

Selecting Alts to Evaluate for the Recon MCDS Exercise

(Agenda Item 7; Documents 5a, 5b, 5c)



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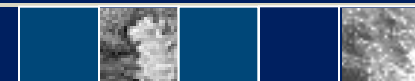
Overview of Discussion

- Review of the “Red Dot” voting exercise
- Alts “selected” for Recon MCDS exercise
- Technical evaluation format for Recon Alts
- Timeline for Recon technical evaluations
- Preliminary evaluations for a subset of Alts.
- Q&A and discussion
- Set up for “What If” exercise



Red Dot Voting

- 13 members provided input on the list of 54 (of the 67 total) alternatives
 - Some of these 54 were bundled into one package for the red dot exercise
- The top 4 include:
 - North Coast Water Storage
 - SCWD 4 Reuse Scenarios
 - SWC Desal alternative
 - WSAC Ranney Collectors



Other Alts Receiving at least 2 dots

- Expanded treatment capacity (membrane/SLR)
- Building code revisions and on-site water systems
- Aquifer restoration with inter-district collaboration
- Water neutral development to address growth
- Storm aquarries
- Regional water authority



Selecting Alts for Recon Exercise

- Objectives:
 - Provide useful cross section of different types of Alts
 - Provide fodder for “exploring the decision space”
 - Reflect (generally) WSAC voting preferences
- **No Alts will be harmed or eliminated for Real Deal consideration**



Various Permutations and Combinations

Sources of Water

- Conservation
- Winter Surface Flows
- Groundwater
- Reuse
- Desal
- Graywater
- Rainwater

Placement and/or Uses

- Loch Lomond
- New surface reservoirs
- Aquifer systems
- Exchanges with neighboring systems
- Irrigation (nonpotable)
- Potable

Additional Infrastructure

- Additional pipelines, Ranney collectors, treatment facilities, etc.



Overview of the 12 Recon MCDS Alts

- Off stream storage (North Coast quarries)
- Water Reuse (2 variations: DPR, NPR/exchange)
- Desal (2 variations: RO, and Trevi/FO)
- Ranney collectors (winter flow capture)
- Expanded treatment capacity (membrane filtration plant to treat/use winter flows)
- Aquifer restoration/inter-district collaboration
- Lochquifer: treat winter flows, recharge aquifers
- Demand Management (4 variations)
 - Code Revisions, Water Neutral Development
 - Conservation Accounts, Landscaping/graywater



Bevirt: North Coast Water

- Convert the Liddell and/or San Vicente Quarries into two reservoirs.
- This would provide up to a combined 11,000 acre feet of storage capacity.
- Some indications that cost may be substantially greater than stated



Santa Cruz Water Department (SCWD): Water Reuse

- Option 1: Potable reuse and groundwater replenishment for Tait Well Field
 - 1a: Potable reuse & North Coast agricultural irrigation
 - 1b: Potable reuse and SLR augmentation
- Option 2: Joint irrigation and groundwater replenishment for Tait Well Field
- Option 3: Santa Cruz regional groundwater replenishment project
- Option 4: Mid-county regional groundwater replenishment project
- Option 5: Large landscape irrigation with grey water



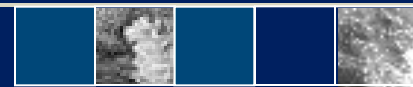
Ripley: Reuse for agriculture

- Reclamation/Coast Groundwater Exchange (RCGE)
 - 4 to 5 MGD tertiary wastewater treatment plant , 8.5 mi pipeline, and associated facilities to deliver water to North Coast farmers for irrigation
 - Wells and associated facilities needed to extract north coast groundwater
- Farmers use reclaimed water to irrigate fields
- City receives N. Coast groundwater supplies (700 MG/yr = 1.9 MGD)



