From: "Cox, Al (Grants)" <ACox@barrick.com>
To: <rwv@nrc.gov>
Date: 12/13/05 1:44PM
Subject: Grants - Draft EA Document & Figures

Bill,
As promised, attached please find a draft EA document and a PDF file with figures that you can use for preparation of the EA for the background standards proposal. You should already have the final letter request for the proposed BG numbers.

If you need anything else, please advise. It will be nice to get this task completed and the license amended!

Have a wonderful Holiday and New Years!
Al

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Files	Size	Date & Time
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11-05 Eafigs.pdf	724964	
Mime.822	1114042	

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DRAFT
ENVIRONMENTAL ASSESSMENT
FOR
HOMESTAKE MINING COMPANY OF CALIFORNIA
GRANTS PROJECT

GRANTS NEW MEXICO

IN CONSIDERATION OF AN AMENDMENT TO
SOURCE MATERIAL LICENSE SUA-1471 FOR
BACKGROUND SITE STANDARDS FOR GROUNDWATER

PREPARED BY

U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE SAFETY AND SAFEGUARDS
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

DECEMBER 2005

1.0 INTRODUCTION

1.1 BACKGROUND

Uranium milling began at the Grants Project, located in Cibola County, New Mexico, in 1958 and continued through 1990 under U.S. Nuclear Regulatory Commission (NRC) License SUA-1471. A total of 22 million tons of ore were milled at this site using a conventional alkaline leach process. The mill was demolished, the demolition debris was placed in several repository trenches adjacent to the mill site, and the material was covered by clean soil and rock for stability. The site has two solid tailings piles (Large Tailings Pile (LTP) and Small Tailings Pile (STP)) and two synthetic lined evaporation ponds. The land and building decommissioning and tailings reclamation activities are addressed in previous environmental assessments. Final reclamation activities and ground water restoration are ongoing.

In 1989, the NRC established the ground water protection standards (GWPS) for the site as background and required installation of three Point of Compliance (POC) wells (D1, X and S4) pursuant to License Condition 35. The POC wells are very near the downgradient side of the tailings and are where the License requires the GWPS to be met. HMC submitted a license amendment request for changes in the background concentrations for alluvial groundwater at the Grants Project in December 2001. The staff requested additional information with respect to the amendment and HMC provided responses dated July 7, 2003. As a result of some of the staff's questions, HMC submitted a proposal and request for setting Chinle background water quality standards in October 2003. The staff requested additional information with respect to these requested site standards and the report was revised in June 2004.

In accordance with 10 CFR Part 40, Appendix A, Criterion 5B(5)(a), the NRC may establish site standards at the point of compliance by reference to the background concentration, the appropriate value found in the table given in paragraph 5C, or using alternate concentration limits. HMC has provided data over a ten year period of record and requested modification of the existing site standards and to establish additional site standards for the alluvial aquifer. Also, site standards are being requested for the Chinle aquifers and the mixing zones associated with the alluvial aquifer and the Upper, Middle and Lower Chinle aquifers. HMC has provided data indicating that alluvial wells DD, ND, P, P1, P2, P3, P4, Q and R are appropriate locations for collecting samples to establish background concentrations for the alluvial aquifer. Figure 1 shows the location of these alluvial wells north of the Grants Project site. This figure also shows the three point of compliance wells S4, D1 and X on the downgradient side of the tailings piles. Figure 2 shows the location of the Upper Chinle background wells, while Figures 3 and 4 show the locations of the Middle and Lower Chinle wells, respectively.

The proposed site standards for the Grants Project are presented in Table 1.

