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

Los Alamos National Laboratory's Chromium Project

Doug Hintze
Manager
Environmental Management Los Alamos Field Office

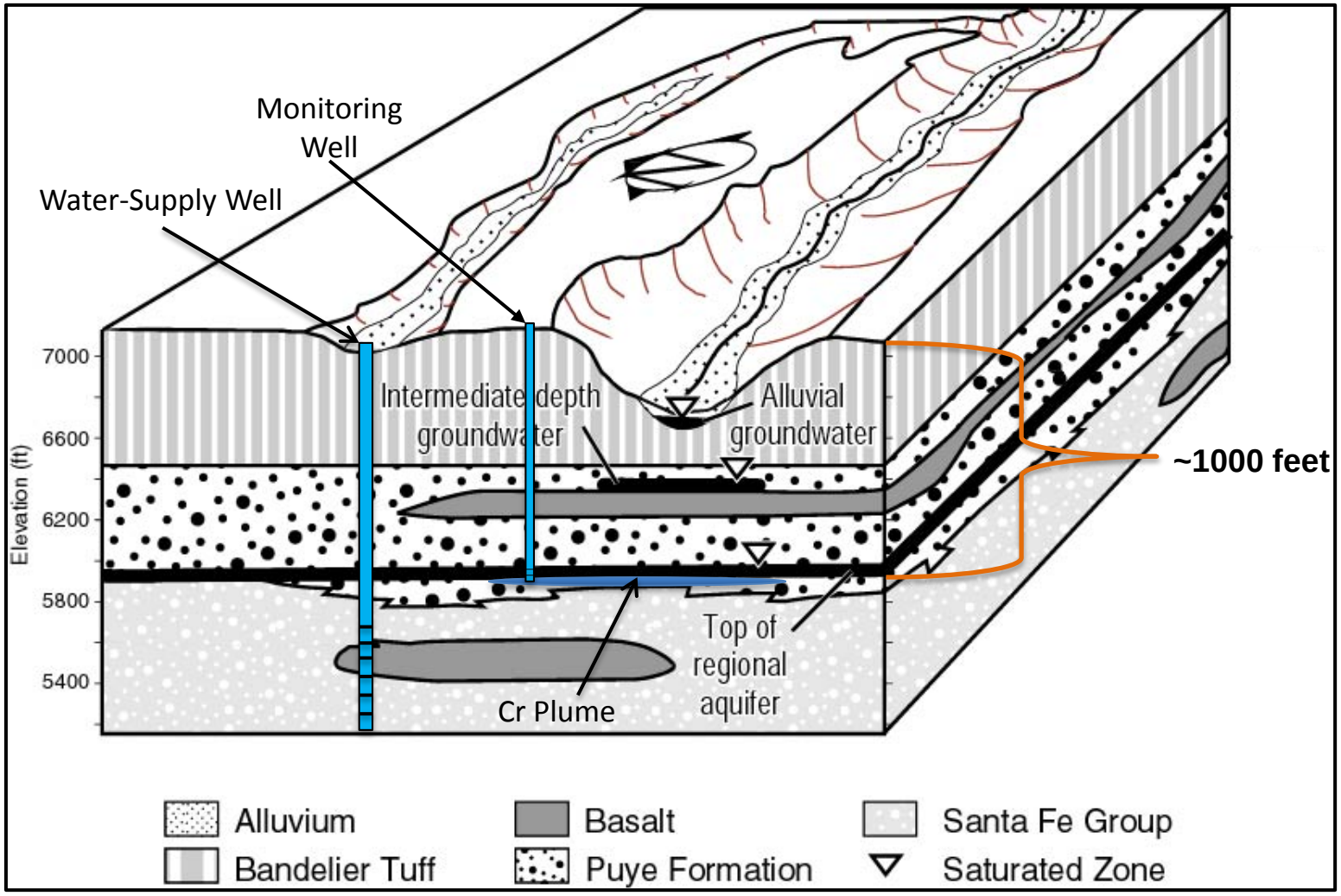
August 15, 2018

ENVIRONMENTAL MANAGEMENT
SAFETY ❖ PERFORMANCE ❖ CLEANUP ❖ CLOSURE

Presentation Topics

- Groundwater Setting
- Where did the chromium come from and where is it now?
- What is being done to address the plume?
- Recent Changes
- Project Status

