Constructed Wetlands A Tool to Improve Water Supply Sustainability for the SBV Water Conservation District



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SBV Water Conservation District Background

SBVWCD water supply operationsHistory





SBV Water Conservation District Background (cont'd)

Spreading basin issues Decreased percolation rates Sediment > Organic mats > Higher O&M costs Endangered species – complicates adding more basins



SBV Water Conservation District Background (cont'd)

> Borrow pit issues > Decreased percolation rates Soil compaction Deposition of fines Fault barrier > A possible solution Constructed wetland



Constructed Wetlands and Water Supply

TRWD

Ottaw

CCWA

New York

Vassau

urks and Calcos Islands

Eve alt 2906.25 mi

ashington

OCWD

© 2010 Google © 2010 Europa Technologies Data SIO, NOAA, U.S. Navy, NGA, GEBCO US Dept of State Geographer elev 1281 ft Huie & Panhandle Wetlands Clayton County Water Authority, GA

Metro Atlanta area; indirect potable reuse Previously utilized forested LAS > Hydraulic limitations on LAS Converting to wetlands increased capacity > Huie site Converted portion of LAS to wetlands Panhandle site Converted all of LAS to wetlands

Huie & Panhandle Wetlands Clayton County Water Authority, GA

Benefits

 Continued reliable water supply during droughts
 Lower energy costs
 Protected green space
 Public support





G. W. Shannon Water Recycling Wetland Richland-Chambers Reservoir Tarrant Regional Water District, TX

> TRWD service area western half DFW metroplex
> Indirect potable reuse
> Multi-phase project
> Goal water quality improvement

Trinity River (before wetland treatment)

Outflow of TRWD Field Scale Wetland (after wetland treatment)



G. W. Shannon Water Recycling Wetland Richland-Chambers Reservoir Tarrant Regional Water District, TX

Benefits

- Effectively reduces
 TSS & nutrients
- > Operational Flexibility
- "Drought-Proofs" reservoir
- Public use through TPWD

TEXAS PARKS & WILDLIFE



Duck Hunting at Davbreak

Prado Wetlands Orange County Water District, CA

> 465 ac wetlands behind Prado Dam
> Primary goal - remove nitrogen



 Removes approx 20 tons nitrate per month
 Summer reduces NO₃-N from approx 10 to < 1 mg/L

Prado Wetlands Orange County Water District, CA

Other Benefits

- Compliments riparian habitat supporting T&E species
- Cost effective nitrogen removal
- Effective in attenuating some PPCPs (NWRI, 2010)



Tailoring a Constructed Wetland to the SBVWCD Site



Utilize borrow pit to maximum extent
 Convert pit to wetlands
 Improve function of the footprint
 Utilize existing basins in pit



Conceptual Layout



Operational Modes for SBVWCD Wetland

Potential source water

- Releases from Seven Oaks Reservoir
- Diverted natural surface flows (SAR)
- > Imported water (SWP)
- Recycled water from nearby WRFs (with appropriate blending)
- Aggregate production wash water



Operational Modes for SBVWCD Wetland



Operational Modes for SBVWCD Wetland



SECONDARY

be in compliance with California regulations

Benefits of a SBVWCD Wetland

- Improves quality of water from reservoir
 - > Percolation improves
 - Lower maintenance needs
- > Opportunity to use other local water sources
 - Reduce need to purchase imported water
 - More consistent ("drought-proof") inflows
- Creates wetland habitat
 - Green space amenity
 - > Eco-tourism
 - Possible mitigation bank



Moving It Forward

Currently completed conceptual-level design Further studies Evaluate regulatory issues Permits, water rights, etc. > Water source/water quality studies > Inflow frequency, identify WQ constituents Prelim geotech investigation (dev. costs) Pilot scale wetland Identify funding Coordination with nearby private developments Park land credits

Questions?

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	Mass Removal Rate (lbs/acre/day)		Percent Mass Removed (%)	
Parameter	Field- Scale	Pilot- Scale	Field- Scale	Pilot- Scale
Total Suspended Solids	103	55	96	95
Total Nitrogen	1.33	1.19	66	82
Total Phosphorus	0.20	0.17	43	66