

Drinking Water

CENTENNIAL 1912-2012



NEW MEXICO

LAND OF ENCHANTMENT

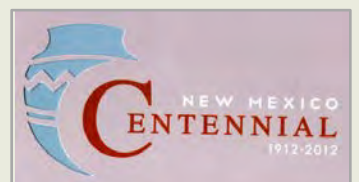
Inscription Rock has been a resting place and watering hole for centuries



El Morro National Monument New Mexico (1873).

Photographer: Timothy O' Sullivan.

<http://www.dailymail.co.uk/news/article-214989>.





Overview: Drinking Water

New Mexico, with a population of 2,062,710 and a land base of 121,336 square miles, is one of the driest states in the United States. For the whole state, precipitation averages between 10 and 20 inches of moisture annually.

Largely because of this, most Community Drinking Water Systems (CWS) utilize a groundwater source (GWS) for their water supply (95% of the systems are GWS) although over 48% of the people served by GWS also consume surface water (Albuquerque and Santa Fe service this large percentage of the State's population, and they have surface water systems).

Albuquerque with the greatest population just recently started using surface water, whereas Santa Fe has been a long time surface water system user.

Including the systems in those two large cities New Mexico has approximately 1,200 public water systems that use ground water extensively and primarily as their drinking water source. About 70% of New Mexico GWS serve populations under 500, yet those same small systems provide water to only 4% of the total population served by GWS.

As to the actual water being used, only about 13% of the water from New Mexico's surface and ground water sources is actually allocated for drinking water. Agricultural irrigation, about 70%, uses the bulk of available water sources in New Mexico with any remaining water going to other entities. In most areas of the state ground waters and surface waters are being depleted by over pumping and surface irrigation, and in most cases the aging and deteriorating water supply and distribution systems are not capable of providing the needed potable water for future.

Therefore, better allocation methods, planning, and increased funding are key elements to providing New Mexico with a safe and adequate supply of drinking water in the future. A recent data/ needs survey of the larger domestic water users was taken by the ASCE NM Section Drinking Water Committee (DWC). The survey is being used as a guide to grade the public water systems. The DWC also consulted with the New Mexico Rural Water Users Association Board to get their input concerning the standards being used for the categories' final grades.



Capacity

The NM ASCE Drinking Water Committee (DWC) recently conducted a data/ needs survey of the larger domestic water use. The survey is being used as a guide to grade the public water systems. The DWC also consulted with the New Mexico Rural Water Users Association Board to get their input concerning the standards being used for this category's final grade. Water is New Mexico's most precious resource. Only about 13% of water used from New Mexico's surface and ground water sources is used for drinking water demands. Agricultural irrigation uses the bulk of available water sources.

About 70% of New Mexico's CWS serve populations under 500; however, those same small systems provide water to only four percent of the total population served by CWS. Whereas 95% of New Mexico's water systems use groundwater, only 48% of the population served by Ground Water Systems also consumes surface water. In 1998-1999, the New Mexico Drinking Water Bureau (NMDWB) developed and implemented the capacity assessment component of the Capacity Development Program. In State Functional Year 04, the New Mexico Drinking Water Bureau



Drinking water plant tour - Albuquerque Bernalillo County Water Utility Authority (NM Section ASCE Spring meeting 2009).

contracted with the New Mexico Environmental Finance Center to develop a new three-tiered capacity assessment approach. The tiered capacity assessments were designed to focus more time and attention on systems that had immediate compliance or capacity problems (Tier 1), and less time and attention on systems that appeared to be in good working order but may have had capacity deficiencies that would have resulted in public health issues over the long term.



Capacity (cont'd)

In State Functional Year 11, the NMDWB revised the tiered capacity assessments, creating separate assessments for specific purposes:

1. *A New System Capacity Assessment*, used to determine whether a Public Water System (PWS) has adequate capacity to begin construction and operation;
2. *A Capacity Assessment for Assistance Actions*, used to determine the capacity assistance a system should be offered; and
3. *A Drinking Water State Revolving Fund (DWSRF) Capacity Assessment*, used to determine whether a PWS meets the capacity criteria for a DWSRF loan.

