0.022ppm	<.002ppm	
E. Benzene	0.75 ppm	0.019ppm	<.002ppm	
Total Xylenes	0.62 ppm	0.034ppm	<.006ppm	
TPH	N/A	28.4ppm	<1.0ppm	
Sodium	N/A	136ppm	106ppm	
Calcium	N/A	91ppm	106ppm	
Magnesium	N/A	49ppm	43ppm	
Potassium	N/A	10.11ppm	7.4ppm	
Conductivity	N/A	1969ppm	1936ppm	
T-Alkalinity	N/A	140ppm	152ppm	
CO <sub>3</sub>	N/A	0ppm	0ppm	
HCO <sub>3</sub>	N/A	205ppm	185ppm	
pН	>6-9<	7.74ppm	7.32ppm	
Sulfate	600 ppm	124ppm	44.2ppm	

Appendix B Analytical Results



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BETH ALDRICH

703 E. CLINTON, SUITE #103

**HOBBS, NM 88240** FAX TO: (505) 393-4388

Receiving Date: 02/23/00

Reporting Date: 02/25/00

**Project Number: NOT GIVEN** 

Relative Percent Difference

Bufly I alable

Project Name: CHEVRON-STEVENS

Project Location: EAST OF EUNICE

Sampling Date: 02/23/00

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

Sample Received By: GP

Analyzed By: BC

1.0

2.4

3.7

LAB NO.	SAMPLE ID	TPH (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS	DATE:	02/24/00	02/23/00	02/23/00	02/23/00	02/23/00
H4668-1	MW #1	<1.0	<0.002	<0.002	<0.002	<0.006
H4668-2	MW #2	<1.0	<0.002	<0.002	<0.002	<0.006
H4668-3	MW #3	<1.0	<0.002	<0.002	<0.002	<0.006
Quality Cor	ntrol	3.94	0.104	0.105	0.098	0.293
True Value	QC	4.00	0.100	0.100	0.100	0.300
% Recover	<b>y</b>	98.5	104	105	98.1	97.5

METHODS: TRPHC - EPA 600/4-79-020, 418.1; BTEX - EPA SW-846 8260

1.8



ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BETH ALDRICH 703 E. CLINTON, SUITE #103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 02/23/00 Reporting Date: 02/28/00 Project Number: NOT GIVEN

Project Name: CHEVRON-STEVENS Project Location: EAST OF EUNICE Sampling Date: 02/23/00

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: GP

Analyzed By: AH

		Na	Ca	Mg	K	Conductivity	T-Alkalinity
LAB NUMBER	SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(u mhos/cm)	(mgCaCO <sub>3</sub> /L)
ANALYSIS DA	re:	02/28/00	02/25/00	02/25/00	02/25/00	02/25/00	02/25/00
H4668-1	MW #1	79	99	37	8.5	1684	168
H4668-2	MW #2	82	99	36	6.7	1774	140
H4668-3	MW #3	106	106	43	7.4	1936	152
Quality Control		NR	52	53	4.89	1392	NR
True Value QC		NR	50	50	5.00	1413	NR
% Recovery		NR	104	106	98	98.5	NR
Relative Percer	nt Difference	NR	7.7	7.5	NR	0.2	NR
METHODS:		SM3	3500-Ca-D	3500-Mg E	8049	120.1	310.1
		cı <sup>-</sup>	\$O₄	CO <sub>3</sub>	HCO₃	pН	TDS
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
ANALYSIS DA	TE:	02/25/00	02/25/00	02/25/00	02/25/00	02/25/00	02/25/00
H4668-1	MW #1	264	40.6	0	205	7.33	1017
H4668-2	MV/ #2	280	46.6	0	171	7.34	1066
H4668-3	MW #3	344	44.2	0	185	7.32	1174
Quality Control		960	53.2	NR	971	7.01	NR
True Value QC		1000	50.0	NR	1000	7.00	. NR
% Recovery		96	106	NR	97	100	NR
Relative Percer	nt Difference	5.2	8.5	NR	NR	0	NR
METHODS:		SM4500-C1-B	375.4	310.1	310.1	150.1	160.1

Chemist

Date



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BETH ALDRICH

703 E. CLINTON, SUITE #103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 02/23/00

Reporting Date: 02/28/00

Project Number: NOT GIVEN

Project Name: CHEVRON-STEVENS

Project Location: EAST OF EUNICE

Analysis Date: 02/28/00

Sampling Date: 02/23/00

Sample Type: GROUNDWATER

Sample Condition: COOL & INTACT

Sample Received By: GP

Analyzed By: AH

		Se
LAB NUMBER	SAMPLE ID	(mg/L)
H4668-1	MW#1	0.057
H4668-2	MW#2	<0.05
H4668-3	MVV#3	<0.05
Quality Control		0.053
True Value QC		0.050
% Recovery		106
Relative Percent D	Difference	0.7

METHOD: EPA 600/4-79-020, 270.2

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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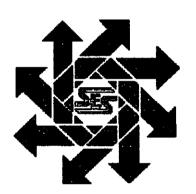
† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.

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# Naomi Keenan Monitor Well Report Unit O, Section 14,T21S, R37E Lea County, New Mexico

September 6, 2000





# RECEIVED

OCT 2 5 2000

ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

# Prepared for:

Chevron USA P.O. Box 1949 Eunice, New Mexico 88231

By:

Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 103 Hobbs, New Mexico 88240 (505) 397-0510

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I. Background	2
II. Work Performed	2
III. Analytical Results	3
IV. Figures and Appendices	3

## I. Background

The subject property is located in Unit O of Section 14, Township 21S Range37E in Lea County, New Mexico. Safety & Environmental Solutions, Inc. (SESI) performed sampling and data collection on the three (3) ground water monitor wells previously installed in November 1998 at the site (See Vicinity Map). The casing size in all wells is 2".

