

# Some Perspectives on the Proposed Cleanup & Abatement Order (CAO) from the IRP Manager

**November 4, 2015**  
**Barstow, CA**

*Prepared for*

**Lahontan Regional Water Quality Control Board**

*Prepared by IRP Manager*

**Dr. Ian A. Webster,**

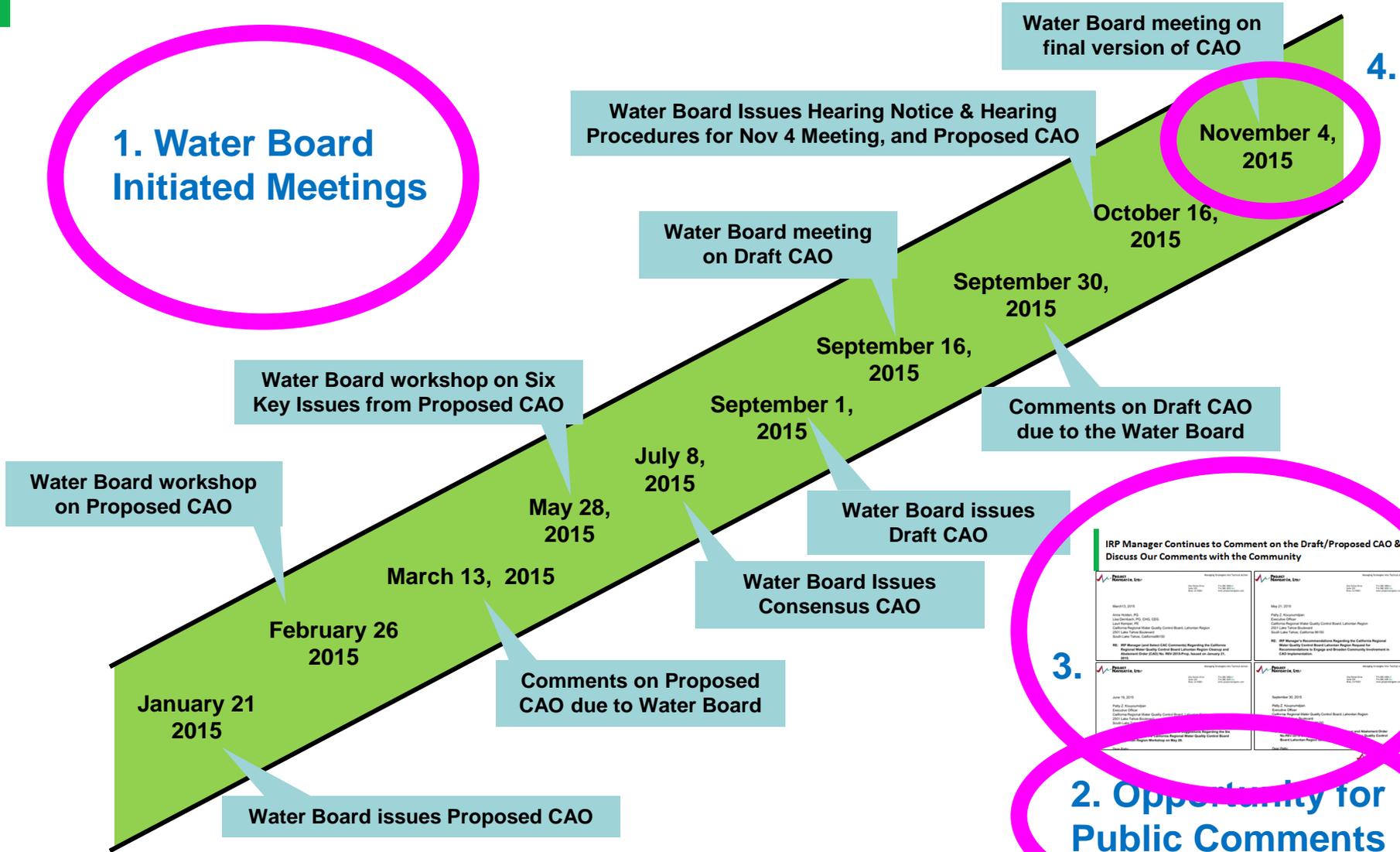
**Dr. Halil Kavak & Dr. Raudel Sanchez**





