Rio Algom Mining LLC

December 7, 2005

ADDRESSEE ONLY
Mr. Steven Cohen
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Re: **License SUA-1473 Docket 40-8905**
Response to October 31, 2005 Request for Additional Information

Dear Mr. Cohen,

Please find enclosed Rio Algom's response to NRC's Request for Additional Information dated October 31, 2005. The responses provided with this submittal for incorporating the non-hazardous constituents into the ACL petition were developed based on teleconferences between NRC, NMED and Rio Algom.

Please contact me if you have any questions or are in need of additional information related to this request.

Regards,

Peter Luthiger
Corporate Manager, Radiation
Safety and Environmental Affairs

xc: T. Fletcher (RAM)
R. Jones (KM)
K. Myers (NMED)
M. Raddatz (NRC)
File

Response to Request for Additional Information

Rio Algom Mining LLC
License Amendment For Alternate Concentration Limits
Non-hazardous Constituents

Prepared for
Rio Algom Mining LLC

Prepared by
Maxim Technologies, Inc.

December 2005

Version 1.0

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

COMMENT 1.A.

Rio Algom Mining, LLC (Rio Algom) proposes a nitrate ACL of 1,627 mg/L. A review of the July 7, 2005, submittal indicates that only five data points were available to calculate the nitrate ACL. Five data points do not appear to provide a sufficient basis on which to base an ACL.

RESPONSE TO COMMENT 1.A

Rio Algom has modified the method for calculating the ACL value for nitrate. The methodology is described in greater detail in the response to the NRC Recommendation following this comment. Rio Algom and NRC have agreed to use current data to develop the ACL values and that current data corresponds to the period from January 1, 1995 through 2005 and including the most recent sampling event for which data is available. The nitrate data set for this period includes 715 records, providing a high degree of statistical power.

COMMENT 1.B

Regarding the above nitrate ACL, according to Figure 2 of the August 31, 2005, submittal, the highest nitrate concentration is approximately 310 mg/L. The location of the highest concentration appears to be an isolated hotspot. Therefore, the proposed nitrate ACL does not appear to be appropriate when compared to current concentrations.

RESPONSE TO COMMENT 1.B

While the current concentration in monitor well 32-43 has a large influence on the calculated ACL value, consistently high nitrate concentrations in groundwater samples from this well suggest that measured concentrations reflect conditions in groundwater in this isolated area. Therefore, data from this well were included in the calculation of the proposed nitrate ACL value as described above (Response to Comment 1.A) and in Rio Algom's response to the NRC Recommendation following this comment. However, using the larger and more recent data set, the ACL value being proposed is an order of magnitude below the value that was proposed in the August 2005 submittal.

COMMENT 1.C

RAM proposes a TDS ACL of 13,511 mg/L; however, according to Figure 4 of August 31, 2005, submittal, the highest TDS concentration is 14,800 mg/L. This concentration appears to be located near the point of compliance. Therefore the proposed TDS ACL may not be high enough to allow for long-term compliance.

RESPONSE TO COMMENT 1.C

Rio Algom has modified the method for calculating the ACL value for TDS (as described in the response to the NRC Recommendation following this comment), resulting in a proposed ACL value that is higher than the value proposed in the August 2005 submittal and more accurately represents current TDS concentrations in groundwater.

COMMENT 1.D

NMED has stated on multiple occasions that they would not accept ACLs based on the pre-1977 data. NMED's rationale is that the pre-1977 data does not appear to represent true background. Wells used to calculate the proposed ACLs could have been impacted by tailings contamination, which would not comply with the definition of background according to the 20 NMAC 6.2.7.

RESPONSE TO COMMENT 1.D

Rio Algom has developed the ACLs proposed within this submittal using current groundwater concentrations. NRC agreed with Rio Algom that current groundwater concentrations constituted data from 1995 through 2005.

RECOMMENDATION

To meet both NRC and NMED requirements, NRC staff recommends that RAM recalculate its proposed ACLs based on current non-hazardous constituent concentrations.

RESPONSE TO RECOMMENDATION

In discussions with the NRC and NMED, Rio Algom has agreed to recalculate its proposed ACLs based on current non-hazardous constituent concentrations. The data set used to represent current concentrations includes data collected during the period from January 1, 1995 through 2005, including the most recent sampling event for which data is available.

This data set contains a number of non-normally distributed subsets. U.S. EPA guidance (1992) states:

> *"When the assumptions of Normality and Lognormality cannot be justified......the use of non-parametric tolerance intervals should be considered."*

Due to the large number of non-normal data sets, non-parametric tolerance intervals were used to calculate the proposed ACL values for non-hazardous constituents under consideration following statistical methodology presented in EPA guidance (EPA, 1992). The primary method of evaluating the assumption of normality was to calculate the Shapiro Wilk W-statistic for each well and each constituent.

After determining that the majority of individual data sets are non-normal, Rio Algom decided to calculate proposed values for each non-hazardous constituent based on the combined data from all wells. This decision was justified for the following reasons:

1) Most data sets are non normal.

2) The non-parametric calculation of the upper tolerance interval defaults to the highest observed value in the data set.

3) Giving equal weight to each well would result in a derived data set containing either the median value or the highest observed value in each well.

4) The median value chosen from the derived data set would be lower, in some cases than the value that caused concern that proposed ACL values would be exceeded.

5) The highest observed value in the derived data set would be the same value that is produced by basing statistical calculations on the combined data from all wells.

Table 1 presents the proposed ACL values calculated by this methodology.

Table 1. Proposed ACL for non-hazardous constituent – Alluvium

Parameter	Proposed ACL Values
Chloride (mg/L)	7,110
Nitrate (mg/L)	351
Sulfate (mg/L)	12,000
TDS (mg/L)	26,100

COMMENT 2.

RAM should provide an assessment of the non-hazardous constituent concentrations in ground water at the point of exposure (POE) and the methods used in this assessment.

RESPONSE TO COMMENT 2.

Rio Algom has requested that the DOE Office of Legacy Management establish the Long Term Surveillance and Maintenance (LTSM) boundary to include the southern part of Section 5 and that portion of Section 4 that is west of Highway 509 (Figure 1). This boundary is necessary in order to support the ACL application. Monitor well MW-24, which is located in the southwest corner of Section 4 approximately 2800 feet southeast of well 5-08, will constitute the POE for the alluvium. However, in order to maintain consistency with past model work, the following analysis was performed by maintaining the POE at well 5-08.

Monitor well MW-24 has been influenced by the drainage upgradient of Section 4 ponds and is close to being dry. Data previously submitted to NRC (August 10, 2004) clearly demonstrated that groundwater resulting from the infiltration of mine discharge water, will rapidly drain away upon cessation of the surface discharge that recharges the system. Falling water levels in MW-24 and others in the area support the conclusion presented in the Alluvial ACL document that the alluvium will return to an unsaturated state when surface discharge of mine treated water ceases, This drainage will result in continuously reducing the transport capabilities within the alluvium.

In a similar manner that Rio Algom used for the assessment in Rio Algom's April 2003 Response to Request for Additional Information for determining the concentrations of metals and radionuclides at the POE (which has been accepted by the NRC for metals and radionuclide ACL values), this analysis does not account for other sources of constituents that are present in the alluvium and focuses on a one dimensional SOLUTE transport model. As before, this is done with the understanding that distributions of constituents from sources other than Rio Algom will not be accounted for in the model, and therefore, the model cannot be calibrated.

Previous models were run using the constant concentration source (ONED-1) module of SOLUTE, representing One-dimensional transport of a of limited duration solute pulse, assuming one-dimensional transport of a well mixed solute in a semi-infinite horizontal column of unit width and thickness.

In order to more accurately depict the decaying water levels and flow in the Alluvial materials that will take place when mine pumping ceases, the model runs presented in this document use the decaying source term module (ONED-2) in SOLUTE. The decaying source module is typically used to model a source whose concentration declines over time (the concentration at the start of the modeled period is greater than the concentration at the end).

In a manner analogous to the decay of radioactive elements as measured in half lives, much of the drainage of alluvial materials in Ambrosia Lake will occur early in the period predicted by the groundwater flow model. Each successive half life will remove ever smaller amounts of water. The groundwater flow model from the ACL document predicts that the alluvium will go dry in 60-100 years. Therefore, a decay term or half life of 30 years was used in this modeling. The source concentration was the currently proposed ACL value from Table 1 and the modeled distances were taken from the distance from the POC to each proposed trend well (32-59 and 5-08) and to the POE well (MW-24). The retardation factor was taken as 1.0 for chloride, 1.3 for nitrate and 1.5 for sulfate and TDS. These factors were estimated based on general observations of the relative distance from the source that each constituent has traveled to date. Other model parameters (i.e. groundwater velocity and dispersivity) are the same as those previously used and accepted by the NRC.

Results of the modeling are presented in Figure 2 (chloride), Figure 3 (nitrate), Figure 4 (Sulfate), and Figure 5 (TDS). Note that this analysis assumes that the initial concentration at the POC is the proposed ACL value and that there is no ambient concentration in groundwater. As an example of model output, Figure 2 predicts that the initial concentration of 7,110 mg/L chloride in POC well 31-61 will reach a peak concentration of 4,800 mg/L at trend well 32-59 in approximately 40 years. A peak chloride concentration of approximately 4,200 mg/L will arrive in monitor well 5-08 in approximately 50 years. This is a 40 percent reduction of the initial concentration, and, more importantly, this reduced concentration is arriving at trend well 5-08 just before the entire alluvial water system is projected to reach a drained condition. Trend well 5-08 is located 2,800 feet upgradient of proposed POE well MW-24.

COMMENT 3.

RAM mentions that extensive mining in the Ambrosia Lake area caused the dewatering of the Westwater Canyon Member of the Morrison Formation, which is the mined unit in this area. Extensive dewatering has formed a cone of depression that is expected to affect ground water for approximately 600 years. Please confirm the location of this cone of depression.

