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September 2, 2022

Mr. Matthew Smith
New Mexico Environment Department
Ground Water Quality Bureau
121 Tijeras Ave. NE, Suite 1000
Albuquerque, New Mexico 87102

Subject: **Revised Stage 2 Abatement Plan and Response to Comments**
La Cueva NM DOT Patrol Yard, La Cueva, Mora County, New Mexico
NM DOT Contract 06164-2

Dear Mr. Smith:

On behalf of the New Mexico Department of Transportation Hazardous Materials Investigation Bureau (NMED HMIB), EA Engineering, Science, and Technology, Inc., PBC (EA) is submitting the attached revised Stage 2 Abatement Plan (Plan) for the La Cueva Patrol Yard located in Mora County, New Mexico.

Provided below are the responses to the New Mexico Environment Department Ground Water Quality Bureau (NMED GWQB) comments dated August 5, 2022. These responses have been incorporated into the Revised Plan.

Comment 1. The proposal meets the definition of a significant modification to a S2AP per 20.6.2.7(S)(4) NMAC, which is defined as *"a change in the abatement technology used excluding design and operational parameters, or re-location of 25 percent or more of the compliance sampling stations, for any single medium, as designated pursuant to Paragraph (4) of Subsection E of 20.6.2.4106 NMAC."* Therefore, the Proposal and associated public notice require modification to explicitly identify this as a S2AP modification request pursuant to 20.6.2.4111(A) NMAC. The Proposal should reference 20.6.2.4111(A) NMAC instead of Subsection 20.6.2.4106.E NMAC.

Response: The Proposal and associated public notice requirements will be identified as a significant modification of the S2AP as per NMAC 20.6.2.7(S)(4).

Comment 2. The GWQB has determined that a Discharge Permit pursuant to 20.6.2.3104 NMAC is necessary for the proposed remedial system design, which would result in discharges of regulated pollutants. NMED requires NMDOT to submit a discharge permit application to the GWQB within 60 days of the date of this letter. The Discharge Permit application is located at www.env.nm.gov/forms/.

Response: Per the GWQB determination that a Discharge Permit is necessary according to 20.6.2.3104 NMAC, a Discharge Permit application will be prepared and submitted to the GWQB.

Comment 3. Section 3.2 of the Proposal indicates that treated groundwater will be stored above ground for use. Please provide details on how the treated groundwater will be stored and how NMDOT plans to utilize the treated groundwater.

Response: The treated groundwater will be stored in an existing above-ground tank. Another tank will be installed if the evaluation of the existing water storage system determines that the storage capacity needs to be increased. The treated groundwater will be used for domestic (household) use.

Comment 4. The Proposal fails to adequality describe how abatement efficacy for impacted soils at the Site will be assessed. The specific deficiencies regarding soil are as follows:

a. Section 2.3.4 and 3.1 of the Proposal references a nonexistent soil screening level (SSL) for chloride.

   Response: The reference to the soil screening levels for chloride will be removed from Sections 2.3.4 and 3.1 of the Proposal.

b. In the absence of an established soil screening level for Site contaminants of concern, NMDOT shall propose a means to establish Site-specific soil standards before the operation of a remedial system.

   Response: During the phone discussion between EA and GWQB on August 18, 2022, it was determined that site-specific soil standards for chloride are not necessary.

c. Further explanation of how the impacted soil at the site will be abated with the use of treated groundwater from the proposed remedial system. NMED requires details of 1) How NMDOT will measure discharges of treated groundwater to the surface for the abatement of soil; 2) How and when NMDOT will sample treated groundwater to evaluate the remedial system efficacy; and 3) How and when NMDOT will sample soil to evaluate the abatement plan's efficacy.

   Responses: 1) there will be no discharge of treated groundwater to abate impacted soil. Impacted soil will be addressed by eliminating infiltration in Arroyo B by routing surface water runoff west of the highway to Arroyo A. A contingency to line Arroyo B with a synthetic liner to prevent infiltration will be included in the S2AP. 2) To evaluate the efficacy of the remedial system, the treated groundwater will be sampled quarterly at the effluent sampling port. In addition, a specific conductivity monitor will be installed for instantaneous and long-term use 3) Soil abatement will be inferred from the groundwater concentrations. A decrease in groundwater concentrations will indicate abatement of vadose zone soil.

Comment 5. Section 6.2 indicates annual reporting of the data collected on a semi-annual basis. Please specify what month the annual report will be delivered to NMED each year.

Response: Annual reports will be provided in January of each year.

Comment 6. Section 6.3 indicates the need for a contingency plan to address potential fouling or scaling of the remedial system. Please provide a contingency plan to address the potential fouling or scaling of the remedial system, such that NMED approval of the contingency plan can be authorized upon approval of NMDOT's abatement plan.

Response: The pre-treatment measures will be evaluated during the design stage of the project. Such a statement was added to Section 6.3.

Comment 7. The Public Notice in Appendix B contains significant errors and omissions and requires thorough review and revision for content clarity and accuracy. NMED informed EA of the errors and omissions in email correspondence on July 12, 2022, with guidance on the necessary revisions.

Response: As per 20.6.2.4108 NMAC, the following public notice actions will be performed:

- The public will be notified through the publication of the notice in English and Spanish in the Las Vegas Optic newspaper.
- A radio public service announcement in English and Spanish by KTAO 101.9 FM, Taos, New Mexico, or by another available radio station in the area.
- Persons identified by the secretary who have requested notifications by mail or email. The GWQB will provide the contact details for such persons.
- The New Mexico Trustee for Natural Resources, and other local, state, or federal government agencies that were affected, as identified by the secretary. The GWQB will identify such agencies.
- Owners and residents that are located within one (1) mile from the perimeter of the geographic area where the standards and requirements of the 20.6.2.4103 are exceeded shall be notified by mail.

The public notice proposal will include the following:

- Name and address of the responsible entity.
- Location of the proposed abatement.
- Brief description of the nature of the water pollution of the proposed abatement action.
- Brief description of the procedures followed by the secretary in making a final determination.
- A statement on the comment period.
- A statement that a copy of the abatement plan can be viewed by the public at the department's main office or the department field office for the area in which the discharge occurred.
- A statement that written comments on the abatement plan, and requests for a public meeting or hearing that include the reason why a meeting or hearing should be held, will be accepted for consideration if sent to the secretary within sixty (60) days after the date of public notice.
- Address and phone number at which the interested person(s) may obtain further information.

Comment 8. NMED requires documentation to confirm that the Spanish version of the Public Notice was at a minimum verified for content clarity and accuracy by a certified translator before publication.

Response: The Spanish version of the Public Notice will be verified for content clarity and accuracy by a certified translator before publication. Documentation of certification will be provided to the GWQB.

Comment 9. The Public Notice fails to identify the radio station that will be utilized to comply with 20.6.2.4108(B)(1) NMAC.

Response: The radio station KTAO 101.9 FM, Taos, New Mexico, or another available radio station in the area will be used to broadcast the public announcement in English and Spanish.

Please let us know if you have any questions regarding the information provided in this plan.

Respectfully,

Jay Snyder, P.E.
Senior Hydrogeologist

Vener Mustafin, P.E.
Project Manager/Engineer

Enclosures

Cc: Mr. Larry Kemp, NMDOT HMIB
Mr. Justin Ball, NMED GWQB
File

STAGE 2 ABATEMENT PLAN
LA CUEVA PATROL YARD
MORA COUNTY, NEW MEXICO

Prepared for:

New Mexico Department of Transportation
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Prepared by:

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September 2022

EA Project No. 1597003.01
Revision 1

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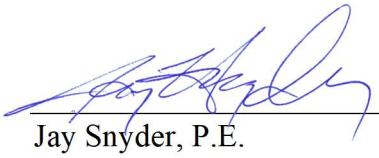

September 2, 2022

Jay Snyder, P.E.
Senior Hydrogeologist

Date

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1.0 INTRODUCTION

On behalf of the New Mexico Department of Transportation (NMDOT) Hazardous Materials Investigation Bureau (HMIB), EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared this Stage 2 Abatement Plan (S2AP) for the La Cueva Patrol Yard located in La Cueva, Mora County, New Mexico (Figure 1). This plan is organized following New Mexico Administrative Code (NMAC) 20.6.2.4106.E, and contains the following Sections:

- Description of Current Situation
- Description of Preferred Abatement Option
- Access and Administrative Requirements
- Modification of Monitoring Plan
- Reporting and Performance Assessment
- Site Maintenance Activities After Termination of Abatement Activities
- Schedule
- Public Notification

2.0 DESCRIPTION OF CURRENT SITUATION

2.1 SITE BACKGROUND

The La Cueva Patrol Yard (the site) is located at mile post 23.39 on State Road NM 518 in La Cueva, Mora County, New Mexico (Figure 1). Historically, road salt (sodium chloride) was carried off site from the patrol yard by surface water runoff during precipitation events and subsequently infiltrated into soil and groundwater downgradient of the site to the east. As a result, a groundwater monitoring well network has been established in the El Queso neighborhood to monitor chloride ion concentrations in groundwater. Currently monitoring wells and domestic wells are monitored at the site.

Date	Activity	Reference
7/10/2000	Notice of Violation issued by the New Mexico Environment Department (NMED) Ground Water Quality Bureau (GWQB). El Queso development wells (2) impacted with elevated sodium, (Na), chloride (Cl) & total dissolved solids (TDS).	*La Cueva Sequence of Events, March 2004* (Historical Document amended by EA, October 2019).
7/11/2000	Richard Heibel requests action from the NMDOT, including bottled water for the El Queso residents and on & off-site investigations.	Ibid.
7/20/2000	Letter to GWQB Chief indicating the NMDOT has started providing bottled water to El Queso, as of July 14, 2004.	Ibid.

Date	Activity	Reference
7/2000 - 11/2000	Selection of consultant to work on the on & off-site investigations. RESPEC selected.	Ibid.
9/20/2000	Secure access to Salman Ranch to advance borings & install one well.	Ibid.
9/21/2000	A workplan for the advancement of hand auger borings & soil analysis submitted to GWQB (Jennifer Parker).	Ibid.
11/2000	Well MW-1 installed & soil borings drilled by RESPEC. Raw data delivered to R. Heibel. See entry below.	Ibid.
1/10/2001	On & Off-site investigations completed & submitted to GWQB.	Ibid.
4/3/2001	On & Off-site investigation report approved by GWQB as a "Stage 1 Abatement Plan" report and NMDOT named "RP" for elevated chloride in groundwater in the El Queso wells. They require a "Stage 2 Abatement Plan" report to include a "discussion of the selection & design of a remedial option for the chloride contamination". "The abatement plan should address continued monitoring of the private wells until site remediation is complete OR a permanent alternative water source is provided to the families" Suggests in the letter that a remediation system such as reverse osmosis, or a new private well should be considered as a permanent potable water source.	Ibid.
5/2001	GWQB published their Salt Pile Containment, Best Management Practices.	Ibid.
5/29/2001	NMDOT requests a variance for State 2 Abatement Plan submittal.	Ibid.

Date	Activity	Reference
8/3/2001	RESPEC submits the Stage 2 Abatement Plan to span a period of 10 years. Plan includes 6 tasks: 1) A boring in the former salted cinder pile location to define vertical extent of contamination beneath it. To be completed as a groundwater monitoring well. 2) Cap the original salted cinder pile location with asphalt to prevent vertical and horizontal migration of residual material. 3) Plug & abandon the two private wells on the El Queso property. 4) Drill & complete a 300' private well on the El Queso property. 5) Install 5 additional groundwater-monitoring wells at El Queso & on Salman Ranch property. 6) Collect water samples from the El Queso/Salman Ranch groundwater-monitoring wells (6), Mora River/Buena Vista Ditch sample locations (3), new supply well (1), and the NMDOT La Cueva PY groundwater-monitoring well (1). Samples to be analyzed for chloride (EPA 300.0). Water from the new private well will also be analyzed for organics, inorganics and microorganisms before use.	Ibid.
9/24/2001	GWQB grants approval of the Stage 2 Abatement Plan with conditions. The GWQB insists on 2 additional surface water samples from the Mora River (at the USGS sampling station west of NM 518 and 300 feet down gradient from the Buena Vista lock). Also, all water samples are to be analyzed for "major ions" (no test method[s] provided.)	Ibid.
2/19/2002	Letter from the El Queso legal counsel, requesting discussion with NMDOT decision makers regarding their private wells and piping.	Ibid.
3/8/2002	NMDOT "notice to proceed" letter not in project file but implied by the handwritten request for a PO for RESPEC to complete Tasks 3 & 4 of the Stage 2 Abatement Plan.	Ibid.
4/30/2002	El Queso settlement demand filed.	Ibid.
4/2002 - 6/2002	RESPEC indicated they were told by NMDOT counsel to not enter the El Queso property until the settlement demand was resolved. No variance requested.	Ibid.

