



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**



# LANL Legacy Environmental Cleanup Update for the Radioactive and Hazardous Materials Committee

Michael Mikolanis, Manager  
Environmental Management  
Los Alamos Field Office  
August 21, 2023



ENVIRONMENTAL MANAGEMENT  
SAFETY ♦ PERFORMANCE ♦ CLEANUP ♦ CLOSURE



- Accelerate progress on hexavalent chromium plume towards a remedy
- Continue meeting Consent Order Milestones
- Optimize corrugated metal pipe (CMP) size reduction and packaging, and begin characterization/certification for shipment
- Continue characterizing, repackaging above-ground transuranic (TRU) waste
- Complete Middle DP Road Site cleanup, turnover to Los Alamos County
- Investigate, characterize legacy contamination and remediate sites under the Aggregate Area Campaigns
- Complete development of an EM-LA Strategic Vision and prioritize stakeholder engagement



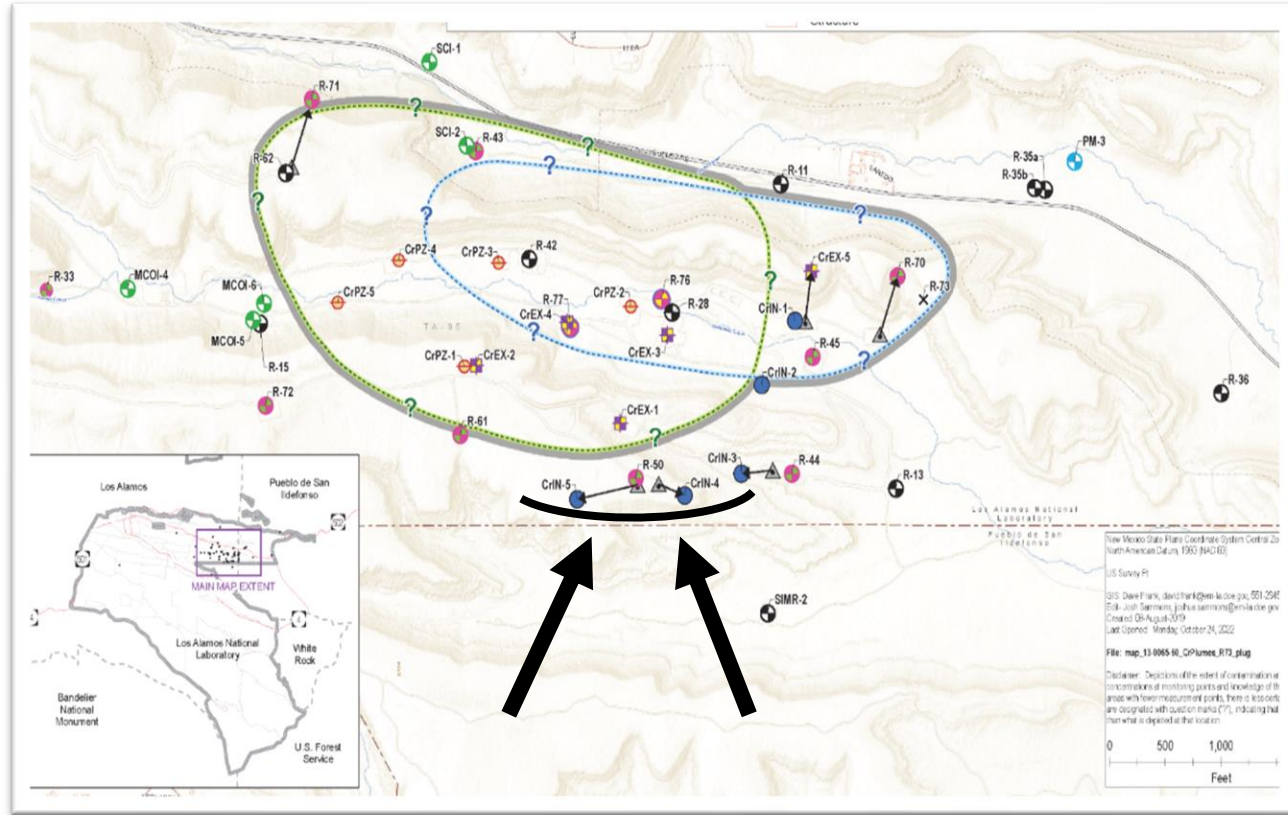


# Chromium Interim Measures & Characterization

## 2016 Consent Order Appendix C – Chromium Interim Measures (IM) and Characterization Primary Objectives:

1. Provide interim measures to prevent migration of plume beyond the Laboratory boundary
2. Perform scientific studies and aquifer testing to obtain data necessary to conduct a corrective measures evaluation
3. Conduct a corrective measures evaluation

DOE believes objectives 1 and 2 have been met



### Achieved Hydraulic Control

Black line shows approximate plume extent in 2015 – now more distant from Pueblo de San Ildefonso property line

No impacts to Los Alamos County Water Supply Well PM-3