# A Year Long "Process" has Been Underway to Develop a Comprehensive Cleanup and Abatement Order (CAO)

**1. Water Board Initiated Meetings**



**3.**

**2. Opportunity for Public Comments**

IRP Manager Continues to Comment on the Draft/Proposed CAO & Discuss Our Comments with the Community

<p>March 3, 2015</p> <p>IRP Manager, P.O. Box 100000, Sacramento, CA 95834-0000</p> <p>Comments on Proposed CAO due to Water Board</p>	<p>May 21, 2015</p> <p>IRP Manager, P.O. Box 100000, Sacramento, CA 95834-0000</p> <p>Comments on Draft CAO due to the Water Board</p>
<p>June 10, 2015</p> <p>IRP Manager, P.O. Box 100000, Sacramento, CA 95834-0000</p> <p>Comments on Draft CAO due to the Water Board</p>	<p>September 30, 2015</p> <p>IRP Manager, P.O. Box 100000, Sacramento, CA 95834-0000</p> <p>Comments on Draft CAO due to the Water Board</p>

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# A Long and Transparent CAO Writing, Discussion & Adoption Process...

1. **Two Major Workshops in Barstow**
2. **30** Community and CAC Meetings and Discussions from January to October, 2015
3. 4 Comment Letters from the IRP Manager to the Water Board
4. **Community's Understanding of the Significance and Long-term Nature of the CAO**
5. Stakeholder Appreciation of the CAO Drafting Challenge
6. Monitoring Requirements
7. **Plume Definition in Upper Aquifer**
  - "Sufficient Resolution" & "Best Professional Judgment"
8. Treatment Approaches: South and North
9. Use of **Adaptive Management** (e.g. see Section V-F in CAO of 9/1/15)
10. Upper Aquifer Clean Up Goals: Timeframes to 50ppb & 10ppb
11. Replacement Water
12. Lower Aquifer
13. **Realization of the Importance of USGS Background Study (BGS)**



# ...with Many Meetings, Frank Discussions and Opportunities for Participation and Comment.



**Weekly Thursday Night Meetings with the CAC and Other Interested Community Members**



**Water Board CAO Workshop on May 28, 2015 in Barstow**



**Hinkley Community Meeting Discussing the Proposed CAO**



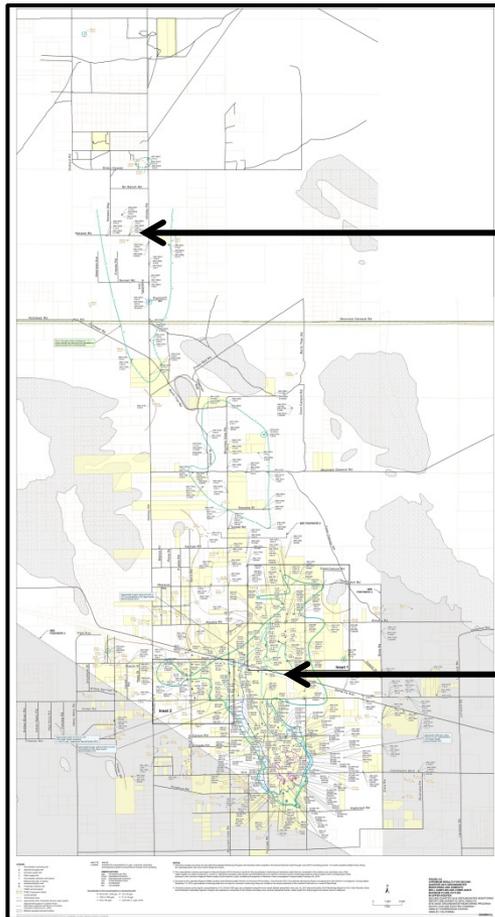
**Water Board Presents the Proposed CAO to the Community in January 2015**

# Some Comments for Your Consideration...

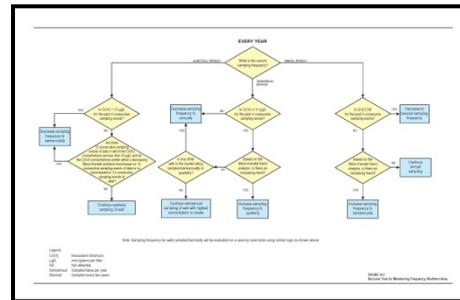
- **Cr6 Plume Monitoring and Reporting Plan (MRP)**
  - Plume Definition
  - The Role of the USGS Background Study
- **Conclusions & Recommendations**

