

DRAFT – FOR CONSIDERATION AT THE OCTOBER 18, 2007  
MEETING OF THE HIGHLANDS COUNCIL



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**RMP Program: The Efficient Use of Water**  
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<b>Issue Overview</b>	<p>Water is a driving force behind many of the goals and policies of the Highlands Act, and protection of water supplies is a critical focus of the Regional Master Plan. Many Highlands Region subwatersheds presently face shortages of water, as current demands exceed estimated water availability for human and ecological purposes and therefore stresses aquatic ecosystems and puts human needs in jeopardy during droughts. In addition, municipalities served by Highlands reservoirs and some Highlands municipalities face future constraints on their ability to serve customers as water demands increase through redevelopment and development.</p> <p>Therefore, it is important that New Jersey obtain the maximum benefit from its Highlands water resources through efficient use and, where feasible and appropriate, beneficial reuse and recycling of water. Water use efficiency has been increasing over the last 20 years, as State and Federal requirements for water conserving plumbing fixtures, appliances and irrigation systems affect a greater proportion of total development. Farmers are also becoming more efficient in water use, moving to drip irrigation and other conserving systems instead of high-pressure broadcast spray systems.</p> <p>However, both the public utility customer base and irrigated farm acreage are increasing, creating more demands that offset improved water use efficiency. For this reason, while some urban areas have seen declining water sales over time (due to both water conservation and the loss of water-intensive industries), other municipalities have seen significant increases in total water use. Further progress in water use efficiency is needed. Many RMP policies and objectives address this need by encouraging general efficiency in water use, providing higher priority to agricultural water uses that employ best management practices, and calling for the use of water conservation, recycling and reuse (among other techniques) to both reduce and eliminate current and future water deficits.</p>
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<p><b>RMP Policies and Objectives Addressed</b></p>	<p><b>Policy 2.1.2.4.</b> To require the development and implementation of Water Management Plans to address any Current Deficit Areas or subwatershed that could become deficit areas based on projected development and water uses, to ensure sustainable water supply, water resource, and ecological value.</p> <p><b>Objective 2.1.2.4.1.</b> <i>Water Management Plans shall include provisions to reduce consumptive and depletive uses of ground and surface waters as necessary to reduce or prevent deficits in Net Water Availability; or to ensure continued stream flows to downstream Current Deficit Areas from Existing Constrained Areas, to the extent practicable within each zone.</i></p> <p><b>Objective 2.1.2.4.1.</b> <i>Proposed increases in water use, including consumptive or depletive water uses, within a Current Deficit Area or Existing Constrained Area shall provide mitigation equal to 125% of the proposed new consumptive or depletive water uses within the same HUC14 subwatershed through: a permanent reduction of existing consumptive and depletive water uses; ground water recharge in excess of the requirements of N.J.A.C. 7:8 (Stormwater Management Rules); or other permanent means.</i></p> <p><b>Objective 2.1.2.4.2</b> <i>All water users within a Current Deficit Area or Existing Constrained Area shall seek funding and opportunities to prevent exacerbation of and help reduce or eliminate existing deficits to ensure sustainable water supply, water resource and ecological values, emphasizing techniques including, but not limited to water reuse, recycling and conservation.</i></p> <p><b>Policy 2.1.2.5</b> To conditionally provide water availability within Current Deficit Area.</p> <p><b>Objective 2.1.2.5.1.</b> <i>Within a Current Deficit Area, a Planned Community Zone shall be assigned a Conditional Net Water Availability of 2 percent of Ground Water Capacity, based on the Low Flow Margin Method, conditioned upon prior implementation or commitment for implementation of the 125% mitigation requirement in Objective 2.1.2.4.1.</i></p> <p><b>Objective 2.1.2.5.2.</b> <i>Within a Current Deficit Area, a Protection or Conservation Zone shall be assigned a Conditional Net Water Availability of 1 percent of Ground Water Capacity, based on the Low Flow Margin Method, conditioned upon prior implementation or commitment for implementation of the 125% mitigation requirement in Objective 2.1.2.4.1.</i></p> <p><b>Policy 2.1.2.6.</b> To require use of water conservation, recycling, and reuse methods (where appropriate) and devices for any redevelopment or development activity, including renovations to existing residential, institutional, commercial or industrial buildings, to minimize consumptive water use tailored to meet the resource protection and other goals for each zone and considering subwatershed-specific conditions and Net Water Availability status.</p> <p><b>Objective 2.1.2.8.2.</b> <i>Prevent net increases in consumptive and depletive water uses in Current Water Deficit Areas to prevent exacerbation of and help reduce or eliminate the deficit to ensure sustainable water supply, water resource and ecological values, emphasizing techniques including, but not limited to water reuse, recycling and conservation.</i></p> <p><b>Objective 2.1.2.8.3.</b> <i>Limit consumptive and depletive water uses in Existing Constrained Areas to 5 percent of the Ground Water Capacity to ensure continued stream flows to downstream Current Deficit Areas, emphasizing techniques including, but not limited to water reuse, recycling and conservation.</i></p> <p><b>Objective 2.1.2.9.3.</b> <i>Prevent net increases in consumptive and depletive water uses in Current Water Deficit Areas to prevent exacerbation of and help reduce or eliminate the deficit to ensure sustainable water supply, water resource and ecological values, emphasizing techniques including, but not limited to water reuse, recycling and conservation.</i></p> <p><b>Objective 2.1.2.9.4.</b> <i>Limit consumptive and depletive water uses in Existing Constrained Areas to the 2003 consumptive and depletive water use plus 5 percent of the Ground Water Capacity (up to the standard thresholds in Objective 2.2.9.1) to ensure continued stream flows to downstream Current Deficit Areas, emphasizing techniques including, but not limited to, water reuse, recycling and conservation.</i></p>
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	<p><b>Objective 2.1.2.9.5.</b> Give highest priority for the use of Net Water Availability for agricultural and related water uses to those using best management practices for irrigation and other activities, and to Specially Planned Areas or TDR Receiving Areas.</p> <p><b>Objective 2.1.2.10.3.</b> Prevent net increases in consumptive and depletive water uses in Current Water Deficit Areas to prevent exacerbation of and help reduce or eliminate the deficit, emphasizing techniques including, but not limited to, water reuse, recycling and conservation.</p> <p><b>Objective 2.1.2.10.4.</b> Limit consumptive and depletive water uses in Existing Constrained Areas to the 2003 consumptive and depletive water use plus 5 percent of the Ground Water Capacity (up to the standard thresholds in Objective 2.2.10.1) to ensure continued stream flows to downstream Current Deficit Areas, emphasizing techniques including, but not limited to, water reuse, recycling and conservation.</p> <p><b>Objective 2.1.2.10.6.</b> Establish and implement best management practices for recreational, landscape irrigation and other practices through applicable State and federal programs.</p> <p><b>Objective 2.4.2.8.1.</b> Require maximized feasible water conservation and recycling or any redevelopment or development activity, including renovations to existing single family residences and commercial/industrial buildings.</p>
<p><b>Program Summary</b></p>	<p>Water use efficiency has three basic components. First, water should be used efficiently regardless of water availability. This conservation principle, equivalent to a “good housekeeping” concept, prevents wasteful use of water even when water is plentiful, so that environmental impacts are minimized, infrastructure capacity is not strained, and the water uses do not result in a false sense that new supplies are needed.</p> <p>Second, water should be used even more efficiently to reduce existing water deficits in subwatersheds and watersheds. These deficits indicate stresses on the aquatic ecosystems, and often will indicate stresses on ground water yields and downstream water supply facilities and threats to human use during droughts.</p> <p>Third, water use efficiency should also be enhanced to avoid the need for additional water infrastructure. Delaying the need for new water supply facilities is highly cost-effective; water conservation measures generally cost significantly less per million gallons than new reservoirs, treatment facilities or water mains. There is a fourth component that this program does not address, regarding conservation during drought emergencies; NJDEP already addresses this component fully.</p> <p>Water use efficiency can be achieved in many ways, including:</p> <ul style="list-style-type: none"> <li>• Supply-side conservation, such as leak detection and control and improved management of water storage facilities;</li> <li>• Demand-side conservation, such as improved plumbing fixtures, appliance selection, irrigation controls, modified landscaping that reduces water needs, and use of car washes instead of hand washing;</li> <li>• Beneficial reuse of water, either within a building structure or in a larger setting, where wastewater is treated and then reused on-site; and</li> <li>• Recycling of water, such as the use of stormwater for irrigation purposes, where no special treatment of the water is required.</li> </ul>
<p><b>Analysis of Water Use Efficiency for Public Water Supplies</b></p>	<p><b>Program Description</b> Analyzing the efficiency of water use for public water supplies, for all systems using Highlands water resources both within and outside the Highlands Region, requires an understanding of the customer base, affected land uses, leakage and water loss potential, and other factors. Efficient use rates for suburban areas (in gallons per capita per day, or <b>gpcd</b>) will be different from the rates for urban areas.</p>

