3. ONGOING AND RECOMMENDED WORK

This section describes:

- the ongoing work of the IMP, which includes the continued monitoring of the aquifer system and land surface deformation and the development of analytical and numerical models of groundwater flow and aquifer-system deformation.
- the work that is currently being implemented that was not initially part of the IMP, but has been recommended by MZ-1 Technical Committee and/or Watermaster based on data obtained during the IMP period. This work includes the expanded aquifer-system monitoring in the central area of MZ-1, and the monitoring of horizontal ground surface deformation along Schaefer Avenue.

Continued Monitoring

Aquifer-System Monitoring. Aquifer-system monitoring efforts will continue for the duration of the IMP. The MZ-1 Technical Committee will likely recommend that the aquifer-system monitoring efforts continue, albeit at a reduced scope, as part of the long-term management plan. Electronic data from the Ayala Park Extensometer facility and from water level recording transducers in surrounding wells will be collected and entered into the MZ-1 database once every two months. The purpose of this continued monitoring effort is to (1) continually evaluate the effectiveness of the long-term plan, and (2) verify the accuracy of the groundwater flow and subsidence models that are being used as management tools.

InSAR. The MZ-1 Technical Committee is recommending that on-going InSAR monitoring of land surface deformation be conducted on a semi-annual interval (spring and fall data acquisition and interferometric analysis) for the next two years. This analysis will (1) reveal seasonal and annual ground surface displacement across the entire MZ-1 area, and (2) be compared to ground-level survey data collected at the same interval (see Section 5.4.2 below) to help determine a long-term strategy to monitor ground surface deformation.

Ground Level Surveying. The MZ-1 Technical Committee is recommending that the entire network be surveyed twice per year for the next two years (during the spring and fall of each year). The ground level survey data will be compared against the InSAR data (see above) to help determine a long-term strategy to monitor ground surface deformation.

Development of Analytical and Numerical Models

The objectives of aquifer-system modeling in MZ-1 are:

- To evaluate fluid withdrawal as the mechanism of historical land subsidence and fissuring
- To predict the effects of potential basin management practices on groundwater levels and land subsidence and fissuring (forecasting tool)

In other words, if a model can be constructed that simulates past drawdown and associated land subsidence, then the model represents an additional line of evidence that fluid withdrawal was the mechanism of historical land subsidence. In addition, the model can be used to predict future drawdown and associated land subsidence that would result from potential basin management practices.

Three distinct modeling efforts will take place in sequence:

1. *Inverse analytical modeling.* This type of modeling will use groundwater level and production data collected as part of the aquifer-system stress testing (pumping tests) that were conducted in 2003 and

2004. The objectives are to determine the hydraulic and mechanical parameters of the aquifer-system and reveal XY-anisotropy. The results will be used in subsequent numerical modeling efforts.

2. *One-dimensional compaction modeling.* This type of modeling will use groundwater level and aquifer-system deformation data collected at the Ayala Park Piezometer/Extensometer Facility, as well as historical water level and subsidence data collected near Ayala Park. One objective is to determine the aquitard properties in the vicinity of Ayala Park. Areal extrapolation of aquitard properties will be based on geology and InSAR data, and the results will be used in the three-dimensional numerical modeling efforts (see Section 3). Another objective is to predict aquifer-system deformation due to predicted water level changes that may occur at Ayala Park in the future due to nearby pumping.

3. *Three-dimensional groundwater flow and subsidence modeling.* This type of modeling will use groundwater level and production data at all wells in the area and historical land subsidence data from ground level surveys and InSAR. Again, this model will attempt to match historical water level and subsidence data and, if successful, will serve as a forecasting tool for MZ-1 managers.

It is desirable that the calibration period for future groundwater flow and subsidence modeling begins before significant drawdown in MZ-1 (~1940). The comprehensive set of subsidence data in this region begins in 1987. If subsidence data exists prior to 1987, then it needs to be collected, evaluated, and linked to the post-1987 survey data if it is to be used in model calibration. Associated Engineers is currently investigating the quantity and quality of pre-1987 subsidence data in MZ-1, and will deliver a report containing these data in October 2005.

Expanded Monitoring

One of the key discoveries of the IMP has been the groundwater barrier located beneath the historic fissure zone. However, the northern and southern extent of this barrier is unknown. The MZ-1 Technical Committee is contemplating the expansion of the aquifer-system monitoring network to the north and south of its current extent to better characterize the location and effectiveness of the barrier. Further aquifer-system testing (i.e. pumping test) may be necessary as part of this effort.

The horizontal surveys will also be extended to the north over this two year period to include the benchmarks along Schaefer Avenue. The next survey of the entire monument network is planned for October 2005.

4. Development of the Long-Term Management Plan for MZ-1

Recall that the objective of the long-term management plan is to minimize or abate permanent land subsidence and ground fissuring in MZ-1. The modeling efforts described above will be critical to the development of the long-term plan, and the continual evaluation of plan in the future.

A workshop was held May 25, 2005 to update the Special Referee on IMP progress and development of the long-term management plan for MZ-1. The OBMP implementation plan called for the development of the long-term plan by June 2005. Because the modeling efforts were just begun in the summer of 2005, the Special Referee was notified before and during the workshop of the impending delay in the development of the long-term plan.

Subsequent to the workshop, the Special Referee issued a report to the Court (Appendix A). In the report, the Special Referee:

- indicated that the IMP progress and current activities are sufficient to warrant a delay in the development of a long-term plan
- indicated that it was incumbent upon Watermaster to request that the Court extend the period for completion of the long-term plan, and that Watermaster file with the Court a motion for an order to set a new schedule for the completion of the long-term plan
- requested that Watermaster produce a MZ-1 Summary Report (this report) that describes the IMP results and conclusions to date, and addresses outstanding issues such as other potential subsidence mechanisms and historical subsidence that pre-dates the 1990s
- requested that Watermaster provide "guidance criteria" to the MZ-1 producers in an effort to minimize the potential for future subsidence and fissuring until the completion of the long-term plan

Guidance Criteria to Minimize Subsidence and Fissuring

In response, Watermaster produced this summary report, and drafted a set of guidance criteria for MZ-1 producers. Again, the purpose of the guidance criteria is to minimize the risk of permanent subsidence and ground fissuring while the long-term plan is being developed. The guidance criteria are listed in Table 4-1 and below:

1. Table 4-2 lists the existing wells (hereafter the Managed Wells) and their owners (hereafter the Parties) that are the subject of these Guidance Criteria.

2. Figure 4-1 shows the area addressed by these Guidance Criteria (hereafter the Area of Subsidence Management). Within the boundaries of this area, both existing and newly-constructed wells are subject to being classified as Managed Wells. This is based upon the observed and/or predicted effects of pumping on groundwater levels and aquifer-system deformation. Initial Managed Well designations for wells that pumped during the IMP were based on effects measured at the Ayala Park Piezometer/Extensometer Facility. Additional Managed Well designations were made based on analysis of well construction and geology.

3. The Guidance Level is a specified depth to water measured in Watermaster's PA-7 piezometer at Ayala Park. It is defined as the threshold water level at the onset of inelastic compaction of the aquifer system as recorded by the extensometer, minus 5 feet. The 5-foot reduction is meant to be a safety factor to ensure that inelastic compaction does not occur. The Guidance Level is established by Watermaster based on the periodic review of monitoring data collected by Watermaster. The initial Guidance Level is 245 feet below the top of the PA-7 well casing.

4. If the water level in PA-7 falls below the Guidance Level, Watermaster recommends that the Parties curtail their production from designated Managed Wells as required to maintain the water level in PA-7 above the Guidance Level.

5. Watermaster will provide the Parties with real-time water level data from PA-7.

6. The Parties are requested to maintain and provide to Watermaster accurate records of the operation of the Managed Wells, including production rates and on-off dates and times. The Parties are requested to promptly notify Watermaster of all operational changes made to maintain the water level in PA-7 above the Guidance Level.

7. Watermaster recommends that the Parties allow Watermaster to continue monitoring piezometric levels at their wells.

8. Watermaster will evaluate the data collected as part of the MZ-1 Monitoring Program at the conclusion of each fiscal year (June 30) and determine if modifications, additions, and/or deletions to the Guidance Criteria are necessary. These changes to the Guidance Criteria could include (1) additions or deletions to the list of Managed Wells, (2) re-delineation of the Area of Subsidence Management, (3) raising or lowering of the Guidance Level, or (4) additions and/or deletions to the Guidance Criteria (including the need to have periods of water level recovery).

9. Watermaster cautions that some subsidence and fissuring may occur in the future even if these Guidance Criteria are followed. Watermaster makes no warranties that faithful adherence to these Guidance Criteria will eliminate subsidence or fissuring.

Development and Schedule of the Long-Term Plan

In a sense, the guidance criteria listed above are a *first draft* of the long-term plan. Over the next nine months (October 2005 to June 2006), Watermaster will conduct its modeling exercises and coordinate a series of meetings with MZ-1 producers that will likely lead to revisions of the guidance criteria.

Of particular interest to the affected Parties is the sixth criterion (6) listed above, which limits the timing of production from the Managed Wells to July through September of each year. It may be that the Managed Wells can be pumped at reduced rates over periods longer than three months, and still not cause drawdown below 245 feet at the PA-7 piezometer or inelastic compaction within the aquifer system. Watermaster's groundwater flow and subsidence models will help to address these unknowns prior to pumping by predicting:

- the water level response at PA-7 due to various proposed pumping scenarios, and
- the aquifer-system compaction response due to the water level responses.

In June 2006, after the MZ-1 meetings and modeling exercises, Watermaster will release an expanded *second draft* of the guidance criteria, which will be defined as the official long-term plan for MZ-1. A key element of the long-term plan will be the verification of the model predictions and the protective nature of the guidance criteria as related to permanent land subsidence and ongoing fissuring. This verification will be accomplished through continued monitoring and reporting by Watermaster and revision of the guidance criteria when appropriate (see Criterion 11 above). In this sense, the long-term plan will be adaptive.

The guidance criteria and the long-term plan discussed above relate to the management of pumping-induced subsidence within south MZ-1 (the Area of Subsidence Management in the terminology of the

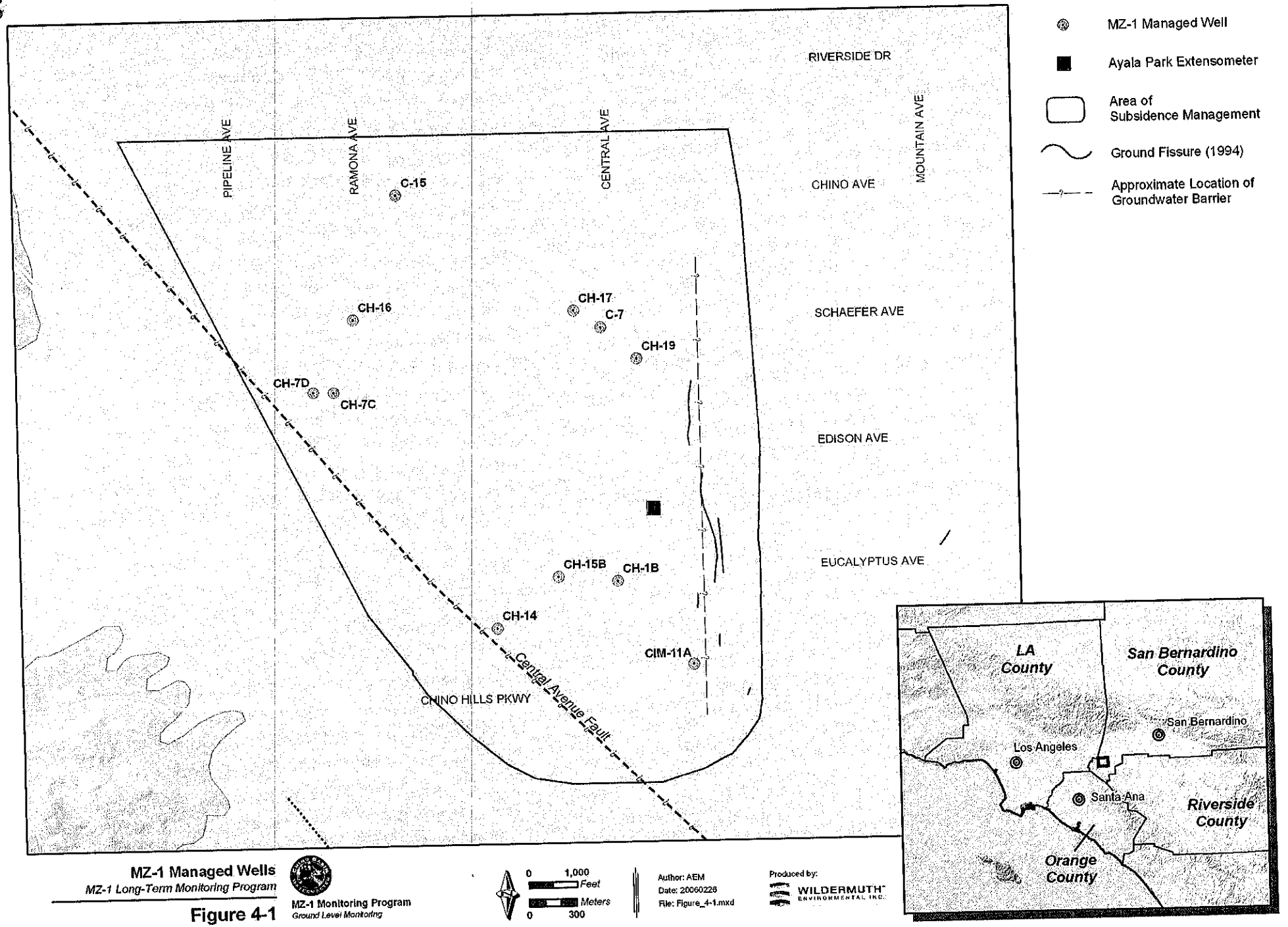
guidance criteria). Recall that central MZ-1 is currently experiencing measurable land subsidence, and is the focus of an expanded effort to monitor piezometric levels and land surface deformation. An adaptive long-term plan will accommodate the results and modified recommendations that will emerge from the expanded monitoring of central MZ-1.

