

TO: BOARD OF DIRECTORS
FROM: BRUCE BUEL *BB*
DATE: OCT. 23, 2009

AGENDA ITEM
C-1
OCT. 28, 2009

WIP AND SOUTHLAND UPGRADE PROJECT UPDATE

ITEM

Mike Nunley of AECOM Engineering re Waterline Intertie Project Update and Southland WWTF Upgrade Project [NO ACTION REQUESTED].

BACKGROUND

Mike Nunley is scheduled to summarize the attached reports.

RECOMMENDATION

Staff recommends that your Honorable Board receive the presentations and ask questions as appropriate.

ATTACHMENTS

- September Monthly Reports

T:\BOARD MATTERS\BOARD MEETINGS\BOARD LETTER\BOARD LETTER 2009\091028AECOM.DOC

AECOM
1194 Pacific Street, Suite 100
San Luis Obispo CA 93401
T 805.542.9840 F 805.542.9990 www.aecom.com

Memorandum

Date: October 21, 2009
To: Bruce Buel, General Manager – Nipomo Community Services District
From: Michael K. Nunley, PE
Subject: Waterline Intertie Project – Design Phase Status Report

Distribution:	Josh Reynolds, PE	Eileen Shields, PE
	Peter Sevcik, PE	Jim Froelicher
	Jon Hanlon, PE	Kirk Gonzalez, PE

The Project Team has completed the following work items this month:

1. AECOM submitted Caltrans encroachment permit application for the Highway 101 crossing.
2. AECOM submitted the 90% design plans and specifications for Bid Package #2 – Nipomo Area Pipeline Improvements. Copies were delivered to the District, the peer reviewers, and the construction management team.
3. AECOM updated the project schedule to reflect delays in the financing schedule.
4. AECOM continued discussions with the City of Santa Maria staff regarding ownership and operation of the connection, flow control valve, and flow meter stations.
5. AECOM received notice from the Santa Barbara County Flood Control District for completion of technical review of Bid Package #3 Plan set with no further comments.
6. Padre has submitted the APCD's Naturally Occurring Asbestos (NOA) project form and request for exemption.

Schedule

The Project Schedule is attached.

Budget Status

As shown on the attached Design Budget and Invoice Summary, our fee earned matches the amount expended. This indicates we are on budget as of this date.

Yours Sincerely



Michael K. Nunley, PE

Enclosures: Design Budget and Invoice Summary; Project Budget Summary; and Project Schedule

Item	Description	Budgeted Amount May 2008 PER	Updated Amount 17-Mar-09	Updated Amount 22-Apr-09 Concept Design Report	Updated Amount date 60% Design Plans
1	Mobilization	\$580,000	\$580,000	\$607,000	\$706,800
2	Blosser Extension (18-in)	\$1,247,000	\$1,247,000	\$1,129,000	\$1,148,800
3	Pump Station No. 1 turnout & meter (Blosser Rd)	\$61,000	\$61,000	\$158,000	\$166,400
4	River Crossing (24-in HDD & levee jack & bore)	\$6,135,000	\$6,135,000	\$5,462,500	\$5,414,200
5	24-in Pipeline to Joshua	\$656,000	\$656,000	\$400,000	\$399,500
6	Reservoir (0.5-MG)	\$1,361,000	\$1,361,000	\$1,365,000	\$1,364,700
7	Pump Station No. 2	\$603,000	\$603,000	\$1,572,500	\$1,512,300
8	Pressure Regulators (200 homes)	\$30,000	--	--	--
9	Pressure Reducing Valve Stations	\$18,000	\$72,000	\$243,000	\$290,100
10	Chloramination (Joshua & 5 wellheads)	\$707,000	\$707,000	\$739,500	\$739,200
11	Upgrade Southland to 12-in	\$799,500 (1)	\$780,000 (7)	\$849,000	\$828,900
12	Upgrade Frontage to 12-in	\$1,101,300 (1)	\$880,000 (7)	\$957,000	\$958,600
13	Upgrade Orchard to 12-in	\$509,000	\$1,040,000 (8)	\$1,103,500	\$1,200,800
14	Upgrade Division to 10-in between Allegre and Meridian (6)	\$53,000	--	--	--
15	Oakglen Avenue 12-in main (5)	--	\$420,000	\$457,000	\$472,600
16	Darby Lane 12-in main (5)	--	\$100,000	\$153,000	\$114,100
17	HWY 101 Bore & Jack (5)	--	\$132,000	\$241,000	\$228,700
18	Isolation Valves (5)	--	\$12,000	\$12,000	\$12,000
19	Pump Station All Weather Access Road	--	--	\$128,000	\$127,500
20	Pipe Cleaning Launch Station Stub Out (Blosser Rd)	--	--	--	\$20,400 (13)
	Construction Subtotal	\$13,860,800	\$14,786,000	\$15,577,000	\$15,705,600
21	Contingency	\$3,643,000	\$3,696,500 (9)	\$3,115,400 (11)	\$3,141,120
	Construction Subtotal + Contingency	\$17,503,800	\$18,482,500	\$18,692,400	\$18,846,720
22	Property Allowance	<i>not included</i> (4)	<i>not included</i> (4)	\$500,000 (4)	\$500,000 (4)
23	Design-Phase Engineering				
	Original Agreement (July 2008)		\$744,993	\$744,993	\$744,993
	Budget Revision 1 - Pressure Reduction		\$132,798	\$132,798	\$132,798
	Budget Revision 2 - Biological Survey for HDD		\$4,050	\$4,050	\$4,050
	Budget Revision 3 - Modeling for GSW/Woodlands Turnouts		\$8,380	\$8,380	\$8,380
	Budget Revision 4 - Additional Survey Services		\$9,900	\$9,900	\$9,900
	Budget Revision 5 - Utility Investigation (Potholing)		--	--	\$8,883
	Budget Revision 6 - (Additional Property Research)		--	--	\$805
24	Office Engineering during construction		\$175,837	\$175,837	\$175,837
25	Estimated Construction Management (3)	\$2,428,000 (2)	\$1,507,170 (10)	\$1,507,170 (10)	\$1,507,170 (10)
26	Permitting Fees To Date	--	\$1,573	\$1,573	--
27	Non-Final Design Funds Spent To Date	<i>not included</i>	<i>not included</i>	\$1,402,879 (12)	\$1,402,879 (12)
28	Estimated Other Costs (Assessment, etc)	<i>not included</i>	<i>not included</i>	\$415,420 (12)	\$415,420 (12)
	WATERLINE PROJECT TOTAL (Rounded to 1000)	\$19,932,000 (4)	\$21,068,000	\$23,596,000	\$23,758,000
A	Frontage Road Sewer Replacement	--	--	\$1,239,500 (A)	\$1,658,600 (A) (B)
B	Sewer Contingency			\$247,900 (A)	\$331,720 (A)
	FRONTAGE RD SEWER TOTAL (Rounded to 1000)			\$1,487,400 (A)	\$1,990,320 (A)

Notes:

- ENR CCI: March 2008 = 8109
 - (1) Costs are from the December 2007 Water and Sewer Master Plan (Cannon).
 - (2) Engineering and Construction Management were originally presented as a "lump sum" amount
 - (3) Includes material testing, construction staking, and environmental monitoring
 - (4) Estimate only. Property allowance not included prior to April 2009 estimate.
 - (5) These work items were added to relieve high pressures on Mesa as an alternative to service pressure regulating valves (See Tech Memo 9). One PRV station at Maria Vista was required initially. Four are recommended for revised project. This was design Budget Revision #1.
 - (6) Based on review of record drawings, this pipeline is already a 10-in main
 - (7) Initial estimate incorporated Master Plan project costs. Revised estimate includes higher unit costs to reflect paving 1 traffic lane, per County standards
 - (8) Updated unit costs include higher costs to reflect paving 1 traffic lane, per County standards
 - (9) Contingency was modified to 25% which is more appropriate for concept design phase.
 - (10) To be provided by CM team - Has not been revised to reflect additional work for construction management of Oakglen, Darby, and Orchard extensions.
 - (11) Contingency was modified to 20% which is more appropriate for 30% design phase.
 - (12) Estimate provided by District staff.
 - (13) Item added during 60% design for potential future pipe cleaning launch station. Cost for potential future receiving station was added to line item #7 (pump station).
- not included* = Item was not included in previous construction cost opinions, but was added into the Concept Design Report to provide a complete assessment of anticipated project costs.
- (A) Frontage Road Sewer to be Part of Bid Package #2, but to be paid for out of funds separate from the Supplemental Water Project
 - (B) Includes 1100 LF of 24-in sewer and manholes from Southland Street to WWTP Lift Station, which was not previously included in project scope.