# Sampling Frequency under the CAO, per the MRP, Assures "Protectiveness"

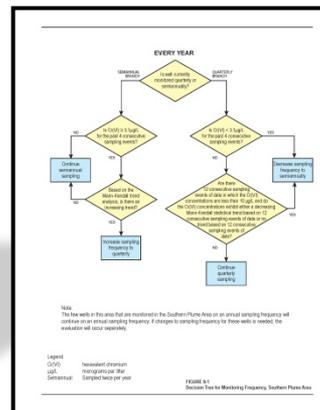
Over 500 monitoring and 90 domestic wells sampled during the 2<sup>nd</sup> Quarter 2015.



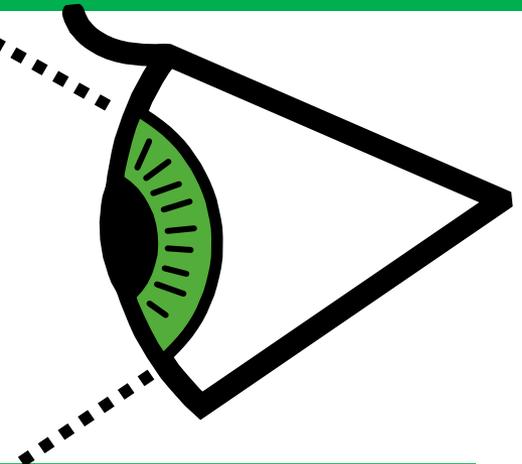
### Northern Plume Decision Tree



### Southern Plume Decision Tree



Community has reached a "comfort level" with the new monitoring requirements.



Well monitoring and sampling frequency is based on decision trees

Q2, 2015  
Plume Shape

# The Challenges of Cr6 Plume Mapping

Lynx Cat Mountain

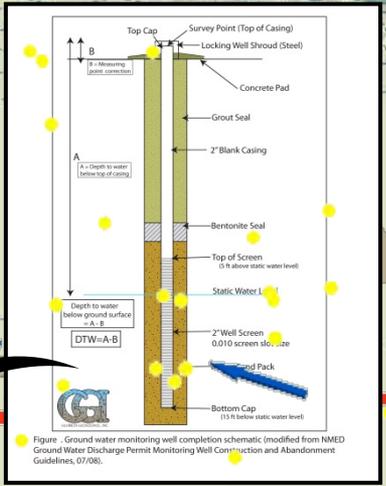
5. ...but today, PG&E and the Water Board has more information available to contour rather than just joining dots, such as; GW flow direction, modeling, geological cores, and new information flowing from USGS's BGS.

4. ...Contour Plume: via a > 3.1 ppb Cr6 "Join-the-Dots" Method...