TABLE 1. PROPOSED SITE STANDARDS

CONSTITUENTS	ALLUVIAL	CHINLE MIXING ZONE	UPPER CHINLE NON-MIXING ZONE	MIDDLE CHINLE NON-MIXING ZONE	LOWER CHINLE NON-MIXING ZONE
SELENIUM (mg/l)	0.32	0.14	0.06	0.07	0.32
URANIUM (mg/l)	0.16	0.18	0.09	0.07	0.03
MOLYBDENUM (mg/l)	0.10	*	*	*	*
SULFATE (mg/l)	1500	1750	914	857	2000
CHLORIDE (mg/l)	250	250	412	250	634
TDS (mg/l)	2734	3140	2010	1560	4140
NITRATE (mg/l)	12	15	*	*	*
VANADIUM (mg/l)	0.02	0.01	0.01	*	*
THORIUM-230 (pCi/l)	0.30	*	*	*	*
RA-226 + RA-228 (pCi/l)	5	*	*	*	*

*NOTE: * = Site standards not necessary for the constituents in the indicated aquifer.*

1.2 REVIEW SCOPE

In accordance with 10 CFR Part 51, this Environmental Assessment (EA) serves to: (1) present information and analysis for determining whether to issue a Finding of No Significant Impact (FONSI) or to prepare an Environmental Impact Statement (EIS); (2) fulfill the NRC's compliance with the National Environmental Policy Act when no EIS is necessary; and (3) facilitate preparation of an EIS when one is necessary. Should the NRC issue a finding of no significant impact, no EIS would be prepared.

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the action is to modify the existing site standards and to establish additional site standards for the Grants Project to be consistent with background conditions at the site. According to Part 40, Appendix A, Criterion 5D the licensee must continue corrective action measures to the extent necessary to achieve and maintain compliance with GWPS. However, the GWPS added to the license in 1989 were derived based on the average of a small number of samples taken from one upgradient background well or based on the EPA drinking water concentration levels at the time. HMC believes that the GWPS established in 1989 are not representative of actual site background water quality. Moreover, HMC believes that it is technically impractical and economically unfeasible to remediate groundwater to the GWPS as required by License Condition 35B for the six constituents listed in Table 1. A letter received from HMC dated 5 December 2005, requested that the NRC amend the Grants license (SUA-1471) to incorporate site standards based on the additional data pertaining to and the further evaluation of background water quality.

Operation of the corrective action program for over 28 years has resulted in significant restoration in groundwater quality in the alluvial aquifer (main aquifer of concern). The current program consists of (1) pumping contaminated ground water from areas

downgradient of the tailings into lined evaporation ponds or treating groundwater with a reverse osmosis unit and re-injecting the product of the reverse osmosis treatment; (2) pumping tailings fluid from the tailings into the evaporation ponds; (3) injecting fresh water into the tailings to aide the collection of the tailings water; and, (4) injecting fresh water into the aquifer downgradient of the site to prevent downgradient plume movement and assist movement of the plume to collection wells.

A total of approximately 362 million gallons of water has been removed from the tailings through 2004. Approximately 300 wells have been installed in the tailings to aide the tailings dewatering program. The dewatering program is projected to continue for several years to remove water containing higher concentrations of various constituents from the tailings.

The alluvial collection program has consisted of pumping numerous wells near the tailings since 1978. A total of approximately 3.89 billion gallons of groundwater has been collected on site through 2004. A total of approximately 5.73 billion gallons of fresh water have been injected into the alluvial aquifer, while an additional approximately 674 million gallons of reverse osmosis product water has been injected into the alluvial aquifer through 2004. In addition, a total of approximately 729 million gallons of fresh water have been injected into the Upper and Middle Chinle aquifers through 2004.

3.0 THE PROPOSED ACTION

The proposed action consists of the following:

1) Establish revised site standards for selenium, uranium and molybdenum for the alluvial aquifer; no change is proposed in the site standards for vanadium, radium-226, plus radium-228 and thorium-230 for the alluvial aquifer;

2) Add site standards for nitrate, TDS, sulfate and chloride for the alluvial aquifer; and,

3) Establish site standards for the Chinle aquifers and mixing zone for the Chinle aquifers and the alluvial aquifer.

4.0 ALTERNATIVES TO THE PROPOSED ACTION

No-Action Alternative (retain Current Site Standards for the Alluvial Aquifer)

The current site standards are based on average concentrations from three samples collected from one alluvial well. Because these samples are not representative of the

background water quality conditions at the site, the current GWPS do not represent the full range of natural concentrations in the alluvial aquifer upgradient of the site. The No-Action alternative would result in the application of unrealistic site standards. The No Action Alternative also would not establish GWPS for additional parameters for the alluvial aquifer or for the Chinle aquifers.