- Commenced Chromium IM in 2018, after NMED approved work plan in 2015, and following installation of:
  - Five extraction wells
  - The treatment system
  - Five injection wells
- Since the start of the IM, there have been positive results:
  - Leading edge of plume in southern portion controlled and moved back from Pueblo de San Ildefonso property boundary ~500 feet through injection and extraction
  - 445 million gallons of contaminated groundwater treated to remove hexavalent chromium (equivalent to 674 Olympic size swimming pools)
  - ~700 pounds of hexavalent chromium removed (a secondary benefit of the IM)

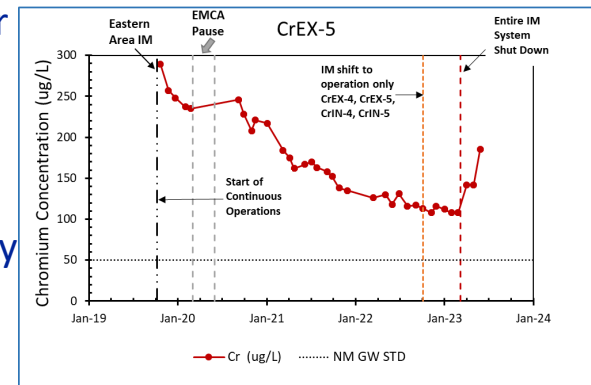
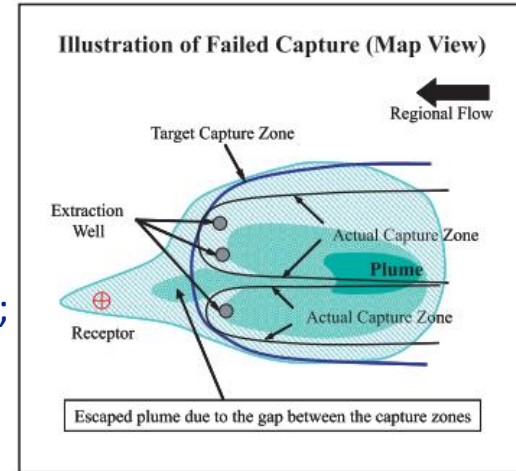




# NMED Regulatory Direction

- November 2022, NMED directs DOE to cease injection
- March 2023, DOE ceased injection per regulatory direction and thus operation of the IM:
  - Extraction not feasible without injection
- DOE conducted three-party summits with DOE, NMED and Pueblo de San Ildefonso:
  - Provided technical understanding of (1) what is happening to plume; (2) impacts of NMED’s direction; and (3) options to restart IM and accelerated measures to remedy plume rather than contain it
- Summits reach an impasse:
  - NMED requested changes which are not protective of the aquifer without total system redesign; resembles a remedy
  - Proceeding would bypass public input required by Resource Conservation Recovery Act corrective action process
  - DOE asserts plume sufficiently characterized to propose a remedy
- Recent monitoring well data indicates regulatory direction is adversely impacting aquifer:
  - NMED informally notified, to be followed up with formal notification

