

Welcome

Public Information Meeting

March 14, 2013

6 pm to 8 pm



Topics

- 1. Manganese in domestic wells**
 - a. Working Group preliminary findings**
 - b. PG&E's proposed investigation workplan**
- 2. Chromium plume definition**
 - a. PG&E's proposed investigation workplan**

Manganese Investigation Update

**Preliminary Findings for
Hinkley Well Water
and Recommendations**

Problem Statement

1. In summer 2012, complaints about black water in domestic wells
2. High levels of manganese (Mn) detected in some domestic wells:
 - a. >50 ppb to >100,000 ppb above 50 ppb drinking water standard
 - b. Wells located south, west & northwest of In-situ Remediation Zone (IRZ) areas



Concern: Mn source was PG&E's IRZ areas

Formation of Manganese Working Group

Composed of:

- Water Board staff
- PG&E staff & consultants
- CAC subcommittee members
- CAC's IRP Manager (Project Navigator)
- U.S. Geological Survey staff



Data Collection

Group members provided:

- Information on Mn properties, Mn occurrences in Mojave Desert
- Mn sampling results
 - ✓ Domestic wells
 - ✓ PG&E wells
 - ✓ USGS wells
- In-situ Remediation Zone (IRZ) reports
- Western groundwater investigation report
- USGS reports with Mn data
- Models and figures of Mn data and locations
- Hinkley historical information

Hinkley Groundwater Remediation Project: Manganese Groundwater Sampling Data from Various Wells by Community Members, Lahontan Water Board, Mojave Water Agency and PG&E

Notes:

1. Mapping depicted in this Figure was produced by Project Navigator, Ltd. (PNL) from information derived from Google Earth topography.
2. Groundwater measurements for Manganese was provided by PG&E, Lahontan Water Board, and Community Member Sampling of Private Wells. This information was supplied to PNL in December, 2012.
3. Data shown was collected from both private wells (long screens and possibly screened over multiple aquifers) and PG&E dedicated monitoring wells (short screens (10 -15 ft) in upper aquifer).

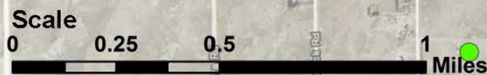
Legend: Manganese Concentrations (in ppb) Measured at Domestic and PG&E Monitoring Wells in Separate Sampling Events Conducted at Different Times by Hinkley Community Members, Lahontan Water Board, Mojave Water Agency, and PG&E. ND means Non Detect. Data shown was collected within the timeframe of August to November 2012.

Mojave Water Agency	PG&E (3Q 2012 Data Only)
● Manganese ND	● ND
● Manganese < 50 ug/L	● ND - 50
● Manganese > 50 ug/L	● 50 - 500
	● 500 - 5000
	● 5000 - 6000
	▣ Location of PG&E Compressor Station
	▭ Boundary of PG&E Upper Aquifer Plume Map (3rd Quarter, 2012 Data) for Cr6 Measurements Greater than 3.1 ppb
	▬ Fault Line
	○ PG&E Monitoring Wells not sampled for Manganese