3. Add > 500 dedicated monitoring well points in the Valley...to....

2. Measure Cr6 concentrations via properly screened, engineered dedicated MWs.

1. Historical release area



Hwy 58 Realignment

IRP Manager's Office

Hinkley Senior and Community Center

# The Challenges of Cr6 Plume Mapping

Lynx Cat Mountain

Red Hill

Mount General

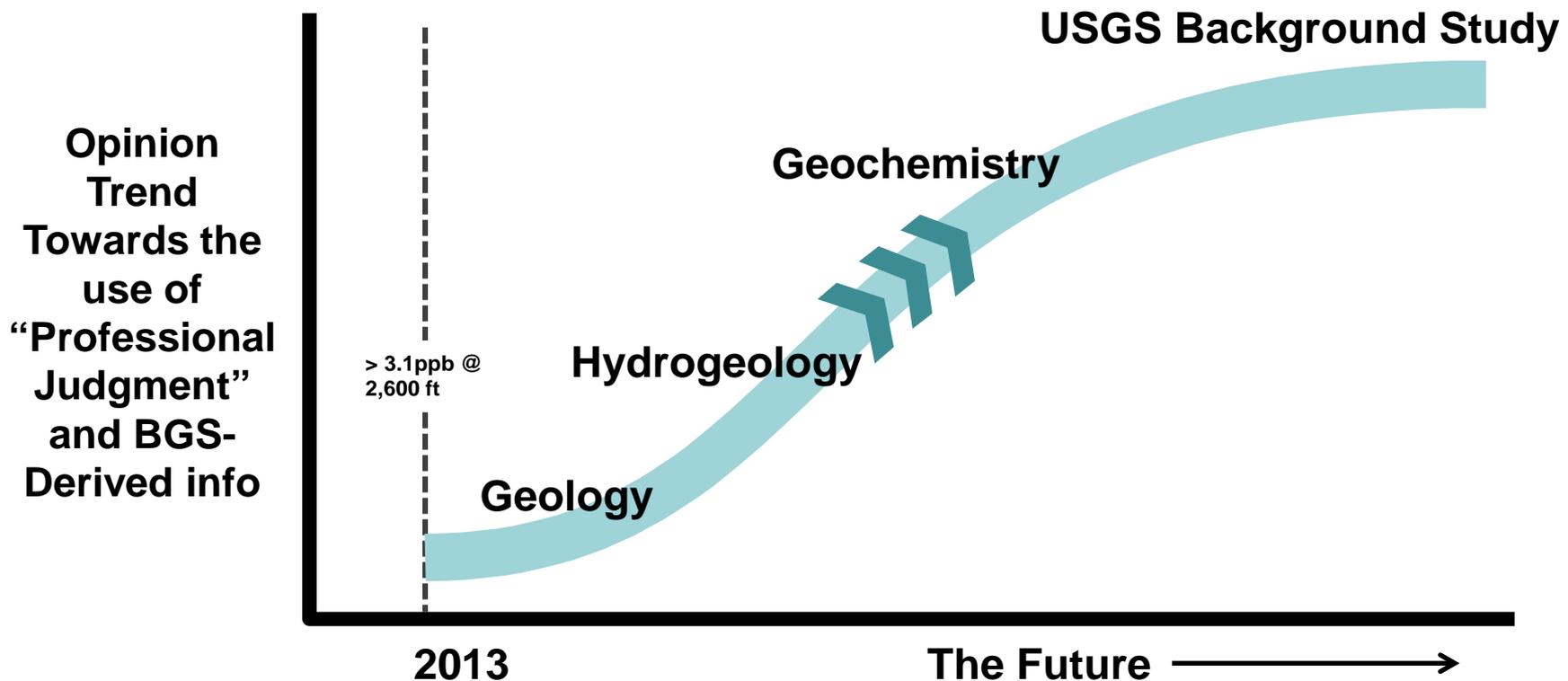
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To emphasize, today, PG&E and the Water Board has more information available to contour rather than just joining dots,

such as; GW flow direction, modeling, geological cores, and new information flowing from USGS's BGS.

The concern has been **when** to incorporate "new information" using "professional judgement."

# 1. There Should be a *Trend Towards* the Use of “Professional Judgment” in Contouring the PG&E Cr6 Discharge





# Summing Up...

## ■ Key Facts

- Plume currently drawn via a “join-the-dots” approach if Cr6 > 3.1ppb background number set in 2007
- Generally, generates a South and North plume
- PG&E has introduced an interpretive plume, based on more recent fact finding and professional judgment

## ■ Opinions

- Advisory Team’s comments allow for the introduction of “best professional judgment” Vs join the “well-dots >3.1” approach