Other Alternatives

Other values for the GWPS could be proposed. However, the available data presented by HMC and the analysis of that data indicate that the proposed GWPS are the most appropriate values. Therefore, alternative values for the GWPS are not analyzed in this EA.

5.0 POTENTIALLY AFFECTED ENVIRONMENT

5.1 LOCATION AND LAND USE

HMC's Grants Uranium Mill site is located in west central Mew Mexico, approximately 12 kilometers (5 miles) north of Milan, New Mexico. Figure 1 shows the location of the HMC tailings with respect to the alluvial background wells.

The nearest residents live in residential subdivisions downgradient of the site approximately 1 kilometer (0.5 miles) southwest of the tailings. The remaining areas surrounding the site are mainly utilized as ranch land. Milling at this site began in 1958 and ceased in 1990.

The HMC site is at an elevation of 6560 ft-msl. The climate is typical of high desert with an average precipitation of approximately 10 inches per year and average evaporation of approximately 55 inches per year.

5.2 HYDROGEOLOGY

The alluvial aquifer, which exists below the tailings, is the uppermost aquifer at the HMC site. The alluvial aquifer flows from north of the site into the area and then to the southwest of the site. The Chinle formation, which is comprised mainly of a massive shale, is situated below the alluvial aquifer. Three aquifers within the Chinle formation have been defined in the area (Upper, Middle and Lower). The deepest producible aquifer in the area is the San Andres which underlies the Chinle formation; this aquifer has been unaffected by the Grants millsite.

5.3 WATER RESOURCES

Groundwater

The regional groundwater aquifer at the site is the San Andres, which is situated below the Chinle formation. This aquifer is at approximately 900 feet below the elevation of the surface in the vicinity of the tailings area. The Chinle aquifers vary in depth from approximately 100 feet to several hundreds of feet below the ground surface in this area. The alluvial aquifer is present in the tailings area, but is limited due to the lack of saturation in the alluvial material to the northwest and east of the site. The water table in the alluvial aquifer is generally 40 to 50 feet below the land surface.

Surface Water

The creeks and surface stream courses in the area do not contain water except during extreme precipitation events and then, typically, only flow over certain sections of the stream course. The San Mateo Creek, which is the main surface drainage in the area, enters the area north of the site and exits to the west.

Background Water Quality

The background water quality conditions at the site have been monitored since 1976. Nine wells completed in the alluvial aquifer to the north of the site have been used to define the background concentrations in the alluvial aquifer. Numerous wells in the Upper, Middle and Lower Chinle aquifers have been used to define the background concentrations in the Chinle aquifers.

Table 2 below presents the background water quality for the aquifers found in the Grants millsite area. Background water quality in the alluvial aquifer has remained relatively consistent over the period of record, but varies considerably over the area. These background water quality concentrations are based on the 95^{th} percentile of the background data which is used to define the full range of background concentration.

TABLE 2. BACKGROUND CONCENTRATIONS

CONSTITUENTS	ALLUVIAL	CHINLE MIXING ZONE	UPPER CHINLE NON-MIXING ZONE	MIDDLE CHINLE NON-MIXING ZONE	LOWER CHINLE NON-MIXING ZONE
SELENIUM (mg/l)	0.32	0.14	0.06	0.07	0.32
URANIUM (mg/l)	0.16	0.18	0.09	0.07	0.02
MOLYBDENUM (mg/l)	0.04	0.10	0.08	0.05	0.03
SULFATE (mg/l)	1500	1750	914	857	2000
CHLORIDE (mg/l)	71	96	412	63	634
TDS (mg/l)	2734	3140	2010	1560	4140
NITRATE (mg/l)	12	15	4.9	4.0	3.0
VANADIUM (mg/l)	0.02*	0.01	0.01	0.01	0.01
THORIUM-230 (pCi/l)	0.3*	0.7	0.33	0.82	0.72
RA-226 + RA-228 (pCi/l)	1.2*	3.5	3.7	2.2	3.2

NOTE: * = Based on average of three samples from one well.

Current and Future Water Uses

Currently, most adjacent residents to the Grants millsite have been connected to the Milan water supply; the use of the ground water by these residents is for non-household property uses such as watering livestock or irrigating trees and grass.

