

Los Alamos Department of Public Utilities

Conservation Plan for Water and Energy

December 2010

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1 Executive Summary

The Board of Public Utilities and the Los Alamos Department of Public Utilities, by way of this document, demonstrate a **commitment to a cleaner environment and a sustainable, independent future**. Conservation is an inexpensive approach to move the community in this direction and is aligned with the Department's overall, broader mission to keep rates competitive while positioning the Department to be able to offer diversified choices for the future. The full mission statement is as follows:

Provide safe and reliably utility services at competitive rates, to support the community now and enable diversified choices for our community's future.

This document is a living document. Annually the Conservation Coordinator will evaluate the progress and amend or modify the Plan accordingly to bring back to the Board. Outlining a six step process is presented in this Plan:

1. Establish consumption baselines,
2. Adopt appropriate, reasonable conservation goals that take into consideration the desires of our community,
3. Determine cost-effective conservation programs to move the community toward the conservation goals.
4. Implement Programs
5. Monitor Conservation
6. Evaluate and Revise

2 Background

The Department of Public Utilities (DPU) currently operates the county-owned electric, gas, water, and wastewater systems servicing the residents, businesses, schools, and local government facilities for Los Alamos and White Rock. This Plan will address both supply- and demand-side conservation measures for potable water, electricity and natural gas

2.1 Water

Water rights for Los Alamos total 5,541.3 acre feet per year (1,805,541,000 gallons/year) and are comprised of groundwater and surface water. Los Alamos also has a contract with the Bureau of Reclamation for an additional 1,200 ac-ft of San Juan-Chama surface water that is currently inaccessible. Since the late 1960s to present, water consumption in Los Alamos hovers between 4,000 and 5,000 ac-ft/yr. Two times during this time span, annual consumption was above 5,000 ac-ft and encroached upon Los Alamos' water rights, once in the mid 1970s and the other in late 1980s. Through conservation and the diversion of the San Juan-Chama water Los Alamos ensures a sustainable future. Other benefits include:

2.1.1 Flexibility of water use and water resources:

For any water rights permitting change that requires the Office of the State Engineer (OSE) approval, such as a change in point of diversion or place of use, the OSE will consider conservation. This requirement is part of an overall strategy by the State to ensure that water is being used wisely before additional diversions are permitted. The Bureau of Reclamation (BOR) also requires as a condition of Los Alamos' contract for San Juan-Chama water that a conservation plan be in place.

2.1.2 Funding:

The New Mexico 40-year water planning statute, as well as Section 72-14-3.2 of NMSA 1978, calls for conservation planning as a prerequisite for funding from key state agencies.

2.1.3 Economic Development:

As mentioned above, Los Alamos' water consumption is hovering between 4,000 and 5,000 ac-ft; as such there is not much room for growth when water rights are 5,541.3 ac-ft and Los Alamos is not able to access the other 1,200 ac-ft. Conservation planning supports the County Council goals to increase the availability of housing, increase retail opportunities and diversify Los Alamos' economy.

2.1.4 Future cost control:

Water conservation can also prevent or delay the need for expensive capital expenditures for developing new water supplies and acquiring additional water rights in order to meet future growth projections.

2.1.5 Protects water supply:

Conservation slows the depletion of existing ground water resources.

2.2 Electric

Although electricity is plentiful, its production is capital intensive and traditional methods of production (such as coal-fired plants) take an environmental toll. Conservation is an inexpensive approach to provide sustainable energy and water resources. Conservation allows DPU to take advantage of low-priced renewable energy generated from hydroelectric facilities, as well as reduce the overall ratio of electricity generated from fossil fuel power plants.

Access to federal hydroelectric power: To qualify for low-cost federally allocated hydroelectric power (a non-hydrocarbon resource) the DPU is required to develop and implement a plan that details supply and demand-side energy conservation efforts. This plan is submitted to the Western Area Power Administration (WAPA) as part of Los Alamos County's section of the joint Integrated Resource Plan (IRP) with DOE.

2.2.1 Smoothing Demand Curves for Price control:

Conservation can lessen peak demand reducing the need to purchase expensive power from the higher-priced spot market which is also electricity that is generated from fossil-fuel power plants.