The NMDWB undertook the revisions to the assessments in recognition of the fact that the capacity criteria differed depending on the purpose of the assessment.

For example, the capacity criteria used to

evaluate a new system must be tailored to systems that are beginning operations or setting up management structures.

New Mexico Drinking Water Regulation 20.7.10.201.F requires new public water systems to demonstrate “sufficient” capacity prior to receiving approval from the New Mexico Drinking Water Board (NMDWB) for construction and operation (but may be denied if “the public water system does not demonstrate sufficient technical, managerial or financial capacity; or public safety”).

New systems in New Mexico must submit an “Application for Construction or Modification of Public Water System.”

This application must include plans and specifications, an engineering design summary, disinfection and sampling plan, an inventory of contamination sources and a set of documents from which it can be determined whether the public water system has sufficient technical, managerial and financial capacity.



Capacity (cont'd)

The public water systems in New Mexico have the treatment and distribution system capacity to meet the demands of its customers. There is a need for upgrades to be able to continue to meet the

sustainability goal and consequently, alternate sources will be needed in the future. Based on this information the grade for Capacity is a C.

Main water line
break at the corner
of Copper and
Jefferson
Albuquerque, NM
(March 2012).





Condition

Funding

New Mexico is a very rural state that has not updated many of its older systems. It ranks 5th in the nation for population living below the poverty level and many of its water infrastructure systems are more than 80 years old. It is the 5th largest state in land mass area, but ranks 37th in population and 47th in population density (approximately 17 people per square mile based on the 2010 Census).

The population is so spread out that as a result, New Mexico has a wide diversity of drinking water system sizes and a large number of small systems. At the end of SFY11, there were 1,201 PWS. Of these, 609 were CWS, 152 were Non-Transient Non-Community systems (NTNC) and 440 were Transient Non-Community systems. Seventy percent of CWS serve a population under 500. However, those same small systems provide water to only four percent of the total population served by CWS.

New Mexico's potable water systems are deteriorating at an ever increasing rate due to the age of the systems. Most were constructed before 1960, and due to the low income/ low cost of the availability of

water (water bills) to its users there has been little if any rehabilitation conducted since the systems were built. Most rehabilitation is done when a system fails or there are outside regulations/enforcement pressures to do so.

The systems have been serving their communities very well over the years with safe reliable water, but routine maintenance and rehabilitation must be increased for there to be any chance of keeping up with the sustainability goal for future generations.

Therefore New Mexico's water systems receive a D+ for Condition.

Funding

The Safe Drinking Water Act (SDWA), as amended in 1996, established the DWSRF to make funds available to drinking water systems to finance infrastructure improvements and to provide assistance to public water systems (PWSs) for the purpose of ensuring the protection of public health.



Funding (cont'd)

The State of New Mexico adopted the *DWSRF Act* to support these efforts and implement the State's DWSRF program. DWSRF funds are used to ensure public health protection, compliance with drinking water standards, and affordable access to safe drinking water.

With the most significant impact affecting New Mexico's drinking water funding being the age of the basic infrastructure itself (50 – 70 years for most locations), and with revenues declining due to water conservation and increased maintenance costs (also age related) --now coupling those things with growth/ tax, investment stagnation, and fewer revenue/ state funds available for most construction/ renewal projects, Rehabilitation Funds are drying up. Another factor impacting New Mexico's drinking water funding is increased regulation. New regulations will be difficult to implement and will probably impose large capital costs on local communities.

The DWSRF Capacity Development Program will be needed to meet the funding needs for the Enhanced Surface

Water Treatment Rules, Ground Water Rule, and new Maximum Contaminant Levels for Arsenic and Radon long beyond their implementation.

The DWSRF will be crucial in providing loans to meet these regulations, but not all publicly owned systems in New Mexico can afford to pay back loans.

Due to requirements of the new rules and most funding sources, there will be a major increase in the number of hours required to manage and operate a public water system. This increase will be seen most significantly in the need for more detailed and accurate record keeping and in the hours needed to operate a water system to be in compliance with the SDWA.

In order for water systems to continue to be in compliance with ever-tightening requirements, many systems will need to upgrade or add new water treatment technology. Additionally, New Mexico has many small, old, volunteer-operated systems constructed pursuant to the state Sanitary Projects Act.