Table 4-1
Guidance Criteria for MZ-1 Producers

1. Table 4-2 lists the existing wells (hereafter the Managed Wells) and their owners (hereafter the Parties) that are the subject of these Guidance Criteria.
2. Figure 4-1 shows the area addressed by these Guidance Criteria (hereafter the Area of Subsidence Management). Within the boundaries of this area, both existing and newly-constructed wells are subject to being classified as Managed Wells. This is based upon the observed and/or predicted effects of pumping on groundwater levels and aquifer-system deformation. Initial Managed Well designations for wells that pumped during the IMP were based on effects measured at the Ayala Park Piezometer/Extensometer Facility. Additional Managed Well designations were made based on analysis of well construction and geology.
3. The Guidance Level is a specified depth to water measured in Watermaster's PA-7 piezometer at Ayala Park. It is defined as the threshold water level at the onset of inelastic compaction of the aquifer system as recorded by the extensometer, minus 5 feet. The 5-foot reduction is meant to be a safety factor to ensure that inelastic compaction does not occur. The Guidance Level is established by Watermaster based on the periodic review of monitoring data collected by Watermaster. The initial Guidance Level is 245 feet below the top of the PA-7 well casing.
4. If the water level in PA-7 falls below the Guidance Level, Watermaster recommends that the Parties curtail their production from designated Managed Wells as required to maintain the water level in PA-7 above the Guidance Level.
5. Watermaster will provide the Parties with real-time water level data from PA-7.
6. The Parties are requested to maintain and provide to Watermaster accurate records of the operation of the Managed Wells, including production rates and on-off dates and times. The Parties are requested to promptly notify Watermaster of all operational changes made to maintain the water level in PA-7 above the Guidance Level.
7. Watermaster recommends that the Parties allow Watermaster to continue monitoring piezometric levels at their wells.
8. Watermaster will evaluate the data collected as part of the MZ-1 Monitoring Program at the conclusion of each fiscal year (June 30) and determine if modifications, additions, and/or deletions to the Guidance Criteria are necessary. These changes to the Guidance Criteria could include (1) additions or deletions to the list of Managed Wells, (2) re-delineation of the Area of Subsidence Management, (3) raising or lowering of the Guidance Level, or (4) additions and/or deletions to the Guidance Criteria (including the need to have periods of water level recovery).
9. Watermaster cautions that some subsidence and fissuring may occur in the future even if these Guidance Criteria are followed. Watermaster makes no warranties that faithful adherence to these Guidance Criteria will eliminate subsidence or fissuring.

Table 4-2
MZ-1 Managed Wells

CBWM_ID	Owner	Well Name	Status	Screened Interval ft-bgs	Capacity gpm
600487	Chino Hills	1B	Inactive	440-470, 490-610, 720-900, 940-1180	up to 1200
600687	Chino Hills	7C	Inactive	550-950	--
600498	Chino Hills	7D	Inactive	320-400, 410-450, 490-810, 850-930	400
600495	Chino Hills	14	Inactive	350-860	300-400
600488	Chino Hills	15B	Active	360-440, 480-900	1500
600489	Chino Hills	16	Inactive	430-940	800
600499	Chino Hills	17	Active	300-460, 500-980	700
600500	Chino Hills	19	Active	340-420, 460-760, 800-1000	1100-1500
3600461	Chino	7	Inactive	180-780	
600670	Chino	15	Inactive	270-400, 626-820	
3602461	CIM	11A	Active	135-148, 174-187, 240-283, 405-465, 484-512, 518-540	500-600



MZ-1 Managed Wells

MZ-1 Long-Term Monitoring Program

Figure 4-1

MZ-1 Monitoring Program
Ground Level Monitoring

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APPENDIX A – SPECIAL REFEREE'S REPORT ON PROGRESS MADE ON IMPLEMENTATION OF THE WATERMASTER INTERIM PLAN FOR MANAGEMENT OF SUBSIDENCE

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SPECIAL REFEREE

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF SAN BERNARDINO, RANCHO CUCAMONGA DIVISION

CHINO BASIN MUNICIPAL WATER DISTRICT, Plaintiff, v. THE CITY OF CHINO, Defendants.	CASE NO. RCV 51010 Judge: Honorable J. Michael Gunn Date: TBD Time: Dept:

SPECIAL REFEREE'S REPORT ON PROGRESS MADE ON IMPLEMENTATION OF THE WATERMASTER INTERIM PLAN FOR MANAGEMENT OF SUBSIDENCE

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I. INTRODUCTION

A workshop was held May 25, 2005, as a follow-up to the workshop held August 29, 2002. The second workshop was originally scheduled to be held in 2003, pursuant to Court Order Concerning Watermaster's Interim Plan for Management of Subsidence, dated October 17, 2002 ("2002 Order"). The second workshop was postponed until substantial data collection and analysis had been completed.

The scope of the workshop was limited to presentation of technical data and analysis completed to date related to the Watermaster Interim Plan for Management of Subsidence ("Interim Plan"). The presentation was made by Mr. Malone of Wildermuth Environmental, Inc., Watermaster Engineering Consultant. Mr. Malone, Mr. Wildermuth, and Mr. Riley addressed questions posed

by the Special Referee, technical expert Joe Scalmanini, and several others. Consistent with use of a workshop format, cross-examination was not allowed. A transcript of the workshop has been prepared and will be filed with the Court by Watermaster.

II. 2002 COURT ORDER

In the 2002 Order, Judge Gunn directed Watermaster to:

(1) Implement the Interim Plan Monitoring Program for subsidence, including all work related to piezometers, extensometers, ground-level monitoring, aquifer testing, and other actions to study, analyze, and interpret subsidence and fissuring in MZ1 and to determine causes in sufficient detail that they can be managed through a long-term plan;

(2) Continue the MZ1 Technical Committee work and have the Technical Committee serve in an advisory capacity to assist Watermaster in developing a long-term subsidence management plan for MZ1;

(3) Develop a long-term management plan by fiscal year 2004/2005;

(4) Submit quarterly reports to the court on all interim and long-term efforts to address MZ1 subsidence and fissuring problems, including documentation of participation, forbearance, impacts, and other "noteworthy details that pertain to the goal of forbearance to minimize subsidence and fissuring";

(5) Schedule a follow-up workshop for July 17, 2003; and

(6) File reports at least quarterly to apprise the court of any actions pending that could cause the "jurisdiction issue" to resurface.

III. COMPLIANCE WITH 2002 COURT ORDER

A. Regular Reports by Watermaster

Watermaster has regularly reported to the court, through its status reports, on the progress of all work related to Management Zone 1 ("MZ1") subsidence issues. Watermaster has also reported that it is not aware of any pending legal actions which have raised issues concerning the court's jurisdiction related to subsidence. The City of Chino ("Chino") has annually asked for continuances of its Paragraph 15 Motion. The process has been that Chino requests continuance after both Chino and the City of Chino Hills ("Chino Hills") have committed to forbear some pumping. (Our files reflect that Chino requested a continuance to September 1, 2005, but we do not have a copy of a court order approving that continuance.) Watermaster has reported that the MZ1 Technical Advisory Committee has been actively meeting.

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B. Pumping Forbearance Agreements

Annual forbearance agreements have been entered into for the past three years by Chino and Chino Hills. On April 28, 2005, Watermaster approved continuation of the forbearance agreements for a fourth year. The fourth year of forbearance will be fiscal year 2005/2006.

C. Court Order and Deadlines

Two of the deadlines set forth in the 2002 Order have not been met. First, a long-term management plan for MZ1 was to have been completed this fiscal year (by July 1, 2005). Second, a follow-up Special Referee workshop was not held in July 2003, but, instead, was postponed in order that a substantial body of work could be completed to study and assess the MZ1 issues.

IV. INTERIM PLAN WORK

A. Technical Work Completed to Date

The purpose of the second workshop was to hear a description of the work and study that has been done since the MZ1 Interim Plan was begun, to ascertain whether any conclusions have been reached, and to obtain a description of the activities that are being undertaken now and that remain to be done. Mr. Malone's presentation on the technical work and analysis to date formed the bulk of the workshop. He provided a very detailed description of the monitoring and other technical work that has been undertaken. Ongoing efforts have included installation of piezometers and an extensometer, installation of transducers to monitor water levels in a network of wells, and ground-level and InSAR monitoring for subsidence. Mr. Malone reported several discoveries which he characterized as significant, including discovery of a groundwater barrier at depth in a location approximately coincident with the fissuring that has occurred, and that there are two very distinct aquifer systems. (Reporter's Transcription ("RT") at pp. 44-47)

Mr. Malone also indicated that all of the potential causes of the subsidence and fissuring which had been previously suggested had been reviewed, but that the Interim Plan work has focused on the hypothesis that the subsidence and fissuring have been caused by subsurface fluid withdrawal:

> We reviewed all these [other potential causes of subsidence], but what we zeroed in on was the subsurface withdrawal as our hypothesis. That's what we identified as the most likely cause of the subsidence that we had observed in the City of Chino . . . so our hypothesis was that the groundwater production caused land subsidence and fissuring in Chino Basin. . . We also noted that it was likely, or that we were

> hypothesizing that the production from the confined aquifer system was the main cause of this recent episode of subsidence and fissuring that was measured in the early 1990's. So this is what we designed our monitoring program to test, whether or not this hypothesis was correct.

(RT at pp. 32-33) There was no further discussion on the record regarding the nature of the review that was done as to other potential causes of the subsidence and fissuring.

A primary focus of the technical work has been to determine at what point subsidence creates inelastic compaction versus subsidence which is elastic and can recover. Mr. Malone described the process to identify:

> . . . the threshold where the deformation process transitions from elastic to inelastic. By doing that, we'd be defining the usable volume of the storage reservoir, under what range of water levels can we operate where we're not causing inelastic compaction. And that would be a very key finding to any long-term management plan that might develop out of this study.

(RT at pp. 43-44) The presentation included detailed descriptions of "stress-strain diagrams" which reflect data on the elastic versus inelastic response of the system to pumping. Mr. Malone drew attention to a "key point" that there appears to have been about two one-hundredths of a foot (0.02 ft.) of permanent compaction over the 2004 pumping season. (RT at pp. 58-59) He indicated that the ". . . inelastic threshold was crossed at about 250 feet below ground surface during the latter part of the pumping season." (RT at p. 60) Mr. Malone made it very clear that it is necessary to wait for "fully recovered water levels" before drawing any final conclusions that the system transitions from elastic to inelastic compaction when water levels are somewhere below 250 feet below ground surface. (RT at p. 95)

In response to questions as to whether there are sufficient data available now to develop a long-term plan, Mr. Malone responded that:

> . . . When we operate in the forbearance agreement where we pump during the pumping season, but we allow the system to recover during the wintertime months, . . . we've demonstrated that we're operating generally in an elastic range. . . And so to how far we can step out of that same pumping pattern and still operate within the elastic range, we have not determined that yet. But the models hold the promise of determining that.

(RT at p. 93)

Mr. Malone explained that the next step in the investigation is to create groundwater models

to ". . . simulate the groundwater production's effects on groundwater levels." (RT at p. 91) The model will: ". . . help us provide that linkage between groundwater production and groundwater levels that would provide a tool to evaluate any management plan that might come out of this." (RT at p. 107)

In response to a question, Mr. Malone indicated that there are not plans to do further testing in the southern part of MZ1:

> We feel like if the stress-strain diagram goes to where it seems to be going, that we've identified this threshold of preconsolidation stress that is the transition between inelastic and elastic compaction. . . I don't think we have any further questions that we're trying to answer in this southern part of Management Zone 1. We're going to be developing the models that will help us provide that linkage between groundwater production and groundwater levels. . .

(RT at p. 107)

B. Recommended Additional Technical Work

Mr. Malone recommended that technical work be continued in the southern part of MZ1 and that certain technical work be started in the central MZ1 area to the north. For the southern MZ1 area, the recommendation is that monitoring continue (RT at pp. 97-99) and that some of the dedicated piezometers be replaced (RT at pp. 103-104). In addition, numerical models would be developed (a one-dimensional compaction model and a three-dimensional groundwater flow and subsidence model). The three-dimensional model would link:

> . . . the areal and vertical distribution of pumpage to water level fluctuations and then the ultimate deformation that occurs in the aquifer system. . . We've been working mostly on this link between water level fluctuation and deformation. The model will, then, now take us from that to include pumpage, how it affects water level fluctuations, and then how the water level fluctuations affect deformation.