Date	Activity	Reference
6/11/2002	NMDOT counsel response to settlement demand.	Ibid.
8/29/2002	Settlement Agreement signed by El Queso residents, NMDOT & D-4. Spells out that the NMDOT and Risk Management of the GSD will pay El Queso $73,500.00 and they will drill their new 300' well, abandon the two other wells and complete tasks 3 & 4 of the Stage II AP.	Ibid.
8/30/2002	GWQB letter indicating they've not received three monitoring reports (quarterly since September 2001). GWQB requested a proposed schedule to comply with the approved abatement plan.	Ibid.
12/9/2002	RESPEC submits their proposed schedule of activities.	Ibid.
12/11/2002	RESPEC publishes & submits their Stage 2 Investigation Report. Indicates that the El Queso well and the NMDOT wells were being drilled concurrently. Completes/initiates Tasks 1, 5 & 6.	Ibid.
12/26/2002	GWQB approves RESPECs December 9, 2002 proposed schedule. GWQB approves the modification transferring the plugging and abandonment of the 2 El Queso wells and the installation of the new well to the El Queso residents. All other AP requirements remain.	Ibid.
1/31/2003	GWQB approves the Stage I Investigation Report. Indicates that the NMDOT must sample the new El Queso well once it is completed, no later than March 31, 2003.	Ibid.
2/6/2003	Stage II Quarterly Monitoring Report, 1st sampling Event, 2003 submitted by RESPEC. Results indicate Fluoride in all wells less than the 1.6 parts per million (ppm) standard, TDS greater than the 1,000 ppm standard in wells MW-5 & MW- 6S, and chloride greater than the 250 ppm standard in wells MW-2, MW-5 and MW- 6S. This report should have represented the 2nd sampling event.	Ibid.
5/7/2003	Fax communication between Richard Heibel & RESPEC regarding elevated chloride & TDS is the El Queso well. John Bunch suggests the new El Queso well was sampled again (on 4-18-03) and returned with elevated TDS & chloride. Based on the wording, RESPEC obtained the sample from "Herman" (assume Herman Romero of El Queso).	Ibid.

Date	Activity	Reference
5/21/2003	Stage I Investigation Report, 3rd Sampling Event submitted by RESPEC. New domestic well sampled following installation. Results indicate fluoride in all wells less than the 1.6 ppm standard, TDS greater than the 1,000 ppm standard in MW-6S and the new El Queso well, and chloride greater than the 250 ppm standard in MW-2, MW-5, MW-6S and the new El Queso well.	Ibid.
8/27/2003	Stage I Investigation Report, 4th Sampling Event submitted by RESPEC. Results indicate fluoride in all wells less than the standard, TDS in all wells greater than the standard, and chloride above the standard in MW-2 and MW-5. El Queso well data not reported.	Ibid.
8/29/2003	GWQB requests re-sampling of the new El Queso well because of the elevated TDS & chloride in March 10, 2003 sampling (presented in May 2003 3rd sampling report).	Ibid.
10/7/2003	NMDOT responds to GWQB request for additional testing of the new El Queso well, asking under what authority are they requesting additional testing of the private water well, beyond that proposed in the Stage II AP.	Ibid.
10/23/2003	GWQB responds indicating they possess the authority under drinking water & groundwater regulations.	Ibid.
10/29/2003	Obtained a copy of the new El Queso well log from the Office of the State Engineer. Well should have been 300 feet deep but it's only 200'. El Queso has violated the terms of the settlement agreement.	Ibid.
11/10/2003	Stage I Investigation Report, 5th Sampling Event submitted by RESPEC. Results indicate fluoride in all wells below the standard, TDS in all wells less than the standard, and chloride greater than the standard in MW-2 and MW-5. El Queso well data not reported.	Ibid.
11/21/2003	NMDOT responds to GWQB letter of October 22, 2003. Proposes sampling MW-2 as an alternative to sampling the new El Queso well because of items listed in the letter.	Ibid.
1/23/2004	GWQB does not approve replacing sampling new El Queso well with MW-2.	Ibid.

Date	Activity	Reference
2/16/2004	Stage 2 Investigation Report, 6th Sampling Event report submitted by RESPEC. Results indicate fluoride in all wells less than the 1.6 ppm standard TDS greater than the 1000 ppm standard in wells MW-5 & MW-6S, and chloride greater than the 250 ppm standard in MW-5 and MW-6S. NMDOT suspects this may be due to seasonal fluctuations. RESPEC recommends discontinuing sampling most of the surface water sampling & the lab analyses of constituents not detected to date. Continue with Cl & TDS analysis.	Ibid.
8/3/2004	The report noted that all wells had been previously mapped together on potentiometric surface maps; due to different screened intervals, INTERA created a shallow map and deep potentiometric surface map for the site. In addition, the report noted that a separate arroyo was observed "south of the road into the El Queso housing development and directly across from the patrol yard that appears as though it could have also been a potential conduit for surface water contamination. It does not appear that investigation of this area has been conducted. A white precipitate was visible in the arroyo north of the patrol yard and in the arroyo directly east and across the road from the patrol yard. It is currently unknown if the precipitate is sodium chloride or a hard scaling (calcite, etc.) from the surface water that did not adversely affect the ground water in the El Queso housing development." In addition, the report noted that remediation "of the contamination in the ground water is not feasible. Ground water monitoring should be continued to better assess the natural attenuation trends of the contaminants."	Intera, Inc. 2004. *La Cueva Patrol Yard Site – Site Conceptual Model*. August 3.
9/14/2004	Stage 2 Investigation Report, 8th Sampling Event report submitted by RESPEC. Results indicate that Cl and TDS concentrations increased in monitoring well MW-2 since the previous sampling event (240 mg/L to 530 mg/L). TDS concentrations increased in MW-2 from 730 mg/L to 1,600 mg/L (above New Mexico Water Quality Control Commission [NMWQCC] limits). Concentrations of chloride, fluoride, and TDS have remained relatively stable in all other sampled monitoring wells.	RESPEC. 2004. *Stage 2 Abatement/ Quarterly Monitoring Report, Eighth Sampling Event, NMDOT La Cueva Patrol Yard Facility*. September 14.

Date	Activity	Reference
1/7/2005	INTERA collected soil and precipitate samples from two southern arroyos that drain toward the El Queso housing development, as INTERA suspected that these arroyos could have been a secondary surface water source for groundwater contamination. The results indicated that a second arroyo was likely a contributor to groundwater contamination at the site, and it was recommended that the contaminated soil in the arroyo should be excavated and removed.	INTERA. 2005. *Site Investigation Activities, La Cueva Patrol Yard Site.* January 7.
3/8/2006	NMED approves the November 8, 2005 Stage 2 Abatement Plan Proposal submitted by NMDOT. The AP proposed: Public Notification; plugging and abandonment of monitoring wells MW-1, MW-3, MW-4 and SHD-1; design and installation of storm-water BMPs, including a swale along the eastern edge of the Patrol Yard property to collect and direct surface water to the northeast corner, and installation of an evaporation pond located at the terminus of swale in the northeast corner of the Patrol Yard; capping of the former salted cinder pile location to prevent continued infiltration of surface/storm water; and a groundwater monitoring program for the natural attenuation of ions of concern, including chloride, fluoride and total dissolved solids. The AP was approved with minor administrative changes.	NMED. 2006. *Stage 2 Abatement Plan Proposal Approval for the NMDOT District 4 Patrol Yard, La Cueva, New Mexico*. March 8.
1/27/2006	Quarterly groundwater report submitted by AMEC Earth and Environmental, Inc. (AMEC). Cl and TDS concentrations were below NMWQCC standards in wells MW-1, MW-3S, MW-3D, MW-4, MW-5 and MW-6D. Wells MW-2, MW-6S, and "the onsite supply well" (i.e., the Romero/Weathers well) exceeded Cl and TDS standards. The groundwater gradient is noted to be to the south/southwest, using all groundwater wells. Note that INTERA separated these wells into shallow and deep maps based upon screened intervals.	AMEC. 2006. *Quarterly Groundwater Monitoring Report, NMDOT District 4 Patrol Yard*. January 27.

Date	Activity	Reference
10/24/2006	A quarterly groundwater report was submitted to NMDOT by AMEC. Groundwater was only collected from well MW-2, which contained groundwater in excess of Cl and TDS standards.	AMEC. 2006. *Quarterly Groundwater Monitoring Report, NMDOT District 4 Patrol Yard*. October 24.
2006 – 2019	Groundwater monitoring continues at the site, where Cl and TDS concentrations in site wells exceed NMWQCC standards. A domestic well ("Garcia Well") begins to exceed Cl and TDS standards in May 2016, with abrupt increases in concentrations after the previous sampling event in April 2015. **Relevant files other than groundwater monitoring reports are continued below.**	Multiple groundwater monitoring reports submitted by various consultants.
3/10/2009	Daniel B. Stephens and Associates (DBS&A) submit a groundwater evaluation wherein the geochemistry of water quality data for the most recent sampling event was compared to groundwater geochemistry of the region. Through geochemical characterization, it was determined that groundwater in the Garcia Well and well MW-3D were comprised of nearly 100% water from the Rio Mora, whereas other site wells were a mixture of Rio Mora and the Romero/Weathers well (the latter well is not considered the source but was simply the well with the highest concentration of Cl/TDS).	DBS&A. 2009. *NMDOT La Cueva Patrol Yard Groundwater Evaluation*. March 10.
6/12/2009	DBS&A found a total of 7 groundwater wells within 2 miles of the site that were near the Sawyer well, a well with documented exceedance of the Cl standard located approximately 3,000 feet south of the Romero/Weathers well.	DBS&A. 2009. *NMDOT La Cueva Patrol Yard Semiannual Groundwater Monitoring and Well Search Report.* June 12.

Date	Activity	Reference
6/18/2019	NV5 submits the latest groundwater monitoring report to NMDOT for May 2019 sampling. Cl and TDS exceeded applicable standards in the Romero/Weathers well (1,100 mg/L Cl and 2,650 mg/L TDS) and in the shallow wells MW-3S (310 mg/L Cl and 1,020 mg/L TDS) and MW-6S (1,100 mg/L Cl and 2,650 mg/L TDS). The Romero/Weathers well has exceeded the chloride and TDS standards for every groundwater monitoring event between April 2003 and May 2019. The Garcia well began exceeding chloride and TDS standards in May 2016, abruptly increasing from low concentrations of both constituents: 39 mg/L to 960 mg/L Cl and 413 mg/l to 2,360 mg/L TDS between April 2015 and May 2016. This well was not sampled in May 2019 as it had been disconnected for unknown reasons.	NV5. 2019. *May 2019 - Second Semi-Annual Groundwater Monitoring Event Report. NMDOT La Cueva Patrol Yard, La Cueva, New Mexico*. June 18.
3/9/2021	EA submits *Quarterly Groundwater Monitoring and Soil Characterization Report* to NMED GWQB. Chloride contamination exceeded the NMWQCC standard of 250 mg/L in monitoring wells MW-2 and MW-6S. TDS exceeded the NMWQCC standard of 1,000 mg/L in monitoring well MW-6S. Chloride and TDS exceeded NMWQCC standards in the Romero/Weathers Supply well. The Estrada Supply well did not exceed NMWQCC standards. The Garcia Domestic Well has been reported as permanently disconnected. Residual chloride contamination in soil in Arroyo A is most prevalent in the vicinity of boring A-3 located at the base of the arroyo. Arroyo B appears to be the main pathway for the chloride contamination transport from the patrol yard. Chloride was detected at all three boring locations.	EA Engineering, Science, and Technology, Inc., PBC. 2021. *Quarterly Groundwater Monitoring and Soil Characterization Report, La Cueva Patrol Yard, La Cueva, Mora County, New Mexico.* March 9.