Groundwater beneath Los Alamos

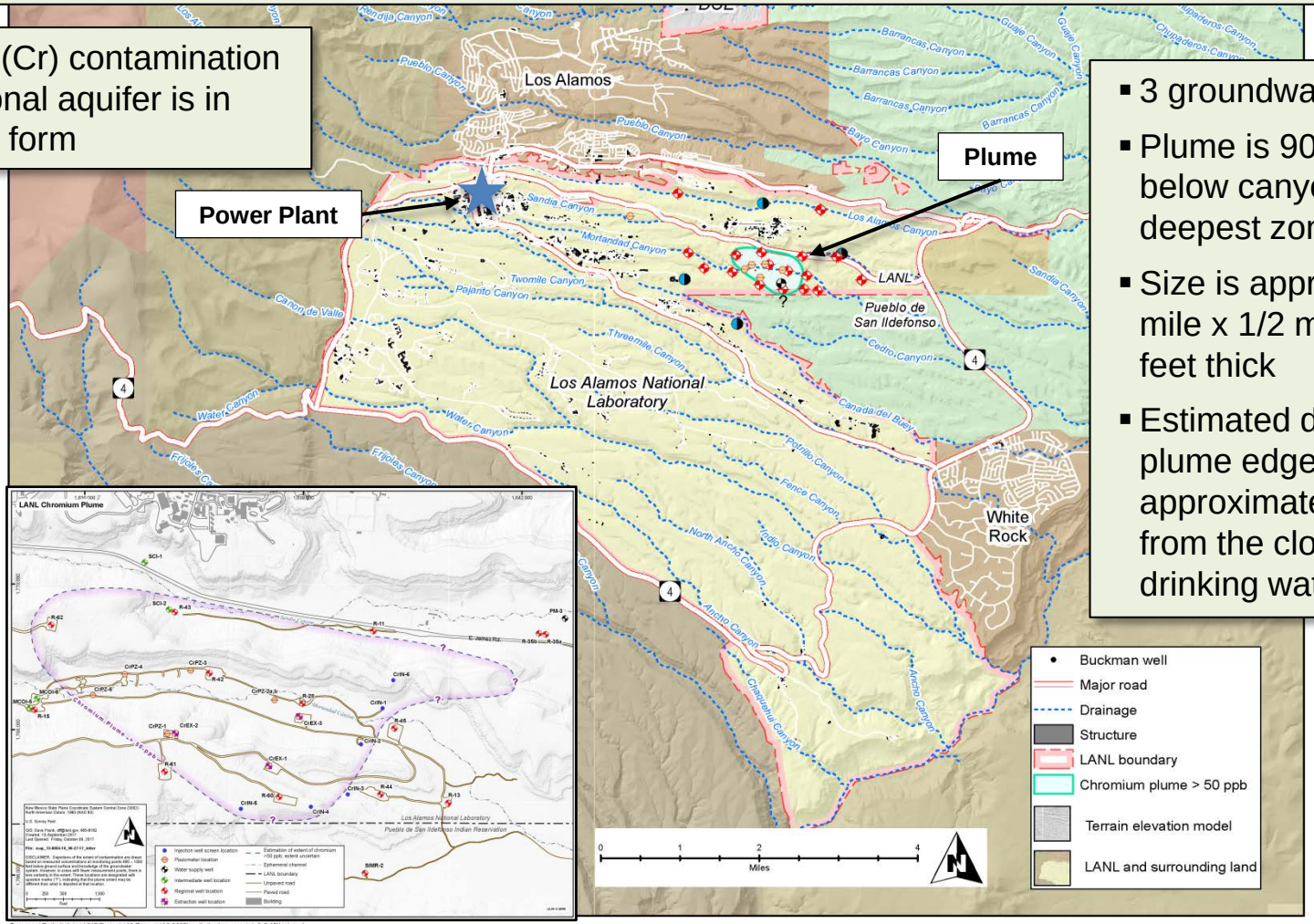


U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

Chromium in Groundwater Beneath LANL

- Potassium dichromate used in cooling towers at a Laboratory power plant
- Up to 160,000 lb released from 1956-72 in hexavalent form [Cr(VI)]

