15. EPA Region 6: Arkansas, Louisiana, New Mexico & Oklahoma

15.1 Demographic and economic indicators

Figure 15.1 Demographic and economic indicators

Population indicators	Arkansas	Louisiana	New Mexico	Oklahoma
2000 population	2,678,288	4,468,979	1,820,813	3,453,943
2008 population	2,867,764	4,451,513	1,986,763	3,644,025
2025 population (projected)	3,151,005	4,762,398	2,106,584	3,820,994
% annual population growth, 2000-2008	0.9%	0.0%	1.1%	0.7%
GDP indicators				
2000 GDP ($ million)	66,801	131,520	50,725	89,757
2008 GDP ($ million)	98,331	222,218	79,901	146,448
% annual GDP growth, 2000-2008	5.0%	6.8%	5.8%	6.3%

Source: Population data: U.S. Census Bureau; GDP data: U.S. Bureau of Economic Analysis

15.2 Overview of regional challenges

Whether you find yourself in the New Mexican desert or in a **Louisiana** swamp, this region's water problems are strikingly similar.

Heavy industry, agriculture and manufacturing are the economic drivers of the region. Feedlot cattle raising, natural gas mining, rapid urbanization, regional migration, and oil & gas production all compete for available water and demand pollution mitigation. It follows then that limited water supply, the management of animal and industrial waste, and sanitary sewer overflows (SSO) will all influence investment priorities here.

Additionally, large parts of Region 6 also depend on groundwater, notably from the Ogallala Aquifer and the Rio Grande Aquifer. Populations in the Central and Rocky Mountain regions of the U.S. depend upon this same water, making the development of alternative water supplies crucial to secure both public and industrial water demand.

The main challenges Region 6 faces are summarized below:

- **Arkansas**: Nutrient management, agricultural pollution, and periodic cycles of drought and flooding.
- **Louisiana**: Wetland loss and the management of industrial by-products.
- **Oklahoma**: Like Arkansas, agricultural pollution and periodic drought.
- **New Mexico**: Water scarcity in areas with increasing residential, commercial and industrial growth.

15.2.1 Environmental

In **New Mexico**,

Industrial and agricultural pollution throughout the watershed,

Population growth in New Mexico's Albuquerque Basin,

Arkansas' substantial poultry production, **Oklahoma's** beef cattle and **New Mexico's** dairy industry

strategies these states will develop.

Wetland loss is a major concern in **Louisiana** and to a lesser degree **Arkansas**.
shows promise for further expansion.

15.2.2 Regulatory

As mentioned previously (see section 15.2.1), regulations for nutrient pollution are in flux and affect all of Region 6.

Hydraulic fracturing is another developing regulatory issue

Fly ash, a by-product of coal combustion, is also being studied by the EPA
. A public comment period on the issue has ended and its outcome may impact NPDES permitting throughout the country.

15.2.3 Economic

Hurricane Katrina repairs in **Louisiana** carry on sluggishly,
the summer 2010 Deepwater Horizon oil spill

All states in the region have significant rural populations on septic systems and wells, unconnected to public water systems.