Date	Activity	Reference
5/3/2021	EA submits *Quarterly Groundwater Monitoring Report* to NMED GWQB. Chloride concentrations exceeded the NMWQCC standard of 250 mg/L in wells MW-2 and MW-6S. TDS exceeded the NMWQCC standard of 1,000 mg/L in wells MW-2, MW-3S, and MW-6S. Chloride and TDS exceeded the NMWQCC standards in the Romero/Weathers domestic well. Chloride and TDS were below the NMWQCC standards in the Estrada domestic well.	EA Engineering, Science, and Technology, Inc., PBC. 2021. *Quarterly Groundwater Monitoring Report, La Cueva Patrol Yard, La Cueva, Mora County, New Mexico.* May 3.
7/22/2021	EA submits *Quarterly Groundwater Monitoring Report* to NMED GWQB. Chloride concentrations exceeded the NMWQCC standard of 250 mg/L in wells MW-2 and MW-6S. TDS exceeded the NMWQCC standard of 1,000 mg/L in wells MW-2 and MW-6S. Chloride and TDS exceeded the NMWQCC standards in the Romero/Weathers domestic well. Chloride and TDS remained below the NMWQCC standards in the Estrada domestic well.	EA Engineering, Science, and Technology, Inc., PBC. 2021. *Quarterly Groundwater Monitoring Report, La Cueva Patrol Yard, La Cueva, Mora County, New Mexico.* July 22.
11/16/2021	EA submits *Quarterly Groundwater Monitoring Report* to NMED GWQB. Chloride concentrations exceeded the NMWQCC standard of 250 mg/L in wells MW-2 and MW-6S. TDS exceeded the NMWQCC standard of 1,000 mg/L in wells MW-2 and MW-6S. Chloride and TDS exceeded the NMWQCC standards in the Romero/Weathers domestic well. Chloride and TDS remained below the NMWQCC standards in the Estrada domestic well.	EA Engineering, Science, and Technology, Inc., PBC. 2021. *Quarterly Groundwater Monitoring Report, La Cueva Patrol Yard, La Cueva, Mora County, New Mexico.* November 16.

2.2 GEOLOGY AND HYDROLOGY

2.2.1 Site Geology

The site is located approximately 5 miles to the east of Mora, New Mexico on the east slope of the Sangre de Cristo Mountains. The Amola Ridge is located immediately west of the site and is composed of Cretaceous and Jurassic sandstones which overlie older Paleozoic and Precambrian rocks of the Sangre de Cristo Mountains. The Mora River is adjacent to the site to the north and east and has created typical floodplain and terrace deposits in the area of the El Queso Neighborhood.

The lithology at the site consists of silty brown sand overlying reddish-brown sandstone, followed by brownish-yellow sandstone.

2.2.2 Site Hydrology

The apparent direction of groundwater flow in wells completed in Quaternary Alluvium, Chinle Formation, and Santa Rosa Sandstone is south, and the apparent hydraulic gradients are 0.006, 0.06, and 0.09, respectively. With only two wells completed in each zone, potentiometric surfaces cannot be created, and only apparent flow directions and gradients can be determined. In October 2021, groundwater was present at the site from 10.48 feet below the top of casing (ft BTOC) in well MW-3D, completed in the Chinle Formation, to 54.54 ft BTOC in well MW-2, completed in the Santa Rosa Sandstone. Well construction details are provided in Table 1, and water level gauging data is presented in Table 2.

2.3 DISCUSSION OF CONTAMINATION

2.3.1 Sources of Contamination

The source of contamination is a previously unlined salted cinders stockpile that was located at the site. Road salt (sodium chloride) was carried off-site from the patrol yard by surface water runoff during precipitation events and subsequently infiltrated into the soil and groundwater downgradient of the site to the east.

2.3.2 Summary of Soil Data

In January 2021, a subsurface soil investigation was conducted by EA and subcontractor, Earth Worx Environmental Services. Six soil borings were advanced at the site: three each in Arroyo A and Arroyo B (Figure 2). EA collected a total of 18 soil samples from the six boreholes. The samples were analyzed for chloride by EPA Method 300.0.

<u>Arroyo A</u>

Boring location A-1 in Arroyo A was advanced to a total depth of 12 feet below ground surface (ft bgs) where sandstone was encountered, resulting in refusal. Of the four soil samples collected from boring A-1, only one sample (interval 9-10 ft bgs) had a chloride detection, 73 milligrams

per kilogram (mg/Kg). Boring A-2 was advanced to a total depth of 6 ft bgs where sandstone was encountered, resulting in refusal. Chloride was not detected above the laboratory reporting limit (RL) in this boring. Boring A-3 was advanced to a total depth of 10 ft bgs where the groundwater was encountered. Three soil samples were collected from boring A-3 (1-2 ft bgs, 5-6 ft bgs, and 9-10 ft bgs), and chloride was detected in all three intervals at respective concentrations of 170 mg/Kg, 470 mg/Kg, and 180 mg/Kg.

Arroyo B

Boring location B-1 in Arroyo B was advanced to a total depth of 4 ft bgs where sandstone was encountered resulting in refusal. Soil samples collected from boring B-1 (intervals 1-2 ft bgs and 3-4 ft bgs) had chloride detections of 110 mg/Kg and 270 mg/Kg, respectively. Boring B-2 was advanced to a total depth of 18 ft bgs where sandstone was encountered resulting in refusal. Five soil samples were collected from this boring, and four intervals (5-6 ft bgs, 9-10 ft bgs, 13-14 ft bgs, and 17-18 ft bgs) had chloride detections of 340 mg/Kg, 970 mg/Kg, 1,200 mg/Kg, and 1,100 mg/Kg, respectively. Two soil samples were collected from boring B-3 which was advanced to a total depth of 6 ft bgs where sandstone was encountered resulting in refusal. The 1-2 ft bgs interval contained chloride at a concentration of 140 mg/Kg; chloride was not detected above the laboratory RL in the 5-6 ft bgs interval.

2.3.3 Summary of Groundwater Data

Groundwater monitoring has been conducted in well MW-1 since December 2000. The current monitoring well network consists of MW-2, MW-3S/D, MW-4, MW-5, and MW-6S/D. There are currently two private supply wells in use, the Estrada Well and the Romero/Weathers Well.

The highest chloride concentration observed at the site historically was in a private supply well, the Garcia Well, at 1,300 milligrams per liter (mg/L) during the February 2019 event. However, this well has reportedly been permanently disconnected and could not be located by EA. The Romero/Weathers private supply well has consistently exceeded 1,000 mg/L chloride concentration since February 2019. Monitoring wells MW-2 and MW-6S also consistently exceed the New Mexico Water Quality Control Commission (NMWQCC) chloride standard of 250 mg/L.

The highest total dissolved solids (TDS) observed at the site historically was in a private supply well, the Romero/Weathers Well, at 3,520 mg/L during the June 2021 event. The Romero/Weathers private supply well, along with monitoring wells MW-2 and MW-6S, has consistently exceeded the NMWQCC TDS standard of 1,000 mg/L.

2.3.4 Nature and Extent of Contamination

Historical groundwater analytical data for analytes including chloride and TDS are summarized in Tables 3 and 4 and trend graphs are presented in Appendix A. Distribution of contaminants in groundwater is shown in Figure 3 for October 2021. Residual soil contamination appears to be limited to Arroyo B (Figure 2).

2.4 CONTAMINANT FATE AND TRANSPORT

Road salt located at the La Cueva Patrol Yard was exposed to precipitation. Runoff transported chloride down Arroyo B where it infiltrated through a thin veneer of alluvium, into bedrock and groundwater. Once in the groundwater, chloride-impacted groundwater is withdrawn by the Romero/Weathers Supply Well and provided to several residences. The wastewater from residential use is in turn discharged to groundwater via septic tanks and leach fields. This water, after infiltration into groundwater, is then recycled in part by the Garcia Well.

Because chloride is not decaying, the maximum impacted groundwater concentrations have remained around three times the standard. Removal of salts from the extracted well water will therefore attenuate chloride concentration in groundwater over time.

2.5 STAGE 2 ABATEMENT PLAN AREA DEFINED

Based on the current extent of chloride and TDS in groundwater, the abatement plan area (APA) is contained in the bottom of the El Queso neighborhood in the vicinity of wells MW-2, MW-6S, and the Romero/Weathers supply well (Figure 3).

2.5.1 Groundwater Cleanup Goals

The primary contaminants of concern (COCs) are chloride and TDS since they have domestic water supply standards under Section 3103.B of 20.6.2 NMAC. The standard for chloride in groundwater is 250 mg/L and for TDS is 1,000 mg/L

3.0 DESCRIPTION OF PREFERRED ABATEMENT OPTION

Since the groundwater in question provides sole drinking water to several residences, it is desirable to formulate a cleanup plan that 1) does hinder the use of the water, 2) substantially improves the quality of water supplied to residents, 3) ultimately achieves NMWQCC standards for chloride and TDS, and 4) restores the aquifer to desired beneficial uses.

Because the impacted groundwater is substantially “recycled” in a closed loop process of extraction, use, and then discharge, the opportunity exists to remove contaminant mass from pumped groundwater, flush contaminants out of the soil beneath residential leach field lines, and as water quality improves address vadose zone impacts, flood the aquifer with cleaner water back to the Romero/Weathers well, extract and treat groundwater, and so on. Since contaminant concentrations only need to be reduced five-fold, this approach provides a steady means of achieving cleanup goals while providing a higher quality supply.

3.1 RESIDUAL SOIL CONTAMINATION ABATEMENT OPTION

Based on source area soil contaminant levels as demonstrated by the January 2021 soil sampling event (Table 5), abatement of soil contamination does not appear necessary; however, to address residual chloride leaching to groundwater, drainage pathways will be rerouted so surface runoff from the patrol yard drains through Arroyo A instead of Arroyo B. This will significantly reduce

surface water runoff in Arroyo B and therefore reduce infiltration. This will significantly reduce the potential for contaminant loading the aquifer via Arroyo B infiltration.

3.2 SOLUTE PLUME ABATEMENT OPTION

Based on the contaminant fate and transport as discussed in Section 2.4 above, the goals of the selected abatement option must include the following:

- Prevent future surface runoff from draining into Arroyo B;
- Prevent exposure throughout the APA;
- Reduce contaminant mass via groundwater extraction, remediate with a reverse osmosis (RO) system, and reuse; and
- Conduct long-term monitoring to demonstrate the protectiveness of the abatement option.

To achieve these goals, several options may be appropriate for all or parts of the plume, and the advantages and disadvantages of these options are discussed below.

NMDOT proposes an RO treatment of the extracted impacted groundwater and transfer of the treated groundwater into existing above-ground storage for household use. This will reduce groundwater contaminant concentrations within the plume and provide hydraulic containment to halt downgradient migration. A process flow diagram is provided in Figure 4 for the RO system. Design specifics will be developed and provided with bid packages for the RO plant.

Long-term monitoring will be performed on the RO system effluent, all site monitoring wells, and the Romero/Weathers supply well under quality control requirements provided in Table 6. This will ensure the plume is stable and not expanding into areas currently below standards. The groundwater monitoring regimen will be per Table 7.

The NMED GWQB determined that the Stage 2 Abatement Plan meets a definition of a significant modification definition under 20.6.2.(S)(4). Within 30 days of the submittal of this Stage 2 Abatement Plan, EA, on behalf of NMDOT HMIB, will submit to the NMED GWQB a Discharge Permit application.

4.0 ACCESS AND ADMINISTRATIVE REQUIREMENTS

To implement this plan, existing access agreements with NMDOT and property owners will be maintained. Property owners maintain adequate water rights with the New Mexico Office of State Engineer (OSE) to implement this abatement alternative.

5.0 MODIFICATION OF MONITORING PLAN

The monitoring regimen to facilitate the implementation of the S2AP is described herein.

5.1 SAMPLING FREQUENCY

Groundwater monitoring will continue as specified in Tables 6 and 7. Because of the numerous data available for monitoring wells, monitoring wells will be sampled semi-annually.

5.2 LONG-TERM MONITORING PROTOCOLS

The monitoring includes standard hand-bailing of monitoring wells, collecting of tap samples at the Romero/Weathers supply wells, and collecting of grab RO effluent samples. Analytical methods, containers, preservations, storage, and holding times are presented in Table 6. Sampling locations, analyses, and sampling frequency are presented in Table 7.

5.2.1 Well Gauging

Before sampling, all monitoring wells will be gauged with a water level indicator. Wells will be gauged to the nearest 1/100 foot. Table 7 lists the wells that will be gauged.

5.2.2 Well Sampling by Hand Bailing

The monitoring wells listed in Table 7 will be sampled by hand bailing. Wells will be sampled from historically clean to dirty to minimize the potential for cross-contamination. New, disposable polyethylene bailers and disposable twine will be used at each well. Non-expendable sampling equipment will be decontaminated between wells to further ensure sample quality.

Field parameters will be measured with a water quality meter. Specific conductance (SpC), TDS, pH, and temperature will be monitored. Before use, all meters will be calibrated and/or checked against a standard following manufacturers' specifications.

Wells will be bailed a minimum of three casing volumes before sample collection when practicable. Purge water will be ground discharged. EA staff will log purge start time, volume purged, and all field parameters on standardized forms during the purge process, with a minimum of three parameters collected, if practicable. Once purging is complete, field parameters will be measured once more before sampling.