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	<p>The Highlands Council will collaborate with NJDEP to determine existing water use rates for all public water systems using Highlands water, categorize the systems for comparison purposes, and assess the relative efficiency of water uses among common classes of public water systems.</p>
<p><b><i>Analysis of Water Use Efficiency for Agriculture and Irrigation</i></b></p>	<p><b>Program Description</b>  The efficiency of water use by agriculture and other forms of self-supplied irrigation must be assessed based on the type of water need, irrigation practices, weather impacts, etc. The Highlands Council will collaborate with NJDEP and the NJ Department of Agriculture to determine existing water use rates for all agricultural and other self-supplied irrigation uses using Highlands water, categorize the uses for comparison purposes, and assess the relative efficiency of water uses among common classes of purposes. As these water users will be highly affected by weather, the assessment must include an analysis of how uses vary by season, year and climate conditions.</p>
<p><b><i>Identification of Water Use Efficiency Metrics and Targets</i></b></p>	<p><b>Program Description</b>  The creation of programs and standards for efficient water use requires an identification of appropriate metrics and targets. The Highlands Council will collaborate with NJDEP for all uses, and the NJ Department of Agriculture regarding agricultural uses, to select the most appropriate metrics for water use efficiency, and either regulatory or normative standards (as appropriate for each type of water use) that should be applied. For public water supply systems, metrics may include per capita water use and water loss ratios by system category. For non-potable uses, metrics will focus more on efficiency of meeting plant needs for specific crops during specific weather conditions.</p>
<p><b><i>Implementation of Water Use Efficiency Measures: General</i></b></p>	<p><b>Program Description</b>  All water uses in the Highlands should be efficient, so that environmental stresses are limited and the ability of water supplies to meet public needs is extended. The following general standards apply:</p> <ol style="list-style-type: none"> <li>1. Meet all Uniform Construction Code requirements for the use of water conservation fixtures in new or rehabilitated structures;</li> <li>2. All new and replacement lawn irrigation systems shall meet State requirements for controls based on soil moisture;</li> <li>3. Non-potable irrigation water uses shall ensure that only the necessary amounts of water are used to achieve optimum plant growth, and such uses with Water Allocation permits shall be required to increase water use efficiency over the permit life to the maximum extent practicable;</li> <li>4. New commercial development shall use internal recycling or beneficial reuse of water to the maximum extent practicable;</li> <li>5. New development shall rely on stormwater for irrigation purposes to the maximum extent practicable, including but not limited to LEED-approved methods;</li> <li>6. Water supply utility rates shall encourage end-user conservation;</li> <li>7. Water supply utilities shall reduce water losses to the maximum extent that is cost-effective;</li> <li>8. Water supply utilities shall provide routine consumer education to conserve water.</li> </ol>

