Imperial IRWMP Project Scoping and Review of CDWR Resources Management Strategies

Reduce Water Demand – Energy Water Use Efficiency Findings

Draft February 3, 2010

- Demand Work Group
    - December 12, 2010. Reviewed state Requirements for cooling water, discussed findings and recommendations from Draft IID Plan and management strategies and concepts.
    - January 19, 2011. Additional briefing, review and discuss findings and recommendations
    - Jan 20, 2011. Meet with energy stakeholder/interest group
- To Forum: February 17, 2011

Edited: Date

Accepted: Date

1.1 Findings

The findings and recommendations from the *Draft IID Plan* related to renewable energy production (Chapter 7 – Demand Management) and related policies (Chapter 9- Policy Alternatives) were provided to the Water Forum and Demand Management Work Group for discussion. Findings and recommendations have been updated in light of the new information in the Renewable Energy Action Team Report (REAT Report)[1] Water Forum input.

1.1.1 *Impacts and Mitigations*

- Renewable Energy projects that result in intensification of water use could have a negative effect on agricultural water supplies unless mitigated, since MCI demands are granted a higher reliability by IID and are less subject to cut back in response to overruns or shortages on the Colorado River as a result of drought or climate change.
- Overruns and supply/demand imbalances require agriculture to implement extraordinary conservation measures including fallowing. Increased MCI use could increase the frequency or amount of land to be fallowed under SDI.

1.1.2 *Best Management Practices for power plant cooling*

- State policy supports use of dry or hybrid cooling to conserve water in desert environmental
- Dry cooling has technical limits and is not cost-effective in the Imperial Region.
- Hybrid cooling may be cost-effective as compared to the cost for developing new supplies for the Imperial Region.
- Hybrid cooling should be required to conserve water if Colorado River water is used.
- The feasibility of changing wet cooled plants to dry cooled plants would be cost prohibitive for the remaining life of the plant, unless major changes are already planned or could be required under existing contracts for water.

1.1.3 *Economics*

- The price per MW of generating capacity is not very sensitive to the price of water.
- Developers should be required to demonstrate water treatment, cooling technology is not economically viable when compared to recycled or other sources when proposing to use IID Colorado River supplies.
- There are economic benefits of renewable energy.

1.1.4 *BMPs for Water Sources for Cooling*

- The critical factor is the water quality. The higher the incoming water quality, the more cooling cycles can occur, resulting both in less use and reduced wastewater discharge.

[1] REAT includes CDWR, California Energy Commission, California Department of Fish and Game (CDFG), U.S. Department of Interior Bureau of Land Management (BLM), and Fish and Wildlife Service (USFWS). REAT-1000-2010-009 1. http://www.drecp.org/documents/index.html#drecp

- Use of recycled municipal water or desalinated brackish water for cooling in lieu of Colorado River water would mitigate for potential impacts to current users and agricultural water supplies, and would demonstrate reasonable beneficial use of Colorado River entitlements.
- Groundwater banking and storage of Colorado River water would provide a supply for renewable energy water requirements and could serve to mitigate impacts to existing supplies.
- Use of recycled municipal or desalinated brackish water for cooling purposes would provide multiple regional benefits; and projects, programs and policies should be further developed through the IRWMP process.
- Projects that seek to utilize and develop recycled municipal or desalinated brackish water sources in-lieu of Colorado River supplies should receive priority for grant funding.
- Requiring use of recycled municipal water sources for cooling would support local communities in meeting water quality requirements.
- Recycled municipal or desalinated brackish water is cost-effective when compared to the price of fallowing land and mitigation of any third party impacts to agriculture; and is a viable water source for cooling purposes in-lieu of Colorado River water.

1.2 Recommendations

1. Develop an integrated Energy Water Use Efficiency, Water Supply, Land Use/Water Supply strategies as part of the IRWMP to address renewable energy water needs, promote economic development and ensure mitigation of environmental impacts and third party effects.

2. IID, Imperial County and Imperial Cities need to work together during project reviews to ensure that direct, indirect, and cumulative impacts of individual projects on agriculture; agricultural water supplies; reduction of return flows to IID drains, the Alamo and/or New rivers; and/or impacts to IID facilities are adequately evaluated. Define appropriate levels of mitigation for implementation and include in permit conditions and approval by Imperial County or Imperial Cities.

3. The IRWMP should support definition of the most cost-effective approach to developing new water supplies or apportioning existing supplies (without impacts to agriculture) that can be provided to geothermal and other renewable energy projects for cooling in lieu.

4. IID and the County should develop local policies and standards for BMPs for the renewable energy industry that are consistent with the Renewable Energy Action Team Report (REAT Report) for renewable energy related to sources of water for cooling and the technologies to reduce cooling water demands.

5. IID, Imperil County and the Imperial Cities should develop a consistent review process for coordinating the land use permitting and water supply assessment process.

6. IID and Imperial County should consider how to use the IRWMP to meet state requirements for a regional water supply assessment and to support streamlining the project review process.