The foreseeable future use of water for the groundwater at this site is expected to be similar to present uses.

6.0 POTENTIAL ENVIRONMENTAL IMPACT

6.1 CULTURAL RESOURCES

The protection of cultural and historical (archeological) resources on the site is addressed in License Condition 43, which requires the licensee to ensure that no disturbance of cultural resources occurs in the future. No potential or identified resource areas would be affected by the Proposed Action.

6.2 ECOLOGICAL RESOURCES

The potential impact to threatened and endangered species on or near this site has been addressed by HMC in the mid-1990's for surface disturbance associated with mill decommissioning and impacted soil cleanup activities. Additionally, potential impacts to T&E species were reviewed in 1990 in relation to evaluation of an alternative tailings pile location to the north of the existing millsite; the New Mexico Department of Fish and Game in a letter dated 1July 1990 referenced a potential black-tailed prairie dog colony

north of the millsite that should be considered in relation to a possible transportation corridor. No other species of interest or concern for the site have been identified. The only exposure pathway for wildlife or stock near the point of exposure would be ingestion of water from a discharge from a well and/or ingestion of irrigated forage. NRC staff has determined that there will be no significant affect on plants or animals resulting from the Proposed Action.

6.3 WATER QUALITY

The water quality that was used in the development of the new background concentrations are natural concentrations. HMC has addressed the constituent concentrations relative to the GWPS levels in various project annual reports and will continue to do so as per existing License Conditions. These reports define the areas of the aquifers that need restoration at the site.

Variation of Concentrations with Time

The concentration time plots are routinely presented in the annual reports for the Grants Project. Trends have been discussed by HMC in the annual report.

6.4 CUMMULATIVE AFFECTS

Since milling ceased years ago, the NRC staff has found no other activities in the area that could result in cumulative impacts.

7.0 MONITORING

The groundwater monitoring plan for the Grants Project consists of monitoring numerous wells. Table 2 of License Condition 35A lists the monitoring required for this site. The monitoring program will be expanded in a future update and revision of the Site Corrective Action Plan (CAP).

8.0 CONCLUSION

The action that the NRC is considering is approval of a request to update the groundwater site standards in License Condition 35B, Source Materials License SUA-1471. The alternatives available to the NRC are:

1) Approve the license amendment requested as submitted.

2) Approve the license amendment with such additional conditions as are considered necessary or appropriate to protect the public health and safety and the environment.

3) Deny the request.

Based on this review, the NRC staff has concluded that the environmental impacts associated with the Proposed Action are not significant and therefore do not warrant the preparation of an environmental impact statement. Additionally, based on comments in the Technical Evaluation Report prepared for the Proposed Action, the staff has reviewed the Proposed Action with respect to the criteria for groundwater restoration, specified in 10 CFR Part 40, Appendix A and has determined that there is no basis for denial of the Proposed Action. Therefore, the staff concludes that Alternative 1 is the appropriate and preferred alternative.

The NRC staff is considering preparation of a FONSI. The following statements support a FONSI and summarize the conclusions resulting from this EA.

1. The background water concentrations are established from wells representing natural concentrations.

2. The calculations and procedures used are those recommended by EPA to develop background concentrations that are representative of the aquifer.

3. Requiring remediation to background standards representative of the site conditions will not result in any significant affect on the environment.

9.0 CONSULTATIONS

Most of the information for this document was obtained from the licensee's two background water quality reports for the alluvial and Chinle aquifers. Previous EAs for site activities related to mill decommissioning and related project reclamation activities have also been used. The NRC staff will provide the EA to, and request comments from various agencies (for example; New Mexico Environmental Department, U.S. Environmental Protection Agency) and stakeholders. The U.S. Fish and Wildlife Service has been consulted on candidate, threatened, and endangered species for Cibola County, New Mexico.

10.0 PREPARER

William Von Till, Project Manager in the Division of Fuel Cycle Safety and Safeguards, Office of Nuclear Materials Safety and Safeguards, NRC.

11.0 REFERENCES

Homestake Mining Company, "Ground Water Hydrology for Support of Background Concentrations at the Grants Reclamation Site", comment letter from Roy Cellan to NRC, December 15, 2001.