Funding (cont'd)

Operation and Maintenance

All of these systems require also a major overhaul of failing distribution networks that have outlived their useful life. Even though there are several funding sources available for New Mexico water systems, - a possible new source of funding called the Water Infrastructure Finance and Innovation Act has been outlined by the Water Environment Federation - obtaining matching funds or paying for loans will be a hard choice for systems with large rehabilitation needs. The shortfalls in revenue and available “free” funding result in a Funding grade of D+ for New Mexico.

Operation and Maintenance

The operators of CWS in small rural areas are typically overwhelmed by the conditions and responsibilities of operating and maintaining a public water system. And the operators of larger water systems are short on revenues/funds to adequately rehabilitate the system to desired levels. Because of the many infrastructure needs of New Mexico water systems and the persistent management problems and needs with some of the

smaller systems in New Mexico, there is a considerable short fall in available Revenue/funds. The Capital outlay portion (free) from the State legislature has not happened since 2009. Because there is no more “free money” and EPA, WTB and CDBG matching funds money is available only on a limited basis, the smaller systems in New Mexico are using a multi-agency effort.

The NMDWB staff, working in coordination with Rural Community Assistance Corporation, New Mexico Rural Water Association, regional Councils of Government and other organizations, is assisting regionalization groups with the myriad of tasks required to successfully regionalize.

There are numerous hurdles to overcome in allocating finances/availability for Drinking Water Operations: under New Mexico water law, all ground and surface waters belong to the public and are subject to appropriation under the Doctrine of Prior Appropriation, a constitutional provision that says earlier appropriations have priority over later appropriations.



Operation and Maintenance (cont'd)

An example of this for surface water use in New Mexico is the *acequia*. Acequias, or community ditches, are recognized under New Mexico law as political subdivisions of the state.

Many of the state's acequia associations have been in existence since the Spanish colonization period of the 17th and 18th centuries. Historically, they have been a principal local government unit for the distribution and use of surface water. The associations have the power of eminent domain and are authorized to borrow money and enter into contracts for maintenance and improvements. Acequia associations do not have the power to tax, so the expenses of maintenance and improvements are borne by the individuals served by the irrigation system. Almost all of these systems are in rural areas.

Also a problem for smaller systems is getting qualified operating and construction assistance to meet regulations. Due to the requirements of new rules and most funding sources, there will be a major increase in the

number of hours required to manage and operate a public water system.

The NMDWB and other assistance providers such as the New Mexico Rural Water Association, the Rural Community Assistance Corporation, and regional Councils of Government coordinate together to ensure that assistance for educating and training is directed where needed and available.

As in the section on Infrastructure condition, this increase will be seen most significantly in the need for more detailed and accurate record keeping and in the hours needed to operate a water system in compliance with the SDWA.

Historically, for New Mexico, the cost of water (water revenue) is and has been low in many locations.

This fact mixed with the increasing costs of water conservation measures, and the need for alternate new sources provides a grade of D+ for Operation and Maintenance and for Sustainability.



Public Safety

All of the New Mexico water systems providers pride themselves on delivering safe and reliable drinking water. The safety of a public drinking water system is contingent upon its infrastructure condition and upon its operational protection/security.

The concerns attendant to the condition of the infrastructure for New Mexico have mainly to do with its age and the issues and costs that stem from that age. Most basic systems in New Mexico are 50 – 70 years old (some are even older).

Though many of these systems serve limited populations, and are therefore not generally targets for terrorism or sabotage, a water problem/ outage, when it occurs, will manifest quickly, and the ensuing damage can be extensive.

In such cases, the local communities and small municipalities have few ways to replace/rebuild them and can only repair and maintain their systems with their minimal revenue funds, or they must obtain outside (matching or borrowed) funds that

have specific guidelines and requirements for use. Larger water systems, in contrast, have emergency response plans, by law, and contractors to assist when there are system problems. Larger systems also have trained people, company rules, IT systems, and experience on how to handle safety situations. Again, through no fault of their own, this is usually not true of the rural systems.