Project Budget Summary

10/21/2009

Engineering Services for NCSD - SWP Design

Nipomo CSD

	Total Budget	Amount Previously Invoiced	Current Invoice Amount	% of Budget Earned to date	% of Work Complete
Task Group 1 - Concept Design Report	\$425,916.00	\$425,916.00	\$0.00	100%	100%
Task Group 2 - Permitting	\$30,651.00	\$30,651.00	\$0.00	100%	100%
Task Group 3 - Construction Documents	\$359,980.00	\$337,643.98	\$0.00	94%	94%
Task Group 4 - Project Management	\$44,320.00	\$37,188.85	\$1,690.20	88%	88%
Task Group 5 - Assistance During Bids	\$48,942.00	\$0.00	\$0.00	0%	0%
Task Group 6 - Office Engineering During Construction (5 Bid Packages)	\$175,837.00	\$0.00	\$1,459.46	1%	1%
Total	\$1,085,646.00	\$831,399.83	\$3,149.66	77%	77%

	Amount Previously Invoiced	Current Invoice Amount	Total Permitting Fees to date
Permitting Fees	\$1,572.91	\$0.00	\$1,572.91

Item	Description	Budgeted Amount Jan 2009 Master Plan	Updated Amount
1	Frontage Road sewer upgrade (street to influent pump station)	\$366,000 (4) (5)	\$366,000
2	Influent pump station upgrade	\$670,900	\$670,900
3	Influent screening system	\$327,400	\$327,400
4	Grit removal system	\$402,700	\$402,700
5	Phase I Biolac system	\$3,877,500	\$3,877,500
6	Phase I Sludge holding lagoons	\$67,700	\$67,700
7	Phase I Sludge drying beds	\$1,160,700	\$1,160,700
Construction Subtotal		\$6,872,900	\$6,872,900
8	Contingency	\$2,061,870 (6)	\$2,061,870
9	Design-Phase Engineering	\$923,093	\$923,093
10	Construction Management	\$1,138,777 (7)	\$1,138,777
11	Environmental Mitigation	-- (8)	-- (8)
12	Environmental Monitoring	-- (8)	-- (8)
13	Permitting Fees	-- (8)	-- (8)
WWTF PROJECT TOTAL (Rounded to 1000)		\$10,997,000	\$10,997,000

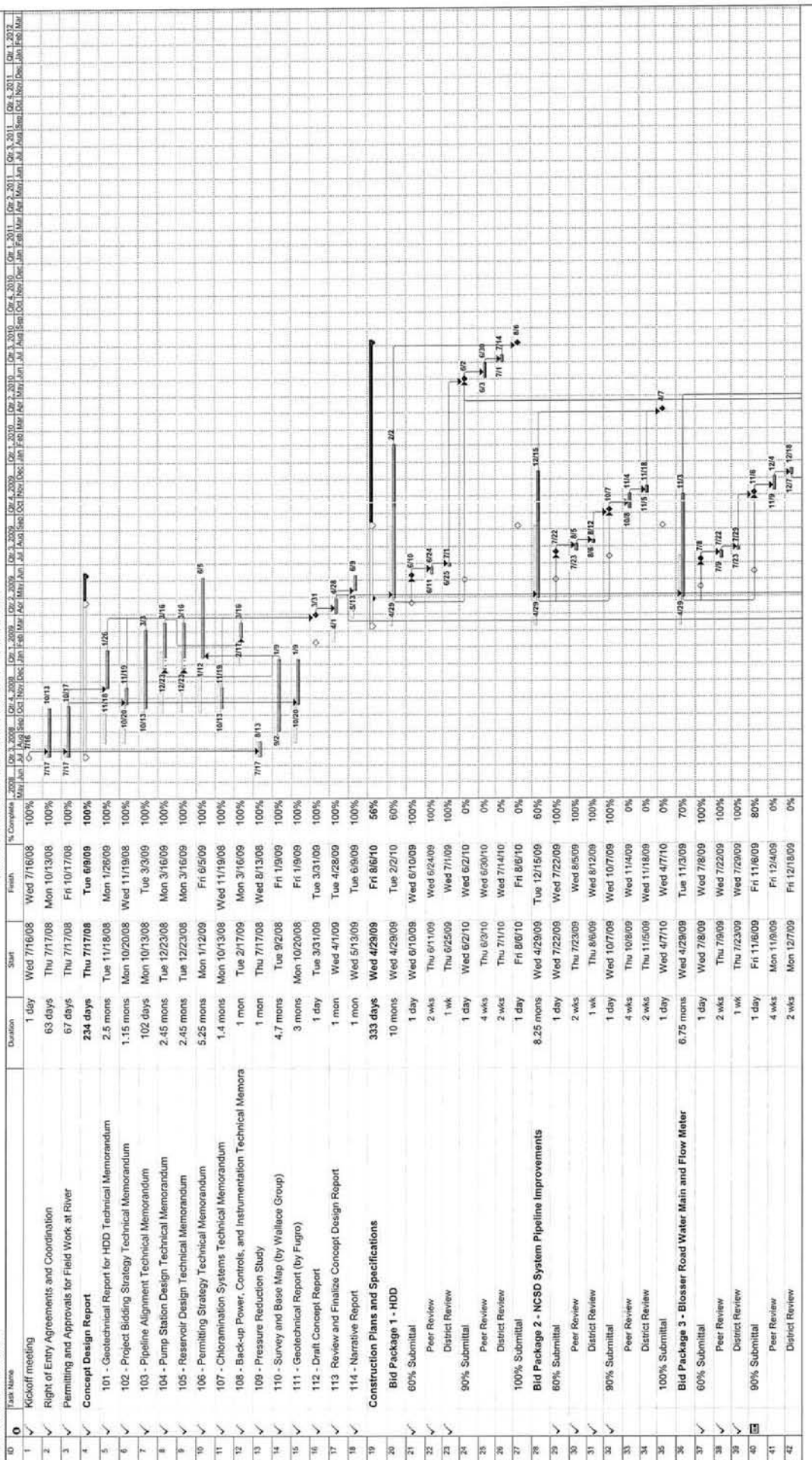
13	Frontage Rd Sewer Upgrade Project (Division St to WWTF property)	--	\$1,658,600 (9) (10)
14	Frontage Rd Sewer Upgrade Project Contingency	--	\$331,720 (9) (10)
FRONTAGE RD SEWER PROJECT TOTAL (Rounded to 1000)		--	\$1,991,000 (9) (10)

Notes:

- (1) ENR CCI: November 2008 = 8602
- (2) Costs are from the January 2009 Southland WWTF Master Plan.
- (3) Costs are escalated by 4 % per year to anticipated midpoint of construction (2011).
- (4) The Frontage Rd Sewer Upgrade project includes the sewer main from Division St. to the influent pump station. The portion between the street and the influent pump station is currently included in the Southland WWTF Upgrades project scope of work, but may be moved to the Waterline Intertie Project for expedited construction.
- (5) The cost for this portion of Frontage Rd was estimated by prorating the cost opinion for the Frontage Road Sewer Upgrade (based on linear footage) to arrive at the 2008 Construction Cost Opinion. A 4% per year escalation was used to arrive at the 2011 midpoint of construction cost opinion.
- (6) Contingency is estimated at 30% of construction subtotal.
- (7) To be updated by CM Team, assumed to be 30% of construction subtotal minus the engineering fee.
- (8) Costs to be developed with EIR process
- (9) The Frontage Road Sewer Upgrade Project plans are being developed as part of the Waterline Intertie Project effort, but construction will be paid for using separate sewer funds, not supplemental water funds
- (10) Costs based on the 90% plans and specifications for Bid Package #2 of Waterline Intertie Project (October 2009)

Print Date: Tue 10/20/09

NCSW WATERLINE INTERTIE PROJECT - Tue 10/20/09



Project: WSP Design Schedule Date: Tue 10/20/09

Task: Program Baseline

Milestone: Milestone Baseline Summary

Rollup Task: Rollup Task Baseline Summary

Rollup Baseline: Rollup Baseline Milestone

Rollup Progress: Rollup Progress External tasks

Split: Split Baseline

Group By Summary: Group By Summary

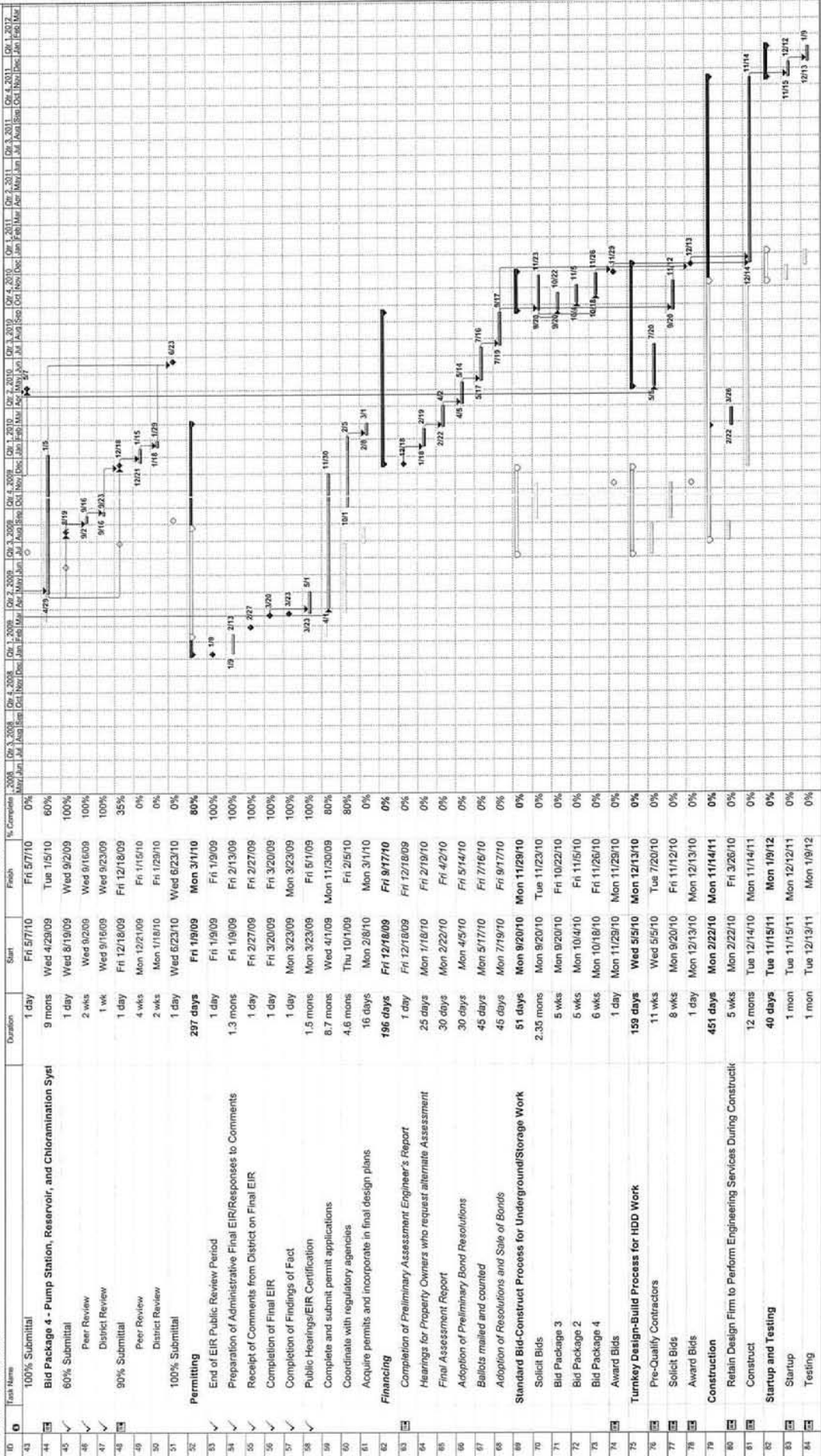
Project Summary: Project Summary

Baseline: Baseline

Summary: Summary

Page 1

AECOM



Project: Water Design Schedule Date: Tue 10/20/09

Task: Milestone Summary Baseline Milestone Summary

Project Summary: Project Summary Group By Summary Deadline

Legend: Shift Rollup Baseline Rollup Milestone Rollup Progress External Tasks

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AECOM
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Memorandum

Date: October 21, 2009
To: Bruce Buel, General Manager – Nipomo Community Services District
From: Michael K. Nunley, PE
Subject: Southland WWTF Upgrade Project – Design Phase Status Report

Distribution: Josh Reynolds, PE
Peter Sevcik, PE
Jon Hanlon, PE
Eileen Shields, PE
Jim Froelicher
Kirk Gonzalez, PE

The Project Team has completed the following work items this month:

1. Draft Technical Memorandum #1 – Operations during Construction and Permitting was completed and submitted to District staff for review and comment.
2. AECOM updated the Environmental Impact Review schedule on the project schedule. The design schedule was not impacted.
3. AECOM has continued work on preliminary design.