(RT at pp. 99-100)

Mr. Malone also discussed expanding the investigation of subsidence, initially via monitoring, to the central region of MZ1, including the installation of water level transducers in existing wells. (RT p. 107) Mr. Malone characterized as speculative the potential need to construct a new monitoring facility or facilities in the central region, including a multi-piezometer and/or extensometer. (RT at p. 102) He clarified that ground-level survey data, InSAR data, and water-level data should be collected in the central MZ1 area before any conclusion would be reached on

the need for piezometers or an extensometer. (*Id.*) Expansion of the subsidence investigation into the central region of MZ1 is prompted by the observation of some historical subsidence in the area, confounded to some degree by the lack of any known local pumping in the immediate subsidence area. (RT at pp. 76, 80, 83-84, 87)

C. Long-Term Plan Schedule

There was not extensive discussion at the workshop on either a long-term plan or a schedule for completion of a plan. Mr. Malone indicated that InSAR surveys and ground surveys will be conducted in both fall 2005 and spring 2006. (RT at p. 104) The modeling would be completed in the spring of 2006, with a modeling report to follow that summer. (*Id.*) Mr. Wildermuth responded to a question regarding scheduling by indicating that several more years of studies and model development and analysis would be required, followed by 12 months to reach an agreement on a long-term plan. (RT at p. 109) This timing is consistent with the discussion in the 2002 workshop. At that workshop, in response to the question of how long it would take to start developing a long-term plan given optimal agreement by all parties, Mr. Wildermuth stated that he thought it would take three to five years (2002 Workshop Transcript at page 101.) Mr. Slater also clarified at the 2002 workshop that Mr. Wildermuth's three to five years were for the "data development side" and that "the business deal probably follows soon thereon, and one would expect maybe twelve months to wrap that piece up." (2002 Workshop Transcript at p. 103.)

V. RECOMMENDATION OF SPECIAL REFEREE

A. Preparation of a Summary Report on MZ1 Technical Work

A substantial body of technical work has been completed in the southern MZ1 area. However, conclusions are still preliminary:

> . . . With our stress-strain diagram . . . we're seeing that these head declines can induce permanent compaction. But again this is a preliminary conclusion because it is still pending fully recovered water levels. We're waiting for those water levels to be fully recovered to see if any inelastic compaction did occur over the last pumping season.

(RT at p. 95) When sufficient time has elapsed for water levels to have fully recovered, it is our view that a summary report on all of the work presented at the workshop would be extremely helpful. Even though no modeling has been completed, there appear to be sufficient data to conclude that

there is a threshold depth to water that, if crossed, will likely lead to new inelastic compaction and subsidence and ground fissuring. That information should be made available to the parties in a summary report as soon as possible. Based on Mr. Malone's presentation, it should be feasible to prepare such a report by the middle of August. When the three-dimensional model is prepared, a modeling report will be written. In the meantime, there are important data and preliminary findings that can be made available very soon that will be of immediate use to the pumpers within MZ1.

A further recommendation related to a summary report is that the summary report should also address the other potential causes of subsidence and fissuring that have been suggested in the past. If any of those items cannot be readily addressed, then the summary report should recommend how they will be addressed. While the detailed monitoring and testing has been substantial, they have not apparently addressed whether subsidence and fissuring might have been partially the result of mechanisms other than deep groundwater pumping. The continuing possibility that other mechanisms may also be responsible for subsidence is a potential impediment to development of the long-term plan.

As part of this discussion, the summary report should discuss any information related to whether any significant subsidence predated the notable subsidence and fissuring since the early 1990's, and should describe the historical surveying investigation commissioned by Watermaster to address that issue. An important outstanding question is whether any pre-1990's subsidence that may have occurred correlates with, or can be attributed to, the large historical changes in groundwater levels that predated the Judgment.

B. Watermaster Issuance of Guidance Criteria.

Near the close of the workshop, there was some discussion of what would be included in a long-term plan, including possibly expanding the study area to include the central MZ1 region. (RT at pp. 123 *et seq.*) The concept of a long-term MZ1 management plan has been part of the Watermaster program since it was first articulated in 1999 in the Optimum Basin Management Program Phase 1 Report. A long-term management plan was to be formulated during the interim plan period, and would be based on investigations, monitoring programs and data assessment. It would be adaptive in nature. The workshop discussion noted that the technical work that has been

done and that will be done will form the basis for a long-term plan. Mr. Wildermuth indicated that:

> . . . we haven't felt until very recently, last maybe six or eight months, that we were at a point where we are getting close to coming up with conclusions from which we could build a plan on, pull the parties together and talk about their deal making to implement a plan.

(RT at p. 125) As discussed, above, however, development of a long-term plan itself does not appear to be imminent.

In response to questions regarding the possibility of phasing the long-term plan, Mr. Wildermuth discussed the option of bifurcating the ". . . southern and central portion, try to get the southern portion going, and then based on the interests of the stakeholders, do something in the central area." (RT at p. 125) Mr. Wildermuth also suggested that Watermaster's long-term plan could range from being "guidance information" to something more aggressive. (RT at p. 108)

The concept of providing guidance criteria is a compelling one. It appears, based on the presentation at the workshop, that Watermaster can very soon alert pumpers in the southern MZ1 area that there is a substantial risk that lowering water levels to below approximately 250 to 260 feet below ground surface will result in new inelastic compaction and subsidence. This type of information should formally be made available to the parties as soon as possible, presumably as soon as a summary report on the MZ1 technical work is completed. The guidance criteria would be issued by Watermaster in a timely fashion, to be followed by the long-term plan development which necessarily will require a longer period to complete.

C. Long-Term Plan and Schedule

It is incumbent upon Watermaster now to request that the court extend the period for completion of a long-term plan for MZ1. The overall testimony indicated that several more years of technical and modeling work will be required, followed by approximately a year of negotiations among the parties. The Watermaster should propose a schedule to the court which takes into account the continuation of data collection and modeling work in the main MZ1 area as well as technical work in the central MZ1 area. A date should be established for completion of a long-term plan.

Whether the long-term plan is ultimately characterized as a management plan is an issue for the parties to address. Based on presentation and discussion at the workshop, it is clear that, at the

very least, an ongoing monitoring program by Watermaster will be required so that the parties have full and sufficient information available to them to inform their decisions.

D. Expanded Monitoring in MZ1

The presentation at the workshop, while focused on monitoring and studies in the southern MZ1 area, indicated that some monitoring work can and should be done in the central MZ1 area, including installation of transducers in wells, and ground and InSar ground-level monitoring. More costly and complex efforts involving piezometers and an extensometer would logically be held in abeyance pending assessment of data collected. A phased long-term plan could include provision for central MZ1 monitoring work and studies, with future efforts considered and scheduled on an as-needed basis, while more definitive conclusions are drawn in the southern MZ1 area based on the extensive work already focused in that area. As noted above, the central MZ1 area appears to warrant additional investigation in light of detectable subsidence in spite of no significant pumping stress in the immediate subsidence area. Such additional investigation would also appear important in light of the overall concept of basin reoperation and hydraulic control, which could result in locally lower groundwater levels in parts of the basin.

VI. CONCLUSION

The workshop was very productive. Mr. Malone's presentation was excellent. The Watermaster does not require court approval to direct the preparation of a summary report on the MZ1 technical work or to issue guidance criteria. The Watermaster, however, should file with the court a motion for an order to set a schedule for the completion of a long-term plan.

Dated: June 16, 2005

Anne J. Schneider

Anne J. Schneider, Special Referee

CHINO BASIN WATERMASTER
Case No. RCV 51010
Chino Basin Municipal Water District v. The City of Chino

PROOF OF SERVICE

I declare that:

I am employed in the County of San Bernardino, California. I am over the age of 18 years and not a party to the within action. My business address is Chino Basin Watermaster, 9641 San Bernardino Road, Rancho Cucamonga, California 91730; telephone (909) 484-3888.

On June 21, 2005 I served the following:

Special Referee's Report on Progress Mad on Implementation of the Watermaster Interim Plan for Management of Subsidence

/_x_/ BY MAIL: in said cause, by placing a true copy thereof enclosed with postage thereon fully prepaid, for delivery by United States Postal Service mail at Rancho Cucamonga, California, addresses as follows:

See attached service list:
Mailing List 1

/___/ BY PERSONAL SERVICE: I caused such envelope to be delivered by hand to the addressee.

/___/ BY FACSIMILE: I transmitted said document by fax transmission from (909) 484-3890 to the fax number(s) indicated. The transmission was reported as complete on the transmission report, which was properly issued by the transmitting fax machine.

/_x_/ BY ELECTRONIC MAIL: I transmitted notice of availability of electronic documents by electronic transmission to the email address indicated. The transmission was reported as complete on the transmission report, which was properly issued by the transmitting electronic mail device.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on June 21, 2005 in Rancho Cucamonga, California.

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CHINO BASIN WATERMASTER

II. BUSINESS ITEMS

C. IEUA GRANT FUNDING AGREEMENT

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KENNETH R. MANNING
Chief Executive Officer

STAFF REPORT

DATE: **March 9, 2006**
March 21, 2006
March 23, 2006

TO: **Committee Members**
Watermaster Board Members

SUBJECT: **DWR Grant Funding Cost Sharing Agreement with IEUA**

SUMMARY

Issue – In January 2005, IEUA received a $15,500,000 grant from DWR for use in funding IEUA's Chino Basin Conjunctive Use Expansion Program. IEUA has proposed using $5,250,000 of this money to fund a second phase of improvements to the recharge basins in Chino Basin. It is proposed that Watermaster will pay one-half of the local cost share required by the DWR grant. Assuming total project cost of $10,500,000, Watermaster's share will be $2,625,000.

Recommendation – Staff recommends approval of the Cost Sharing Agreement

BACKGROUND

In January 2005, Inland Empire Utilities Agency ("IEUA") received a grant of $15,500,000 from the Department of Water Resources ("DWR") through the Proposition 13 Groundwater Recharge and Storage Programs. (Contract E90020.) The purpose of this grant was to fund IEUA's Chino Basin Conjunctive Use Expansion Program. The total project cost for this program was estimated to be $39,026,300, with the local share being funded through IEUA's Water and Sewer Rate revenue and a combination of various State and Federal funds.

In 2002, a separate grant of Proposition 13 money was given to IEUA that was used to fund implementation of Watermaster's Recharge Master Plan. That project involved a total cost of approximately $40 million. One half of this project cost was paid through grant funds, and the one-half local share was split evenly between IEUA and Watermaster.

Through the initial implementation of the Recharge Master Plan, most, but not all, of the identified recharge basin improvements were constructed. The available funding fell short of being able to fund all of the identified

improvements. In addition, additional improvement work was identified as necessary over the course of initial project construction and over the past year of use of the facilities.

Because of this, IEUA has proposed using a portion of the most recent grant funding to perform further improvement work on the recharge basins. IEUA has proposed using $5,250,000 of grant money for this purpose, using the same cost sharing arrangement that was used for the grant money that was used for initial implementation of the Recharge Master Plan.

Summary of Agreement

Staff from IEUA and Watermaster met on January 16, 2006 and developed a list of additional projects that would be beneficial to implement. This list was distributed as a handout at the February 2006 Pool meetings, and at the February Advisory Committee and Board meetings. A final version of this list will be attached to the cost sharing agreement as Exhibit "A".

The Agreement calls for a simple split of the local share costs of construction of the projects listed in Exhibit A. Since the amount of the grant funding is fixed at $5,250,000, any variation in costs from the amount estimated in Exhibit A, will change the amount of the local share of funding. Under the Agreement, Watermaster must approve any changes to either the projects to be constructed, or any changes that change the estimated cost of construction of the projects. So long as the changes do not amount to an increase of 10% of the cost of the project to Watermaster, the Watermaster CEO may approve the change. After the 10% point is reached, any further changes must be approved through the Watermaster process.

The Agreement spreads Watermaster's portion of the costs over a three year period. Watermaster will pay IEUA $1,000,000 at the end of the first year, $1,000,000 at the end of the second year, and whatever remains of its portion of the local share of costs at the end of the third year. If the total cost of the project does not vary from the amount estimated, then Watermaster's share in the third year will be $625,000.

Since this financial relationship is not a loan, there is no interest or financing cost to Watermaster.

AGREEMENT REGARDING RECHARGE FACILITIES IMPROVEMENTS MATCHING FUNDS COST SHARING AGREEMENT
between
INLAND EMPIRE UTILITIES AGENCY
and
CHINO BASIN WATERMASTER

March, 2006

WHEREAS, the Program Element 2 of the Optimum Basin Management Program calls for the implementation of the Recharge Master Plan to enhance the physical recharge capacity in the Chino Basin.

WHEREAS, grant funding in combination with funding from Inland Empire Utilities Agency ("IEUA") and the Chino Basin Watermaster ("Watermaster") financed the first phase of implementation of the Recharge Master Plan.

WHEREAS, the local share of the funding for the first phase of implementation of the Recharge Master Plan was shared equally between IEUA and Watermaster.

WHEREAS, additional funding has been obtained by IEUA from the Department of Water Resources ("DWR") that can be used to implement further portions of the Recharge Master Plan.

WHEREAS, IEUA is willing to make this grant funding available to Watermaster under the same cost sharing arrangement that was utilized for the local share of implementation of the first phase of the Recharge Master Plan.

NOW THEREFORE IT IS AGREED THAT:

1. IEUA will make $5,250,000 of DWR grant money ("Grant Money") available for project construction costs.

2. The Grant Money shall be used to construct projects as described in Exhibit "A" to this agreement.

3. The total cost of all projects proposed for construction under Exhibit "A" is anticipated to be approximately $10,500,000. Any changes to the proposed list of projects or to the anticipated total cost of all projects shall require agreement by both IEUA and Watermaster.

4. Watermaster's share of the total cost of the projects proposed for construction on Exhibit "A" shall be one half of the total cost that is not paid with the Grant Money. For example, if the total cost is $10,500,000, then $5,250,000 of that total will be paid with the Grant Money, and Watermaster's share of the remaining cost will be $2,625,000.