15.3 Water and wastewater sector organization and structure

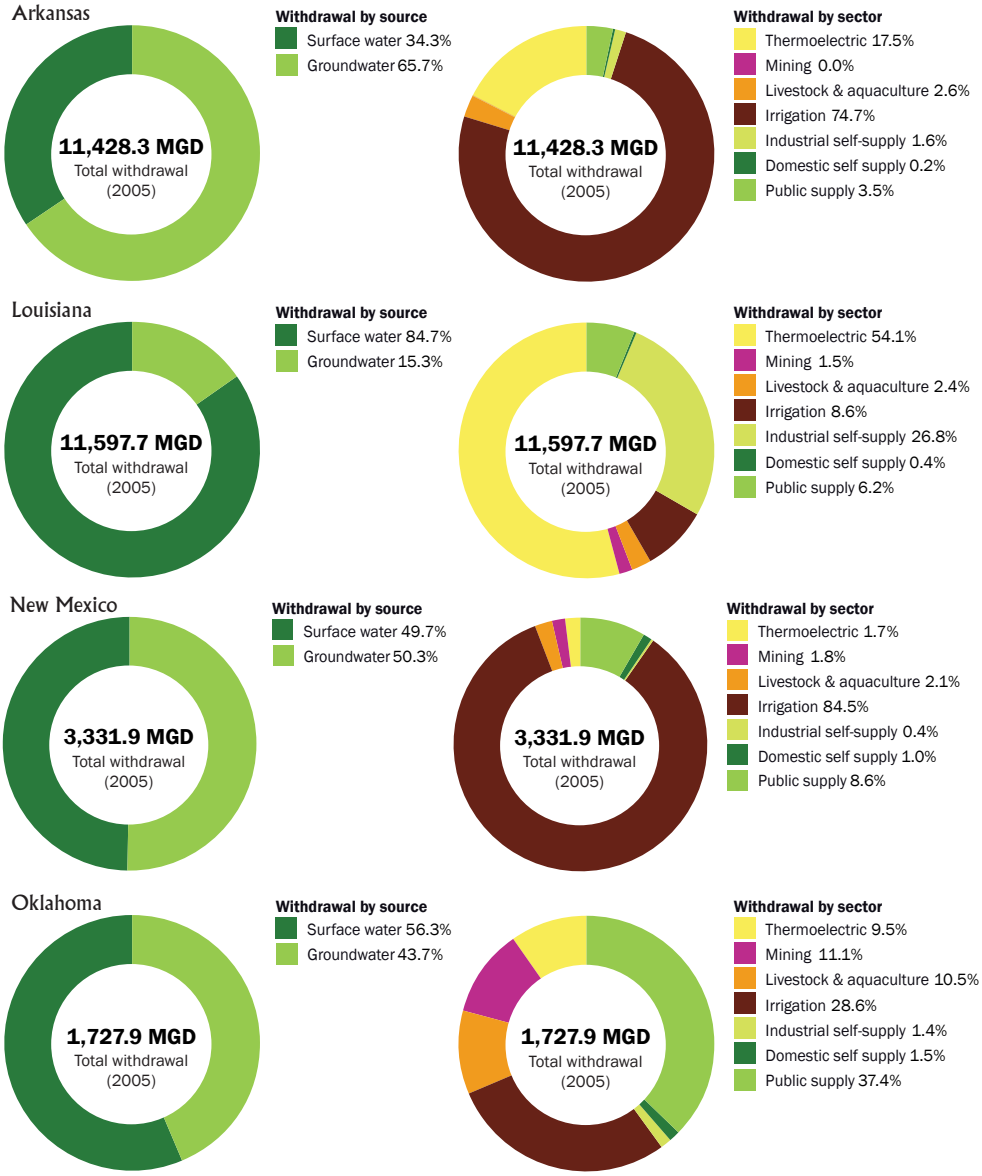
Figure 15.2 State sector structure: Region 6

State	Agency	Roles
Arkansas	Department of Environmental Quality (ADEQ)	Clean Water Act enforcement NPDES permits TMDL program Certify wastewater facility operators
	Department of Health (ADH)	Review and inspect water facilities
	Natural Resources Commission (ANRC)	State water plan Permit water use Can designate “critical groundwater areas”
Louisiana	Department of Environmental Quality (LDEQ)	NPDES permits TMDL program CWSRF
	Department of Health and Hospitals (LDHH)	Regulate drinking water quality and permitting DWSRF
New Mexico	Environment Department (NMED)	NPDES permits TMDL program Develop water quality standards Certify water facility operators
	Office of the State Engineer (NMOSE)	Determine and enforce water rights
Oklahoma	Department of Environmental Quality (ODEQ)	NPDES permits TMDL program Certify water facility operators
	Water Resources Board (OWRB)	Comprehensive Water Plan Permit water use and well drilling

