



# Proposed Plan for Groundwater Remediation at NASA's Jet Propulsion Laboratory

Steven Slaten, NASA Remedial Project Manager

Merrilee Fellows, NASA Manager for Community Involvement

## Purpose of the Meeting:

Describe NASA's Proposed Plan for the Final  
Groundwater Cleanup and Obtain Public Comment

# Presentation Summary

- Background and History
- Current Treatment Activities
- Proposed Plan for the Final Remedy for Groundwater

# History

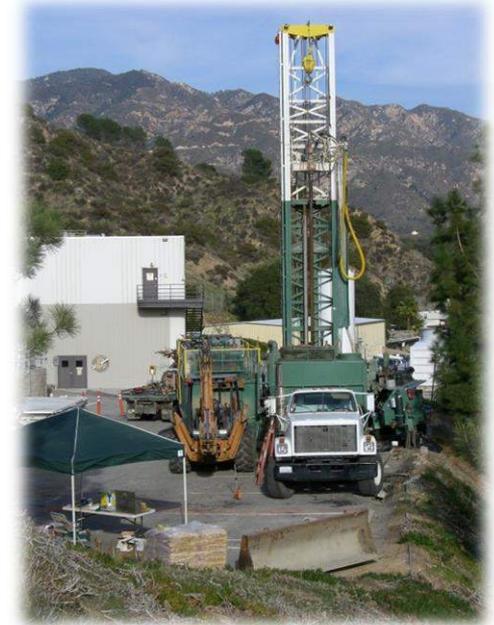
- WWII – U.S. Army started what is now JPL to develop and test rockets
- December 1958 – NASA takes over control of JPL from the Army
- 1980s and 1990s – Chemicals discovered in off site groundwater
- October 1992 – JPL placed on the National Priorities List (NPL). All investigation and cleanup activities governed by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)



**In the 1930s and during the years of World War II, the area that is now JPL was a site for testing some of the first rockets.**

# What Have We Done?

- 1990 – NASA funds water treatment plant to remove VOCs from four City of Pasadena production wells (Arroyo Well, Well 52, Ventura Well, and Windsor Well)
- 1992 – NASA funds water treatment plant to remove VOCs from two Lincoln Avenue Water Company (LAWC) production wells (LAWC#3 and LAWC#5)
- 1994 to Present – Extensive investigation and sampling
  - » Drilled more than 40 soil borings and installed 35 soil vapor wells with 200 discrete sampling locations, resulting in a database of more than 1,500 samples
  - » Installed 26 wells with 82 discrete sampling locations (both on-facility and off-facility) and conducted 72 quarterly groundwater sampling events since 1996, providing a database of more than 30,000 samples



# What Have We Done (Cont.)?

- 1998 to 2007 – On-site soil cleanup completed
- 2004 – NASA funded 2,000 gpm ion exchange system at LAWC to remove perchlorate
- 2005 – NASA completed construction of an onsite (i.e., source area or OU-1) treatment system to address the perchlorate and VOCs at the JPL Site
- 2007 – Source area treatment system began operating at full capacity
- 2007 – Final Interim Record of Decisions completed for OU-1 (on-site) and OU-3 (off-site) Groundwater
- July 2011 – Completed construction of the City of Pasadena Monk Hill Treatment System (MHTS), operation begins



# Where Are We Now?

- February 2012 – Completed the First Five-Year Review for the JPL CERCLA Site, which showed the systems operating effectively
- June 2014 – Completed the Final Focused Feasibility Study for on-site and off-site groundwater (OU-1 and OU-3)
- November 2014 – Proposed Plan for the Final Groundwater Remedy available for Public Review and Comment