5. Watermaster shall reimburse IEUA for Watermaster's share of the total cost over a period of three years according to the following schedule:

A. End of FY 2005-2006: $ 1,000,000
B. End of FY 2006-2007 $ 1,000,000
C. End of FY 2007-2008 Remainder of Watermaster share.

Reimbursements by Watermaster under this schedule shall be paid by the 31st of January following the end of the fiscal year.

6. So long as changes to the proposed list of projects or to the cost of such projects do not cause Watermaster's share of the total costs to increase by a cumulative total of 10%, then approval of such changes may be made in writing by the Watermaster CEO. If Watermaster's share of the total costs increases by more than 10%, then any further changes shall require approval by the Watermaster Board after consideration by the Pools and the Advisory Committee.

7. This agreement shall be specifically enforceable in the Court maintaining continuing jurisdiction over the case *Chino Basin Municipal Water District v. City of Chino*, San Bernardino Superior Court Case No. RCV 51010. In any dispute under this agreement, each party shall bear its own legal costs and expenses.

Signed:

_____
For Chino Basin Watermaster

_____
For Inland Empire Utilities Agency

Exhibit "A"

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RECHARGE FACILITIES IMPROVEMENTS - PROPOSED GRANT FUNDED PROJECTS
BASED ON IEUA/CBWM EQUAL SPLIT OF MATCHING FUNDS TO DWR $5,280,000 GRANT
For discussion purposes, developed from direction at Jan 16, 2006 meeting between IEUA and CBWM

DWR GRANT PHASE 2A PROJECTS
Monitoring Wells, Lysimters, and Recycled Water Connections

Total Grant Participation	(Grantee/Grantor/Total)	$ 24,456	$ 1,530,544	$ 1,555,000
Facility	**Description**	**Status**	**Completion Schedule**	**Estimated Cost**
Banana	Lysimeter Cluster	Completed		$ 50,000
Hickory	Lysimeter Cluster, two sets	Completed		$ 100,000
Banana-Hickory	Monitoring Well	Completed		$ 180,000
Turner 1	Monitoring Well	Completed		$ 180,000
Turner 1	Lysimeter Cluster	Completed		$ 50,000
Turner 4	Monitoring Well	Completed		$ 180,000
Turner 4	Lysimeter Cluster	Completed		$ 50,000
RP3	Monitoring Well	Pending	Summer 2006	$ 180,000
RP3	Lysimeter Cluster	Pending	Spring 2007	$ 50,000
Declez	Monitoring Well	Pending	Summer 2006	$ 180,000
Declez	Lysimeter Cluster	Pending	Spring 2007	$ 50,000
Ely	Lysimeter Cluster (Replacement)	Pending	Spring 2007	$ 50,000
Eighth	Lysimeter Cluster	Pending	Spring 2007	$ 50,000
Eighth	Monitoring Well	Pending	Summer 2006	$ 180,000
All Sites	Completion - Data Report - Asbuilts	Pending	Fall 2007/2007	$ 25,000
			Subtotal	$ 1,555,000

DWR GRANT - PHASE 2B
SCADA Improvements (Prioritized List Developed by AC, BK, GT)

Total Grant Participation		(Grantee/Grantor/Total)	$ 487,353	$ 382,647	$ 870,000
Rank	**Facility**	**Description**	**Status**	**Completion Schedule**	**Estimated Cost**
1a	San Sevaine 5	Add level transmitter, mechanical actuator, and SCADA control to outlet gate	Pending	Fall 2007	$ 125,000
1b	San Sevaine 1 & 2	Add level transmitter, mechanical actuator, and SCADA control to interbasin gate	Pending	Fall 2007	$ 125,000
2a	Montclair 1	Add level transmitter to wet well and report flow rate per flume curve	Pending	Fall 2006	$ 20,000
2b	Montclair 1	Add mechanical actuator and SCADA control inlet gate	Pending	Fall 2006	$ 30,000
3	Various	DCS programming, security package, and bandwidth expansion	Pending	Fall 2007	$ 150,000
4	Lower Day 3	Add mechanical actuator and SCADA control to outlet gate	Pending	Fall 2006	$ 50,000
5	Upland	Add a level transmitter to basin	Pending	Fall 2006	$ 20,000
6	Brooks	Add mechanical actuator and SCADA control to inlet gate on West State Street Storm Drain	Pending	Fall 2007	$ 70,000
7	Turner 1 & 2	Add level transmitter to Turner 2 and mechanical actuator and SCADA control to interbasin gate	Pending	Fall 2007	$ 70,000
8	RP3	Add level transmitters, mechanical actuator, and SCADA control to two diversion channel gates	Pending	Fall 2007	$ 70,000
9	Montclair 1 & 2	Add mechanical actuator and SCADA control to interbasin gate	Pending	Fall 2007	$ 70,000
10	8th Street N & S	Add mechanical actuator and SCADA control to interbasin gate	Pending	Fall 2007	$ 70,000
				Subtotal	$ 870,000

DWR GRANT - PHASE 2C
NEW MWD TURNOUT/8TH STREET BASIN PIPELINE

Total Grant Participation	(Grantee/Grantor/Total)	$ 800,412	$ 699,588	$ 1,500,000
Facility	**Description**	**Status**	**Completion Schedule**	**Estimated Cost**
New MWD Turnout	Add a new turnout to Rialto Feeder for 8th Str Basin (and Ely Basins), add short pipeline to route water to storm drain feeding West Cucamonga Channel, add GWR SCADA Controlled Valve and metering.	Discussing with MWD and RFP preparation	Fall 2007	$ 1,500,000

DWR GRANT - PHASE 2D
ALTERNATE PROJECTS

Total Grant Participation	(Grantee/Grantor/Total)	$ 3,967,779	$ 2,160,618	$	6,128,397

MWD TURNOUT/VICTORIA BASIN PIPELINE

Facility	Description	Status	Completion Schedule	Estimated Cost
New MWD Turnout	Add a new turnout to Etiwanda intertie for Victoria Basin (and possible other new basin), add pipeline to route water to basin(s), add GWR SCADA Controlled Valve and metering.	Discussing with MWD and RFP preparation	Fall 2007	$ 2,000,000

BERM HEIGHTENING AND HARDENING

Rank	Facility	Description	Feasibility Study Completed, preparing scope for RPF	Fall 2006 to Fall 2007	$ 2,628,397
1	Hickory	Conservation berm harden	Design hardened wide spill over point for all basins and heightening of rest of berm. Build those berm improvements for allowable budget	Fall 2006	$ 600,000
2	Ely	Outlet berms to Basins 1 and 2 harden and heighten		Fall 2006	$ 300,000
3	Eighth	Internal Berm Harden		Fall 2006	$ 300,000
4	Declez	Internal Berm Harden		Fall 2007	$ 600,000
5	Jurupa	Conservation Berm Harden (soil berm not yet constructed)		Fall 2007	$ 600,000
6	San Sevaine	Conservation Berm Harden		Not a part	$ 600,000
7	Victoria	Internal Berm Harden		Not a part	$ 300,000
8	Lower Day	Internal Berm Harden		Not a part	$ 600,000
9	Etiwanda SC	Outlet Berms Harden (basin not yet constructed)		Not a part	$ 600,000

MONTCLAIR 2 AND 3 INLET

Facility	Description	Preparing scope for RPF	Fall 2007	$ 750,000
San Antonio Ch	In San Antonio Channel, build a new inlet (drop or rubber dam)			
Montclair 2	Build inlet pipe and vault with gates and flowmeter, inlet to basin, add inlet controls, gates and flow meter to GWR SCADA			
Montclair 3	Build a transfer pipe under City street and inlet to basin			

BASIN CLEANING VEHICLE DEVELOPMENT

Various	Develop Hood Device and Clarifier	Development	Fall 2007	$ 750,000

Other Misc. DWR Grant funding for Phase 2			
2A-2C Construction Contingency	$ -	$ 502,203	$ 502,203
2A-2C Land Costs	$ -	$ 4,400	$ 4,400
Total of All Projects	$ 5,280,000	$ 5,280,000	$ 10,560,000

CHINO BASIN WATERMASTER

II. BUSINESS ITEMS

D. ALLOCATION OF VOLUME VOTE

CHINO BASIN WATERMASTER

9641 San Bernardino Road, Rancho Cucamonga, Ca 91730
Tel: 909.484.3888 Fax: 909.484.3890 www.cbwm.org

KENNETH R. MANNING
Chief Executive Officer

STAFF REPORT

DATE: **March 9, 2006**

TO: **Appropriative Pool Committee Members**

SUBJECT: **Allocation of Volume Vote**

RECOMMENDATION: **None**

BACKGROUND

Following the Appropriative Pool meeting on February 9, 2006, staff was asked to compare various approaches to calculating the Appropriative Pool's allocation of volume votes.

The following documents include a summary page of the various approaches compared, with attached pages detailing the calculations for each approach.

The first column of the summary page allocates volume vote based on total dollars paid to Watermaster. The second column of the summary page allocates volume vote based on total dollars paid to Watermaster, less the total cost of replacement water charged by Watermaster. The third column allocates volume vote based on the amount of production by each appropriator along with their share of operating safe yield.

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Santa Barbara, CA 93101
Telephone: (805) 963-7000
Fax: (805) 965-4333

HATCH & PARENT
A Law Corporation

Michael T. Fife

(805) 882-1453
MFife@HatchParent.com

MEMORANDUM

PRIVILEGED AND CONFIDENTIAL
Attorney-Client Privilege
(Evid. Code, § 950 et seq.)

TO: Ken Manning

FROM: Michael T. Fife

DATE: February 8, 2006

SUBJECT: Volume Voting

Volume vote allocations for Appropriative Pool members are calculated based on a formula that accounts for initial share of Operating Safe Yield, and the amount of assessments that are paid to Watermaster in a given year. This is a feature of the Appropriative Pool Pooling Plan which is Exhibit "H" to the Judgment. According to the Pooling Plan:

> *"The total voting power on the Pool Committee shall be 1,000 votes. Of these, 500 votes shall be allocated in proportion to decreed percentage shares in Operating Safe Yield. The remaining 500 votes shall be allocated proportionally on the basis of assessments paid to Watermaster during the preceding year." (Judgment, Exhibit "H", paragraph 3.)*

Currently, Watermaster includes payments made to Watermaster for replenishment water to account for over-production as a component of "assessments paid to Watermaster" when calculating voting power..

Issue:

Does the current manner of calculating volume votes inappropriately penalize parties who reduce their replenishment assessments through the purchase of water from other parties, or who use water from their storage accounts?

After this issue was raised at the November Pool meetings, Watermaster informally solicited feedback from the parties regarding potential approaches to the issue. These suggestions are listed below and are presented here for the purpose of facilitating discussion of the issue by the Pool. Watermaster does not endorse any of these approaches.

Sample Approaches:

1. Continue current practice.

The question of the allocation of the voting power of the Pool to the members of the Pool is ultimately a question for the members of the Pool to decide. The issue of a potential inequity in allocation was raised to Watermaster in November and so the issue has been agendized for discussion by the members of the Pool, but Watermaster has no position on the issue. It is possible that discussion of the issue will reveal that there is no issue.

2. Eliminate replenishment assessment costs from the current formula and instead use only Watermaster administrative and OBMP assessment values.

This approach would function as an interpretation of Exhibit "H" such that when it describes "assessments paid to Watermaster" such assessments are not intended to include costs associated with overproduction. Potentially, any policies associated with the allocation formula that relate to equities for producers who have high production by small allocations of water rights under the Judgment, would still be satisfied.

3. Calculate a "replenishment assessment cost" for all over-producers regardless of actual replenishment sources.

This method would act as a surrogate for the actual amount spent by an overproducer on replenishment water. This approach would preserve the structure of the existing method of allocation of voting power, and would narrowly address only the potential inequity caused by overproducers who satisfy their replenishment obligation in ways other than payment of replenishment assessments to Watermaster.

3. Revise the formula to include only initial share of Operating Safe Yield and actual production for the given fiscal year (rather than OSY and assessments paid).

This method appears very similar to number 2., above, to the extent that Watermaster Administrative Assessments and OBMP Assessments are tied to actual production.