RESPONSE TO COMMENT 3.

Figure 6, taken from a 1983 study by William F. Guyton Associate, Inc, is an estimate of the drawdown and extent of the groundwater depression due to mine pumping by 1979. This figure (similar to several others that have been published – c.f. Stone, 1983) indicates that the area affected by drawdown due to mine pumping at Ambrosia Lake may be as much as one thousand square miles of the San Juan Basin. Note that the highest head loss is centered on the Ambrosia Lake site.

COMMENT 4.

According to RAM's review of well completion records, well S-9 was installed in 1962 and its completion is not documented. RAM states that the integrity of this well is suspect because it is constructed of thin metal pipe in acidic subsurface environment. RAM should state its future plans for this well.

RESPONSE TO COMMENT 4.

Rio Algom intends to plug and abandon well S-9 following NRC approval.

As Rio Algom proceeds with overall site closure, the remaining reclamation activities at the site will result in transforming the existing land surface. Key projects include relocation of the Section 4 lined ponds and Pond 9, completion of building demolition, contouring the mill yard, closure of the intercept trench, and closure of Pond 3.

This transformation will result in the inevitable destruction of additional monitoring wells. Alluvial wells that have been or will be impacted by remaining reclamation work include 19 monitoring wells associated with the Section 4 ponds, D-4, E-5, S-9, S-12, 32-72, and 32-60. To ensure that proper well closure is performed, Rio Algom will plug and abandon wells prior to encroachment of reclamation activities.

Additionally, upon approval of the ACL and discontinuation of the CAP and as part of the overall site closure process, Rio Algom will initiate the plugging and abandonment of all monitoring wells within the Dakota, Tres Hermanos A, and Tres Hermanos B units that are not included in the stability monitoring plan approved by NRC.

COMMENT 5.

RAM states that the non-hazardous ACLs will be the same for both the alluvial and bedrock aquifers. This does not appear to be technically defensible. Although ground water would migrate from the alluvial to the bedrock aquifers, attenuation to some degree would likely occur. This is evident by the proposed ACLs for the hazardous constituents, which are lower for the bedrock aquifers than for the alluvial aquifer. RAM should present its rationale for proposing similar bedrock and alluvial ACLs.

RESPONSE TO COMMENT 5.

Rio Algom proposes the values presented in Table 3 as the non-hazardous ACL values for the bedrock Aquifers. These values were developed in a process that is identical to the one described in the response to the recommendation following Comment 1, pooling all data for each constituent and each geologic unit and preparing non-parametric upper tolerance limits.

Table 2. Proposed ACL for non-hazardous constituent – Bedrock Units (mg/L).

Parameter	Dakota	TRA	TRB
Chloride	3,200	1,070	2,810
Nitrate	22.8	9.2	7.7
Sulfate	6,480	2,584	4,760
Total Dissolved Solids (TDS)	14,100	6,400	11,700

Rio Algom used modeling procedures identical to those described above (Comment 2) to assess concentrations of non-hazardous constituents at the POE over time. Results are presented in Figure 7 (chloride), Figure 8 (nitrate), Figure 9 (sulfate), and Figure 10 (TDS). Modeling was only completed for the Dakota because the transport distance is the same as that for the other units and initial concentrations of all constituents were highest in the Dakota.

PROPOSED STABILITY MONITORING PLAN

INTRODUCTION

Rio Algom's ACL review has resulted in the proposed stability monitoring plan undergoing several transformations to address the outcomes of meetings and correspondence between NRC, NMED and Rio Algom as part of the ACL review process. Specific documents/meetings included:

1) Center for Nuclear Waste Regulatory Analyses document entitled, Draft Evaluation of Alternate Concentration Limit Applications, Rio Algom Mining LLC Mill Facility, Ambrosia Lake, New Mexico;

2) August 12, 2003 site visit at the Ambrosia Lake Facility between NRC and Rio Algom;

3) August 22, 2003 NRC letter to Rio Algom confirming agreements on follow-up actions for all parties;

4) September 2, 2003 NRC email accepting a retardation factor of 50 for the bedrock units and alluvium and suggesting that Rio Algom's objectives might be met using a retardation factor of 20;

5) October 16, 2003 Rio Algom response to NRC's August 22, 2003, letter proposing a retardation factor of 20 for the alluvium;

6) March 2004 Center for Nuclear Waste Regulatory Analyses report discussing outstanding issues on Rio Algom's proposed ACLs;

7) June 30, 2004 public meeting held at NRC with NRC Staff and, via telephone, NRC's consultants, the Center for Nuclear Waste Regulatory Analyses to discuss remaining technical issues;

8) June 30, 2004 management meeting between Rio Algom and NRC management and staff;

9) July 29, 2004 letter from Rio Algom to NRC summarizing ACL review process and submission of responses to remaining questions on ACL;

10) February 10, 2005 NRC request to address non-hazardous constituents as part of the Ambrosia Lake ACL application;

11) July 7, 2005 submittal from Rio Algom responding to NRC's February 10, 2005 request to address non-hazardous constituents;

12) October 31, 2005 letter from NRC requesting additional information regarding the non-hazardous constituents proposal;

13) November 9, 2005 teleconference between NRC, NMED, and Rio Algom discussing NRC's October 31, 2005 letter regarding the non-hazardous constituents proposal.

These submittals, conference calls and meeting agreements were reviewed in conjunction with assessing the remaining reclamation activities necessary to achieve site closure and transfer to the US Department of Energy to ensure that the stability monitoring plan will provide appropriate monitoring of the groundwater conditions at the site following cessation of the CAP.

MONITORING WELL NETWORK

Rio Algom's proposed stability monitoring plan has been designed to ensure appropriate monitoring points will be maintained to evaluate the groundwater conditions within the four geologic units associated with the current CAP. The plan includes point of compliance wells, trend wells, and where appropriate, point of exposure wells.

Point of Compliance Wells

RAM designates the following monitor wells as Point of Compliance (POC) wells:

Alluvium:	Monitor Well 31-61
TRA:	Monitor Well 31-01
TRB:	Monitor Well 36-02
Dakota:	Monitor Well 36-06

Trend Wells

RAM proposes that the following wells be classified as trend wells:

Alluvium:	Monitor Wells 32-59, 5-08
TRB:	Monitor Wells 36-01, and 31-67
TRA:	Monitor Well 30-01
Dakota:	Monitor Wells 30-02, and 32-45

Point of Exposure Wells

Bedrock

Groundwater flow in bedrock units (Dakota, Tres Hermanos A, and Tres Hermanos B) is toward the northeast, away from potential milling related sources of constituents. Therefore, POE locations of primary concern are those across the northernmost LTSM boundary. Due to drainage through vent holes and mineshafts, groundwater availability is limited in bedrock units at the northernmost LTSM boundary. As a result, POE wells would be difficult to establish and be of limited usefulness.

The Dakota, Tres Hermanos A, and Tres Hermanos B trend wells proposed above, exist upgradient of the northernmost LTSM boundary, allowing confidence that health based levels of constituents of concern will not be exceeded at POE locations. For these reasons, RAM believes that there is no need for POE wells for the Dakota, Tres Hermanos A, and Tres Hermanos B units at the northernmost LTSM boundary. Figures 11 through 13 depict the locations of the POC wells and trend wells for the Dakota, Tres Hermanos A, and Tres Hermanos B units, respectively.

Upon approval of the ACL and discontinuation of the CAP and as part of the overall site closure process in preparation for transfer to DOE, Rio Algom will initiate the plugging and abandonment of all monitoring wells within the Dakota, Tres Hermanos A, and Tres Hermanos B units that are not included in the approved stability monitoring plan.

Alluvium

The water that is present in the alluvium is the result of the mining and milling activities that occurred in the Ambrosia Lake valley and Rio Algom's current groundwater CAP has continued to recharge this water mound at a reduced rate. From the Ambrosia Lake mill site, the flow direction within the alluvium is toward the east/southeast. The POE location for the alluvial unit is along the southeast boundary of the LTSM withdrawal area. Rio Algom proposes to assign existing NRC POC well MW-24 as the POE for the alluvial unit. Well MW-24 is located approximately 500 feet inside of the southern extent of the LTSM boundary and, therefore, it is ideally situated to act as a POE well. Figure 14 depicts the location of the POC well, trend wells, and POE well for the alluvial unit.

GROUNDWATER STABILITY MONITORING PLAN

RAM requests that, upon ACL approval, the current groundwater corrective action program be terminated and the source material license for the Ambrosia

Lake facility be modified to reflect the following post remediation groundwater stability monitoring plan.

Schedule

Upon ACL approval, monitoring will occur on a semi-annual basis for the first two years. Thereafter, monitoring will occur once a year until the site is transferred to the DOE for long-term surveillance and maintenance.

RAM believes that annual monitoring is justified based on the average rate of groundwater flow in bedrock and alluvial units. Calibration of flow and transport models suggests average flow rates of approximately 125 feet per year in bedrock units and 182 feet per year in the Alluvium. These values suggest that the groundwater in the bedrock units would move approximately 375 feet in three years and alluvial groundwater would move approximately 550 feet. Applying an attenuation factor of 10 to flow velocity (much lower than predicted), implies that hazardous constituents would migrate less than 20 feet per year.

Monitoring Locations

Table 3 lists the monitoring wells that will be included in each monitoring event associated with the groundwater stability monitoring plan.