## INTRODUCTION

National Aeronautics and Space Administration (NASA) has been conducting environmental investigations and cleanup activities at the Jet Propulsion Laboratory (JPL) in Pasadena, CA for more than two decades. These activities have been performed under the *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*<sup>1</sup>. NASA has already implemented several cleanup initiatives to accelerate remediation of groundwater and soils while considering options for the final remedy. Specifically, three groundwater treatment plants are already operating and cleaning up groundwater: one treatment plant is treating water from two Lincoln Avenue Water Company (LAWC) wells in Altadena, the Monk Hill Treatment System (MHTS) is treating water from four City of Pasadena wells (Arroyo Well, Well 52, Ventura Well, and Windsor Well), and a third treatment plant located within the JPL fence line is operating to clean water directly underneath JPL. NASA has completed a Focused *Feasibility Study* to evaluate the overall effectiveness of these groundwater *interim actions* and to determine whether additional cleanup measures are required for on-facility and off-facility groundwater. In addition, the existing three-system treatment alternative is compared to a *no-action alternative*, which is required by the *National Oil and Hazardous Substances Pollution Contingency Plan (NCP)* and CERCLA to serve as the baseline condition for comparison with other remedial alternatives.

This *Proposed Plan* outlines NASA's *preferred alternative* to conduct a remedial action for cleaning up the on-facility groundwater beneath JPL (*Operable Unit [OU]1*), as well as the off-facility groundwater (OU3). Under the preferred alternative, NASA would continue the effective interim remedies currently underway, and continue the groundwater monitoring program. NASA's preferred alternative also includes the addition of *institutional controls (ICs)* to restrict access to chemicals in groundwater originating from JPL. As the lead agency, NASA is required to issue the Proposed Plan to

## PUBLIC MEETING AND COMMENT PERIOD MARK YOUR CALENDAR

**Public Comment Period:** November 3 - December 3, 2014  
**Public Meeting:** 7 to 9 p.m., November 12, 2014 at the Altadena Senior Center, 560 E. Mariposa St., Altadena

NASA invites public comment on the actions described in this Proposed Plan. Supporting technical documents (including the *Remedial Investigation* report and Focused Feasibility Study) are available in the *Administrative Record* file by visiting any of the public *information repositories* listed on the last page of this summary or at the NASA JPL Groundwater Cleanup website: <http://JPLwater.nasa.gov>.

The public can also call (818) 393-0754 for information.

Comments on NASA's Proposed Plan may be submitted electronically to [mfellows@nasa.gov](mailto:mfellows@nasa.gov) or by mail to the attention of Merrilee Fellows, NASA Manager for Community Involvement, Jet Propulsion Laboratory, NASA Management Office, 180-801, 4800 Oak Grove Drive, Pasadena, CA 91109.

