

MEMORANDUM

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TO: UTILITIES ADVISORY COMMISSION

**FROM: UTILITIES DEPARTMENT
PUBLIC WORKS DEPARTMENT**

DATE: DECEMBER 2, 2009

**SUBJECT: RECOMMENDATION TO APPROVE RECYCLED WATER SALINITY
REDUCTION POLICY**

RECOMMENDATION

Staff recommends that the UAC recommend that Council approve the proposed Recycled Water Salinity Reduction Policy (Salinity Policy).

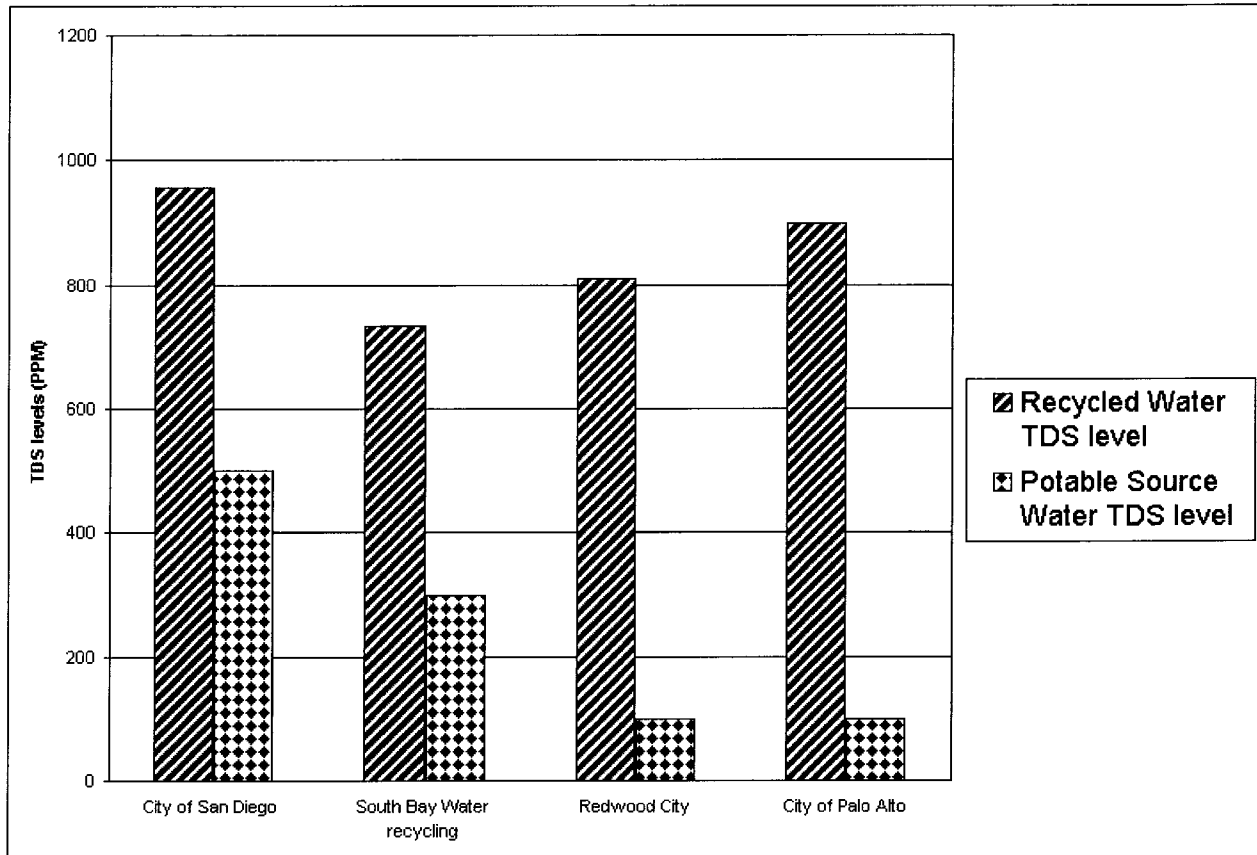
BACKGROUND

Recycling treated wastewater is increasing in the arid West as a response to the fact that populations are increasing and fresh water supplies are not. Palo Alto and other communities are using treated wastewater for landscape irrigation and that use is expected to grow dramatically in the future. Salts accumulate in water when it is used by people and industrial processes. To maximize the use of recycled water on the widest variety of green plants, the recycled water's salt content (salinity) needs to be minimized. The purpose of this policy is to ensure that the City is taking all practical steps to reduce salinity in recycled water.