5.2.3 Reverse Osmosis System and Water Supply Well Sampling

Tap samples will be collected from the Romero/Weathers supply well and sampled for chloride and TDS (Tables 6 and 7). Tap water samples will be collected by allowing the tap to run for approximately 20 minutes and then filling the sample container directly from the tap. Field parameters will be collected immediately before sampling.

After the RO system is commissioned, RO effluent samples will be collected and analyzed for chloride and TDS bi-weekly for the first month, monthly for the first six months, and quarterly thereafter (Tables 6 and 7). Samples will be collected from a sampling port that will be purged for 30 seconds to flush the port.

5.2.4 Sample Handling

Samples will be placed in containers as specified in Table 6 and placed immediately on ice awaiting delivery to the laboratory. A chain of custody will be completed before leaving the site, and the samples will be delivered under custody procedures to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque. Method holding times are specified in Table 6.

5.2.5 Decontamination

Expendable sampling equipment and materials (i.e., gloves, bailers, twine, etc.) will be disposed of after use. Non-expendable sampling equipment, field meters, and water level indicators will be decontaminated between wells. Equipment will be washed in a potable water/Alconox® solution followed by a potable water rinse.

6.0 REPORTING AND PERFORMANCE ASSESSMENT

This section provides a summary of reporting requirements and an annual performance assessment of the preferred abatement option. The annual report will be provided in January of each year.

6.1 SEMI-ANNUAL MONITORING AND REPORTING

Semi-Annual groundwater monitoring will be performed as discussed in Section 5.0 and Table 7. All monitoring wells will be gauged semi-annually so the apparent groundwater gradients can be monitored.

6.2 ANNUAL REPORTING AND PERFORMANCE ASSESSMENT

Performance assessment will be reported annually. The performance assessment report will include the semi-annual data, and the following:

- Updated trend plots;
- Evaluation of whether the total mass of chloride and TDS are declining over time;
- Evaluation of trends and protectiveness at wells located at the margins of the APA;
- General discussion of whether the plan is achieving target cleanup goals through evaluation of declining trends and estimation of cleanup times;
- Demonstrate the S2AP is performing according to expectations. This will be principally measured by:
    - Declining chloride and TDS concentrations in wells MW-2 and MW-6S; and
    - Decline in source strength (Romero/Weathers Well) chloride and TDS concentrations.

6.3 CONTINGENCY MEASURES

The following are the contingency measures:

- The need for pretreatment of extracted groundwater before RO treatment will be evaluated during the design stage.
- An additional storage tank will be installed for storage of treated groundwater if the evaluation of the existing water storage system determines that the storage capacity needs to be increased.
- Installation of a monitoring well in Arroyo B to evaluate chloride groundwater concentrations will be assessed.
- The lining of Arroyo B to mitigate infiltration may be considered if chloride sourcing from Arroyo B soil into groundwater continues.

7.0 MAINTENANCE ACTIVITIES POST TERMINATION OF ABATEMENT

Once the Stage 2 Abatement activities have concluded (including successful long-term monitoring), the RO system will be removed and all site monitoring wells will be plugged and abandoned.

8.0 PUBLIC NOTIFICATION

The following requirements of 20.6.2.4108 NMAC will be fulfilled:

- The public will be notified through the publication of the notice in English and Spanish in the Las Vegas Optic newspaper.
- A radio public service announcement in English and Spanish by KTAO 101.9 FM, Taos, New Mexico, or by another available radio station in the area.
- Persons identified by the secretary who have requested notifications by mail or email. The GWQB will provide the contact details for such persons.
- The New Mexico Trustee for Natural Resources, and other local, state, or federal government agencies that were affected, as identified by the secretary. The GWQB will identify such agencies.
- Owners and residents that are located within one (1) mile from the perimeter of the geographic area where the standards and requirements of the 20.6.2.4103 are exceeded shall be notified by mail.

The public notice will include the following:

- Name and address of the responsible entity.
- Location of the proposed abatement.
- Brief description of the nature of the water pollution of the proposed abatement action.
- Brief description of the procedures followed by the secretary in making a final determination.
- A statement on the comment period.

- A statement that a copy of the abatement plan can be viewed by the public at the department's main office or the department field office for the area in which the discharge occurred.
- A statement that written comments on the abatement plan, and requests for a public meeting or hearing that include the reason why a meeting or hearing should be held, will be accepted for consideration if sent to the secretary within sixty (60) days after the date of public notice.
- Address and phone number at which the interested person(s) may obtain further information.

TABLES

TABLE 1. WELL CONSTRUCTION DETAILS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well	Date Installed	Date Plugged & Abandoned	Type	Location	Northing[1]	Easting[1]	Casing Diameter (inches)	Top of Casing[1] (feet amsl)	Total Depth (feet bgs)	Screen Interval (feet bgs)
MW-1	28-Nov-00	12-Oct-07	monitoring well	El Queso Neighborhood	1797136.0	269989.9	2	-	15	5 - 15
MW-SHD-1	15-Oct-02	1-Dec-05	monitoring well	La Cueva Petrol Yard	1797167.2	269141.3	2	-	65.5	55.5 - 65.5
MW-2	16-Oct-02	-	monitoring well	El Queso Neighborhood	1796861.2	269889.3	2	7017.21	62	41.5 - 61.5
MW-3S	15-Oct-02	-	nested monitoring well	El Queso Neighborhood	1797008.2	270040.9	2	7008.16	20	10 - 20
MW-3D	15-Oct-02	-	nested monitoring well	El Queso Neighborhood	1797008.5	270040.9	2	7008.15	45	30 - 45
MW-4	17-Oct-02	12-Oct-07	monitoring well	El Queso Neighborhood	1797105.1	270054.1	2	-	40.5	20.5 - 40.5
MW-5	17-Oct-02	-	monitoring well	El Queso Neighborhood	1797208.5	269853.0	2	7020.46	60	40 - 60
MW-6S	18-Oct-02	-	nested monitoring well	El Queso Neighborhood	1796805.6	270046.6	2	7008.98	20.5	10.5 - 20.5
MW-6D	18-Oct-02	-	nested monitoring well	El Queso Neighborhood	1796805.4	270046.6	2	7008.46	65	45 - 65
Garcia Well?	3-Aug-90	-	private well	El Queso Neighborhood	-	-	5	-	151	60 - 63; 128 - 130
Romero/Weathers Well?	25-Oct-02	-	private well	El Queso Neighborhood	1796816.9	270046.7	5	-	200	180 - 200
Hand Dug Well	31-Dec-64	-	private well	El Queso Neighborhood	-	-	12	-	30	unknown
Estrada Well	unknown	-	private well	El Queso Neighborhood	1796946.0	270102.7	unknown	-	unknown	unknown

NOTES:
[1] = New Mexico State Plane coordinates (NAD 83/ NAVD 88)
amsl = Above mean sea level
bgs = Below ground surface
NA = Not applicable
NM = Not measured

TABLE 2 SUMMARY OF FLUID GAUGING DATA
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date	Top of Casing Elevation (feet amsl)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)
MW-2	5-Oct-21	7017.21	54.54	6962.67
	30-Jun-21		55.40	6961.81
	13-Apr-21		54.73	6962.48
	20-Jan-21		54.08	6963.13
	13-May-19		30.42	6986.79
	14-Feb-19		28.99	6988.22
	11-Apr-18		37.38	6979.83
	11-Jul-17		47.75	6969.46
	21-Nov-16		43.28	6973.93
	31-May-16		36.90	6980.31
	24-Nov-15		29.76	6987.45
	14-Apr-15		44.52	6972.69
	30-May-14		51.34	6965.87
	21-Nov-13		50.45	6966.76
	28-May-13		53.30	6963.91
	31-Jan-13		53.00	6964.21
	18-Sep-12		51.17	6966.04
	12-Apr-12		50.77	6966.44
	26-Oct-11		50.41	6966.80
	17-Mar-11		45.78	6971.43
	17-Sep-10		44.26	6972.95
	28-Dec-09		48.57	6968.64
	30-Jul-09		47.86	6969.35
	21-May-09		46.68	6970.53
	15-Jan-09		44.27	6972.94
MW-3D	5-Oct-21	7008.15	10.48	6997.67
	30-Jun-21		9.71	6998.44
	13-Apr-21		10.81	6997.34
	20-Jan-21		10.52	6997.63
	13-May-19		8.39	6999.76
	14-Feb-19		10.05	6998.10
	11-Apr-18		9.12	6999.03
	11-Jul-17		10.00	6998.15
	21-Nov-16		9.42	6998.73
	31-May-16		8.72	6999.43
	24-Nov-15		9.30	6998.85
	14-Apr-15		9.61	6998.54
	30-May-14		9.38	6998.77
	21-Nov-13		9.55	6998.60
	28-May-13		9.34	6998.81
	31-Jan-13		9.78	6998.37
	18-Sep-12		9.75	6998.40

TABLE 2 SUMMARY OF FLUID GAUGING DATA
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date	Top of Casing Elevation (feet amsl)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)
MW-3D (cont.)	12-Apr-12	7008.15	9.82	6998.33
	26-Oct-11		10.10	6998.05
	17-Mar-11		9.48	6998.67
	17-Sep-10		9.99	6998.16
	28-Dec-09		9.91	6998.24
	30-Jul-09		9.62	6998.53
	20-May-09		9.73	6998.42
	15-Jan-09		10.05	6998.10
MW-3S	5-Oct-21	7008.16	11.08	6997.08
	30-Jun-21		10.53	6997.63
	13-Apr-21		11.04	6997.12
	20-Jan-21		10.76	6997.40
	13-May-19		8.80	6999.36
	14-Feb-19		10.17	6997.99
	11-Apr-18		9.20	6998.96
	11-Jul-17		10.58	6997.58
	21-Nov-16		9.68	6998.48
	31-May-16		9.10	6999.06
	24-Nov-15		9.30	6998.86
	14-Apr-15		9.84	6998.32
	30-May-14		9.72	6998.44
	21-Nov-13		9.70	6998.46
	28-May-13		9.60	6998.56
	31-Jan-13		9.90	6998.26
	18-Sep-12		9.81	6998.35
	12-Apr-12		10.15	6998.01
	26-Oct-11		10.46	6997.70
	17-Mar-11		9.71	6998.45
	17-Sep-10		10.46	6997.70
	28-Dec-09		10.07	6998.09
	30-Jul-09		10.00	6998.16
	20-May-09		10.25	6997.91
	15-Jan-09		10.30	6997.86
MW-5	5-Oct-21	7020.46	24.17	6996.29
	30-Jun-21		22.75	6997.71
	13-Apr-21		23.59	6996.87
	20-Jan-21		23.75	6996.71
	13-May-19		23.00	6997.46
	14-Feb-19		Interface probe blocked at 5.86 ft btoc	
	11-Apr-18		21.53	6998.93
	11-Jul-17		23.05	6997.41
	21-Nov-16		22.35	6998.11

TABLE 2 SUMMARY OF FLUID GAUGING DATA
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date	Top of Casing Elevation (feet amsl)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)
MW-5 (cont.)	31-May-16	7020.46	21.12	6999.34
	24-Nov-15		22.05	6998.41
	14-Apr-15		21.39	6999.07
	30-May-14		21.30	6999.16
	21-Nov-13		22.70	6997.76
	28-May-13		21.71	6998.75
	31-Jan-13		23.22	6997.24
	18-Sep-12		22.65	6997.81
	12-Apr-12		NA	NA
	26-Oct-11		NA	NA
	17-Mar-11		15.58	7004.88
	17-Sep-10		16.82	7003.64
	29-Dec-09		17.37	7003.09
	30-Jul-09		16.73	7003.73
	20-May-09		16.21	7004.25
	15-Jan-09		17.16	7003.30
MW-6D	5-Oct-21	7008.85	23.83	6985.02
	30-Jun-21		23.35	6985.50
	13-Apr-21		23.24	6985.61
	20-Jan-21		23.38	6985.47
	13-May-19		18.71	6990.14
	14-Feb-19		17.91	6990.94
	11-Apr-18		19.95	6988.90
	11-Jul-17		22.41	6986.44
	21-Nov-16		21.14	6987.71
	31-May-16		19.67	6989.18
	24-Nov-15		18.00	6990.85
	14-Apr-15		20.97	6987.88
	30-May-14		21.83	6987.02
	21-Nov-13		21.50	6987.35
	28-May-13		21.49	6987.36
	31-Jan-13		21.45	6987.40
	18-Sep-12		20.99	6987.86
	12-Apr-12		21.40	6987.45
	26-Oct-11		21.84	6987.01
	17-Mar-11		20.55	6988.30
	17-Sep-10		20.61	6988.24
	28-Dec-09		21.28	6987.57
	30-Jul-09		20.98	6987.87
	20-May-09		21.11	6987.74
	15-Jan-09		20.74	6988.11

TABLE 2 SUMMARY OF FLUID GAUGING DATA
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date	Top of Casing Elevation (feet amsl)	Depth to Water (feet bgs)	Groundwater Elevation (feet amsl)
MW-6S	5-Oct-21	7008.98	13.07	6995.91
	30-Jun-21		12.26	6996.72
	13-Apr-21		12.37	6996.61
	20-Jan-21		12.05	6996.93
	13-May-19		10.46	6998.52
	14-Feb-19		11.02	6997.96
	11-Apr-18		10.40	6998.58
	11-Jul-17		12.29	6996.69
	21-Nov-16		10.92	6998.06
	31-May-16		10.39	6998.59
	24-Nov-15		10.40	6998.58
	14-Apr-15		10.92	6998.06
	30-May-14		11.13	6997.85
	21-Nov-13		10.68	6998.30
	28-May-13		10.61	6998.37
	31-Jan-13		10.80	6998.18
	18-Sep-12		10.98	6998.00
	12-Apr-12		11.54	6997.44
	26-Oct-11		11.89	6997.09
	17-Mar-11		10.63	6998.35
	17-Sep-10		11.88	6997.10
	28-Dec-09		11.11	6997.87
	30-Jul-09		11.21	6997.77
	20-May-09		11.57	6997.41
	15-Jan-09		11.60	6997.38

NOTES:

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

btoc = below top of casing

NA = original well casing extends approximately 4 ft above the ground, therefore water depth does not correlate to the other site monitoring wells.