Homestake Mining Company, "Background Water Quality Evaluation of the Chinle Aquifers", letter from A. Cox to NRC, October 22, 2003.

NRC, "Request for Additional Information", letter from William Von Till to A. Cox, EPA letter of April 8, 2003

Homestake Mining Company, "Response to NMED Comments on Background Water Quality Evaluation of the Chinle Aquifers", letter to NRC, June 23, 2004

Homestake, "Responses to NMED Comments on Background Water Quality Evaluation of the Chinle Aquifers", June 23, 2004

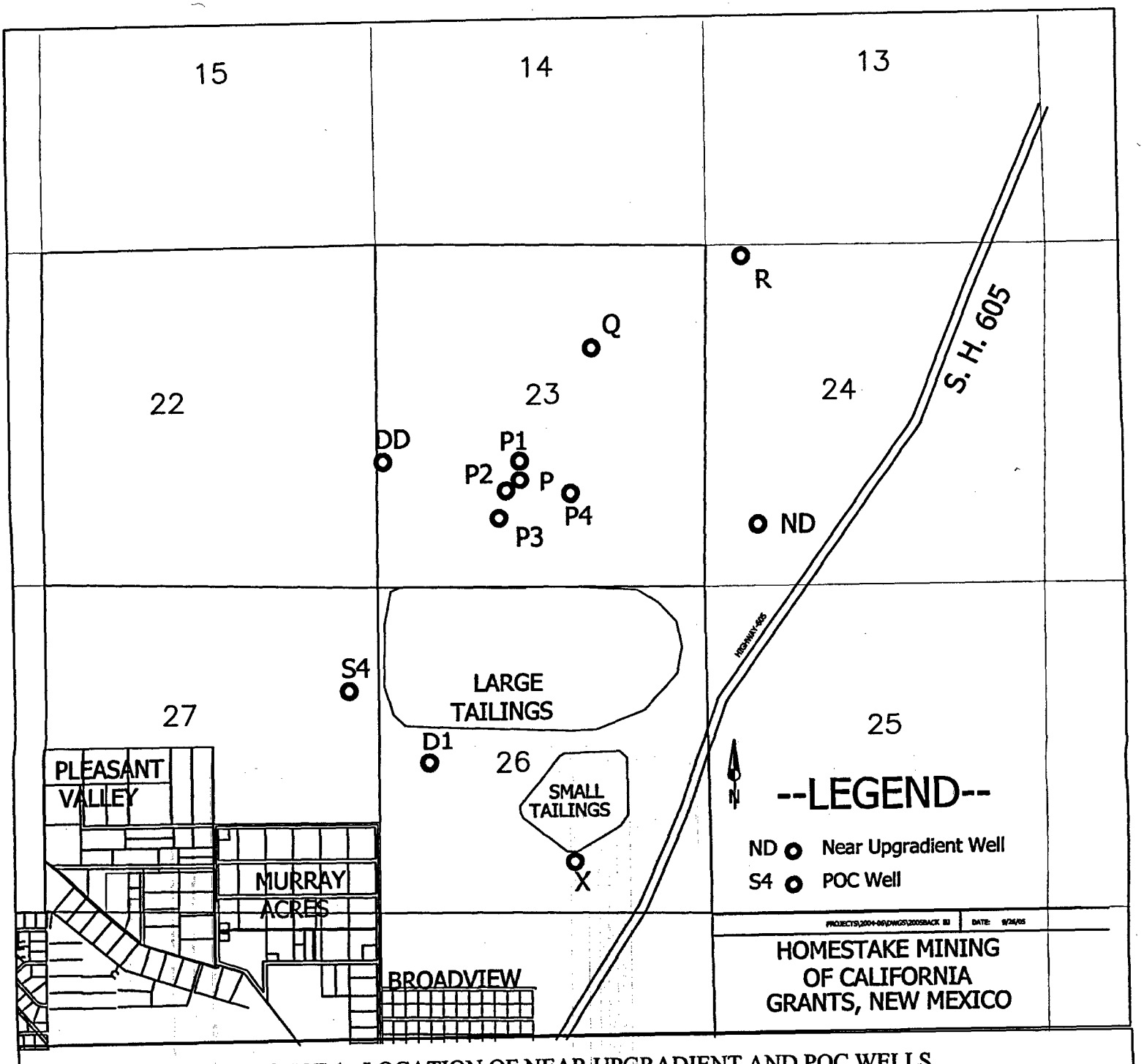

FIGURE 1. LOCATION OF NEAR UPGRADIENT AND POC WELLS.