DISCUSSION

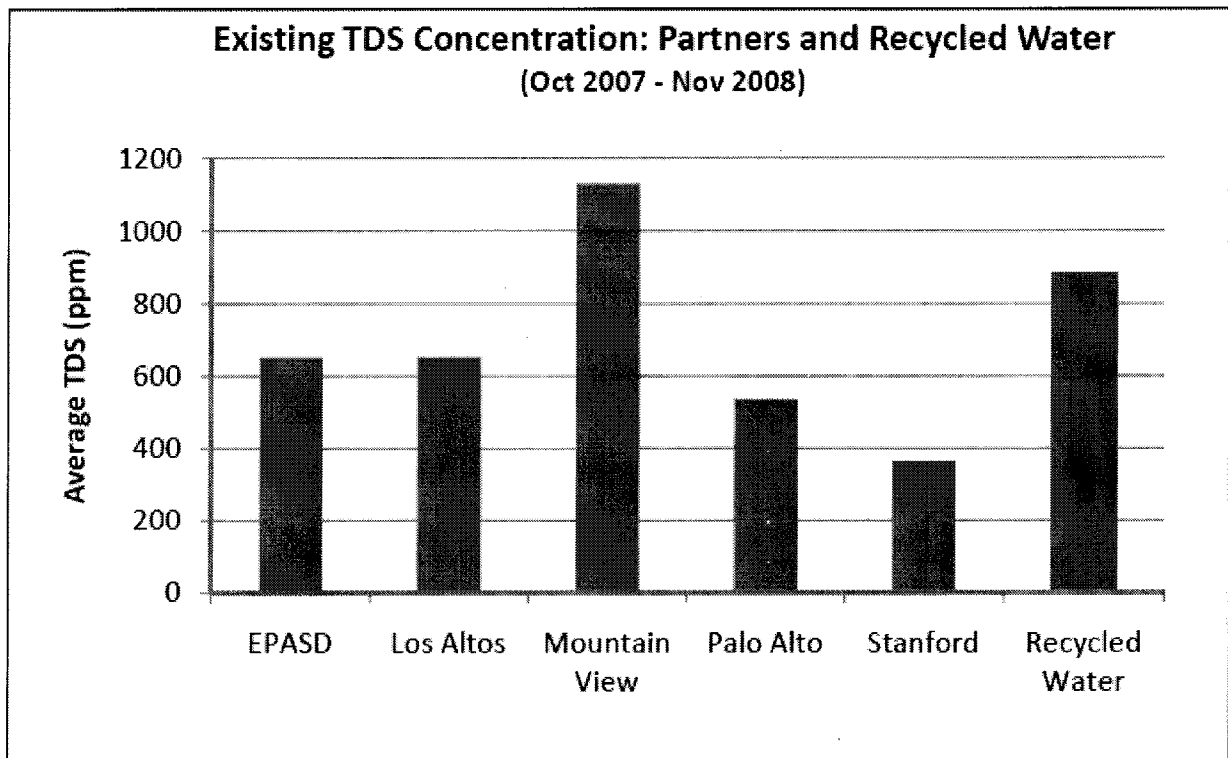
Total Dissolved Solids (TDS) is a common measure of the salinity in a water system. In general, the higher the TDS, the more soil, plant, and irrigation management will be required when using recycled water for landscape irrigation. The total amount of TDS in recycled water depends on a variety of factors, including, but not limited to, the TDS levels of the potable source water, the level of industrial/commercial inflow into the system, water softener use, and infiltration into the sewer collection system from highly saline areas. Throughout California, different recycled water retailers produce recycled water with a wide range of TDS levels (as shown in Chart I below). The City of San Diego produces recycled water with a TDS level approaching 1000 parts per million (PPM), compared to a potable source water level of approximately 500 PPM. In northern California, the South Bay Water Recycling system has a TDS level of 700-750 PPM, compared to a source water concentration of approximately 300 PPM.