### II. Work Performed

On September 6, 2000, SESI environmental technician Gabriel Terrazas arrived at the site. Ground water samples were taken from each well after a hand bailer was used to develop the wells. Three to five casing volumes of water were removed from each well until pH and temperature of the water were stabilized. The water that was removed was placed in appropriate drums for disposal. The samples were obtained and placed in appropriate containers, preserved and transported under chain of custody to Cardinal Laboratories of Hobbs, New Mexico for analysis of the Total Petroleum Hydrocarbons (TPH), Selenium, Major Cations & Anions, and Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX). (See Analytical Data)

In addition to the sampling, SESI also measured the depth to the top of the water table and the total depth of each well. The depth to the top of ground water was measured using a Solinst water level indicator. The total depth of each well was measured in order to compute the proper casing volumes.

A summary of this data follows:

ID	DATE	TOP OF CASING ELEVATION	DEPTH TO WATER	POTENTIO- METRIC ELEVATION	TOTAL WELL DEPTH	FREE PRODUCT THICKNESS
MW – 1	9/6/00	3,402.18'	49.39'	3352.79'	67.88'	0.00
MW – 2	9/6/00	3,399.58'	47.30'	3352.28'	56.33'	0.00
MW – 3	9/6/00	3,402.19'	48.57'	3353.62'	59.11'	0.00

# III. Analytical Results

The analysis of the groundwater samples performed by Cardinal Laboratories are summarized as follows:

CONTAMINANT	WQCC STANDARD	MW	MW	MW
		#1	#2	#3
Chloride	250.0 ppm	303ppm	311ppm	354ppm
Selenium	0.05 ppm	<0.05ppm	<0.05ppm	<0.05ppm
TDS	1000 ppm	1215ppm	1151ppm	1226ppm
Benzene	0.01 ppm	<0.002ppm	<0.002ppm	<0.002ppm
Toluene	0.75 ppm	<0.002ppm	<0.002ppm	<0.002ppm
Ethyl Benzene	0.75 ppm	<0.002ppm	<0.002ppm	<0.002ppm
Total Xylenes	0.62 ppm	<0.006ppm	<0.006ppm	<0.006ppm
TPH	N/A	2.00ppm	1.45ppm	1.72ppm

SAMPLE ID	NA (MG/L)	CA (MG/L)	MG (MG/L)	K (MG/L)	CO <sub>3</sub> (MG/L)	SO <sub>4</sub> (MG/L)	HCO <sub>3</sub> (MG/L)
MW – 1	217	86	27	5.47	0	225	255
MW – 2	214	79	28	4.86	0	229	260
MW – 3	226	82	26	3.76	0	225	210

# IV. Figures and Appendices

# Figures:

Vicinity Map Potentiometric Map

### **Appendices:**

Cumulative Well Water Quality Data Analytical Results Water Analysis Validation Figure 1 Vicinity Map

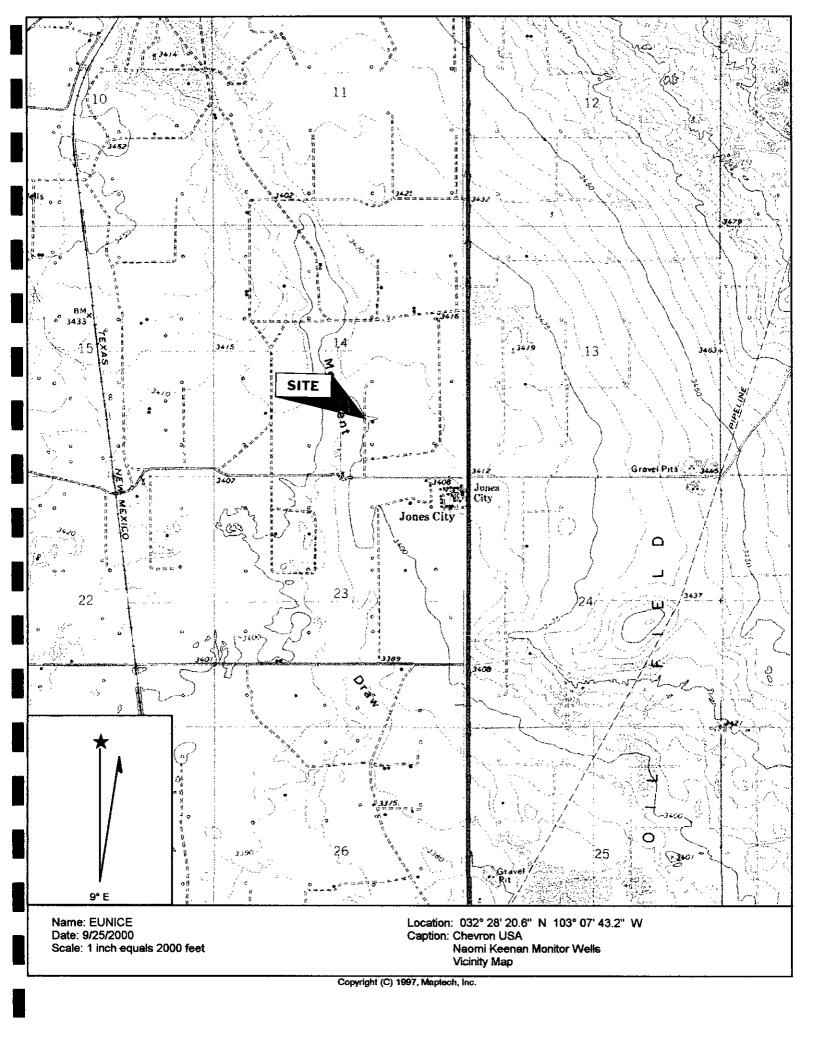
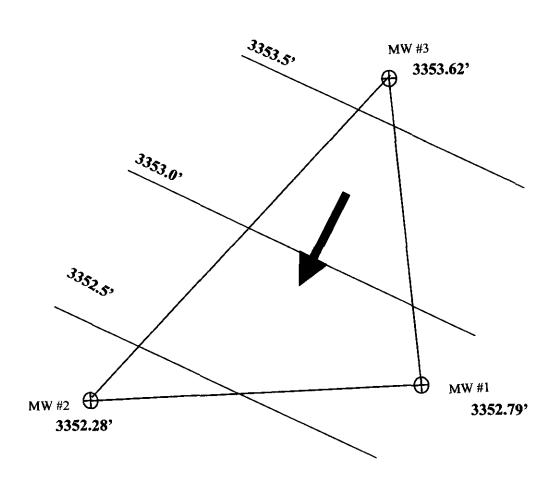


Figure 2
Potentiometric Map





Unit O Section 14, Township 21 South Range 37 East

Scale 1"= 40'
Contour Interval 0.5'
Gradient 0.0076



Chevron USA

Potentiometric Surface Map Naomi Keenan Monitor Wells September 6, 2000

Safety & Environmental Solutions, Inc.