Source: Data prior to 1-20-2021 from: NV5, 2019. *NMDOT La Cueva Patrol Yard Second Semi-Annual Groundwater Monitoring and Report* . June 18.

TABLE 3. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHLORIDE AND TOTAL DISSOLVED SOLIDS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date Sampled	Chloride (mg/L)	Total Dissolved Solids (mg/L)
MW-2	5-Oct-21	550	1,460
	30-Jun-21	470	1,610
	13-Apr-21	560	1,620
	20-Jan-21	300	796
	13-May-19	220	760
	14-Feb-19	410	1,190
	4-Nov-18	440	1,220
	7-Nov-17	650	1,710
	21-Nov-16	480	1,280
	31-May-16	780	2,170
	24-Nov-15	660	1,760
	14-Apr-15	550	1,460
	30-May-14	280	826
	21-Nov-13	320	1,070
	28-May-13	170	651
	31-Jan-13	230	706
	18-Sep-12	360	1,040
	12-Apr-12	320	925
	26-Oct-11	220	728
	17-Mar-11	310	861
	17-Sep-10	564	1,400
	28-Dec-09	310	817
	30-Jul-09	270	800
	21-May-09	230	710
	15-Jan-09	390	990
	9-Dec-08	330	940
	12-Oct-07	360	1,000
	29-Mar-07	370	1,000
	9-Dec-06	390	1,300
	13-Jun-06	260	830
	8-Mar-06	330	1,100
	13-Dec-05	390	1,200
	19-Jul-04	530	1,600
	14-Apr-04	540	1,300
	13-Jan-04	240	730
	21-Oct-03	280	750

TABLE 3. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHLORIDE AND TOTAL DISSOLVED SOLIDS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date Sampled	Chloride (mg/L)	Total Dissolved Solids (mg/L)
MW-2 (cont.)	17-Jul-03	290	870
	14-Jan-03	330	930
	22-Oct-02	320	960
MW-3D	5-Oct-21	20	333
	30-Jun-21	21	357
	13-Apr-21	33	374
	20-Jan-21	47	391
	13-May-19	160	614
	14-Feb-19	87	468
	4-Nov-18	460	1,140
	7-Nov-17	46	391
	21-Nov-16	77	446
	31-May-16	69	418
	24-Nov-15	NM	NM
	14-Apr-15	55	451
	30-May-14	31	376
	21-Nov-13	25	366
	28-May-13	26	371
	31-Jan-13	30	345
	18-Sep-12	29	390
	12-Apr-12	78	479
	26-Oct-11	38	382
	17-Mar-11	460	1,220
	17-Sep-10	58	398
	28-Dec-09	23	334
	30-Jul-09	13	304
	21-May-09	13	310
	15-Jan-09	11	310
	9-Dec-08	9.8	310
	12-Oct-07	13	300
	29-Mar-07	23	340
	13-Dec-05	20	360
	19-Jul-04	15	370
	14-Apr-04	11	310
	13-Jan-04	11	310
	21-Oct-03	14	300

TABLE 3. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHLORIDE AND TOTAL DISSOLVED SOLIDS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date Sampled	Chloride (mg/L)	Total Dissolved Solids (mg/L)
MW-3D (cont.)	17-Jul-03	15	300
	18-Apr-03	17	310
	14-Jan-03	10	320
MW-3S	5-Oct-21	29	840
	30-Jun-21	28	580
	13-Apr-21	55	1,050
	20-Jan-21	27	640
	13-May-19	310	1,020
	14-Feb-19	370	1,140
	4-Nov-18	250	890
	7-Nov-17	290	1,300
	21-Nov-16	510	1,470
	31-May-16	340	1,470
	24-Nov-15	510	1,250
	14-Apr-15	220	828
	30-May-14	59	570
	21-Nov-13	38	550
	28-May-13	60	670
	31-Jan-13	70	740
	18-Sep-12	75	620
	12-Apr-12	88	690
	26-Oct-11	85	800
	17-Mar-11	180	745
	17-Sep-10	190	845
	28-Dec-09	66	579
	30-Jul-09	120	614
	21-May-09	84	490
	15-Jan-09	66	520
	9-Dec-08	59	590
	12-Oct-07	170	860
	29-Mar-07	160	760
	13-Dec-05	170	670
	19-Jul-04	110	610
	14-Apr-04	34	440
	13-Jan-04	52	480
	21-Oct-03	63	580

TABLE 3. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHLORIDE AND TOTAL DISSOLVED SOLIDS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date Sampled	Chloride (mg/L)	Total Dissolved Solids (mg/L)
MW-3S (cont.)	17-Jul-03	110	590
	18-Apr-03	120	430
	14-Jan-03	210	760
	22-Oct-02	62	850
MW-5	5-Oct-21	180	704
	30-Jun-21	190	712
	13-Apr-21	140	640
	20-Jan-21	150	625
	13-May-19	98	541
	14-Feb-19	80	520
	7-Nov-17	85	514
	21-Nov-16	64	482
	31-May-16	70	480
	24-Nov-15	NM	NM
	14-Apr-15	60	482
	30-May-14	66	485
	21-Nov-13	180	715
	28-May-13	59	484
	31-Jan-13	140	618
	18-Sep-12	160	674
	12-Apr-12	77	538
	26-Oct-11	180	654
	17-Mar-11	130	564
	17-Sep-10	372	1,060
	28-Dec-09	220	667
	30-Jul-09	130	544
	21-May-09	62	460
	15-Jan-09	200	610
	9-Dec-08	350	960
	12-Oct-07	57	460
	29-Mar-07	130	550
	13-Jun-06	48	480
	13-Dec-05	110	570
	14-Apr-04	260	740
	13-Jan-04	270	780
	21-Oct-03	280	770

TABLE 3. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHLORIDE AND TOTAL DISSOLVED SOLIDS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date Sampled	Chloride (mg/L)	Total Dissolved Solids (mg/L)
MW-5 (cont.)	17-Jul-03	290	820
	18-Apr-03	370	860
	14-Jan-03	420	1,000
	22-Oct-02	390	1,000
MW-6D	5-Oct-21	130	524
	30-Jun-21	150	652
	13-Apr-21	120	760
	20-Jan-21	130	630
	13-May-19	120	495
	14-Feb-19	83	426
	4-Nov-18	190	632
	7-Nov-17	250	900
	21-Nov-16	220	670
	31-May-16	280	1,030
	24-Nov-15	220	705
	14-Apr-15	230	841
	30-May-14	220	761
	21-Nov-13	150	621
	28-May-13	190	753
	31-Jan-13	210	680
	18-Sep-12	64	399
	12-Apr-12	230	1,270
	26-Oct-11	140	597
	17-Mar-11	160	600
	17-Sep-10	217	850
	28-Dec-09	88	501
	30-Jul-09	110	538
	21-May-09	150	550
	15-Jan-09	130	550
	9-Dec-08	22	300
	12-Oct-07	33	270
	29-Mar-07	34	300
	13-Jun-06	200	740
	13-Dec-05	160	630
	19-Jul-04	18	320
	14-Apr-04	22	270

TABLE 3. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHLORIDE AND TOTAL DISSOLVED SOLIDS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date Sampled	Chloride (mg/L)	Total Dissolved Solids (mg/L)
MW-6D (cont.)	13-Jan-04	23	300
	21-Oct-03	25	300
	17-Jul-03	29	300
	18-Apr-03	37	300
	14-Jan-03	57	350
	22-Oct-02	200	790
MW-6S	5-Oct-21	580	1,730
	30-Jun-21	380	1,440
	13-Apr-21	400	1,510
	20-Jan-21	480	1,600
	13-May-19	540	1,670
	14-Feb-19	560	1,820
	4-Nov-18	350	1,160
	7-Nov-17	740	2,120
	21-Nov-16	850	2,100
	31-May-16	640	1,880
	24-Nov-15	790	1,920
	14-Apr-15	350	1,240
	30-May-14	550	1,560
	21-Nov-13	350	1,460
	28-May-13	240	1,140
	31-Jan-13	300	1,150
	18-Sep-12	1,000	3,060
	12-Apr-12	360	1,660
	26-Oct-11	650	1,910
	17-Mar-11	280	1,090
	17-Sep-10	1,210	3,310
	28-Dec-09	350	1,340
	30-Jul-09	970	2,360
	21-May-09	290	880
	15-Jan-09	480	1,400
	9-Dec-08	590	2,000
	12-Oct-07	800	2,100
	29-Mar-07	540	1,600
	13-Jun-06	500	1,500
	13-Dec-05	510	1,500

TABLE 3. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHLORIDE AND TOTAL DISSOLVED SOLIDS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date Sampled	Chloride (mg/L)	Total Dissolved Solids (mg/L)
MW-6S (cont.)	19-Jul-04	12	630
	14-Apr-04	50	620
	13-Jan-04	340	1,100
	21-Oct-03	190	850
	17-Jul-03	60	680
	18-Apr-03	790	2,000
	14-Jan-03	600	1,600
Romero/Weathers Well	5-Oct-21	1,200	2,570
	30-Jun-21	1,100	3,520
	13-Apr-21	1,000	2,380
	21-Jan-21	1,000	1,250
	30-May-19	1,100	2,650
	14-Feb-19	1,100	2,610
	4-Nov-18	680	1,770
	7-Nov-17	1,200	2,380
	21-Nov-16	1,100	2,240
	31-May-16	990	2,340
	24-Nov-15	970	2,000
	14-Apr-15	850	1,960
	30-May-14	690	1,710
	21-Nov-13	750	1,880
	28-May-13	530	1,490
	31-Jan-13	640	1,660
	18-Sep-12	740	1,730
	12-Apr-12	630	1,540
	26-Oct-11	700	1,680
	17-Mar-11	780	1,500
	17-Sep-10	686	1,590
	28-Dec-09	700	1,620
	30-Jul-09	700	1,490
	21-May-09	700	1,400
	15-Jan-09	730	1,500
	9-Dec-08	740	1,400
	12-Oct-07	670	1,500
	29-Mar-07	680	1,600
	13-Jun-06	660	1,500
	3-Aug-06	620	1,500

TABLE 3. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
CHLORIDE AND TOTAL DISSOLVED SOLIDS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date Sampled	Chloride (mg/L)	Total Dissolved Solids (mg/L)
Romero/Weathers Well (cont.)	13-Dec-05	670	1,400
	13-Jan-04	570	1,300
	18-Apr-03	820	1,900
Estrada Well	5-Oct-21	18	327
	30-Jun-21	17	353
	13-Apr-21	21	357
	21-Jan-21	19	330
Garcia Well	30-May-19	Well Permanently Disconnected	
	13-May-19	NM	NM
	14-Feb-19	1,300	3,040
	4-Nov-18	890	1,980
	7-Nov-17	1,200	2,390
	21-Nov-16	1,200	2,250
	31-May-16	960	2,360
	24-Nov-15	NM	NM
	14-Apr-15	39	413
	30-May-14	30	407
	21-Nov-13	NM	NM
	28-May-13	31	410
	31-Jan-13	20	331
	18-Sep-12	31	380
	12-Apr-12	23	375
	26-Oct-11	20	333
	17-Mar-11	40	357
	17-Sep-10	115	531
	28-Dec-09	9	304
	30-Jul-09	12	305
	21-May-09	17	320
	15-Jan-09	13	310
NMWQCC Standards		**250**	**1,000**

Notes:
Highlight indicates concentration exceeds NMWQCC standard.
mg/L = Milligrams per liter
NM = Not measured
NMWQCC = New Mexico Water Quality Control Commission
Source: Data prior to 1-20-2021 from: NV5, 2019. NMDOT La Cueva Patrol Yard Second Semi-Annual Groundwater Monitoring and Report. June 18.

