U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT



Welcome to the Public Scoping Meeting for the Chromium Interim Measures and Final Remedy Environmental Assessment

Public Scoping Meetings
May 8-9, 2023

EM-LA
ENVIRONMENTAL MANAGEMENT
SAFETY ❖ PERFORMANCE ❖ CLEANUP ❖ CLOSURE

EM-LA thanks you for your participation.
The presentation will begin momentarily.

Today's Agenda

NEPA Process

- ❑ National Environmental Policy Act (NEPA)
- ❑ Purpose of Public Scoping Meetings
- ❑ Public Scoping Comment Procedures
- ❑ Timeline for Comment Submission
- ❑ How to Submit a Substantive Comment

Project Background

- ❑ Purpose and Need for Agency Action
- ❑ Potential Alternatives
- ❑ Draft Environmental Assessment (EA)

National Environmental Policy Act (NEPA)

NEPA is a Federal law that requires agencies to identify and consider the environmental consequences of implementing proposals

The analysis of environmental consequences presented in an EA accomplishes the following objectives:

- Identifies and describes the affected environment
- Provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI)
- Evaluates the potential environmental consequences of reasonable alternatives

The EA process concludes with a FONSI or decision to proceed with EIS

Public Scoping Meetings

The Purpose of Public Scoping Meetings

Provide the public with information regarding the Chromium Interim Measures (IM) and Final Remedy, and how EM-LA will evaluate proposed alternatives in the EA

- Describe the NEPA process and objectives of the EA
- Provide an overview of public scoping comment procedures
- Receive public input on other options or alternatives and other resources to be considered for the EA

Public scoping is not required for an EA. EM-LA is conducting scoping meetings as part of its stakeholder engagement priority and because there is significant interest in the hexavalent chromium plume.

Public Scoping Comments

Public Scoping is the first stage in the EA Process

The Public Scoping Phase provides EM-LA with the opportunity to identify issues of interest and concern to frame the environmental analysis, and to more effectively shape the alternatives to be considered

EM-LA is seeking feedback from stakeholders, including local, state, and federal agencies; local and state elected officials, pueblos, non-governmental organizations, and the public on the development of the EA

Public scoping comments will be part of the official NEPA record and a summary will be included in the Draft EA.

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Timeline and Procedures for Comment Submission

30-day Public Comment Period Starts
May 8, 2023

↓

Public Scoping Meetings
May 8-9, 2023

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30-day Public Comment Period Ends
June 6, 2023

↓

Draft EA Available
Anticipated for July 2023

↓

DOE Announces Findings
December 2023

Provide comments TODAY by:

- Recording a verbal comment with the stenographer
- Submitting a written comment form to the EM-LA representatives

Submit comments LATER by:

- Submitting comments via email, with "Chromium EA Scoping Comment" in the subject line:

  emla-nepa@em.doe.gov

- Or submitting comments by U.S. Mail:

  ATTN: NEPA Document Manager
  U.S. DOE Environmental Management
  Los Alamos Field Office
  1200 Trinity Drive, Suite 400
  Los Alamos, NM 87544

Comments should be postmarked by June 6, 2023, for consideration in the Draft EA

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Comments

NEPA requires a rigorous process to be followed prior to making a final decision, including consideration of comments

- Substantive comments identify potential alternatives, information, and analyses relevant to the NEPA evaluation
- All substantive comments received, whether spoken, written, or electronic, will be given equal consideration

To receive a notice of availability of the Draft EA, please sign up for the notification list by entering your contact information on the meeting sign-in form or sending an email to **emla-nepa@em.doe.gov**

Purpose and Need

- In accordance with applicable Federal and state regulations, and the 2016 Compliance Order on Consent (Consent Order) between DOE and the New Mexico Environment Department (NMED), EM-LA needs to assess, identify, clean-up, and otherwise address environmental contamination at LANL

- The purpose of the proposed action is to remediate hexavalent chromium contaminated groundwater below Sandia and Mortandad canyons
- EM-LA needs to evaluate both the Interim Measures and a final remedy

- The primary objective of the IM is to control downgradient migration of the hexavalent chromium plume, with the benefit of removing some chromium mass from the regional aquifer
- EM-LA now needs to evaluate alternatives for groundwater remediation to achieve compliance with the New Mexico chromium groundwater standard

Potential Alternatives

No Action Alternative
Continue Interim Measures and Plume Characterization

- This alternative is a continuation of the preferred alternative in the *Environmental Assessment for Chromium Plume Control Interim Measure and Plume-Center Characterization, Los Alamos National Laboratory, Los Alamos, New Mexico* (DOE/EA-2005, December 2015) and Finding of No Significant Impact (FONSI, December 2015)
- The 2015 Assessment prioritized the Chromium Plume Interim Measures and Plume Characterization

- Under the No Action Alternative, EM-LA would control plume migration and maintain hexavalent chromium contamination levels within the LANL boundary while long-term corrective action remedies continue to be evaluated and implemented
- EM-LA would continue to further characterize the plume to evaluate the effectiveness and feasibility of implementing a final remedy

Potential Alternatives

Proposed Action
Adaptive Site Management

- Under this alternative, EM-LA would use Adaptive Site Management (ASM) to select and implement remedies to remediate the hexavalent chromium plume
- The goal of ASM is to create a framework of structured and continuous planning, implementation, and monitoring that accommodates new information and changing site conditions to develop effective and efficient cleanup strategies

- In accordance with the 2016 Consent Order, the final remedy will be selected by NMED after EM-LA submits a Corrective Measures Evaluation (CME) Report to NMED
- The CME Report will identify and evaluate potential corrective measures for removal, containment, and/or treatment of the hexavalent chromium plume
- In the CME Report, DOE will also recommend a preferred alternative for remediation
- NMED will then issue a Statement of Basis, engage in a public comment period, and select a remedy

Poster Session and Comment Submittal

Public scoping, history of the plume, potential alternatives, and other information on the NEPA EA process is provided in the following posters

EM-LA, N3B, and Leidos Introductions

EM-LA Representatives	Contractor Representatives
Lee Bishop, Director, Office of Quality and Regulatory Compliance	Shawn Stone, N3B Environmental Programs and Services Director
Jesse Kahler, NEPA Compliance Officer	Sean Dolan, N3B Cultural Resources Specialist
Hai Shen, NEPA Document Manager	Clark Short, N3B Water Project Manager
Cheryl Rodriguez, Program Manager, Soil and Water Remediation, Office of Cleanup Execution	Mike Erikson, N3B Director, Water Oversight Program
Tom McCrory, Senior Geologist, Office of Cleanup Execution	Troy Thomson, N3B Program Manager, Environmental Remediation
	Jenifer Nordstrom, Leidos, NEPA Support Program Manager

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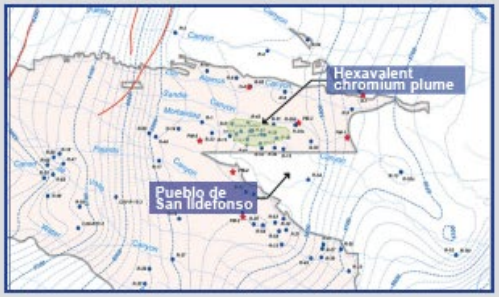
Historical Context of the Hexavalent Chromium (Cr) Plume

Origin of the Hexavalent Cr Plume

- The source of the hexavalent Cr plume was a non-nuclear power plant at Los Alamos National Laboratory (LANL) that periodically flushed water containing potassium dichromate from the plant's cooling towers into Sandia Canyon from 1956-1972.
- Up to 160,000 lbs of hexavalent Cr was released during this period, but most of it did not migrate into the regional aquifer.
- Current measurements estimate the hexavalent Cr plume is ~1 mile long x ½ mile wide.