2.2.2 Increasing the ratio of Los Alamos' renewable energy and reducing the environmental toll:

Reducing spot market purchases also increases Los Alamos' ratio of electricity from renewable resources, such as the afore-mentioned federally allocated hydroelectric power and power generated from the county-owned hydroelectric plants in Abiquiu and El Vado.

2.2.3 Economic Development:

Economic development can be promoted and sustained by the availability of reasonably priced electricity.

2.3 Natural Gas

Rationale for conserving natural gas aligns with the rationale for conserving electricity. Natural gas prices are extremely volatile and the DPU purchases this commodity at the best price possible on behalf of its customers. It is a capital intensive production industry with differential pricing for different markets and purchasing arrangements. Conservation can lessen peak demand reducing the need to purchase expensive natural gas from the higher-priced spot market, enabling the DPU to provide increased pricing reliability.

3 General Provisions:

3.1 Purpose and Policy

This document is intended to establish methods to determine appropriate baselines, goals, conservation measures and methods to assess the effectiveness of the Plan in encouraging the efficient use of water and energy amongst DPU customers. While the primary motivation is to ensure that Los Alamos' demand does not exceed supply, there are regulatory requirements that mandate the DPU adopt a conservation plan. Other advantages to a Plan come in the form of economic and environmental gains. Utility customers benefit with lower utility bills while the whole community benefits from a cleaner environment and a sustainable future.

3.2 Scope

The provisions of this document shall apply only to potable water, electricity and natural gas and shall apply to all customer classes with the exception of the Department of Energy and the Los Alamos National Laboratory. At some point in the future, the Plan may be extended to non-potable water as well.

3.3 Administration

The DPU Conservation Coordinator shall administer and implement the provisions within this document. Reporting to the Deputy Utilities Manager of Engineering, the Conservation Coordinator shall receive assistance and support from the Public Relations Manager and Public Information Specialist, Meter Readers, 311 Customer Care Center, the Gas Water Sewer Division, Water Production, and Electric Production.

The Conservation Plan is a living document. Recommendations to the Utilities Manager and the Utilities Board for improvements and adjustments to the Plan will be made by the Conservation Coordinator annually.

3.4 Enforcement

The measures identified in this Plan are to encourage *voluntary* conservation from DPU customers. At some point in the future, the Conservation Coordinator, Utilities Manager, and Utilities Board may wish to recommend that the Council adopt ordinances that impose some level of enforcement either through rates or surcharges.

4 Establish Consumption Baselines

Prior to establishing appropriate conservation goals, the DPU must determine a baseline or reference point for which conservation results will be measured. The Conservation Coordinator will establish an appropriate baseline for customer classes based on the best available information.

5 Develop Conservation Goals

DPU is a county-owned utility and accountable to its customers. As such, it will listen to customers to arrive at conservation goals that meet the desires of the community.

Once baselines are finalized the Conservation Coordinator may choose to publish the on-line survey already developed in Share Point and linked to the county website as a means to ascertain DPU customer desires and commitment. Or the Conservation Coordinator may also choose to implement another strategy to better understand DPU customer desires and commitment.

Once customer input is received, and if deemed appropriate, the Conservation Coordinator will assess the reasonableness of these goals and incorporate such goals into the Plan. These goals will allow the Conservation Coordinator to determine how aggressive the conservation measures/programs to be implemented need to be in order to meet such goals.

5.1 Conservation Affect on Rates

When determining appropriate conservation goals, the Conservation Coordinator must also take into consideration the level of conservation and how it may affect rates. The cost of providing utility service consists of two primary elements, capacity or fixed costs, and variable costs. Such costs are recovered through rates that typically have fixed and variable components. The variable portion of a utility rate often includes an element of fixed cost recovery. As consumption is reduced, rates may need to be increased as the fixed cost component is spread over fewer units.

Fire protection costs are an excellent example of this. Water distribution systems are sized to meet fire flow requirements. Peak system demand for other purposes is typically substantially below the flow required for fire protection. Costs for fire protection are primarily the incremental capital costs for sizing pipes, tanks and pumps to meet fire flow requirements. Under most rate designs, high volume customers subsidize the fire protection costs for low volume customers within the same customer class. As consumption is decreased, new rate designs will have to be developed that assign such costs to customers on a basis other than volume used.