EPA illustration for conceptual purposes only





## Material Disposal Areas (MDAs)

- Continue monitoring and inspections
- MDA H Corrective Measures Evaluation is in preparation
- Performed operational testing of MDA L (TA-54) vapor extraction system to begin operation in first quarter of FY24
- Waiting for NMED response to MDA C (TA-50) Corrective Measures Evaluation Report
  - Completed Appendix B FY21 Milestone in June 2021

## Middle DP Road Site

- Completed all necessary excavation and additional cleanup work based on extent sampling
- Submitted Arsenic White Paper to NMED for comment
- Low-level waste shipments from site are in progress
- Assessment Report is in preparation and will be submitted to NMED for review/approval
  - Forecast to submit report by January 2024





## Aggregate Area Campaigns

- 2,100 potentially contaminated sites originally identified for action, ranging from small spills to large landfills
- >50% of sites across canyons and drainages throughout LANL have been investigated and, if needed, remediated
- Dispositioned a total of 5,869 cubic meters of contaminated soil and debris since start of N3B contract (approximately 28,190 55-gallon drums)
- Shipping waste to designated disposal facility
- Two large Consent Order Campaigns in progress:
  - Southern External Boundary Campaign: 65 Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)
  - Pajarito Watershed Campaign: 177 SWMUs/AOCs



As part of the Southern External Boundary Campaign, a geologist assesses excavation of contaminated soil in Lower Water Canyon





- At ready shipping resulted in 59 TRU waste shipments to Waste Isolation Pilot Plant (WIPP) so far in FY23
  - Exceeds FY23 goal of 40 waste shipments
- Completed 20 corrugated metal pipe retrievals at Technical Area 54 (TA-54), Area G
  - 4 CMPs have been size reduced and placed in standard waste boxes



Crews use a mobile-loading unit to place containers of LANL's legacy transuranic waste into casks for transport to WIPP

N3B Waste Retrieval Operations crew guide a cut section of corrugated metal pipe (CMP) filled with cemented transuranic waste into a standard waste box.