Movement of the Hexavalent Cr Plume

- Water containing hexavalent Cr traveled down Sandia Canyon.

- Unsaturated zones in tilted rock formations beneath the canyon allowed hexavalent Cr to infiltrate into the regional aquifer underlying Mortandad Canyon.

First Samples

- Monitoring Well R-28 was installed in Mortandad Canyon in 2004 to investigate the regional aquifer beneath LANL.
- The first groundwater samples from R-28 contained hexavalent Cr concentrations ~8x the New Mexico drinking water standard.
- EM-LA prepared the Environmental Assessment for Chromium Plume Control Interim Measure and Plume-Center Characterization (DOE/EA-2005) to analyze environmental impacts of actions to limit downgradient migration of the plume edge in the regional aquifer.

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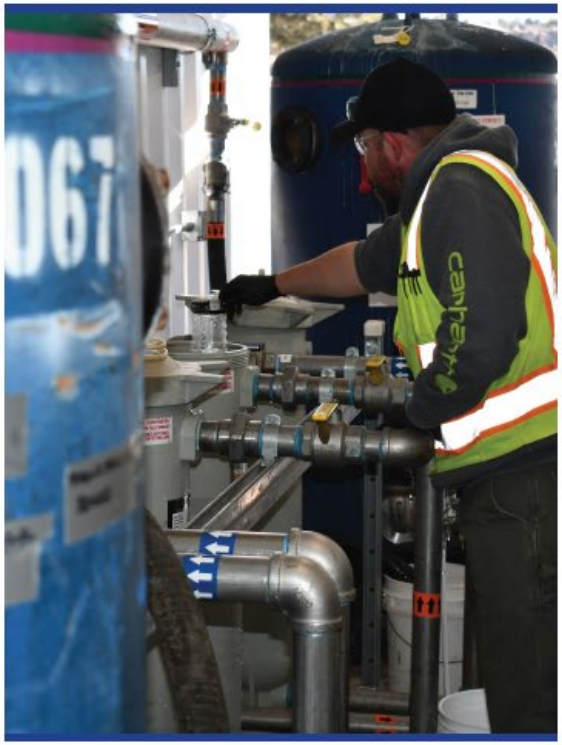
The Interim Measures (IM) for Hexavalent Chromium Plume Control

Primary Goal of the IM

- The goal of the IM is to control migration of the hexavalent chromium (Cr) groundwater plume while long-term corrective action remedies are evaluated.
- Plume control is achieved through extraction and treatment of contaminated groundwater ("pump and treat") and injection of treated (clean) groundwater along the downgradient plume edge.
- The IM includes extraction and injection wells and associated equipment necessary to prevent migration of the hexavalent Cr plume beyond the LANL boundary.



Key Highlights Associated with IM Design

- Installed Sentinel Wells R-35a and R-35b in 2006 as an early warning signal for hexavalent Cr approaching Los Alamos County supply well PM-3.
- Prior to the IM, 10 regional monitoring wells, 2 perched-intermediate wells, and 6 core holes/ piezometers were installed to define the nature and extent of the plume.
- Hydraulic control successfully moved the southern extent of the hexavalent Cr plume ~500 feet away from the Pueblo de San Ildefonso.

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Potential Alternatives

No Action Alternative – "Continue Interim Measures and Plume Characterization"

- Under the No Action Alternative, EM-LA would continue to control plume migration and maintain hexavalent chromium contamination levels within the LANL boundary while long-term corrective action remedies continue to be evaluated and implemented.
- EM-LA would continue to further characterize the plume to evaluate the effectiveness and feasibility of implementing a final remedy.

Alternative 1 – "Adaptive Site Management"

- EM-LA would use adaptive site management to select and implement remedies to remediate the hexavalent chromium plume.
- This approach would create a framework of structured and continuous planning, implementation, and monitoring that accommodates new information, changing site conditions, and public participation.
- EM-LA is considering the following options, or a combination of these options:
  - **Option 1:** Expanded Pump and Treat with Expanded Injection
  - **Option 2:** Expanded Pump and Treat with Land Application
  - **Option 3:** Expanded Pump and Treat with Injection and/or Land Application and In-situ Treatment
  - **Option 4:** Monitored Natural Attenuation

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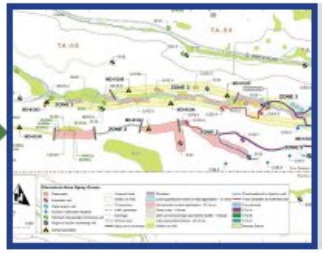
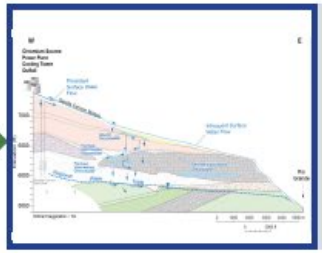
Adaptive Site Management Options

Continue Interim Measures and Plume Characterization:
Pump and treat contaminated water, inject treated (clean) water that meets the New Mexico chromium groundwater standard. Continue characterization with additional monitoring wells, studies, and modeling.

Option 1 - Expanded Pump & Treat with Expanded Injection:
Additional extraction and injection wells for increased mass removal and rates of pump and treat and injection into regional aquifer.

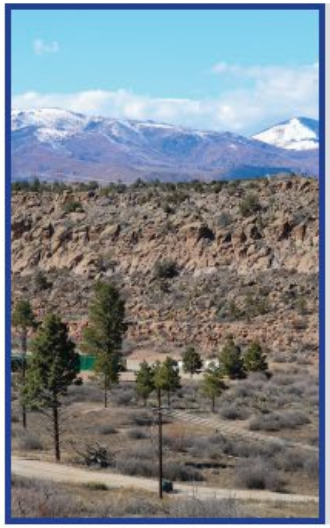


Option 2 - Land Application:
Additional extraction and injection wells as in Option 1, and additional treated groundwater disposition through land application.



Option 3 - In-Situ Treatment:
Similar to Option 2 in adding extraction and injection wells, but amendments are also deployed in groundwater to rely on chemical processes to reduce and immobilize hexavalent chromium without removing it from the ground.

In-situ is a remediation strategy for treatment in groundwater that involves manipulating aquifer conditions with the goal of converting hexavalent chromium to trivalent chromium within the aquifer.



Option 4 - Monitored Natural Attenuation:
Viable option following operation of other remedial actions once concentrations of hexavalent chromium meet the New Mexico chromium groundwater standard.

Relies on natural physical, chemical, or biological processes to further reduce concentrations of hexavalent Cr.