Chromium (Cr) contamination in the regional aquifer is in hexavalent form

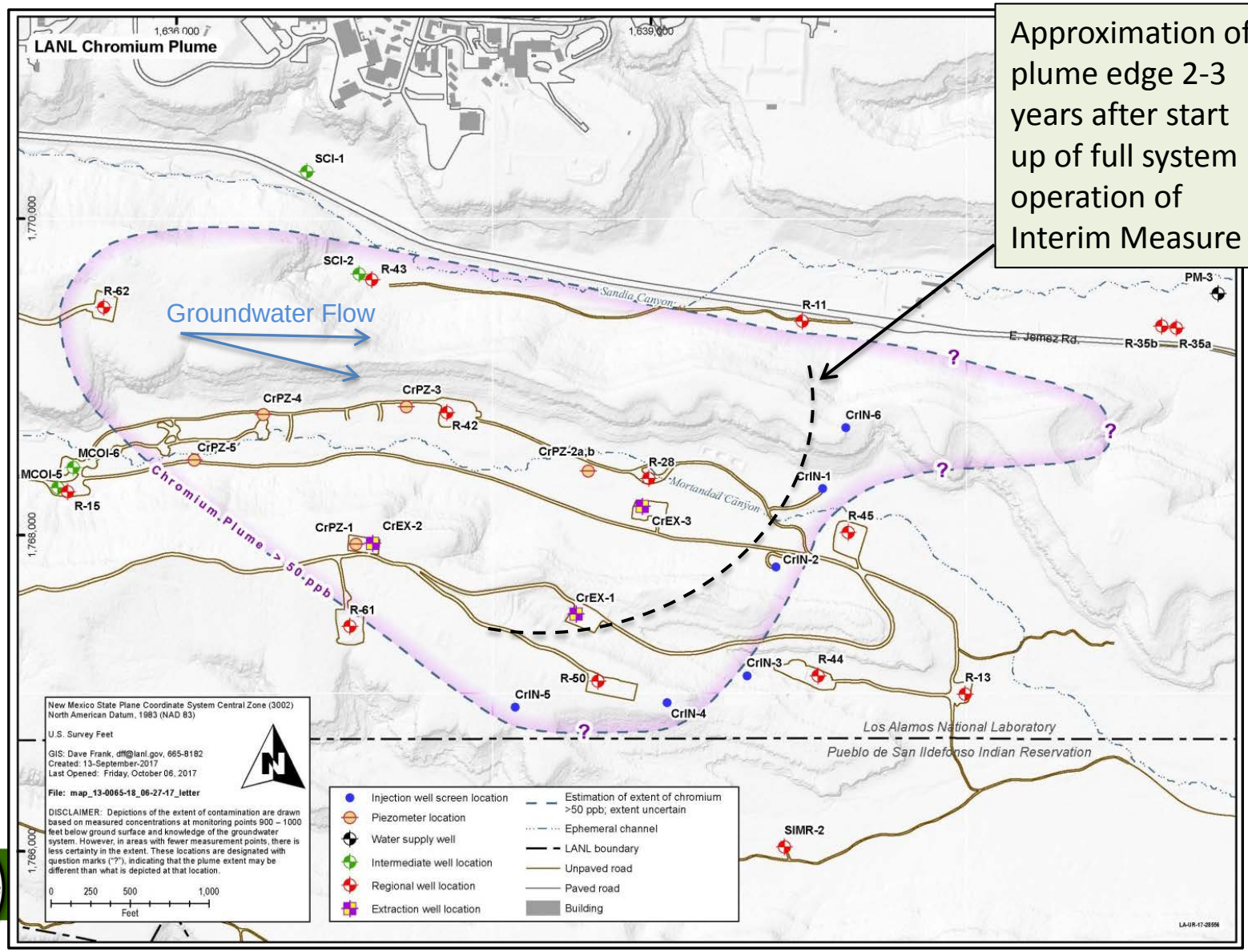


- 3 groundwater zones
- Plume is 900–1,000 feet below canyon bottom in deepest zone
- Size is approximately 1 mile x 1/2 mile x <50 feet thick
- Estimated downgradient plume edge is approximately 1/4 mile from the closest drinking water well