Community
▲ ND
▲ ND - 50
▲ 50 - 500
▲ 500 - 5,000
▲ 5,000 - 144,000

Lahontan Water Board
■ ND
■ ND - 50
■ 50 - 500
■ 500 - 5,000
■ 5,000 - 144,000

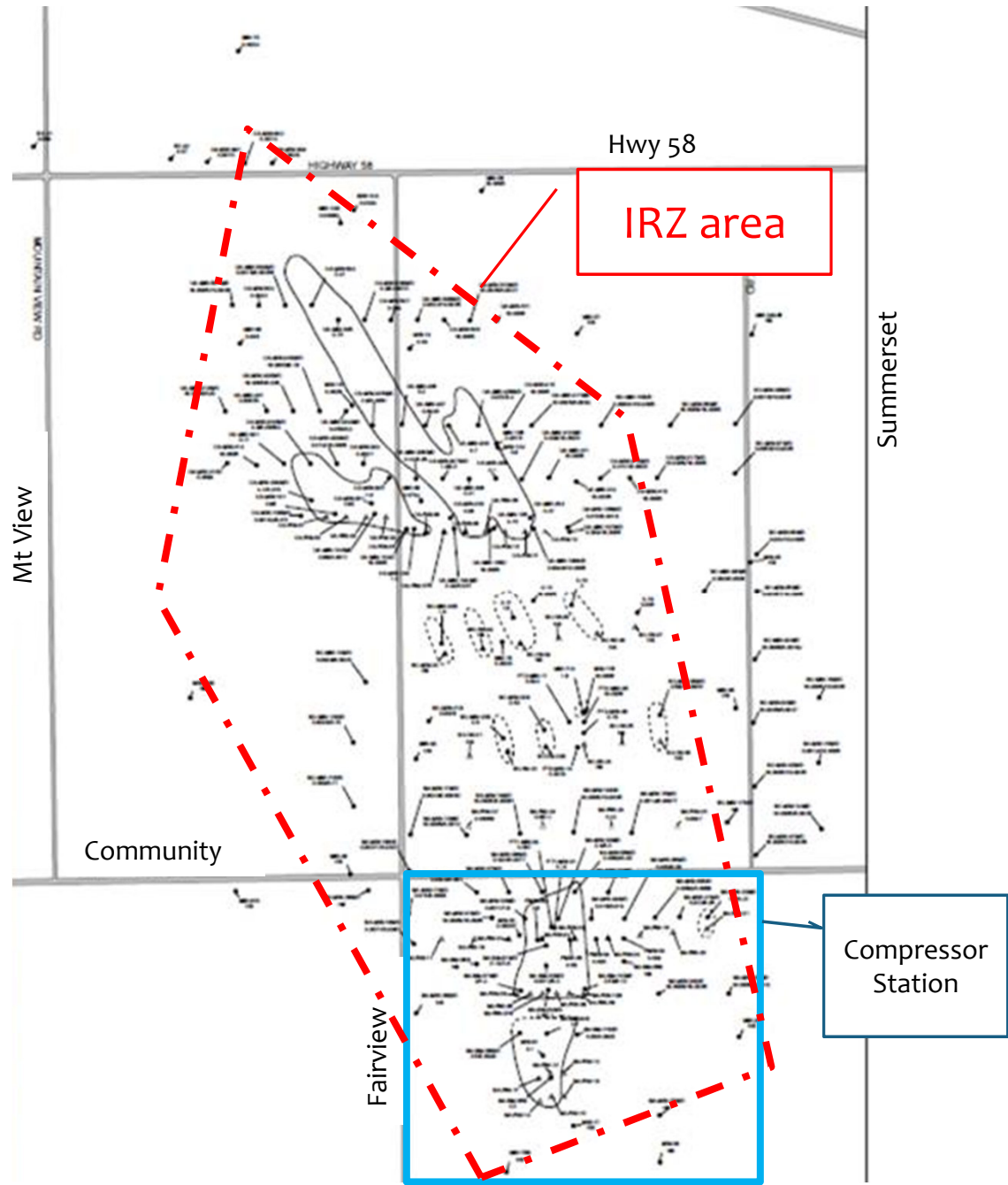
This Map of Manganese Concentrations in Groundwater was generated by Project Navigator, Ltd. (PNL) from data supplied to PNL by other parties. PNL makes no warranties as to the accuracy of the data or decisions which are made from the data.