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Posters

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National Environmental Policy Act (NEPA)

Purpose of the NEPA Environmental Assessment (EA)

- EM-LA is initiating the National Environmental Policy Act (NEPA) process to evaluate potential environmental impacts of continued operations of the Interim Measures (IM) to control migration of the hexavalent chromium plume and to evaluate the environmental impacts of alternatives for the final remedy.
- Public scoping meetings provide interested stakeholders with opportunities to ask questions and submit comments on the considered alternatives for the proposed EA. After public comments are received, EM-LA will prepare a Draft EA.
- The proposed action may include well pad and access road installation and maintenance, piezometer placement, and pipeline placement in the 100-year floodplain in Mortandad and Sandia canyons on LANL.

NEPA Timeline

30-day Comment Period Starts
May 8, 2023

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Public Scoping Meetings*
May 8-9, 2023

↓

30-day Comment Period Ends
June 6, 2023

↓

Draft EA Notice of Availability*
Summer 2023

↓

Final EA Notice of Availability
Winter 2023

**Includes opportunities for public involvement*

How to Provide Scoping Comments

Provide comments TODAY by:

- Recording a verbal comment with the court reporter

Submit comments LATER by:

- **Email:** emla-nepa@em.doe.gov
  Please include "Chromium EA Scoping Comment" in the subject line
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  ATTN: NEPA Document Manager
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  Los Alamos Field Office
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Environmental Assessment

Resources to Be Evaluated

- **Cultural Resources**
- **Ecological Resources**
  - » Vegetation
  - » Wildlife
  - » Threatened and Endangered Species
  - » Migratory Birds and Sensitive Species
- **Water Resources**
  - » Groundwater
  - » Surface Water
- **Visual Resources**
- **Air Quality**
- **Geology and Soils**
- **Environmental Justice**
- **Socioeconomics**
- **Land Use**
- **Noise**
- **Traffic and Transportation**
- **Utilities and Infrastructure**
  - » Electricity
  - » Water
  - » Roads
- **Hazardous Materials and Waste Generation**
- **Human Health and Worker Safety**

Thank You for participating in the Public Scoping Meeting

EM-LA would like to thank all attendees for their interest and participation

A review on how to submit comments outside of this meeting is available on the following slide

For your convenience, a copy of this presentation is available online at: www.energy.gov/em-la/presentations

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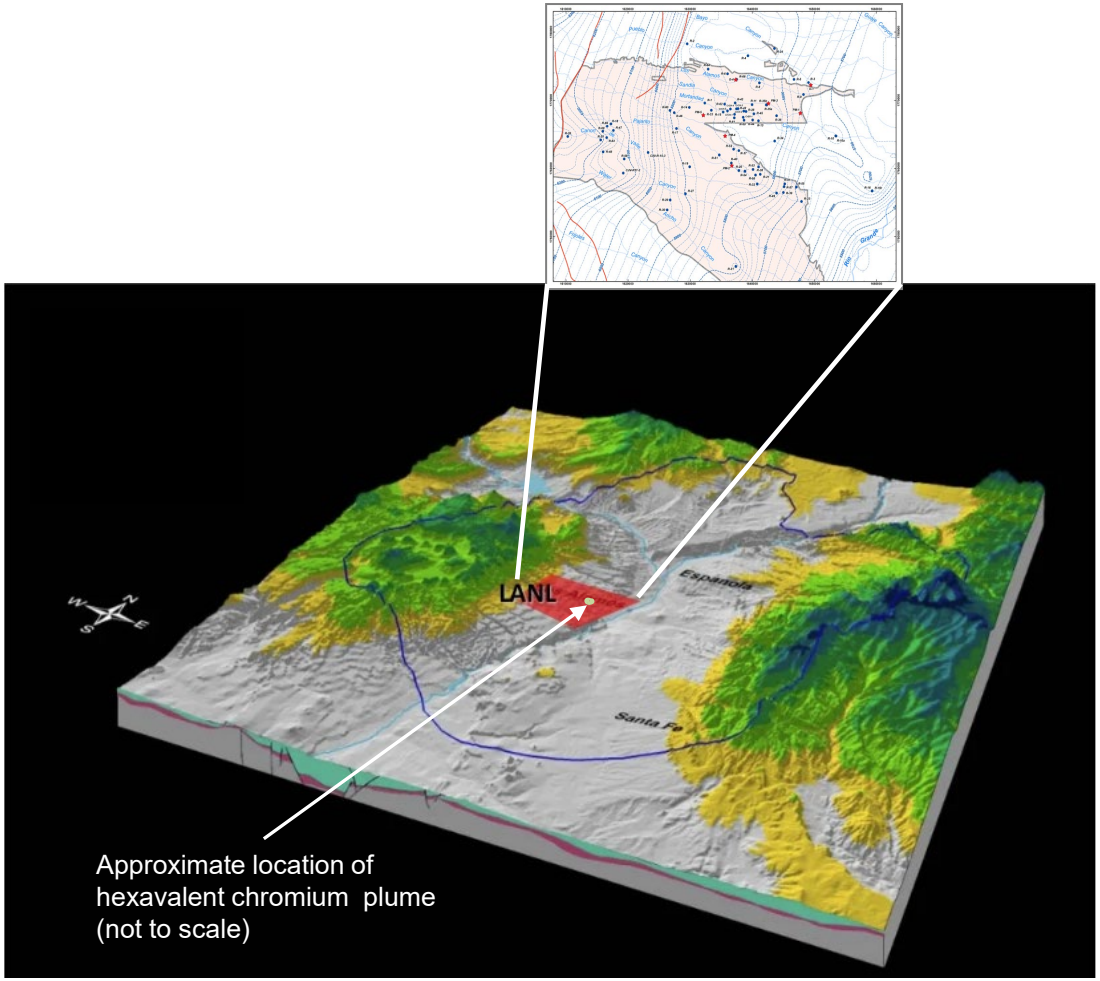
BACKUP SLIDES

Background

- The regional aquifer beneath the Laboratory is part of the Espanola Basin
- The basin is ~ 50 miles long and ~18 to 40 miles wide
- Hexavalent chromium plume footprint is approximately 1 mile long and ½ mile wide



Location of the Los Alamos National Laboratory within the Espanola basin (image from Vessilinov et. al 2010)