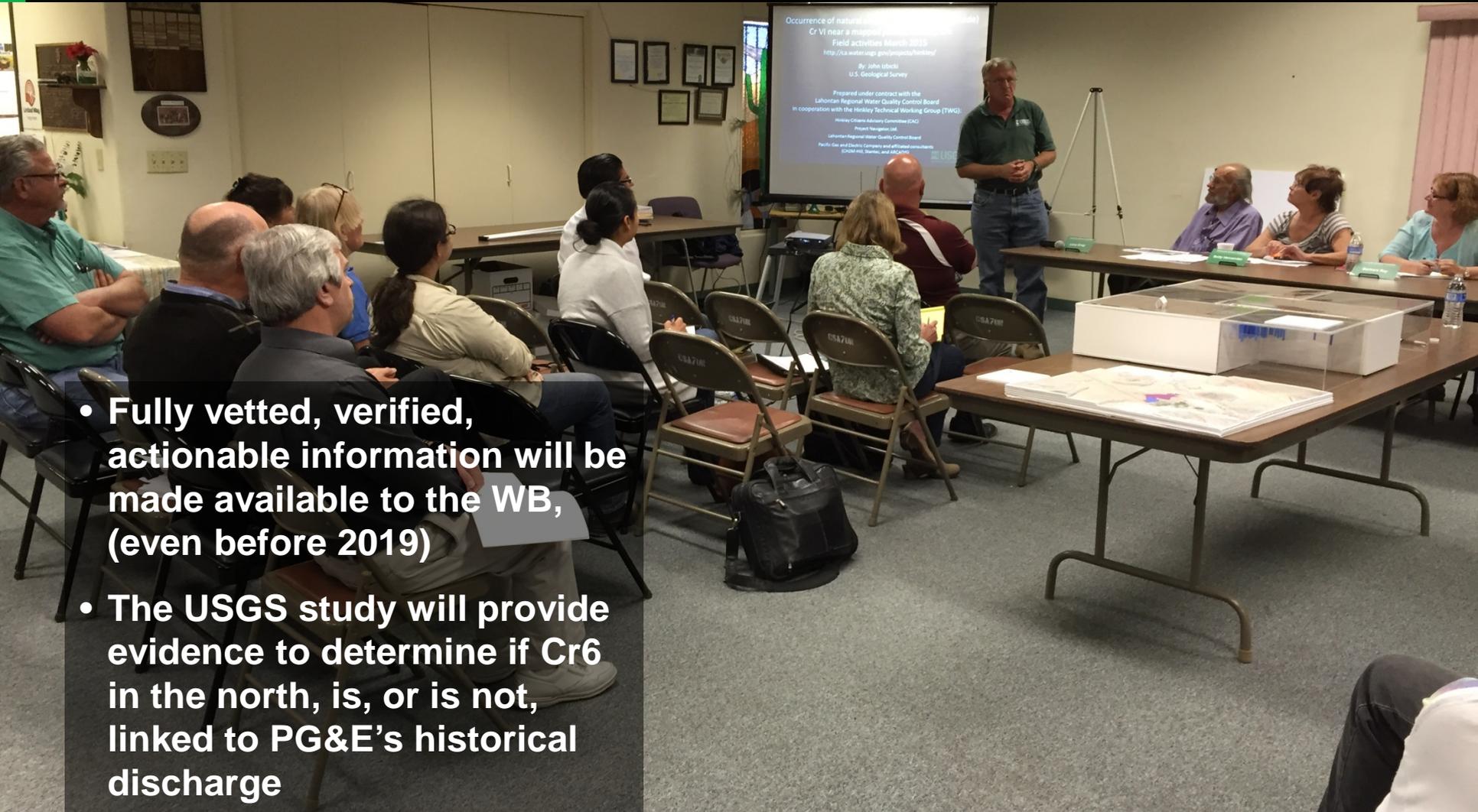
## ■ For Consideration re CAO Adoption

- As remediation professionals, it would be illogical, *with time*, to not consider “all appropriate information” and employ “professional judgment”