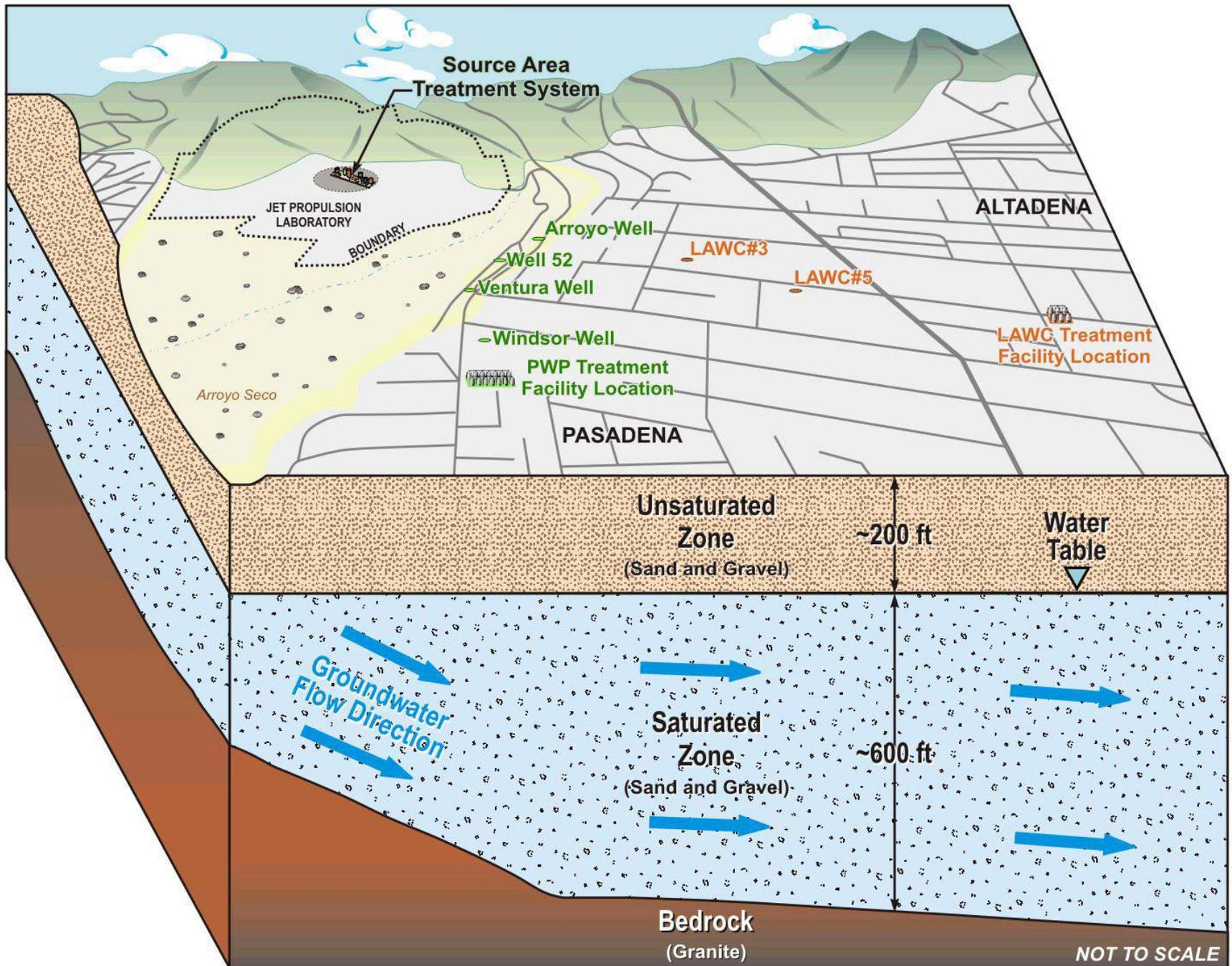
No specific format for the comments is necessary. All comments must be submitted either electronically before midnight on December 3, 2014, or the comments must be postmarked no later than December 3, 2014. Oral and written comments will be accepted at the public meeting and NASA will prepare a transcript of the meeting.