Schedule

The Project Schedule is attached. The Design Phase is on schedule.

Budget Status

The Invoice Summary is attached. The Invoice Summary indicates an amount invoiced which is consistent with the work completed to date. The project cost opinion has not been updated since the January 2009 Master Plan, but the summary table is included and will be updated with the 30% design submittal.

Yours Sincerely



Michael K. Nunley, PE

Enclosures: Project Schedule
Invoice Summary
Project Budget Summary

AECOM Water

Southland WWTF Upgrades Design Schedule

Tue 10/20/09

ID	Task Name	% Work Complete	Duration	Start	Finish	Gantt Chart																						
						Q08	1Q09	2Q09	3Q09	4Q09	1Q10	2Q10	3Q10	4Q10	1Q11	2Q11	3Q11											
						N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
1	Negotiation and Notice to Proceed	100%	20 days	Thu 2/26/09	Wed 3/25/09	100% — 3/25																						
2	Design	0%	357 days	Thu 3/26/09	Fri 8/6/10	[Gantt bars for Design tasks]																						
3	Survey	100%	105 days	Thu 3/26/09	Wed 8/19/09	100% — 8/19																						
4	Preliminary Soils Report	100%	75 days	Thu 3/26/09	Wed 7/8/09	100% — 7/8																						
5	Draft Site Plan	100%	117 days	Thu 3/26/09	Fri 9/4/09	100% — 9/4																						
6	Draft Soils Report	100%	50 days	Thu 7/9/09	Wed 9/16/09	100% — 9/16																						
7	Operations Plan - TM 1	80%	30 days	Thu 8/20/09	Wed 9/30/09	80% — 9/30																						
8	Final Soils Report	0%	15 days	Thu 10/1/09	Wed 10/21/09	0% — 10/21																						
9	Administrative Draft Concept Report	0%	41 days	Fri 10/23/09	Fri 12/18/09	0% — 12/18																						
10	District Review	0%	10 days	Mon 12/21/09	Fri 1/1/10	0% — 1/1																						
11	Draft Concept Report	0%	5 days	Mon 1/4/10	Fri 1/8/10	0% — 1/8																						
12	District / Peer Review	0%	10 days	Mon 1/11/10	Fri 1/22/10	0% — 1/22																						
13	Final Concept Report	0%	20 days	Mon 1/25/10	Fri 2/19/10	0% — 2/19																						
14	60% Plans, Specifications, and Estimates	0%	60 days	Mon 2/22/10	Fri 5/14/10	0% — 5/14																						
15	District / Peer Review	0%	10 days	Mon 5/17/10	Fri 5/28/10	0% — 5/28																						
16	95% Plans, Specifications, and Estimates	0%	20 days	Mon 5/31/10	Fri 6/25/10	0% — 6/25																						
17	District / Peer Review	0%	10 days	Mon 6/28/10	Fri 7/9/10	0% — 7/9																						
18	Final Plans, Specifications, and Estimates	0%	20 days	Mon 7/12/10	Fri 8/6/10	0% — 8/6																						
19																												
20	Environmental Impact Report	0%	317 days	Wed 4/8/09	Thu 6/24/10	[Gantt bars for EIR tasks]																						
21	Notice of Award	100%	1 day	Wed 4/8/09	Wed 4/8/09	100% — 4/8																						
22	Preparation of Public Draft EIR	0%	22.8 wks	Fri 8/7/09	Wed 1/13/10	0% — 1/13																						
23	EIR Public Review Period	0%	7.4 wks	Mon 1/25/10	Tue 3/16/10	0% — 3/16																						
24	Preparation of Administrative Final EIR/Responses to Comments	0%	1 mon	Wed 3/17/10	Tue 4/13/10	0% — 4/13																						
25	Completion and Receipt of Comments from District on Final EIR	0%	6 days	Wed 4/14/10	Wed 4/21/10	0% — 4/14																						
26	Completion of Final EIR	0%	2 wks	Mon 5/3/10	Fri 5/14/10	0% — 5/14																						
27	Completion of Findings of Fact	0%	11 days	Mon 5/17/10	Mon 5/31/10	0% — 5/31																						
28	Public Hearings/EIR Certification	0%	11 days	Thu 6/10/10	Thu 6/24/10	0% — 6/24																						
29																												
30	Bid Phase	0%	55 days	Mon 8/9/10	Fri 10/22/10	[Gantt bars for Bid Phase tasks]																						
31	Advertisement	0%	30 days	Mon 8/9/10	Fri 9/17/10	0% — 9/17																						
32	Bid Opening	0%	5 days	Mon 9/20/10	Fri 9/24/10	0% — 9/24																						
33	Bid Review and Notice of Award	0%	20 days	Mon 9/27/10	Fri 10/22/10	0% — 10/22																						
34																												
35	Construction	0%	295 days	Mon 5/17/10	Fri 7/1/11	[Gantt bars for Construction tasks]																						
36	Retain Design Firm to Perform Services During Construction	0%	20 days	Mon 5/17/10	Fri 6/11/10	0% — 6/11																						
37	Construct	0%	160 days	Mon 10/25/10	Fri 6/3/11	0% — 6/3																						
38	Startup & Testing	0%	20 days	Mon 6/6/11	Fri 7/1/11	0% — 7/1																						

Project: Southland Design 8 03 09	Date: Tue 10/20/09	Task	Progress	Baseline	Milestone	Baseline Milestone	Summary	Rolled Up Task	Rolled Up Critical Task	Rolled Up Milestone	Baseline Summary	Rolled Up Baseline	Rolled Up Baseline Milestone	Rolled Up Progress	Split	Baseline Split	External Tasks	Project Summary	Group By Summary	Deadline
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Project Budget Summary

10/20/2009

Engineering Services for NCS - Southland WWTF Upgrade

Nipomo CSD

	Total Budget	Amount Previously Invoiced	Current Invoice Amount	% of Budget Earned to date	% of Work Complete
Task Group 1 - Concept Design Phase	\$188,622.00	\$53,474.85	\$51,878.59	56%	56%
Task Group 2 - Construction Documents	\$478,948.00	\$0.00	\$2,794.50	1%	1%
Task Group 3 - Project Management	\$68,787.00	\$12,615.75	\$978.75	20%	20%
Task Group 4 - Assistance During Bid	\$39,539.00	\$0.00	\$0.00	0%	0%
Task Group 5 - Office Engineering Services	\$147,198.00	\$0.00	\$0.00	0%	0%
Total	\$923,094.00	\$66,090.60	\$55,651.84	13%	13%

TO: BOARD OF DIRECTORS
FROM: BRUCE BUEL *BB*
DATE: OCT. 25, 2009

AGENDA ITEM
C-2
OCT. 28, 2009

SUNDALE WELL FIRE

ITEM

NCSD District Engineer Peter Sevcik re fire at Sundale Well and rebuild. [NO ACTION REQUESTED].

BACKGROUND

Peter Sevcik are scheduled to summarize the fire and subsequent efforts.

RECOMMENDATION

Staff recommends that your Honorable Board receive the presentations and ask questions as appropriate.

ATTACHMENT – NONE

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TO: BOARD OF DIRECTORS
FROM: BRUCE BUEL *B588*
DATE: OCT. 23, 2009

AGENDA ITEM
C-3
OCT. 28, 2009

SUPERINTENDENT UPDATES

ITEM

NCSD District Superintendent Tina Grietens re Sept. 2009 Utility Division Activities [NO ACTION REQUESTED].

BACKGROUND

Tina Grietens is scheduled to summarize the attached outline.

RECOMMENDATION

Staff recommends that your Honorable Board receive the presentations and ask questions as appropriate.