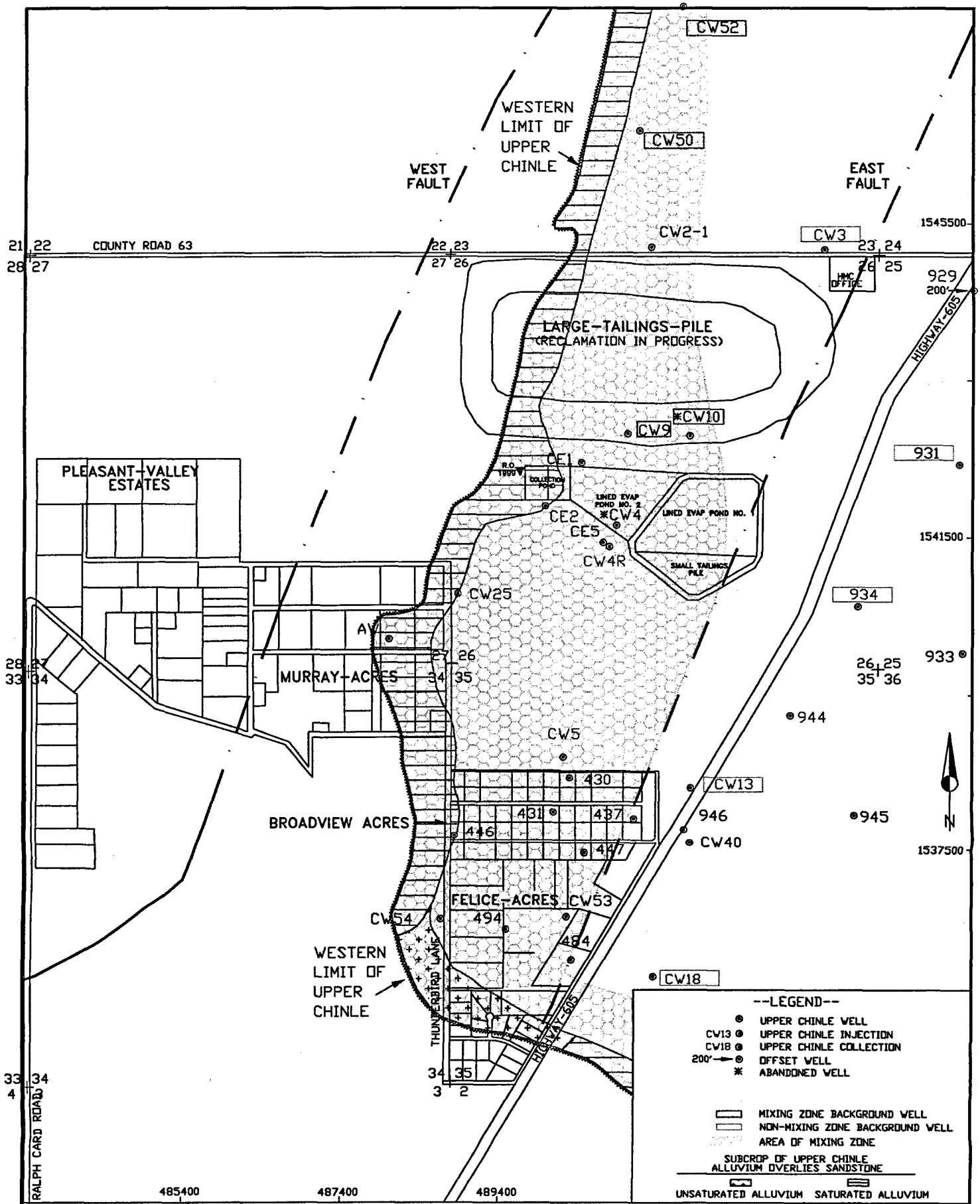

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FIGURE 2. UPPER CHINLE MIXING