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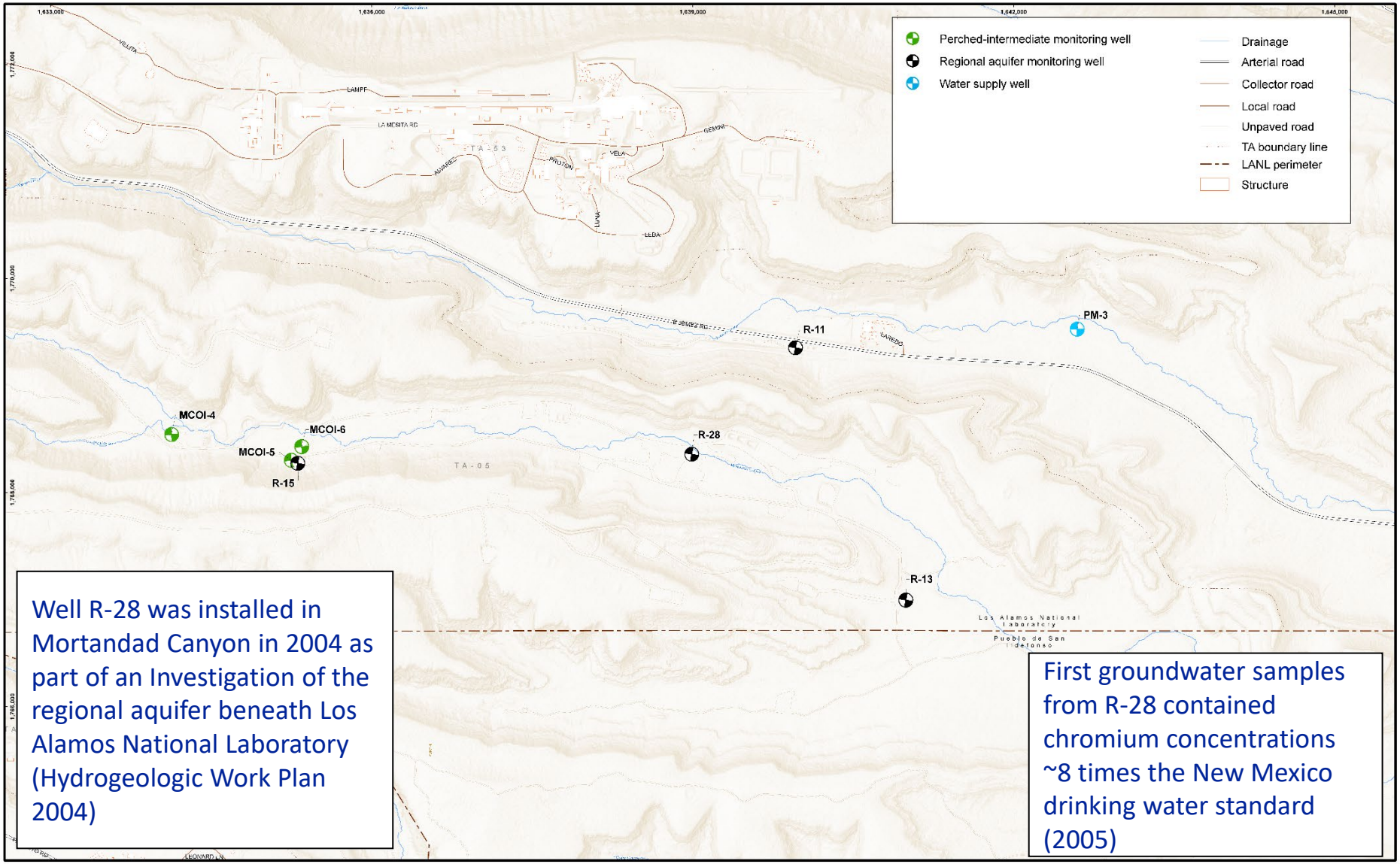
First Samples at R-28



Well R-28 was installed in Mortandad Canyon in 2004 as part of an Investigation of the regional aquifer beneath Los Alamos National Laboratory (Hydrogeologic Work Plan 2004)

First groundwater samples from R-28 contained chromium concentrations ~8 times the New Mexico drinking water standard (2005)

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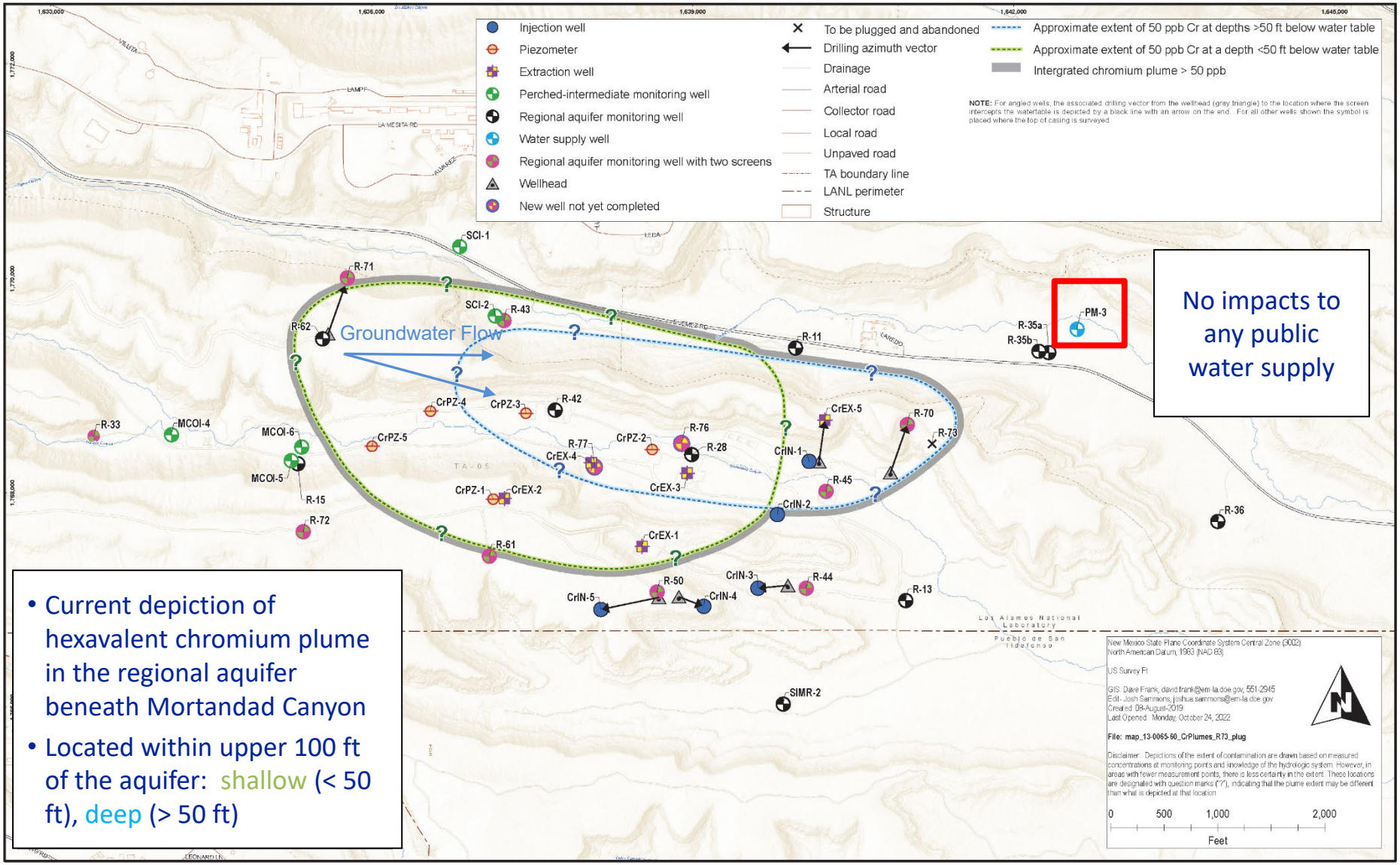
Hexavalent Chromium Plume