Source: GWI/AWI research

15.4 State water withdrawal

Figure 15.3 Estimated water withdrawal by source and by sector, 2005



Water source (MGD)	Arkansas	Louisiana	New Mexico	Oklahoma
Groundwater	7,506.8	1,775.4	1,677.0	755.3
Surface water	3,921.5	9,822.3	1,654.9	972.6
Sector (MGD)	**Arkansas**	**Louisiana**	**New Mexico**	**Oklahoma**
Public supply	404.1	719.0	286.3	646.2
Domestic self-supply	17.8	44.1	32.0	25.1
Industrial self-supply	178.3	3,108.1	13.2	24.1
Irrigation	8,534.2	992.1	2,814.9	494.9
Livestock & aquaculture	295.3	279.0	70.9	180.8
Mining	1.3	178.2	58.7	192.7
Thermoelectric	1,997.2	6,277.2	55.9	164.2
Total	**11,428.3**	**11,597.7**	**3,331.9**	**1,727.9**

Source: USGS, 2005

15.5 Wastewater management

15.5.1 Wastewater

In **New Mexico**, dairy farms in the Southeast, oil and gas drilling in the Northwest and agriculture in the central region are the main polluters of water. In addition, much of the population is still on septic systems. This means wastewater is decentralized, making it more expensive to treat and creating more point-sources of pollution for wastewater facilities to manage. The **New Mexico Environment Department** aims to tackle such issues through the Liquid Waste (Septic Tank) Program, which ensures safe disposal of household sewage. The program applies to wastewater treatment and disposal systems receiving up to 2,000 gal/d (7571,000 m³/d) of domestic liquid waste. The program requires that if a lot is less than 3/4 acres, then traditional septic systems should be replaced by advanced-treatment, evapotranspiration, or a split-flow system. This is in accordance with the Liquid Waste Regulations, which became effective September 1, 2005, and were amended February 21, 2007.

The East Bank Wastewater Treatment Plant, located in New Orleans, is one of the major wastewater treatment facilities in **Louisiana**. The plant is capable of treating 100% of the city's sewage to secondary treatment levels, using the high-purity oxygen modification of the activated sludge process. The main wastewater treatment issues in the state are the contamination of surface water from improperly treated municipal wastewater and agricultural runoff. Atmospheric deposition of industrial chemicals is also a primary source of contamination. Additionally, spring and summer agricultural runoff from the Mississippi River into the Gulf of Mexico creates a "dead zone" killing off fish and other marine life off the coast of **Louisiana** during these times of the year.

Due to problems with nutrient pollution in **Arkansas** (see section 15.2.1) the EPA is reviewing state standards for phosphorus levels in wastewater. Many states, including Arkansas, have moved from narrative criteria for nutrient limits to numeric criteria. This means that standards for nitrogen and phosphorus concentrations in wastewater have changed from ecological impacts and subjective, effects-based limitations, to standards that have a fixed, measurable amount. Wastewater operators keep their eyes on these changing standards in anticipation of mandated treatment level upgrades. **Fourche Creek Treatment Plant** is considered to be one of the most innovative WWTPs in the state, with the capacity to treat 16 MGD (61,000 m³/d) of wastewater to a secondary level with step-feed activated sludge. A combination of physical and biological treatment processes enables a reduction of approximately 90% of the pollutant.

The Coffee Creek Wastewater Treatment Plant is one of the largest wastewater treatment facilities in **Oklahoma.** The plant was also recognized by the Oklahoma Water Pollution Control Association as the Outstanding Large Plant in 2005. The plant has the design capacity to treat 9 MGD (34,000 m³/d) of wastewater to a secondary level using a continuous flow activated-type process. In terms of regulation, the state has so far only made laws about phosphorus concentrations in the Illinois Basin watershed, which spans the Oklahoma-**Arkansas** border. The ruling, passed in 2003, calls for all point source polluters in the basin to comply with 0.37 ppm of phosphorus by June 2012.