Another example that goes beyond conservation is the effect of distributed electric generation. Many Utilities offer net-metering arrangements where a customer's meter may run in reverse when the electricity production from their roof mounted PV system exceeds their use. It is quite possible for individual customers to totally offset their usage with their PV generation, in effect using the grid as a battery. As total consumption decreases as the

result of distributed generation, costs of maintaining the grid will need to be recovered through increased fixed charges.

In summary, as long as the utility is providing service or back-up supply to a customer, fixed costs of the infrastructure required to provide that service must be recovered from the customers served

5.2 Right-sizing infrastructure

Conservation should lead to the reduction of demands on the system resulting in lower system infrastructure requirements. If required infrastructure could be reduced in conjunction with declines in system demand, the need for rate increases could be mitigated. To truly accomplish this, the system demand reduction must be permanent. An example of a permanent reduction is the replacement of large areas of turf with xeric plantings, reducing a major component of seasonal irrigation.

6 Determine Conservation Programs

6.1 Programs

In light of newly established conservation goals, the level of commitment from DPU customers, available resources, and identifying various target audiences the Conservation Coordinator will determine which programs would best effect conservation on the supply- and demand-side to reach the established goals. Programs can be categorized in the following categories:

- System Efficiency Improvements
- Regulatory Measures
- Incentives
- Training and Education programs.

6.2 Public Input

Once the Conservation Coordinator has arrived at baselines, conservation goals and conservation programs, the Plan will be made available to DPU customers for public input. Input will be considered and applicable input will be incorporated into the Plan. The modified Plan will be taken back to the Utilities Board for approval.

7 Implement Programs

Upon approval from the Utilities Board the finalized conservation programs will be implemented by the Conservation Coordinator.

It should be noted, that even without an approved Plan, the DPU and the Board have already deployed several water and energy conservation measures. These programs are summarized on pages 12 through 18 and will continue as baselines and goals are finalized. However, depending on the ultimate conservation goals, the Conservation Coordinator may or may not choose to continue these programs.

7.1 Target Audience and Message Consideration

As part of the consideration for implementing various programs, the Conservation Coordinator will consider who the target audience is for each program and how best to reach them. It may be that special messaging may need to be considered in order to tap into the values of a particular target audience.

8 Deployed Water Conservation Programs

8.1 System Efficiency Improvements – Annual

8.1.1 Water and Energy Conservation Coordinator (Demand and Supply)

This position was created in January 2008 (Demand and Supply). The DPU hired a Water and Energy Conservation Coordinator in January 2008. The position was vacated in March 2010 and has been recently filled. The new Conservation Coordinator will begin in January 2011 and will oversee all aspects of the conservation program.

8.1.2 Meter Testing and Replacement (supply)

Maintenance, testing and replacement of water meters is a critical component of a water utility operation since water meters lose accuracy with age. The DPU has an existing program to test on a scheduled interval and replace water meters that are found to be inaccurate.

8.1.3 System Leak Detection (Supply)

Complete water system audits are conducted on a routine basis to locate and repair water leaks. In 2008 13.72 miles of water lines including all intersecting lines were surveyed. A total of 12 leaks were detected and repaired saving an average of 8,460 GPD or 3.2 million gallons of water annually. The most recent assessment conducted in April 2010 surveyed 18.45 miles and found only 4 leaks. These leaks were repaired saving an average of 4,320 GPD or 1.6 million gallons of water annually.

8.1.4 Effluent Reuse Washwater System (supply)

In December 2010 the DPU installed an effluent reuse washwater system into the Los Alamos wastewater treatment plant. This system pumps treated wastewater back into the wastewater treatment operation replacing operational functions that were using pumped potable water. It is estimated that the wastewater treatment plant will conserve approximately 12 million gallons of potable water annually.

8.1.5 Expanding the Effluent System - Purple pipe in Diamond Drive (supply)

Installation of purple pipe has been added to utility work on Diamond Drive. This will allow the DPU to improve and expand upon the existing effluent system in the town site. The new pipe will make the effluent available to various parks and schools for irrigation, replacing the current practice of irrigating with potable water. The system will also transmit gravity fed non-potable surface water for irrigation.