EM-LA ENVIRONMENTAL MANAGEMENT LOS ALAMOS

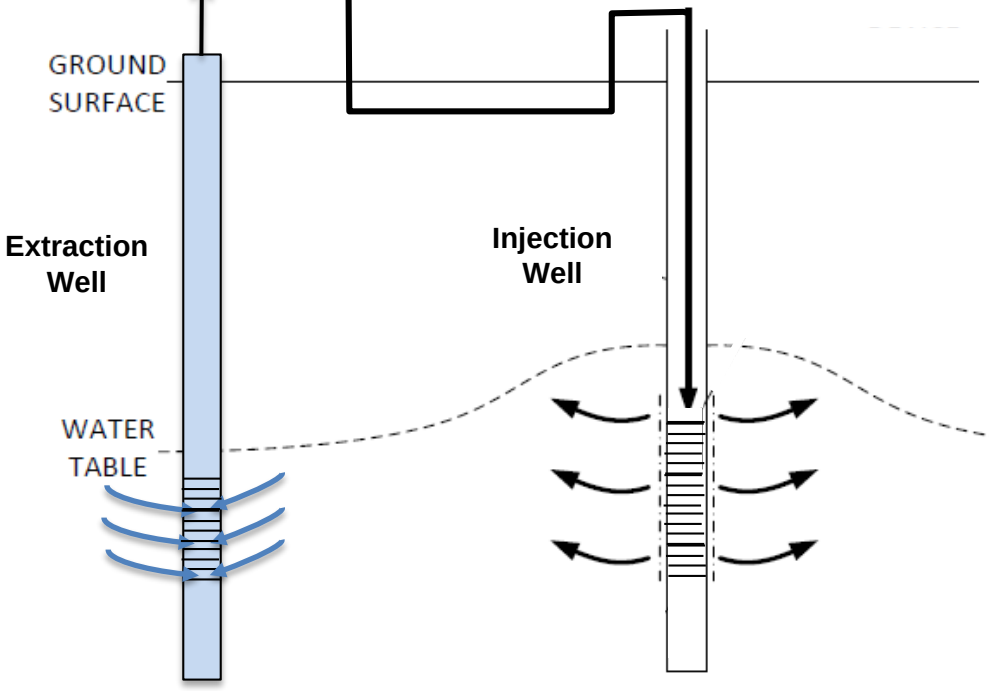
SAFETY ❖ PERFORMANCE ❖ CLEANUP ❖ CLOSURE