ATTACHMENTS

- Sept. 2009 Outline

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NIPOMO COMMUNITY

BOARD MEMBERS

JAMES HARRISON, PRESIDENT
LARRY VIERHEILIG, VICE PRESIDENT
ED EBY, DIRECTOR
MIKE WINN, DIRECTOR
BILL NELSON, DIRECTOR



SERVICES DISTRICT

STAFF

BRUCE BUEL, GENERAL MANAGER
LISA BOGNUDA, ASSISTANT GENERAL MANAGER
JON SEITZ, GENERAL COUNSEL

148 SOUTH WILSON STREET POST OFFICE BOX 326 NIPOMO, CA 93444 - 0326
(805) 929-1133 FAX (805) 929-1932 Website address: NCS.D.CA.GOV

TO: BRUCE BUEL, GENERAL MANAGER
FROM: TINA GRIETENS, UTILITY SUPERINTENDENT
DATE: OCTOBER 22, 2009
SUBJECT: UTILITY DIVISION UPDATE FOR SEPTEMBER 2009

- **Blacklake Wastewater Reclamation Facility**
Discharge of undisinfected effluent resulted from power outage (10/13/09)
- **Southland Wastewater Plant and Utility Yard**
Setup of EOC Facility continuing, researched existing radio frequency, radios ordered
Scheduled for EOC training for Oct 20, 21
Biosolids removal and disposal project ongoing
Assisted Aecom with data collection for expansion
Responded to data inquiries from EcoStar USA
Electrical work at yard and WWTP
- **Collection system**
inspecting manholes for future repair
Cleaned 6 lift stations and jetted sagging line at Blacklake Golf Course
Tejas Lift Station electrical system debugged
Replaced battery charger and block heater on Maria Vista Lift Station generator
- **Distribution System**
Replaced seal at Blacklake Booster
Troubleshooting generator problem at Blacklake Booster (repaired 10/19)
- **Maintenance**
Met with APCD staff to discuss permitting of Tier 0 generators
Air-vacs replaced, hydrant painting, numbering, blue reflectors placed for hydrant location
Preventive maintenance plan implementation continues, updating forms
Valve exercising, angle meter stops replaced
Received new backhoe 9/10/09
Board awarded purchase of Vacuum truck
- **Compliance**
Monitored laboratory results, prepared compliance reports for WWTPs
- **Other**
Traffic control and flagging class attended by entire crew 9/22/09
Reviewed Urban Water Management Plan update proposals

TO: BOARD OF DIRECTORS
FROM: BRUCE BUEL *BB*
DATE: OCT. 23, 2009



MONTHLY WATER CONSERVATION COORDINATOR UPDATE

ITEM

NCSD District WCC Celeste Whitlow re Sept 2009 Outreach Activities [NO ACTION REQUESTED].

BACKGROUND

Celeste Whitlow is scheduled to summarize the attached outline.

RECOMMENDATION

Staff recommends that your Honorable Board receive the presentations and ask questions as appropriate.

ATTACHMENTS

- District Sept 2009 Outreach Activities Outline

T:\BOARD MATTERS\BOARD MEETINGS\BOARD LETTER\BOARD LETTER 2009\091028WCCSuper.DOC



NIPOMO COMMUNITY SERVICES DISTRICT

148 SOUTH WILSON STREET
POST OFFICE BOX 326
NIPOMO, CA 93444 - 0326
(805) 929-1133 FAX (805) 929-1932
Web site address www.ncsd.com

MEMORANDUM

TO: BRUCE BUEL, GENERAL MANAGER
FROM: CELESTE WHITLOW, WATER CONSERVATION COORDINATOR *CW*
DATE: OCTOBER 22, 2009
RE: ITEM – C4: WATER CONSERVATION ACTIVITIES UPDATE

Newsletters, Mailings, Advertising

- Prepared and purchased materials for November-December holiday bill stuffers.
- Design, printing and submission of ad materials for events and Water Conservation Program.
- Started the Fall-Winter cycle of Adobe Press ads.
- NEW: Worked on postcard for the Utility Department's fats-oils-grease program.
- Twitter accounts maintained.
- Updated website.

WC Program Implementation

- Continued processing the NCSD High-Efficiency Clothes-Washer Rebate applications Newsletter.
- Outreach to Dorothea Lange Elementary School: provided age-appropriate materials for an activity event regarding water conservation.
- Water Audit Program, residential.
- Water audits for selected homeowner's associations.
- Implementation of turf-replacement program.
- Research on weather-based irrigation controllers.
- Continued assisting Vista Verde Homeowners Association in the common-area's transition from low-efficiency to high-efficiency irrigation.

District Landscape

- Requesting quote from Earthscapes for mulch placement on NCSD landscape.

Other

- Attended Emergency Operations Center two-day workshop with other NCSD staff.
- Reworked display in Board Room.
- Prepared Request for Proposal for landscape maintenance contract for Landscape Maintenance District #1.
- Attended and participated in Water Innovations 2009 Conference (see attached *SUMMARY: Water Innovations 2009 Conference*).
- Nipomo Park Fall Festival.
- Worked on analysis of Model Water-Efficient Landscape Ordinance.

ATTACHMENT

SUMMARY: Water Innovations 2009 Conference.

SUMMARY: Water Innovations 2009 Conference Workshops Las Vegas, Nevada • October 7 – 9, 2009

The Water Innovations Conference was first held last year. The conference focuses entirely on water-conservation issues, and brings presenters from all over the country to speak at the workshops. Local San Luis Obispo County and Santa Barbara County attendees who attended last year raved about the conference.

Water and Energy Efficiency Program (WEEP) for Commercial, Industrial, and Institutional Customer Classes in Southern California

U.S. Bureau of Reclamation

Link to Studies: <http://www.usbr.gov/lc/socal/planning.html>

Take-Home Message:

1. For CII customers, to maximize savings, water, wastewater treatment and energy savings (WWES) should be calculated together.
2. Where possible, the three areas should combine efforts for energy and water efficiency.

This study was undertaken by the USBR to assess potential opportunities, identify barriers, and examine local and state-wide benefits for a regional program allowing wastewater, water conservation and energy utilities to join in promoting the efficient use of water and energy.

WEEP was designed to bring utilities together to study the effectiveness of combining water and energy conservation together. The program identified classes of customers benefiting the most from the WEEP program, identified the types of incentive programs in which businesses would participate, and developed tools for businesses and utilities.

There were 24 Southern California utility and other entities involved in the identification and selection of CII customer classes, developed a process of summarizing savings for customers, developed tools and protocols for performing integrated audits, identified marketing and outreach best management practices, identified a method to analyze costs and benefits, identified possible barriers and types of successful incentives for participation.

CII Customer Classes:

1. Accommodation.
2. Amusement, gambling and entertainment.
3. Chemical manufacturing.
4. Computer, Electronics manufacturing.
5. Educational services.
6. Fabricated metal product manufacturing.
7. Food manufacturing.
8. Food service and drinking establishments.
9. Hospitals.
10. Personal laundry services.
11. Petroleum and coal products manufacturing.
12. Professional, scientific and technical services.
13. Real estate.
14. Textile mills.
15. Utilities.

When calculating improvements in energy and water efficiency, they found that a measure that would have been discarded for one of the three groups (water, wastewater, energy) because it did not generate enough savings, would actually, when considered with the combined WWES, provide overall savings that would justify the expense of the measure.

Presenter gave examples of energy-water savings for measures. For example, cooling would save 20% to 30% for both water and energy, and none for natural gas, but the overall increase in savings in energy and water would justify natural gas's participation, as long as it was a reciprocal relationship where, for another measure, natural gas savings would be supported even if it didn't particularly help water OR energy.

Often combining WWE will allow for large benefits for the smaller of the three participants. For example, Southern California Gas has large resources for getting grants and providing support for a combined WWES program, and the NCSD could enjoy the benefits of SCG's resources if NCSD was part of the WWES program.

Efficiency of the WWES group includes having only one point of contact (usually the largest member with the most resources).

Integrated audits for energy efficiency would provide information to the customer on a whole range of available incentives, the customer would receive only one audit report for all of the savings possible, and would receive recommendations for equipment or process upgrades or changes.

Combining marketing outreach would expand the benefits of partnerships, provide a unified message to customers, and could establish measures like an awards program.

The possible barriers to forming the unified WWEs approach include:

1. Limited program coordination between WWEs to develop integrated water/energy efficiency programs.
2. CII customers not knowledgeable about available incentives and programs, and without resources to design technical aspects of efficiency programs.
3. CII lack of financial resources to implement energy/water efficiency programs.
4. CII institutional issues, such as route for approval, lack of funds, and regulatory requirements which may delay implementing efficiency projects.
5. Limited CII recognition programs for CII customers implementing water/energy efficiency programs.

Final emphasis points:

1. Integrated resource management programs could reduce water and energy use.
2. Coordinated management efforts and partnerships are needed to gather information, conduct integrated audits and consistently report costs and benefits.
3. Joint marketing and outreach efforts increase benefits to WWEs and customers..
4. Coordination of administration of water/energy rebates.
5. Customers who benefit from more customized incentive programs would be more likely to participate in water/energy efficiency programs.
6. Customer benefits include building customers' level of expertise, technical assistance offered, and receiving public recognition from the water/energy efficiency measures.
7. Water and energy efficiency products become more attractive to customers when all savings are contained in one cost/benefit analysis; payback periods decrease when incentives are bundled; greater returns for customers as costs of water/energy increase.

SMART Water Application Technologies, 2009 Update.

Irrigation Association

SWAT: Smart Water Application Technologies. A coalition of water suppliers, equipment manufacturers and irrigation practitioners with interests in the SWAT initiative. Their goal is to remain viable in the water-conservation turn in landscaping by advocating conservation by state-of-the-art technology and systems running efficiently and without water waste.

The SWAT coalition has published a set of Turf and Landscape Best Management Practices, which follows this summary of the workshop.

Their main focus is turf, and the groups that support it have to do with the turf industry.

SMART water testing is at Phase III for everything but soil-moisture sensors. Testing is for what manufacturer says it does, not whether it saves water. (This is not stated on the web pages for the results of the SMART testing of irrigation controllers.) The manufacturer controls whether the results of the testing are published or not. The test results seen on the IA website are for the controllers' that their manufacturers allowed to be published.

Testing is done at the Center for Irrigation Technology Studies, at Fresno State. This center is totally supported by irrigation industry funding, particular those who pay to have their irrigation equipment tested.

When looking at test scores, under "irrigation excess," scores less than 100% start showing up secondary to how well the technology handles rain and other climate-based issues.

Soil moisture sensors are in Phase I testing. They only test the sensor, not how it works with the controller. Phase III will be the SMS and the controller. They are currently running a pilot test program to see if they can avoid doing field tests.

The next technologies with promise are MP Rotators (multiple-stream/multiple-trajectory nozzles). MP Rotators are application heads that replace sprinkler heads on existing irrigation systems. They are expensive, around \$5.00, but some manufacturers offer a 5-year warranty, and that may help homeowners. Also, many water conservation programs offer rebates for MP Rotators. (NOTE: A quick internet search found the amount of each rebate to be between \$1.00 and \$5.00).

MP rotators provide the following benefits.