◆ ◆ ◆

APPROPRIATIVE POOL

ALLOCATION OF VOLUME VOTE

COMPARISON OF APPROACHES

Fiscal Year 2004-2005 (Based on 2003-2004 Production)

	As Approved Allocated Vote	**Excluding Replenishment Water** Allocated Vote	**Production & OSY** Allocated Vote
Arrowhead Mtn. Spring Water Co.*	0.51	0.09	0.19
Chino, City of	50.51	65.00	48.60
Chino Hills, City of	28.58	34.97	42.50
Cucamonga Valley Water District	49.59	61.79	70.77
Desalter Authority	0.00	0.00	35.96
Fontana Union Water Company	68.85	82.08	58.28
Fontana Water Company	159.84	61.02	87.60
Inland Empire Utilities Agency*	0.02	0.00	0.01
Jurupa Community Services District	68.73	72.67	74.94
Los Serranos Country Club	0.00	0.00	0.00
Marygold Mutual Water Company*	7.21	8.77	6.59
Metropolitan Water Dist of So Calif	0.00	0.00	0.00
Monte Vista Irrigation Co.*	8.44	11.27	6.17
Monte Vista Water District	113.88	102.02	101.24
Niagara Bottling Company, LLC*	4.86	0.85	1.77
Nicholson Trust*	0.04	0.04	0.03
Norco, City of*	3.17	3.53	3.19
Ontario, City of	220.98	230.65	223.20
Pomona, City of	129.23	162.95	156.91
Santa Ana River Water Company*	13.62	15.36	14.95
San Antonio Water Company*	17.50	21.50	13.78
San Bernardino County (Shooting Park)*	0.11	0.03	1.92
Southern California Water Company*	3.75	3.75	4.33
Upland, City of	33.42	41.21	32.55
West End Consolidated Water Company*	10.21	12.17	8.64
West Valley Water District*	6.95	8.28	5.88
* Indicates Minor Rep	1,000.00	1,000.00	1,000.00

APPROPRIATIVE POOL

ALLOCATION OF VOLUME VOTE

AS APPROVED, INCLUDING REPLENISHMENT WATER

Fiscal Year 2004-2005 (Based on 2003-2004 Production)

	2004-2005 Assmts. Billed & Paid (1)	Assmt. Vote	O.S.Y. Vote	Allocated Vote
Arrowhead Mtn. Spring Water Co.*	$14,897	0.51	0.00	0.51
Chino, City of	$399,622	13.72	36.79	50.51
Chino Hills, City of	$271,483	9.32	19.26	28.58
Cucamonga Valley Water District	$483,358	16.59	33.00	49.59
Desalter Authority	$5	0.00	0.00	0.00
Fontana Union Water Company	$308,027	10.57	58.28	68.85
Fontana Water Company	$4,655,832	159.83	0.01	159.84
Inland Empire Utilities Agency*	$537	0.02	0.00	0.02
Jurupa Community Services District	$1,454,731	49.94	18.79	68.73
Los Serranos Country Club	$5	0.00	0.00	0.00
Marygold Mutual Water Company*	$36,222	1.24	5.97	7.21
Metropolitan Water Dist of So Calif	$25	0.00	0.00	0.00
Monte Vista Irrigation Co.*	$66,042	2.27	6.17	8.44
Monte Vista Water District	$2,035,933	69.89	43.99	113.88
Niagara Bottling Company, LLC*	$141,438	4.86	0.00	4.86
Nicholson Trust*	$190	0.01	0.03	0.04
Norco, City of*	$38,696	1.33	1.84	3.17
Ontario, City of	$3,416,024	117.27	103.71	220.98
Pomona, City of	$785,429	26.96	102.27	129.23
Santa Ana River Water Company*	$50,856	1.75	11.87	13.62
San Antonio Water Company*	$109,479	3.76	13.74	17.50
San Bernardino County (Shooting Park)*	$3,213	0.11	0.00	0.11
Southern California Water Company*	$0	0.00	3.75	3.75
Upland, City of	$215,937	7.41	26.01	33.42
West End Consolidated Water Company*	$45,666	1.57	8.64	10.21
West Valley Water District*	$31,054	1.07	5.88	6.95
* Indicates Minor Rep	$14,564,701	500.00	500.00 500.00	1,000.00 1,000.00

(1) Assmts. Billed & Paid reflect actual assessment billed & paid.

Motion:____by _____, 2nd by _____, _____ vote_____

_____

_____

Date:_____

Quorum: 50% of voting power or 7 members to give affirmative action.

APPROPRIATIVE POOL

ALLOCATION OF VOLUME VOTE

NOT INCLUDING REPLENISHMENT WATER

Fiscal Year 2004-2005 (Based on 2003-2004 Production)

	2004-2005 Assmts. Billed & Paid (1)	Assmt. Vote	O.S.Y. Vote	Allocated Vote
Arrowhead Mtn. Spring Water Co.*	$1,147	0.09	0.00	0.09
Chino, City of	$364,973	28.20	36.79	65.00
Chino Hills, City of	$203,361	15.71	19.26	34.97
Cucamonga Valley Water District	$372,618	28.79	33.00	61.79
Desalter Authority	$5	0.00	0.00	0.00
Fontana Union Water Company	$308,027	23.80	58.28	82.08
Fontana Water Company	$789,655	61.01	0.01	61.02
Inland Empire Utilities Agency*	$59	0.00	0.00	0.00
Jurupa Community Services District	$697,396	53.88	18.79	72.67
Los Serranos Country Club	$5	0.00	0.00	0.00
Marygold Mutual Water Company*	$36,222	2.80	5.97	8.77
Metropolitan Water Dist of So Calif	$25	0.00	0.00	0.00
Monte Vista Irrigation Co.*	$66,042	5.10	6.17	11.27
Monte Vista Water District	$751,061	58.03	43.99	102.02
Niagara Bottling Company, LLC*	$11,052	0.85	0.00	0.85
Nicholson Trust*	$190	0.01	0.03	0.04
Norco, City of*	$21,851	1.69	1.84	3.53
Ontario, City of	$1,643,112	126.94	103.71	230.65
Pomona, City of	$785,429	60.68	102.27	162.95
Santa Ana River Water Company*	$45,218	3.49	11.87	15.36
San Antonio Water Company*	$100,450	7.76	13.74	21.50
San Bernardino County (Shooting Park)*	$372	0.03	0.00	0.03
Southern California Water Company*	$0	0.00	3.75	3.75
Upland, City of	$196,758	15.20	26.01	41.21
West End Consolidated Water Company*	$45,666	3.53	8.64	12.17
West Valley Water District*	$31,054	2.40	5.88	8.28
* Indicates Minor Rep	$6,471,748	500.00	500.00 499.99	1,000.00 1,000.00

(1) Assmts. Billed & Paid reflect actual assessment billed & paid.

Motion:____by _____, 2nd by _____, _____ vote_____

APPROPRIATIVE POOL

ALLOCATION OF VOLUME VOTE

OSY & PRODUCTION

Fiscal Year 2004-2005 (Based on 2003-2004 Production)

	2003-2004 Production	Assmt. Vote	O.S.Y. Vote	Allocated Vote
Arrowhead Mtn. Spring Water Co.*	55	0.19	0.00	0.19
Chino, City of	3,485	11.82	36.79	48.60
Chino Hills, City of	6,852	23.24	19.26	42.50
Cucamonga Valley Water District	11,139	37.77	33.00	70.77
Desalter Authority	10,605	35.96	0.00	35.96
Fontana Union Water Company	0	0.00	58.28	58.28
Fontana Water Company	25,828	87.59	0.01	87.60
Inland Empire Utilities Agency*	2	0.01	0.00	0.01
Jurupa Community Services District	16,556	56.15	18.79	74.94
Los Serranos Country Club	0	0.00	0.00	0.00
Marygold Mutual Water Company*	183	0.62	5.97	6.59
Metropolitan Water Dist of So Calif	1	0.00	0.00	0.00
Monte Vista Irrigation Co.*	0	0.00	6.17	6.17
Monte Vista Water District	16,881	57.25	43.99	101.24
Niagara Bottling Company, LLC*	522	1.77	0.00	1.77
Nicholson Trust*	0	0.00	0.03	0.03
Norco, City of*	397	1.35	1.84	3.19
Ontario, City of	35,234	119.49	103.71	223.20
Pomona, City of	16,111	54.64	102.27	156.91
Santa Ana River Water Company*	908	3.08	11.87	14.95
San Antonio Water Company*	13	0.04	13.74	13.78
San Bernardino County (Shooting Park)*	567	1.92	0.00	1.92
Southern California Water Company*	171	0.58	3.75	4.33
Upland, City of	1,929	6.54	26.01	32.55
West End Consolidated Water Company*	0	0.00	8.64	8.64
West Valley Water District*	0	0.00	5.88	5.88
* Indicates Minor Rep	147,439	500.00	500.00 500.01	1,000.00 1,000.00

(1) Assmts. Billed & Paid reflect actual assessment billed & paid.

Motion:____by _____, 2nd by _____, _____ vote_____

CHINO BASIN WATERMASTER

III. REPORTS AND UPDATES

C. CEO/STAFF REPORT

3. SAW DMS Data Coordination

Santa Ana Watershed Project Authority

SAWPA

February 15, 2006

Danielle Maurizio
Chino Basin Water Master
9641 San Bernardino Road
Rancho Cucamonga, CA 91730

Subject: Data Collection & Coordination: Santa Ana Watershed Data Management System

Dear Santa Ana Watershed Stakeholder:

The Santa Ana Watershed Project Authority (SAWPA) received funding from the State Water Resources Control Board to develop Phase II of the Santa Ana Watershed Data Management System (SAW DMS). This system is currently under development to hold watershed-wide data needed for a variety of purposes. Phase II of the project will focus on supporting the following essential watershed activities:

- The triennial recalculation of Ambient Water Quality Standards for nitrogen and total dissolved solids, as required by the Santa Ana Watershed Water Quality Control Plan (or Basin Plan) as amended in 2004
- Preparation of the Annual Report of Santa Ana River Water Quality, Reaches 2, 4, & 5 as required by the Basin Plan,
- Water quality monitoring for Total Maximum Daily Load (TMDL) standards in the Middle Santa Ana River area (pathogens) and Lake Elsinore/Canyon Lake (nutrients) as required by the Basin Plan.

One of the goals of SAW DMS is to make data collection and management for these projects easier and less expensive in the future by developing standardized data collection methods and formats. It is our understanding, based on previous efforts for these projects, that your agency is a source of essential data for one or more of these projects.

We and our consultants will be contacting you shortly to request a meeting with you and/or the appropriate staff at your agency. At this meeting, we would like to:

- Interview you regarding what data you have and how you manage it
- Discuss collection of specific data associated with one or more of the three projects listed above
- Discuss means/methods/benefits of standardized data formats

11615 Sterling Avenue, Riverside, CA 92503 • (909) 354-4220 Fax (909) 352-3422

SAWPA

- Discuss mechanisms to allow for and to streamline future data collection efforts supporting these long-term projects
- Listen to you so that we may better understand your perspective on potential benefits and potential issues
- Discuss the project's Technical Advisory Committee.

We appreciate your time and cooperation discussing these matters with us and highly value your inputs.

Sincerely

Gregory T. Duecker

Greg Duecker
Information Systems & Technology Manager

Cc: RWQCB Support Letter

California Regional Water Quality Control Board
Santa Ana Region

Alan C. Lloyd, Ph.D.
Agency Secretary

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288 • TDD (951) 782-3221
www.waterboards.ca.gov/santaana

Arnold Schwarzenegger
Governor

February 9, 2006

Dear Santa Ana Watershed Stakeholder:

The Santa Ana Regional Water Quality Control Board (RWQCB) staff requests your support of efforts being performed by the Santa Ana Watershed Project Authority (SAWPA) in developing the Santa Ana Watershed Data Management System (SAW DMS). This pilot program is key to making the collection and management of this data easier and less expensive in the future. This effort, funded by Proposition 13 funds by the State Water Resources Control Board, is focusing on developing new methods to collect and standardize water-related data for several very important projects throughout the Santa Ana Watershed. The SAW DMS will be used to support the following essential watershed activities:

- The triennial recalculation of nitrogen and total dissolved solids ambient groundwater quality, as required by the Santa Ana River Basin Water Quality Control Plan (or Basin Plan) as amended in 2004,
- Preparation of the Annual Report of Santa Ana River Water Quality, Reaches 2, 4, & 5 as required by the Basin Plan,
- Water quality monitoring for Total Maximum Daily Loads (TMDLs) in the Middle Santa Ana River area (pathogens) and Lake Elsinore/Canyon Lake (nutrients) as required by the Basin Plan.

Each of these projects is a high priority for the RWQCB and we appreciate SAWPA's efforts in the development of SAW DMS. This work is critical for accomplishing water quality improvements and preserving beneficial uses of water in the Santa Ana Watershed.

Your agency has been identified as a source of essential data valuable to one or more of these projects. SAWPA and their consultants will be contacting your agency in relation to the SAW DMS.

We encourage your agency's cooperation with SAWPA in providing data, in working to develop standard data exchange formats, and in coordinating future data collection activities. We believe communication and cooperation in the early stages of the project will ensure smoother, easier data exchange in the future and will create more reliable data and reduced costs.

Sincerely,

for Gerard J. Thibeault
Executive Officer
Santa Ana Regional Water Quality Control Board

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CHINO BASIN WATERMASTER

V. INFORMATION

1. Newspaper Articles

PE·com

Water agency is no model of accord

OPPOSED: The governor visits today to tout a regional authority that disagrees with his plans.

08:39 AM PST on Friday, February 17, 2006

By JIM MILLER / Sacramento Bureau

The Inland agency held as the model for the regional approach envisioned in Gov. Schwarzenegger's $29 billion waterworks plan has come out against a key part of the legislation.

Schwarzenegger is scheduled to visit Prado Dam near Corona today to praise the Santa Ana Watershed Project Authority and encourage other water agencies to take similar approach.

The authority, formed in the early 1970s, includes five agencies providing water and wastewater services to parts of Riverside, San Bernardino and Orange counties. Administration officials consider the authority a statewide template for tackling waterworks problems on a regional basis instead of each agency acting independently.

Earlier this week, however, the authority voiced its opposition to a major piece of Schwarzenegger's water plan -- a proposed monthly charge on every water user in the state that would raise an estimated $5 billion for water projects over 10 years.

Inland officials complain that the charge would take an estimated $50 million in local money and send it to Sacramento.

"Right now you want the money without any assurances we're going to get a reliable statewide water supply," said Geoffrey T. Vanden Heuvel, a Chino dairyman and member of the Chino Basin Water Conservation District, which also opposes the monthly user charge.

The water proposal is part of the governor's $222.6 billion plan for new roads, levees and other infrastructure improvements, which includes $68 billion in borrowing.