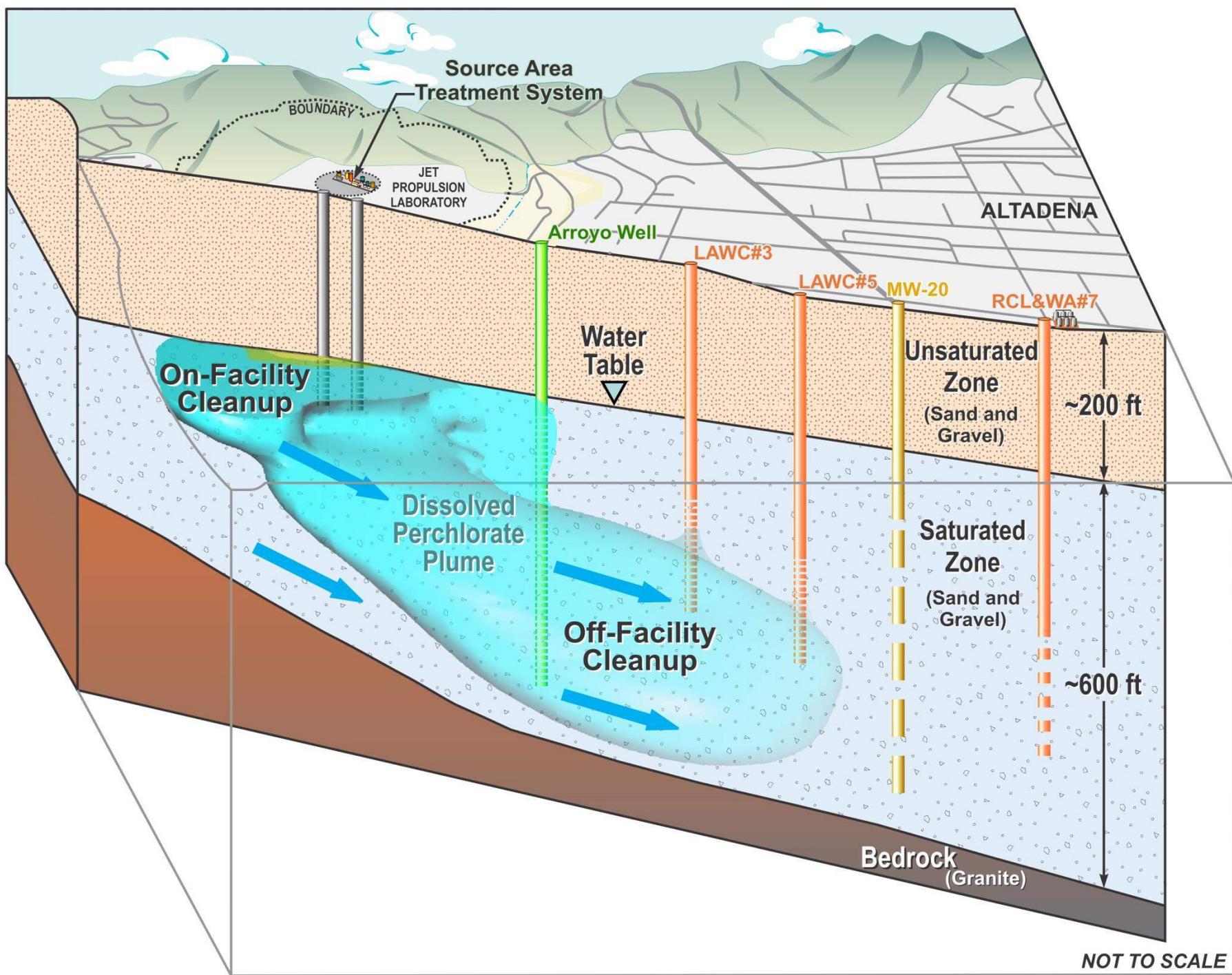
fulfill requirements under CERCLA §117(a) and NCP §300.430(f)(2).

NASA will make a final decision on the proposed cleanup remedy after reviewing and considering all information submitted during a 30-day public comment period. NASA may modify its preferred alternative based on public comments, before issuing a *Record of Decision (ROD)*.