No impacts to any public water supply

- Current depiction of hexavalent chromium plume in the regional aquifer beneath Mortandad Canyon
- Located within upper 100 ft of the aquifer: shallow (< 50 ft), deep (> 50 ft)

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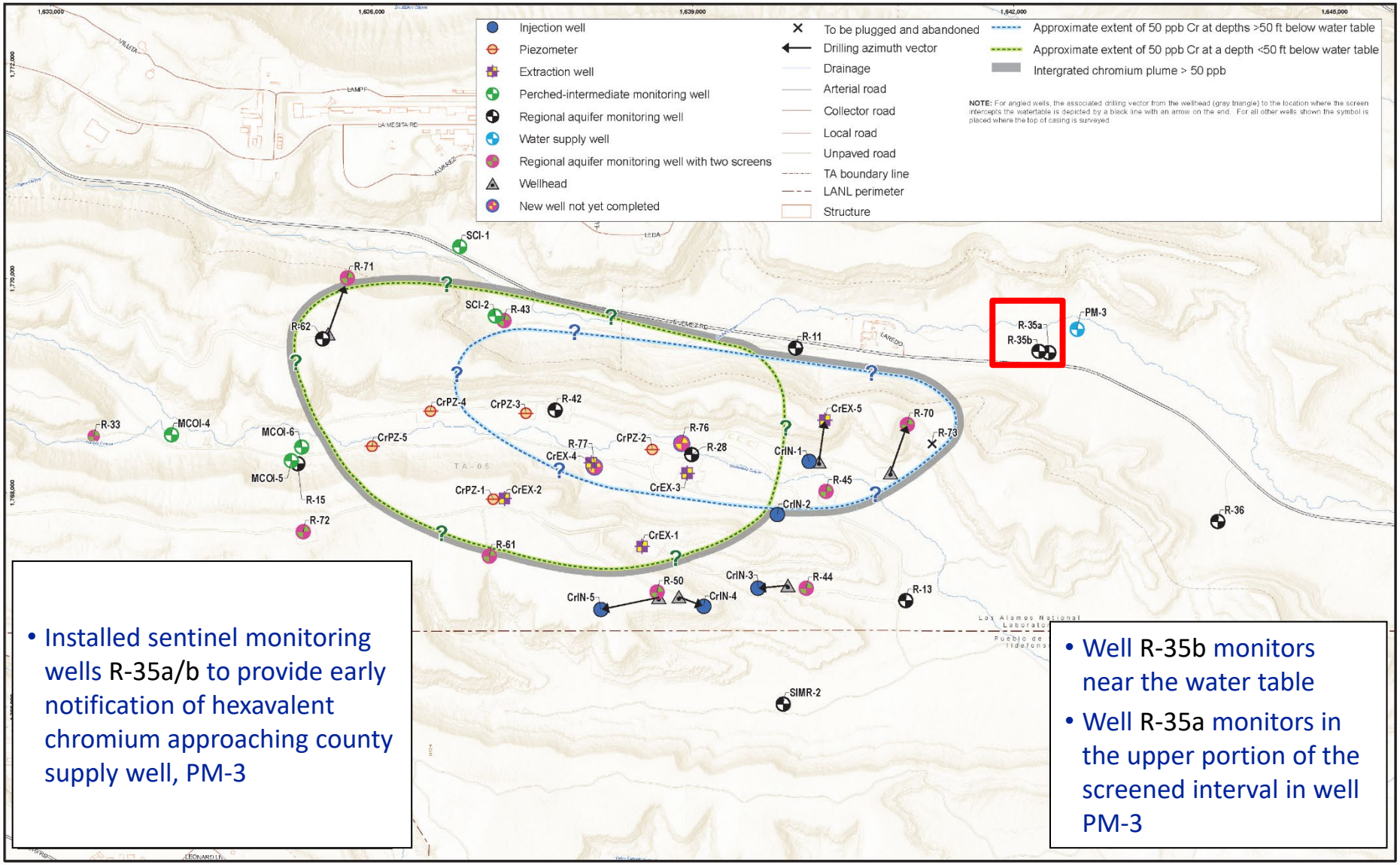
Sentinel Monitoring Wells



- Installed sentinel monitoring wells R-35a/b to provide early notification of hexavalent chromium approaching county supply well, PM-3

- Well R-35b monitors near the water table
- Well R-35a monitors in the upper portion of the screened interval in well PM-3

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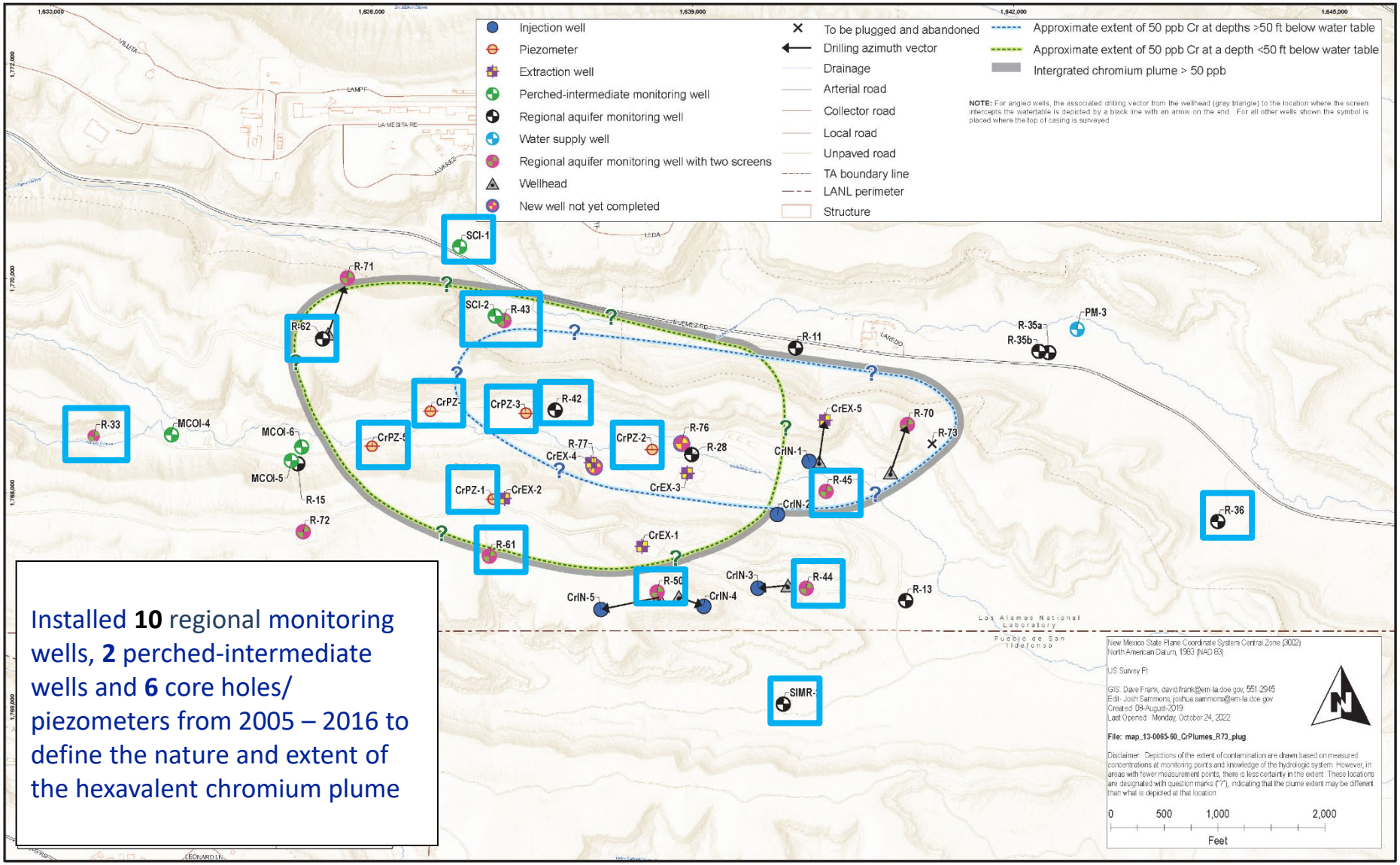
Monitoring Wells