Table 3. Groundwater Stability Monitoring Plan – Monitoring Well Network

Dakota		TRA		TRB		Alluvium		
POC Well	Trend Wells	POC Well	Trend Well	POC Well	Trend Wells	POC Well	Trend Wells	POE Well
36-06	30-02	31-01	30-01	36-02	31-67	31-61	32-59	MW-24
	32-45				36-01		5-08	

Constituents

Table 4 lists the constituents that will be analyzed during each groundwater sampling event conducted under the stability monitoring plan following termination of the CAP. Analysis will be for the dissolved portion of the constituents and gross alpha will be reported to exclude uranium and radon, as per 10 CFR 40 Appendix A Criterion 5C.

Table 4. Groundwater Stability Monitoring Plan – Constituents

Dakota	TRA	TRB	Alluvium
pH (s.u.)	pH (s.u.)	pH (s.u.)	pH (s.u.)
Chloride (mg/L)	Chloride (mg/L)	Chloride (mg/L)	Chloride (mg/L)
Sulfate (mg/L)	Sulfate (mg/L)	Sulfate (mg/L)	Sulfate (mg/L)
TDS (mg/L)	TDS (mg/L)	TDS (mg/L)	TDS (mg/L)
Nitrate (mg/L)	Nitrate (mg/L)	Nitrate (mg/L)	Nitrate (mg/L)
Nickel (mg/L)	Pb-210 (pCi/L)	Nickel (mg/L)	Mo (mg/L)
U-nat (mg/L)	Ra-226 + 228 (pCi/L)	U-nat (mg/L)	Ni (mg/L)
Pb-210 (pCi/L)	Th-230 (pCi/L)	Pb-210 (pCi/L)	Se (mg/L)
Ra-226 + 228 (pCi/L)		Ra-226 + 228 (pCi/L)	U-nat (mg/L)
Th-230 (pCi/L)		Th-230 (pCi/L)	Pb-210 (pCi/L)
			Ra-226 + 228 (pCi/L)
			Th-230 (pCi/L)
			Gross Alpha (pCi/L)

ALTERNATE CONCENTRATION LIMITS

Rio Algom consolidated the ACLs into the following section to provide one location where all ACLs are presented. The Alternate Concentration Limits (ACL) presented below for the hazardous constituents (metals and radionuclides) have been previously agreed to between NRC and Rio Algom. The non-hazardous constituents presented below (chloride, nitrate, sulfate, total dissolved solids) are being proposed by Rio Algom and Rio Algom requests NRC approval of these ACLs.

Bedrock Units

Table 5 presents the ACLs for the bedrock units. ACLs for the non-hazardous constituents are presented as proposed values in the table.

Table 5. Consolidated Listing of ACLs – Bedrock

Parameter	ACLs		
	Dakota	**Tres Hermanos A**	**Tres Hermanos B**
U-nat (mg/L)	1.6	No ACL	1.6
Th-230 (pCi/L)	945	945	945
Ra-226 and –228 (pCi/L)	218	218	218
Pb-210 (pCi/L)	88	88	88
Nickel (mg/L)	6.8	No ACL	6.8
Chloride (mg/L)*	3,200	1,070	2,810
Nitrate (mg/L)*	22.8	9.2	7.7
Sulfate (mg/L)*	6,480	2,584	4,760
Total Dissolved Solids (mg/L)*	14,100	6,400	11,700

Notes: Values based on dissolved portion.
Parameters containing asterisk are proposed ACLs. All other ACL values previously agreed to by NRC and RAM.

Alluvium

Table 6 presents the ACLs for the bedrock units. ACLs for the non-hazardous constituents are presented as proposed values in the table.

Table 6. Consolidated Listing of ACLs – Alluvium

Parameter	ACL
Mo (mg/L)	176
Ni (mg/L)	98
Se (mg/L)	49
Gross Alpha (pCi/L)	8,402
Ra-226 + 228 (pCi/L)	3,167
Th-230 (pCi/L)	13,627
U (mg/L)	23
Pb-210 (pCi/L)	1,274
Chloride (mg/L)*	7,110
Nitrate (mg/L)*	351
Sulfate (mg/L)*	12,000
Total Dissolved Solids (mg/L)*	26,100

Notes: Values based on dissolved portion.
Parameters containing asterisk are proposed ACLs. All other ACL values previously agreed to by NRC and RAM.

REFERENCES

Stone, W.J., Lyford, F.P., Frenzel, P.F., Mizell, N.H., and Padgett, E.T., 1983, Hydrology and Water Resources of the San Juan Basin, New Mexico, New Mexico Bureau of Mines and Mineral Resources, Hydrologic Report 6, Socorro, New Mexico, 70p.