8.2 Regulatory Measures

8.2.1 Water Rule W-8 – Implemented 2005 (Demand)

Water Rule W-8 was adopted by the Board of Public Utilities in July 2005 as part of the DPU Rules and Regulations. The Rule prohibits water waste and irrigation water runoff; establishes an Even/Odd Address Watering Schedule May 1 – Sept 30; restricts day time watering; and requires that customers repair leaks.

Water Rule W-8 has no punitive consequences for customers not in compliance. This Rule is designed to encourage customers to voluntarily conserve through best management practices for outdoor water use.

8.2.2 Conservation Policy Alignment – Implemented 2008 (Demand)

It may be that individual customers will have their own conservation goals outside of the conservation goals identified in the Plan. Los Alamos County is an example of a DPU customer who has expressed a desire to incorporate water and energy conservation measures that may be more stringent than overall goals. The County Council has adopted a resolution that new County buildings will be a minimum of LEED silver, created an Environmental Sustainability Board, and instructed staff to assess existing county facilities and incorporate conservation measures to these facilities. DPU is committed to and will support this customer and other customers to meet these individual goals.

8.3 Conservation Incentives

8.3.1 Leak Detection Program – Implemented 2008 and Continuing (Demand)

Customers that have a spike in their water consumption are flagged by our billing system, based on either their previous month's usage, or the same month last year. These customers receive a notice informing them that they are eligible to receive a free leak check from the DPU. Leak checks are conducted with the customer present by a DPU representative. The representative provides this one-on-one service to locate the leak, advise how best to repair the leak, as well as educate the customer on other conservation opportunities.

8.3.2 Conservation Audits – Implemented 2008 and Continuing (Demand)

Conservation audits will be provided to our customers free of charge. Audits will consist of, but are not limited to:

- A review of historical water consumption
- Low-flow water devices
- Kitchen faucet aerators (1.5gpm)
- Bathroom faucet aerators (1.0gpm)
- Water savings showerheads (2.0gpm)

- Toilet tank banks (saves .08gpf)
- Dye tablets
- Drip gauge
- Leak check
- Irrigation audit
- Educational materials

As stated above, the conservation audit will review indoor consumption and irrigation requirements. The audit program is voluntary; customers can refuse any or all services provided.

8.3.3 Restaurant Audits – Completed 2010 (Demand)

The DPU was the recipient of a grant through the Bureau of Reclamation to conduct restaurant audits for approximately 40 sites in Los Alamos. Audits included training and educational materials, low-flow dish-spray nozzles (1.5gpm), bathroom faucet aerators (1.0gpm), toilet tank banks (saves .08gpf) and free leak detection. The audits were completed in 2010 and performed by the water and energy conservation coordinator.

8.3.4 Rain Barrels – Completed 2010 (Demand)

For two summer seasons, the DPU offered customers 60 gallon rain barrels at cost. It is estimated that over 200 rain barrels were sold.

8.4 Training and Educational Measures

8.4.1 General Conservation Education – Implemented 2005 and Continuing (Demand)

General water conservation materials have been distributed to our customers through bill inserts, feature articles and announcements in the news media, workshops, booklets, wall calendars, community events, and the distribution of water saving devices. In addition, the DPU donated to the Los Alamos libraries over 50 gardening books with an emphasis on water conservation in the Rocky Mountain area.

8.4.2 Conservation Outreach to Youth – Implemented and Continuing (Demand)

Reaching the community's youth is an effective means for instilling water conservation awareness. In October 2007 the DPU collaborated with the New Mexico State University and the University of New Mexico on an all-day water festival for all Los Alamos County fourth graders. The festival brought in several federal, state and local agencies to provide hands-on water activities for the children.

8.4.3 Conservation Partnerships

DPU recognizes the importance of conservation partnerships to continue to share ideas, learn valuable lessons from other communities and state and federal agencies, and continue to improve. The DPU is a partner in these progressive conservation programs.

- ***WaterSense (EPA) Promotional Partner***

The DPU became an official WaterSense Promotional Partner in March of 2008. WaterSense seeks to protect the future of our nation's water supply by promoting water efficiency and enhancing the market for water-efficient products, programs, and practices.

WaterSense will help consumers identify water-efficient products and programs. The WaterSense label will indicate that these products and programs meet water efficiency and performance criteria. WaterSense-labeled products perform well, help save money, and encourage innovation in manufacturing.