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<p><b><i>Implementation of Water Use Efficiency Measures: Deficit Areas and Deficit Utilities</i></b></p>	<p><b>Program Description</b></p> <p>The elimination of water supply deficits on a subwatershed or watershed basis is addressed by a separate RMP program (see <i>Highlands Restoration: Water Deficits</i>) that give highest priority to water use efficiency and ground water recharge enhancements within the deficit area, then to the development of new internal water supplies, and last to the transfer of water resources from another area. These priorities address both environmental and cost issues.</p> <p>Where deficit areas exist, the RMP calls for development of a Water Management Plan to determine how the deficit can be eliminated. Where a water supply utility faces constraints on its ability to supply consumers due to inadequate transmission mains, treatment facilities or supply sources, the most effective method of avoiding major capital costs is water use efficiency. The same efficiency methods are applicable to both situations.</p> <p>The following enhanced water use efficiency measures shall be considered, and where feasible, included in Water Management Plans or utility water supply plans to eliminate water availability or utility supply deficits, to the extent that they do not cause or exacerbate other environmental harm. Implementation or a firm commitment for implementation of the selected methods shall be required prior to approval of additional consumptive or depletive water uses or new water supply sources:</p> <ol style="list-style-type: none"> <li>1. Incentive programs, up to and including full payment, for replacement of residential and commercial plumbing fixtures, water-using appliances and lawn irrigation systems with water conservation devices;</li> <li>2. Incentive programs, up to and including full payment, for modification of residential landscaping to forms that require minimal if any artificial irrigation;</li> <li>3. Incentive programs, up to and including full payment, for retrofitting of existing development with systems that allow for the beneficial reuse of water within the development;</li> <li>4. Incentive and cost-share programs for replacement of agricultural irrigation and other water uses with water conservation devices;</li> <li>5. Reduction of water losses within water utility systems to the maximum extent that is technologically feasible;</li> <li>6. Modification of water rates to enhance financial incentives for water conservation by end users;</li> <li>7. Enhanced consumer education regarding water conservation, including the potential for direct-to-consumer approaches.</li> </ol>
<p><b><i>Ensuring Implementation of Water Management Plans</i></b></p>	<p><b>Program Description</b></p> <p>Where a water utility or water user chooses to make a commitment to implementation of water use efficiency rather than implementing the measures prior to a new consumptive or depletive use, the following requirements shall apply:</p> <ol style="list-style-type: none"> <li>1. All implementation measures shall be completed within one year of approval if the amount is less than 100,000 gallons per day in the Planning Area or 50,000 gallons per day in the Preservation Area, on average. Implementation may occur within a longer time period for larger amounts, up to five years from approval;</li> <li>2. If the implementing entity is a public agency, the commitment must be in the form of a binding resolution or ordinance of the governing body, and the cost of implementation must be bonded to ensure sufficient resources;</li> <li>3. If the implementing entity is a private corporation or individual, they must establish either an escrow account or provide bonding to ensure that the</li> </ol>

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	<p>commitments are met. A public entity must be named as recipient of the escrow account or bonds in the event of default by the implementing entity, to be used by the public entity to complete implementation.</p>
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