# Appendix A Cumulative Well Water Quality Data

# Naomi Keenan Cumulative Monitor Well Data

Contaminant	WQCC	11/10/98	2/23/00	5/25/00	9/6/00
	Standard	Initial test	Quarterly	Quarterly	Quarterly
·			Fest	Test	Test
Chloride	250.0ppm	313ppm	264ppm	308ppm	303ppm
Selenium	0.05ppm	0.08ppm	0.057ppm	<0.05ppm	<0.05ppm
TDS	1000ppm	1045ppm	1017ppm	948ppm	1215ppm
Benzene	0.01ppm	0.008ppm	<0.002ppm	<0.002ppm	<0.002ppm
Toluene	0.75ppm	0.023ppm	<0.002ppm	<0.002ppm	<0.002ppm
E. Benzene	0.75ppm	0.016ppm	<0.002ppm	<0.002ppm	<0.002ppm
Total	0.62ppm	0.027ppm	<0.006ppm	<0.006ppm	<0.006ppm
Xylenes					
TPH	N/A	88.9ppm	<1.0ppm	<1.00ppm	2.00ppm
Sodium	N/A	184ppm	79ppm	229ppm	217ppm
Calcium	N/A	69ppm	99ppm	99ppm	86ppm
Magnesium	N/A	36ppm	37ppm	35ppm	27ppm
Potassium	N/A	14.10ppm	8.5ppm	9.8ppm	5.47ppm
Conductivity	N/A	1805ppm	1684ppm	1376ppm	1702ppm
T-Alkalinity	N/A	168ppm	168ppm	188ppm	209ppm
CO <sub>3</sub>	N/A	0ppm	0ppm	0ppm	0ppm
HCO <sub>3</sub>	N/A	205ppm	205ppm	229ppm	255ppm
pН	>6-9<	7.74ppm	7.33ppm	7.03ppm	7.45ppm
Sulfate	600ppm	124ppm	40.6ppm	197ppm	225ppm

Contaminant	WQCC	11/10/98	2/23/00	5/25/00	9/6/00
	Standard	Initial	Quarterly	Quarterly	Quarterly
		Test	Test	Test	Test
Chloride	250.0ppm	294ppm	280ppm	316ppm	311ppm
Selenium	0.05ppm	0.12ppm	<0.05ppm	<0.05ppm	<0.05ppm
TDS	1000ppm	1030ppm	1066ppm	1022ppm	1151ppm
Benzene	0.01ppm	0.007ppm	<0.002ppm	<0.002ppm	<0.002ppm
Toluene	0.75ppm	0.024ppm	<.002ppm	<0.002ppm	<0.002ppm
E. Benzene	0.75ppm	0.021ppm	<.002ppm	<0.002ppm	<0.002ppm
Total Xylenes	0.62ppm	0.039ppm	<.006ppm	<0.006ppm	<0.006ppm
TPH	N/A	64.9ppm	<1.0ppm	1.52ppm	1.45ppm
Sodium	N/A	125ppm	82ppm	217ppm	214ppm
Calcium	N/A	85ppm	99ppm	106ppm	79ppm
Magnesium	N/A	47ppm	36ppm	32ppm	28ppm
Potassium	N/A	8.35ppm	6.7ppm	7.2ppm	4.86ppm
Conductivity	N/A	1814ppm	1774ppm	1465ppm	1717ppm
T-Alkalinity	N/A	144ppm	140ppm	164ppm	213ppm
CO <sub>3</sub>	N/A	0ppm	0ppm	0ppm	0ppm
HCO <sub>3</sub>	N/A	176ppm	171ppm	200ppm	260ppm
pН	>6-9<	7.69	7.34ppm	7.32ppm	7.46ppm
Sulfate	600ppm	124ppm	46.6ppm	211ppm	229ppm

Contaminant	WQCC	11/10/98	2/23/00	5/25/00	9/6/00
	Standard	Initial	Quarterly	Quarterly	Quarterly
		Test	Test	Test	Test
Chloride	250.0ppm	333ppm	344ppm	356ppm	354ppm
Selenium	0.05ppm	0.13ppm	<.05ppm	<0.05ppm	<0.05ppm
TDS	1000ppm	1118ppm	1174ppm	1169ppm	1226ppm
Benzene	0.01ppm	0.006ppm	<.002ppm	<0.002ppm	<0.002ppm
Toluene	0.75ppm	0.022ppm	<.002ppm	<0.002ppm	<0.002ppm
E. Benzene	0.75ppm	0.019ppm	<.002ppm	<0.002ppm	<0.002ppm
Total	0.62ppm	0.034ppm	<.006ppm	<0.006ppm	<0.006ppm
Xylenes					
TPH	N/A	28.4ppm	<1.0ppm	<1.00ppm	1.72ppm
Sodium	N/A	136ppm	106ppm	232ppm	226ppm
Calcium	N/A	91ppm	106ppm	112ppm	82ppm
Magnesium	N/A	49ppm	43ppm	37ppm	26ppm
Potassium	N/A	10.11ppm	7.4ppm	7.2ppm	3.76ppm
Conductivity	N/A	1969ppm	1936ppm	1601ppm	1802ppm
T-Alkalinity	N/A	140ppm	152ppm	185ppm	172ppm
CO <sub>3</sub>	N/A	0ppm	0ppm	0ppm	0ррт
HCO <sub>3</sub>	N/A	205ppm	185ppm	185ppm	210ppm
pН	>6-9<	7.74ppm	7.32ppm	7.35ppm	7.59ppm
Sulfate	600ppm	124ppm	44.2ppm	221ppm	225ppm

# Appendix B Analytical Results

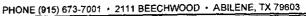
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CHECKED BY: (Initials)





ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BOB ALLEN 703 E. CLINTON, #103 HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 09/07/00 Reporting Date: 09/12/00 Project Number: NOT GIVEN

Project Name: CHEVRON STEVENS

Project Location: NOT GIVEN

Sampling Date: 09/07/00

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: GP

Analyzed By: AH

	Na	Ca	Mg	к	Conductivity	T-Alkalinity
LAB NUMBER SAMPLE ID			=	•		
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mS/cm)	(mgCaCO <sub>3</sub> /L)
ANALYSIS DATE:	09/11/00	09/08/00	09/08/00	09/0800	09/08/00	- 09/08/00
H5152-1 MW 1	217	86	27	5.47	1702	209
H5152-2 MW 2	214	79	28	4.86	17.17	213
H5152-3 MW 3	226	. 82	26	3.76	1802	172
Quality Control	2.096	42	45	5.05	1368	NR NR
True Value QC	2.000	50	50	5.00	1413	NR
% Recovery	105	84	91	101	96.7	NR
Relative Percent Difference	0.2	.0	2.4	.0.	0.1	NR
METHODS:	SM	3500-Ca-D	3500-Mg E	8049	120.1	310.1
	.CI	SO <sub>4</sub>	CO <sub>3</sub>	HCO₃	рН	TDS
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
ANALYSIS DATE:	09/08/00	09/08/00	09/08/00	09/08/00	09/08/00	09/11/00
H5152-1 MW 1	303	225	0	255	7.45	1215
H5152-2 MW 2	311	229	0	260	7.46	1151
H5152-3 MVV 3	354	225	0	210	7.59	1226
Quality Control	1025	51.51	NR	1088	6.99	NR
True Value QC	1000	50.00	NR	1000	7.00	NR
% Recovery	97.6	103	NR	109	99.9	NR
Relative Percent Difference	6.1	1.5	NR	8.1	. 0	NR
METHODS:	SM4500-CI-B	375.4	310.1	310.1	150.1	160.1

Amy Hill
Chemist

1-12-00 Date





ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BOB ALLEN 703 E. CLINTON, #103 HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 09/07/00

Reporting Date: 09/11/00

Project Number: NOT GIVEN

Project Name: CHEVRON STEVENS

Project Location: NOT GIVEN

Analysis Date: 09/11/00

Sampling Date: 09/07/00

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: GP

Analyzed By: AH

LAB NUMBER	SAMPLE ID	Se (mg/L).
H5152-1	MW 1	<0.05
H5152-2	MW 2	< 0.05
H5152-3	MW 3	<0.05
Quality Control		0.215
True Value QC		0.200
% Recovery		108
Relative Percent D	Difference	5.4

METHOD: EPA 600/4-79-020 270.2

chemis

Date



PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603

PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BOB ALLEN 703 E. CLINTON, #103 HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 09/07/00

Reporting Date: 09/08/00 Project Number: NOT GIVEN

Project Name: CHEVRON STEVENS

Project Location: NOT GIVEN

Sampling Date: 09/07/00

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

Sample Received By: GP

Analyzed By: BC

LAB NO.	SAMPLE ID	TPH (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS	DATE:	09/08/00	09/07/00	09/07/00	09/07/00	09/07/00
H5152-1	MW 1	2.00	<0.002	<0.002	<0.002	<0.006
H5152-2	MW 2	1:45	<0.002	<0.002	<0.002	<0.006
H5152-3	MW 3	1.72	<0.002	<0.002	<0.002	<0.006
Quality Con	ntrol	10.6	0.088	0.094	0.097	0.294
True Value	QC	12.0	0.100	0.100	0.100	0.300
% Recovery	y	88.7	87.6	94.0	97.1	98.1
Relative Pe	ercent Difference	9.0	2.6	3.7	11,1	9.0

METHODS: TRPHC - EPA 600/4-79-020, 418.1; BTEX - EPA SW-846 8260

wofdCushe

Chemist

Date

# Appendix C Water Analysis Validation

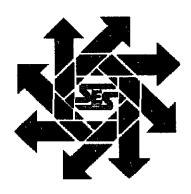
### Portrait

	Ca	ntions and	d Anions (	Calculati	on Check	•		
	Sample Name	H5152-1	H5152-2	H5152-3				
	Well Number	MW1	MW2	MW3				
	Date	09/06/00	09/06/00	09/06/00				
Equivalent							<del>                                     </del>	-
Weight:	Lab	Cardinal	Cardinal	Cardinal				
22.99	Sodium (mg/L)	217	214	226				
20,04	Calcium (mg/L)	86	79	82				
12.15	Magnesium (mg/L)	27	28	26				
39.09	Potassium (mg/L)	5.5	4.9	3.8			· ·	+
35,45	Chloride (mg/L)	303	311	354				
48.04	Sulfate (mg/L)	225	229	225				
30.00	Carbonate (mg/L)	0.0	0.0	0.0				
61.01	Bicarbonate (mg/L)	255	260	210				-
01.01	Alkalinity (mg/L)	400	200	210				+
50.04	CaCO3)	209	213	172				
62.00	Nitrate (mg/L)	0.0	0.0	0.0				
02.00	Tittlase (mg/L)	0.0	0.0	0.0		1		
	Sum Cations (meq/L)	16.1	15.7	16.2				-
<del></del>	Sum Anions (meq/L)	17.4				<u> </u>		
	Percent Difference		17.8	18.1				
	Percent Difference	3.9	6.3	5.7				
	NA LANDO A							
	Measured TDS (evap.,	1.015	1 151	1.007				
	mg/L)	1,215	1,151	1,226				
	TDS (calc. USGS sum,	989	004	1.000				
	mg/L)	989	994	1,020				
	TDS (meas.) / TDS (calc. USGS)	1.2	12	1.2				
	UaGaj	1.2	1.2	1,2				
	TDS (calc. sum, mg/L)	1 110	1 126	1 127				
	Elect. Conductivity	1,118	1,126	1,127		-		1
	(umhos/cm)	1,702	1,717	1,802				
	TDS (C*0.7, mg/L)	1,191	1,202	1,261	<u> </u>	·		+
	TDS (calc. USGS) /	1,171	1,202	1,201			<del>                                     </del>	
	Conductivity	0.58	0.58	0,57				
	Conductivity	0.56	0.56	0.57				<u> </u>
	Test Criteria	<del></del>	-		]	<del>                                     </del>		+
	tot Criteria		Anion	Max %		-		_
Anion-Co	ition Balance:		Sum	diff.				
	WANTE		0 - 3.0	± 0.2				+
			3.0 - 10.0	± 0.2 ± 2				+
							1	
· · · · · · · · · · · · · · · · · ·			10.0 - 800	± 5			<del> </del>	
TDC 3#			10 < 1	100001	_1_1	TD(1)		
. 1D5, Me	asured to Calculated:		1.0 < (meas	aired TDS/c	calculated T	DS) < 1.2		<del>-</del>
			1		1	1	1	l .



