

**Pollution Prevention Plan
For
Mountain Water Ice Company
2843 Benet Road
Oceanside, San Diego County, California
Permit R9-2005-0015**

11 March 2009

Description of the Facility:

Mountain Water Ice Company is owned by Arctic Glacier California, Inc. and operates a packaged-ice facility at 2843 Benet Road, Oceanside, San Diego County, California. The Mountain Water Ice facility is served by a 4-inch water main from the City of Oceanside (www.ci.oceanside.ca.us) Public Utilities department.

Water is fed (without pretreatment) into one of eight (8) Turbo stand-alone ice machines. Each machine has four processing areas which consist of single sided-ice freezing surfaces and a processing sump. Water flows across the refrigerated surface and ice buildup occurs (approximately 22 minutes). Once ice has been built, a cycle (lasting 1.75 minutes) begins, which sends warm water at approximately 50 gallons per minute along the back side of the freezing plates, along with hot refrigeration gas.

During this process (known as harvesting) the sump fills to overflowing and water is drained from the process into a central sump located below the ice machines. Water from the sump is then sent directly to the facility's evaporative condensers. The feed to the evaporative condensers is continuous and immediate; all of the overflow from this system is routed to the discharge pipe for the facility's NPDES outfall.

The facility has experienced high levels of Total Dissolved Solids (TDS) and water flow in the past and has developed this pollution prevention plan to discuss the potential alternatives for reducing TDS and the flow of effluent from the facility. This plan has been prepared in accordance with the requirements of the California Water Code (CWC) § 13263.3(d)(2).

Analysis of Pollutants

As a beverage ice facility, Mountain Water Ice discharges only those components found in the influent water received from the City of Oceanside. No pollutants are introduced into the process. As authorized by its NPDES Permit the facility does not treat its wastewater. The process of manufacturing beverage ice from a moving flow of water (continuous freezing rather than block ice) has the result of concentrating dissolved minerals in the water source. As a result, the ice making process concentrates TDS in the discharge water. Increasingly high levels of TDS and other constituents (Bromoform, chlorine, pH) in the intake water from the City of Oceanside has resulted in the facility's inability to meet its permit limits.

During times of increased production in the summer months, where additional water is used to harvest the ice and the equipment runs longer hours, the facility also discharges a large volume of water.

Water from the ice making process flows to the evaporative condensers, where the evaporation of water for cooling will also increase the levels of TDS (TDS remains behind when water vapor is released).

Pollution Prevention Potential

The facility has three identified opportunities to reduce the TDS levels and discharge flow volume:

1. Diversion of the entire stream of effluent to a secondary user: A neighboring facility has indicated that it may be able, and would be willing to use the entire discharge of the Mountain Water Ice facility wastewater, with the exception of that used for cooling tower makeup water. This diversion would prevent pollution by eliminating the entire stream. This option is technically feasible, but requires that the parties reach an agreement on the supply of the water, including the cost of installation of water transfer equipment/structure. The facility's discharge to the San Luis Rey River would be eliminated under this scenario.
2. Installation of a reverse osmosis (RO) unit to reduce the TDS levels of the discharge. It is possible to restore, lease or purchase a RO unit to treat discharge water to both reduce the overall volume of water discharged (through operational changes) and to meet the required TDS levels for NPDES discharge. This option is technically feasible. It would lead to a continued discharge of water to the receiving body. This option would involve taking the wastewater to the river after running it through the RO system. This option will be weighed against option 3 which would eliminate the facility discharge.
3. Installation of a reverse osmosis (RO) to recycle all water in the facility. In this scenario, all water generated in the facility will be RO purified and recycled through the facility. Only the "reject" water from the RO (concentrated TDS levels) will be discharged to the City of Oceanside Wastewater System. This methodology is technically feasible and it would eliminate entirely the discharge from the facility. This scenario would require an agreement with the City of Oceanside for the discharge of the reject water to the City's sewer.