# What's the Source of the "New Information" Which will be "Judged?" ..PG&E and USGS..



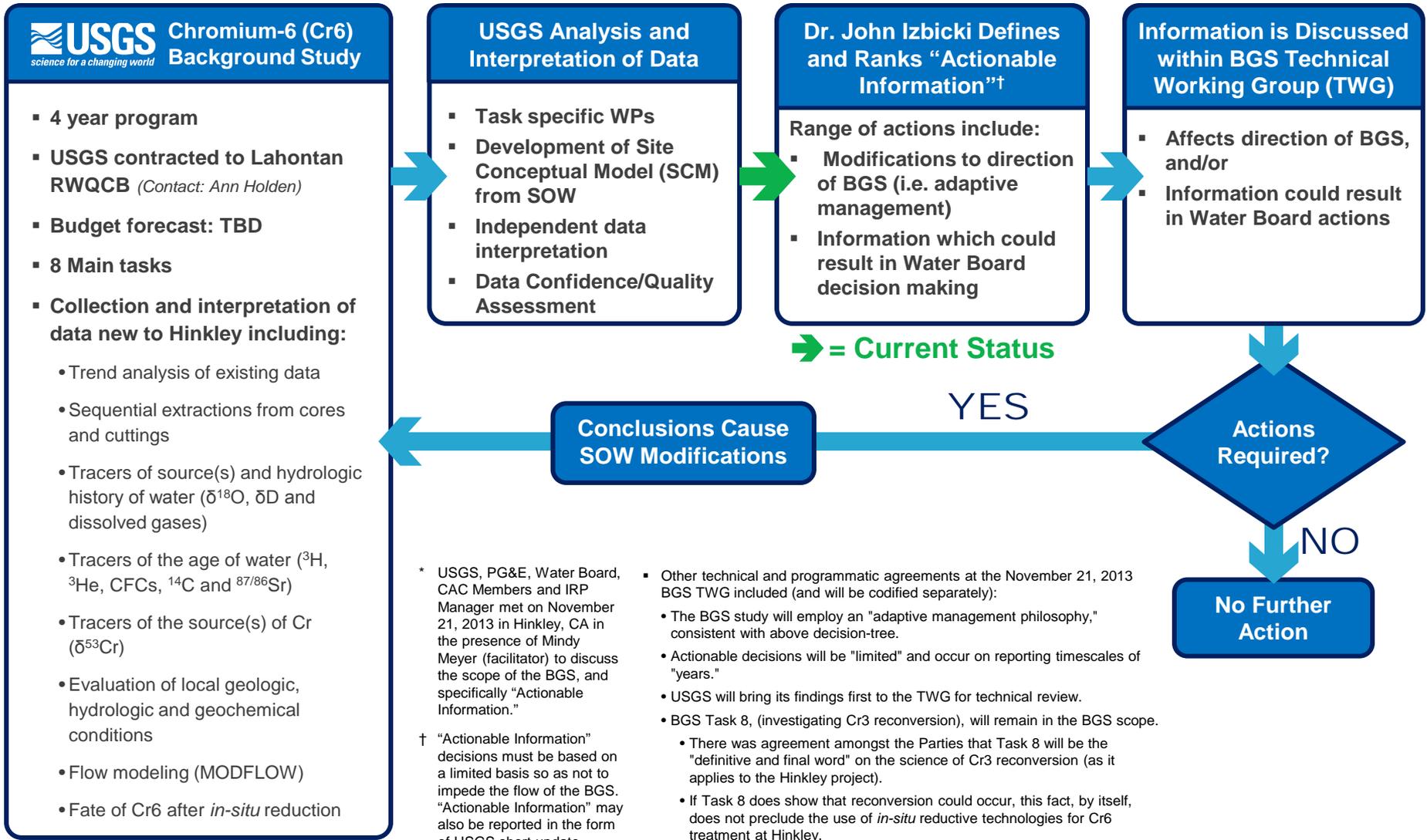
# ...The USGS Background Study Has a Pivotal Role and is Accounted for in the CAO.



- Fully vetted, verified, actionable information will be made available to the WB, (even before 2019)
- The USGS study will provide evidence to determine if Cr6 in the north, is, or is not, linked to PG&E's historical discharge