15.5.2 Water reuse

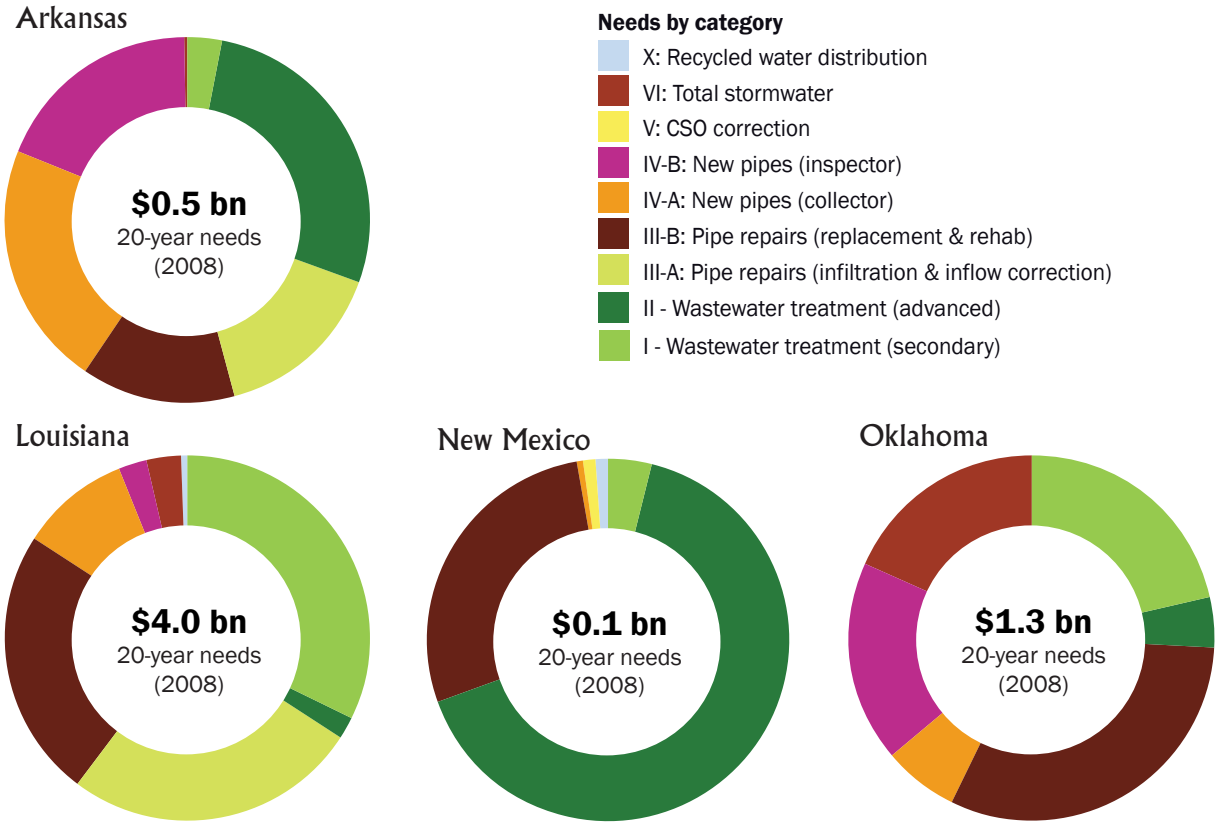
While there is not a great deal of water reuse infrastructure in Region 6, **New Mexico**, faced with low rainfall and little surface water, has pioneered indirect potable reuse. The town of Cloudcroft, NM developed a project employing second-generation MBR, RO and UF to treat wastewater. The treated wastewater is then blended with reservoir, well and spring water to supplement the drinking water for Cloudcroft's 1,000 residents.

Rules for reuse of wastewater are state-specific and **New Mexico** is the only state in the region reporting water reuse facilities.