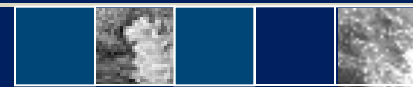
McKinney: Ranney Collectors on SLR

- Install Ranney collector wells along the SLR to enable tapping high turbidity winter flows
- Alternative to extracting from Loch Lomond because Ranney collectors can filter high turbidity river water
- Enables additional SLR water to be pumped to and stored in Loch
- Several potential locations (e.g., Fenton, Tait)
- Geo-physical conditions *may* be suitable



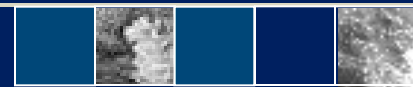
McKinney: Expanded Treatment Capacity

- New Membrane Plant to treat high-turbidity winter water from SLR, or from North Coast streams (Laguna Creek, Majors Creek, and Liddell Creek)
 - Treatment capacity of 9 – 13 MGD located close to the Tait Street Diversion.
 - Or, treatment capacity of 5 MGD located near the Bay Street Reservoir.
- Enables more use of river water, less of Loch
- Additional water can be sent to Loch and/or transferred to neighboring districts



Sustainable Water Coalition: Desalination

- Seawater pumped to Desalination Plant through filtered intakes.
- Freshwater distributed to customers through existing water system.
- Brine waste transferred to the city's existing wastewater treatment facility.
- Brine mixed with treated wastewater and returned to the Pacific Ocean at close to the salinity and temperature of seawater.



Trevi: Forward Osmosis Desalination

- Forward osmosis (FO) process that relies on a source of low-grade heat to supply a large share of the system's energy requirements.
- Waste heat, rather than electricity, is used to desalinate or remove impurities from the water.
- FO process is at least four times more energy efficient than reverse osmosis (RO) in electricity use.



Paul: (13) The Lochquifer Alternatives

- Divert up to 6,000 AFY of SLR/Zayante Creek winter water to LLR and dispense it to aquifer-dependent districts
 - Double Loch pipeline capacity to 28 MGD
 - Build an 8 MGD conventional WTP to treat Loch-bound water all year
 - Use Ranney collectors for water diversions to filter out turbidity
- Resting wells enables regional aquifers to recharge and recover (offering long-term drought protection)



SCDA: Regional Aquifer Restoration

- Sending river water to Scotts Valley and Soquel Creek during winter months, allowing these districts to reduce their well pumping and allow the aquifer to recharge
- May include “banking”/exchange to provide water to City in dry periods (18% return)
- May contribute to higher base flows in local streams, limit saltwater intrusion, ease use of Loch for drought storage



Markowitz: Landscaping, Capture, Reuse

- Grey water for your landscape; minimize irrigation requirements; minimize lawns/design in patios.
- Rainwater to go into the house/building for domestic, non-potable use.



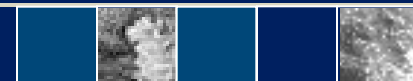
Santa Cruz Desal Alternatives (SCDA): Conservation Building Codes

- Working group to consider building code revisions that include onsite water systems.
- Go beyond the California Building Code, so that new buildings are highly water-efficient and can capture and reuse water onsite.
- The city can pass an ordinance requiring highly efficient fixtures in existing buildings.



SCDA: Water-Neutral Development

- Implementing a water demand offset program
 - Developers fund conservation retrofits to offset the new demand for water created by the development.
 - Also advocates focusing conservation efforts on existing customers



Smallman: Conservation Savings Accounts

- Show a special account with a line on each invoice. This account will accrue money from a percentage of the billing.
- Slowly increase base charge enough to run the agency, and start putting more and more of the high water use fee income toward conservation improvements.
- Part of the money could go toward capital improvement for the water agency and part could go into these conservation accounts.



Approach for Technical Evaluation of Recon Alts

- Bill Faisst will discuss handouts – templates filled in for 2 Alts



“What Ifs” for MCDS Exercise

- **Trevi Forward Osmosis**
 - Potential emerging technology for reuse, desal, other membrane applications
 - Large energy and carbon footprint savings
 - Will it work reliably at municipal scale?
- **Direct Potable Reuse**
 - Will it be permitted by state?
 - What will be required?
 - Will public accept it?