# Naomi Keenan Monitor Well Report Unit O, Section 14,T21S, R37E Lea County, New Mexico

March 14, 2001



Prepared for:

Chevron USA P.O. Box 1949 Eunice, New Mexico 88231

By:

Safety & Environmental Solutions, Inc. 703 E. Clinton Suite 102 Hobbs, New Mexico 88240 (505) 397-0510

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II.Work Performed	7
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III. Analytical Results	3
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IV. Figures and Appendices	3

### I. Background

The subject property is located in Unit O of Section 14, Township 21S Range 37E in Lea County, New Mexico. Safety & Environmental Solutions, Inc. (SESI) performed sampling and data collection on the three (3) ground water monitor wells previously installed in November 1998 at the site (See Vicinity Map). The casing size in all wells is 2".

### II. Work Performed

On March 14, 2001, an environmental technician with SESI arrived at the site. Ground water samples were taken from each well after a hand bailer was used to develop the wells. Three to five casing volumes of water were removed from each well until pH and temperature of the water were stabilized. The water that was removed was placed in appropriate drums for disposal. The samples were obtained and placed in appropriate containers, preserved and transported under chain of custody to Cardinal Laboratories of Hobbs, New Mexico for analysis of the Total Petroleum Hydrocarbons (TPH), Selenium, Major Cations & Anions, and Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX). (See Analytical Data)

In addition to the sampling, SESI also measured the depth to the top of the water table and the total depth of each well. The depth to the top of ground water was measured using a Solinst water level indicator. The total depth of each well was measured in order to compute the proper casing volumes. A summary of this data follows:

ID	DATE	TOP OF CASING ELEVATION	DEPTH TO WATER	POTENTIO- METRIC ELEVATION	TOTAL WELL DEPTH	FREE PRODUCT THICKNESS
MW - 1	3/14/01	3,402.18'	49.00'	3353.18'	67.88'	0.00
MW – 2	3/14/01	3,399.58'	46.85'	3352.73'	56.33'	0.00
MW – 3	3/14/01	3,402.19'	48.20'	3353.99'	59.11'	0.00

## III. Analytical Results

The analysis of the groundwater samples performed by Cardinal Laboratories are summarized as follows:

CONTAMINANT	WQCC STANDARD	MW #1	MW #2	MW #3
Chloride	250.0 ppm	300ppm	316ppm	300ppm
Selenium	0.05 ppm	0.063ppm	0.092ppm	0.064ppm
TDS	1000 ppm	1139ppm	1154ppm	1180ppm
TPH	N/A	6.90ppm	1.53ppm	<1.0ppm
Benzene	0.01 ppm	<0.002ppm	<0.002ppm	<0.002ppm
Toluene	0.75 ppm	<0.002ppm	<0.002ppm	<0.002ppm
Ethyl Benzene	0.75 ppm	<0.002ppm	<0.002ppm	<0.002ppm
Total Xylenes	0.62 ppm	<0.006ppm	<0.006ppm	<0.006ppm

SAMPLE ID	NA (MG/L)	CA (MG/L)	MG (MG/L)	K (MG/L)	CO <sub>3</sub> (MG/L)	SO <sub>4</sub> (MG/L)	HCO <sub>3</sub> (MG/L)
MW - 1	104	127	36	7.19	0	266	233
MW – 2	340	120	30	4.72	0	260	216
MW – 3	231	129	33	4.86	0	242	216