ZONE AND BACKGROUND WELLS

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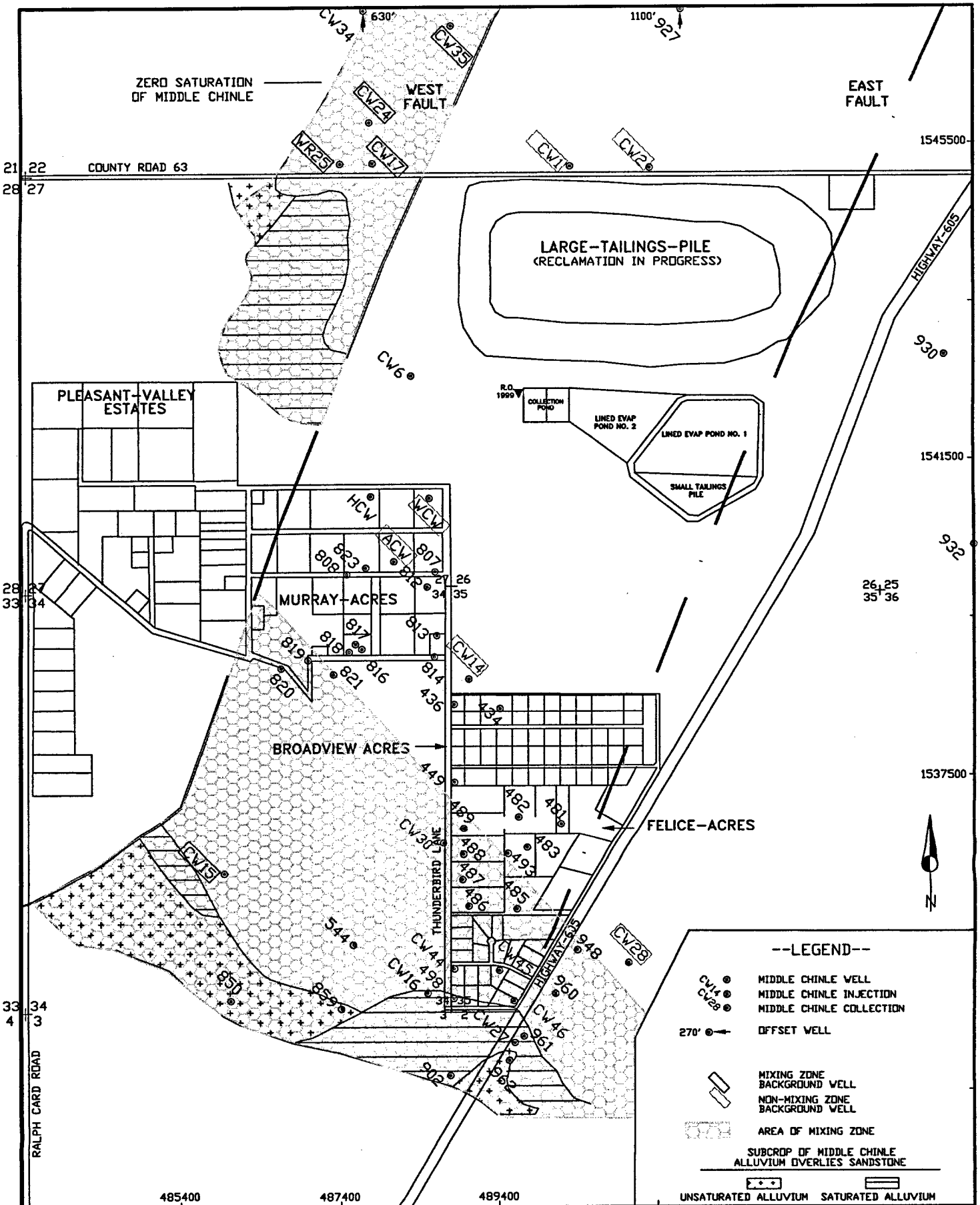