1950s steel line leak. Photo by J. Myers (11 May 2012)



Public Safety (cont'd)

Going forward, the most significant trends affecting New Mexico's drinking water protection efforts result from the work being done to meet all the many Federal standards and regulations. Regulations that are being proposed for radon and arsenic and other new regulations will be difficult to implement.

Most of the technology needed to ensure system compliance with these new regulations are highly advanced and will require a significant increase in the level of training, expertise of the public water system operators in New Mexico, and, therefore funding.

Additionally, many of these technologies have significant concerns associated with them, such as excessive water loss (in a desert state this is a real problem) and generation of hazardous and/or radioactive waste streams.

The needed additional operator training and operator expertise is a major concern for all New Mexico communities but especially weighs on smaller communities. Other areas of drinking water infrastructure safety which include production,

distribution, storage, and measurement system security have not been well addressed since New Mexico has such a wide diversity of drinking water system sizes and an abundance of small marginal operations systems.

With such disparity in number and size, it will be difficult to secure for a terrorist type of contingency. Whether we think such a thing will happen or not, though, it is still an issue that must be examined.

The Rural Community Assistance Corporation and regional Councils of Government are coordinating efforts in the areas of education and training to ensure they are directed where needed, appropriate and to insure compliance with the new regulations for public safety. Also the ASCE/AWWA/WEF WISE (Water Infrastructure Security Enhancements) training and videos are available to any of the water systems.

With these measures in mind and with the systems receiving assistance from state agencies for security measures, Public Safety receives a C for a grade.



Resilience

The “resilience” of a water system is defined as the system’s ability to provide water to its customers on a continuing and sustainable basis. Most small water user suppliers in New Mexico are able to provide water to their customers on a continuing basis. However, if there are operational problems or infrastructure damages, water in these systems can be off for long periods of time.

For municipalities and large water systems the system resilience is much better. Large water system operators reported an ability to repair or bypass system breaks within 12 hours or less. Therefore, water system outages tend to be shorter in duration, and, in most cases, there is no outage at all. Another factor to consider is the State’s DWSRLF program the Sustainable Water Infrastructure Management portal (SWIM), (formerly referred to as the Uniform Funding Application, Public Water Systems).

The purpose of SWIM is to ensure projects are fully funded and able to meet minimum capacity requirements. Under this program

water systems are required to conduct capacity assessments to make funding applications. Project interest forms submitted through SWIM for water projects are forwarded to the NMDWB to perform a Capacity Assessment if the Public Water System (PWS) did not have recent assessment. In addition to conducting the capacity assessments, NMDWB staff collaborates with the NMED Construction Programs Bureau to assist the PWS in identifying and determining qualifications for funding of infrastructure projects.

In conclusion, most major water systems in New Mexico have constructed robust water distribution systems and have adequate capacity for the near-term. The small water communities have reliable and safe systems, and even though they are determined to reliably operate and maintain their systems, they are on the edge when it comes to source supply and ability to do so.

New Mexico Public Water Systems are given a C+ when it comes to Resilience.



DRINKING WATER

Because ground water is being depleted in many locations, there must be an increased emphasis on: decreasing dependence on groundwater, groundwater recharging, conservation measures, and on alternate potable water sources.

Summary NM Drinking Water 2012:



Evaluation Criteria	Grade
Capacity	C
Condition	D+
Funding	D+
Operation and Maintenance	D+
Public Safety	C
Resilience	C+

Drinking Water Final Grade = C - (70.8)





Recommendations



Sustainable increased funding sources in the form of grants or loans need to be identified. Example: Encourage the passage of the “2010 Sustainable Water Infrastructure Investment Act.” There are existing programs that can be applied for with SWIM but the available funds are lacking.

EPA and the State expect water projects to be sustainable – therefore all loan and grant applicants must be reviewed to meet the criteria, plus require that the user, the loan and grant users help the effort to educate the public about the “true cost of water.”

Continued use and research of the use of brackish water as an additional water resource.

Water conservation at all levels/ types of use will need to be promoted by all suppliers/purveyors.

Because ground water is being depleted in many locations, there must be an increased emphasis on: decreasing dependence on groundwater, groundwater recharging, conservation measures, and on alternate potable water sources.