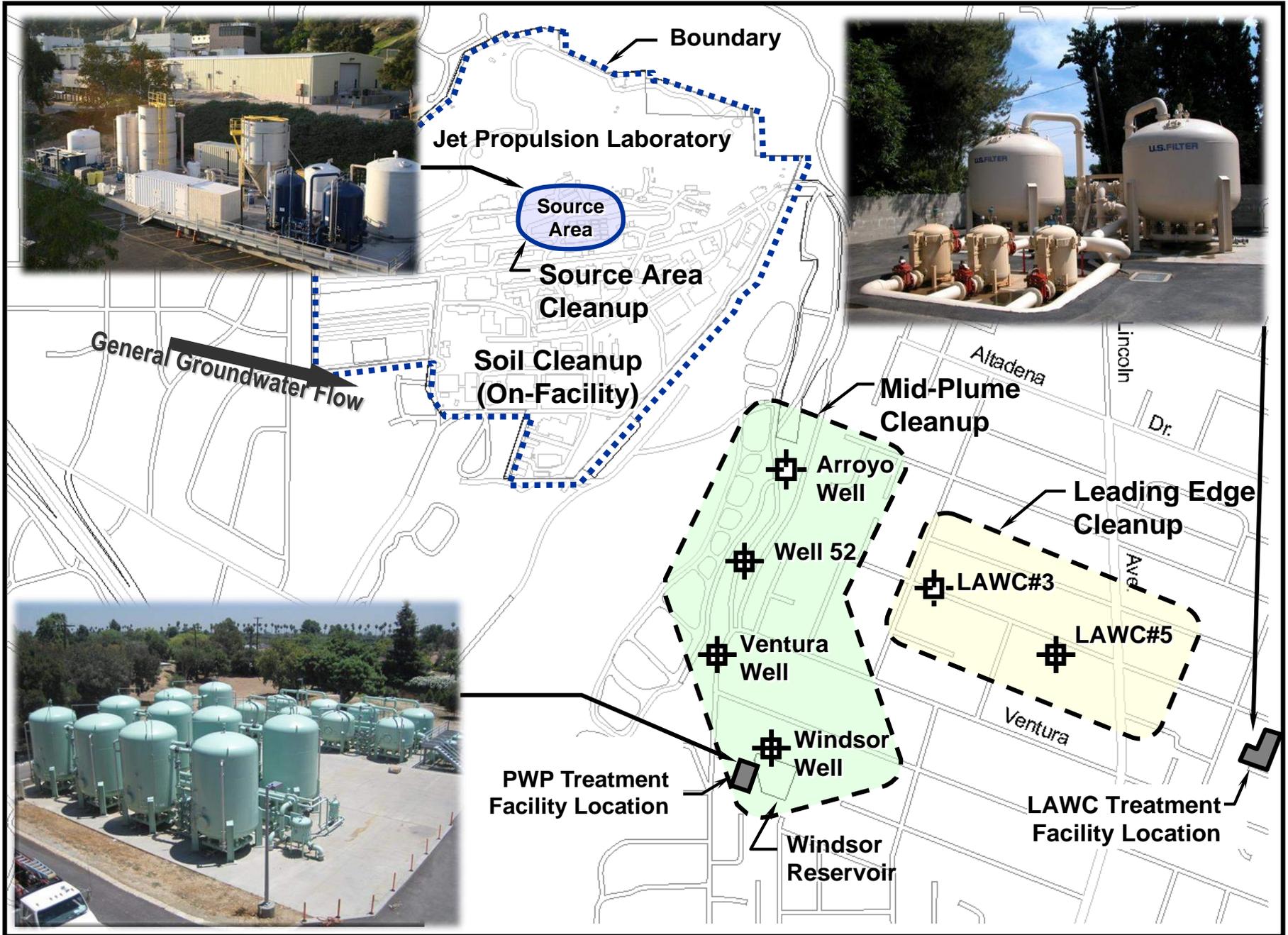
<sup>1</sup> Definitions of *italicized words* are in the glossary on pages 14 and 15.