TABLE 4. SUMMARY OF ADDITIONAL HISTORICAL GROUNDWATER ANALYTICAL RESULTS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Well ID	Date	BOD (mg/L)	COD (mg/L)	Bromide (mg/L)	Fluoride (mg/L)	Conductivity (µmhos/c)	Bicarbonate (mg/L)	Carbonate (mg/L)	Total Alkalinity (mg/L)	Total Suspended Solids (mg/L)	Total Organic Carbon (mg/L)	Nitrate As N (mg/L)	Nitrite As N (mg/L)	TKN (mg/L)	Orthophosphate Phosphorous (mg/L)	Sulfate (mg/L)	Total Coliform (P/A)	E Coli (mpn), or (P/A)	Aluminum (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)
MW-2	14-Feb-19	NM	NM	<0.10	0.12	NM	NM	NM	299.7	NM	NM	1.8 J	<2.0	<1.0	<0.50	90	P	A	NM	200	NM	43	NM	3.2	130
MW-3D	14-Feb-19	NM	NM	0.045 J	0	NM	NM	NM	227.4	NM	NM	<0.10	<0.10	<1.0	<0.50	54	P	A	NM	100	NM	22	NM	1.8	28
MW-3S	14-Feb-19	NM	NM	0.061 J	0.17	NM	NM	NM	320.5	NM	NM	<0.10	0.099 J	<1.0	<0.50	81	10	<10	NM	160	NM	28	NM	3.9	160
MW-5	14-Feb-19	NM	NM	0.051 J	0.31	NM	NM	NM	265.9	NM	NM	0.73	<0.10	<1.0	0.15 J	60.0	P	A	NM	110.0	NM	21.00	NM	1.9	46.00
MW-6D	14-Feb-19	NM	NM	0.069 J	0.21	NM	NM	NM	176.4	NM	NM	0.5	<0.10	<1.0	<0.50	51.0	P	A	NM	80.0	NM	27.0	NM	2.5	29.0
MW-6S	14-Feb-19	NM	NM	0.088 J	0.069 J	NM	NM	NM	395.2	NM	NM	<2.0	<2.0	<1.0	<0.50	170.0	10.0	<10	NM	260.0	NM	63.0	NM	5.6	230.0
Romero/Weathers Well	21-Jan-21	<2.0	33.9	0.22	<0.10	3,700	199.7	<2.000	199.7	<4.0	<1.0	2.6	<2.0	NM	<0.50	66	NM	NM	<0.020	350	<0.020	96	<0.0020	3.8	220
	14-Feb-19	NM	NM	<2.0	<0.10	NM	NM	NM	231	NM	NM	3.2	<2.0	<1.0	<0.50	68.0	NM	NM	NM	400.0	NM	98.0	NM	3.9	240.0
Estrada Well	21-Jan-21	<2.0	<20.0	<1.0	0.46	560	195.3	20.88	216.2	<4.0	<1.0	<0.10	<0.10	NM	<0.50	56	NM	NM	<0.020	69	0.13	14	0.013	1.1	27
Garcia Well	14-Feb-19	NM	NM	<2.0	<0.10	NM	NM	NM	284.8	NM	NM	4.2	<2.0	<1.0	<0.50	61	NM	NM	NM	460	NM	86	NM	4.5	390
NMWQCC Standards (mg/L)		--	--	--	**1.6**	--	--	--	--	--	--	**10**	**1.0**	--	--	**600**	--	--	--	--	**1.0**	--	**0.2**	--	--

Notes:
Bold indicates concentration in exceedance of standard.
J = Estimated concentration
mg/L = Milligrams per liter
N = Nitrogen
TKN = Total Kjeldahl Nitrogen
mpn = Most probable number
P/A = Present/absent
NM = Not measured
NMWQCC = New Mexico Water Quality Control Commission
Source: Data prior to 1-20-2021 from: NV5, 2019. *NMDOT La Cueva Patrol Yard Second Semi-Annual Groundwater Monitoring and Report* . June 18.

TABLE 5 SUMMARY OF SOIL ANLYTICAL RESULTS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Sample Location	Sample Interval (feet bgs)	Date	Chloride (mg/Kg)	Sample Location	Sample Interval (feet bgs)	Date	Chloride (mg/Kg)	Sample Location	Sample Interval (feet bgs)	Date	Chloride (mg/Kg)
A-1	1 - 2	1/21/2021	<59	A-2	1 - 2	1/21/2021	<60	A-3	1 - 2	1/21/2021	170
	5 - 6	1/21/2021	<60		5 - 6	1/21/2021	<60		5 - 6	1/21/2021	470
	9 - 10	1/21/2021	73		Not Sampled Deeper - Refusal				9 - 10	1/21/2021	180
	11 - 12	1/21/2021	<60						Encountered Groundwater		
	Not Sampled Deeper - Refusal										
B-1	1 - 2	1/21/2021	110	B-2	1 - 2	1/21/2021	<60	B-3	1 - 2	1/21/2021	140
	3 - 4	1/21/2021	270		5 - 6	1/21/2021	340		5 - 6	1/21/2021	<60
	Not Sampled Deeper - Refusal				9 - 10	1/21/2021	970		Not Sampled Deeper - Refusal		
					13 - 14	1/21/2021	1,200				
					17 - 18	1/21/2021	1,100				
					Not Sampled Deeper - Refusal						

Notes:
bgs = Below ground surface
mg/Kg = Milligrams per Kilogram
Chloride by EPA Method 300.0

TABLE 6. SAMPLE ANALYTICAL AND QUALITY CONTROL REQUIREMENTS
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Target Analytes	Matrix	Analytical Method	Sample Container	Preservative	Holding Time
Chloride	Soil	EPA 300.0	1 x 8 oz Glass Jar	Cool to <6°C	28 days
Chloride	Water	EPA 300.0	1 x 250-mL Polyethylene	Cool to <6°C	28 days
Total Dissolved Solids	Water	EPA 2540 C Modified	1 x 250-mL Polyethylene	Cool to <6°C	7 days
Biochemical Oxygen Demand	Water	SM 5210 B	1 x 2-L Polyethylene	Cool to <6°C	48 hours
Chemical Oxygen Demand	Water	410 Modified	1 x 250-mL Polyethylene	H_2SO_4; Cool to <6°C	28 days
Total Organic Carbon	Water	SM 5310 B	2 x 40-mL Glass Vials	H_2SO_4; Cool to <6°C	14 days
Total Suspended Solids	Water	EPA 2540 D Modified	1 x 250-mL Polyethylene	Cool to < 6°C	7 days
Cation/Anion Balance	Water	EPA 6010, 300.0, 120.1, SM 2320 B, 2540 C	1 x 125-mL Polyethylene Field Filtered; 1 x 500-mL Polyethylene; 1 x 125-mL Polyethylene	HNO_3; Unpreserved; H_2SO_4; Cool to < 6°C	48 hours, 28 days, 90 days
Total Iron, Manganese, and Aluminum	Water	EPA 6010	1 x 500 mL Polyethylene	HNO3; Cool to < 6°C	28 days

NOTES:
Cation/Anion Balance = Ca, Mg, Na, K, Alk, F, Cl, Br, PO_4, NO_3, NO_2, SO_4, eC, TDS
EPA = U.S. Environmental Protection Agency
mL = Milliliter
°C = Degrees Celcius
< = Less than

TABLE 7. PROPOSED GROUNDWATER SAMPLING REGIMEN
LA CUEVA PATROL YARD, MORA COUNTY, NEW MEXICO

Sampling Point	Frequency	Sample Type and Method	Gauge Well	Geochemical Parameters	Chloride	TDS
MW-2	Semi-Annually	Well, Hand Bailing	X	X	X	X
MW-3S	Semi-Annually	Well, Hand Bailing	X	X	X	X
MW-3D	Semi-Annually	Well, Hand Bailing	X	X	X	X
MW-5	Semi-Annually	Well, Hand Bailing	X	X	X	X
MW-6S	Semi-Annually	Well, Hand Bailing	X	X	X	X
MW-6D	Semi-Annually	Well, Hand Bailing	X	X	X	X
Romero/Weathers Well	Quarterly	Tap		X	X	X
System Effluent	Bi-weekly for the first month Monthly for the first six months Quarterly Thereafter	RO Effluent Port		X	X	X

NOTES:
Geochemical Parameters to include pH, TDS, temperature, and specific conductance
System Effluent frequency is referenced to the RO system commissioning
Chloride to be analyzed by EPA Method 300.0
TDS = Total dissolved solids to be analyzed by SM 2540C Mod

FIGURES

LEGEND:

MW-1	MONITORING WELL
MW-4	ABANDONED MONITORING WELL
GARCIA WELL	WATER SUPPLY WELL
	APPROXIMATE PROPERTY BOUNDARY AS OF 9/10/15
	SURFACE RUNOFF REROUTE
	CULVERT
XXXX	ESTIMATED AREA OF LEACHING THROUGH THE ARROYO

N

150 75 0 150

SCALE IN FEET

NEW MEXICO DOT
LA CUEVA PATROL YARD
MORA COUNTY, NEW MEXICO

FIGURE 1
SITE MAP

PROJECT #:	1597003	PROJECT PHASE:	01	PROJECT MANAGER:	DW

320 Gold Avenue, SW Suite 1300
Albuquerque, NM 87102
Phone: (505) 224-9013
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC

LEGEND:

MW-1	MONITORING WELL
MW-4	ABANDONED MONITORING WELL
GARCIA WELL	WATER SUPPLY WELL
	APPROXIMATE PROPERTY BOUNDARY AS OF 9/10/15
A-1	SOIL SAMPLE LOCATIONS

N

70 35 0 70

SCALE IN FEET

SAMPLE LOCATION	SAMPLE INTERVAL (FEET BGS)	DATE	CHLORIDE (mg/Kg)
A-1	1-2	1/21/2021	<59
	5-6	1/21/2021	<60
	9-10	1/21/2021	73
	11-12	1/21/2021	<60
	NOT SAMPLED DEEPER - REFUSAL		
B-1	1-2	1/21/2021	110
	3-4	1/21/2021	270
	NOT SAMPLED DEEPER - REFUSAL		

SAMPLE LOCATION	SAMPLE INTERVAL (FEET BGS)	DATE	CHLORIDE (mg/Kg)
A-2	1-2	1/21/2021	<60
	5-6	1/21/2021	<60
	NOT SAMPLED DEEPER - REFUSAL		
B-2	1-2	1/21/2021	<60
	5-6	1/21/2021	340
	9-10	1/21/2021	970
	13-14	1/21/2021	1200
	17-18	1/21/2021	1100
	NOT SAMPLED DEEPER - REFUSAL		

SAMPLE LOCATION	SAMPLE INTERVAL (FEET BGS)	DATE	CHLORIDE (mg/Kg)
A-3	1-2	1/21/2021	170
	5-6	1/21/2021	470
	9-10	1/21/2021	180
	ENCOUNTERED GROUNDWATER		
B-3	1-2	1/21/2021	140
	5-6	1/21/2021	<60
	NOT SAMPLED DEEPER - REFUSAL		

NOTES:
CHLORIDE BY EPA METHOD 300.0
mg/Kg = MILLIGRAMS PER KILOGRAM
BGS = BELOW GROUND SURFACE

NEW MEXICO DOT
LA CUEVA PATROL YARD
MORA COUNTY, NEW MEXICO

FIGURE 2
SOIL CONCENTRATIONS MAP
JANUARY 2021

PROJECT #:	1597003	PROJECT PHASE:	01	PROJECT MANAGER:	DW

320 Gold Avenue, SW Suite 1300
Albuquerque, NM 87102
Phone: (505) 224-9013
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC

LEGEND:

MW-1	MONITORING WELL
MW-4	ABANDONED MONITORING WELL
GARCIA WELL	WATER SUPPLY WELL
	APPROXIMATE PROPERTY BOUNDARY AS OF 9/10/15

NOTES:

1. ALL CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (Ug/L).
2. **BOLD** INDICATES CONCENTRATION ABOVE THE NEW MEXICO WATER QUALITY CONTROL COMMISSION (NMWQCC) STANDARD.