Installed **10** regional monitoring wells, **2** perched-intermediate wells and **6** core holes/ piezometers from 2005 – 2016 to define the nature and extent of the hexavalent chromium plume

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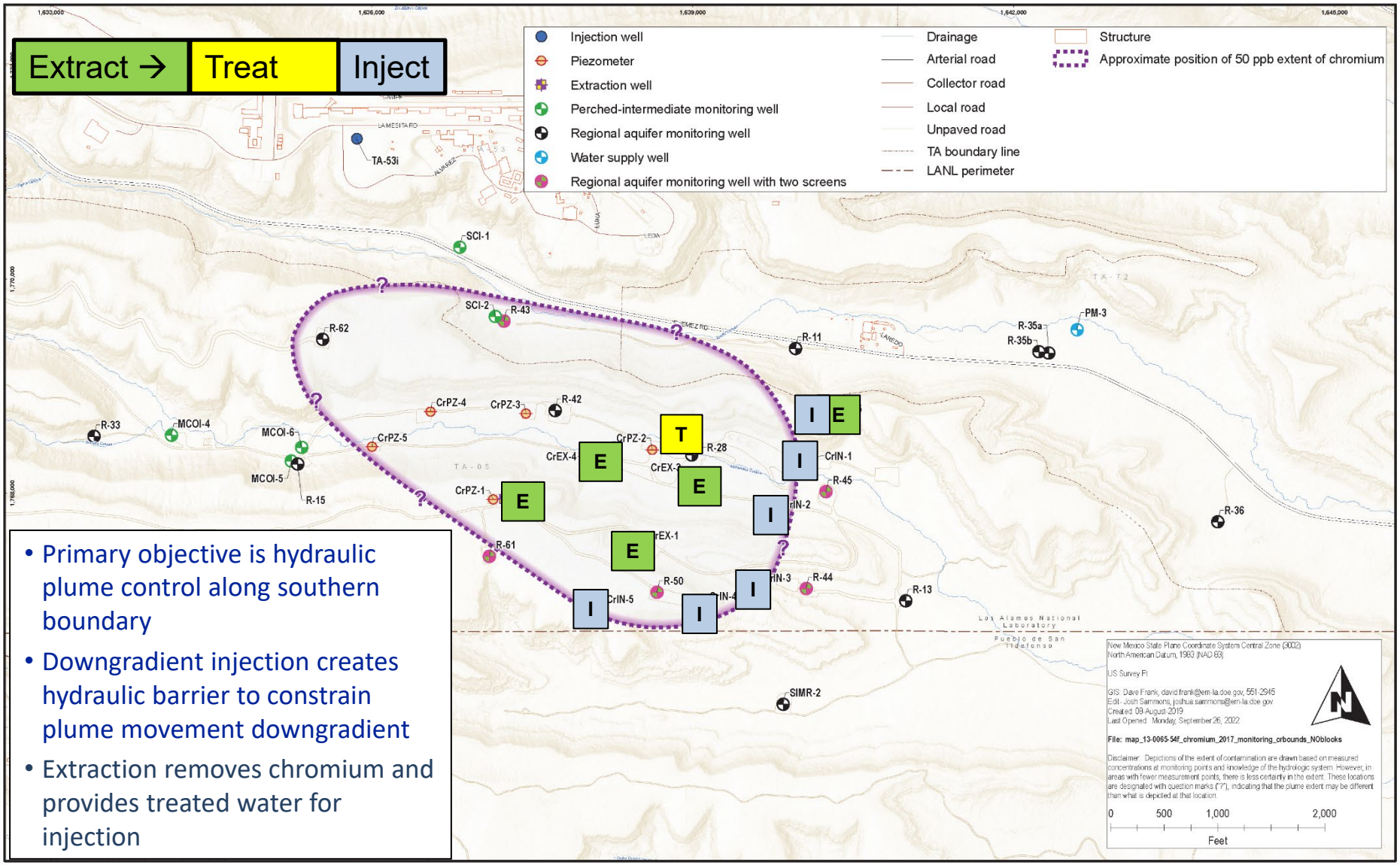
Plume Control Interim Measure Configuration



- Primary objective is hydraulic plume control along southern boundary
- Downgradient injection creates hydraulic barrier to constrain plume movement downgradient
- Extraction removes chromium and provides treated water for injection