Schwarzenegger has said he wants the first installment of bonds -- totaling $25.2 billion -- to go on the June ballot. To do that, the Legislature would have to approve a bond package by March 10. The governor has said he also is open to a November bond measure.

Democratic and Republican lawmakers object to the size of the governor's proposed bond package, calling it too large.

In addition, Republicans have called for changes to environmental and union-labor rules, while

Democrats want nonprofit hospitals, parks and affordable housing to be part of any borrowing proposal.

The conference committee crafting the bond legislation met for the first time Thursday. It heard testimony from administration officials and the Legislature's nonpartisan fiscal analyst but made no decisions.

Reach Jim Miller at (916) 445-9973 or jmiller@PE.com

Online at: http://www.pe.com/localnews/corona/stories/PE_News_Local_M_sawpa17.1d26bf03.html

PE.com

Water agencies say they'll go with flow

PACT: Districts agree to settle how Seven Oaks Dam water will be split -- if the state says it's OK.

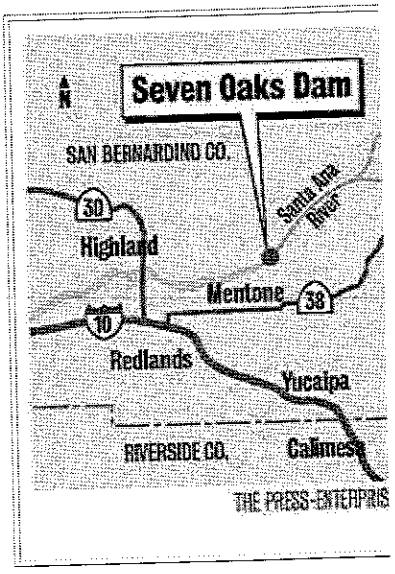
08:12 AM PST on Wednesday, January 25, 2006

By JENNIFER BOWLES / The Press-Enterprise

Inland water agencies involved in a long-standing dispute have agreed how they would like to divvy up what could be billions of gallons of water that stockpiles behind the towering Seven Oaks Dam near Highland.

But officials at the State Water Resources Control Board said Tuesday that they'll have to give that agreement their stamp of approval as they weigh who will get the rights and how much additional water actually exists in the Santa Ana River.

"We won't put something in a permit that we can't enforce ourselves," said Jim Kassel, assistant chief of the board's water-rights division.



The construction of the 550-foot dam, dedicated six years ago, created a new opportunity to collect river water that otherwise would wash toward the Pacific Ocean.

Agencies say an extreme rainy season could result in 65 billion gallons of rain and snowmelt collected behind the barricade, enough to serve 400,000 homes for a year.

The extra water, which could be served as far away as western Riverside County, is seen as crucial for the growing Inland region and is far cheaper and typically of better quality than imported water.

Under the settlement agreement, San Bernardino Valley Water Conservation District will reduce the amount of water it's seeking from a state permit and withdraw its protest of efforts by Riverside-based Western Municipal Water District and the San Bernardino Valley Municipal Water District to get their own state-issued rights to water.

In exchange, the water agencies will not contest the conservation district's historic use of the water.

Since 1910, the conservation district has taken water from the river and nearby Mill Creek and stored it in an adjacent aquifer known as the Bunker Hill basin, where it can be pumped for later use.

"In essence, we agreed to not disagree," said Bob Reiter, general manager of the San Bernardino Valley Municipal Water District, whose effort to get the water right dates back to 1991.

Tom Crowley, assistant general manager of the conservation district, said his agency agreed last August to

withdraw its protest after getting assurances that the Bunker Hill basin would be the first priority for the water behind the dam before any water was sent to another storage facility or aquifer.

The conservation district, Crowley said, will also allow the other water agencies to build pipelines and other facilities on its property near the dam.

Melodie Johnson, a spokeswoman for Western Municipal, said the agreement allows for the potential to transport some of that water in a proposed 28-mile pipeline so it can be served to residents in Riverside, Corona, Rubidoux, Jurupa, Norco and Lake Elsinore.

Crowley said all sides were motivated to reach an agreement before going before the state water board.

"We didn't want to go to the state board in an adversarial environment," he said.

Before the state issues any water rights, environmental laws will have to be met, said Jane Farwell, an environmental scientist with the state board.

She said those include determining how much of the dam's water will be needed to maintain the downstream habitat of three endangered species -- two plants and a kangaroo rat -- which requires regular flooding.

In the summer of 2004, Reiter's agency and Western reached similar deals with six historic users of the river's water -- including the city of Redlands -- in which they also agreed to withdraw protests.

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Online at: http://www.pe.com/localnews/pass/stories/PE_News_Local_C_dam25.12f56184.html

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Article Display Date:

Lawmakers want $50M for rocket-fuel cleanup

By Amy Frye, Staff Writer
Inland Valley Daily Bulletin

New legislation introduced Thursday in the House and the Senate could bring $50 million to California to clean up rocket-fuel contamination.

The bill would give priority to contaminated areas in San Bernardino and Riverside counties because they are heavily affected by perchlorate contamination.

Perchlorate is a major ingredient in rocket fuel. Contaminated soil and water is known to impair thyroid function and could be potentially harmful for children and developing fetuses.

The California Perchlorate Contamination Remediation Act was introduced by Democratic Sen. Dianne Feinstein and Republican Rep. Richard Pombo of Stockton.

"So far, both the Defense Department and the Environmental Protection Agency have failed to recognize the gravity of perchlorate contamination. In the meantime, communities in California have been forced to suffer the financial burden of trying to provide safe drinking water for their residents," Feinstein said in a press release Thursday.

In addition to providing cleanup grants, the bill asks for $8 million to develop more efficient and less expensive perchlorate cleanup technologies.

Feinstein and Pombo are asking the Environmental Protection Agency to set a national standard for perchlorate in drinking water.

The contaminant has been detected in Norco where the state is currently conducting an investigation into and cleanup of Wyle Laboratories, a munitions and aerospace testing facility that operated in the city from the 1950s to the 1990s.

Residents concerned with the impact contamination from Wyle is having on their health have been pushing the state for a faster cleanup and more comprehensive investigation.

Tony Mauro, a biologist who sits on the Citizens Advisory Group to help residents understand the status of the Wyle cleanup, praised the proposed bill.

"The problem is the equipment to clean up perchlorate is expensive and the operation of the equipment is expensive, so if they could do something to make that process faster, that's great," Mauro said.

He added that so far Riverside County has been very successful in reducing the levels of perchlorate in drinking water, but this money would help them even more.

In Rialto, Fontana and Colton, perchlorate was found in at least 20 wells and has been seeping into the cities' water supply since World War II. The contamination is thought to come from old ammunition bunkers and fireworks companies near the Mid-Valley Landfill in Rialto.

Rialto has filed lawsuits against the Department of Defense, which manufactured munitions in the area, San Bernardino County and 39 companies believed to be responsible.

Amy Frye can be reached by e-mail at amy.frye@dailybulletin.com or by phone at (909) 483-9347.

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Daily Bulletin ★★★★ MJ

Board sides with Claremont

Vulcan Company's request for mining project denied

By Caroline An
Staff Writer

CLAREMONT — The state Mining and Geology Board on Wednesday backed the city in its dispute with Vulcan Materials Co. about its request to mine sand and gravel in the city's northeast section, but not without some criticism.

In the 4-3 vote, the board found enough evidence to support the city's denial in issuing an amendment in its General Plan that would have allowed mining in an area designated as open space.

"Vulcan is understandably disappointed with the state Mining and Geology Board's ruling last night. We are, however, pleased that the Board acknowledged its disappointment with the city's lack of responsibility and failure to implement SMARA," said Vulcan officials in a statement released Thursday.

Throughout the deliberations, some board members were critical of several missteps made by the city, including its failure to adopt a Surface Mining and Reclamation Act (SMARA) ordinance. State law requires that cities adopt this regulation regarding the use of any land after a mining operation is completed.

"The city hasn't taken responsibility to regulate mining, allowing us to step in," said Robert Griego, a state board member. "The city has to adopt an ordinance as soon as possible."

The city, however, argues that a mining ordinance isn't necessary if mining doesn't exist. Once a mining permit is submitted, the city's logic follows, then an ordinance has to be adopted.

Derek Cole, a city lawyer, noted that the city wasn't barring Vulcan from mining, but that they wanted to solve the zoning issue.

Vulcan's initial efforts involved a request for a zoning change for the area from open space to business/industrial park.

"We believed that the zoning issue should be addressed first," Cole said. "We are going forward with the ordinance now in light of the board's comments."

A draft of a mining ordinance that will put the city in compliance with SMARA is expected to be reviewed by the City Council this spring.

Councilmembers note that they have started the process of developing an ordinance – and last night's decision speeds up the timetable.

"In hindsight, we should have gone ahead and done it when Vulcan first approached the city," Mayor Sandy Baldonado said.

Councilmember Peter Yao felt that the board criticism was understandable.

"We were aware that we had valuable resources in the 1980s. We should have proposed the SMARA plan and yet we failed to do so," he said.

"We didn't do it, and they were justifiable in terms of saying, 'You should have done it. There's no excuse for not doing it.' "

The area in which Vulcan wanted to mine is 214 acres at the north end of the San Antonio Spreading Grounds in front of San Antonio Dam. In 1987, the state designated the property as an area of significant mineral resources. Vulcan has leased the property from the Pomona Valley Protective Association since 1973 with the intention of mining there once its nearby Upland site was exhausted.

The plan called for operating the mine for more than 10 years.

In his statements, Vulcan attorney Joel Deutsch faulted the city for approving in 1990 Baldy View Estates, an adjacent housing development, in an area with mineral resources. In addition, he said that the city didn't prepare an impact analysis report on that development.

City staff noted that an impact report was developed and sent to state agencies, including the mining board, for comment.

The city received no comments, said Greg Gubman, senior planner.

Community presence at Wednesday's meeting was estimated at nearly 300 people. Many who attended feared for their quality of life if mining were to begin in their neighborhood.

"This project is putting fear into the community," said resident Michael Kunce.

While the board decision is a victory, a civil suit brought by Vulcan against the city is still pending, and the city is mindful that Vulcan may again seek permission to mine at the site.

"We're waiting for the next shoe to drop," Baldonado said. "There's probably a lot of legs with a lot of feet so there will be a lot of shoes coming down."

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LA TIMES

1/30/04

Medications Discovered in Aquifers

Various drugs are detectable in local water supplies that have been derived from treated sewage. The health risk, if any, is unknown.

By Marla Cone
Times Staff Writer

Behind a tangle of willows, every second of every day for almost half a century, recycled sewage has gushed into an El Monte creek and nourished one of Los Angeles County's most precious resources: the drinking water stored beneath the San Gabriel Valley.

Cleansed so thoroughly that it is considered pure enough to drink, this flow from the Whittier Narrows reclamation plant meets all government standards. Yet county officials now report that they have found some potent — and until recent months undetected — ingredients in the treated waste: prescription drugs.

As new technology enables detection of infinitesimally smaller doses of chemicals in the environment, Southern California water-quality officials have learned that an array of hardy pharmaceuticals are defying even the most sophisticated sewage treatments in use.

Around the world, waterways and groundwater basins are virtual drugstores, awash in low doses of hundreds of prescription drugs excreted by people and flushed down drains.

Wherever there is sewage, there are traces of whatever pills people have popped: antibiotics and antipsychotics, birth-control hormones and beta blockers, Viagra and Valium.

"There is no place on Earth exempted from having pharmaceuticals and steroids in its wastewater," said Shane Snyder, head toxicologist at Las Vegas' water provider, the Southern Nevada Water Authority, and one of the nation's leading experts on pharmaceuticals in water. "This is clearly an issue that is global, and we're going to see more and more of these chemicals in the environment; no doubt about it."

Locally, small amounts of medicines for depression, seizures, high cholesterol, anxiety, infections, inflammation and pain — among other ailments — have been detected in the wastewater that flows into California streams and seeps into drinking-water aquifers. The contamination raises questions about the safety of reclaimed water consumed by the public and the health of wild creatures that inhabit waterways.

The concentrations are so minuscule — in parts per trillion, or a few drops in an Olympic-sized swimming pool — that scientists suspect there is little or no human danger. They acknowledge, however, that no one knows the effects of ingesting tiny doses of multiple drugs continuously over a lifetime.

So far, concerns have focused mostly on the ecological threat. Biologists studying frogs on Prozac, insects dosed with anti-seizure drugs, algae killed by antibiotics and fish feminized by birth-control pills have discovered that some streams contain pharmaceuticals and synthetic estrogen at levels harmful to aquatic life.

"All the data we have compiled indicates these concentrations are trivial to public health. Even putting massive safety factors on this, it still wouldn't have a [human] impact," Snyder said. "Now for wastewater — that's a different story. When you have a fish or endangered species that is exposed 24 hours a day, we do need to look at this."

[*See Water, Page B8*]

Military Family Aid Fund Untapped

The National Guard is blamed for a lack of awareness but says the rules are too restrictive.

By Rone Tempest
Times Staff Writer

SACRAMENTO — A year after it was launched to help activated National Guard families suffering financial hardships, the California Military Family Relief Fund has been a major disappointment to its sponsors.

In 2005, the fund paid out only $7,687 to just three families from among the 7,000 soldiers activated for federal duty in Iraq, Afghanistan and other postings that year. The emergency fund was designed to help National Guard families facing unexpected bills, such as food, housing, child care, utilities, medical services and insurance.

