

Appropriate Urban Water Use Measurement Strawman Draft Implementation Approach

The outline for the proposed Implementation Approach for Appropriate Urban Water Use Measurement is as follows:

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I.A. State standards/protocols for recording, reporting, quality assuring, and disseminating urban water use data

Main Action: Develop data collection guidelines and protocols for urban water purveyors. Develop system for reporting water supply data annually to the state. Develop system for disseminating data to governmental agencies, water purveyors, research institutions, and the public. Develop guidelines for ensuring accuracy of the measurement data.

Status:

- This effort will need to coordinate with current efforts to consolidate existing reporting systems (e.g., DWR, USBR, CUWCC, DHS).
- Expected level of effort is large.
- The expected impact on state water management/planning is large

Action Options:

[Action Approach 1: Preferred approach] State to develop a database that will be used for recording, reporting, and disseminating urban water use data. This will involve the following steps:

- State to coordinate with urban water purveyors to develop a broad number of data collection (i.e., input) fields. These fields should include all of the data categories by which purveyors currently record and report their data.
- State to coordinate with water purveyors, researchers, and the public to establish set of fields for data output.
- State to establish standard definitions for particular data terms and categories.
- State to develop data conversion software for the database to convert from the input fields to a set of pre-defined output fields. Note: Water purveyors will be able to input data according to their historical categories as long as these categories match one of the fields defined by the state.
- Water purveyors would be able to record data and report through the database.
- Dissemination of data would include a packaging step.

[Action Approach 2: Minimum requirement] Water purveyors to provide conversion factors to State so state can make sense of their data.

Actors:

- Lead/responsible actor: DWR
- Key implementation partners: urban water purveyors, USBR, DHS, CUWCC, CPUC, Researchers, environmental groups

Funding:

- The State would be responsible for funding the creation of standards/protocols and the development of reporting and data dissemination systems.
- The State would provide funding to assist local purveyors needing to alter their data categories to match the standards established by the State.
- The costs to design and maintain a database would be significant.
- There may be some cost savings if this database allows purveyors to more efficiently submit reports to different governmental agencies.

Timeline:

- Two years, with a one year milestone

Assurances:

- An independent entity would evaluate and report back to the legislature on the effectiveness of the data recording, reporting, and dissemination system.

Institutional vehicles:

[For Action Approach 1]

Option 1 (Preferred)

- Legislation: none
- Directive would come from the CBDA, which would also provide oversight.
- Administratively, DWR would issue guidelines for using the database and for ensuring the quality of the data.
- Budget requirement: Money would have to be budgeted.

Option 2

- Legislation: Action would be legislatively mandated
- Money would have to be budgeted.
- Administratively, DWR would issue guidelines for using the database and for ensuring the quality of the data.
- Rationale: Legislative action is necessary due to the large number of players involved.

[For Action Approach 2]

- Legislation: none
- Directive would come from the CBDA, which would also provide oversight.
- Administratively, DWR would issue guidelines for producing conversion factors.
- Budget requirement: Modest budget when compared with Option 1 above.

Technical assistance:

- Will be provided for local water suppliers to adapt to the new standards/protocols.
- Technical assistance to be provided, if possible, through existing DWR, USBR, or CUWCC technical assistance programs.

Exemptions/exceptions:

- **[Threshold option 1]** Drawing upon the 1991 California Water Use Measurement Law (S.B. 229) as a model, exemptions include community water systems which serve less than 15 service connections used by yearlong residents or regularly serve less than 25 yearlong residents, or a single well which services the water supply of a single family residential home.
- **[Threshold option 2]** Drawing on the Urban Water Management Planning Act as a model, exemptions include urban water purveyors providing water for municipal purposes either directly or indirectly to less than 3,000 customers or supplying less than 3,000 acre-feet of water annually.

Adaptive management:

- Evaluate efficacy and accuracy of new system after xx years.

Key Questions:

- Which action approach is preferred?
- Which institutional vehicle option is preferred?
- Which exemption threshold option is preferred?
- What are the approximate costs to design and operate a database system?
- What is the timeline for adaptive management review?

I.B. State standards/protocols for recording/reporting urban wastewater discharge

Main Action: Develop standards/protocols for recording and reporting urban *wastewater discharge*. Develop system for reporting wastewater discharge data annually to the state. Develop system for disseminating data to governmental agencies, water purveyors, research institutions, and the public. Develop guidelines for ensuring accuracy of measurement equipment.

Status:

- EPA is currently working with the SWRCB to develop a reporting system for CA wastewater discharge that largely accomplishes the above action.
- Expected level of effort: This action will not require much effort in addition to the EPA reporting system.
- The expected impact on state water management/planning is large.
- The EPA reporting system would operate independently but in parallel to any system developed for urban water use data (see I.A. above).