Goal of the Interim Measure



Extraction, Treatment & Injection Loop

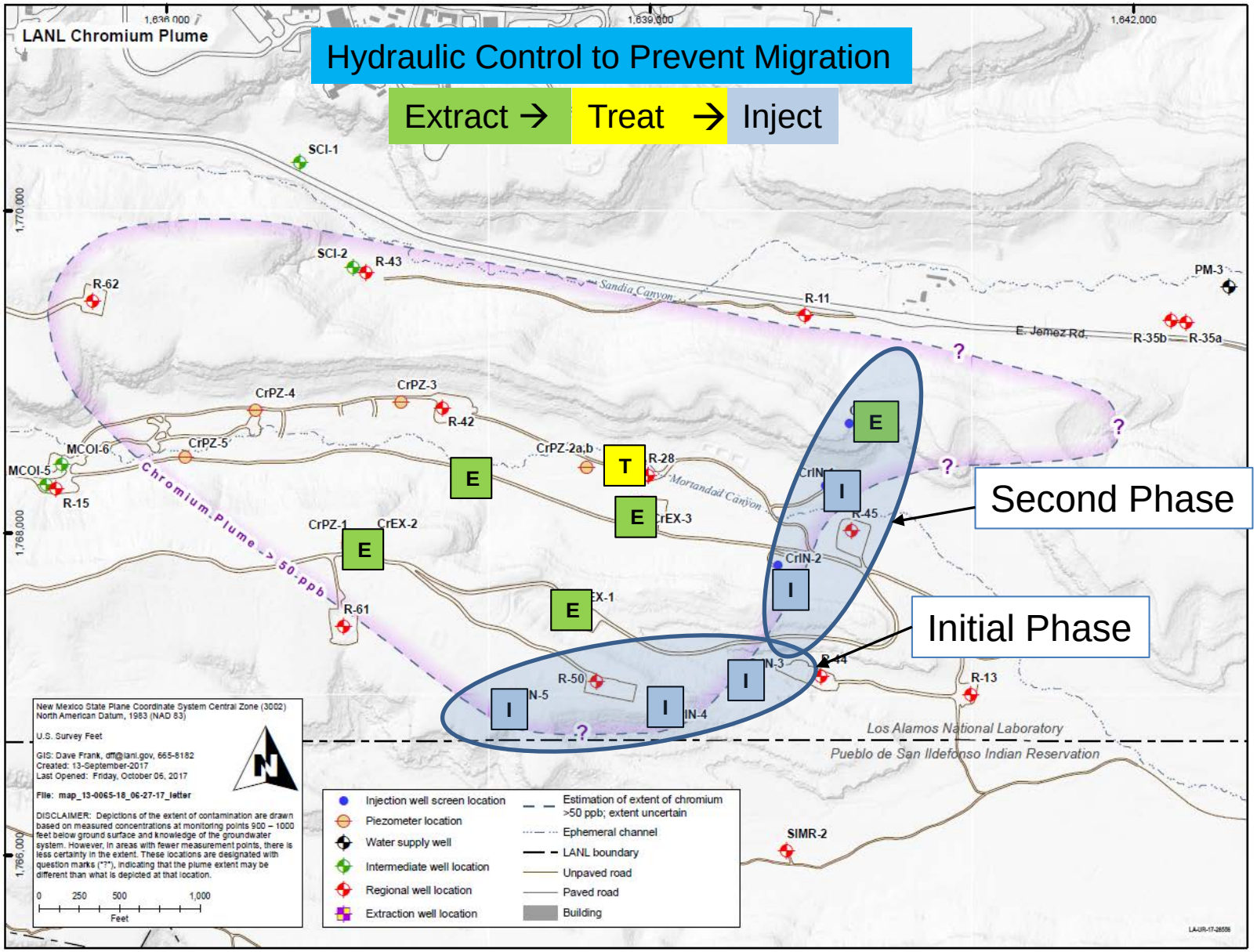
Ion Exchange Treatment Unit



- Contaminated groundwater is pumped from extraction wells
- Groundwater is treated using a method called ion exchange
- Clean water is delivered via buried thick-walled piping to injection wells
- Water exits the injection wells within the aquifer

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

What is being done about the plume? "Interim Measure"