7. Use the IRWMP to define water supplies, water costs, and charges for funding capital projects to produce new supplies, or other IID programs (e.g.; MCI Water Exchange) that would mitigate impacts and ensure that a firm and verifiable supply is available.

Attachment 1 – REAT BMPs for Desert Renewable Energy Projects

The BMP Guidelines in the REAT Report are listed below. These need to be adapted to the Imperial Region.

1. Given scarce water resources in the desert region use of dry cooling technologies for power plant cooling is encouraged and preferred. To the extent that water is proposed for power plant cooling, conduct an analysis to demonstrate that alternative water supply sources and alternative cooling technologies are environmentally undesirable or economically unsound. It is recommended the analysis identify land-use, electricity efficiency, and other tradeoffs associated with the proposed cooling technology[2]. Developers are advised that agencies may condition such project permits/authorizations with water conservation offset mitigation measures.
2. If recycled water is proposed, provide a "will serve" letter from the water supplier and an approved agreement, a "will serve" letter and approved agreement to return the wastewater stream, and/or provide a plan for a zero liquid discharge (ZLD) system. If the water supply or waste water treatment services are to be supplied by a special district and the proposed project is to be located outside the service boundaries of the district, the Local Agency Formation Commission (LAFCo) will need to approve the project annexation to the district, or approve an "out of service area" contract to provide the services requested. If the supplier of water is a private water company, similar approvals will be required from the CPUC.
3. For any planned water use, identify the water sources, legal entitlements, water rights, adequacy of capacity to serve project demands while maintaining aquatic and riparian resources, quantity of water used for project construction and operational needs, and water discharges, including but not limited to construction, systems testing, process and cooling needs, and mirror washing.
4. Identify wastewater treatment and pre-treatment measures and new or expanded facilities, if any, to be included as part of the facility's NPDES permit, if such a permit is needed.
5. Where use of recycled water is proposed, submit permit applications to the California Department of Public Health and RWQCB. Include the applications with applications to appropriate lead agencies.
6. If use of groundwater is proposed for industrial purposes, ensure a comprehensive analysis of the groundwater basin is provided and the following potential significant impacts are thoroughly evaluated. Address, as applicable, uses that would:
    a) Exacerbate or create overdraft conditions.
    b) Cause drawdown in adjacent wells.
    c) Cause changes in water quality and affects other beneficial use.
    d) Affect groundwater basins in adjacent areas and states.
    e) Affect other environmental resources such as springs providing water for plants and wildlife.

    Include adequate mitigation for potential impacts and analyze alternative water sources and technologies. Project developers are advised that planned use of groundwater in the portion of

[2] See REAT Report Appendix B, Solar and Geothermal, for detailed discussions on such tradeoffs.

the California desert region located in the Colorado River Basin may be restricted and approvals to use such water may be difficult to obtain.

7. Where a groundwater well is proposed to be drilled or used, submit a permit application to the appropriate local jurisdiction. Include the application with applications to appropriate lead agencies and provide the following information:

    a) The legal description (township, range, section, and quarter section) of each proposed well to be used for the project, the anticipated pumped capacity of each well in gallons per minute, and the total withdrawal in acre-ft/year. Include the peak pumping rates anticipated during the project. Locate the planned well sites (within the area under application) on a suitable map.

    b) For wells, identify the aquifer, the aquifer's hydrogeologic characteristics, and its targeted production zone.

    c) Identify known surface water resources (springs or streams) that may be affected by the proposed pumping, due to a hydraulic connection between surface and ground water.

    d) The potential cone of depression that might be caused by the proposed pumping. This could be done by use of an analytical model (for example, a well field simulation program such as THWELLS or by use of a numerical model such as MODFLOW). Also, identify the cone of depression's predicted extent and magnitude (in feet of water level drawdown) after 10, 20, and 50 years of operation and/or for the expected life of the project. Discuss the maximum drawdown expected during the life of the project.

    e) Alternative ways to meet project water requirements that would reduce water requirements. For example, use of dry cooling technology, or use of several concentration cycles for cooling water.

    f) Plans for monitoring ground water conditions during the life of the project, such as the use of nearby wells to monitor water levels. Start monitoring early in the permitting process; expect to provide agencies with a minimum of one year of data before groundwater is withdrawn for the project. Confer with the appropriate local jurisdiction and/or lead agency when developing details.

8. If use of surface water is proposed for industrial purposes, ensure a comprehensive supply analysis is provided and the following potential significant impacts are evaluated and issues are addressed:

    a) Potential impacts to other users or adjacent states.

    b) Potential use that impacts water quality.

    c) Potential use that impacts other water resources.

    d) Potential use that impacts environmental resources, including protected wildlife and fishes.

    e) Reliability of the water supply proposed for project use.

    f) Alternative water sources and technologies.

    g) Mitigation for water use impacts.

9. Where use of surface water is proposed for industrial purposes, provide a "will serve" and/or an approved water service agreement/water supply contract with applications to appropriate federal, state, and/or local lead agencies. This may include LAFCo or CPUC approvals, as discussed above.