- ***Alliance for Water Efficiency Charter Member***

In July 2008, the DPU became a charter member of the Alliance for Water Efficiency "AWE," which provides comprehensive information about water-efficient products, practices, and programs. Additional services include the

development of conservation codes and standards, coordination with green building initiatives, training for conservation professionals, and general water use education.



- ***New Mexico Water Conservation Alliance***

In 2007, DPU joined the New Mexico Water Conservation Alliance. The alliance is a non-profit organization dedicated to water conservation issues.

Many communities from around the state meet regularly to exchange information, provide education, and work towards a water-secure future for New Mexico.



9 Deployed Energy Conservation Programs

9.1 System Efficiency Improvements – Annual

9.1.1 Meter Testing and Replacement

Maintenance, testing and replacement of electric and natural gas meters is a critical component of an electric utility operation since electric and natural gas meters can lose accuracy. The DPU has an existing program to test on a scheduled interval and replace electric and natural gas meters that are found to be inaccurate.

9.1.2 Effluent Reuse Washwater System (supply)

In December 2010 the DPU installed an effluent reuse washwater system into the Los Alamos wastewater treatment plant. This system pumps treated wastewater back into the wastewater treatment operation replacing operational functions that were using pumped potable water. It is estimated that the wastewater treatment plant will conserve approximately 12 million gallons of potable water annually. This translates into a reduced demand for drinking water and which saves energy by reducing water pumping costs.

9.1.3 Expanding the Effluent System - Purple pipe in Diamond Drive (supply)

As mentioned under “water conservation programs,” the DPU has installed a purple pipe with other utility work on Diamond Drive. This will allow the DPU to replace pumped drinking water with non-potable water for irrigation at various parks and schools in the town site. While the replacement of pumped drinking water with surface water doesn’t conserve water, it does conserve energy in reduced water pumping costs.

9.1.4 Hydroelectric Facilities (supply)

While hydroelectric power doesn’t reduce energy consumption, it is clean energy as it emits no greenhouse gas emissions. DPU owns two hydroelectric plants and is entitled to federal hydroelectric energy through the Western Area Power Administration. Increasing generation from these resources displaces dependence on energy generated from coal-fired plants. For the past year the DPU has been installing a third low-flow turbine to increase the generation capacity at the Abiquiu hydroelectric facility.

9.2 Regulatory Measures

The conservation plan does not currently call for any regulatory measures.
Conservation Incentives

9.3 Incentives

9.3.1 Conservation Audits (demand)

Audits include the identification of the customer's consumption distribution and additional information on energy conservation. Additional services include a complete walk-through of the home or business by the DPU representative, using an infrared imager to identify and locate system inefficiencies. The audit program is voluntary; customers can refuse any or all services provided.

9.3.2 Energy Conservation Kits (demand)

311 Customer Care Center professionals provide new utility customers with an "Energy Conservation Kit." The kit includes three compact fluorescent light bulbs, two air filter whistles, a refrigerator/freezer thermometer, twelve draft stoppers (insulation pads that replace empty space between switches and outlets to prevent drafts), one lime light night light that uses only 26 cents worth of electricity for one year, and an Energy Wheel (provides numerous conservation tips).

9.3.3 CFL Light Bulb Exchange (demand)

DPU entered in a contractual agreement with the Pajarito Environmental Education Center (PEEC) to provide energy conservation services. One task order requests PEEC to conduct a CFL (Compact Fluorescent Light Bulb) exchange program. PEEC offered up to six CFL light bulbs (provided by the DPU) in exchange for six 60 watts or greater incandescent light bulbs to customers with an active Utilities Department account. This program ended in July 2010. More than 1500 light bulbs were exchanged.

9.4 Training and Education

9.4.1 General Conservation Education – Implemented 2005 and Continuing (Demand)

General conservation materials have been distributed to our customers through bill inserts, feature articles and announcements in the news media, booklets, community events, and the distribution of energy saving devices.

9.4.2 Conservation Outreach to Youth – Implemented and Continuing (Demand)

DPU contracted with the Pajarito Environmental Education Center for energy conservation services. One task order is the development and implementation of an "energy trunk." The program goes into fourth and third grade classrooms with fun activities that educate on: 1) the definition of energy, 2) its different uses, 3) renewable and non-renewable energy sources, 4) greenhouse effect and carbon emissions, 5) energy conservation, and 6) the impact of energy conscious actions on the environment. Thus far, the program has been taught to three fourth grade classes at Aspen School.