15.6 Water and wastewater finance

15.6.1 Water and wastewater 20-year needs

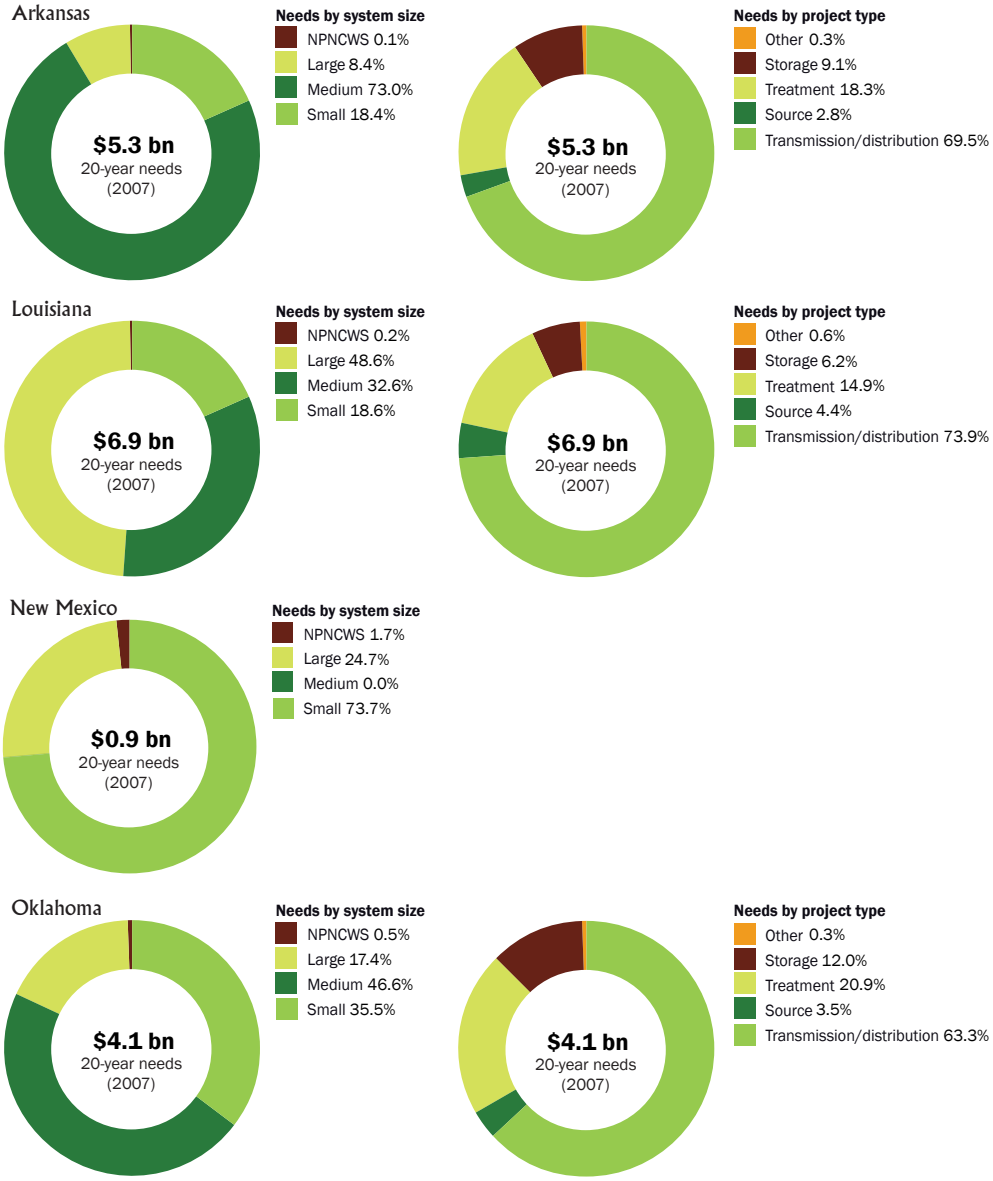
Figure 15.4 20-year needs for wastewater, stormwater and recycled-water infrastructure