Actors:

- Lead/responsible actor: EPA, SWRCB
- Key implementation partners: urban wastewater dischargers, DHS, CUWCC, CPUC, Researchers, environmental groups

Funding:

- EPA is currently funding the creation of a wastewater discharge reporting system for CA. No new funding would be required.

Timeline:

- The new EPA reporting system is due to be completed in 2004-2005.

Assurances:

- It is assumed that all assurances will be taken care of by the EPA system [To be determined via consultation with EPA/SWRCB].

Institutional vehicles:

- Legislation: none.
- Administrative: EPA/SWRCB would issue guidelines for using the reporting system.
- Budget requirement: none.

Technical assistance:

- It is assumed that all technical assistance needs will be captured by the EPA system [To be determined via consultation with EPA/SWRCB].

Exemptions/exceptions:

- [Thresholds to be determined via consultation with EPA/SWRCB]

Adaptive management:

- Evaluate efficacy and accuracy of new system after xx years.

Key Questions:

- Does deference to the new EPA system meet appropriate measurement needs as defined?
- What are the assurances, technical assistance, and exemption provisions of the new EPA system?
- What is the timeline for adaptive management review?

II.A. Measurement of urban water purveyor water sources/production

Main action: Urban water purveyors to install suitable water source meters, read and maintain accuracy of the meters, and record and store data per standards/protocols

Status:

- This action is already being done by the vast majority of urban water purveyors
- This action is already required for all Investor Owned Utilities regulated by the CPUC
- Level of effort to accomplish this action is low
- Expected impact for state/federal water management and planning is relatively small

Actors:

- Lead/responsible actor: Urban water purveyors
- Key implementation partners: DWR, County Sealers of Weights and Measures, Water Measurement Industry

Funding:

- Urban water purveyors who are not currently measuring water source information would be responsible for covering the costs of these retrofits. These purveyors would be eligible for grant funding in cases where the retrofits are not locally cost effective.
- Total cost impact is expected to be low. Costs for individual purveyors needing to make this change may be high.

Timeline:

- Source meters would have to be installed within xx years.

Assurances:

- Reliance upon internal controls: purveyor to employ an accredited professional to maintain source meters.

Institutional vehicles:

Institutional option 1 (preferred)

- Legislation: No new legislation needed. Draw upon existing legislation—i.e., Water Code section 520 (measure when possible) and general DWR water management authority.
- Administrative: This action would be a CBDA directive. State agencies would also establish guidelines would be established for reading/maintaining source meters.
- Budget requirement: none.

Institutional option 2

- Legislation: Produce new legislation mandating this action (similar to rationale for service metering).
- Administrative: State agencies would establish guidelines for reading/maintaining source meters.
- Budget requirement: none.

Technical assistance:

Exemptions/exceptions:

- ***Threshold option 1*** Drawing upon the 1991 California Water Use Measurement Law (S.B. 229) as a model, exemptions include community water systems which serve less than 15 service connections used by yearlong residents or regularly serve less than 25 yearlong residents, or a single well which services the water supply of a single family residential home.

- **Threshold option 2** Drawing on the Urban Water Management Planning Act as a model, exemptions include urban water purveyors providing water for municipal purposes either directly or indirectly to less than 3,000 customers or supplying less than 3,000 acre-feet of water annually.

Adaptive management:

- Evaluate quality of data after xx years.

Key Questions:

- Do sufficient existing statutes exist to cover this action?
- What is the rationale for requiring legislation?
- Is the exemption threshold reasonable? This threshold applies more to service connections than water source/production.
- What is an appropriate timeline for meter installation?
- Are internal assurance controls sufficient?
- What is the percentage of source water that would be affected by Options 1 and 2 in the Exemptions section?
- What is the timeline for adaptive management review?

II.B. Measurement of urban water purveyor customer water uses

Main action: Urban water purveyors to install suitable customer service meters, read and maintain accuracy of the meters, and record and store data per standards/protocols

Status:

- Over 90% of all customer water deliveries are already metered. The signing of AB 514 will increase this by another 3-4%. Remaining effort will fall onto a relatively small number of purveyors in the Central Valley.
- For these remaining purveyors, the expected level of effort is high.
- Legal precedence exists: 1991 law requires meters to be installed on all residences built after Jan. 1, 1992.
- Expected impact: significant—approximately 20% decrease in water use for applicable customers.