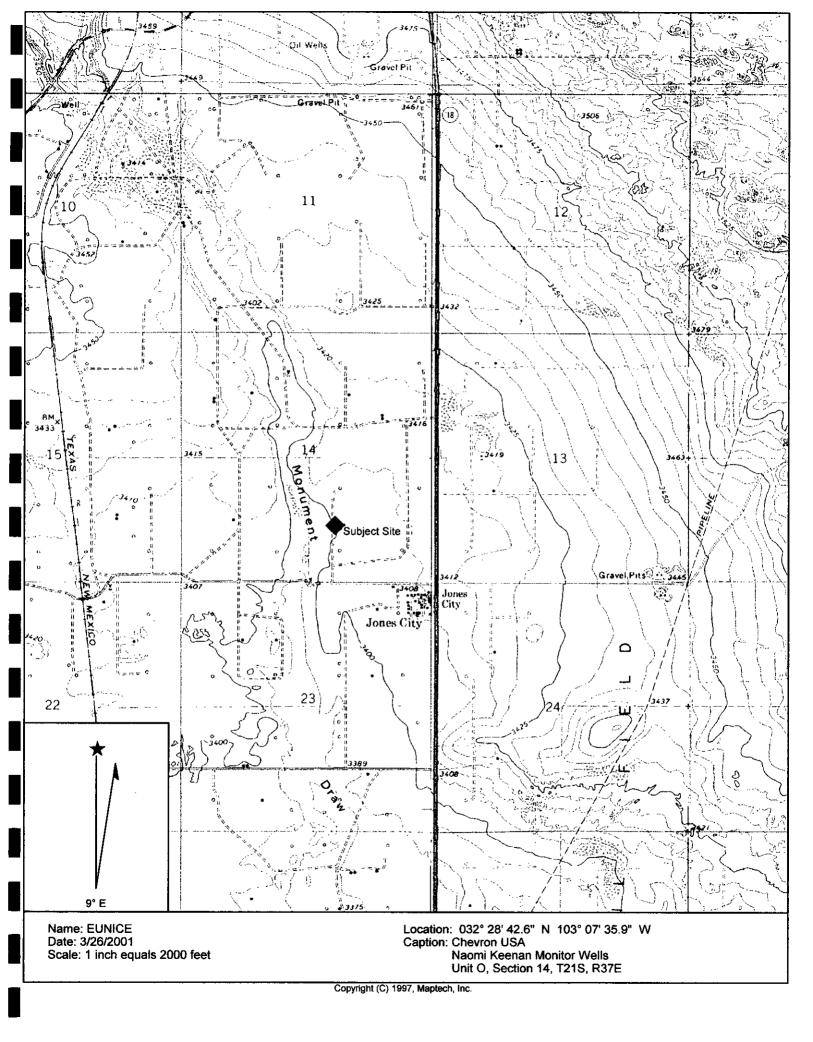
# IV. Figures and Appendices

# Figures:

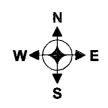
Vicinity Map
Potentiometric Map

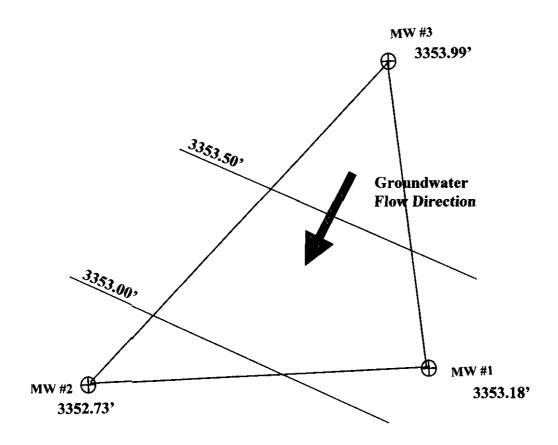
# Appendices:

Cumulative Well Water Quality Data Analytical Results Water Analysis Validation Figure 1 Vicinity Map



# Figure 2 Potentiometric Map





Unit O Section 14, Township 21 South Range 37 East

Scale 1"= 40' Contour Interval 0.5' Gradient 0.0072



**Chevron USA** 

Potentiometric Surface Map Naomi Keenan Monitor Wells March 14, 2001

Safety & Environmental Solutions, Inc.

# Appendix A Cumulative Well Water Quality Data

# Naomi Keenan Cumulative Monitor Well Data

# Monitor Well #1

Contaminant	WQCC	11/10/98:-	2/23/00	5/25/00	9/6/00	12/30/00
	Standard	Initial	Quarterly	Quarterly	Quarterly	Quarterly
		Test	Test -	Test	Test	Test
Chloride	250.0ppm	313ppm	264ppm	308ppm	303ppm	340ppm
Selenium	0.05ppm	0.08ppm	0.057ppm	<0.05ppm	<0.05ppm	<0.05ppm
TDS	1000ppm	1045ppm	1017ppm	948ppm	1215ppm	1177ppm
Benzene	0.01ppm	0.008ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
Toluene	0.75ppm	0.023ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
E. Benzene	0.75ppm	0.016ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
Total Xylenes	0.62ppm	0.027ppm	<0.006ppm	<0.006ppm	<0.006ppm	<0.006ppm
TPH	N/A	88.9ppm	<1.0ppm	<1.00ppm	2.00ppm	<1.0ppm
Sodium	N/A	184ppm	79ppm	229ppm	217ppm	222ppm
Calcium	N/A	69ppm	99ppm	99ppm	86ррт	124ppm
Magnesium	N/A	36ppm	37ppm	35ppm	27ppm	42ppm
Potassium	N/A	14.10ppm	8.5ppm	9.8ppm	5.47ppm	7.38ppm
Conductivity	N/A	1805ppm	1684ppm	1376ppm	1702ppm	1907ppm
T-Alkalinity	N/A	168ppm	168ppm	188ppm	209ppm	214ppm
CO <sub>3</sub>	N/A	0ppm	0ppm	0ppm	0ppm	0ppm
HCO <sub>3</sub>	N/A	205ppm	205ppm	229ppm	255ppm	262ppm
pН	>6-9<	7.74ppm	7.33ppm	7.03ppm	7.45ppm	7.56ppm
Sulfate	600ppm	124ppm	40.6ppm	197ppm	225ppm	270ppm

# Monitor Well #1 (Continued)

Contaminant	WQCC Standard	3/14/01 Quarterly Test
Chloride	250.0ppm	300ppm
Selenium	0.05ppm	0.063ppm
TDS	1000ppm	1139ppm
Benzene	0.01ppm	<0.002ppm
Toluene	0.75ppm	<0.002ppm
E. Benzene	0.75ppm	<0.002ppm
Total Xylenes	0.62ppm	<0.006ppm
ТРН	N/A	6.90ppm
Sodium	N/A	104ppm
Calcium	N/A	127ppm
Magnesium	N/A	36ррт
Potassium	N/A	7.19ppm
Conductivity	N/A	1742ppm
T-Alkalinity	N/A	191ppm
$CO_3$	N/A	0ppm
HCO <sub>3</sub>	N/A	233ppm
pН	>6-9<	7.19ppm
Sulfate	600ppm	266ррт

# **Monitor Well #2**

Contaminant	WQCC Standard	11/10/98 Initial	2/23/00 Quarterly	5/25/00 Quarterly	9/6/00 Quarterly	12/30/00 Quarterly
The state of the s		Test	Test	Test	Test	Test *
Chloride	250.0ppm	294ppm	280ppm	316ppm	311ppm	315ppm
Selenium	0.05ppm	0.12ppm	<0.05ppm	<0.05ppm	<0.05ppm	<0.05ppm
TDS	1000ppm	1030ppm	1066ppm	1022ppm	1151ppm	1064ppm
Benzene	0.01ppm	0.007ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
Toluene	0.75ppm	0.024ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
E. Benzene	0.75ppm	0.021ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
Total Xylenes	0.62ppm	0.039ppm	<0.006ppm	<0.006ppm	<0.006ppm	<0.006ppm
TPH	N/A	64.9ppm	<1.0ppm	1.52ppm	1.45ppm	<1.0ppm
Sodium	N/A	125ppm	82ppm	217ppm	214ppm	154ppm
Calcium	N/A	85ppm	99ppm	106ррт	79ppm	107ppm
Magnesium	N/A	47ppm	36ррт	32ppm	28ppm	42ppm
Potassium	N/A	8.35ppm	6.7ppm	7.2ppm	4.86ppm	4.75ppm
Conductivity	N/A	1814ppm	1774ppm	1465ppm	1717ppm	1781ppm
T-Alkalinity	N/A	144ppm	1 <b>40</b> ppm	164ppm	213ppm	163ppm
CO <sub>3</sub>	N/A	0ppm	0ppm	0ppm	0ppm	0ppm
HCO <sub>3</sub>	N/A	176ppm	171ppm	200ppm	260ppm	199ppm
pН	>6-9<	7.69	7.34ppm	7.32ppm	7.46ppm	7.77ppm
Sulfate	600ppm	124ppm	46.6ppm	211ppm	229ppm	167ppm