FIGURES

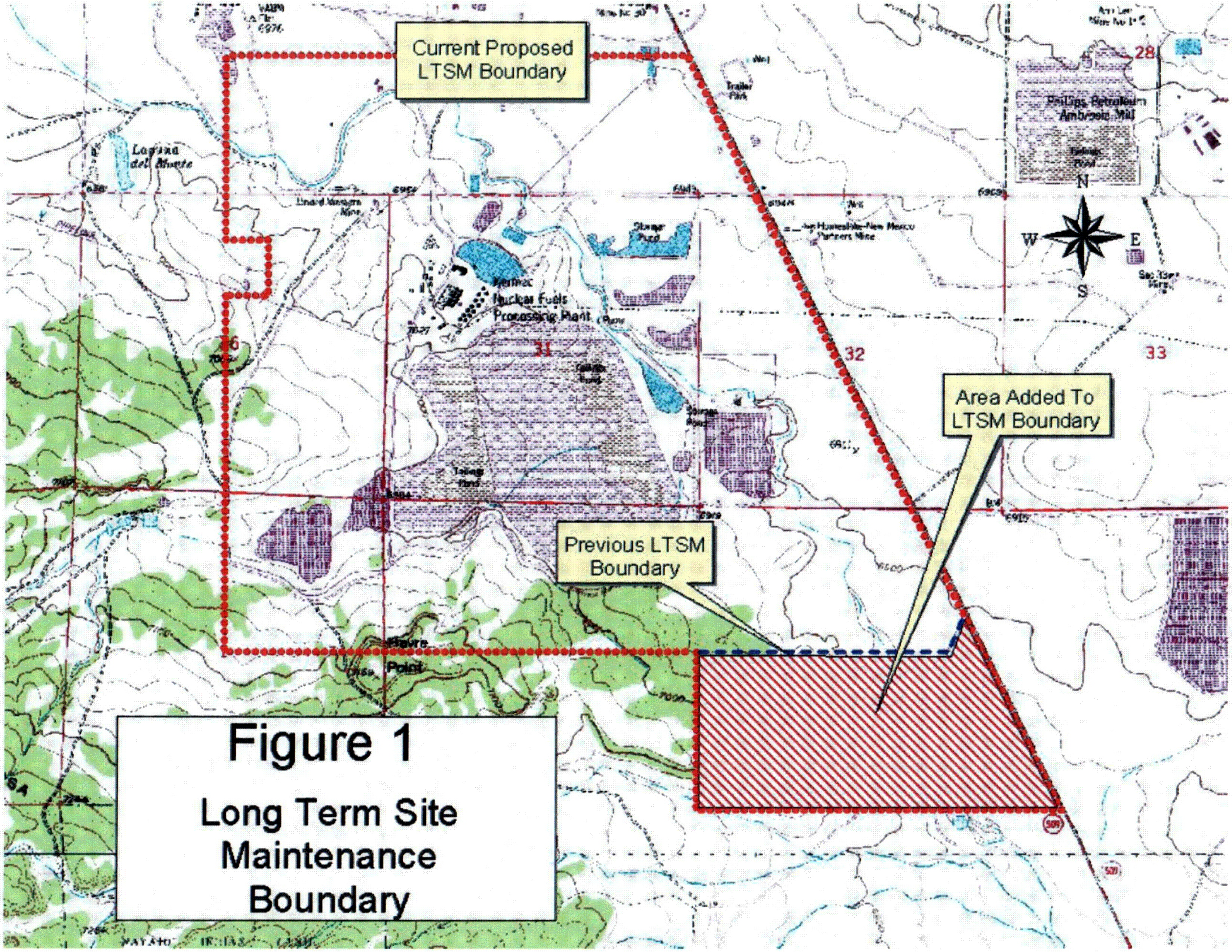

Figure 1

Long Term Site Maintenance Boundary

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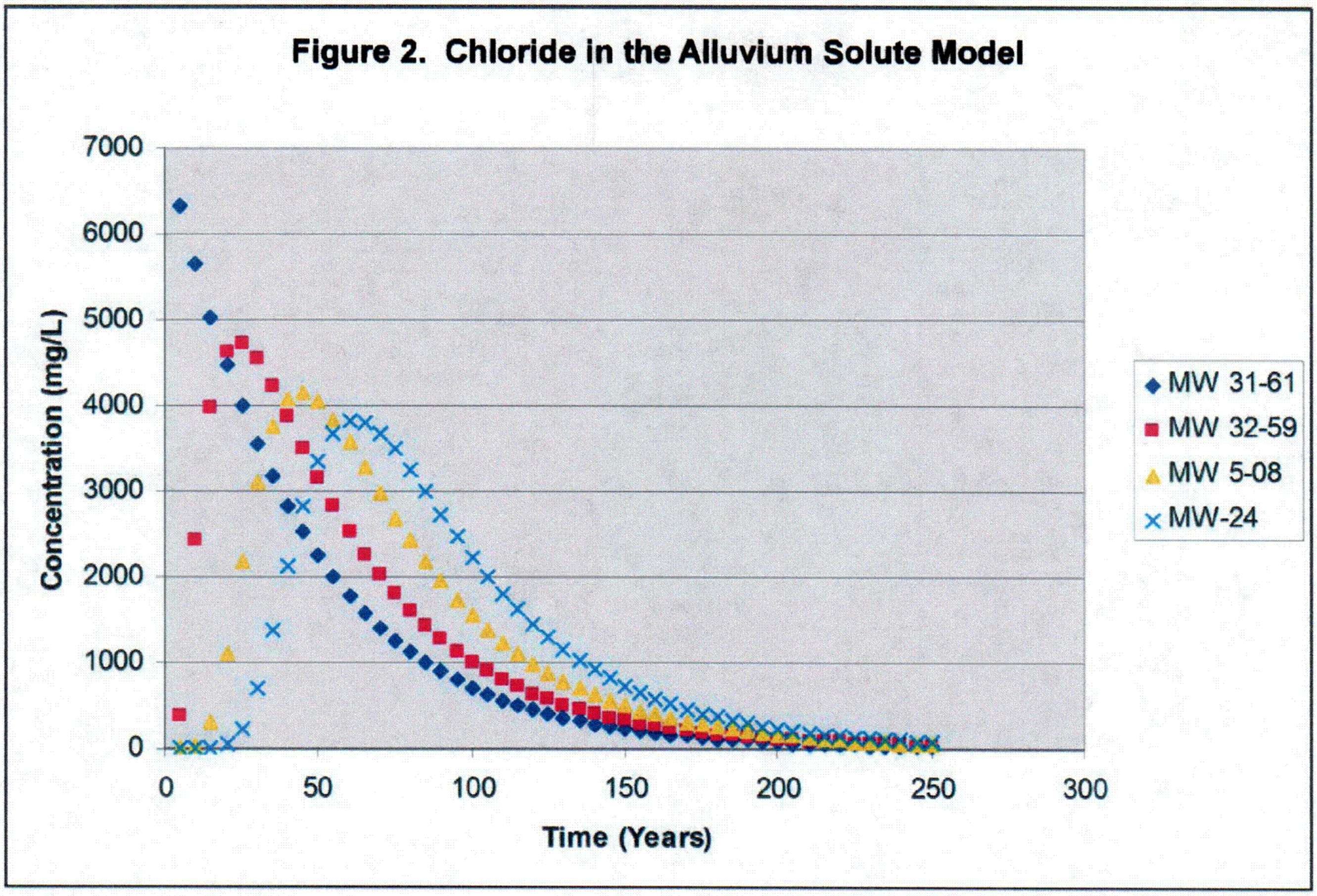
C01



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Longitudinal dispersivity........ = 500 [ft]
Retardation factor............... = 1
Initial aquifer concentration.... = 0.00000D+00[mg/l]
Initial source concentration..... = 7.11000D+03[mg/l]
Source half-life (0 if no decay). = 30 [y]
Source decay constant............ = 0.2310D-01 [1/y]
Half-life in aquifer (no decay=0) = 0 [y]
Decay coefficient for aquifer.... = 0.0000D+00 [1/y]
Length of time step.............. = 5 [y]
Number of time steps............. = 50
Number of observation points..... = 4

1 Distance (from source)..... = 1 [ft]
2 Distance (from source)..... = 2640 [ft]
3 Distance (from source)..... = 5808 [ft]
4 Distance (from source)..... = 8712 [ft]

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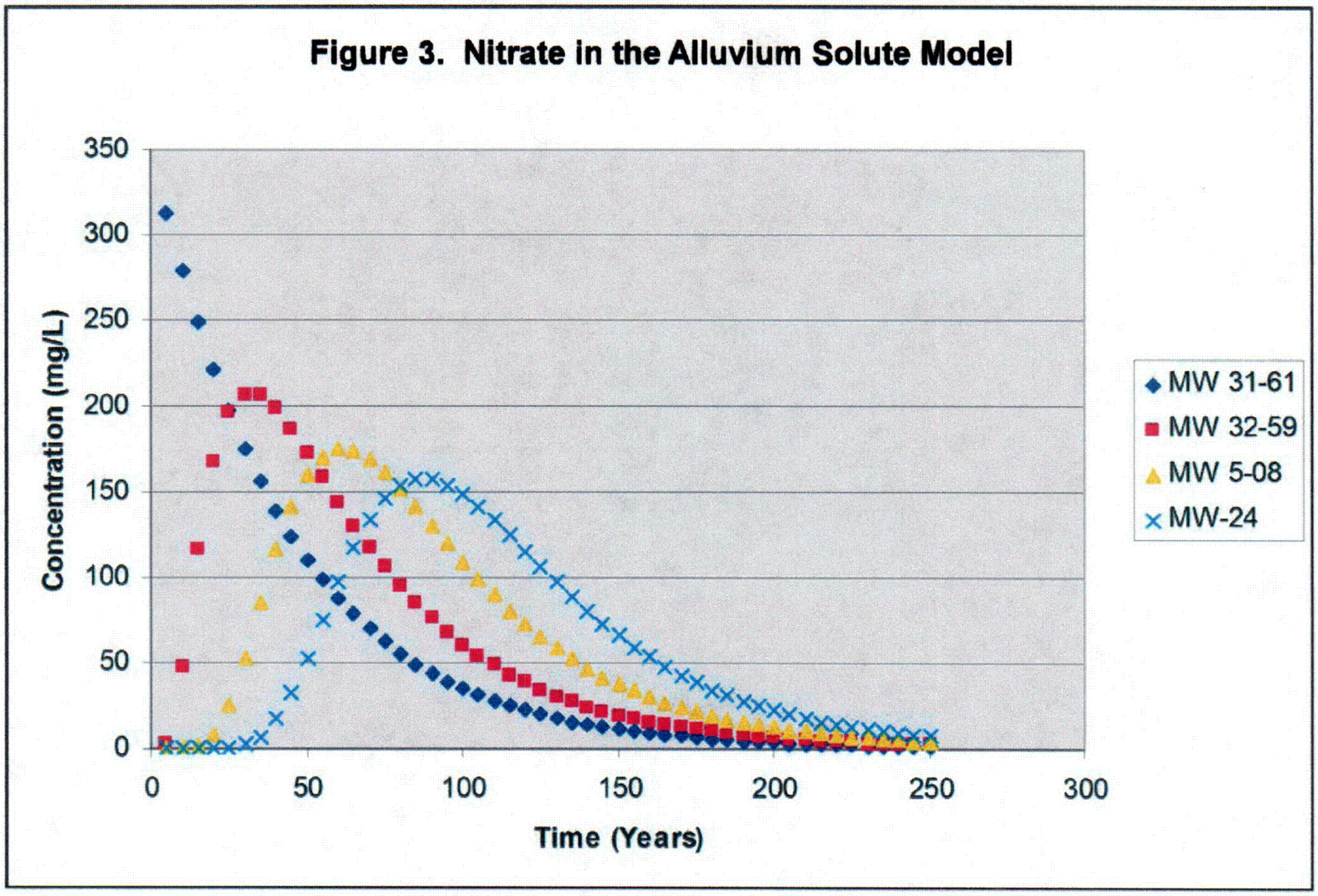
C02



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Initial source concentration..... = 3.51000D+02[mg/l]
Source half-life (0 if no decay). = 30 [y]
Source decay constant............ = 0.2310D-01 [1/y]
Half-life in aquifer (no decay=0) = 0 [y]
Decay coefficient for aquifer.... = 0.0000D+00 [1/y]
Length of time step.............. = 5 [y]
Number of time steps............. = 50
Number of observation points..... = 4

1 Distance (from source)..... = 1 [ft]
2 Distance (from source)..... = 2640 [ft]
3 Distance (from source)..... = 5808 [ft]
4 Distance (from source)..... = 8712 [ft]

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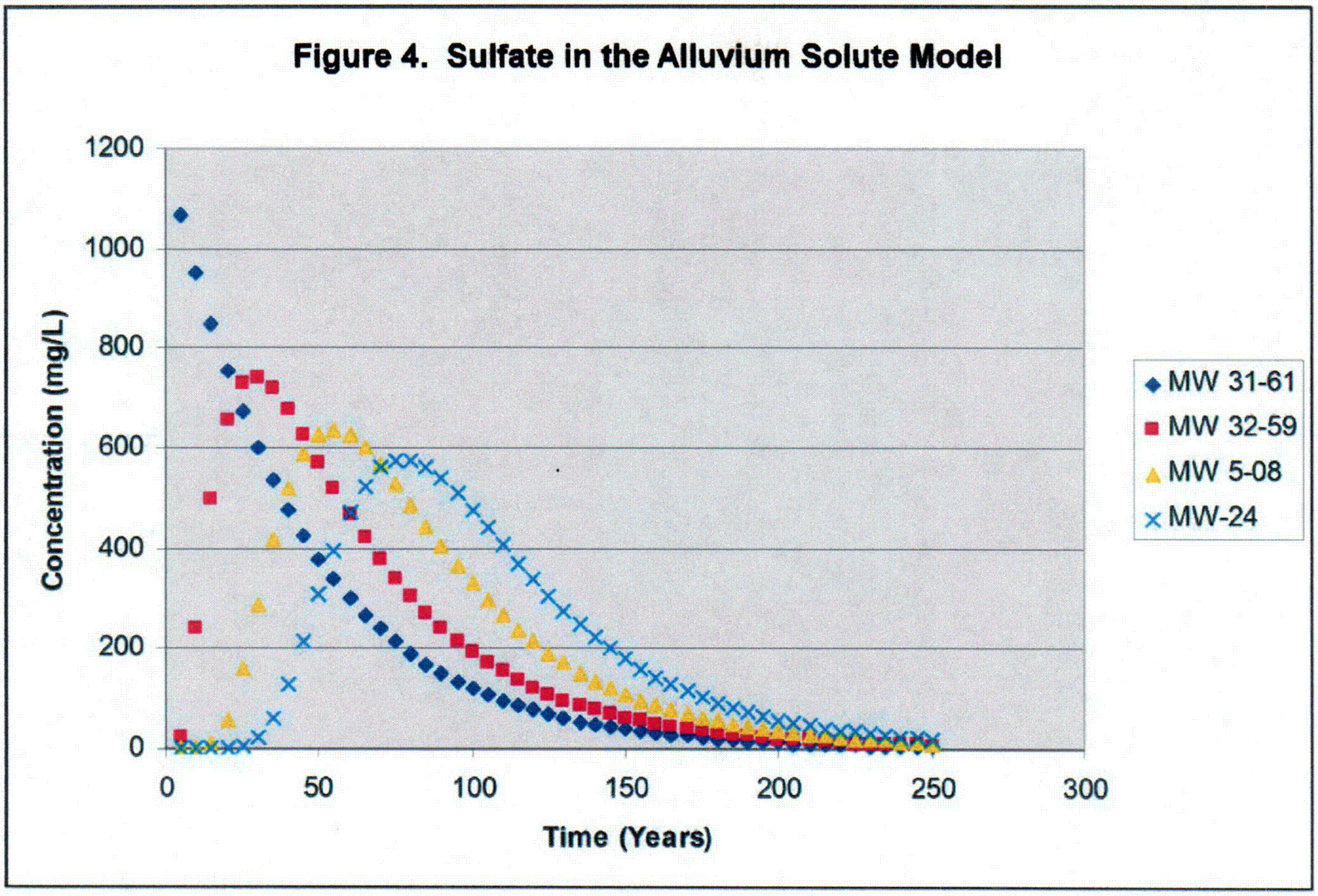
C03