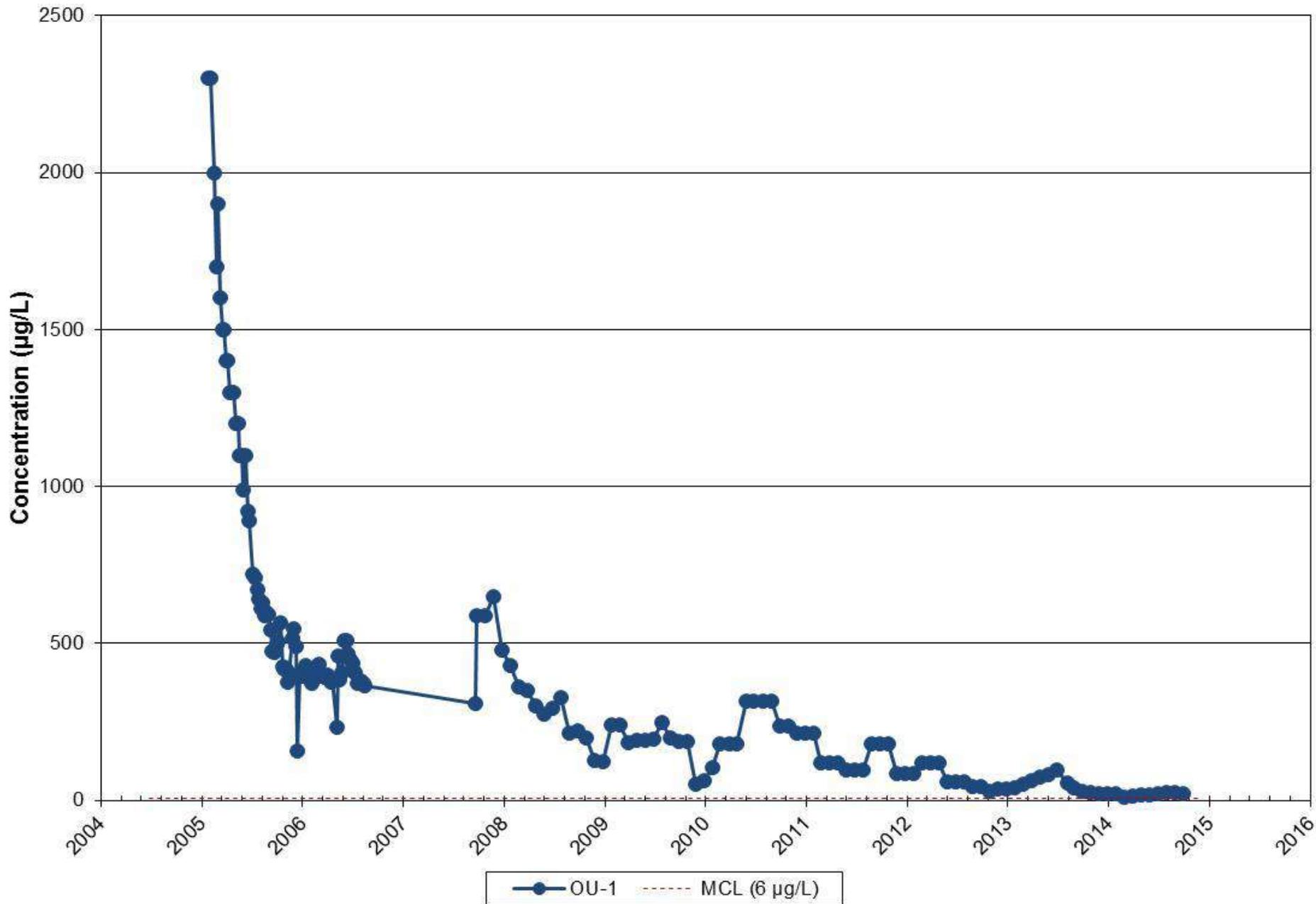




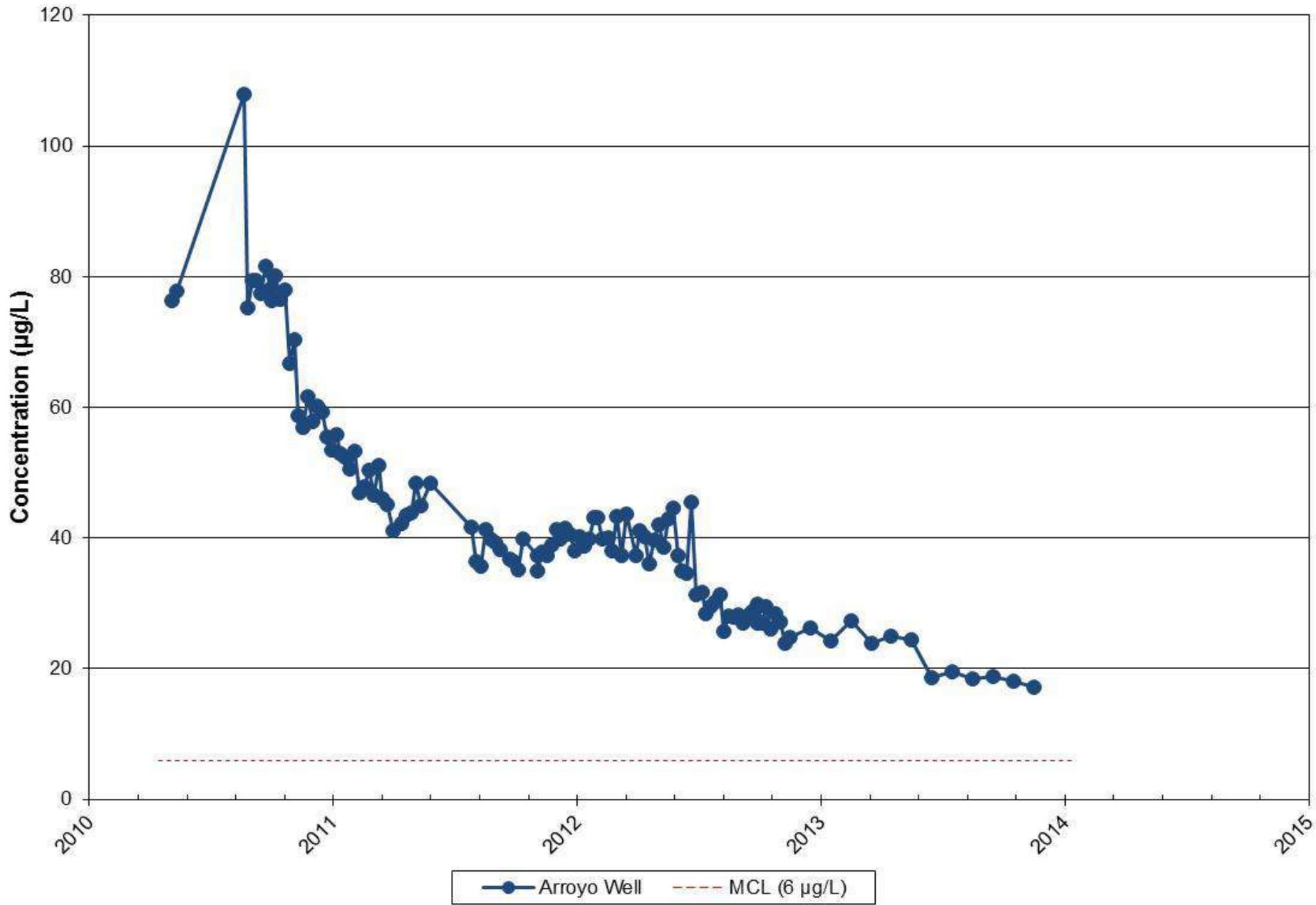
NOT TO SCALE



# Perchlorate Concentrations - Source Area



# Perchlorate Concentrations - Mid-Plume (Arroyo Well)



# Remedial Action Objectives...Clean it up

- Continue to protect human health and the environment by preventing exposure to VOCs (carbon tetrachloride and TCE) and perchlorate in groundwater originating from JPL.
- Continue to prevent further migration of carbon tetrachloride, TCE, and perchlorate beyond the current extent.
- Restore unrestricted beneficial use of groundwater containing VOCs and perchlorate originating from JPL

## Cleanup Goals

### Drinking Water Standard

- Carbon Tetrachloride = 0.5 ppb (California MCL)
- Perchlorate = 6 ppb (California MCL)
- Trichloroethylene = 5 ppb (Federal and California MCL)

# Focused Feasibility Study: Alternatives Evaluated

- The current source area system, LAWC system, and the MHTS are operating effectively and are fully protective of human health and the environment
- In situ remedies evaluated and determined to not be effective
- Current three-system approach evaluated against the No-Action Alternative on nine criteria:
  - » *Overall Protection of Human Health and the Environment*
  - » *Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)*
  - » Long-Term Effectiveness and Permanence
  - » Reduction of Toxicity, Mobility, or Volume Through Treatment
  - » Short Term Effectiveness
  - » Implementability
  - » Cost
  - » State Acceptance
  - » Community Acceptance