Tasks and Time Schedules

As discussed below, the Mountain Water Ice facility will analyze the various options and select, develop and implement an option to address the potential to eliminate or control the discharge of constituents to the receiving water. During the development of these options, Mountain Water Ice will monitor and control flow volume at or below permitted levels through operational controls and/or process limitation. These pollution prevention options will be developed according to the following schedule:

Task 1: Feasibility Study: Mountain Water Ice is currently in the process of completing a feasibility study for all three of the options above. If Option 1 is chosen, time will be required

for negotiation as well as for the design and installation of the water transfer system. Options 2 and 3, will require time for design and eventual installation.

Task 2: Design Phase: Mountain Water Ice will need to modify the flows at the facility to accommodate any of the three options. Once the feasibility study is complete and an option selected Mountain Ice will enlist an engineer to design the system modifications. It is estimated that the design phase will take between 4-6 weeks.

Task 3: Permitting: Discharge to the City of Oceanside will require approval from the City sewer authority. This process will be conducted in conjunction with Task 2, but may require an additional 4-6 weeks for plan review following the completion of design.

Task 4: Construction/Installation: The completion of the chosen option will require approximately 8 weeks, including the acquisition of building permits from the City.

Allowing for contingencies it is estimated that the time needed for the new system to be operational would be 20-26 weeks.

Pollution Prevention Goals and Strategies

Mountain Water Ice has established a goal of reducing TDS from its process effluent discharged to the San Luis Rey River to below 500 ppm. Mountain Water Ice will also reduce flow volume to below 85,000 gallons per day.

Pollution Prevention for the Immediate Future

Mountain Water ice will reduce flows to the permitted outfall by process optimization and conservation. Where possible, TDS levels will be reduced. TDS levels are caused by increasingly high levels in the source water from the City of Oceanside.

Existing Pollution Prevention Methods

At the time of the plant shut-down in December, 2008, the Mountain Water ice facility had no designated pollution prevention activities.

Cross-Media Pollution Transfers

Mountain Water Ice's existing and planned pollution prevention strategies do not constitute cross-media pollution transfers. Should the facility choose any of the three options, some of all of the effluent from the facility will be discharged for treatment to the City of Oceanside POTW. The POTW will not be adversely affected.

Toxic Chemical Release Inventory Data

The Mountain Water Ice facility is not subject to the provisions of Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023).

Compliance with the Hazardous Waste Source Reduction and Management Review Act

Mountain Water Ice is not subject to the Hazardous Waste Source Reduction and Management Review Act of 1989 (Article 11.9 (commencing with Section 25244.12) of Chapter 6.5 of Division 20 of the Health and Safety Code)

Cost/Benefit Analysis

An analysis of the relative costs and benefits of the possible pollution prevention activities.

Mountain Water Ice is still developing cost estimates and is studying the feasibility of each. Based on current understanding the following is noted:

Option #1: Sending the all the waste water to the secondary user for reuse. Current cost estimate is approximately \$131,000, however alternative designs are being studied. There may also be some operation and maintenance costs and possibly fees related to water use and discharge by the secondary user to the City of Oceanside sewer system. The benefit of this approach is that it would eliminate the discharge to the receiving water and would eliminate the need to monitor. There would be no monetary return to Mountain Water Ice under this approach. Option #1 is subject to reaching agreement with the neighboring facility to allow the transfer of the wastewater to its facility for reuse.

Option #2 and #3: Installation of an RO system. Cost estimates for the purchase, lease or restoration of a used RO system and accompanying installation are still being developed. Rough estimates for the restoration of a used RO system are in the range of \$130,000 - \$150,000. This estimate includes purchasing new tanks and pumps, outsourcing the plumbing and electrical work and constructing a city sewer line with a flow meter. Mountain Water Ice has solicited bids for an entirely new system with both purchase and lease options. If Option #3 is selected (recycle all water within the facility) approximately 19,000,000 gallons of water per year currently being discharged would be eliminated or greatly reduced. Option #2 may also result in a reduction in the volume of water being discharged. Option #3 would result in some cost saving to Mountain Water Ice from the purchase of water. However, Mountain Water would have an increased city sewer charge and an increased electrical bill for running the RO system plus incremental maintenance expenses. Option #3 would completely eliminate the discharge to the San Luis Rey River. Other benefits would include conservation of the water resource through the recycling effort. Option #3 is subject to obtaining permission from the City of Oceanside to discharge RO reject water to the City sewer system.