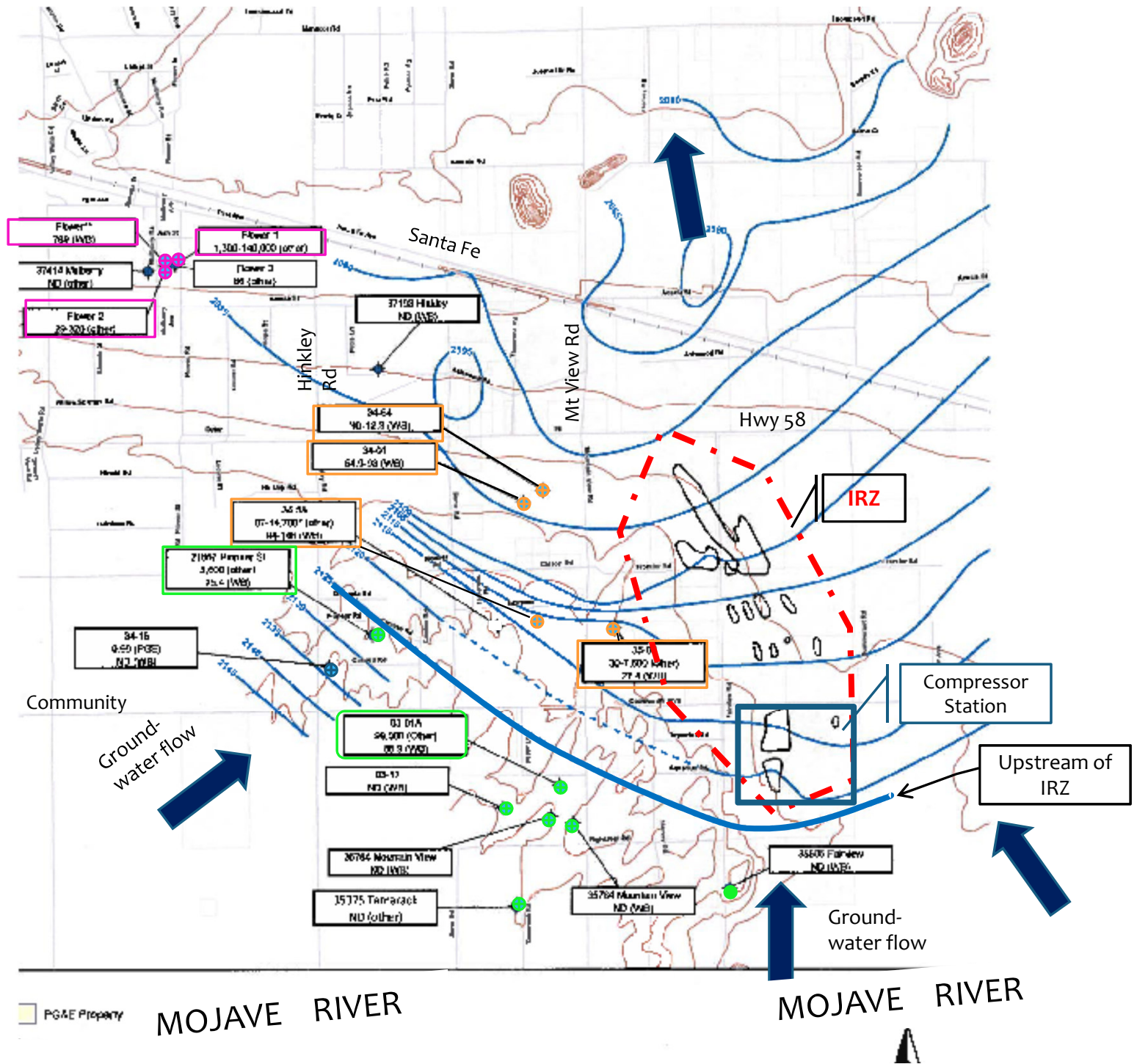


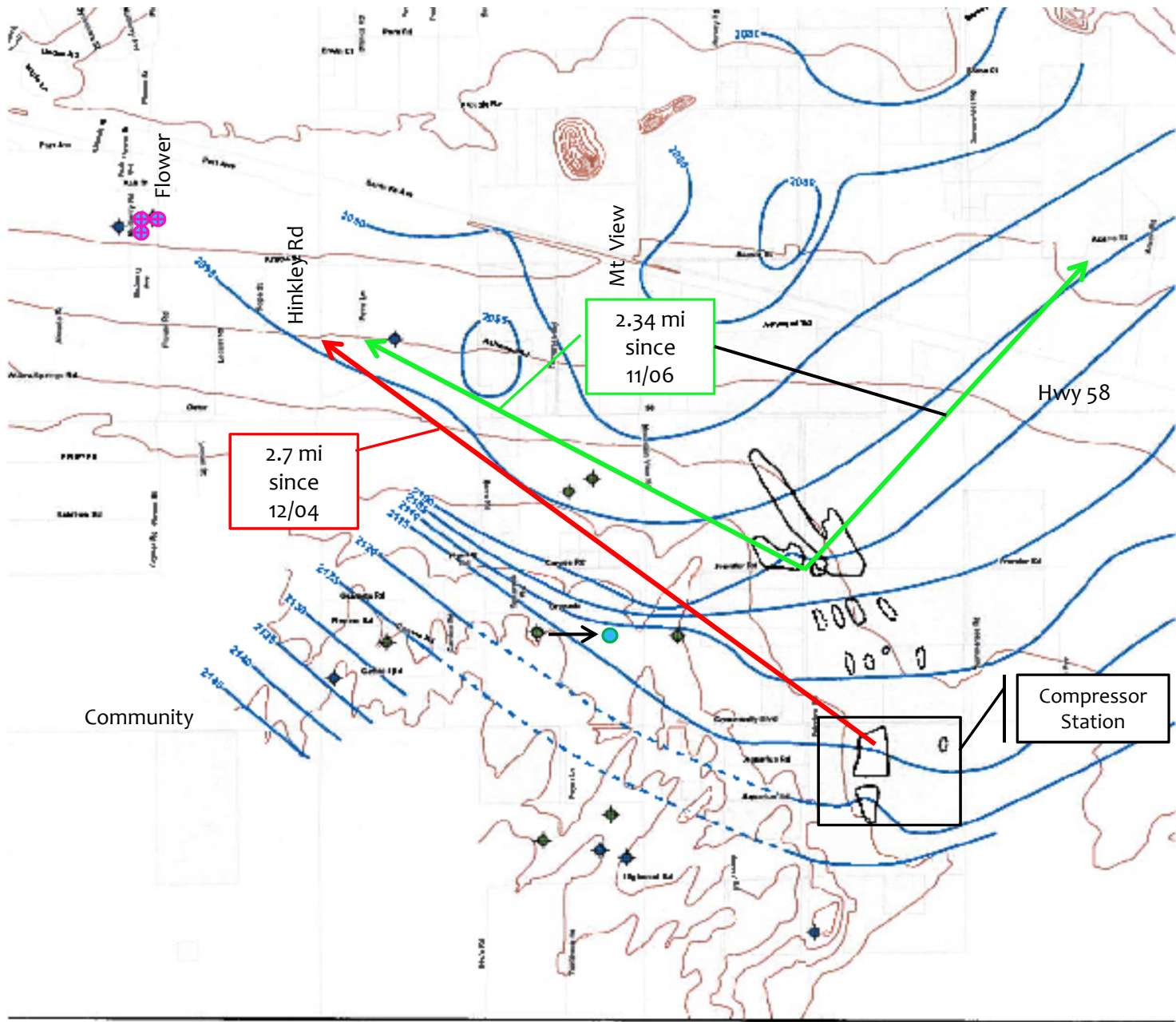
Source: Esri, I-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, Community, Copyright:© 2012 Esri, DeLorme, NAVTEQ, TomTom



Map of Manganese byproduct plumes in PG&E's In-situ Remediation Zone (IRZ)