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Initial source concentration..... = 1.20000D+03[mg/l]
Source half-life (0 if no decay). = 30 [y]
Source decay constant............ = 0.2310D-01 [1/y]
Half-life in aquifer (no decay=0) = 0 [y]
Decay coefficient for aquifer.... = 0.0000D+00 [1/y]
Length of time step.............. = 5 [y]
Number of time steps............. = 50
Number of observation points..... = 4

1 Distance (from source)..... = 1 [ft]
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3 Distance (from source)..... = 5808 [ft]
4 Distance (from source)..... = 8712 [ft]

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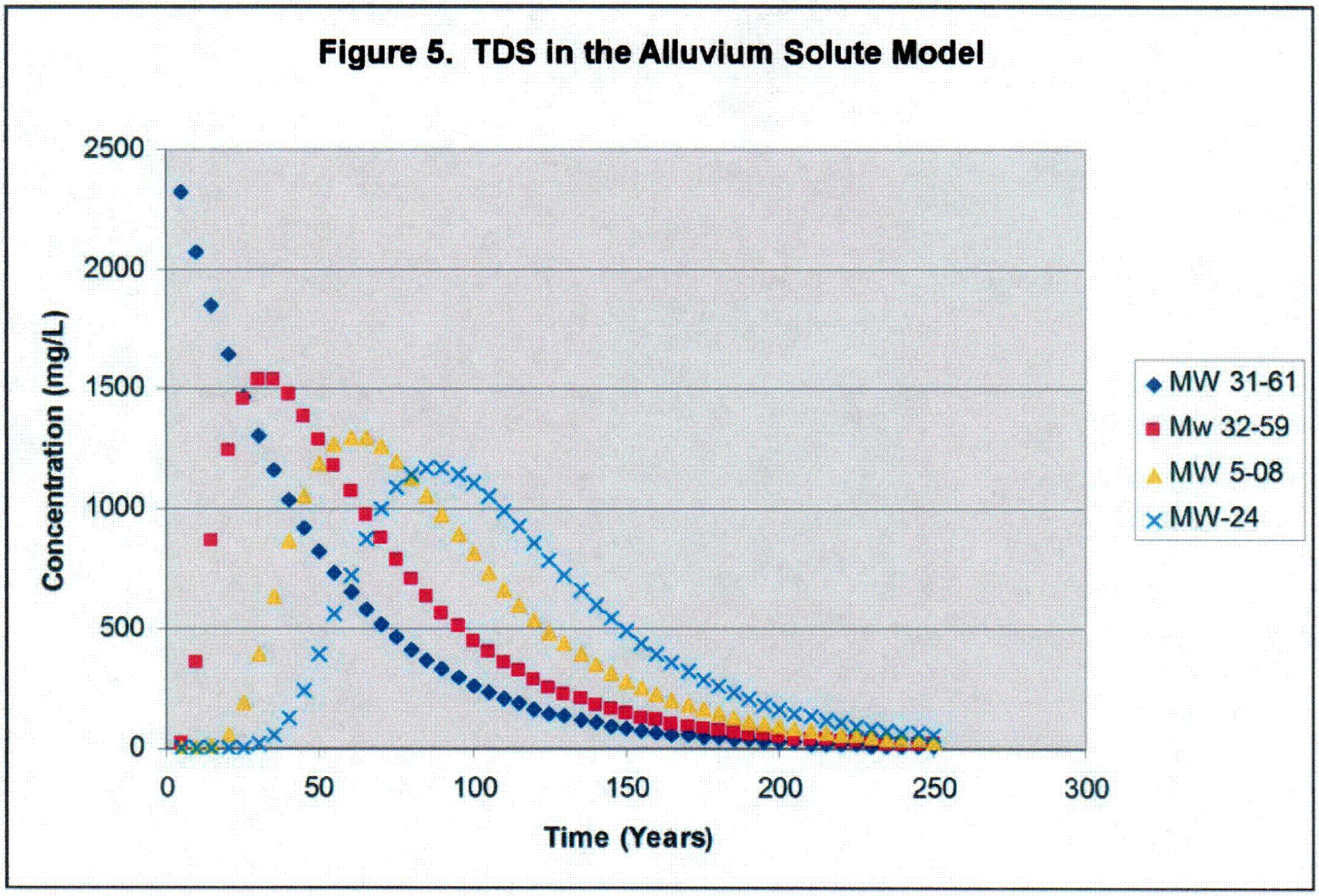

INPUT DATA:

Groundwater (seepage) velocity... = 182 [ft/y]
Longitudinal dispersivity........ = 500 [ft]
Retardation factor............... = 1.5
Initial aquifer concentration.... = 0.00000D+00[mg/l]
Initial source concentration..... = 2.61000D+03[mg/l]
Source half-life (0 if no decay). = 30 [y]
Source decay constant............ = 0.2310D-01 [1/y]
Half-life in aquifer (no decay=0) = 0 [y]
Decay coefficient for aquifer.... = 0.0000D+00 [1/y]
Length of time step.............. = 5 [y]
Number of time steps............. = 50
Number of observation points..... = 4

1 Distance (from source)..... = 1 [ft]
2 Distance (from source)..... = 2640 [ft]
3 Distance (from source)..... = 5808 [ft]
4 Distance (from source)..... = 8712 [ft]

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EXPLANATION

APPROXIMATE WATER-TABLE AREA FOR WESTWATER CANYON AQUIFER

AREA GENERALLY OUTSIDE WESTWATER CANYON AQUIFER

Wells
Mines
LOCATIONS OF EXISTING AND PROPOSED WITHDRAWALS FROM WESTWATER CANYON AQUIFER CONSIDERED IN COMPUTER MODELING

50 — CONTOUR OF CALCULATED WATER-LEVEL DECLINE, FEET

NOTE: CONTOURS PLOTTED BY COMPUTER FROM DIGITAL MODEL RESULTS.

Figure 6.
CALCULATED WATER-LEVEL DECLINE BY OCTOBER 1979
(PHILLIPS SJ-109 ORDER DATE)

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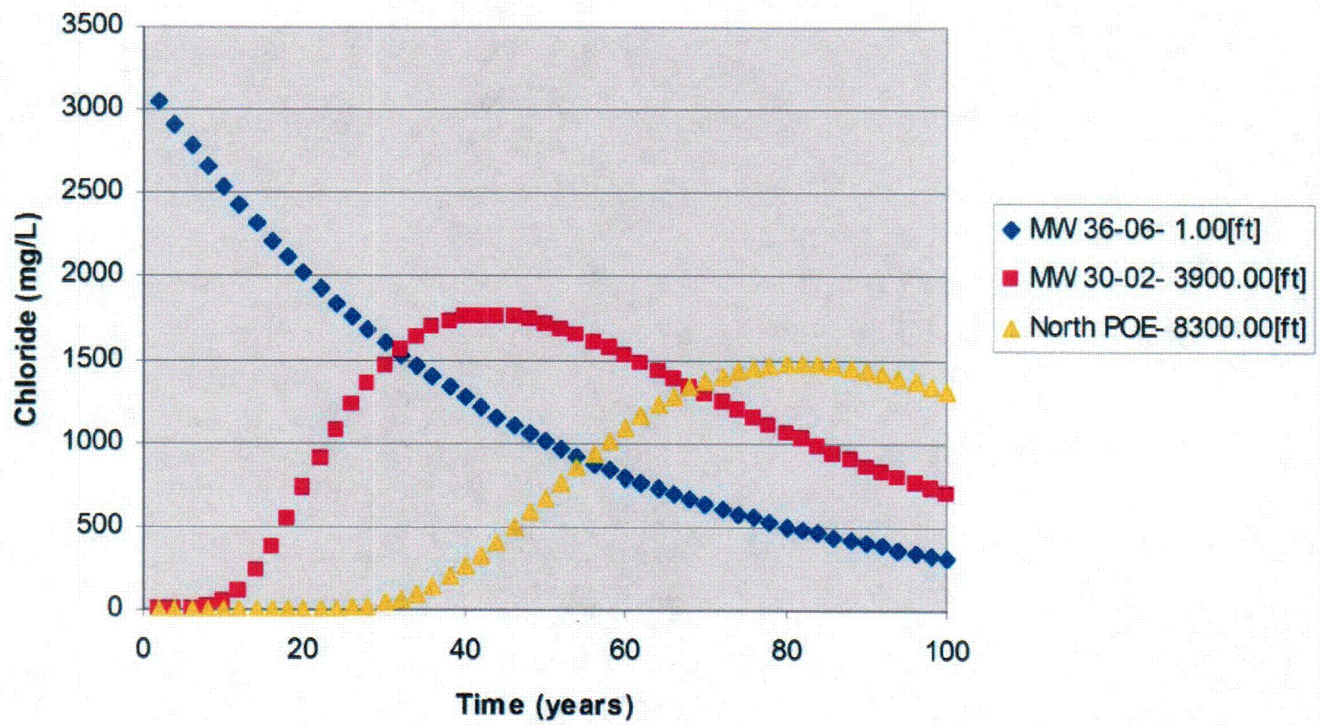
Figure 7. Chloride in the Dakota Solute Model