70 35 0 70

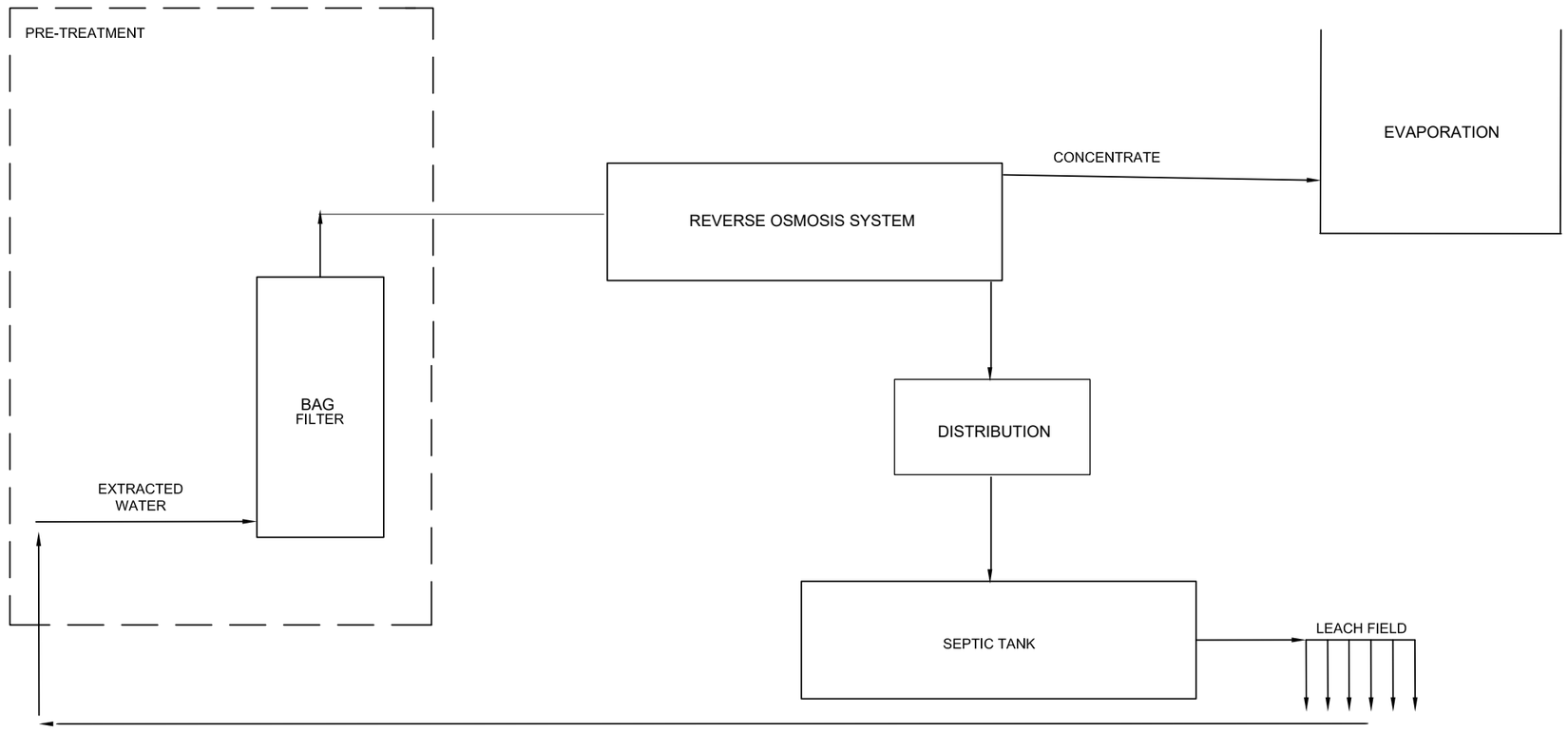
SCALE IN FEET

NEW MEXICO DOT
LA CUEVA PATROL YARD
MORA COUNTY, NEW MEXICO

FIGURE 3
CHLORIDE AND TDS CONCENTRATIONS
OCTOBER 2021

PROJECT #:	1597003	PROJECT PHASE:	01	PROJECT MANAGER:	DW

320 Gold Avenue, SW Suite 1300
Albuquerque, NM 87102
Phone: (505) 224-9013
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC., PBC



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SCALE IN FEET

NMDOT LA CUEVA PATROL YARD
MORA COUNTY, NEW MEXICO

REVERSE OSMOSIS PROCESS FLOW DIAGRAM

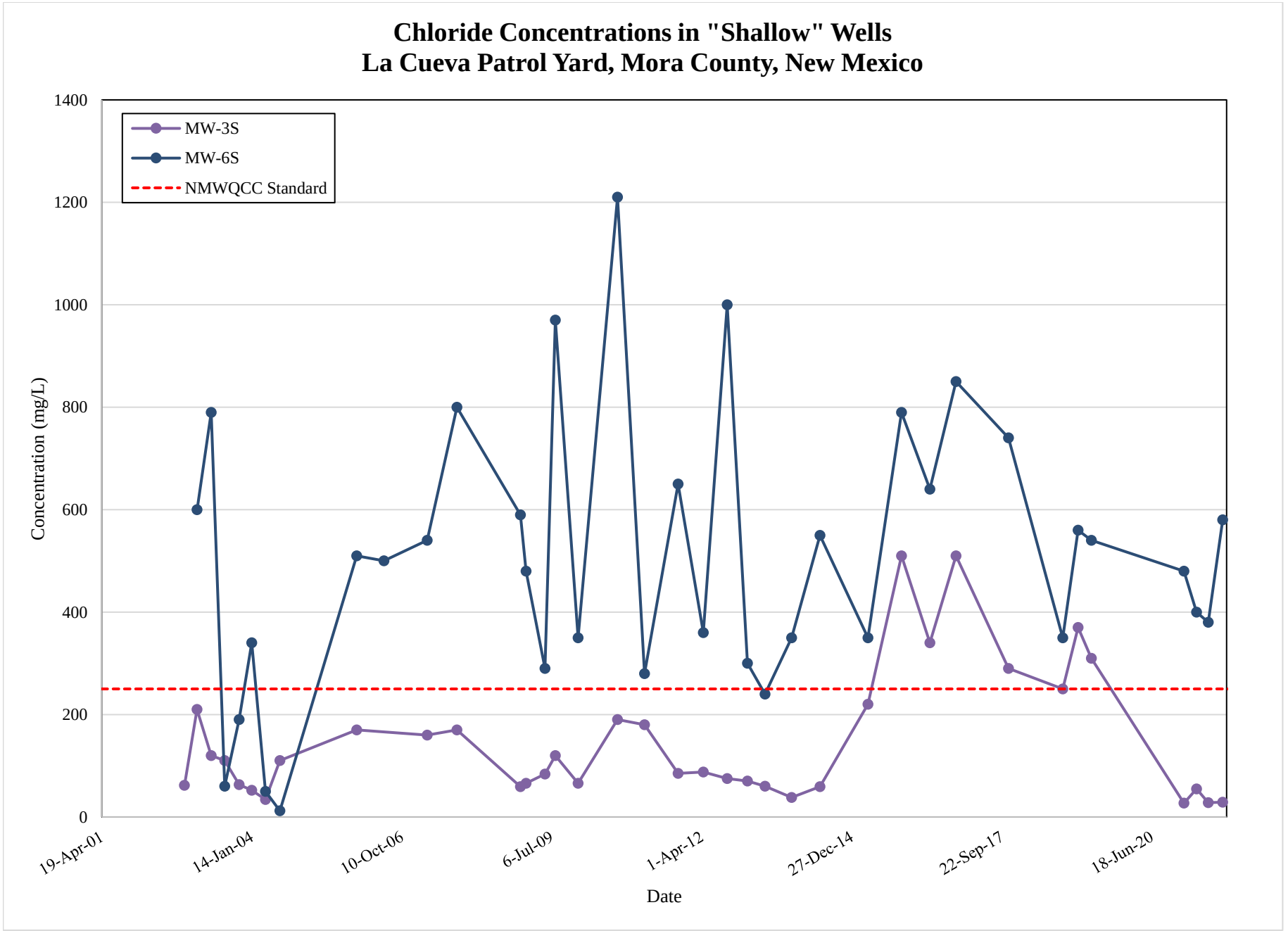
PROJECT #:	1597003	PROJECT PHASE:	01	PROJECT MANAGER:	DW

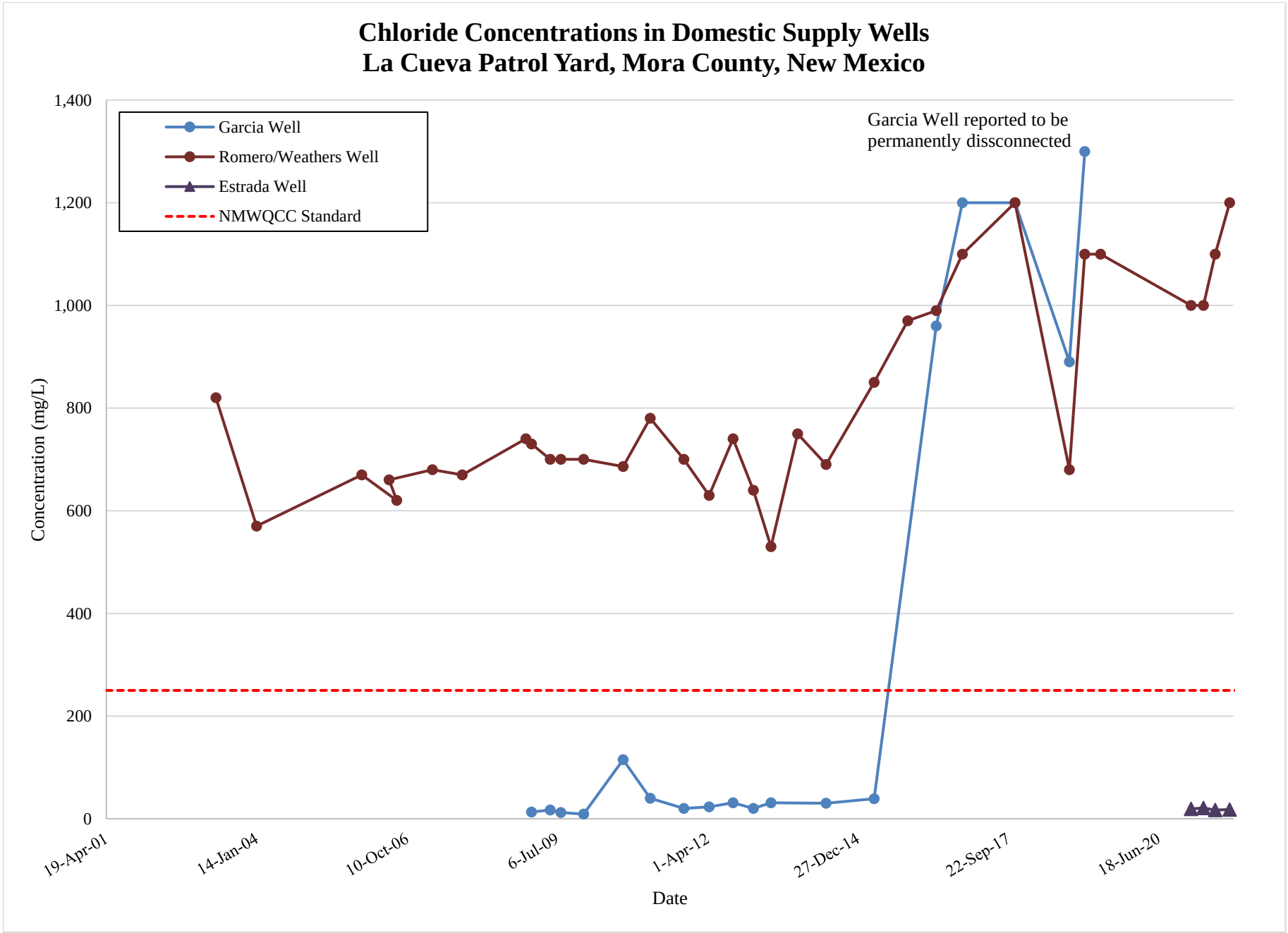
EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.
320 Gold Avenue, SW Suite 1210
Albuquerque, NM 87102
Phone: (505) 224-9013
Fax:(505) 224-9016