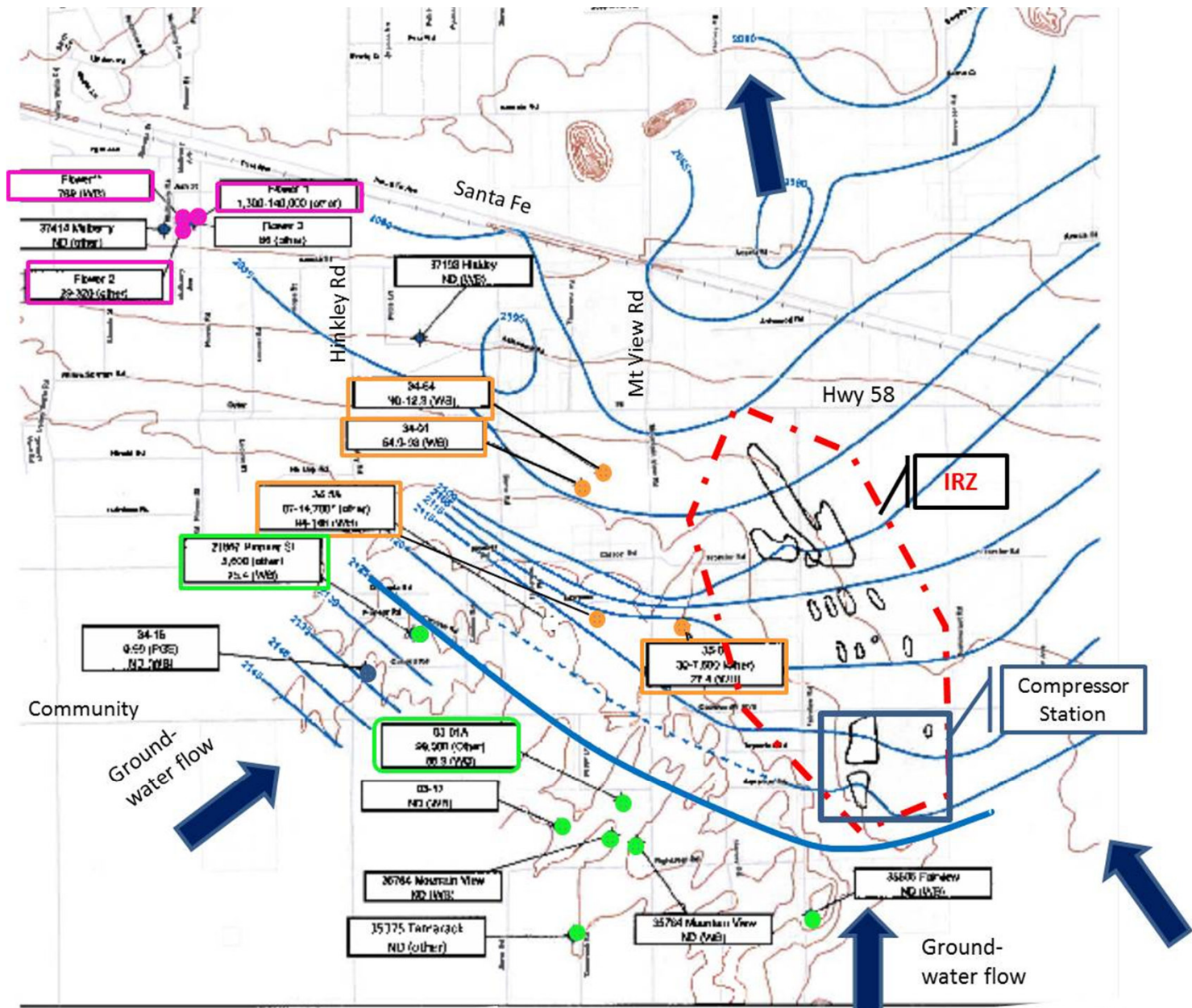






Preliminary Findings

- 1. Domestic wells with Mn not likely related to IRZ areas:**
 - In groundwater “upstream” of IRZ areas (to south and southwest), green dots**
 - In groundwater too far from IRZ for Mn migration (to northwest), pink dots**



PG&E Property

MOJAVE RIVER

MOJAVE RIVER



0 2,300






Preliminary Findings

2. Relationship of domestic wells to IRZ areas needing further investigation:
 - 4 wells to west and northwest of IRZ areas, orange dots