# USGS's Cr6 Background Study, 2014-2017

## "Actionable Information" Decision Tree\*



➔ = Current Status

**Conclusions Cause SOW Modifications**

YES

**Actions Required?**

NO

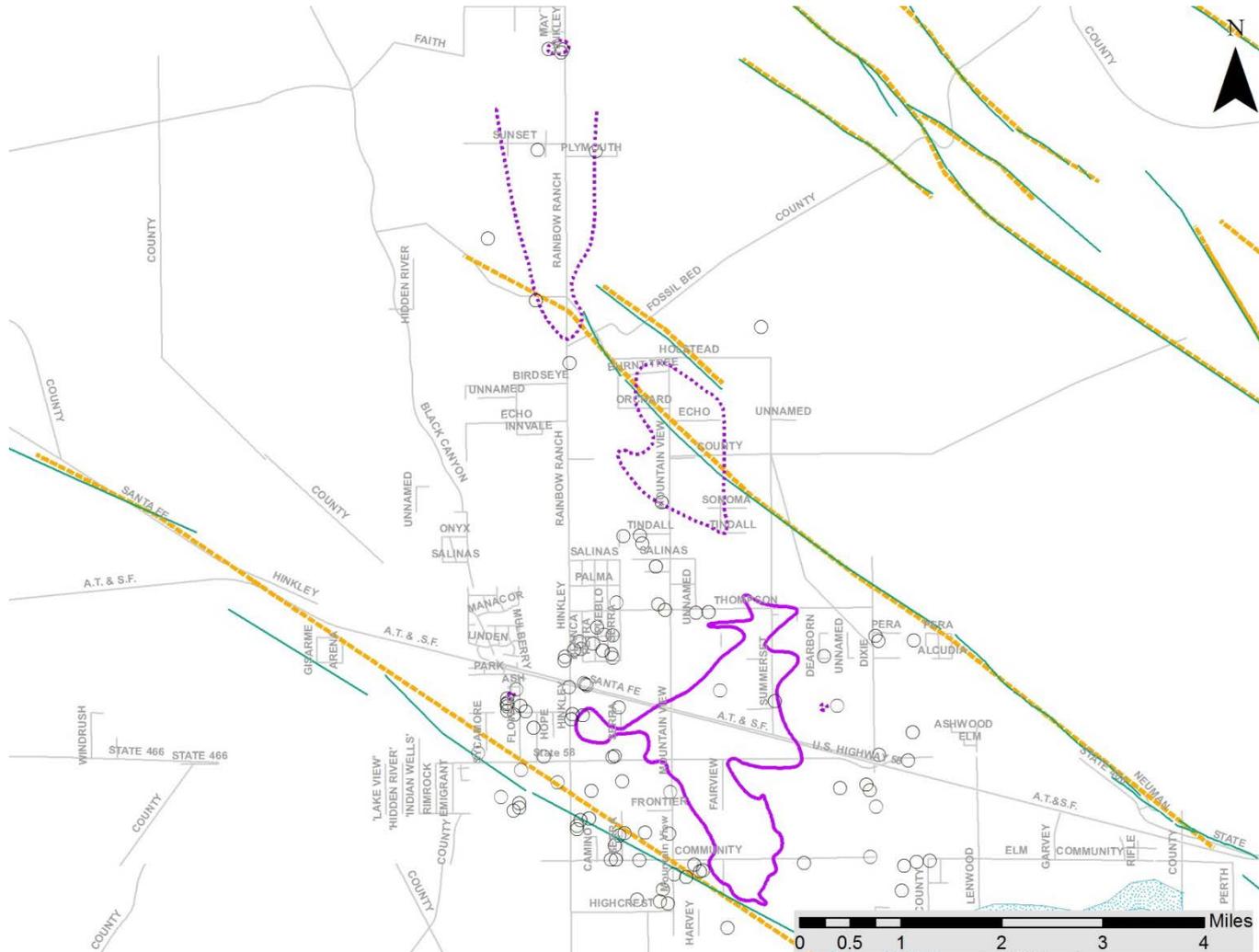
**No Further Action**

\* USGS, PG&E, Water Board, CAC Members and IRP Manager met on November 21, 2013 in Hinkley, CA in the presence of Mindy Meyer (facilitator) to discuss the scope of the BGS, and specifically "Actionable Information."

† "Actionable Information" decisions must be based on a limited basis so as not to impede the flow of the BGS. "Actionable Information" may also be reported in the form of USGS short update reports.

- Other technical and programmatic agreements at the November 21, 2013 BGS TWG included (and will be codified separately):
  - The BGS study will employ an "adaptive management philosophy," consistent with above decision-tree.
  - Actionable decisions will be "limited" and occur on reporting timescales of "years."
  - USGS will bring its findings first to the TWG for technical review.
  - BGS Task 8, (investigating Cr3 reconversion), will remain in the BGS scope.
    - There was agreement amongst the Parties that Task 8 will be the "definitive and final word" on the science of Cr3 reconversion (as it applies to the Hinkley project).
    - If Task 8 does show that reconversion could occur, this fact, by itself, does not preclude the use of *in-situ* reductive technologies for Cr6 treatment at Hinkley.
    - Task 8 will also be performed independently of the planned permitting process for expanding/modifying the IRZ(s).

# So, With the Reminder that no Sampled Domestic Wells Exceed the MCL, and a Robust Sentinel Well Monitoring Plan is in Place for Community Protectiveness...



# ...The IRP Manager's Conclusions and Recommendations Are...

- CAO's flexibility allows for "adaptive plume management" practices
- Sampling frequencies at monitoring wells will be guided by "Decision Trees"
- Allow the methodology of plume contouring to evolve, *gradually*, from
  - the pure "3.1ppb approach" (currently used)
  - to one which also considers "lines of evidence" and "professional judgment"
- Allow the "Process of the Background Study" to generate "Actionable Information" which will be considered by the Technical Working Group (TWG) and Water Board, and used, if appropriate, in Cr6 plume contouring

# Community Sincerely Thanks the Water Board for the Opportunity to be Heard.