Chart I: TDS level comparison in potable and recycled water supplies in California



The Regional Water Quality Control Plant (RWQCP) serves the cities of Palo Alto, Los Altos, and Mountain View, the East Palo Alto Sanitary District, the town of Los Altos Hills and Stanford University. The TDS levels in the recycled water from the RWQCP currently are in the 850 to 900 PPM range, however individual participants' influent contributions vary considerably. Considering the high quality of the potable water source for most of the RWQCP partners, the current TDS levels are higher than expected. There are several reasons for the elevated TDS levels, but the primary sources are saltwater discharges and infiltration into the wastewater collection system in the Baylands area where the groundwater salinity level is high. The RWQCP partner influent TDS levels are depicted in Chart II below and demonstrate the TDS variations between the different partners.

Chart II: RWQCP Partner TDS concentrations and Total Recycled Water TDS levels



Staff is recommending that a Recycled Water Salinity Reduction Policy be adopted to facilitate a focused effort to reduce TDS levels over time. The proposed Salinity Policy will provide a basis to implement activities to achieve those results. Based on the existing TDS levels and comparisons with other recycled water providers, it is apparent that there is an opportunity to further reduce the TDS levels of the recycled water from the RWQCP by working with individual RWQCP partners.

Regulatory limits for TDS for landscaping do not exist because landscape requirements are driven by individual site soil conditions. However, the establishment of a quantitative goal based on elimination of infiltration will assist the RWQCP partners and the City in efforts to reduce the TDS levels to a level one would expect given the source water for the service area of the RWQCP. The Salinity Policy contains a TDS goal of 600 PPM. Staff has estimated that this level can be achieved without modifying normal human or industrial activities, but rather by controlling saline groundwater infiltration.

The RWQCP has already identified a preliminary list of efforts that can be implemented or are in the process of implementation in support of the Salinity Policy. Notable examples include:

- The City of Mountain View has just eliminated the sewer discharge of 3 saline wells in the north of Bayshore area. This action alone should reduce the TDS to 800 PPM.
- The RWQCP will continue to monitor potential saltwater intrusion “hotspots” and communicate the results to the relevant RWQCP partners
- The RWQCP will develop a database to track salinity data and other investigative work

- Utilities will coordinate implementation of the recently approved Sanitary Sewer Management Plan (CMR: 303:09) to manage the Palo Alto wastewater collection system and identify inflow and infiltration reduction actions
- The RWQCP will develop a groundwater management plan to coordinate salinity reduction activities with the RWQCP partners and prepare for expanded recycled water application. This groundwater management plan will be coordinated with the Santa Clara Valley Water District, which has jurisdiction over the groundwater basins in Santa Clara County.

The benefits of achieving the TDS goals in the Salinity Policy include greater acceptability of the use of recycled water. Recycled water is currently blended with potable water when used on the Municipal Golf Course and at Greer Park. It is expected that reducing the salinity of the water will enable a greater fraction of recycled water to be used by these existing recycled water customers. These efforts and the efforts to expand the recycled water system to serve new customers will help the City reduce its consumption of potable water and reduce treated effluent flow to the Bay

NEXT STEPS

The next key step is securing adoption of the Salinity Policy by the other RWQCP partners. On a semi-annual basis, staff will report to the UAC and Council the progress towards achieving the goals of the Salinity Policy.