- They are more efficient than pop-up spray heads
- They do not mist or fog
- They hold up better in the wind
- They reduce runoff because they put down water at a slower rate
- They are great on slopes
- They water better in front of the sprinkler head
- They are adjustable from 90°-210° and also come in full circle (360°)
- They will retrofit Rainbird, Hunter and Toro sprinklers. They will not retrofit Orbit, Lawn Genie, or Champion
- Tests have shown 30% savings over pop-up spray heads
- The change-out is easy: just unscrew the old ones and put on the new ones
- They work best at 40psi

Texas A&M College study: Poor results for irrigation technology were achieved because the college used its own set of criteria and not the industry's criteria (their own BMPs).

Future focus: Develop solutions to barriers to sales.

They are currently considering testing rain-detector/system shut-off sensors.

In the future:

1. In spring 2010 climate-based controllers will receive EPA WaterSense certification and labeling.
2. Moisture sensor based controller protocol sent to EPA in "late 2009."
3. Develop MSMT protocol and pressure-regulating sprinkler protocol, and review second-draft protocols in 2010.
4. Develop solutions to barriers.

He summarized:

1. Controllers require a good knowledge of irrigation and equipment. Just changing the controller will not save water.
 2. The performance of the controller is highly based on who installed it.
 3. Follow-up after installation is essential.
 4. Studies are inconsistent, but may include other factors such as how weather is normalized.
-

IRRIGATION ASSOCIATION BEST MANAGEMENT PRACTICES

Smart controllers, Turf and Landscape

Water sustains every community... from the most basic needs of its citizens to the very lifeblood of the community's economic growth. In both urban and rural areas across the U.S., water rights, allocation, treatment, delivery, and supply issues are increasingly subject to legislation and regulation. Frequently, measures are passed in reaction to a crisis and without a comprehensive plan. As the focus on our water resources increases, so does the need for equitable policy and progressive water management practices.

The Irrigation Association® has developed *Turf and Landscape Irrigation Best Management Practices (BMPs)* for policymakers and professionals who must save and extend our water supply while protecting water quality. The *BMPs* will help key stakeholders - policymakers, water purveyors, designers, installation and maintenance contractors, and consumers - to develop and implement appropriate codes and standards for effective water stewardship.

The *BMPs* recommend parameters for water resource policies; define key stakeholders in water policy and management decisions; present tools to formulate and implement sound water policy; and raise the bar for efficient water management industry standards.

Landscapes where we live, work and play are in jeopardy for their visible water use. Yet, modern irrigation technology, prudent design and diligent maintenance allow us to grow and maintain landscapes without sacrificing the benefits landscapes offer. It's possible to do more with less... starting today.

The five Turf and Landscape Irrigation Best Management Practices include:

1. **Assure Overall Quality** of the Irrigation System;
2. **Design** the Irrigation System for the Efficient and Uniform Distribution of Water;
3. **Install** the Irrigation System to Meet the Design Criteria;
4. **Maintain** the Irrigation System for Optimum Performance; and\
5. **Manage** the Irrigation System to Respond to the Changing Requirement for Water in the Landscape.

The *Best Management Practices* feature detailed *Practice Guidelines*, or recommendations, for locally implementing the *BMPs*. The *Guidelines* are based on proven science and engineering principles, and present professional, easily understood methods for primary stakeholders to incorporate. Additionally, the *Practice Guidelines* promote consideration of local geographic, economic and political conditions - crucial to overall program success. Developed by recognized irrigation experts; the *Guidelines* represent the best approaches to managing our landscape water resources.

The *Turf and Landscape Irrigation Best Management Practices and Practice Guidelines* are designed to help water purveyors, industry professionals and irrigation consumers make responsible and informed decisions about water usage. Sustaining your community's economic growth on a finite water supply is a shared responsibility.

The consequences of ineffective planning, little cooperation, overuse, and continued wastefulness will result in more mandates with little regard for personal consequence, inability to meet demand, increased costs to make infrastructure improvements, customer dissatisfaction and failed confidence in landscape, irrigation and water companies. These consequences are preventable if we act together.

AUSTRALIA DROUGHT: Lessons to be Learned (Rain Bird and the Intelligent Use of Water)

According to the presenter, the U.S. can learn a lot from Australia:

- U.S. water consumption: 640 liters/day/person.
- Australian water consumption: 200 liters/day/person.
- 30 of 50 U.S. states expect water shortages by 2010.

Australian context:

- **Population growth.** Continues as immigration continues.
- **Drought.** Rain has decreased secondary to a shift of air stream so the air stream is not able to pick up as much moisture as it did before.
- **Long-term climate trends.** Expected for continuation of decreased rain except in the northwest where monsoons occur, and they are expected to continue to be too much too soon, decreasing the amount of water that can be stored in the groundwater basin.

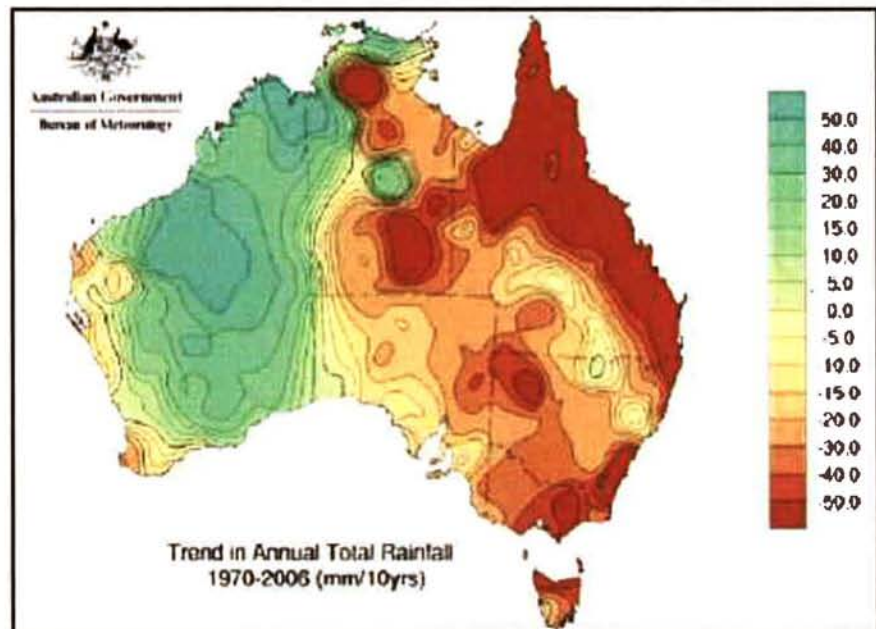
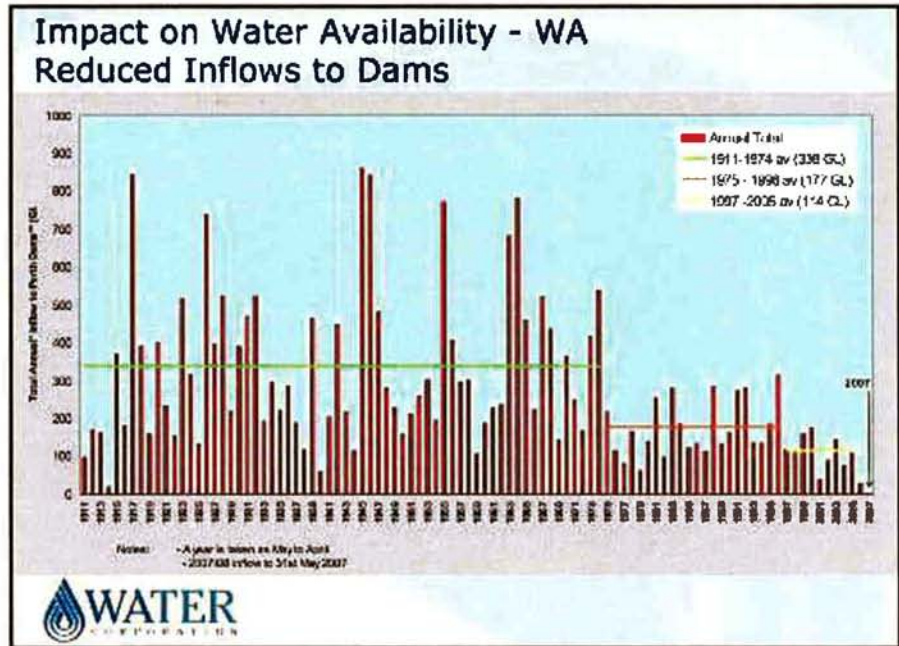
Pre-drought, Australian water consumption was 300 liters/day/person: 190 indoor, 110 outdoor. Target was a l/d/p of 140 liters.

They used TV and radio advertising, as well as ads in newspapers and magazines.

Every day the weather was given on TV, they would also give the level of water in reservoirs.

Because they were able to decrease water consumption, they were able to decrease water restrictions.

They used the SMART-Approved Water labeling (a nonprofit organization, funded by the Australian government) to identify water-conserving items.



They went out and promoted products and services, ran behavior-change campaigns, and promoted new technology and tactics.

Economics of Water Conservation:

Most water agencies in the U.S. have the luxury of, if not acting now, not having to work in a crisis situation.

From my own recent visit to Australia:

The homeowners I met and talked to had already relandscaped, removing turf and installing drought-tolerant plants, were planning to do so, or had bought a home already landscaped in drought-tolerant plants.

The majority of the people I talked to were very excited about their drought-tolerant landscapes, and glad the homeowners were pushed to make the change. The chuckled about the "boring" lawns present before.

When asked why they thought the Australian people had responded so positively to demands that they conserve water, the answers usually ran in the "because-we-all-have-to-do-ou- own-part,- don't-we?" vein.

One woman, when asked if there were any waivers requested for the water conservation requirement, said that there were, and the newspapers carried intermittent articles about the types of requests for waivers received. The impression was those seeking waivers were looked down upon by their neighbors as not caring for the community and the future of the country.

I did not see one toilet in Australia that was not dual-flush. Unfortunately, they were not universal in which side of the button was high-flush and which was low-flush, and any labeling had been worn away.

The government properties were mostly in drought-tolerant landscape. Plants that were not drought-tolerant were, in many cases, showing the impact of decreased irrigation (turning brown).

