

**Commercial, Industrial, Institutional (CII) Task Force (TF)**  
**Final Report to the Legislature**  
**Draft Outline**  
**October 5, 2011**

Note: This outline is generally representative of the areas to be covered in the final report. However, individual items are subject to change, deletion, and amplification, depending upon the outcome of the research work to be undertaken and decisions of the CII TF. As such, there is no assurance that all of the items listed will result in BMPs or discussion within the report.

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**II. Executive Summary**

**III. Introduction**

- A. Defining Commercial, Industrial, and Institutional Water Use**
  - 1. Defining the terms**
  - 2. Determining customer types**
- B. How water efficiency benefits the community**
  - 1. Sustainability policies**
  - 2. More economy on the same capacity**
  - 3. Wastewater discharge limits**
  - 4. Energy use reductions**
  - 5. Cost reductions**
  - 6. Business retention**
  - 7. Risk management**
- C. Getting Started**
  - 1. Looking at water use and true costs in a CII application**
  - 2. Establishment of a conservation ethic and program within your CII organization**
  - 3. Codes, standards, (State) executive orders, and water use 'green' guidelines**
- D. Organization of this document and how to apply these Best Management Practices**

**IV. Appropriate Metrics**

NOTE: this topic will be discussed within each of the BMPs listed in the following section, but will be described generally here.

**V. Evaluation of Water Demand**

NOTE: this topic will be discussed within each of the BMPs listed in the following section, but will be described generally here.

## VI. Technical Feasibility and Cost and Benefits of BMPs

NOTE: this topic will be discussed within each of the BMPs listed in the following section, but will be described generally here.

- A. **Technical feasibility**
- B. **Water Costs from the Business or Industry Perspective**
  - 1. **The true cost of water**
  - 2. **Cost to the CII sector**
- C. **Evaluating costs from a utility and societal basis**
  - 1. **Increasing cost to utilities**
  - 2. **More economy on the same dollar**
  - 3. **The water-energy connection**
  - 4. **life cycle analysis**
- D. **Approximate savings statewide**

## VII. BMPs and Water Use Efficiency Assessment

- A. **Overall discussion of commercial and institutional sectors**
- B. **Commercial and Institutional BMPs**
  - 1. **Commercial Food Service-Related Operations and Equipment**

**Market dynamics and impact -- Over 121,000 food service facilities in California including restaurants, school cafeterias, military mess halls, hospital food service establishments and similar food service facilities. California Restaurant Association estimates the restaurants alone employ over 1.43 million people or about 10 percent of employed people in the state.**

    - a) ***How water is used (graphic, etc.)***
      - (1) Refrigeration and defrosting
        - (a) *Refrigeration equipment cooled with pass-through water*
        - (b) *Refrigeration capacity sufficient to minimize thawing in sink*
        - (c) *Other refrigeration equipment*
        - (d) *Ice makers*
      - (2) Food preparation
        - (a) *Steam tables*
        - (b) *Steam kettles*
        - (c) *Steamers*
        - (d) *Woks*
      - (3) Scullery operations
        - (a) *Garbage disposer*
        - (b) *Scrap basket or other strainer in place of disposer*
        - (c) *Pulper*
        - (d) *Sluice trough with fresh water feed*
        - (e) *Sluice trough with recycle*
      - (4) Dishwashing
        - (a) *Pre-rinse spray valve*

- (b) *Warewasher (dishes, pots and pans, sheet pans, utensils, etc.)*
  - (c) *Three-compartment sink*
  - (d) *Power soaker*
- (5) Hood Washer Systems
- (6) Common metrics for sector
- (7) Technology chapters to refer to (matrix)
- (8) BMPs
- 2. **Offices**
  - a) *Water Use*
  - b) *BMPs*
- 3. **Fabric Cleaning and Washing Equipment and Technologies**
  - a) *Coin-operated laundry equipment*
  - b) *On-premise laundry equipment (high-volume washers)*
  - c) *Industrial laundry equipment*
  - d) *Water recycle and reuse*
  - e) *Dry cleaning equipment*
  - f) *Wet cleaning*
  - g) *BMPs*
- 4. **Schools and educational facilities**
  - a) *Water Use*
  - b) *BMPs*
- 5. **Prisons**
  - a) *Water Use*
  - b) *BMPs*
- 6. **Medical and Laboratory Equipment & Processes**
  - a) *Hospitals*
  - b) *Medical clinics and outpatient services*
  - c) *Dental offices*
  - d) *Water Uses*
    - (1) Equipment cooling
    - (2) Sterilization processes
    - (3) X-Ray film processing
    - (4) Vacuum pumps
    - (5) Compressors
    - (6) Other equipment
- 7. **Retail, grocery stores, and food markets**
- 8. **Entertainment and recreation**
  - a) *Water Use*
  - b) *BMPs*
- 9. **Auto and truck**
  - a) *Vehicle Washing Equipment*
    - (1) Spray wand and foamy brush systems
    - (2) Roll-over systems
    - (3) Tunnel or conveyor systems
    - (4) Water recycle and reuse potential