Actors:

- Lead/responsible actor: Urban water purveyors
- Key implementation partners: DWR, County Sealers of Weights and Measures, Water Measurement Industry, DWR

Funding:

- Action would be locally funded by affected urban water purveyors. Where not locally cost effective, purveyors could defer timeline for implementation. Purveyors could pass investment costs on to customers.
- Estimated total cost of retrofitting unmetered connections is approximately \$250 million. Capital and O&M costs may be significant for some Central Valley water purveyors.

Timeline:

- Implement in 10 years (based on AB 306 model). Extended timelines could be established for purveyors for whom this is not locally cost effective. No deferments beyond xx years.

Assurances:

- Reliance upon internal controls: purveyor to employ an accredited professional to maintain source meters.

Institutional vehicles:

- Legislation: will be needed. Legislation will affect only pre-1992 and non-CVP cases. Rationale: Such legislation is consistent with past service meter policy. Any legislation would have to be reconciled with existing metering mandates and agreements.
- Administrative: Guidelines would be established for reading/maintaining source meters.
- Budget requirement: none.

Technical assistance:

Exemptions/exceptions:

- **Threshold—Option 1** Drawing upon the 1991 California Water Use Measurement Law (S.B. 229) as a model, exemptions include community water systems which serve less than 15 service connections used by yearlong residents or regularly serve less than 25 yearlong residents, or a single well which services the water supply of a single family residential home.
- **Threshold—Option 2** Drawing on the Urban Water Management Planning Act as a model, exemptions include urban water purveyors providing water for municipal purposes either directly or indirectly to less than 3,000 customers or supplying less than 3,000 acre-feet of water annually.

- Locally cost effective deferment allowing qualified purveyors to extend the timeline of meeting this requirement. No deferments will be extended beyond xx years.

Adaptive management:

- Evaluate quality of data after xx years.

Key Questions:

- What are the expected annualized capital and O&M costs for affected customers?
- What is the maximum period beyond which timeline extensions would not be granted?
- What threshold exemption option is preferable?
- What is the timeline for adaptive management evaluation?

II.C Measurement of urban wastewater discharge

Main action: Wastewater dischargers to install suitable effluent measuring devices, read and maintain accuracy of effluent measuring devices, and record and store data per standards/protocols.

Status:

- Urban wastewater dischargers are already required by NPDES and WDR permits to measure accordingly.
- Expected level of effort: small.

Actors:

- Lead/responsible actor: Urban wastewater dischargers
- Key implementation partners: EPA, SWRCB, County Sealers of Weights and Measures, Water Measurement Industry

Funding:

- Action would be funded by local urban wastewater dischargers.
- Expected costs are small, as most urban wastewater dischargers already measure accordingly.

Timeline:

- As per existing NPDES permits and Waste Discharge Requirements.

Assurances:

- Reliance upon internal controls: wastewater discharger to employ an accredited professional to maintain effluent meters.

Institutional vehicles:

- Legislative: none, as current statutes (Clean Water Act and Porter-Cologne Water Quality Control Act) already require this.
- Administrative: Guidelines for reading/maintaining meters.
- Budget requirements: none.

Technical assistance:

- It is assumed that all technical assistance needs will be captured by the EPA system [To be determined via consultation with EPA/SWRCB].

Exemptions/exceptions:

- [To be determined via consultation with EPA/SWRCB]

Adaptive management:

- Evaluate quality of data after xx years.

Key Questions:

- What percentage of urban wastewater dischargers are not metering effluent per NPDES/WDR requirements?
- What is an appropriate timeline?
- What are the EPA's technical assistance provisions?
- What are the EPA's exemptions provisions?
- What is the timeline for adaptive management review?

II.D Measurement of net groundwater use

Main action: Appropriate measurement of groundwater includes a focus on net groundwater use and requires continuous regional characterization of groundwater volume using two methods simultaneously: (1) development of detailed sub-basin hydrologic balances; and (2) the water table/specific yield method. Additionally, when water transfers involve groundwater substitution, the groundwater wells directly involved in the transfer require continuous measurement and monitoring.

Status:

- Currently, state and federal water management agencies conduct periodic assessments of groundwater resources for selected basins. However, these analyses are not conducted using consistent methods and are not done frequently enough to adequately characterize groundwater usage.
- Level of effort for this action is high, as it would constitute a substantial change from current practices. Impacts to water users likely to be minimal. Some costs might be internalized to participants of transfer transactions.
- Expected impact on state water management/planning is high. This action would help improve measurement of water balance components, including net groundwater use, which will help update State Water Plan, make decisions about future storage and conveyance investments, and characterize and assess the sustainable yield of groundwater basins as well as the extent of overdraft.

