

Groundwater/Aquifer Remediation Management Strategy

Questions of Clarification

- Saltwater instruction will be addressed in a salt management strategy; nitrate will be included as a salt.

GW/Aquifer Remediation Overview (1st section)

- explain why we want to address groundwater contamination/pollution – we recognize that there are degraded aquifers; need to meet drinking water standards; perhaps protection of adjoining aquifers
- will link to drinking water treatment and distribution RMS – Burbank is one example of drinking water treatment from aquifer remediation
- pump and treat is not geared to lower levels (than well-head treatment) – it's rare that pump and treat systems go back into a potable water supply. These are not considered acceptable for well-head treatment when there are other supplies available for potable use.
- issue: agencies have different interpretations of pump and treat v. well-head treatment – chlorination could be wellhead treatment and therefore regulated. It's different from adding GAC or fluoride.
- there is a sense of overlap with a few of the other strategies. If contaminated groundwater is due to hyper-salination, that could be brackish water desal.
- need to point out that this is permitted by DPH if it goes to drinking water supplies (public water systems).
- governance is an issue
- if this is targeted to drinking water uses, might want to flag that (as opposed to say using lesser quality groundwater for agricultural or industrial purposes, then recharging the aquifer with clean water)
- ASR issue – recharge conformed to background. From a policy standpoint, might be good just to treat it. Policies put bounds on what we can recharge. Region 5 has requested that the State Board develop a statewide policy for ASR.
- Perhaps the place to talk about the difference (between intending to treat the pollutant v. purpose of obtaining a water source) should occur on page 4 – just before the first full paragraph (where it talks about remediated water for potable use).

Remediation in California

- explain the scope of the problem and where are we in terms of addressing the problem - are the 16,000 sites all of them; are we dealing with most of the problems or only 5%
- 800 site have pump and treat; course resolution of the magnitude of the problem is \$20 billion
- what's the very broad picture look? is this is a problem anchored in time? is this a thirty-year effort or a 300-year effort? can give a generally sense

Benefits of Remediation

- avoided health costs do not really factor in as benefit, since most of the contaminants are regulated by DPH to make sure that the public is not impacted; we don't want to imply that these contaminated sources are allowed into public drinking water supplies. Nitrates in the Central Valley are a special case, and dealt with by Legislature.
- page 6 – avoided cost is really a discussion of benefit

Costs of Remediation

- the purpose of the costs section is to identify the costs associated with achieving the stated benefits during the planning horizon
- in comparing RMSs, it's important to see the relative investment costs – e.g. that the costs of prevention are less than the costs of remediation; remediation is significantly more costly, and encourages investing in pollution prevention (bolsters RMSs such as groundwater protection and pollution prevention); how this investment might weigh up against another investment – helps identify the value of different investments
- time has a cost value, value for doing things in a time scale
- most aquifer remediation deals with legacy contaminants (e.g. perc) – except for salts, we do a pretty good job of prevention; are dealing with remaining tanks and solvents (would be good to presenting this along with scale of problem); pollutants are urban phenomenon

Major Issues Facing Remediation

- some issues relate to other RMSs – need to provide links
- sheer complexity might be an issue – right application [of treatment] to right issue; also, this is a 3D problem (e.g. users/generators argue that it is shallow water aquifer that become contaminated – aren't used for drinking water)
- governance is an issue
- one or several issues: institutional or social avoidance of talking about the margins of this issue

water quality

- there could be emerging pollutants, from natural disruptions or pollutants that we don't understand the effects that their having – e.g. wetting agents, personal care products; detection limits don't measure effective concentrations for endocrine disruptors. What we know about has a time horizon. There are other things we don't know about.

water quantity

- change the title of this section – which talks about characterizing the extent of the contamination (plumes have jagged fronts laterally); lack of information is the real issue.

costs of treatment

- what percentage of remediation costs represent energy costs? these will only be going up
- the issue is not that is there insufficient investment in emerging treatment technologies – rather this issue is that there are sites where responsible parties have no resources to pay (e.g. drycleaning businesses); that's overwhelming and dwarfs all the other issues, except for nitrates

- don't want to foster false hopes in new treatment breakthroughs; the costs of identifying, characterizing, and treating solvents are much greater than for tanks – there is a funding source for dealing with tanks; research is an issue for wellhead treatment, and less so for pump and treat.
- need options for funding cleanup (e.g. polluter pays, etc.), we haven't been able to crack this; investigate user or generator funding – we don't even charge a fee for pesticides, where we know it creates a problem; it's OK to be bold with recommendations – they will move forward to the Advisory Committee and Executive Branch; challenge is that the users or generators may not even be regulated – difficult to get our arms around; the coarse-level resolution of problem will put this issue on the table

use of extremely impaired water sources for domestic water supply

- do we need to have plans for abandoning groundwater basins in a reasonable manner? we don't really remediate aquifers, or write off basins – the types of contaminants that we deal with, contaminate only a very small part of the aquifers we deal with.

Recommendations Regarding Groundwater Remediation

- some recommendations address prevention or prevention, instead of remediation; will want to point to related RMSs
- on the lead-in sentence drop the phrase “for State action” – recommendations may be directed at other folks
- recommendations have to be very broad, not specific solutions – which are juggled with the legislature, State Boards strategic plan [comment: objectives, action, and recommendations from companion plans will be discussed in Volume 1]
- regarding emerging contaminants, there is a monthly roundtable (CAL and Fed EPA, DTSC, DPH) and statewide monitoring program looking at parts per trillion monitoring for emerging, endocrine disruptor research – would like the monitoring program to continue
- is there a need for investment in applied treatment technology – research funding is not well directed; research is an issue for wellhead treatment; less of an issue for pump and treat.

Participants

Lisa Babcock, State Water Board
John Carmona, Region 7 Water Board
James Giannopoulos, State Water Board
Julia Grim, NRCS
Bruce Guinn, Dept. of Conservation
Karl Hauge
Rebecca Kanegawa, MWH
Kevin Kashi, City of Oakland
Luanna Kiger, NRCS
Karl Longley, Region 5 Water Board
John Mills,
Melanie Powers, CABY
Matthew Silver,

Susan Strachan, Big Chico Creek Watershed
Allicance
Jack Sullivan, League of Women Voters
Betty Yee, Region 5 Water Board

DWR and Facilitation Staff

Megan Fidell, DWR
Tom Filler, DWR
Ray Hoagland, DWR
Lew Moeller, DWR
Lisa Beutler, CCP
Judie Talbot, CCP