- (5) Wastewater considerations
- b) Vehicle repair and fuel*
- C. Industrial BMPs**
  - 1. Overall discussion of industrial sectors**
  - 2. Industry-specific information**
    - a) Aerospace and Metal Plating and Processing*
    - b) Food and Beverage Industry*
    - c) Microelectronics*
    - d) Petroleum refining and Chemicals*
    - e) Pharmaceutical*
    - f) Power Plants*
    - g) How water is used by the selected sectors*
    - h) Description of industry-specific BMP's*
    - i) Reference to technology section for common water using technologies (boilers, cooling tower, water treatment, etc.)*
    - j) Summary of BMP's and recommendations*
- D. Commercial, Institutional, and Industrial BMPs**
  - 1. General Building Sanitary and Safety Applications (cleaning, health, and safety)**
    - a) Toilets*
    - b) Urinals*
    - c) Showers and baths*
    - d) Floor drain trap primers*
    - e) Indoor faucets and valves*
    - f) Janitorial (mop) sinks*
    - g) Kitchen sinks*
    - h) Food service sinks*
    - i) Hand washing lavatories*
    - j) Water heater temperature pressure relief valves (TPRV's)*
    - k) Emergency shut off valves*
    - l) Outdoor faucets and valves*
    - m) Outdoor cleaning*
    - n) Equipment cleaning*
    - o) Pumps*
    - p) Backflow preventers*
    - q) Other plumbing, sanitary, and health and safety considerations*
  - 2. Building Systems - Thermodynamic Processes**
    - a) Cooling Towers*
      - (1)** Instrumentation and metering
      - (2)** Cycles of concentration
      - (3)** Drift eliminators
      - (4)** Condensate collection
      - (5)** Other considerations
    - b) Boilers*
      - (1)** Instrumentation and metering

- (2) Steam traps and condensate collection
- (3) Other considerations
- c) **Energy efficiency impacts on water use**
- 3. **Water Treatment Processes**
  - a) **Equipment and technologies selection**
  - b) **Filtration (non-membrane technologies)**
  - c) **Ion exchange**
  - d) **Membrane technologies**
  - e) **Distillation**
  - f) **Disinfection technologies**
  - g) **Reuse of reject streams**
- 4. **Commercial Landscape**
  - a) **Consider alternative water resources**
    - (1) Rainwater harvesting (cisterns, catchment basins)
    - (2) Cooling tower blowdown, reverse osmosis reject
    - (3) Graywater
    - (4) Stormwater Retention
  - b) **Design**
    - (1) Landscape design
      - (a) *Site inspection (overhead & underground lines)*
      - (b) *Appropriate plant material*
      - (c) *Hydrozones*
      - (d) *Micro-climates*
    - (2) Soil management and grading
    - (3) Irrigation system design
  - c) **Installation**
    - (1) Installation oversight per approved plans
    - (2) Plant installation
    - (3) Irrigation system installation
    - (4) As-built check list
  - d) **Management**
    - (1) Landscape budgets
    - (2) Landscape audits
    - (3) Irrigation scheduling
    - (4) Communication (between site staff and management)
  - e) **Maintenance**
    - (1) Maintenance schedule
    - (2) Mulching
    - (3) Weeding and pruning
    - (4) Backflow prevention device
    - (5) Leak repair
    - (6) Water pressure
    - (7) Emergency water shutoff plans
    - (8) Communication plan (between site staff & management)
  - f) **Record Keeping**

- (1) As-built plans
- g) *Alternative BMPs***
  - (1) Artificial turf
  - (2) Subsurface irrigation
  - (3) Estimate of CII landscape water savings and cost
- 5. Building Meters, Submeters, and Management Systems**
  - a) *Metering criteria***
  - b) *Meter selection considerations***
  - c) *Building management systems for energy and water***
- 6. Alternate Water Sources**
  - a) *Examples of possible sources***
    - (1) Rainwater and stormwater
    - (2) Air conditioner condensate
    - (3) Boiler steam condensate
    - (4) Filter and membrane reject water recovery
    - (5) Foundation drain water
    - (6) Cooling tower blowdown
    - (7) Municipally reclaimed/recycled water
  - b) *Source design and evaluation considerations***
    - (1) Water quality and standards
    - (2) Fit for purpose – water quality matched to use
    - (3) Treatment systems