Actors:

- Lead/responsible actor: DWR
- Key implementation partners: CBDA

Funding:

- Action would be funded by DWR appropriations.
- Expected to cost the state an additional \$2 million per year.

Timeline:

- Implementation prior to publication of next Bulletin 160 after current draft is finalized.

Assurances:

- DWR commitment to undertake this approach and to state in each Bulletin 160 the extent to which groundwater data is based on this approach (i.e., the share or number of basins in which these methods are used for calculations).

Institutional vehicles:

- Legislative: none.
- Administrative: DWR staffing
- Budget requirements: Funding of DWR

Technical assistance:

- N/A

Exemptions/exceptions:

- Agency to start with most impacted groundwater resources and work toward eventually including all by the timeline indicated above.

Adaptive management:

- Evaluate the degree to which information coming from net groundwater usage measurement is satisfying state and federal water management information needs. Re-evaluate the need for additional gross groundwater extraction data.

Key Questions:

- Are the preliminary incremental cost estimates accurate?

III.A. Reporting by urban water purveyor to State of California

Main action: Water purveyors to report specified information annually to State of California.

Status:

- Much/all of the specified information is already required to be reported by UWMPA, CVPIA, CUWCC MOU, DHS.
- Key problem is one of compliance. Many purveyors are not providing the information, are providing partial information, are providing erroneous information, or not providing information in a format that is understandable and comparable by the state.
- Expected level of effort: small for purveyors already reporting correctly; small to large for those purveyors that have not been providing satisfactory information.
- Current assurance mechanisms: voluntary. Access to loans/grants is dependent upon satisfactory reporting.
- Expected impact for state/federal water management and planning: large in terms of improving the quality of information.

Main options: voluntary versus a mandated system.

Actors:

- Lead/responsible actor: Urban water purveyors
- Key implementation partners: DWR

Funding:

- State will provide funding for technical assistance.
- State will provide funding for assurance function.
- State will provide funding for QA/QC of reported information.

Timeline:

- Water purveyors have xx years to implement this action.

Assurances:

- External assurances are needed.
- Access to incentives (e.g., grants and loans) would be tied to compliance.
- State will perform spot auditing to ensure compliance.

Institutional vehicle:

Institutional option 1 (preferred)

- Legislative: not needed. Rely on existing statutory reporting requirements: e.g., UWMPA, Water Code Section 226, subsection C (“DWR ‘may’ collect records of diversion and use of water”).
- Administrative: need regulation through the DWR dictating the information needed.
- Budget requirements: sustained funding for technical assistance.

Institutional option 2

- Legislative: will be needed.
- Administrative: need regulation through the DWR dictating the information needed.
- Budget requirements: sustained funding for technical assistance.

Technical assistance:

- Technical assistance provision will be needed. Could utilize existing DWR, USBR, or CUWCC technical assistance mechanisms.

Exceptions:

- Drawing on the Urban Water Management Planning Act as a model, exemptions include urban water purveyors providing water for municipal purposes either directly or indirectly to less than 3,000 customers or supplying less than 3,000 acre-feet of water annually.

Adaptive management:

- Need to revisit the program after 5 years to evaluate compliance and the quality of the information being received.

Key Questions:

- Do existing statutes require annual reporting?
- Is new legislation needed?
- Would DWR and USBR need to revise UWMPA and CVPIA?
- Will DWR be willing to use its authority under Water Code Section 226, subsection C: “DWR ‘may’ collect records of diversion and use of water.”
- What is an appropriate timeline for implementation?

III.B. Reporting by urban wastewater discharger to State of California

Main action: Wastewater dischargers to report specified information annually to State of California

Status:

- All of the specified information is already required to be reported by CWA and WDR permits.
- EPA is developing a database to facilitate reporting by wastewater dischargers
- Expected level of effort: small for purveyors already reporting correctly; small to large for those purveyors that have not been providing satisfactory information.
- Expected impact: large in terms of the state having higher quality information.

Actors:

- Lead/responsible actor: Urban wastewater dischargers
- Key implementation partners: EPA, SWRCB

Funding:

- EPA is currently funding the creation of a wastewater discharge reporting system for CA. No new funding would be required.

Timeline:

- The new EPA reporting system is due to be completed in 2004-2005.

Assurances:

- It is assumed that all assurances will be taken care of by the EPA system [To be determined via consultation with EPA/SWRCB].

Institutional vehicles:

- Legislation: none.
- Administrative: EPA/SWRCB would issue guidelines for using the reporting system.
- Budget requirement: none.

Technical assistance:

- It is assumed that all technical assistance needs will be captured by the EPA system [To be determined via consultation with EPA/SWRCB].