RESOURCE IMPACT

The City of Palo Alto has an aggressive wastewater collection system Capital Improvement Program (CIP) which identifies and evaluates issue areas and prioritizes projects to manage available funding. By its very nature the CIP has inherent TDS reduction benefits, as demonstrated by the City's current TDS levels entering the RWQCP. Staff does not anticipate any additional CIP cost or structural changes are needed at this time to accommodate the Salinity Policy.

The City will coordinate implementation of the Salinity Policy with the other RWQCP partners. It is unknown at this time what additional costs could be borne by the other RWQCP partners towards achieving this policy goal.

POLICY IMPLICATIONS

Continuing the exploration of expanding the use of recycled water in Palo Alto is consistent with Council policy. The Council has supported this goal through approval of the Water Integrated Resources Plan (WIRP) Guidelines in December 2003 [CMR:547:03], specifically, WIRP Guideline #3: Actively participate in development of cost-effective regional recycled water plans. Council also approved ordinance No. 5002 in May 2008 [CMR:203:08] adding Chapter 16.12 to Title 16 of the Palo Alto Municipal Code to require the use of recycled water for irrigation, toilet and urinal flushing and trap priming.

The City's Sustainability Policy supports the development of recycled water, specifically in the policy's statement to "reduce resource use and pollution in a cost-effective manner while striving to protect and enhance the quality of the air, water, land, and other natural resources."

The City's Comprehensive Plan contains Natural Environment Goal N-4: Water resources that are prudently managed to sustain plant and animal life, support urban activities and protect public health and safety. Specifically, Program N-26 addresses the use of recycled water: Implement incentives for the use of drought-tolerant landscaping and recycled water for landscape irrigation.

ATTACHMENT

Attachment A: Proposed Recycled Water Salinity Reduction Policy

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CITY OF PALO ALTO
RECYCLED WATER SALINITY REDUCTION POLICY

POLICY STATEMENT

Recycling treated wastewater is increasing in the arid West as a response to the fact that populations are increasing and fresh water supplies are not. Palo Alto and other communities are using treated wastewater for landscape irrigation and that use is expected to grow dramatically in the future. Salts accumulate in water when it is used by people and industrial processes. To maximize the use of recycled water on the widest variety of green plants, the salt content (salinity) needs to be minimized. The purpose of this policy is to ensure that the City is taking all practical steps to reduce salinity in recycled water.

Therefore, it shall be the policy of Palo Alto to prevent unnecessary additions of salt to the sewer system, with a goal of lowering the Total Dissolved Solids (TDS) in the recycled water to less than 600 parts per million (PPM).

Applicability of this Policy

Palo Alto shall utilize this policy and its 600 PPM Total Dissolved Solids (TDS) goal to develop salinity control measures. Palo Alto owns and operates the Regional Water Quality Control Plant (RWQCP), which treats wastewater from Palo Alto and five other communities. The RWQCP Partners, including Palo Alto, will be asked to identify controllable salt inputs to wastewater from their communities and to implement control measures.

PROCEDURES

Staff estimates that the wastewater TDS can be reduced to 600 PPM without modifying normal human use or industrial activities. The major way in which salts can be reduced is by controlling the infiltration of saline groundwater which is currently entering sewer pipes through cracks and problem areas in those pipes as they cross saline areas near San Francisco Bay. Other sources of controllable salt must also be explored.

The activities that will be completed to implement this policy include:

1. Determine the salinity levels for each entity whose wastewater is treated by the RWQCP.
2. Identify the sources of salinity.
3. Develop alternatives for reducing the salinity levels.
4. Identify the actions that can be implemented to meet the TDS goal.
5. Prepare Salinity Reduction Plan.
6. Monitor TDS and report to Council semi-annually on progress towards meeting the TDS goal.

Note: Questions and/or clarifications of this policy should be directed to the Public Works Department.