The Brisbane Botanical Gardens were letting plants turn brown and droop, and established native plants were not being irrigated.

**Public Involvement in the Internet Age:
Understanding the Role of New and Social Media in Citizen Engagement**
(Katz & Associates)

(NOTE: The "social media" classes were very popular with the conference attendees.)

Social Media Defined: Email, blogs, social networking sites (Facebook, MySpace), video-sharing sites (YouTube), online surveys, and discussion boards (less used now).

Research:

- Who is using social media?
- What was learned?
- How can we start using social media?

Study by San Diego State University Professor David Dozier, November 2008:

They wanted to learn what forms of media people use in general, what forms of new media people use to participate in local policy issues, and the willingness of people to use various forms of new media to participate.

Barriers to adoption of new media:

- Prefer speaking face-to-face: 42%
- People use fake names online: 26%
- People are rude online: 21%
- People my age are not interested: 20%

How likely are you to use various forms of new media for public participation?

• Send email to official:	Somewhat likely:	33%	Very likely:	22%
• Watch net video on issue affecting me:		18%		9%
• Read blog on issue affecting me:		11%		13%
• Post to blog on issue affecting me:		11%		3%
• Go to a social network issue site to find others:		9%		4%
• Go to issue-based social network site:		9%		4%
• Post to issue-based social network site:		8%		3%

Water infrastructure scenario question example: Suppose aging pipes and other infrastructure in your area need to be replaced. This is needed to keep your tapwater safe. This will cost a lot of money and your utility bill will probably go up:

How scenario affects respondent:

• Environment scenario:	Somewhat:	43%	A great deal:	38%
• Water scenario:		37%		44%
• Land-use scenario:		44%		31%
• Traffic scenario:		38%		30%

Number "enthusiasts" = Attend 2 or more meetings: 29% Speak at 2 or more meetings: 2%

"Enthusiasts are more likely to":

Send email to officials, read blogs on issues important to them, watch internet videos on issues important to them, complete online surveys on issues important to them, but LESS likely to seek social network sites on issues important to them.

"Non-Enthusiasts are more likely to:

- | | | | | |
|--|------------------|-----|--------------|-----|
| • Send email to official: | Somewhat likely: | 24% | Very likely: | 12% |
| • Watch net video on issue affecting me: | | 14% | | 5% |
| • Read blog on issue affecting me: | | 10% | | 7% |
| • Post to blog on an issue affecting me: | | 8% | | 2% |

RESEARCH CONCLUSIONS:

For those already involved: New media offers new forms of public participation.

For those not involved in traditional public participation (public meetings): New media provides other public participation options they may use.

Advise for using new media:

Email: Create and maintain lists for specific purposes.

Internet videos: Short informative videos posted on YouTube and your website are easy to access.

Blogs: Post to existing blogs, or start your own (requires a lot of time)

Remember:

- New media is still changing and will continue to change.
- Think about your audience before you start using new media.
- Consider resources (time, funds) required; some new media requires more than others.

Advantage of social media:

- Direct control of message (no media filter).
- Water agencies must stay on the bandwagon or fall behind in the crowd.
- Smaller audience, but "qualified" audience," getting your message because they want to.
- Tools like email, Twitter and Facebook are cheap and easy, and enable you to reach your target audience by the way they are constructed and how you run them. Tools can be "broadcast" or "two-way," and you can "go deep"—offer in-depth of info.
- You can become very entertaining by videos and other graphic means.
- More opportunities for behavior-modification prompts.

Disadvantages:

- There are people you will never meet, and with two-way communication, the organization can be attacked without factual basis.
- You can get "nuisance" spammers if you don't specify members/participants must be invited in.
- Audience may be difficult to find, and success may be difficult to measure. Once you start, you are expected to continue.

Overall challenges:

- You need to have fresh content all the time, Information must be short and crisp sound bites.
- Recipients may already be overloaded with groups sending them information.
- Social media is constantly changed and you have to keep up.

MANPOWER AND TECHNOLOGY: Implementing a New Tiered-Rate Structure Irvine Ranch Water District

Irvine Ranch Water District has successfully used tiered water rates for decades to provide pocketbook incentive needed for water conservation to an existing water district they acquired, Los Alivos Water District (which includes Lake Forest). The LAWD was on a flat-rate structure, and when it merged with IRWD the rate structure was changed to a multi-tiered rate structure.

Lake Forest is a more rural area with multi-acred lots.

An allocation-based rate structure:

- Uses property-specific water budgets.
- Rewards those who use water wisely.
- Penalizes inefficient water use.

This type of rate structure was first implemented in the IRWD in 1991, and it

- Is equitable.
- Provides revenue stability.
- Keeps low rates for a large majority of customers.
- Demonstrates water savings.
- Provides funding for water-use efficiency programs.

Since adopted in 1991, water use has dropped from 4.4 AF/acre/yr to 1.9 AF/acre/yr. It has stabilized runoff during dry weather, and has capitalized on changing plant material selection to more "California friendly" landscaping.

From 1992 to 2000, irrigated acreage doubled, and water use increased 3%.

Average annual water use for residential customers decreased by 7-8% after implementing a multi-tiered water rate structure.

Residential rates are:

Tier	% of Allocation	Cost/ccf
Low Volume	0-40%	\$0.91
Base Rate	41-100%	\$1.15
Inefficient	101-150%	\$2.33
Excessive	151-200%	\$4.65
Wasteful	201+%	\$9.30

Monthly water charge: \$7.75 (up to a 1" meter)

Allocations are:

Type of Residence	Occupants	Gal/Day/Person	SqFt of Landscaping
Single-family resident	4	55	1300
Townhouse/Condo	3	55	435
Apartment	2	55	0

Irrigation system efficiency for warm-season turf is 71%

Water use in IRWD was lower than in LAWD, so water conservation based on allocation was set up for LAWD.

Problem: Lake Forest is much less homogenous than IRWD, and there was much concern for the survival of the many existing, very large eucalyptus trees.

They believe the evaporation from a pool is about the same as water loss from lawn, so considered any pool present to be "lawn" for allocation purposes.

Implementation. There was a transition interdisciplinary team. Changes in billing software programming were done, GIS determination of lot size was done, tier rate allocations were defined, and test bills were sent out. They had a proactive outreach team.

To provide water allocations to the LAWD customers, all of the lots were GIS'ed, linked to parcel numbers, and an average amount of irrigation based for each parcel size was found. Allocation was then made for each parcel based on the size of the parcel.

For irrigation accounts they measured size served by each meter and then designed the allocation based on the size measured.

Test bills were an important part of the transition. Two months before the rates were to go into effect, customers were sent out test bills showing what their water bill would be if the rate structure was already in place (i.e., "you would have \$500 in surcharges if the rate system was already in place"). They proactively identified the ones with use way beyond the allocation, and contacted them with offers of help in finding ways for them to conserve water, leak detection, etc.

The outreach underwent test scripting. They found it was important to immediately identify who they were with and that their water was being provided by IRWD, and to next say they weren't trying to sell them anything. This was especially important if the contact was by phone.

Very few people came to the forums scheduled. Webinars were used because they are available all the time and most people have computers.

Other tactics used: offered to appear at small HOA meetings, used banners throughout LAWD, compiled email contact information so mass outreach could be done, increased the number of cards at the office reception counter.

Customers were offered \$25 off their bill if they attended a webinar.

They have a Water Waste Traffic School for interventions with consistent water wasters.

They had great success. The most important measure of the coordinated interdisciplinary approach was sending out the test bills and following up with interventions. Behavior modification was the most important type of measure achieved.

They continue to work with high-use customers.

In the beginning 10% of Lake Forest users were in the "wasteful" category, now it's less than 2%.

Overcoming Barriers to SMART Technology Acceptance

(Ewing/ California Licensed Irrigation Association)

Higher water pressure decreases irrigation distribution efficiency (43%-decrease example given)

Required for a SMART controller installation: Education, site analysis, technology, caution, and confidence.

Required site information includes size of irrigated area, ID of plant material and size, current irrigation schedules/practices, property water bills or meter readings, actual/historical ET, distribution uniformity, precipitation rate, dynamic pressure.

Bit difference between precipitation rate of sprinklers heads and rotors.

Two types of irrigation approaches are used: weather-based and soil-moisture based. Soil-moisture based produced an increase in water used in 48% of the sites it was installed in.

“WARNING: YOU CAN’T PUT A SMART CONTROLLER ON A DUMB SYSTEM AND EXPECT GOOD APPEARANCE OF LAWN AND BEST WATER SAVINGS” (he made a big deal about this and had it in huge type on his PowerPoint presentation).

High-performance nozzles:

Multi-stream rotating nozzles: Hunter MP Rotator, Rain Bird Rotary Nozzle.

High-performance sprays: Toro Precision, Rain Bird U Series

Multi-stream multi-trajectory rotating stream sprinklers produce the highest distribution uniformity.

Under-utilized technology: Pressure-regulating sprinklers. They save 123 gallons/day per each 10-sprinkler zone.

Recommendations usually made to upgrade old sprinkler systems to greater efficiency:

- Retrofit sprinkler nozzles to MP Rotators.
 - Regulate pressure to 40 psi.
 - Improve distribution uniformity to 73%
 - SMART controller.
-

Why Do Irrigation Technologies Sit on the Shelf? (Irrigation Association)

Tools:

- SMART irrigation controllers.
- Sensors.
- Drip irrigation.
- Matched precipitation.
- High-efficiency nozzles.
- Pressure regulation.
- High-flow detection.
- Principles.
- People.

Limitations in irrigation efficiency interventions:

- Comfort zone: If landscape is set in efficient ways, difficult to change.
- Lack of customer awareness of gallons used per cycle of irrigation system, per month, per billing cycle, and per year.
- Skill to retrofit landscape to efficiency, and maintain it at efficiency.
- Cost upfront (bringing landscape to efficiency) and ongoing (routine maintenance to keep it efficient).
- Cheap water, vastly underpriced.
- No satellite signal changing controller and irrigation.
- Proof backed by research.

Primary deciding factor for irrigation purchase? Cost. When sales in homes drop, sales in irrigation controllers drop.