Input Data

Groundwater (seepage) velocity	= 125 [ft/y]
Longitudinal dispersivity	= 500 [ft]
Retardation factor	= 1
Initial aquifer concentration	= 0.00000D+00[mg/l]
Initial source concentration.....	= 3,200 [mg/l]
Source half-life (0 if no decay).	= 30 [y]
Half-life in aquifer (no decay=0)	= 0 [y]
Length of time step..............	= 2 [y]
Number of time steps.............	= 50
Number of observation points.....	= 3

Assume 36-06 is Source

MW 36-06 Distance (from source)	= 1 [ft]
MW 30-02 Distance (from source)	= 3900 [ft]
Noth POE Distance (from source)	= 8300 [ft]

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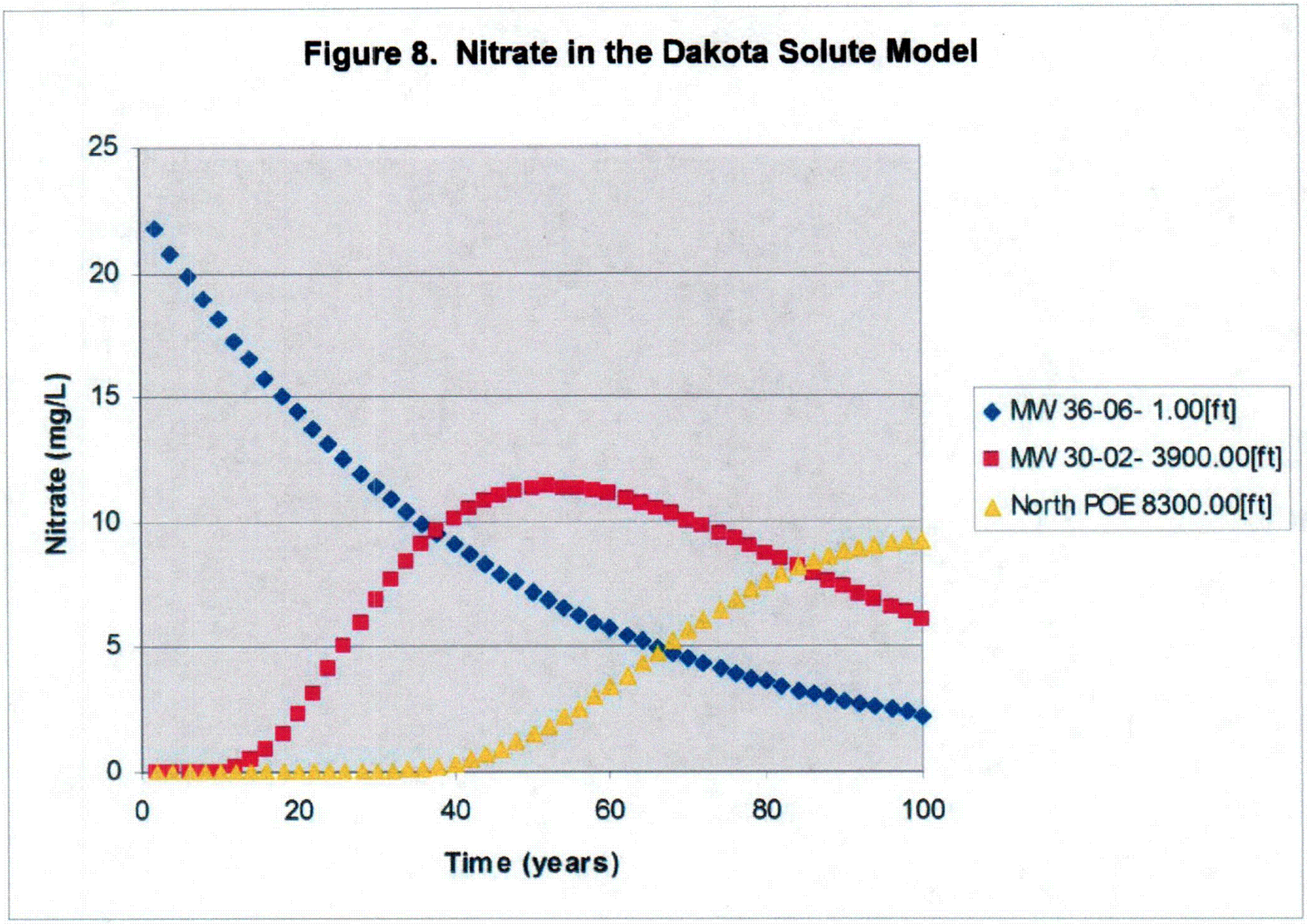

Input Data

Groundwater (seepage) velocity	=	125 [ft/y]
Longitudinal dispersivity	=	500 [ft]
Retardation factor	=	1.3
Initial aquifer concentration	=	0.00000D+00[mg/l]
Initial source concentration.....	=	22.8 [mg/l]
Source half-life (0 if no decay).	=	30 [y]
Half-life in aquifer (no decay=0)	=	0 [y]
Length of time step.............	=	2 [y]
Number of time steps............	=	50
Number of observation points.....	=	3

Assume 36-06 is Source

MW 36-06 Distance (from source)	=	1 [ft]
MW 30-02 Distance (from source)	=	3900 [ft]
Noth POE Distance (from source)	=	8300 [ft]

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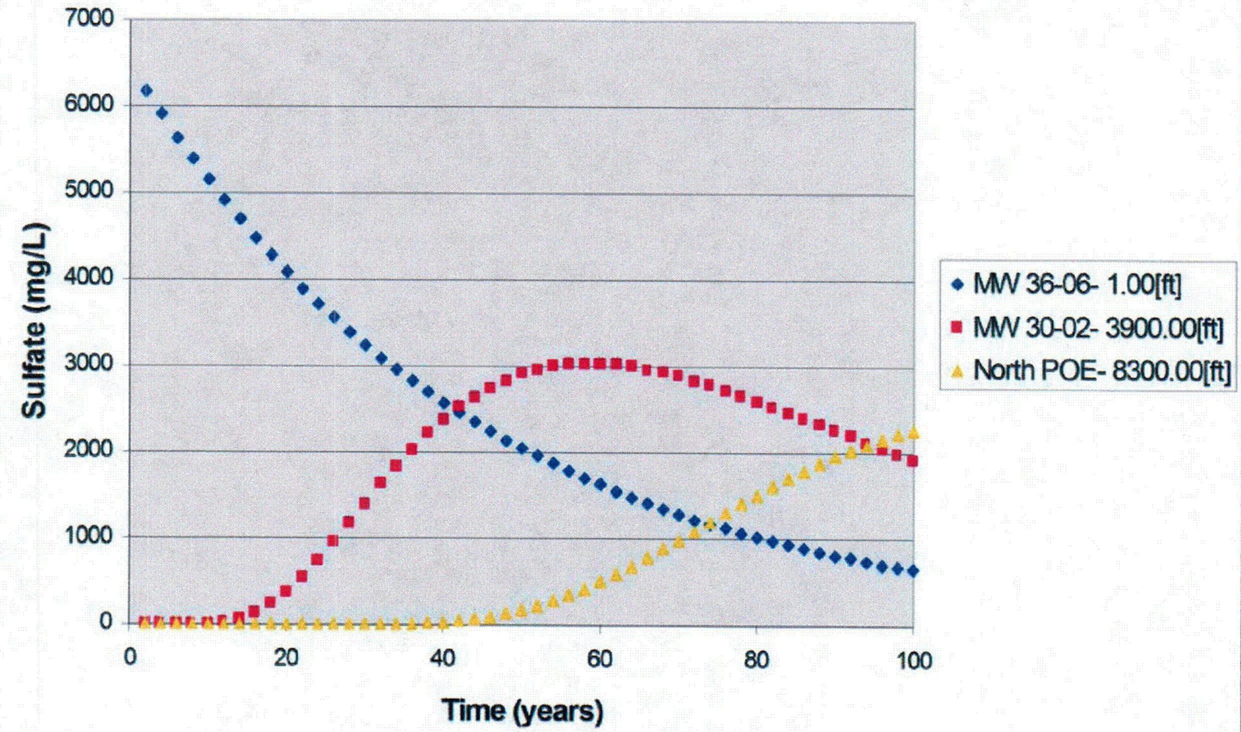
Figure 9. Sulfate in the Dakota Solute Model



Input Data

Groundwater (seepage) velocity	= 125 [ft/y]
Longitudinal dispersivity	= 500 [ft]
Retardation factor	= 1.5
Initial aquifer concentration	= 0.00000D+00[mg/l]
Initial source concentration.....	= 6,480 [mg/l]
Source half-life (0 if no decay).	= 30 [y]
Half-life in aquifer (no decay=0)	= 0 [y]
Length of time step..............	= 2 [y]
Number of time steps.............	= 50
Number of observation points.....	= 3

Assume 36-06 is Source

MW 36-06 Distance (from source)	= 1 [ft]
MW 30-02 Distance (from source)	= 3900 [ft]
Noth POE Distance (from source)	= 8300 [ft]