Category of need ($ million)		Arkansas	Louisiana	New Mexico	Oklahoma
Wastewater treatment	I - Secondary WW treatment	14.7	1,303.0	4.1	279.9
	II - Advanced WW treatment	130.1	81.2	67.4	56.0
Pipe repairs	III-A - inflow & infiltration (I&I) correction	71.7	1,055.2	-	1.1
	III-B - Sewer replacement and rehabilitation	64.3	958.0	28.7	408.8
Pipe repairs subtotal		**136.1**	**2,013.2**	**28.7**	**409.9**
New pipes	IV-A - Collector	101.3	392.3	0.5	84.2
	IV-B - Inspector	88.3	100.3	-	233.3
New pipes subtotal		**189.6**	**492.5**	**0.5**	**317.6**
V - Combined sewer overflow (CSO) correction		-	-	1.3	-
VI - Total stormwater		0.2	121.7	-	235.4
X - Recycled water distribution		-	21.0	0.9	-
Total		**470.6**	**4,032.6**	**102.9**	**1,298.8**

Source: EPA, 2008

Figure 15.5 20-year needs for drinking water infrastructure by system size and project type



Project type ($ million)	Arkansas	Louisiana	New Mexico	Oklahoma
Transmission/distribution	3,667.5	5,100.7	n/a	2,603.5
Source	149.3	305.7	n/a	142.0
Treatment	966.0	1,024.8	n/a	858.9
Storage	478.3	427.4	n/a	493.5
Other	17.4	41.3	n/a	14.1
Total	**5,278.5**	**6,900.1**	**n/a**	**4,112.1**

System size ($ million)	Arkansas	Louisiana	New Mexico	Oklahoma
Small	973.3	1,281.0	687.5	1,457.9
Medium	3,854.3	2,249.4	n/a	1,917.2
Large	443.6	3,354.7	230.0	714.8
NPNCWS	7.3	14.9	15.4	22.3
Total	**5,278.5**	**6,900.1**	**932.9**	**4,112.1**

n/a – information not available

Source: EPA, 2007

Clearly the needs here are in transmission and, by extension, piping, in medium to large communities. Limited need for recycled water distribution exists because of undeveloped water reuse systems. **New Mexico** is the only state in the region with any reported municipal wastewater reuse. Industry trends in water reuse indicate that in places such as **Louisiana**, however, an untapped market for high-value industrial consumers, specifically in the thermoelectric sector, could be expanded.

15.6.2 State revolving funds

Figure 15.6 CWSRF and DWSRF federal allotments, 2009 and 2010

DWSRF ($ million)	Arkansas	Louisiana	New Mexico	Oklahoma
2010 federal allotment	20.54	25.65	13.57	16.86
2009 federal allotment	10.23	11.54	8.15	13.15
2009 ARRA allotment	24.49	27.63	19.50	31.48
CWSRF ($ million)	**Arkansas**	**Louisiana**	**New Mexico**	**Oklahoma**
2010 federal allotment	13.46	22.62	10.10	16.63
2009 federal allotment	4.50	7.56	3.37	5.55
2009 ARRA allotment	25.90	43.52	19.43	31.98
2009 SRF total (inc ARRA)	**65.11**	**90.24**	**50.45**	**82.17**
2010 SRF total	**34.00**	**48.27**	**23.68**	**33.49**

Source: EPA

15.6.3 Finance in selected large cities

15.6.3.1 Finance in Little Rock, Arkansas

Central Arkansas Water is the largest utility in **Arkansas**, providing an average of 56 MGD (212,000 m³/d) of drinking water to 398,000 people in Saline and Pulaski counties. The utility does not provide wastewater treatment.

Projected capital expenditures for expansions and capital improvements of the water system for the 2010-2014 period total $128 million. This is expected to be financed from a combination of:

- Loan proceeds through the revolving loan fund program of the Arkansas Natural Resources Commission (approximately $4 million)
- Remaining proceeds of the Series 2007 Bonds (approximately $3.8 million)
- Cash generated by the water system (approximately $50.5 million)
- Revenue bond issues in 2012 and 2013 (estimated to be $19.5 million each)
- Bonds to be issued in 2010.

Of the 5-year investment plan,

15.6.3.2 Finance in New Orleans, Louisiana

The Sewerage and Water Board of New Orleans is one of the major utilities in the state, serving around 350,000 people in New Orleans and neighbouring communities. The region has been massively impacted by the Hurricane Katrina event of 2005.