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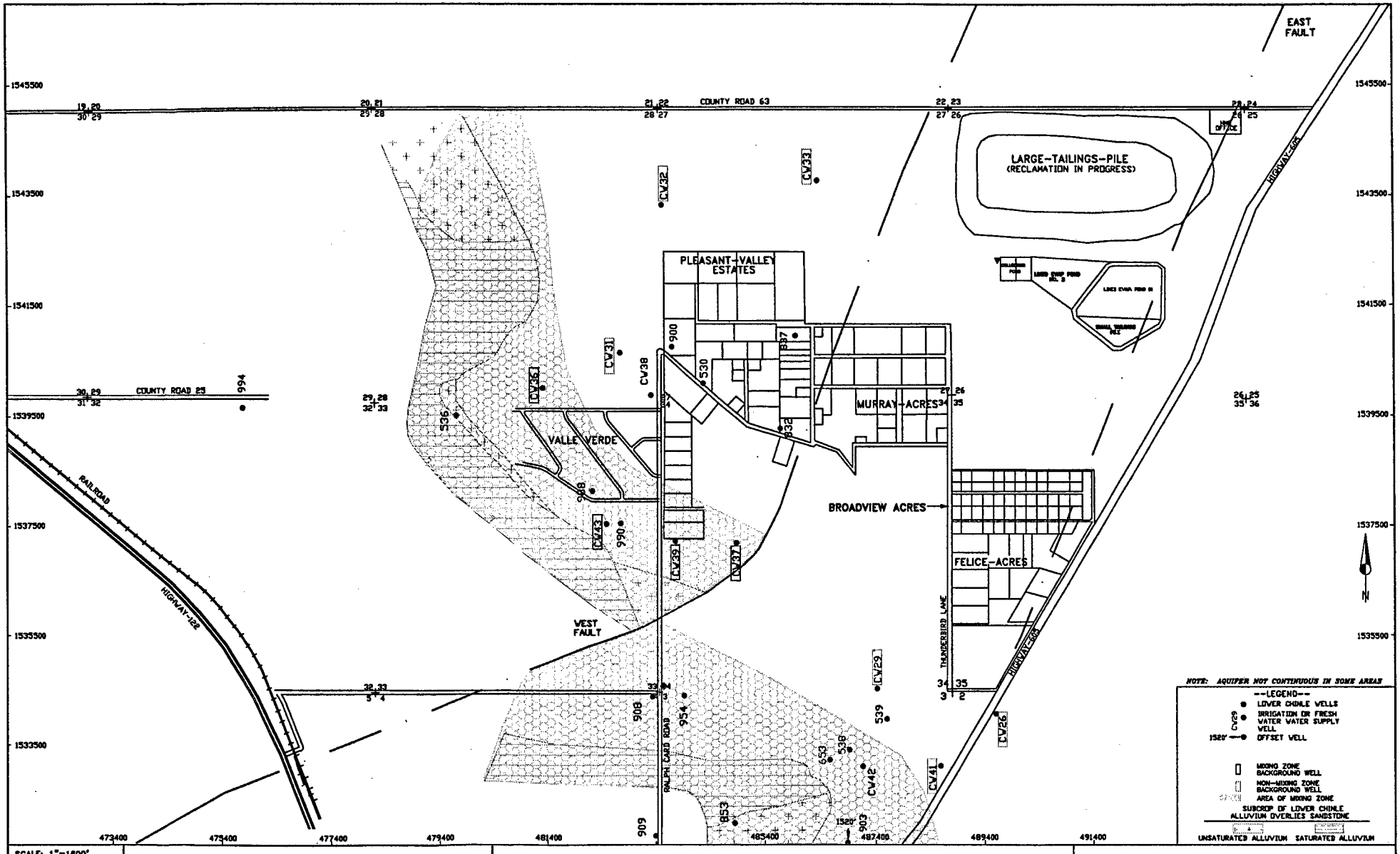
FIGURE 3. MIDDLE CHINLE MIXING ZONE AND BACKGROUND WELLS

c:\projects\2005-06\1600MID



SCALE: 1"=1600' C:\PROJECTS\2005-06\1600new DATE: 11/14/05	HOMESTAKE-MILL-AND-ADJACENT-PROPERTIES GRANTS-NM-TOWNSHIP-11&12-N-RANGE-10-W	FIGURE 4. LOWER CHINLE MIXING ZONE AND BACKGROUND WELLS