# Monitor Well #2 (Continued)

Contaminant	WQCC Standard	3/14/01 Quarterly Test
Chloride	250.0ppm	316ppm
Selenium	0.05ppm	0.092ppm
TDS	1000ppm	1154ppm
Benzene	0.01ppm	<0.002ppm
Toluene	0.75ppm	<0.002ppm
E. Benzene	0.75ppm	<0.002ppm
Total Xylenes	0.62ppm	<0.006ppm
ТРН	N/A	1.53ppm
Sodium	N/A	340ppm
Calcium	N/A	120ppm
Magnesium	N/A	30ppm
Potassium	N/A	4.72ppm
Conductivity	N/A	1797ppm
T-Alkalinity	N/A	177ppm
CO <sub>3</sub>	N/A	0ppm
HCO <sub>3</sub>	N/A	216ppm
pН	>6-9<	7.46
Sulfate	600ppm	260ppm

# Monitor Well #3

Contaminant	WQCC	11/10/98	2/23/00	5/25/00	9/6/00	12/30/00
	Standard	💯 Initial 🦠	Quarterly	Quarterly	Quarterly.	Quarterly '
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Test	Test	Test	Test	Test
Chloride	250.0ppm	333ppm	344ppm	356ppm	354ppm	352ppm
Selenium	0.05ppm	0.13ppm	<0.05ppm	<0.05ppm	<0.05ppm	<0.05ppm
TDS	1000ppm	1118ppm	1174ppm	1169ppm	1226ppm	1169ppm
Benzene	0.01ppm	0.006ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
Toluene	0.75ppm	0.022ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
E. Benzene	0.75ppm	0.019ppm	<0.002ppm	<0.002ppm	<0.002ppm	<0.002ppm
Total Xylenes	0.62ppm	0.034ppm	<0.006ppm	<0.006ppm	<0.006ppm	<0.006ppm
TPH	N/A	28.4ppm	<1.0ppm	<1.00ppm	1.72ppm	<1.0ppm
Sodium	N/A	136ppm	106ppm	232ppm	226ppm	180ppm
Calcium	N/A	91ppm	106ppm	112ppm	82ppm	116ppm
Magnesium	N/A	49ppm	43ppm	37ppm	26ppm	39ppm
Potassium	N/A	10.11ppm	7.4ppm	7.2ppm	3.76ppm	5.61ppm
Conductivity	N/A	1969ppm	1936ppm	1601ppm	1802ppm	1913ppm
T-Alkalinity	N/A	140ppm	152ppm	185ppm	172ppm	168ppm
CO <sub>3</sub>	N/A	0ppm	0ppm	0ppm	0ppm	0ppm
HCO <sub>3</sub>	N/A	205ppm	185ppm	185ppm	210ppm	205ppm
рН	>6-9<	7.74ppm	7.32ppm	7.35ppm	7.59ppm	7.71ppm
Sulfate	600ppm	124ppm	44.2ppm	221ppm	225ppm	1 <b>77</b> ppm

# **Monitor Well #3 (Continued)**

Contaminant	WQCC Standard	3/14/01 Quarterly Test
Chloride	250.0ppm	300ppm
Selenium	0.05ppm	0.064ppm
TDS	1000ppm	1180ppm
Benzene	0.01ppm	<0.002ppm
Toluene	0.75ppm	<0.002ppm
E. Benzene	0.75ppm	<0.002ppm
Total Xylenes	0.62ppm	<0.006ppm
ТРН	N/A	<1.0ppm
Sodium	N/A	231ppm
Calcium	N/A	129ppm
Magnesium	N/A	33ppm
Potassium	N/A	4.86ppm
Conductivity	N/A	1850ppm
T-Alkalinity	N/A	177ppm
CO <sub>3</sub>	N/A	0ppm
HCO <sub>3</sub>	N/A	216ppm
рН	>6-9<	7.41ppm
Sulfate	600ppm	242ppm

# Appendix B Analytical Results



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BOB ALLEN

703 E. CLINTON, STE. 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 03/14/01 Reporting Date: 03/19/01 Project Number: NOT GIVEN

Project Name: CHEVRON STEVENS

Project Location: EAST OF EUNICE

Sampling Date: 03/14/01

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

Sample Received By: AH

Analyzed By: AH

		Na	Ca	Mg	K	Conductivity	T-Alkalinity
LAB NUMBER	SAMPLE ID	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mS/cm)	(mgCaCO <sub>3</sub> /L)
ANALYSIS DATI	<u> </u>	03/16/01	03/15/01	03/15/01	03/15/01	03/15/01	03/15/01
H5705-1	MW #1	104	127	36	7.19	1742	191
H5705-2	MW #2	340	120	30	4.72	1797	177
H5705-3	MW #3	231	129	33	4.86	1850	177
Quality Control		1.170	47	52	5.02	1489	NR
True Value QC		1.000	50	50	5.00	1413	NR
% Ассигасу		117	94.3	104	100	105	NR
Relative Percent	Difference	4.3	0	0	2.8	0.3	NR
METHODS:		SM	3500-Ca-D	3500-Mg E	8049	120.1	310.1
		cı-	SO <sub>4</sub>	CO <sub>3</sub>	HCO₃	pН	TDS
		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(s.u.)	(mg/L)
ANALYSIS DATI		03/15/01	03/15/01	03/15/01	03/15/01	03/15/01	03/16/01
H5705-1	MW #1	300	266	0	233	7.19	1139
H5705-2	MW #2	316	260	0	216	7.46	1154
H5705-3	MW #3	300	242	0	216	7.41	1180
Quality Control		1050	54.86	NR	995	7.04	NR NR
True Value QC		1000	50.00	NR	1000	7.00	NR
% Accuracy		105	110	NR	99.5	101	NR
Relative Percent	Difference	10.5	7.4	NR	0	0	NR
METHODS:		SM4500-CI-B	375.4	310.1	310.1	150.1	160.1

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliate 17765 (12) and or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above-stated reasons or otherwise.