Price signals (water rates) have to be equitable. Have to be relative to amount of land and how much water is used.

If people are charged what water is worth, they will irrigate and landscape based on that price.

EVALUATION OF WEATHER-BASED SMART CONTROLLER PROGRAMS

East Bay MUD, Metropolitan Water District

This was a 4-year study, with process evaluation, impact evaluation, customer survey, agency survey, water-savings analysis (with pre- and post- weather-normalized consumption data), irrigated area and CIMS ET data, and cost-effectiveness analysis.

It is the largest SMART controller study ever performed.

Factors that influenced water savings:

- Pre-SMART controller installation application Ratio: Level of over- or under-irrigation before installation of SMART controller.
- Installation method (self vs. professional).
- Participating agency (sometimes significant).

Factors that did not influence water savings:

- Site classification (residential v. nonresidential)
- Region (northern v. southern).
- Climate zone (coastal, intermediate, inland).
- SMART irrigation control technology (historical ET, on-site readings, remote readings, soil-moisture sensor).

CONCLUSIONS:

- Historically over-irrigated sites had a reduction in water use.
- Historically under-irrigated had an increase in water use.
- Weather-normalized change in usage averaged -6.1% across all 2294 sites.
- Water savings can be maximized by improved programming and targeting over-irrigators.
- SMART controllers are cost-effective for water providers and customers in many cases, but not for all customers and utilities.
- Most SMART controller brands decreased water use, but not all decreases were significantly important.

Agencies will monitor programs for 5 years.

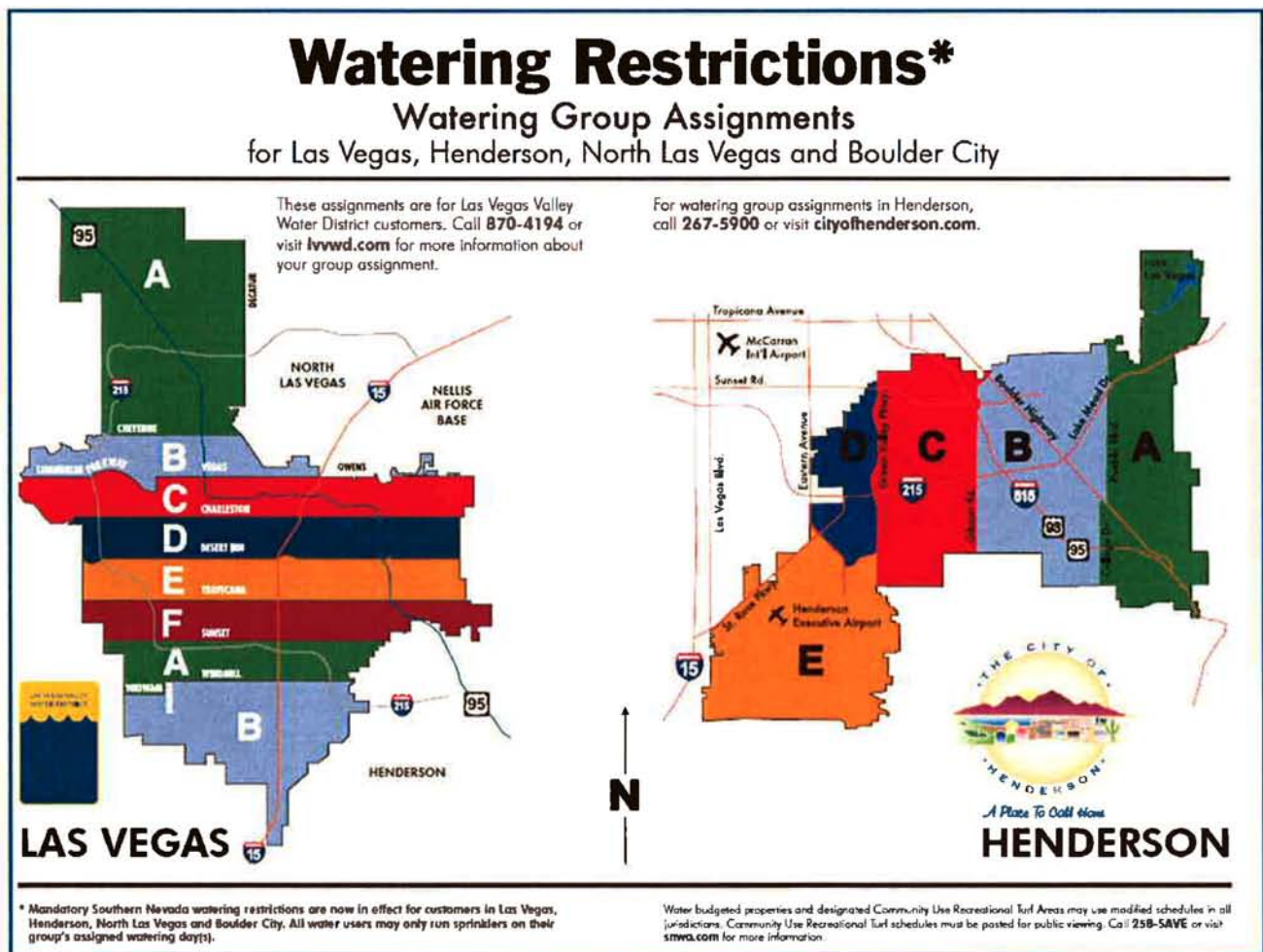
SOUTHERN NEVADA WATERING AUTHORITY "WATERING-GROUP ASSISTANT" STUDY

Kent Sovocool, Senior Conservation Programs Analyst

Background. SNVA has group watering days. Instead of having opposite-side-of-street or even-odd watering days, watering days are for regional areas.

(Example: Old Towne could water on Fridays, Blacklake on Tuesdays, etc.). The group watering days are only for spring and fall because in summer, without daily irrigation, landscapes fry.

They clearly marked watering-day zones so they would be easy for field crews to identify. This is what it looks like:



They found that having a regional group watering-day set-up made it easier to tell if someone is not watering on their day, and it was easier on the utility workers.

There was a linear relationship between # of days irrigated and amount of water used. They found that May through August was efficient, but September through January was worse.

93% of water waste issues at SNVA are resolved without water-waste fees. There have been no court appearances. Water-waste fee goes on the water bill.

They found that the most water waste was in the fall, and that messaging has a positive influence on water use but it is not sustained.

“Watering-Group Assistant” Study. A watering-group assistant is a device that forces an irrigation controller into compliance with watering-day restrictions (if programmed correctly). It interrupts the common wire. It can be used on both drip and spray irrigation-controller stations. It is usually an add-on device. A rain sensor is an example of such a device. There are devices that change your irrigation controller scheduling by a percentage, based on a water index that is usually located on the device’s web pages. It does not have refined climate information, however, and will provide the index for your zip code, which often is not very accurate since the climate can change a lot in a zip code area, depending on where you are.

In 2007 the SNWA Board authorized \$250,000 to find a device which would help customers deal with water restriction days. The problem with the watering-day group assignment is the majority of irrigation controllers cannot schedule for every other day, even-odd days, or different assigned days, and different times of days. [Hydropoint’s WeatherTRAK is an exception.]

SNWA thought maybe customers having to constantly adjust their irrigation clock to be on schedule with their watering days was creating the significant noncompliance seen.

In theory, with a watering-group assistant device customers can always be in compliance with watering-day restrictions because they don’t have to remember to reset the irrigation schedule. The device will work with both day-of-week and time-of-day schedules throughout the year.

Their water-waste fees are quite significant:

Water Waste Fee Schedule					
Meter Size	1st Violation	2nd Violation	3rd Violation	4th Violation	5th Violation and More
1” and Less	\$ 80.00	\$ 160.00	\$ 320.00	\$ 640.00	\$ 1,280.00
Over 1” but less than 3”	160.00	320.00	640.00	1,280.00	2,560.00
3” and over	320.00	640.00	1,280.00	2,560.00	5,120.00

SNWA is working on this device because they estimate that if more people complied with the restrictions, 30,000 acre-feet/year could be saved.

The RFP was quite detailed, and provided for upgrading, working in Southern Nevada’s climate, etc.

Five manufacturers and 6 devices were selected, 100 units of each were purchased, 600 units in total. Not all 600 were installed; they kept some for replacements. They examined both self-install and SNWA install.

All had their pluses and minuses. None complied with RFP requirements, were compatible with all systems, and had the capability to exempt a watering station (i.e., if seeds were planted and needed more frequent irrigation in one of the irrigation controller's stations).

They are currently in a one-year monitoring study.

Preliminary observations.

All of the units had straight-forward installations, but none of the units had flawless installations.

There are problems with SFR installations because residential customers don't understand why the device isn't saving them water during peak times (the devices are not peak-reduction devices).

Self-installation may be an unrealistic expectation for most homeowners. SNWA capped self-installations at 70 because there were so many problems.

Thirty days before installation was completed, the fall-winter average day-per-week compliance was 41%, noncompliance 59%. Thirty days after installation was completed, average day-per-week compliance was 71% and noncompliance was 29%.

CITY OF HENDERSON TURF-REMOVAL PROGRAM

City of Henderson covers 104 square miles, has 269,826 residents, and 80,000 utility accounts.

Issues include extreme temperatures, lack of precipitation, and one water source.

Their category-use breakdown is:

SFR: 50.4%
MFR: 10.1%
CII: 9.4%
Resorts: 0.6%
Golf course: 14.4%
Common Area: 9.1%
Schools/government/parks: 4%
Other-Construction water: 1.9%

60% of potable water is used outdoors. Of that, up to 50% is wasted. Irrigation run-off translates to lost, untreated water.

Current landscape restrictions include:

- No turf installation in front yards or commercial properties.
- Turf in backyards limited at 50%.
- Replacement of turf with drought-tolerant plant material cannot be prohibited (i.e., by homeowners' associations).

The SNWA goal in their turf-replacement program was to reduce water consumption by 50 to 70 gallons per square-foot converted. They used a per-square-foot turf-conversion rebate, and included beneficial landscaping requirements.