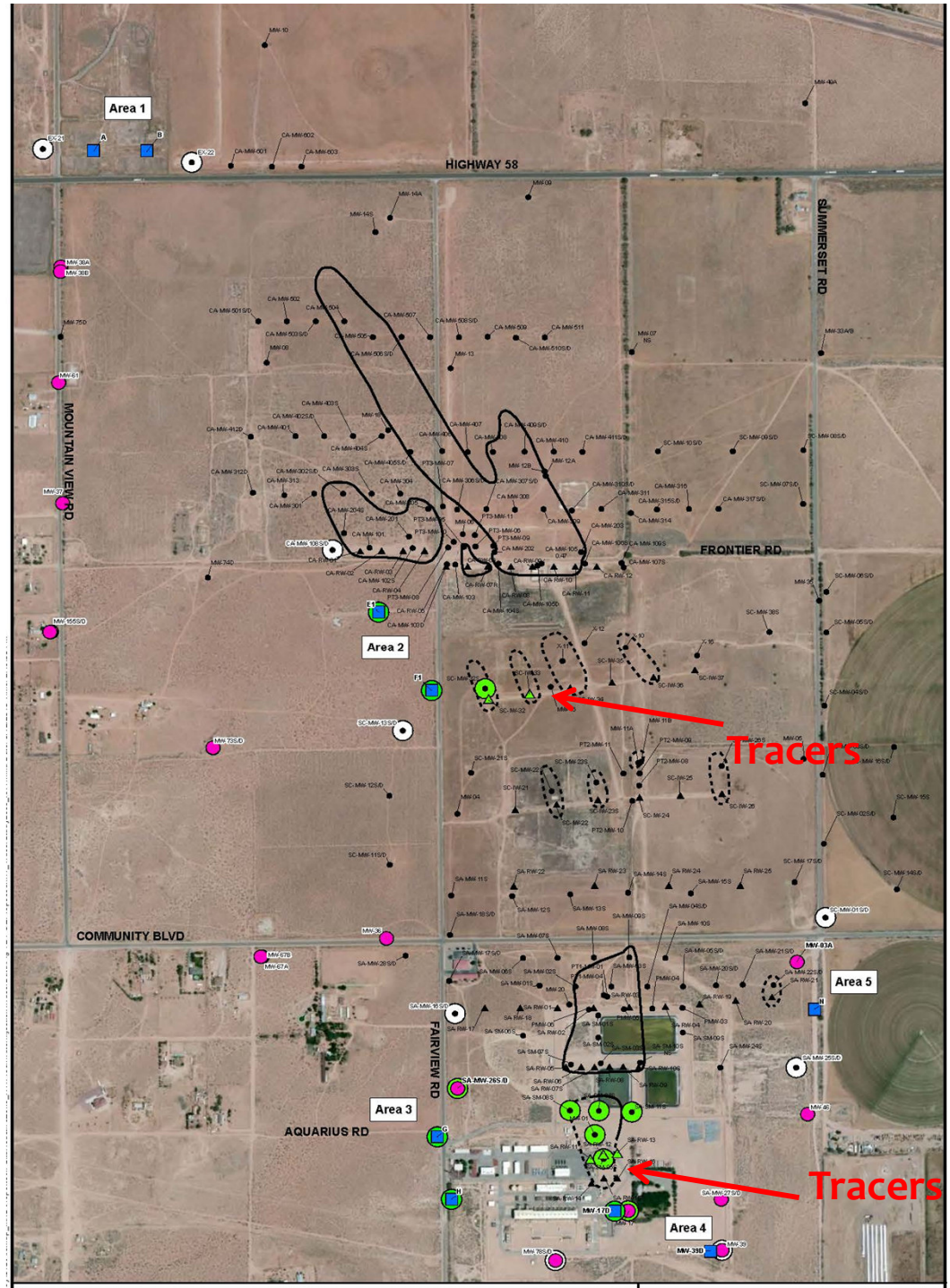
Investigations involve:

- a. Monitoring well sampling for Mn (reported quarterly)
- b. Adding more monitoring wells in IRZ areas to reduce gaps
- c. Conduct two tracer tests along IRZ western boundary
- d. Results for b. and c. to be reported in October 2013

Map of PG&E's Workplan for Manganese Investigation

-  Existing Monitoring Wells (MWs)
-  Existing MWs added to sampling
-  New Proposed MWs
-  Tracer Injection Well
-  MWs for Tracer Study

Mn byproduct plume



Possible Causes of Black Water

High levels of Mn in groundwater together with aeration of water

- **Plumbing fixtures (showerheads, faucets)**
- **Large capacity pumps**



Reducing Exposure to Manganese in Well Water

1. **Drink and cook with bottled water**
2. **Take one or more actions for domestic wells:**
 - a. **Sanitize well to remove bacteria**
 - b. **Clean or change out indoor faucets**
 - c. **Change pump depth**
 - d. **Redevelop well**
 - e. **Install wellhead treatment with manganese-specific filter**
 - f. **Install new well with screen at different depths**



Questions?