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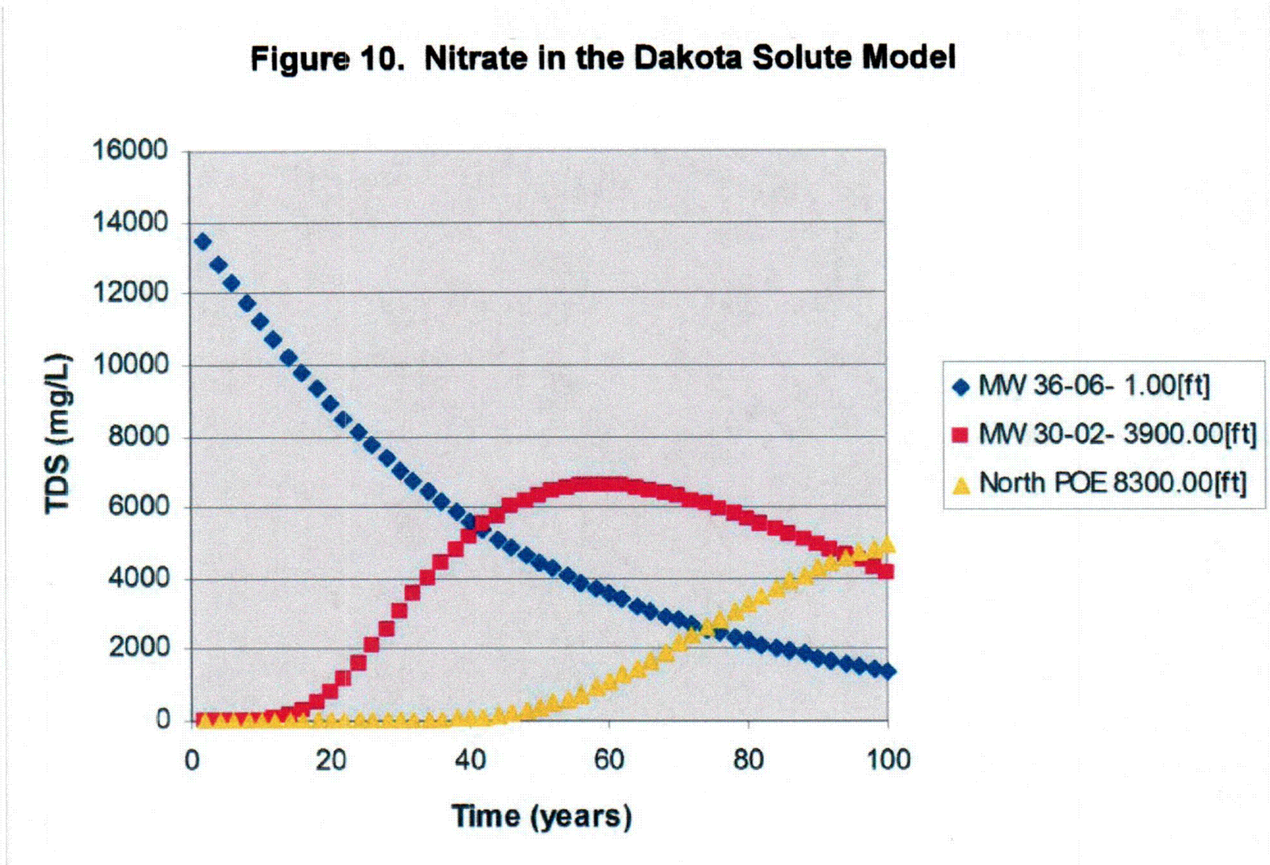

Input Data

Groundwater (seepage) velocity	= 125 [ft/y]
Longitudinal dispersivity	= 500 [ft]
Retardation factor	= 1.5
Initial aquifer concentration	= 0.00000D+00[mg/l]
Initial source concentration.....	= 14,100 [mg/l]
Source half-life (0 if no decay).	= 30 [y]
Half-life in aquifer (no decay=0)	= 0 [y]
Length of time step..............	= 2 [y]
Number of time steps............	= 50
Number of observation points.....	= 3

Assume 36-06 is Source

MW 36-06 Distance (from source)	= 1 [ft]
MW 30-02 Distance (from source)	= 3900 [ft]
Noth POE Distance (from source)	= 8300 [ft]

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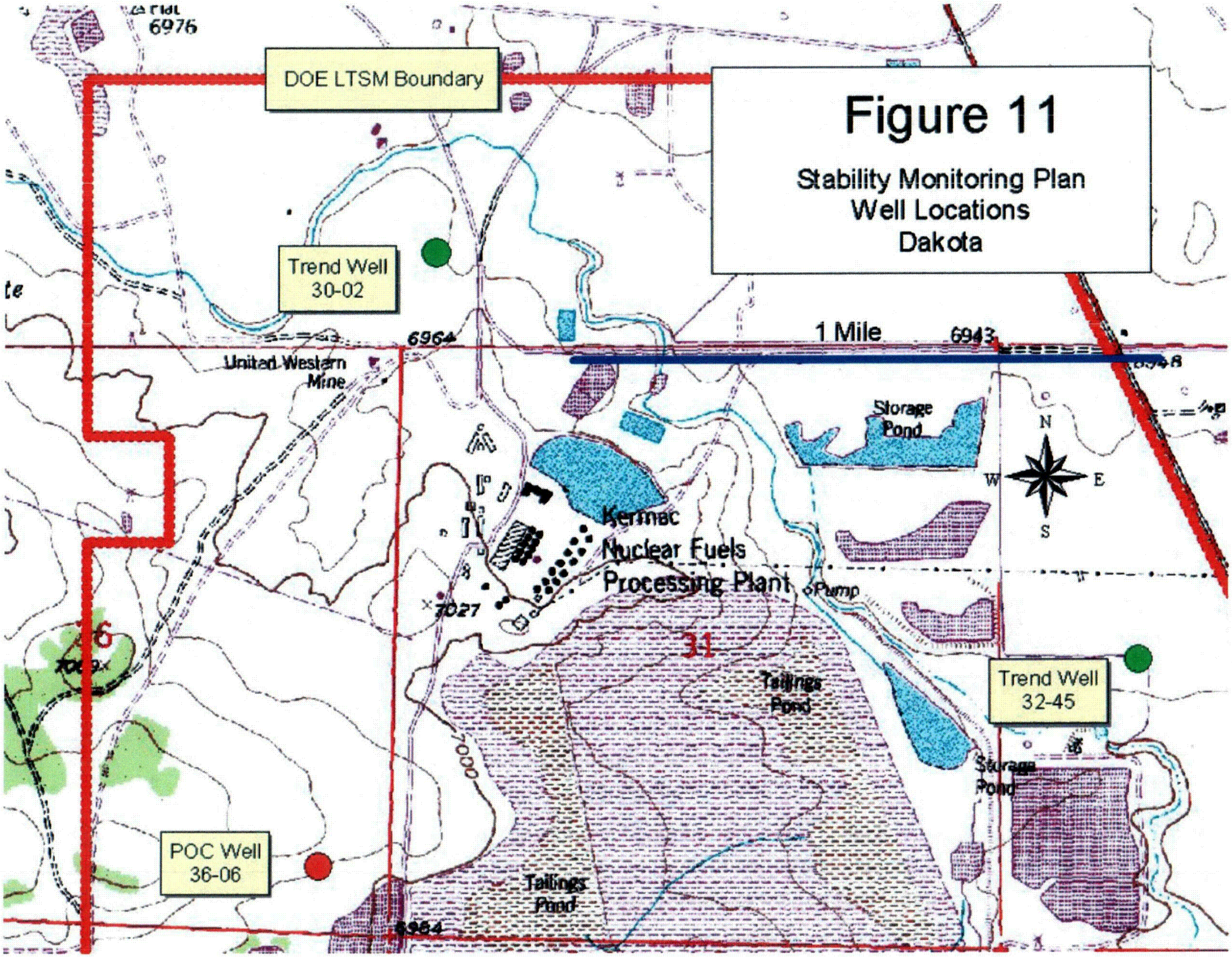