Up to 30% of applicants withdrew because of up-front expenses (from \$2 to \$5 per square foot). The rebate wasn't received until the project was completed. Because the up-front expenses were so hefty, the result was inferior quality landscaping due to the customers not being able to provide enough up-front funds to do the project well, and incomplete projects which were community eyesores, and a successful generator of neighbor complaints.

Southern Nevada Water District has a HELP program to help low-income landscape renovations. The money comes from redevelopment loans and grants, and enrollment is restricted.

Henderson joined with SNWA to provide a Turf Removal Assistance Program which would facilitate participation of homeowners (especially low-income homeowners, of which Henderson has quite a few). It provides assistance with a loan for up-front expenses to ensure completion and to encourages quality conversions.

The loan is at 3% interest, \$5000 maximum loan, 7-year deferred-payment schedule, with the option to credit the turf-removal program rebate to the loan balance.

The home must be the primary residence of the homeowner, homeowners must meet minimum credit requirements, and must be accepted by the Turf Removal Program.

They marketed it by media coverage, via the utility's website and bill inserts, and through SNWA who referred customers to Henderson's Turf Removal Program.

To date, 50 projects have been funded, they are on budget, and converted homes have shown reduced water consumption. A large number of participants requested that the rebate be applied to the loan balance. This enables Henderson/SNWA to then add that amount to the available funds for loans.

Additional benefits for customers are reduced water bills, personalized water conservation education, and increased curb appeal of their homes.

Additional benefits for the city include increased customer education, positive publicity and goodwill, strengthened relationships.

CONSERVATION: IT IS GOOD FOR BUSINESS

San Antonio Water Conservation Division

San Antonio, like many southwestern cities, has alternating wetter and drier years. Customers use more in dry years, and less in wetter years to meet their water needs.

There is a wide swing in their demand, from 109 gpcd in one year to 139 in the next. From a financial planning point of view, this is a poor business model. To meet the demands in the highest-use years they would have to carry 40% extra in the lowest-use years. This is the equivalent of a store carrying 40% extra inventory for years for the possibility that the customer demand will fluctuate upward 40% in one year.

Concerns were for the capabilities of the utility to provide the 40% extra that customers would demand in a seven-year drought, with the need to build another desal plant (they already are constructing one), which would greatly increase the cost of water to the place where it would be unaffordable by most residents.

Studies on the categories of customer consumption demonstrated that a significant part of the customer usage was by a very small number of customers who used far more than other residents.

Their financial department decided their current business model (with the goal of providing water to meet the demand of their customers when it required having 40% extra "in inventory" for the drought years, not being able to meet the consumption demand if consecutive drought years occurred, thus necessitating even more extra water "in inventory, which could only be met by building another desal plant) was a poor business model, and would ultimately lead to very high water prices which would be an unbearable burden for the majority of customers) was a poor one, and that changes needed to be made.

So the goal was changed. The goal became not to meet whatever demand customers made for water, but to convince them to consistently conserve water. The city's financial department told Water Conservation to do what it takes to decrease GPCD to fiscally sound and sustainable levels..

There are four legs to the water-conservation table:

- Reasonable regulations.
- Early drought warning.
- More financial motivation: specifically, rate increase to make water cost more for the top end of users, with the top tiers considered as representing discretionary use.

They figured out that in the fourth tier, the cost for one irrigation cycle of 20 minutes was \$10 a month, which they considered to be far too low. They needed to increase the cost of water in the fourth tier. They raised the top tier and lowered the bottom tier so that 95% of customers experienced a decrease in their bill. The customers who consistently were at the top end of water use, and would be the ones forcing the construction of another desal plant if their consumption remained unchanged, would experience a large increase in their water bills.

A medium-sized lot in San Antonio is less than ¼ acre.

She told her financial officer she could do it, but the cost for commercial had to be the same as for residential. Otherwise, it breeds hostility in the customer community. The financial officer agreed.

Their drought patrol goes out at night, seven days a week, especially in times of higher consumption. No watering is allowed on the weekend.

She stressed the importance of starting restrictions early in a drought cycle because it will keep from having to restrict water consumption to the level of just meeting public health levels.

Getting support from stakeholders.

Stakeholders who can promote or fight water restrictions include landscape/irrigation professionals, pool companies, powerwashers, motels, builders, plumbers, and large property owners (residential and commercial).

If everyone participates in water conservation, it promotes a culture of efficiency. Rules should be shared equally amongst customer categories. Sacrifice is easier if it is not just one group doing the sacrifice, and lobbying to elected officials is harder if the whole group is sharing in the sacrifice.

It is an issue of community need, not what one group of customers can force their elected officials to do for them.

They formed a Water Conservation Community Committee, appointed by the Board. It is an advisory committee, but it serves as a way to get message to the community and can provide vital information about public feelings about the approach to the water conservation demands. Using a community committee can only work if elected officials stand firmly behind need for water conservation. Otherwise, it becomes an avenue for a few discontents to attack the elected officials and the utility, undermining efforts at community conservation efforts..

Water-related businesses realize that if water conservation goals are not met that there will have to be severe restrictions, which will end many of their businesses. Attempts were made to help water-related businesses by bringing them into the education part of the program when possible (i.e., landscapers can get new customers by performing water audits, and then subsequently doing turf removal and irrigation system upgrades for the customers who are interested).

Water Saver Awards: 12 years of recognition programs. Given annually. They raise money for scholarships by the award luncheons. Companies display the awards, and the luncheon attendance is several hundred with high-profile attendees.

Education and outreach. They have a slew of training and networking programs, including a green plumbers program, training of plumbers on local programs and options, washing machine rebates, outreach to homeowners associations, school facility managers, etc.

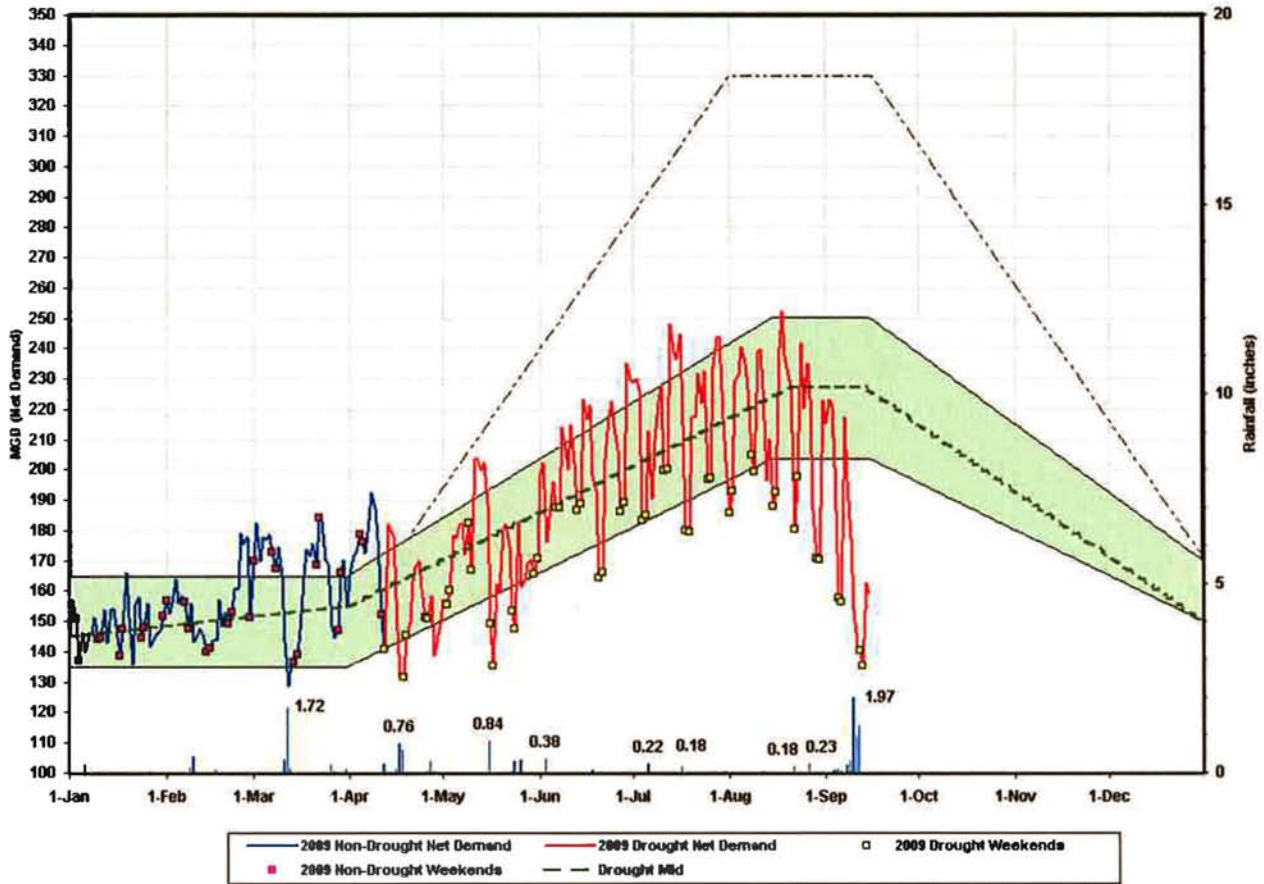
They also have many outdoor-focused programs, such as tracking sales at nurseries, with partners marketing special rebates, engage with local irrigation groups, etc.

Their outreach efforts resulted in contacts with 10,000 people in 2008, and volunteers reached another 50,000. They used "only" \$45,000 a year for staffing at events and presentations, and for outreach.

Over a few years they were able to achieve enough conservation that they were able to increase the level of the "high" water-use tiers so high-end users could use a bit more and not have to pay the higher-tier prices.

This is a graph of their pumping changes with water conservation and restrictions.

**Drought Savings Assessment Tool
Net Demand**



The dotted line represents consumption without restrictions, The red line represents the 2009 drought net demand, and the blue line represents 2009 drought net demand. Daily pumping demand has basically been within the green target area all summer.

Conclusions.

- Conservation recognition can be a marketing advantage.
- New construction/ new installation is down but contractors can market retrofits and improvements, and can market water conservation program options.
- Nonprofits with overlapping missions (i.e., Master Gardeners Program) are a bargain.
- Pay attention to stakeholders and get involved in their organizations.