9.4.3 Conservation Partnerships

DPU recognizes the importance of conservation partnerships to continue to share ideas, learn valuable lessons from other communities and state and federal agencies, and continue to improve. The DPU is a partner in these progressive conservation programs.

- ***Energy Star (EPA) Promotional Partner***

In September of 2008, the DPU became a promotional partner with the Environmental Protection Agency's Energy Star Program. Partnership offers a unique opportunity to leverage ENERGY STAR and receive free energy efficiency updates designed for customer education. The ENERGY STAR label appears on over 50 different product categories as well as new homes, commercial buildings and industrial plants.



- ***Alliance to Save Energy Member***

In 2008 the DPU became a member of the Alliance to Save Energy. Well known for their National Energy Hog Campaign, "the mission of the Alliance to Save Energy is to promote energy efficiency worldwide to achieve a healthier economy, a cleaner environment and greater energy security" by Kateri Callahan, President. Founded in 1977, the Alliance to Save Energy is a non-profit coalition of business, government, environmental and consumer leaders.



10 Monitor Conservation (Tracking Methods and Metrics)

A significant aspect of the Department of Public Utilities Water and Energy Conservation Program includes monitoring. Measurement and verification of the various programs will be ongoing. Measurement of water and energy conservation will be assessed by the Conservation Coordinator.

10.1 Water Tracking Tool

As a member of the Alliance to Save Water, DPU has access to a water tracking tool. The Conservation Coordinator will assess whether or not he/she would like to utilize this tool or implement other tools or methods for measuring success.

10.2 Database

A database has been created to track water and energy audits. The purpose is to assess whether or not customers who have had an audit have realized a savings. This will assist the Conservation Coordinator in determining the value that audits offer in the total picture of conservation. The Conservation Coordinator may decide to expand this database to assess other programs.

11 Evaluate and Revise the Conservation Plan

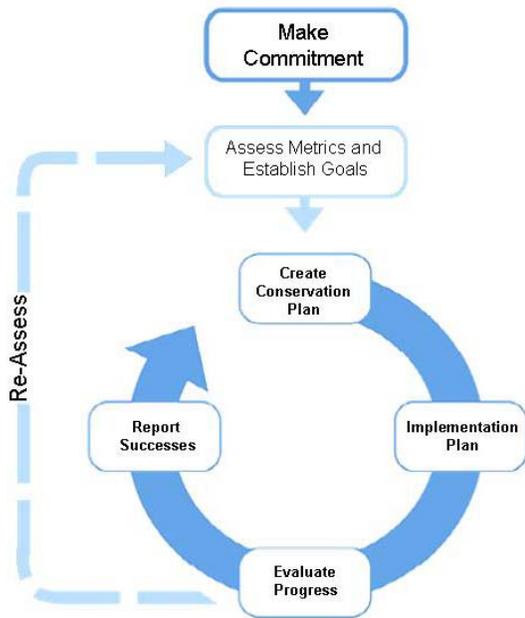


Diagram 1 – Revision Process

- 1) Make Commitment
- 2) Assess Metrics and Establish Goals
- 3) Create Conservation Programs
- 4) Implement
- 5) Evaluate Progress
- 6) Report Successes

For the Water and Energy Conservation Plan to successfully reach the established goals, it needs to be adaptable and dynamic. An annual review and revision of the plan will enable the evaluation of the effectiveness of programs, and allow for any necessary adjustments or changes moving forward. Diagram 1 summarizes the revision process.

Modifications to the Plan will then be recommended by the Conservation Coordinator to the Utilities Manager and Utilities Board. Approved recommendations will be incorporated into this Plan.

12 Conclusion

The overall objective of the Department of Public Utilities' water and energy conservation plan is to reduce water and energy consumption by a reasonable amount that is supported by the community, balances costs and resources, and supports a cleaner environment and a sustainable, independent future for Los Alamos. As previously mentioned, the Plan is a living document. The Conservation Coordinator will continually monitor, assess, and make recommended adjustments to the Plan through the Utilities Manager and Utilities Board so that the Plan may meet the ever-changing needs of the community.