C:\Users\vmustafin\Desktop\Corona\NMDOT\La Cueva NMDOT Yard

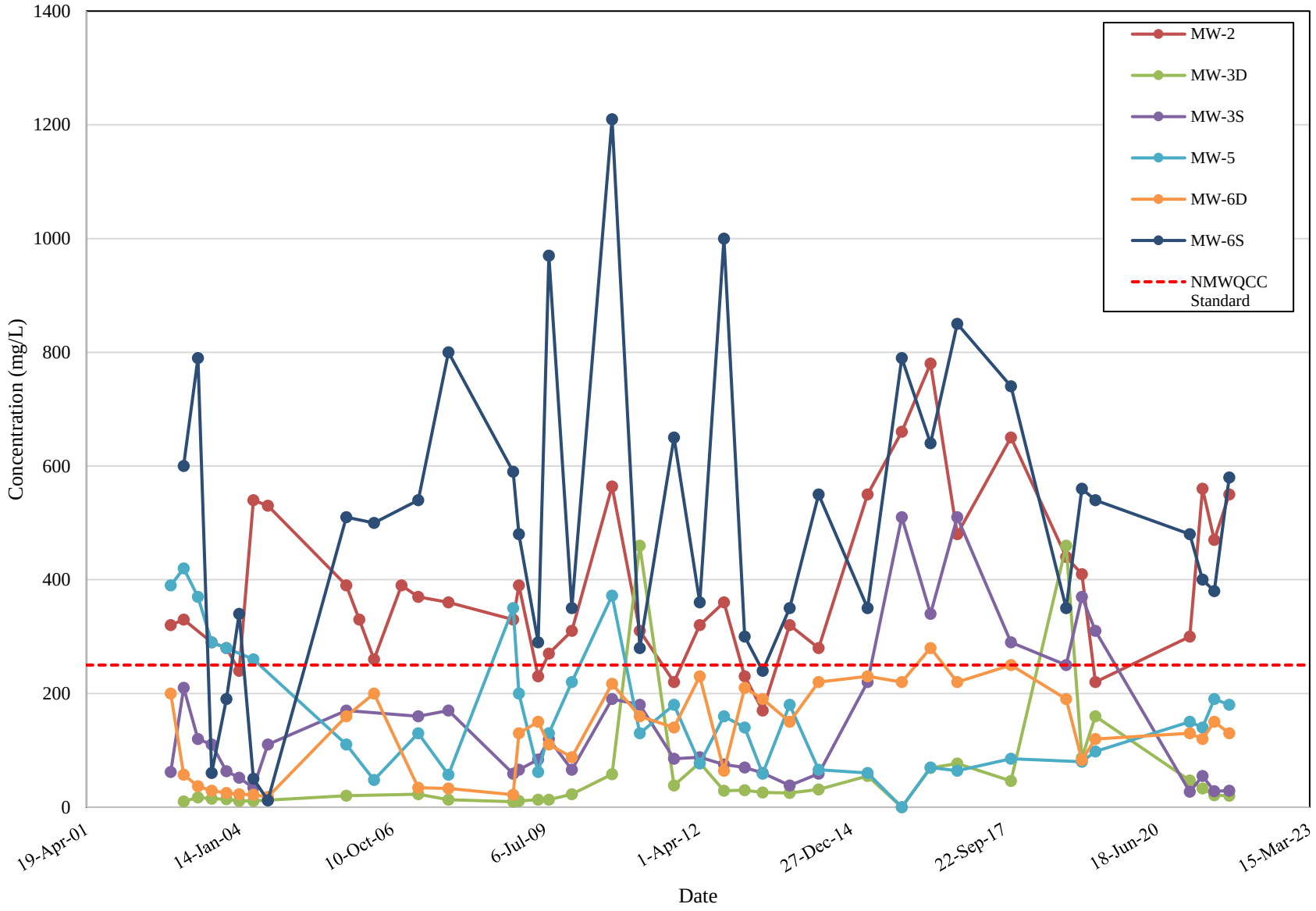
APPENDIX A

CHLORIDE AND TDS TREND GRAPHS

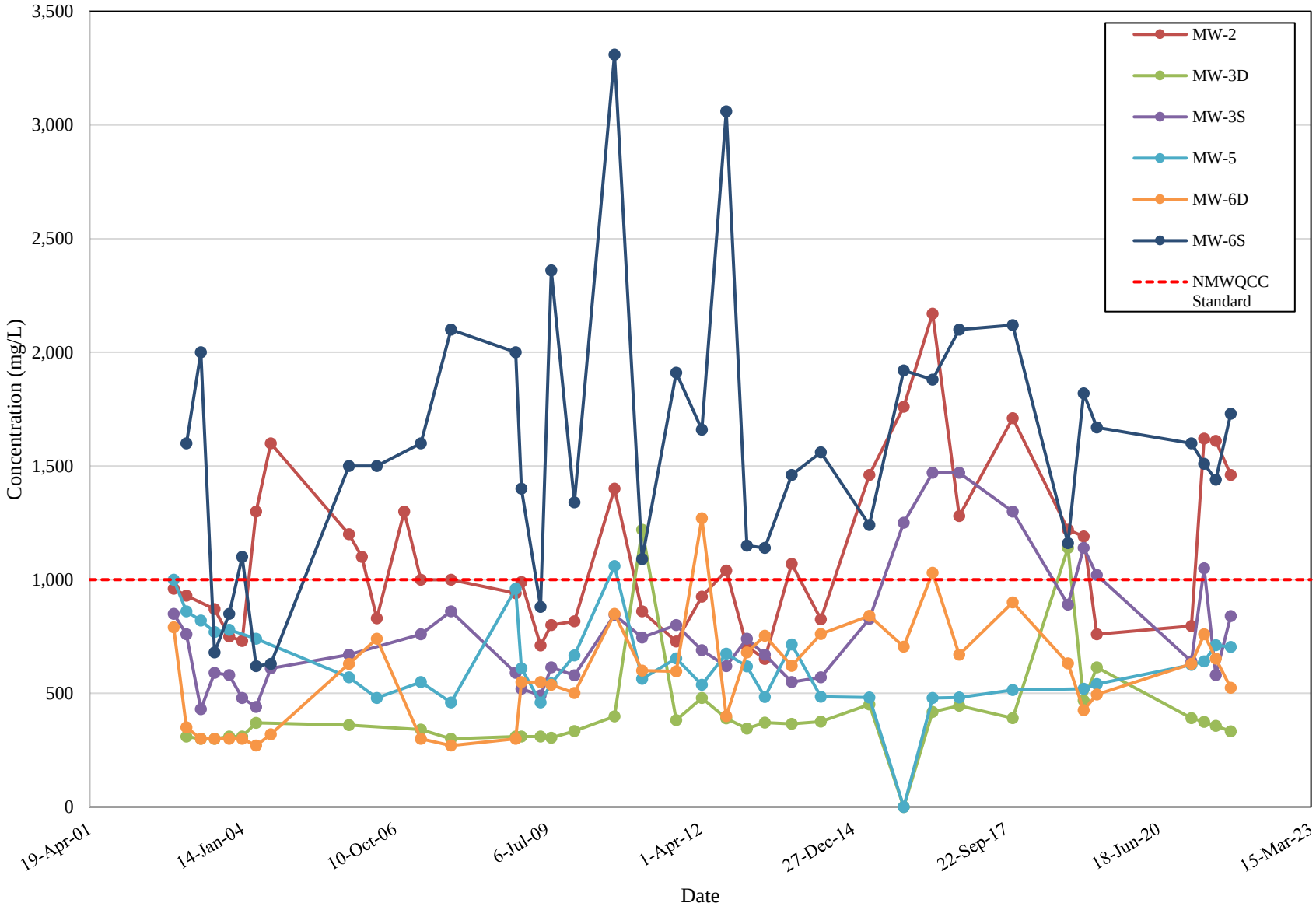

Chloride Concentrations in "Shallow" Wells
La Cueva Patrol Yard, Mora County, New Mexico
MW-3S
MW-6S
NMWQCC Standard
Concentration (mg/L)
1400
1200
1000
800
600
400
200
0
19-Apr-01
14-Jan-04
10-Oct-06
6-Jul-09
1-Apr-12
27-Dec-14
22-Sep-17
18-Jun-20
Date

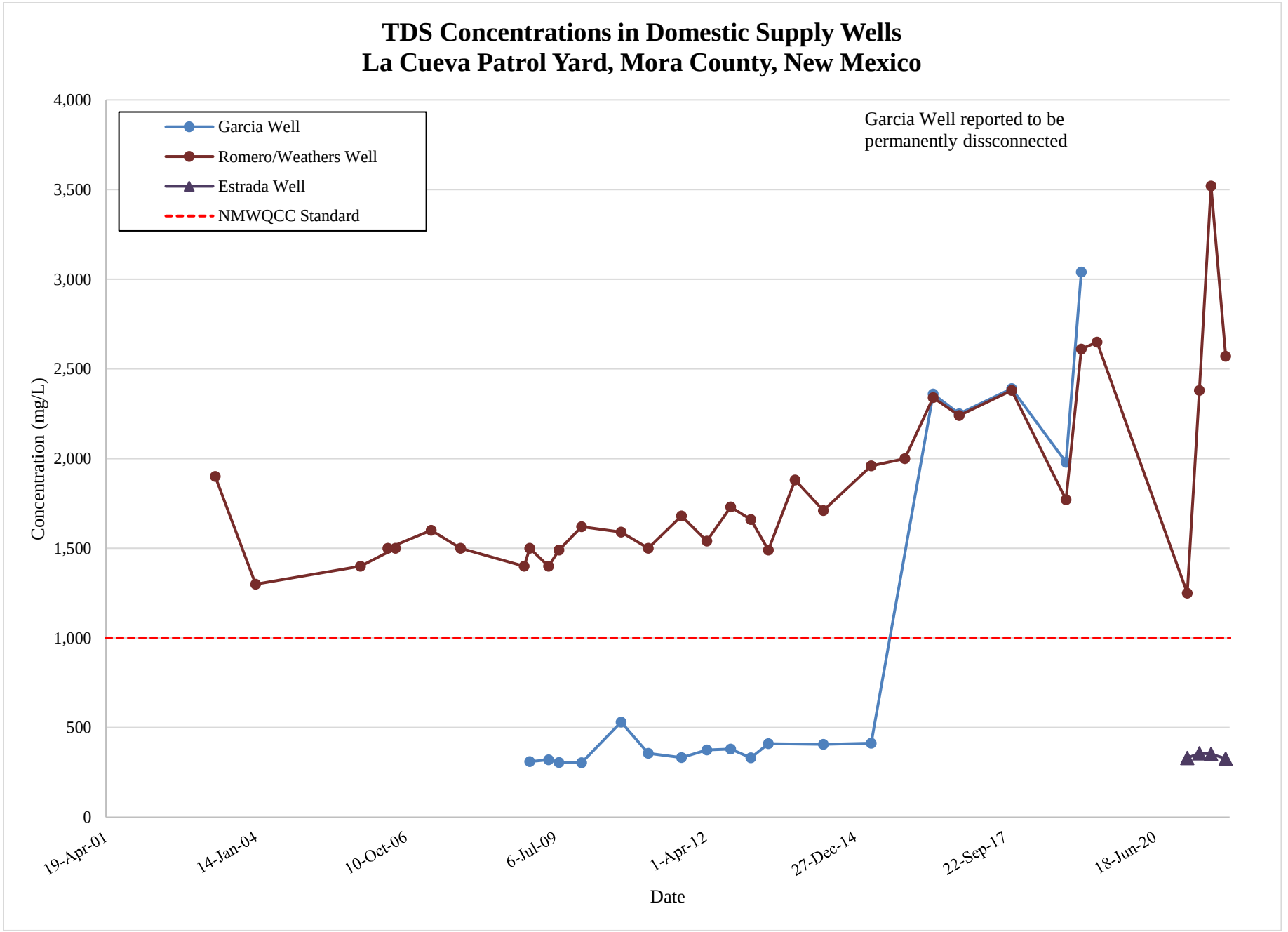

Chloride Concentrations in Domestic Supply Wells
La Cueva Patrol Yard, Mora County, New Mexico
Garcia Well
Romero/Weathers Well
Estrada Well
NMWQCC Standard
Garcia Well reported to be
permanently dissconnected
Concentration (mg/L)
1,400
1,200
1,000
800
600
400
200
0
19-Apr-01
14-Jan-04
10-Oct-06
6-Jul-09
1-Apr-12
27-Dec-14
22-Sep-17
18-Jun-20
Date

Chloride Concentrations in Monitoring Wells
La Cueva Patrol Yard, Mora County, New Mexico



TDS Concentrations in Monitoring Wells
La Cueva Patrol Yard, Mora County, New Mexico




TDS Concentrations in Domestic Supply Wells
La Cueva Patrol Yard, Mora County, New Mexico
Garcia Well
Romero/Weathers Well
Estrada Well
NMWQCC Standard
Garcia Well reported to be
permanently dissconnected
Concentration (mg/L)
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
19-Apr-01
14-Jan-04
10-Oct-06
6-Jul-09
1-Apr-12
27-Dec-14
22-Sep-17
18-Jun-20
Date