In comparison, a similar fund in Illinois but which also includes military reservists called up for duty paid $1.1 million to 2,682 families in its first year of operation. At least half of those who were helped, said Illinois program director Eric Schuller, were members of the Illinois National Guard.

Disturbed by the California relief program's performance, Lt. Gov. Cruz Bustamante, the fund's initial sponsor and primary advocate, wrote a Jan. 2 letter to National Guard Maj. Gen. William H. Wade, requesting an explanation.

"To find that a year later that we have served only a few people is very disappointing. It's shameful," Bustamante said in an interview. "The program is not being used. It's not being publi[illegible]

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Traces of Drugs Are Found in Water Supply

[Water, from Page B1]

With about 2,000 varieties of prescription and over-the-counter drugs being sold, there are no government standards restricting any of them in drinking water or in effluent released into streams or lakes.

Water and sewage agencies aren't even required to look for them — and most don't. Testing of drinking water for drugs has been so infrequent that no one knows how much people are ingesting. A national association of wastewater agencies warned in November that pharmaceuticals are a "potential sleeping giant."

Los Angeles and Orange counties are among the world's leaders in recycling sewage to replenish water supplies, and officials there worry that the public's perception of the water supply will be tainted.

The Whittier Narrows plant, which has operated in El Monte since 1962, was the nation's first reclamation plant. Since then, nearly half a trillion gallons of treated sewage from Whittier Narrows and two other county plants have replenished the Central Basin aquifer beneath the San Gabriel Valley, which supplies water to 1 million people.

Sewage in Southern California undergoes some of the world's most rigorous cleansing — tertiary treatment — to protect rivers and streams from bacteria and nitrogen. Much of the wastewater then is routed into aquifers, where it remains for at least six months so soil can filter out more contaminants before potable water is pumped.

In November, the Los Angeles County Sanitation Districts reported at a scientific conference that they found high levels of ibuprofen, naproxen and acetaminophen in raw sewage coming into its Whittier Narrows plant, and very small concentrations going out.

In waste that had undergone treatment, the antibiotic sulfamethoxazole and anti-cholesterol medication gemfibrozil were found at fairly high levels of around one part per billion. The antidepressant fluoxetine, the arthritis drug diclofenac, anti-anxiety and anti-seizure drugs, three more antibiotics and others were detected at lower levels, in parts per trillion. Estrogens also were measured in low levels.

Similar findings from two Los Angeles County reclamation plants will be published later this year by Jorg Drewes, an assistant professor of environmental science and engineering at the Colorado School of Mines.

Robert Horvath, the districts' technical services director, said tiny doses of over-the-counter drugs aren't that worrisome, but other less common medications can amount to an involuntary though "extremely low" public exposure. The agency, which operates 10 reclamation plants, is one of a few with the ability to test for pharmaceuticals.

"It's such a large list of compounds that even the testing is a lot of work — just teasing out which ones are important. So far, we have no [federal or state] goals to shoot for," Horvath said.

Orange County is spending $500 million to build the world's most advanced sewage-recycling plant. When operating in 2007, it is expected to bring pharmaceuticals and other contaminants to undetectable levels.

Christian Daughton, chief of environmental chemistry at the EPA's National Exposure Research Laboratory branch in Las Vegas, has said that drugs rival pesticides but unlike such conventional pollutants, they are unregulated and flow continuously into waterways from sewage treatment plants. The U.S. Geological Survey found one or more pharmaceuticals in 80% of 139 streams tested in 2002.

> *'There's a question of which pharmaceuticals may be persistent in the environment, which have the greatest potential for adverse effects.'*
>
> **Michael Wehner,** the Orange County Water District

In a 1999 report, Daughton warned that medications "could lead to cumulative, insidious, adverse impacts" on aquatic ecosystems — such as declining reproduction and survival rates — that "can accumulate over time to ultimately yield truly profound changes," even in protected areas such as national parks.

Fish, frogs and other creatures live, feed and breed in waterways — exposed to the drugs from birth to death.

Collecting carp and other fish in a Dallas stream fed by treated sewage, Baylor University toxicologist Bryan Brooks found fluoxetine, an ingredient of Prozac and other antidepressants, in all fish sampled.

In laboratory frogs, Prozac slows growth and metamorphosis, leaving tadpoles more vulnerable to predation, according to research by University of Georgia ecotoxicologist Marsha Black. In fish, it causes lethargy and delays reproduction, and in crustaceans and shellfish, reproductive rates drop.

The most striking discovery is feminized fish. Male fish in British rivers, Nevada's Lake Mead, the Potomac River and elsewhere are growing female ovarian tissues from continuous exposure to birth-control estrogens and natural hormone excretions in treated sewage.

Many popular medications, such as acetaminophen and ibuprofen, are eliminated during sewage treatment. But some pass out of the plants unaltered and are released into streams, oceans and groundwater basins.

"Most pharmaceuticals are designed to be tough because they have to get through your body to have a therapeutic effect," said Margaret Nellor, an environmental consultant who specializes in reclaimed water.

Two widely used anti-epileptic medications — carbamazepine and primidone — survive not only Arizona's advanced, tertiary treatment but also filtration through aquifers' soil. Even after eight years underground, they still contaminate well water used to irrigate parks in Mesa and Tucson, Drewes said.

Yet experts suspect that the millions of Americans who drink reclaimed water — which includes virtually everyone in Los Angeles County — would experience no effects.

Drugs in wastewater are detected in nanograms though they usually are administered by doctors in milligrams, a unit 1 million times larger.

"People would have to drink the water for many hundreds of years to get a dose of a pharmaceutical equivalent to therapy," said Drewes.

Still, the public exposure is widespread, and some drugs share a common mode of action. When combined, they could lead to significant exposure.

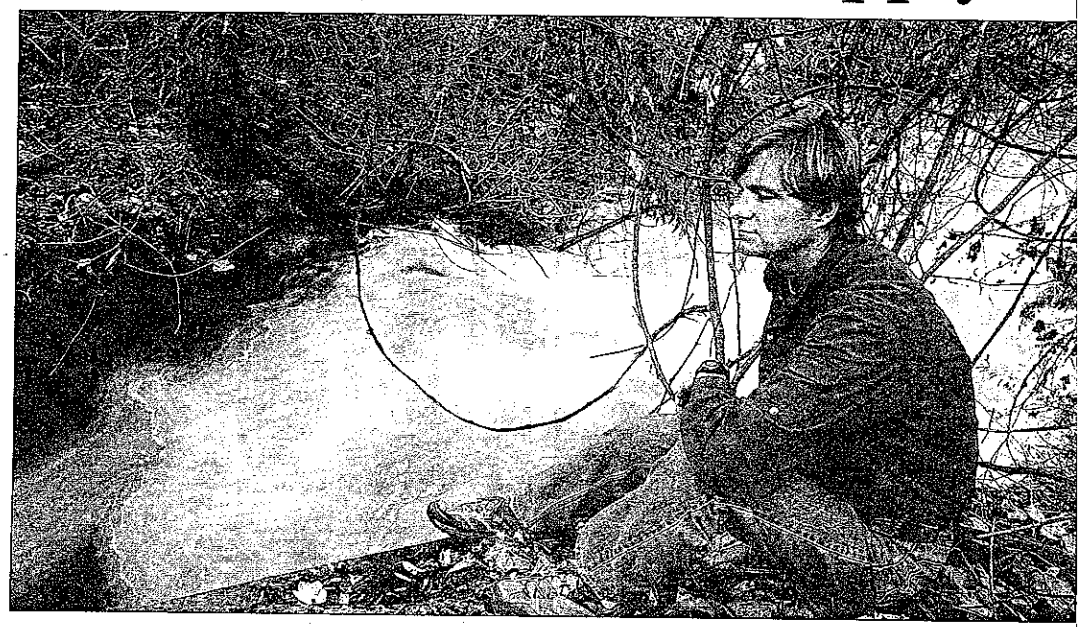
Because some pills are intentionally flushed down toilets, Los Angeles and Orange counties will begin distributing cards to pharmacies in March advising customers to take unwanted drugs to hazardous waste roundups or wrap them and put them in the trash.

Water agencies predict that soon they will have to tackle this new generation of contaminants. The EPA is likely to add a few pharmaceuticals to a new candidates list, which could initiate monitoring of water in 2008.

In the meantime, the newest technology can detect chemicals in parts per quintillion — equivalent to one tablespoon in the Mississippi River.

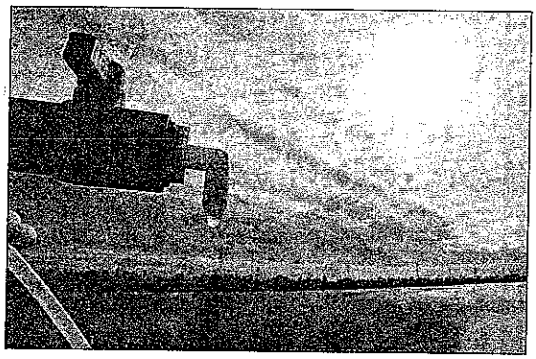
"The analytical capability has really, really outstripped our ability to understand what it means," said Michael Wehner of the Orange County Water District, which taps a basin replenished by the Santa Ana River, composed almost entirely of treated sewage.

"There's a question of which pharmaceuticals may be persistent in the environment, which have the greatest potential for adverse effects," he said. "The information is still sketchy compared to the traditional contaminants. There's some good work going on to help us get a handle on it, but it's still early."



Photographs by ROBERT GAUTHIER Los Angeles Times

CONTAMINANTS: *Ted Johnson, chief hydrologist for the Water Replenishment District of Southern California, sits near a pipe where effluent treated at the Whittier Narrows treatment plant runs into the Rio Hondo. Fish and other aquatic life are particularly vulnerable.*



HEALTH: *A national association of wastewater agencies has warned that pharmaceuticals are a "potential sleeping giant."*

Drugs in the environment

Tests of raw and treated sewage at Los Angeles County's Whittier Narrows Reclamation Plant show that some pharmaceuticals are resistant even to advanced treatment and are released into the San Gabriel Valley's groundwater basin in ultra-low levels.

Drugs in sewage and in treated water
(Parts per trillion)

	Entering plant	Discharged into groundwater
Estrogens (female sex hormones)	69.6	4.6
Triclosan (antibiotic)	610–667	51–74
Acetaminophen (analgesic)	20,300–35,200	under 10
Naproxen (analgesic)	3,780–5,100	35–74
Ibuprofen (analgesic)	4,720–6,630	43–52
Hydrocodone (pain-killer)	31–52	34–50
Sulfamethoxazole (antiobiotic)	320–882	742–919
Meprobamate (anti-anxiety)	194–241	219–294
Dilantin (anti-convulsant)	39–48	98–120
Carbamazepine (anti-seizure, analgesic)	58–95	93–133
Diclofenac (arthritis)	22–30	40–63
Trimethoprim (antibiotic)	178–591	231–337
Erythromycin (antibiotic)	205–299	419–517
Gemfibrozil (anti-cholesterol)	2,300–3,020	733–1,110
Fluoxetine (anti-depressant)	under 10	13–18

*The tests of the incoming sewage and the outgoing waste were made at different times, which explains why some effluent is more contaminated than the incoming waste.

Source: Los Angles County Sanitation Districts, Nov. 2005

Los Angeles Times

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LA TIMES

Traces of prescription drugs found in recycled Los Angeles-area water

Associated Press

LOS ANGELES — Water quality officials have found traces of resilient prescription drugs in wastewater that has been filtered and recycled into a Southern California aquifer for eventual use as drinking water, but the amounts are so small that the health effects are unclear, a Los Angeles newspaper reported Monday.

Drugs including antibiotics, antipsychotics, birth-control hormones, Viagra and Valium routinely turn up in wastewater all over the world because people flush them down their toilets. But medications have also ended up in Los Angeles County's water supplies because of the region's aggressive efforts to turn treated sewage into drinking water.

Nearly half a trillion gallons of sewage from three treatment plants have replenished the Central Basin aquifer beneath the San Gabriel Valley east of Los Angeles, which supplies 4 million people with water.

Southern California sewage undergoes some of the world's most rigorous cleansing to remove bacteria and nitrogen, and recycled wastewater added to the drinking water supply meets all government standards. But water officials are discovering the medications as they become capable of detecting smaller amounts of chemicals.

Among the medicines found in local water supplies are small amounts of prescription drugs to treat depression, seizures, high cholesterol, anxiety, infections, inflammation and pain.

Because the medications have been found in very small amounts – the equivalent of a few drops in an Olympic-sized swimming pool – scientists suspect there is little or no human danger. But they say no one knows if there are health hazards from ingesting small doses of drugs continuously over a lifetime.

What's more clear are the health effects for fish, frogs and other creatures that spend their entire lives in waterways exposed to drugs.

Christian Daughton, chief of environmental chemistry at the EPA's National Exposure Research Laboratory branch in Las Vegas, said in a 1999 report that medications "could lead to cumulative, insidious, adverse impacts" on aquatic ecosystems, including declining reproduction and survival rates.

In British rivers, Nevada's Lake Mead, the Potomac River and elsewhere, male fish are growing female ovarian tissues from exposure to birth-control estrogens and natural hormone excretions in treated sewage.

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POLITICS:
Column: Water stalemate a symptom of California's governance crisis
Sacramento Bee – 2/19/06
By Dan Walters, Bee columnist

As expostulated in this space previously - perhaps ad nauseam - California faces any number of long-range political issues that stem from its rapid population growth and equally dramatic social and economic evolution, but those same factors also block responses to those issues.

California's growth and ever-increasing diversity - it's already the most complex society in the history of humankind - dissipate social cohesion and undermine the consensus necessary for political decision-making.