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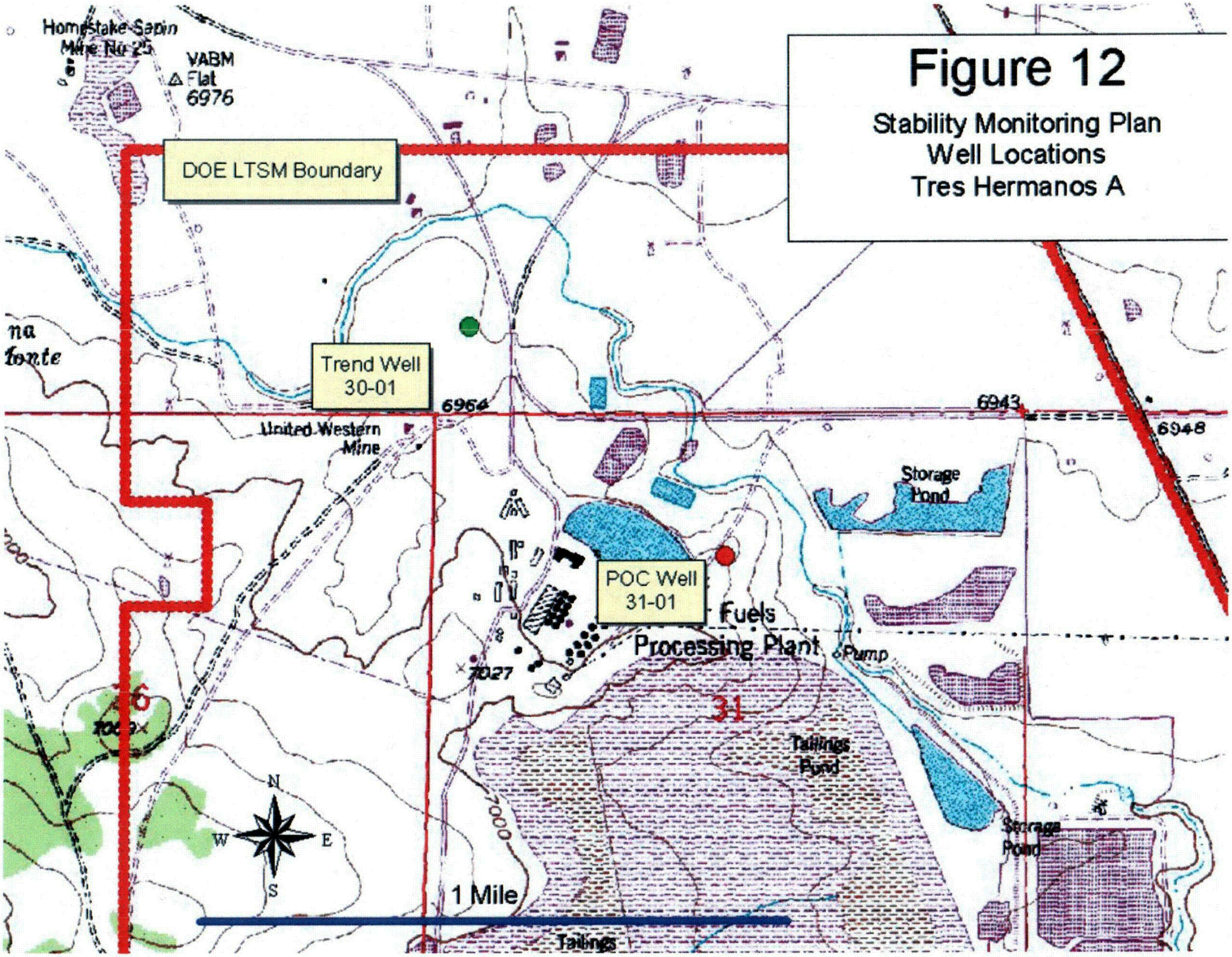

Figure 12

Stability Monitoring Plan
Well Locations
Tres Hermanos A

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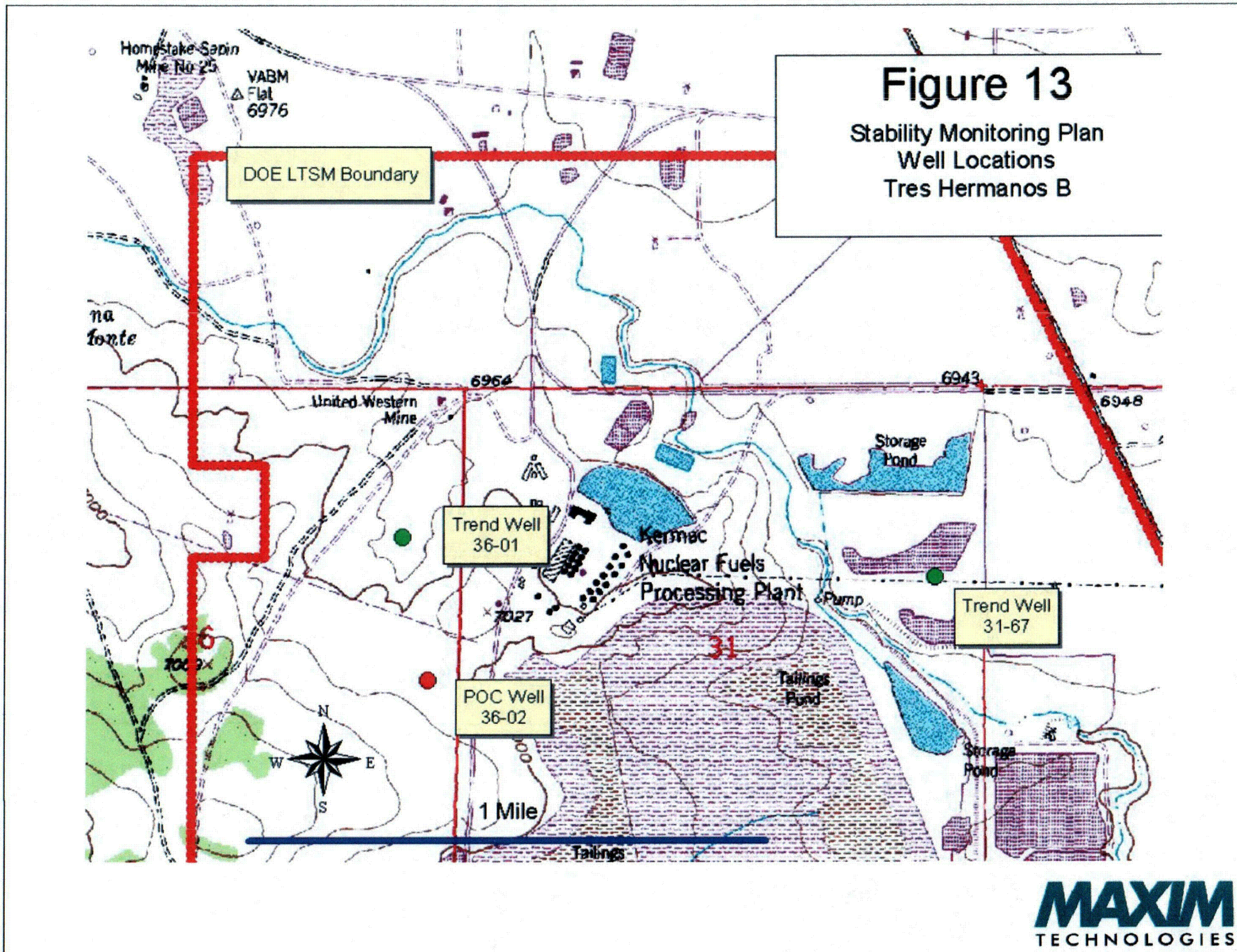

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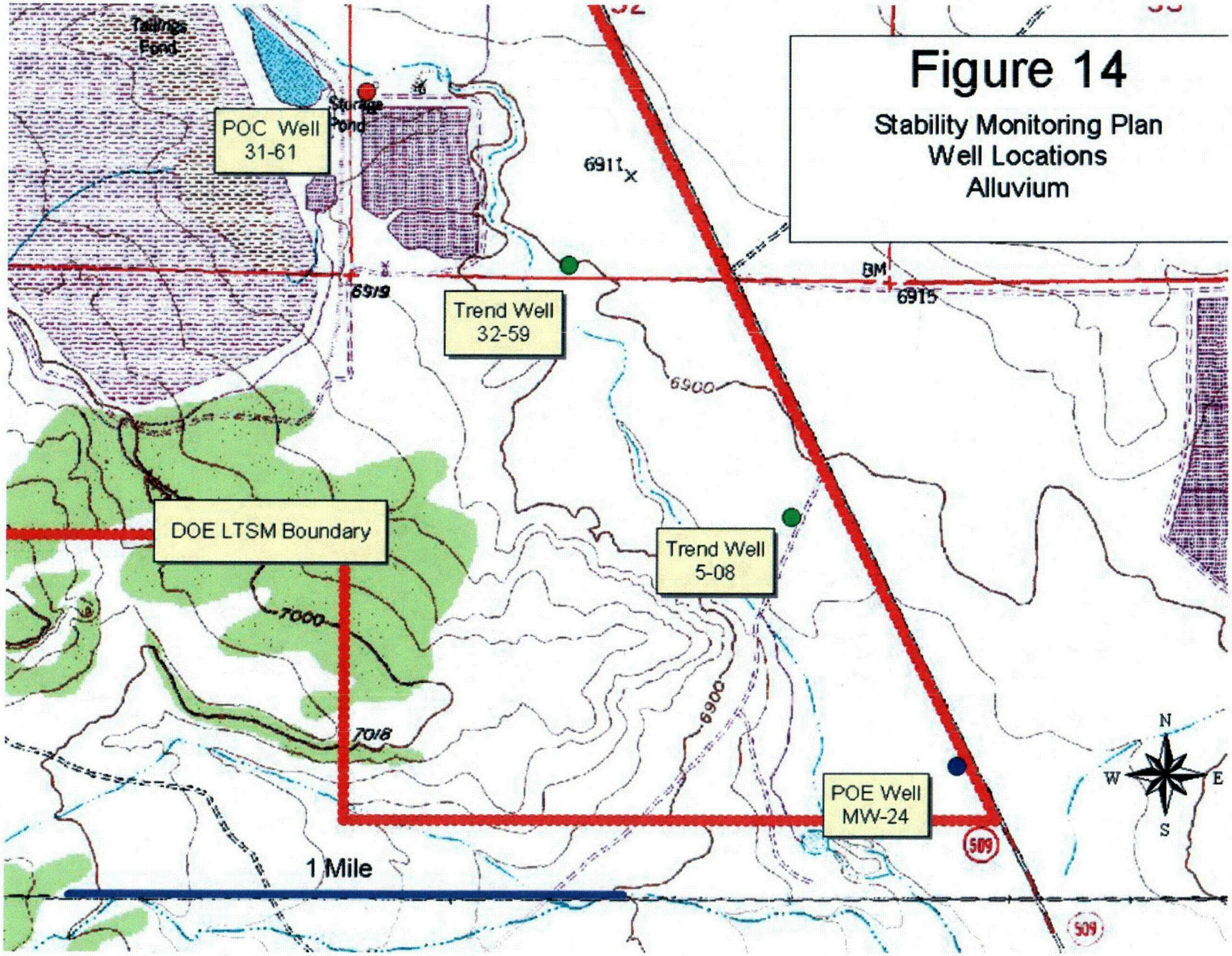

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C14