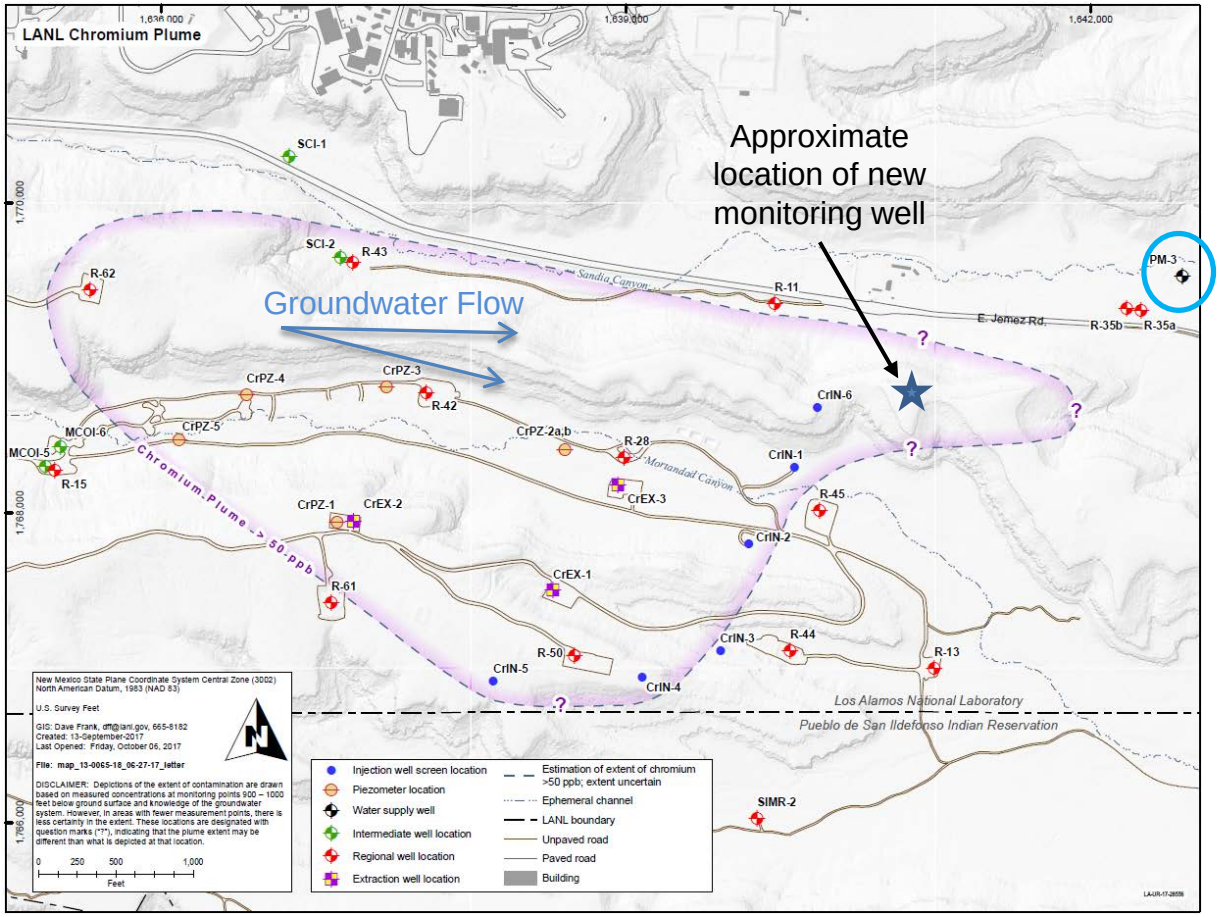


Recent Changes to Approach

April 26, 2018 Submittal to NMED - *Evaluation of Chromium Plume Control Interim Measure Operational Alternatives for Injection Well CrIN-6*

- Evaluated injection vs. extraction scenarios for CrIN-6
- Primary considerations:
  - Establish control of plume edge
  - Protect PM-3
  - Rate of reduction of Cr downgradient (east) of CrIN-6
- Conclusion:
  - Convert CrIN-6 to extraction well
  - Install additional monitoring well