When journalists and academics talk or write about California's crisis of governance, they're not referring to Gov. Arnold Schwarzenegger's up-and-down governorship or the antics of legislators, but about the sclerosis that's afflicted the entire system of political government and made Californians increasingly cynical about those they elect to public office.

It explains why the governor and lawmakers this year are publicly acknowledging the ill repute in which they are held and are pledging to work together on universally recognized problems, such as the state's chronic lack of investment in highways, levees, schools and other forms of public infrastructure.

Whether they succeed is, in effect, a test of whether California's political system is irretrievably broken and the state has, as many suggest, become ungovernable or whether there is hope for resurrection.

There are any number of examples of how cultural and economic diversity interact with the "checks and balances" of American-style government to create political gridlock in California, but few are starker, or more important, than an adequate supply of clean water, on which the state's human and economic well-being depend.

As with highways and other infrastructure systems, California is living off the decisions that earlier generations of voters and politicians made on water during the two decades that followed World War II. We have one of the

planet's most extensive systems for moving water from where it originates - in the mountains of Northern California, mostly - to where it's needed and used. The federal government, the state government and local water agencies operate pieces of the system.

It has, for the most part, served us well, but with age, changes in the farm economy (which consumes much of the water), population growth, and other factors, the system needs expansion and upgrading. A major problem is that the State Water Plan, first written nearly a half-century ago, has never been completed. Most of the water that's being shipped from Northern California to Southern California via the California Aqueduct is still being pulled out of the Sacramento-San Joaquin Delta, which is suffering much environmental degradation as a result, rather than being routed around the Delta, as the state plan envisioned.

The Department of Water Resources has just unveiled a new version of the plan, emphasizing regional cooperation on water-related issues, a more activist approach by the state government (including a big chunk of Schwarzenegger's infrastructure bonds) and a fresh look at the Delta's problems.

It's a welcome start after decades of wheel-spinning, but water, like government in general, suffers from a lack of broad consensus.

Those who want to develop more water and reservoirs to hold it have been locked in an epic, decades-long battle with those who believe that water development despoils the environment and encourages more population growth. In the 1980s, the clash derailed the Peripheral Canal that was supposed to carry water around the Delta, and later it stalled the much-trumpeted "CalFed process" that was to find cooperative solutions to the Delta's problems without a Peripheral Canal. On those and other water-related issues, the lack of consensus led directly to political stalemate.

DWR Director Lester Snow, a veteran of the CalFed wars, is still hopeful that with a carrot-and-stick approach, the state can persuade local and regional water agencies to come together - but he and Schwarzenegger must first persuade the Legislature to even try to resolve its own conflicts, as well as those of outside interest groups. Water is, indeed, symptomatic of California's larger crisis of governance.

Article Last Updated: 1/28/2006 12:13 AM

Water, water everywhere

Researchers look into rainwater for irrigation

Mason Stockstill, Staff Writer
San Bernardino County Sun

ONTARIO - Millions of gallons of water are wasted each year here, and a group of former engineering students from UC Riverside believe they have a way to save it.

The source of the water is rain, and the group's idea is as old as the concept of irrigation: Catch the water falling from the sky, and use it to water our lawns.

As simple as it sounds, storage and irrigation systems using harvested runoff could save the region millions of dollars in utility costs, according to the group's research.

"The main thing is to see how clean the water is," said Greg Guillen, one of the researchers. "Hopefully, we can just catch it, fill it and put it on the lawn."

The group of five came up with the project while they were undergraduates in the university's engineering program. The idea was that as Southern California becomes paved over with more streets and buildings, more rainwater is diverted into storm drains that eventually run to the ocean.

If the water sliding off the roofs of large buildings is clean enough, the students figured, there's no reason why it shouldn't be put to use.

"This is not necessarily a big source of water," said Mark Matsumoto, associate dean of the engineering department and the group's adviser. "But if the idea is to save as much water as possible, this is one way to do it."

The project has several components. First, the students built a catch basin outside a building on campus to collect rainwater as it is funneled off the roof.

They later tested the water quality, which is particularly important for the "first flush" that is, the water that hits the roof during the first rainfall of the season.

"If you can imagine how dirty the roof is at the end of the summer after it hasn't rained for months, we want to measure what that rainwater's like coming off there the first time," Guillen said.

That data will determine what the water can be used for and whether it needs to be treated, Guillen said.

In addition, the researchers used computer models to calculate how much water could be saved and re-used. They chose Ontario because of the high number of warehouses and other buildings (such as Ontario Mills) with large roof areas.

"They looked at the space in terms of rooftop area in a couple of areas, and thought that Ontario was one that would benefit from catching the rainwater from the rooftop," said Kawai Tam, a lecturer at UC Riverside involved with the project.

The computer models found that harvesting rainwater in Ontario could yield as much as 2,200 acre-feet of water each year more than 700 million gallons, enough to meet the annual household needs of nearly 10,000 people.

Though it sounds simple, saving rainwater will take some work. Individual property owners would need to install plumbing systems and storage tanks to hold all the water, and then connect them to existing irrigation systems such as lawn sprinklers.

The group has already won grants from the Metropolitan Water District and the U.S. Environmental Protection Agency to continue the research and come up with ways to make the project feasible.

Guillen envisions a system, one day, where runoff is diverted into a central supply so that individual properties won't be relying only on their own irrigation systems.

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Article Last Updated: 1/26/2006 10:20 PM

Critics rip EPA well-water standard

California proposes tougher standards for perchlorate

Andrew Silva, Staff Writer
San Bernardino County Sun

The U.S. Environmental Protection Agency on Thursday proposed a cleanup standard for a rocket fuel ingredient that's four times weaker than the level proposed by California and is woefully inadequate to protect fetuses and children, critics said.

Perchlorate has contaminated numerous wells in San Bernardino County and elsewhere in California, leading to cleanup projects that will cost tens of millions of dollars and take decades to complete.

The EPA has proposed a preliminary goal of 24.5 parts per billion, compared to a health goal of 6 parts per billion in California. Many experts argue the standard should be set at 1 part per billion.

"A precautionary approach would be to not allow any," said Penny Newman, director of the Riverside-based Center for Community Action and Environmental Justice. "This is rocket fuel. To set a level of 24 is unconscionable."

Perchlorate, a salt that provides the oxygen to propel rockets, flares, fireworks, air bags and other products, can reduce thyroid function and is thought to be dangerous to fetuses and young children.

Sen. Barbara Boxer, D-Calif., slammed the Bush administration for the proposal.

"This standard fails to protect pregnant women, children and other vulnerable individuals from this dangerous health hazard," she said in a written statement. "EPA's standard also ignores new and mounting evidence that this toxic chemical is more prevalent in food than previously thought."

Perchlorate has been found in breast milk of nursing women, cow milk and lettuce.

The EPA proposal is based on a review of the current science by the National Academy of Sciences. Previously, the agency recommended a level of 4 to 18 parts per billion.

The recommendation is designed to protect a 154-pound person who consumes two liters of water per day.

The proposed level is one-tenth the dose at which any ill effects are seen "to protect the most sensitive population, the fetuses of pregnant women who might have hypothyroidism or iodide deficiency, it is also protective of other sensitive populations, such as (newborns) and developing children," wrote Susan Parker Bodine, assistant administrator, in the memo that went out to regional EPA offices.

A former rocket plant in Mentone is the source of a major plume of contamination that has been moving west for years. Aerospace giant Lockheed Martin has spent millions to clean up the contaminated groundwater and is the target of a lawsuit by Redlands residents.

Rialto, Colton and Fontana are also wrestling with roughly 20 wells closed because of perchlorate. The contamination is thought to have originated from old munitions bunkers and fireworks manufacturers near the county-owned Mid-Valley Landfill in Rialto.

Though California has a health goal of 6 parts per billion, that is not an enforceable drinking water standard. The state is two years behind a statutory deadline to establish a standard.

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LA Times 3/1/06

Huntington Beach OKs Desalination Plant on PCH

By Jean O. Pasco
Times Staff Writer

A controversial proposal to build what would be the largest desalination plant in the nation along the Huntington Beach coast was approved early Tuesday after months of consideration.

Poseidon Resources Corp.'s plans to build a $250-million desalination facility next to the AES power station on Pacific Coast Highway at the city's southern edge were approved by the Huntington Beach City Council on a 4-3 vote.

The plant would produce as much as 50 million gallons of fresh water daily by tapping ocean water already pumped into the power station to cool the huge electrical facility.

The plant still must receive approvals from the California Coastal Commission, the state Regional Water Quality Control Board and the State Lands Commission.

Most of the water would be sold to as-yet-unknown buyers, although Huntington Beach has agreed to buy a modest amount — 3.2 million gallons a day — at a rate less than what it now pays for imported water from the Metropolitan Water District. About a third of the city's water is imported; the rest is groundwater. The city uses about 34 million gallons a day.

"Obviously, I'm pleased with the vote regardless of the numbers," Poseidon Senior Vice President Billy Owens said after the council voted following hours of debate. "After all of this time, we have a good relationship with the city. We're not going to cause any problems. We just need our chance."

The vote was a huge victory for Poseidon, a small, privately held firm based in Connecticut that has fought for two years to build a landmark desalination plant on the Southern California coast. The company's plant in Tampa Bay, Fla. — half the size of the one approved for Huntington Beach — was taken over by a public water agency and has been beset by financial and technical problems.

Another Poseidon facility proposed in Carlsbad is expected to go before the City Council there in May.

The desalination proposal was vigorously opposed by some residents and environmental groups, who lamented the building of more industrial plants along the city's tourist-heavy beaches. They also cautioned that the plant's briny discharge could kill sea life. Other critics said the project was an improper use of a public resource — the ocean — for private profit.

"Frankly, it would be irresponsible of us to make our city a guinea pig for this," said Mayor Dave Sullivan, who joined Councilwomen Jill Hardy and Debbie Cook in opposing the permits.

More than 100 people spoke at a meeting packed with four times that many spectators. Reaction was mixed, though many who spoke for the project belong to labor unions that would benefit from construction jobs.

Other supporters praised desalination as a proven technology for giving Southern California a source of fresh water other than groundwater and the Colorado River. Though the Metropolitan Water District has said water supplies are adequate through 2030, several speakers urged the city to plan ahead.

"We live in a desert, and we need all the sources of fresh water that we can develop," said Councilwoman Cathy Green, who supported the project with council members Keith Bohr, Gil Coerper and Don Hansen.

In September, the city narrowly approved an environmental review of the plant, following a five-hour hearing at which nearly 80 residents, environmentalists and experts spoke. It was the second attempt for Poseidon, whose earlier environmental study was rejected because the council said it understated the potential effects on marine life.

Poseidon offered several incentives to the city, including building a 10-million-gallon storage tank for emergency water use; paying $2 million to the city; and providing another $1.9 million for street improvements.

One point of contention wasn't resolved with Tuesday's vote: The city contends the company must pay a tax on its electric use amounting to $840,000 a year; Poseidon says its share would be only $50,000 a year.

The company is banking that water prices will surge in coming years, making the high electric cost of producing its water worth the investment. It plans to sell its water for about $1,000 an acre-foot, company officials said. Groundwater from an aquifer costs about $200 an acre-foot; imported water is about $500 an acre-foot. An acre-foot is roughly the amount that two families use in a year.

Cook argued that the plant was relying on an expensive energy source — natural gas. Future energy shortages could push prices so high, she said, that no one would buy the desalted water.

Hardy said she was opposed because most of the water would be shipped elsewhere, particularly to fuel development in southern Orange County, where 90% of water is imported.

The firm wants to build its Huntington Beach and Carlsbad plants next to power stations to use their cooling water pipes, which range from 12 to 25 feet in diameter, to draw in ocean water for their operations.

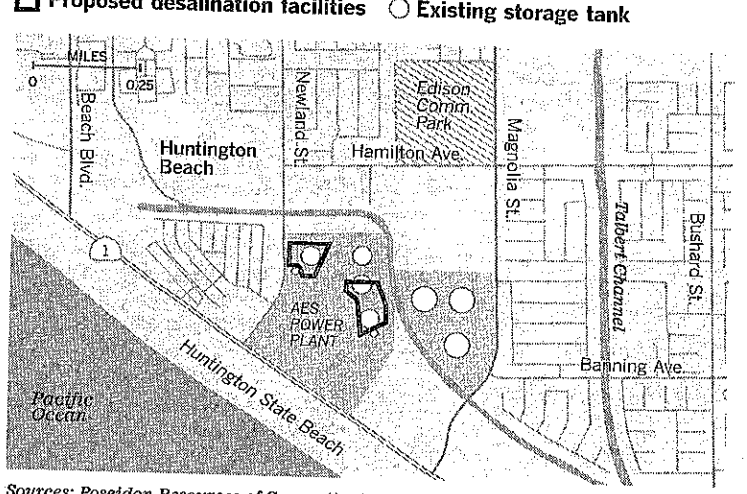
Piggy-backing on the electric plants has drawn additional opposition from environmentalists who say the facilities are outdated eyesores that kill fish, plankton and crustaceans by sucking in millions of gallons of seawater.

Environmentalists are pressuring the state to phase out all ocean cooling pipes for coastal power plants by 2020.

Times staff writer Sara Lin contributed to this report.

Salt-free effort

The Huntington Beach City Council approved development permits for a proposed desalination plant across from Huntington State Beach. The $250-million facility would be the largest desalination plant in the nation.



Sources: Poseidon Resources of Connecticut; city of Huntington Beach

Los Angeles Times

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