Exemptions/exceptions:

- [Thresholds to be determined via consultation with EPA/SWRCB]

Adaptive management:

- Need to revisit the program after 5 years or so to evaluate compliance and the quality of the information being received.

Key Questions:

- Does deference to the new EPA system meet appropriate measurement needs as defined?
- What are the assurances, technical assistance, and exemption provisions of the new EPA system?

IV.A. Urban water use research program

Main action: State agencies to work with water purveyors, and research institutes/universities to develop and sustain an urban water research program. Urban water research program to make available the resulting data/information to water purveyors, state agencies, research institutes/universities, and the public.

Status:

- Research is currently being performed by many different governmental agencies, purveyors, and research institutions but not in a coordinated or sustained fashion.
- Expected level of effort: relatively large. Will require coordination among many actors and the naming of a lead organization. Will require significant funding.
- Significant research programs already exist to build upon.
- Expected impact: large over the long term.

Actors:

- Lead/responsible actors:
 - California Bay-Delta Authority Science Board to develop and carry out prioritization and review of urban water use research program.
 - DWR to take lead on ag/urban issues
 - SWRCB to take lead on recycling issues
- Key implementation partners: water purveyors, USBR, CPUC, DHS, CUWCC, Researchers, urban end users, public interest/environmental groups

Funding:

- State to take lead in providing and assuring funding. State to pursue cost sharing as possible.
- Expected costs are to be determined.

Timeline:

- Research program in place by 200x.

Assurances:

Institutional vehicle:

- Legislation: none required.
- Administrative: An administrative initiative will require reporting back to the legislature on the research results per funding invested.
- Budget requirements: budget funding will be required.

Technical assistance:

Exemptions/exceptions:

Adaptive management:

- Review system after 5 years to evaluate effectiveness of coordination structure and cost-effectiveness of research findings.

Key Questions:

- What level of funding is needed to sustain a research program?
- What is anticipated timeline?

IV.B. Adaptive Management Program

Main action: State agencies to identify and pursue adaptive management needs for measurement as appropriate over time.

In general, a framework for adaptive management can be thought of as a cycle consisting of six steps:

1. *Problem assessment*, including identification of objectives, proposed actions, hypotheses about relationships and forecasts about outcomes based on those hypotheses, and identification of knowledge gaps;
2. *Design of a plan and monitoring program* that will provide reliable feedback about the effectiveness of the chosen actions;
3. *Implementation of the plan and program*;
4. *Monitoring of indicators* to determine action effectiveness and to test the hypotheses that formed the basis for the forecasts;
5. *Evaluation of actual outcomes compared with forecast outcomes*; and
6. *Adjustment of objectives, actions, and hypotheses to reflect new understanding*, leading to a renewed cycle commencing again with problem assessment.

Likely topics for evaluation include (note that this is not intended to be a comprehensive list):

- Efficacy and accuracy of new system for recording/reporting/disseminating data
- Quality and completeness of urban source, delivery, and discharge water data being reported
- Degree to which water quality information is being effectively measured and reported.
- Quality of information regarding urban self-supplied groundwater use
- Effectiveness of research coordination program and cost-effectiveness of research findings

Status:

- California is experiencing a historical transition from an era characterized primarily by water resource development to an era characterized primarily by water resource management. Significant future population growth is anticipated for California, and demand for water is therefore also anticipated to increase. Future improvements in water measurement technology are anticipated.
- Pursuant to the direction provided in the CALFED Record of Decision, the CBDA is carrying out the first round of *problem assessment* and *design*, as described above. The Authority is doing so using a structured program of outreach to a wide variety of governmental and other stakeholders.
- The State Water Plan has an adaptive management function embedded within its five year review and update cycle.
- Expected level of effort: small. This action is subsumed by ongoing CBDA Science Program and State Water Planning efforts.
- Expected impact: depends on the degree to which changes to the system are necessary. term.

Actors:

- Lead/responsible actors: CBDA Science Board
- Key implementation partners: DWR and all persons/entities whom DWR must consult in preparation of State Water Plan.

Funding:

- Funding will be covered by a CBDA Science Program and/or State Water Plan funding.

Timeline:

- The adaptive management action will take place regularly on the same cycle as the State Water Plan process (i.e., 5-year cycle), with reviews of measurement needs probably preceding finalization of the Plan by two or three years.

Assurances:

Institutional vehicle:

- Legislation: none required.
- Administrative: none.
- Budget requirements: To be included as part of the CBDA Science Program and/or State Water Plan processes.

Technical assistance:

Exemptions/exceptions:

Adaptive management:

Key Questions:

- What is the entire list of things that will need to be evaluated?