June 6, 2018 NMED Approval to convert CrIN-6 to CrEX-5



Modeling Results

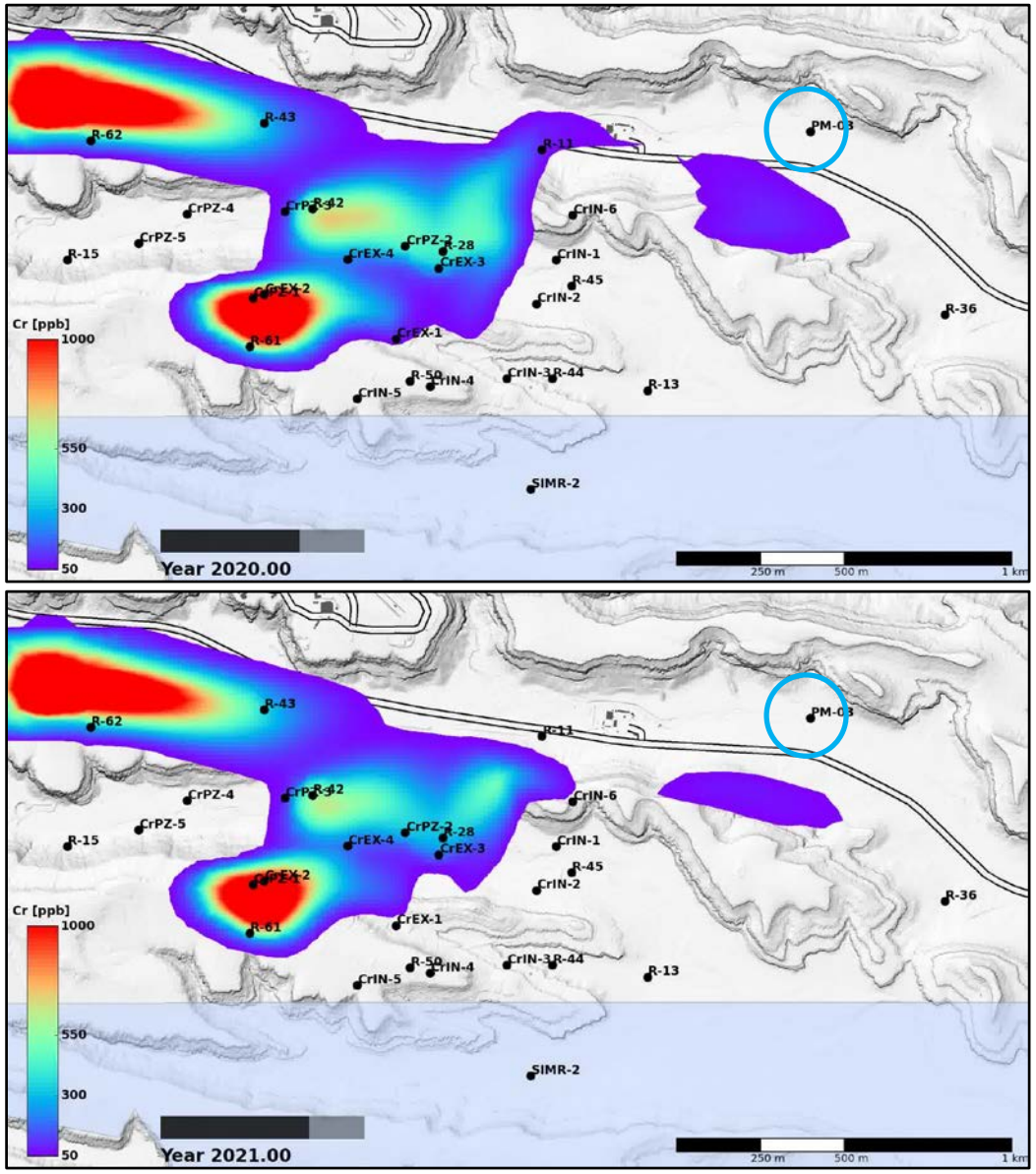
Scenarios evaluated included continuous extraction at CrEX-1, -2 and -3, and continuous injection at all injection wells

Injection Scenarios

- "Pushes" contamination to the north and possibly towards the Los Alamos County well PM-3

Extraction Scenarios

- "Captures" contamination from the north
- More protective of PM-3



Project Status

- Operated pumping and injection system for ~ 5 months in early 2017
- Full-time operations along Laboratory boundary with Pueblo de San Ildefonso restarted late May 2018 and will run continuously for foreseeable future
- CrIN-6 reconfiguration activities July – December 2018
  - Converting CrIN-6 into an extraction well (“CrEX-5”)
  - Design/install infrastructure to connect to treatment system
- Full system operation (inclusive of CrEX-5) expected to start in early 2019
- Continue studies to evaluate final remedy


Questions?