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: BOB ALLEN

703 E. CLINTON, STE. 103

HOBBS, NM 88240 FAX TO: (505) 393-4388

Receiving Date: 03/14/01

Reporting Date: 03/19/01

Project Number: NOT GIVEN
Project Name: CHEVRON STEVENS

Project Location: EAST OF EUNICE

Analysis Date: 03/19/01 Sampling Date: 03/14/01

Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT

Sample Received By: AH

Analyzed By: AH

LAB NUMBER	SAMPLE ID	Se (ppm)
H5705-1	MW #1	0.063
H5705-2	MW #2	0.092
H5705-3	MW #3	0.064
Quality Control		0.049
True Value QC		0.050
% Recovery		98.0
Relative Percent D	Difference	4.1

METHOD: EPA 600/4-79-020 270.2

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03/22/2001



ANALYTICAL RESULTS FOR

SAFETY & ENVIRONMENTAL SOLUTIONS, INC.

ATTN: DEE WHATLEY 703 E. CLINTON, #103 **HOBBS, NM 88240** FAX TO: (505) 393-4388

Receiving Date: 03/14/01

Reporting Date: 03/22/01 Project Number: NOT GIVEN

Project Name: CHEVRON-STEVENS

Project Location: EAST OF EUNICE

Sampling Date: 03/14/01

Sample Type: GROUNDWATER Sample Condition: COOL & INTACT

Sample Received By: AH

Analyzed By: BC

LAB NO.	SAMPLE ID	TPH (mg/L)	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL BENZENE (mg/L)	TOTAL XYLENES (mg/L)
ANALYSIS	DATE:	03/21/01	03/14/01	03/14/01	03/14/01	03/14/01
H5705-1	MW #1	6.90	<0.002	<0.002	<0.002	<0.006
H5705-2	MW #2	1.53	<0.002	<0.002	<0.002	<0.006
H5705-3	MW #3	<1.0	<0.002	<0.002	<0.002	<0.006
Quality Cor	ntrol	5.73	0.113	0.105	0.108	0.315
True Value	QC	6.00	0.100	0.100	0.100	0.300
% Recover	y	95.5	113	105	108	105
Relative Pe	rcent Difference	5.4	1.6	9.0	6.6	7.2

METHODS: TRPHC - EPA 600/4-79-020, 418.1; BTEX - EPA SW-846 8260

# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

ARDINAL LABORATORIES, INC. 2111 Beechwood, Abliene, TX 79603 (915) 673-7001 Fax (915) 673-7020

(505) 393-2326 Fax (505) 393-2476 101 East Marland, Hobbs, NM 88240

Company Name: SEST Project Manager:						- 1	TOBITO.		
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		(TO PO#:				_			
Address: 703 E. CLINTON, #103	Company:	iny: SAME							
City: HOBBS State: NM Zip: 88240	Attn:								
Phone #: (505) 397-0510	Address:	5:							
Fax#: (505) 393_4388	city:								
#:	State:	Zip:		<u> </u>			<u></u>		<del></del>
ame: CHEVIC	Phone #:	#		in			·	·	
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# Appendix C Water Analysis Validation

### **Portrait**

	Ca	tions and	d Anions (	Calculati	on Chec	k		
•	Sample Name	H5705-1	H5705-2	H5705-3				
	Well Number	MWi	MW2	MW3		_ <del> </del>		
	Date	03/14/01	03/14/01	03/14/01				
Equivalent				······································				
Weight:	Lab	Cardinal	Cardinal	Cardinal				
22.99	Sodium (mg/L)	104	340	231				
20.04	Calcium (mg/L)	127	120	129				
12.15	Magnesium (mg/L)	36	30	33				
39.09	Potassium (mg/L)	7.2	4.7	4.9				
35.45	Chloride (mg/L)	300	316	300				
48.04	Sulfate (mg/L)	266	260	242				
30.00	Carbonate (mg/L)	0.0	0.0	0.0				
61.01	Bicarbonate (mg/L)	233	216	216				
			j					
50.04	Alkalinity (mg/L CaCO3)	191	177	177		<u> </u>		
62.00	Nitrate (mg/L)	0.0	0.0	0.0				
	Sum Cations (meq/L)	14.0	23.4	19.3				
	Sum Anions (meq/L)	17.8	17.9	17.0				
	Percent Difference	12.0	-13.3	-6.3				
	Measured TDS (evap.,							
	mg/L)	1,139	1,154	1,180				
	TDS (calc. USGS sum,							
	mg/L)	955	1,177	1,046				
	TDS (meas.) / TDS (calc.	1.0	1.0					
	USGS)	1.2	1.0	1.1		-		_
	TDS (calc. sum, mg/L)	1,073	1,287	1,156				
	Elect. Conductivity	1,075	1,207	1,150				
	(umhos/cm)	1,742	1,797	1,850				
	TDS (C*0.7, mg/L)	1,219	1,258	1,295				
	TDS (calc. USGS) /	1,=13	1,200	1,=/-		<u> </u>		
	Conductivity	0.55	0.65	0.57				
					l			
7	Fest Criteria							1
			Anion	Max %				
l. Anion-Ca	tion Balance:		Sum	diff.				
			0 - 3.0	± 0.2				
			3.0 - 10.0	± 2				
			10.0 - 800	± 5				
. TDS, Mea	asured to Calculated:		1.0 < (meas	sured TDS/o	alculated	TDS) < 1.2	,	