The FY 2010-14 CIP totals $2,987 million. This includes $239 million for water supply and distribution, $427 million for wastewater systems, and $2,321 million for drainage facilities. Nearly 78% of the fund is allocated to drainage facilities. However, the total funds available for drainage are only $1,786 million, creating a balance deficit of $535 million which is mainly to be covered by debt.

The majority of funds for capital investment are obtained from grants and external funds.

The Board continues to focus on improvements to drainage systems and repairs to infrastructure, many of which have been damaged by Katrina. Notably, in January 2010, the Board reinstated the Sewer System Evaluation and Rehabilitation Program, which had been interrupted by Hurricane Katrina. The Board has agreed to make extensive repairs to

wastewater systems; this involves repairing 62 pump stations that were affected by Katrina, and other related collection systems served by those pump stations.

15.6.3.3 Finance in Oklahoma

The City of Oklahoma City Utilities . A large proportion of the city's major capital investments are financed by General Obligation Bonds that are issued only upon approval of voters. Property tax is used as the primary revenue source for repaying the bonds.

15.6.3.4 Finance in Albuquerque and Bernalillo, New Mexico

The City of Albuquerque and the County of Bernalillo manage their water and wastewater services through a joint agency called the **Albuquerque/Bernalillo County Water Authority Utility**, which provides over 150 MGD (568,000 m³/d) of drinking water to 533,250 people in **New Mexico**. The authority's major capital investments are funded by a combination of cash and revenue bond issues. The Authority proposes using working capital or fund balance to close this difference.

15.6.4 Current and future projects

Figure 15.7 Tracked projects

State	Project name	Expected cost	Details

State	Project name	Expected cost	Details

Source: GWI and AWI project trackers

Figure 15.8 Other notable projects in Region 6 (excluding Texas)

Utility / location	Project name	Anticipated cost	Details

Utility / location	Project name	Anticipated cost	Details

Source: Water Market USA 2011 Project List. A complete list can be found on the accompanying CD.

15.7 Procurement models

With the exception of **Oklahoma**, three of the four states in Region 6 have embraced design-build (DB). **New Mexico**, for example, allows DB for public works projects that are budgeted at $10 million or more.

Following the devastation that Hurricane Katrina wreaked on the state, **Louisiana** passed legislation in 2006 authorizing DB for use on any infrastructure improvements in affected areas until 2008. In 2009 Louisiana extended that legislation to allow DB, design-build-operate-maintain (DBOM), design-build-finance-operate-maintain (DBFOM), and construction-manager-at-risk (CM@R) procurement for any state or municipal project.

Arkansas specifically authorizes DB procurement for water and wastewater plants and infrastructure. Design-build-operate (DBO) is permitted for stormwater treatment facilities.

Of all the states in Region 6, **Oklahoma** has the strictest laws regarding alternative procurement. Municipal authorities may only use DB or CM@R if the project benefits the public, requires cost control, and involves an unusually complex design and construction process. The only exception is if the project responds to an emergency or a natural disaster. However, as the agency only has to prove to itself that DB is the best option, these stipulations do not pose much of an obstacle.

15.8 Industrial market profile

EPA effluent outfall permitting gives the following profile of industry in region 6:

Figure 15.9 Industrial market profile

Industry	No. of major facilities	No. of minor facilities	Recorded flow - large facilities only (MGD)
Automotive			
Chemicals			
Electrics			
Food			
Metals			
Mining			
Oil and Gas			
Power			
Pulp and Paper			
Textiles			
Other			

Source: EPA

15.9 Forecast

Figure 15.10 EPA Region 6 (excluding Texas) market forecast

Utility water capex ($m)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Water network - new										
Water network - rehab										
WTP - new										
WTP - upgrade / expansion										
Water resources inc. desal.										
Total utility water capex										
Utility wastewater capex										
WW network - new										
WW network - rehab										
WWTP - new										
WWTP - upgrade / expansion										
Other wastewater										
Total utility WW capex										
Utility water and WW opex										
Industrial capex										
Equipment (utility + industrial)										

Source: GWI/AWI