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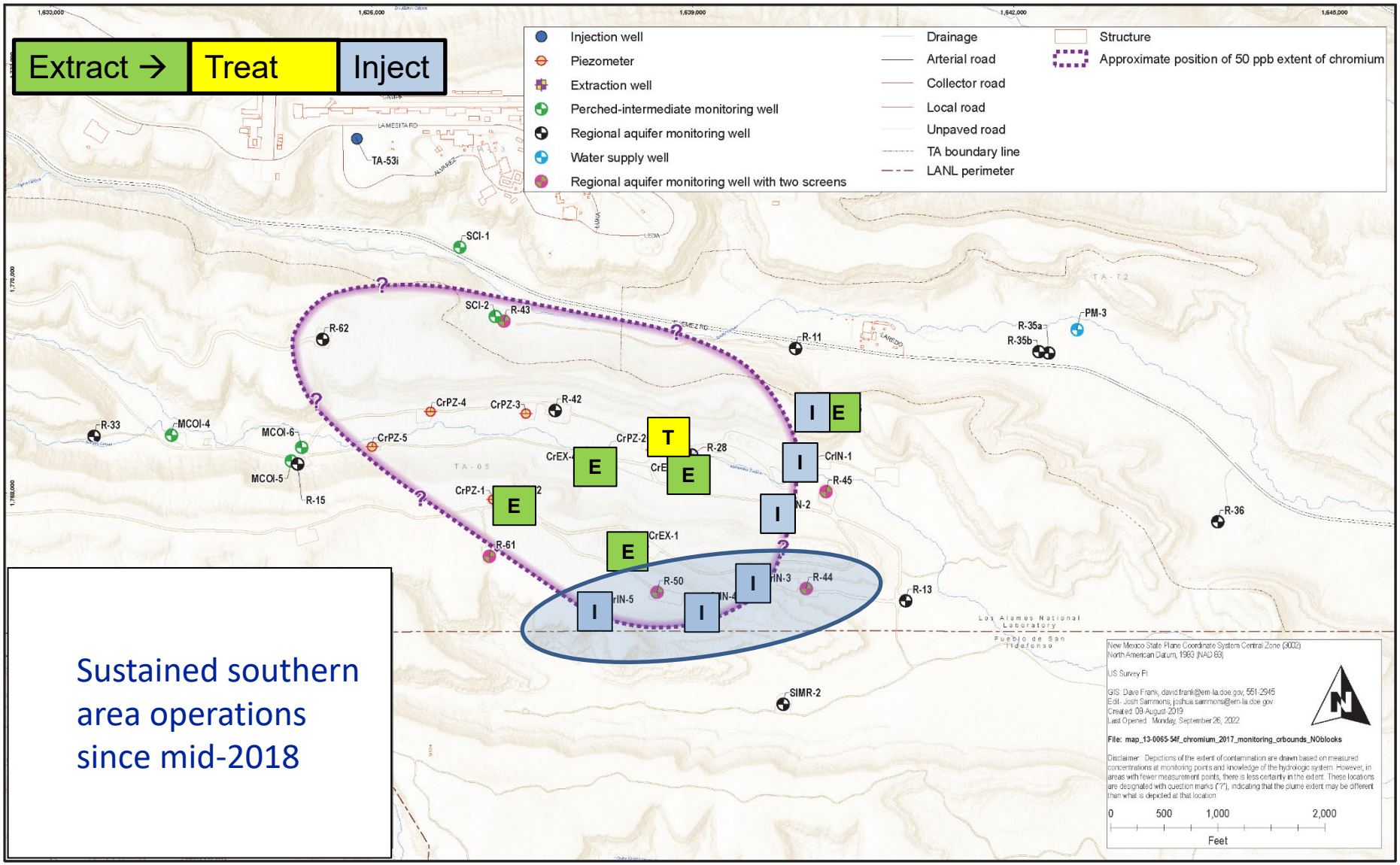
Plume Control Interim Measure Configuration



Sustained southern area operations since mid-2018

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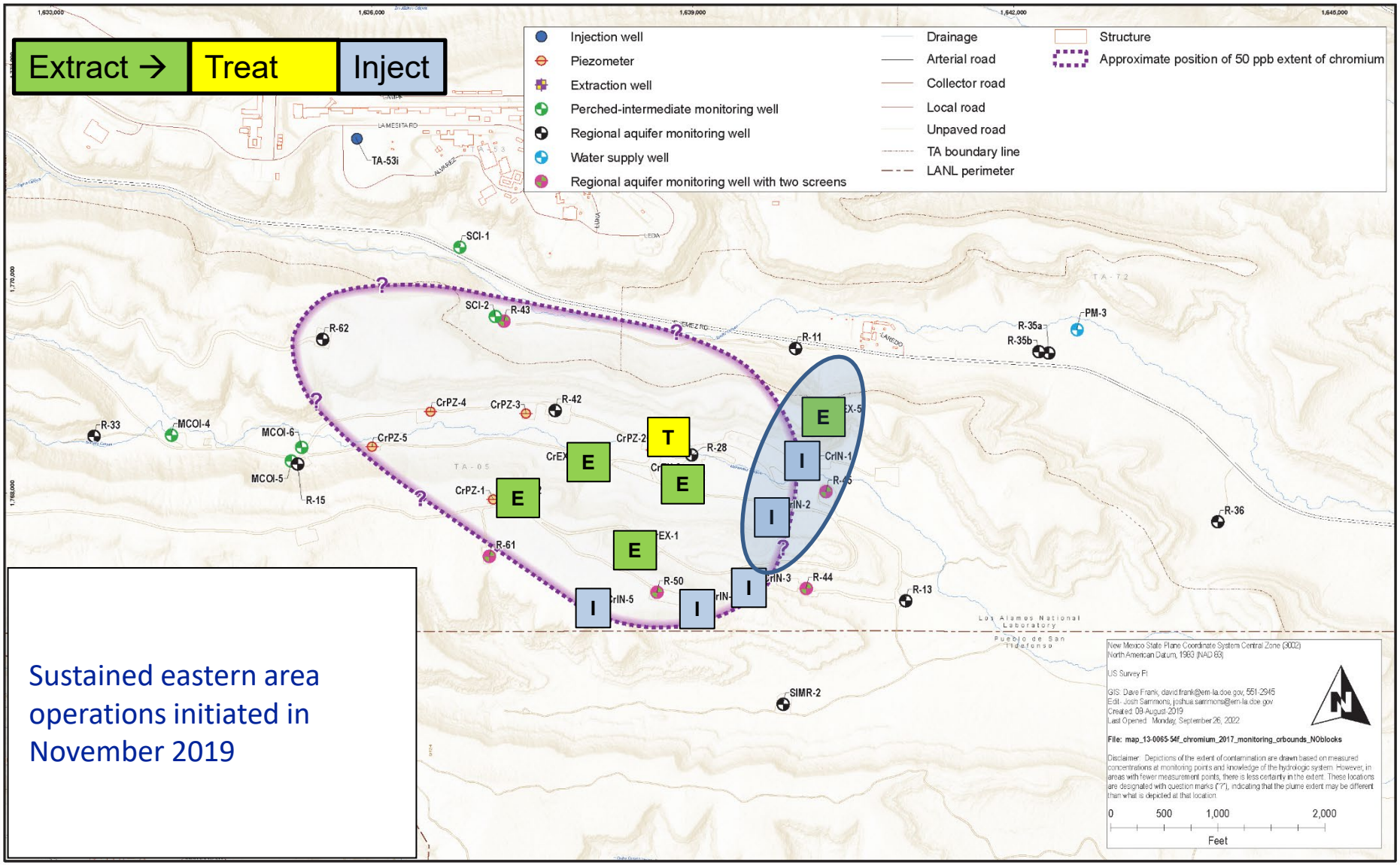
Plume Control Interim Measure Configuration