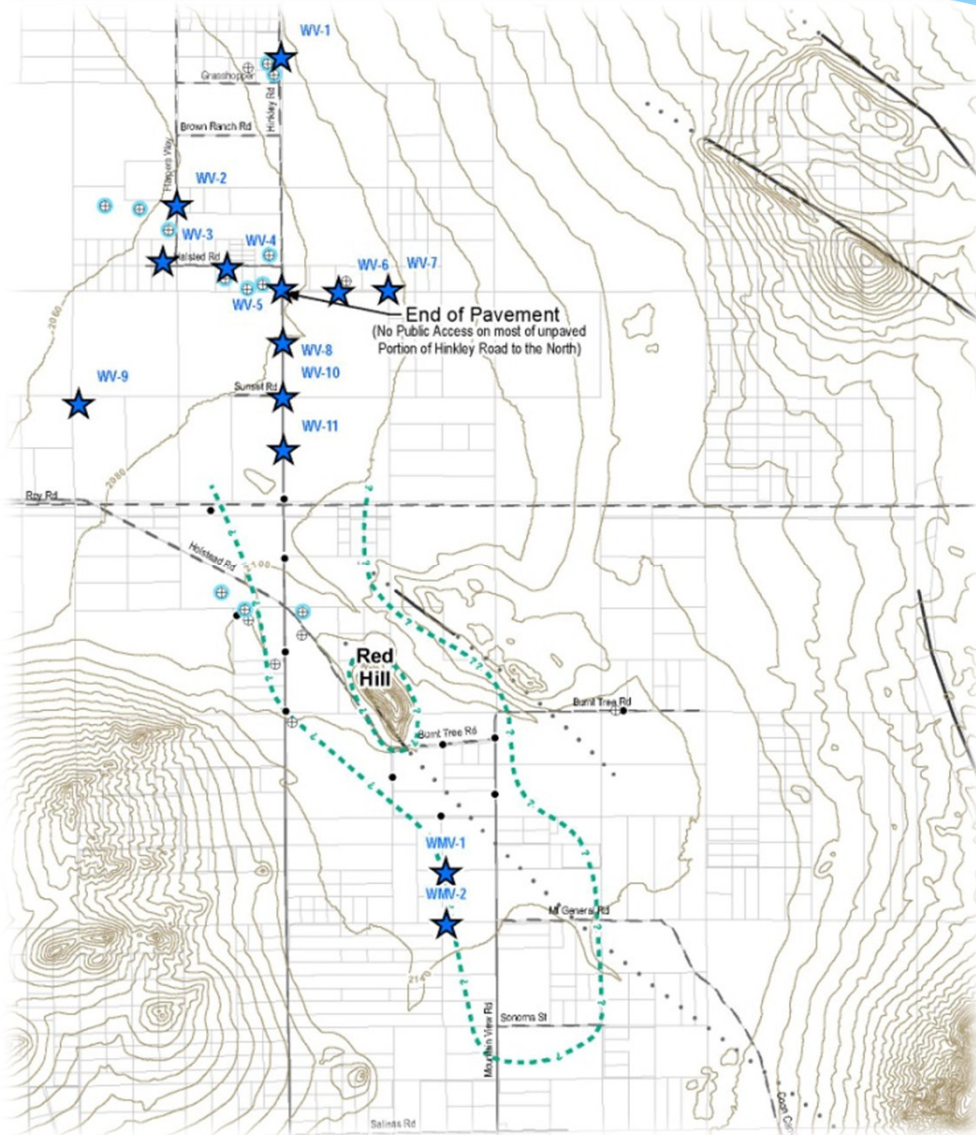


Chromium Plume Definition Workplan

Cleanup and Abatement Order by Water Board, issued January 8, 2013

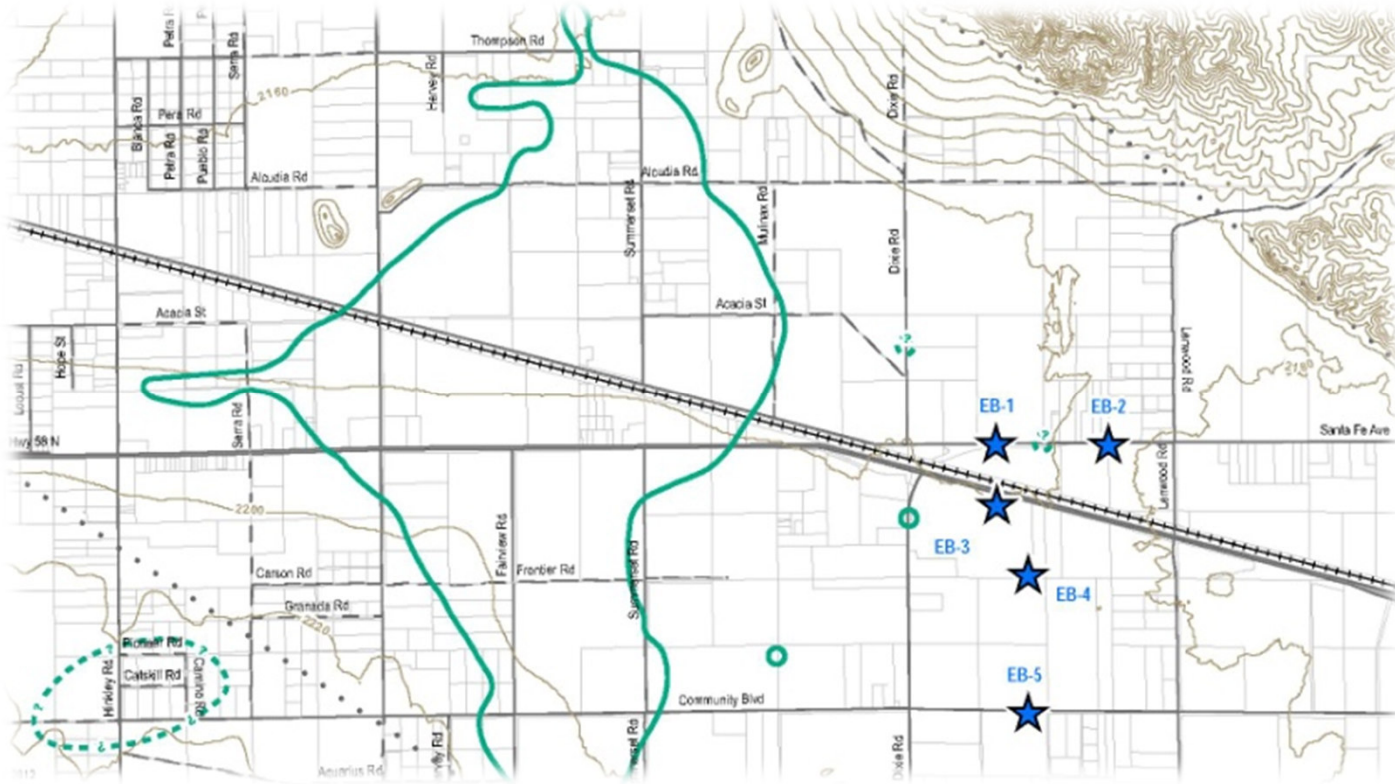
- 1. Required chromium plume definition:**
 - in north
 - In east
- 2. Required monthly domestic well sampling to determine additional areas needing monitoring wells.**
- 3. Report due October 30, 2013.**





★ Northern area proposed monitoring wells

★ Eastern area proposed monitoring wells



Chromium Plume Definition Workplan

In place of monthly domestic well sampling for increasing trends over 6 months, PG&E proposes to install more monitoring wells near domestic wells not already covered by monitoring wells.

Board staff considering this proposal because:

- Less intrusive upon residents in homes
- Achieves goal of installing more monitoring wells
- Acquire aquifer data from monitoring wells sooner

Questions?