Stakeholder and Community Engagement

EM-LA Strategic Vision



Justice40 Initiative

Pueblo Engagement

Northern New Mexico Citizens' Advisory Board

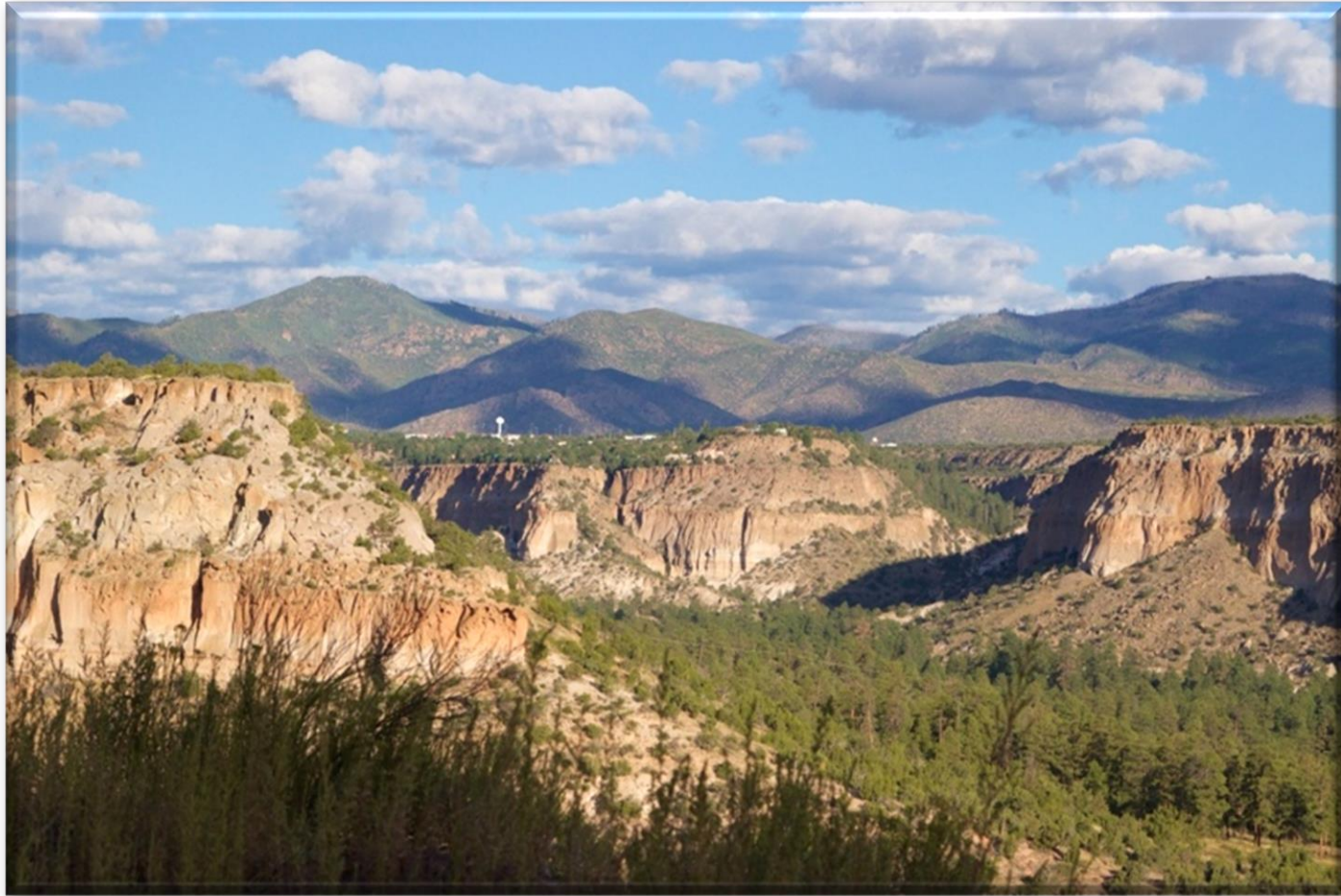
Regulator Relationships





- Accelerating cleanup is a priority for DOE
- Request support from RHMC to ensure NMED has adequate staffing needed to review DOE deliverables so that cleanup is not delayed
- Over 200 Certificate of Completion requests awaiting NMED review:
  - Represents nearly 25% of remaining Solid Waste Management Units and Areas Of Concern listed in Consent Order
  - For some requests, DOE has been waiting for over 1,000 days
- Chromium Interim Measures and Characterization Work Plan:
  - Received NMED feedback 244 days after DOE's submission on September 30, 2022
- MDA C Corrective Measures Evaluation Report:
  - Awaiting feedback on DOE submission over 780 days ago on June 30, 2021







U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
ENVIRONMENTAL  
MANAGEMENT

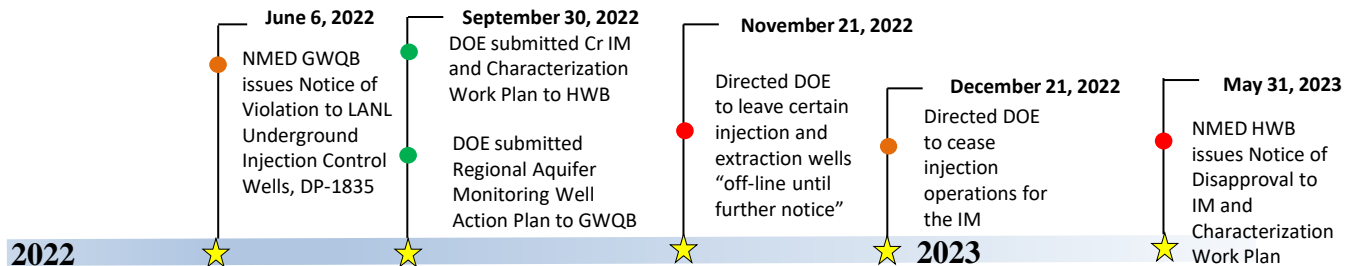
# BACKUP SLIDES



ENVIRONMENTAL MANAGEMENT  
SAFETY ♦ PERFORMANCE ♦ CLEANUP ♦ CLOSURE



## Direction from New Mexico Environment Department



### Key Issues:

1. NMED Hazardous Waste Bureau 244-day review time for Chromium Interim Measures and Characterization Work Plan
2. Added requirements changing the purpose of the Interim Measures
3. Did not address inability of DOE to perform Work Plan with IM system not operating