Sustained eastern area operations initiated in November 2019

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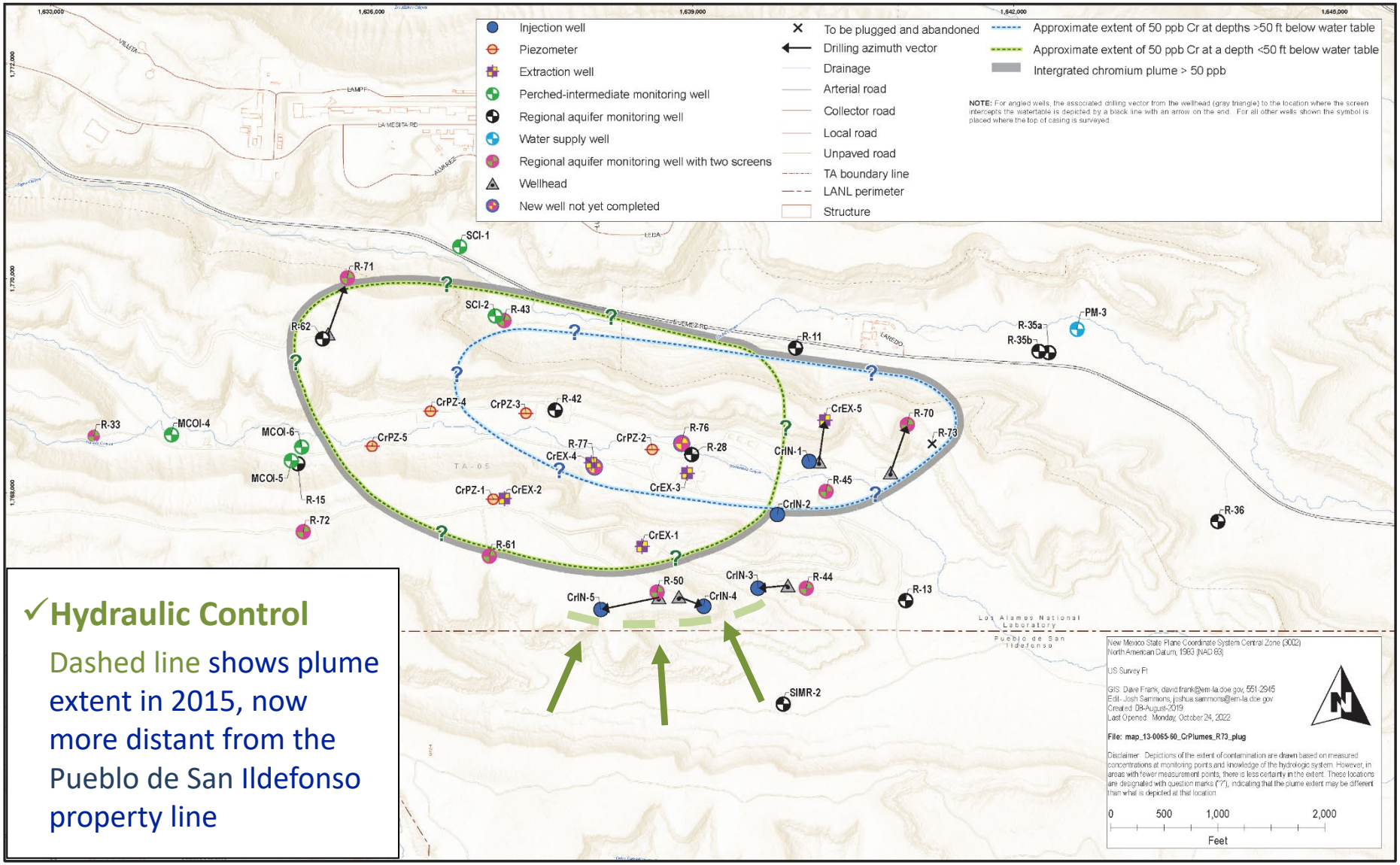
Plume Control Interim Measure Success



✓Hydraulic Control

Dashed line shows plume extent in 2015, now more distant from the Pueblo de San Ildefonso property line

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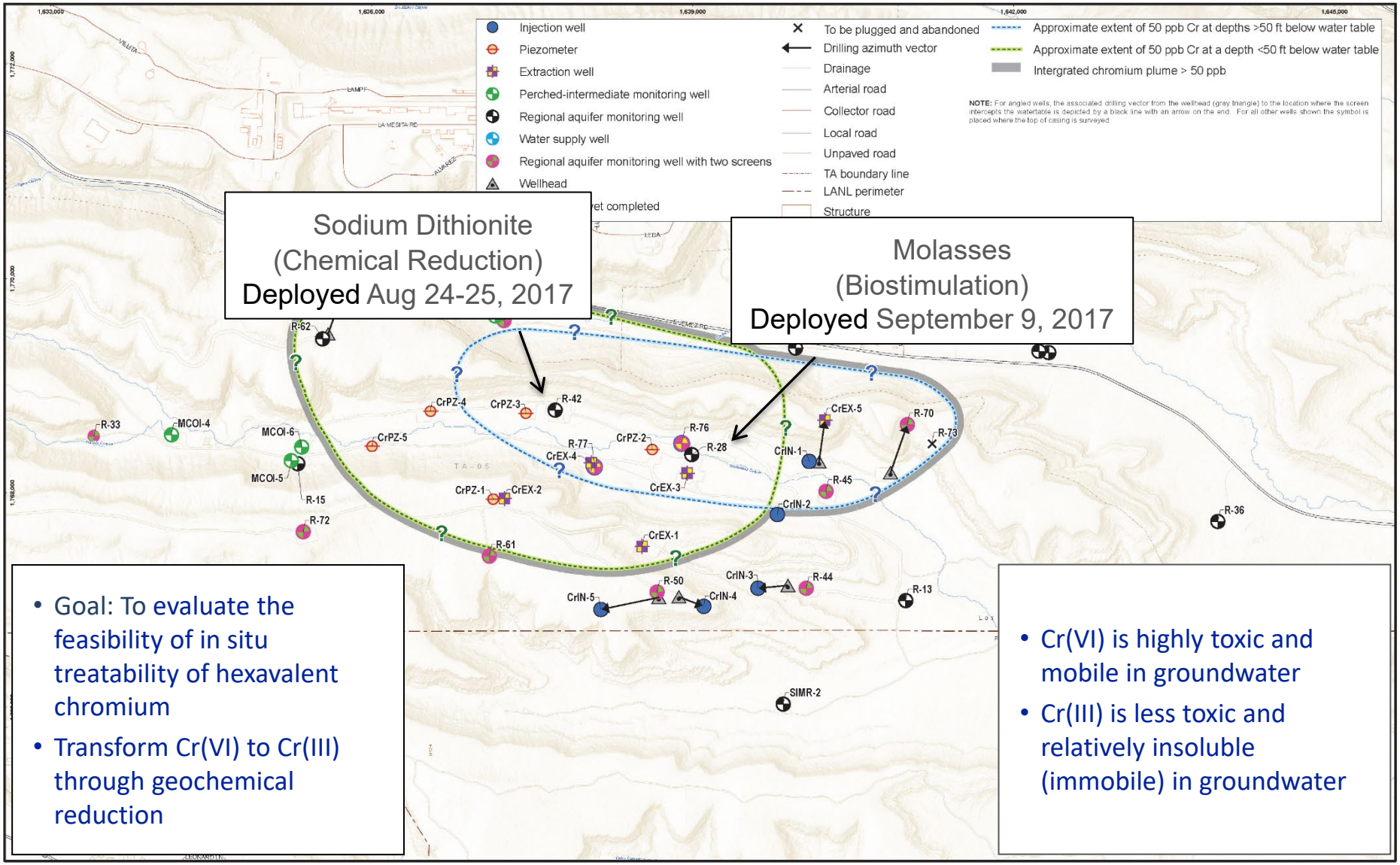
Amendments Pilot Tests 2017



- Goal: To evaluate the feasibility of in situ treatability of hexavalent chromium
- Transform Cr(VI) to Cr(III) through geochemical reduction

- Cr(VI) is highly toxic and mobile in groundwater
- Cr(III) is less toxic and relatively insoluble (immobile) in groundwater