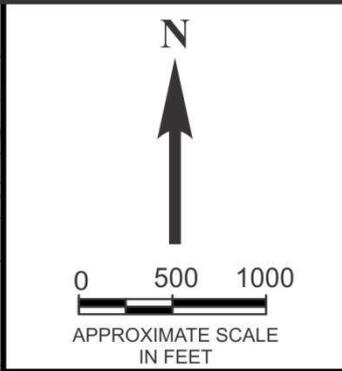
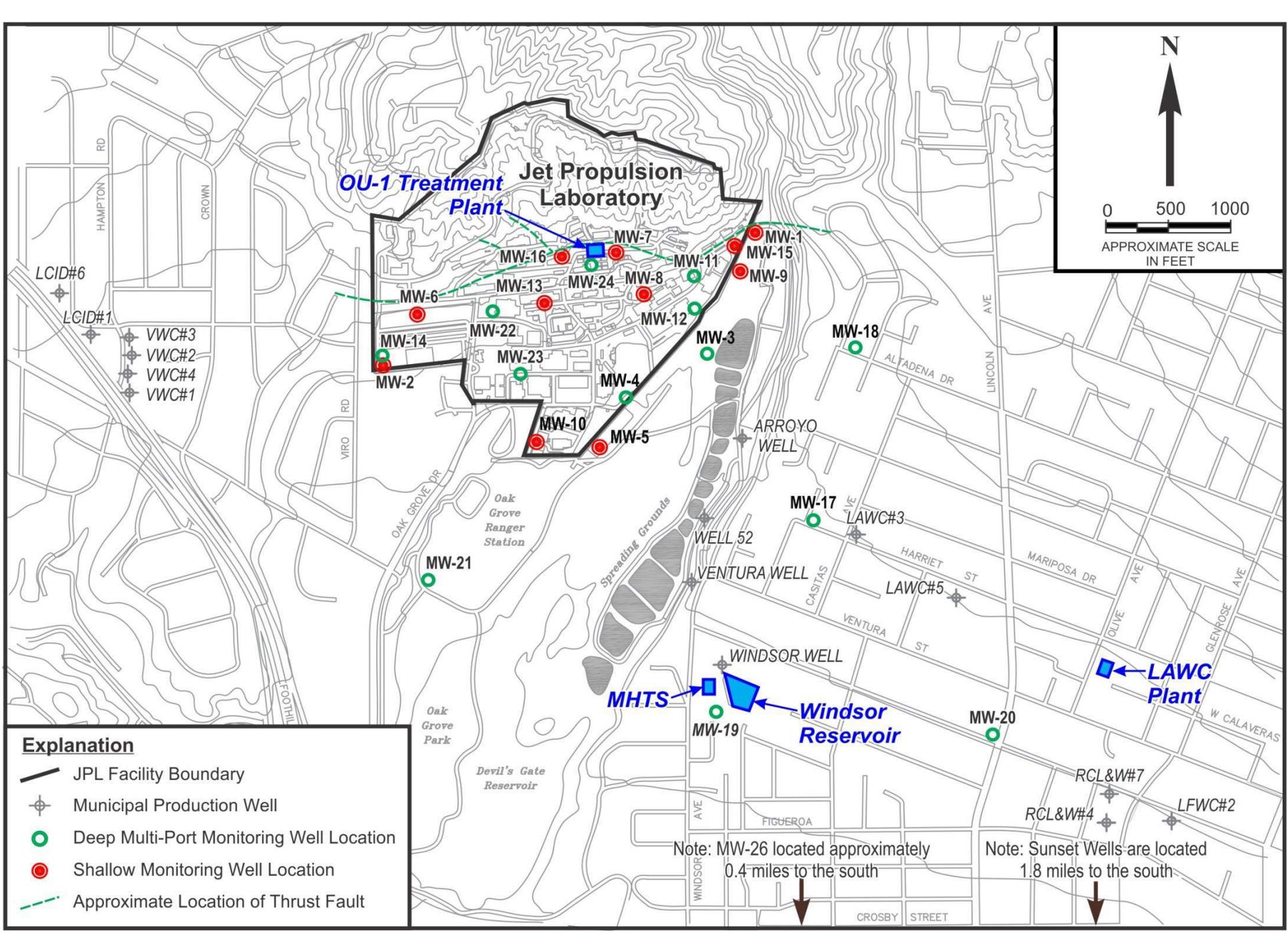
# Final Remedy for Groundwater

- Continue operation of the three treatment systems until cleanup goals are achieved
- Addition of formalized institutional controls – these will be legal agreements with the Raymond Basin Management Board and/or the California State Water Resources Control Board that would require coordination with NASA to evaluate the impact and protectiveness if a new well were going to be installed near JPL
- Continue ongoing groundwater monitoring

# Path Forward

- Proposed Plan and Public Comment Period – November 3, 2014 through December 3, 2014
- Final Record of Decision (ROD) – 2015
- Cleanup Complete – 2030





- Explanation**
- JPL Facility Boundary
  - Municipal Production Well
  - Deep Multi-Port Monitoring Well Location
  - Shallow Monitoring Well Location
  - Approximate Location of Thrust Fault

Note: MW-26 located approximately 0.4 miles to the south

Note: Sunset Wells are located 1.8 miles to the south