**VIII. Standards for Water Use Efficiency**

- A. Existing water use efficiency standards**
- B. Federal Standards/Executive Order**

**IX. Issues Associated with CII Water Use Efficiency Measures**

- A. Water quality in different industrial processes**
- B. Health requirements**
- C. Effluent quality**
- D. Economic ramifications of conservation**

**X. Public Infrastructure Needs for Recycled Water**

- A. Infrastructure (needs, public,)**
  - 1. Needs identified by the Water Recycling Task Force**
    - a) *History of infrastructure from 1890 to current***
    - b) *State-wide capital costs – Estimated to 2030 range of \$9.2 to \$11 billion and O&M average \$300 per AF***
    - c) *Funding for projects top recommendation of TF***
  - 2. 2009 State Water Plan**
    - a) *Range of capital and O&M costs \$300 – \$1,300***
    - b) *Discussion of “purple pipe” costs and other issues***

- B. Status of reuse in California**
  - 1. Water Recycling Task Force findings**
    - a) Use at time of TF (ranged 450-580 TAF)*
    - b) Types of use and percentages of each type*
      - (1) Objectives for use of recycled water (4 major and 4 secondary)
  - 2. 2009 State Water Plan B-160**
    - a) Types of use updated*
    - b) Projections for use to 2030 1.85 - 2.25 MAF*
    - c) New issues identified (climate change & potable)*
    - d) Identified barriers and status of TF recommendations*
    - e) Included four new recommendations to increase reuse*
  - 3. 2009 SWRCB Recycling Survey**
    - a) Estimate of current use 750 TAF*
      - (1) Current assessment of use types and amounts to be maintained in future
- C. Estimate of total municipal effluent volumes that may be reused**
  - 1. Water Recycling Task Force findings**
    - a) Bay Area and Southern California Studies*
    - b) Estimated 5 million AF of treated wastewater available*
    - c) 500 TAF, or 10%, reused*
      - (1) By 2030 projected to be 6.5 million AF of wastewater – 1.5 million AF reused
  - 2. SWRCB Recycling Survey estimate is 750 TAF reused**
- D. General infrastructure requirements (describe what a utility needs to do to make recycled water available, including several case studies)**
  - 1. Treatment key - List levels and describe (from TF report)**
  - 2. Infrastructure needs by element in non-potable process**
    - a) Treatment facilities up to and including tertiary*
    - b) Distribution system, pumping, storage, backflow and cross connection devices, and metering*
    - c) Ongoing maintenance needs*
  - 3. Infrastructure needs for potable reuse**
    - a) Treatment facilities beyond tertiary*
    - b) Conveyance system and groundwater recharge, surface water mixing, or direct potable mixing facilities*

**XI. Evaluation of Institutional and Economic Barriers to Recycled Water Use**

**A. Terminology barriers**

- 1. Provide project examples and case studies of problems**
- 2. Potential solutions and case study examples where terminology issues have been overcome**

**B. Data barriers**

- 1. Provide examples where lack of data has caused problems**
- 2. Provide solutions and case studies**

- C. Awareness barriers
  - 1. Provide examples and case studies
  - 2. Potential solutions and case studies
- D. Acceptance barriers
  - 1. Provide examples of problems and case studies
  - 2. Provide solutions and case studies
- E. Regulatory barriers
  - 1. Provide examples of problems and case studies
  - 2. Provide solutions and case studies
- F. Water Quality barriers
  - 1. Provide examples of problems and case studies
  - 2. Provide solutions and case studies
- G. Infrastructure barriers
  - 1. Provide examples of problems and case studies
  - 2. Provide solutions and case studies
- H. Water Supply reliability barriers
  - 1. Provide examples of problems and case studies
  - 2. Provide solutions and case studies
- I. Institutional barriers
  - 1. Provide examples of problems and case studies
  - 2. Provide solutions and case studies
- J. Pricing
  - 1. Provide examples of problems and case studies
  - 2. Provide solutions and case studies
- K. Suggested industries that can use recycled water
  - 1. Non-potable - assuming supply available
    - a) *Landscape irrigation (all CII)*
    - b) *Cooling towers (most CII)*
    - c) *Toilet and urinal flushing (most CII)*
    - d) *Fire protection (all CII)*
    - e) *Commercial car washes (commercial and institutional)*
    - f) *Commercial laundries (commercial and institutional)*
    - g) *Artificial snow making*
    - h) *Soil compaction, concrete mixing and other construction related*
    - i) *Process water (industrial)*
  - 2. Potable - appropriate for all uses

## **XII. Appendices**