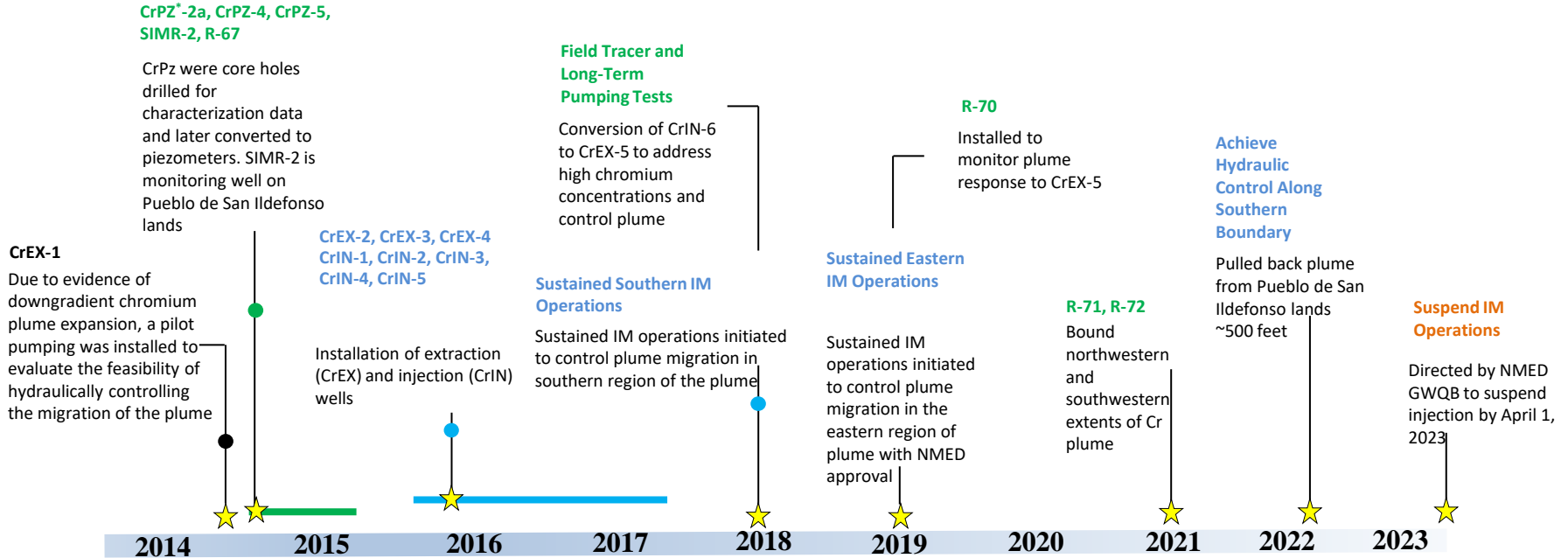
**Color Key**

- NMED GW Quality Bureau
- NMED Hazardous Waste Bureau
- DOE Activity





# Chromium Interim Measures Operations Timeline



### Key Issues:

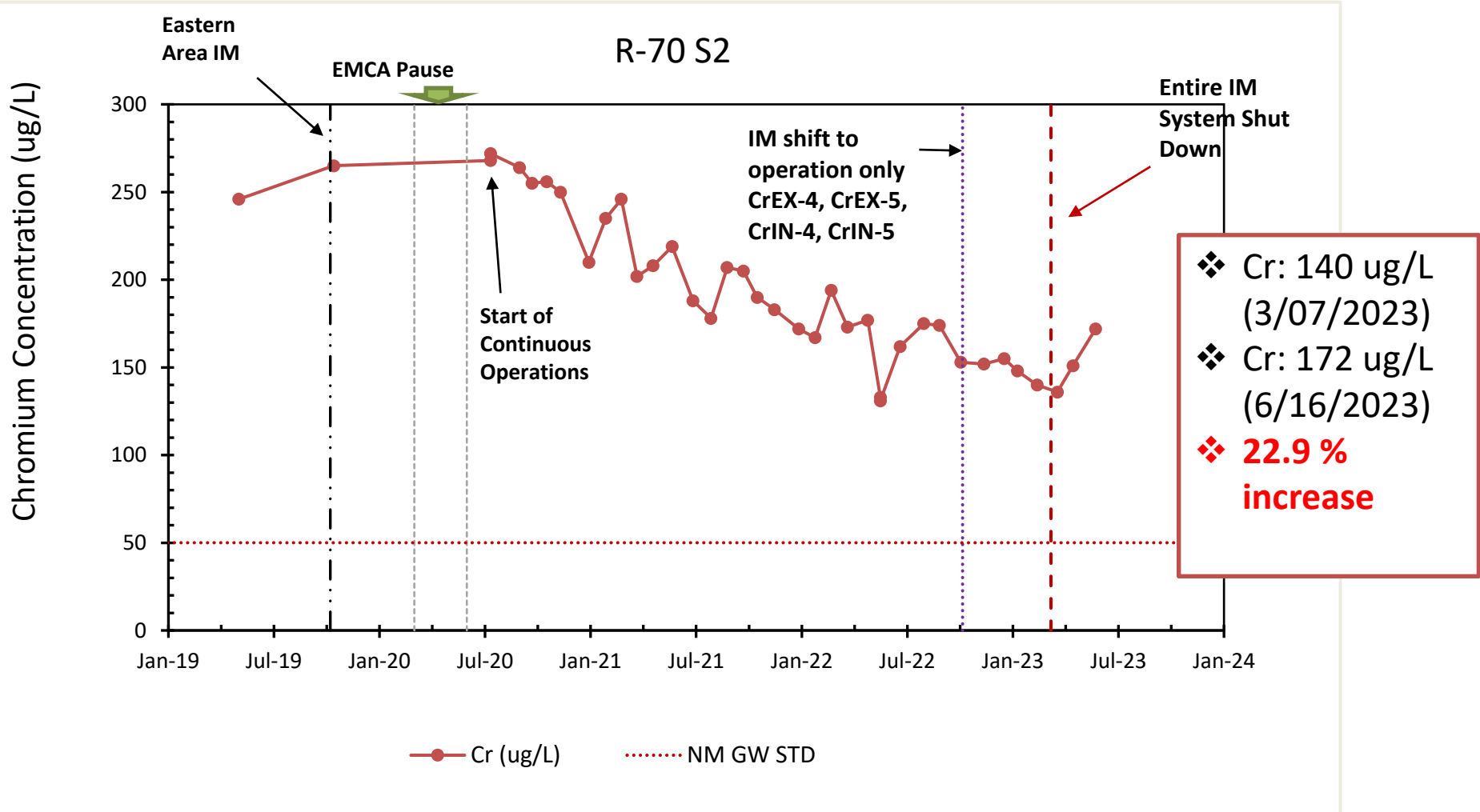
1. DOE actions have been performed with NMED approval
2. DOE is responsible for the consequence of actions
3. DOE strives to be timely in response to NMED requests per guidelines of Consent Order

Color Key	
●	Interim Measure
●	NMED GW Quality Bureau
●	NMED Hazardous Waste Bureau
●	Characterization Activity



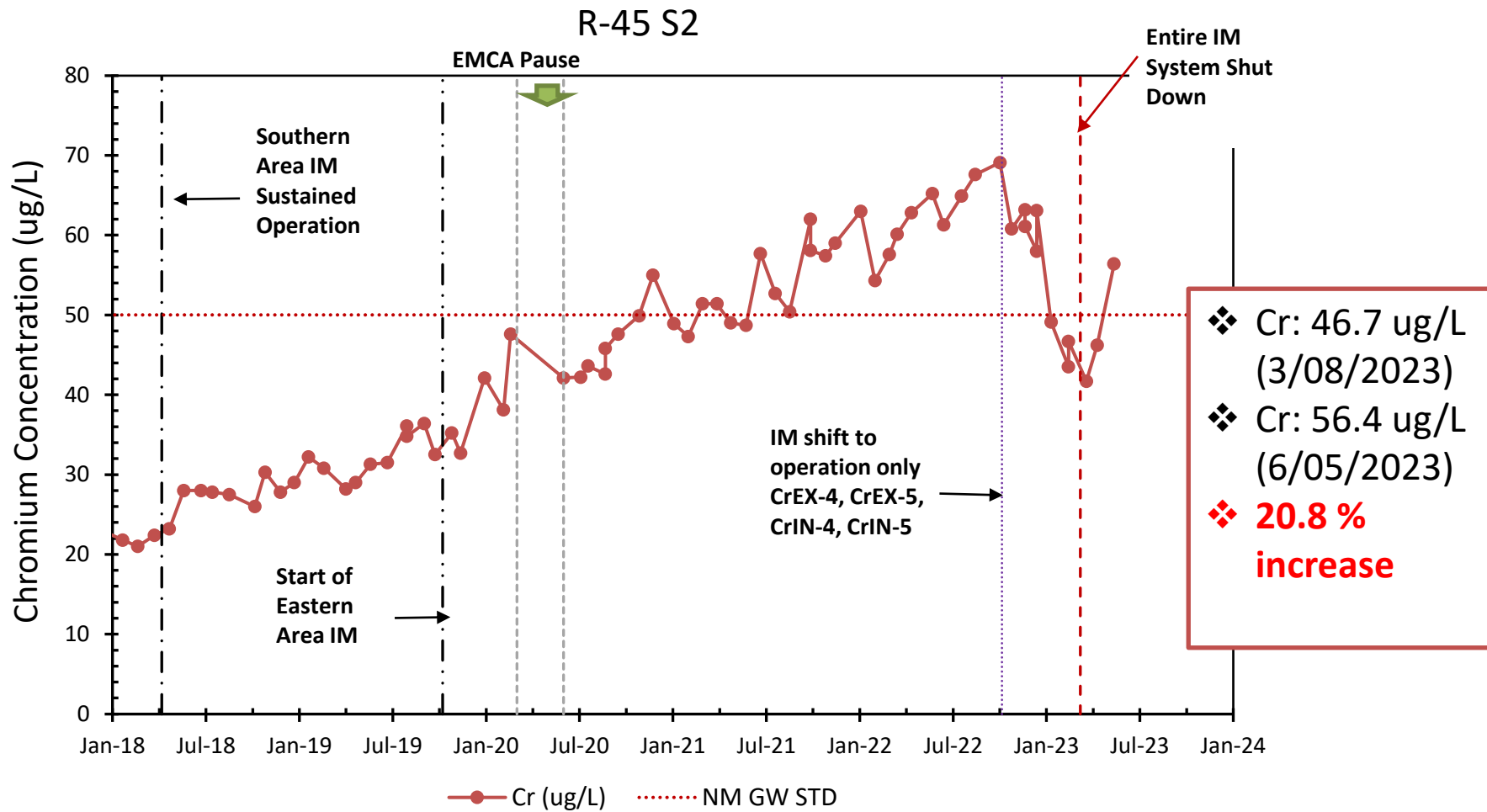


# Impact of NMED Direction: R-70, S2





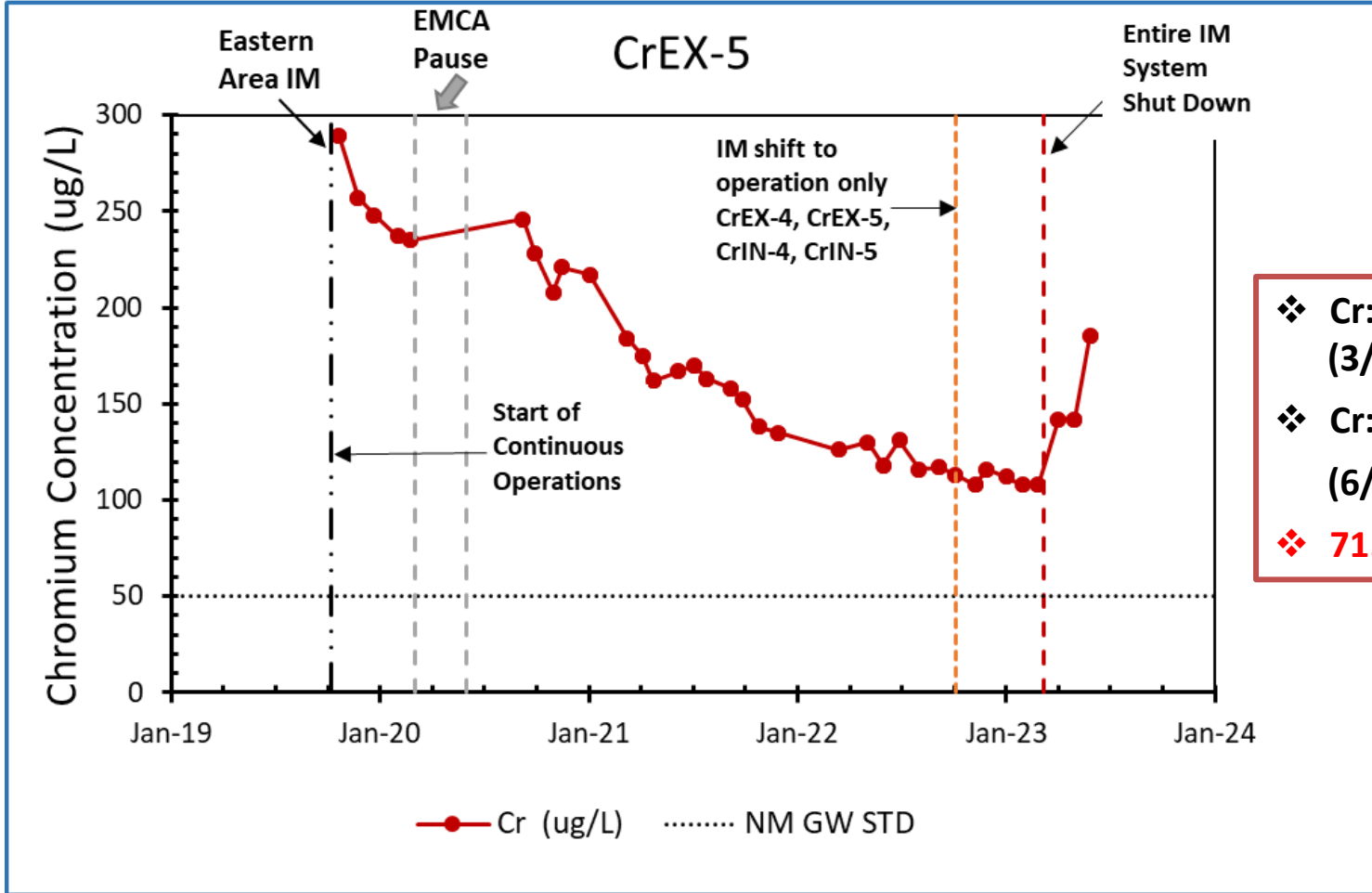
# Impact of NMED Direction: R-45, S2







# Impact of NMED Direction: CrEX-5



- ❖ Cr: 108 ug/L (3/21/2023)
- ❖ Cr: 185 ug/L (6/20/2023)
- ❖ **71.3 % increase**





## DOE'S INTERIM MEASURES OBJECTIVES

NMED Community  
Engagement Meeting  
presentation on October 21,  
2021

“The overarching assumption guiding the IM strategy is that the dominant mass and mass flux of contamination in the medial and peripheral portions of the plume is in the upper 50–60 ft of the water table in the strata with the highest hydraulic conductivity.”

- The principal objective is to achieve and maintain the downgradient chromium plume edge with a specific metric of reduction of chromium concentrations at IM monitoring well R-50 to concentrations of 50 µg/L or less over a period of approximately 3 yr.
- The principal objective has been met.
- A secondary objective is to hydraulically control plume migration in the eastern downgradient portion of the plume.
- The IM operations are in the early stages of implementation to meet the secondary objective.

7

