Contents

Section 12

West Desert Basin

Utah State Water Plan

Water Quality

12.1 INTRODUCTION

This section presents data and information on existing levels of water quality in the West Desert Basin. Sources of pollution are identified, problems and solutions are discussed, and recommendations for control and improvement by responsible agencies are given. Water pollution comes from both natural and man-caused sources. Examples of naturally occurring pollution include such things as mineral springs, erosion, landslides, wildlife waste materials, and dead and decaying animals. Man-caused pollution is categorized as being from either point or non-point sources. Point sources contribute pollution from a single definable point such as a pipe discharge from an industrial plant or municipal wastewater treatment facility. Non-point pollution comes from diffuse sources via overland flow and gully erosion. This includes pollution from activities such as agriculture, grazing, mining, construction, urban runoff, and recreation.

Water quality is very important and often easily degraded. While natural environmental processes provide a means for removing pollutants from water, there are definite limits. It is up to society to provide safeguards to protect and maintain water quality.

12.2 SETTING

There are 12 wastewater treatment plants (WWTP) in the basin. These are shown in Table 12-1. Tooele City's new Wastewater Reclamation System went into operation in April 2000 and is the first of its kind in Utah. The Treatment plant is located adjacent the Overlake golf course and the system's effluent is used in the golf course's water features and to irrigate the course. At the present time the plant is processing 1.4 million gallons of wastewater per day. The system is designed to handle 2.35 million gallons per day with the capability of expanding to 4.7 million gallons per day. Treated municipal wastewater has been has been used to irrigate cropland for years, but this is the first time in Utah that reclaimed municipal water has been reused in a residential setting. The reclaimed water is used not only to maintain fairways and greens but is also available for lawns in the Overlake community.

Tooele Wastewater Reclamation Plant

Table 12-1
MUNICIPAL AND INDUSTRIAL WASTEWATER TREATMENT FACILITIES

Treatment Facility	Type of Treatment	Receiving Stream	Discharge (mgd)
Box Elder County			
Thiokol Wastewater Treatment Plant	Oxidation	Blue Creek	.23
Tooele County			
Grantsville Wastewater Treatment Plant	Aerated Lagoon	Blue Lake	.74
Lake Point Wastewater Treatment Plant	Total Containment	N.A.	N.A.
Stansbury Park Wastewater Treatment Plant	Total Containment	N.A.	N.A.
Tooele Wastewater Reclamation System	Trickling Filter	Irr. ditch	1.4
Tooele Army Depot Wastewater Treatment	Total Containment	N.A.	N.A.
Wendover Wastewater Treatment Plant*	Facultative Lagoon/ Total Containment	N.A.	N.A.
Barrick-Mercur Mine	Total Containment	N.A.	N.A.
Dugway - Baker	Total Containment	N.A.	N.A.
Dugway - Carr	Total Containment	N.A.	N.A.
Dugway - Ditto	Total Containment	N.A.	N.A.
Dugway English Village	Total Containment	N.A.	N.A.

* 20% goes to West Wendover Treatment Plant where the effluent is used on the golf course

12.3 ORGANIZATIONS AND REGULATIONS

Passage of the Utah Water Pollution Control Act of 1953 ushered the state into maintaining high quality water resources. The Federal Water Pollution Control Act in 1972 brought about major changes, particularly in the wastewater treatment program. The Safe Drinking Water Act of 1976 requires individual water systems to collect data on various bacteriological parameters, inorganic chemicals, and organic chemicals that may be a hazard to public health.

A number of federal, state and local agencies are currently involved in the management and monitoring of water quality. These agencies include: the Utah Department of Agriculture and Food, the Utah Department of Environmental Quality (Division of Water Quality, and Division of Drinking Water), the U.S. Bureau of Reclamation, the U.S. Geological Survey, and the U.S. Environmental Protection Agency.

12.3.1 Local

Towns, cities and counties have primary responsibilities for water pollution control within their respective entities. These responsibilities and authorities are contained in Titles 10, 11, 17, 19 and 73 of the *Utah Code Annotated*, 1953, amended.

12.3.2 State

The state agency charged with the responsibility to regulate water quality is the Utah Division of Water Quality within the Utah Department of Environmental Quality. Historically, water quality has been under jurisdiction separate from water quantity and the Division of Water Rights. Changing conditions will impact this relationship. Increasing populations will require more high quality water.

There will also be more water quality problems associated with increased urban growth and recreational activities. These conditions will require those concerned with water quality to work closely with administrators of water rights. Eventually, close coordination will be required as one issue will directly influence the other.

State programs are not comprehensive enough to cover all activities which can be sources of groundwater contamination. The number of these activities suggests it will be difficult in the future to maintain the high quality of groundwater unless local governmental agencies take an active role in protecting wells, springs and the groundwater aquifer. This issue is discussed in more detail in Section 11 - "Drinking Water" and Section 19 - "Groundwater."

Utah Department of Agriculture and Food - The Environmental Quality Section of the Department of Agriculture manages Utah's agricultural non-point source water pollution control and prevention program via contract from the Department of Environmental Quality (DEQ). This is partially funded through federal grants passed through DEQ from the Environmental Protection Agency (EPA) and partially supported by matching funds from state and local government agencies and private sources. The program is divided into several parts: watershed management projects, usually on-the-ground conservation efforts; groundwater monitoring, which is a combination of education and monitoring; and information and education, a combination of school and adult education and public information, including newsletters, brochures, videos and slide shows.

Department of Environmental Quality - The Department of Environmental Quality has implemented the Groundwater Quality Protection Strategy for the state of Utah based on an Executive Order issued in 1984 by the governor of Utah.

Under the Utah Water Quality Act, the Division of Water Quality is responsible for establishing water quality standards and regulating impacts to the waters of the state. Additionally, the Environmental Protection Agency has delegated authority to Utah to administer its federal-based water quality regulatory programs. Facilities that produce, treat, dispose of or otherwise discharge wastewater may need permits from the Division of Water Quality.

Storm water discharge permits are required from most industries and some municipalities that discharge storm water runoff to surface waters such as lakes or streams. Storm water pollution prevention plans must be in place prior to application. Any facility that discharges, or may discharge, pollutants to groundwater is required to obtain a Ground Water Discharge permit. Major agricultural, municipal and industrial dischargers are regulated.

Wastewater discharge to surface waters, including storm drains, requires a permit prior to such discharge. Utah Pollutant Discharge Elimination System (UPDES) permits are required for all industrial, municipal and federal facilities. Any facility discharging wastewater may need a UPDES permit unless it discharges into a municipal sanitary sewer system.

The Division of Water Quality has established surface stream classifications in Utah based on existing uses. Table 12-2 gives the classification for the basin's streams. Different reaches of the same stream can fall under different classifications.

12.3.3 Federal

To date, the role of the federal government has been to set national policy by passing laws such as the Safe Drinking Water Act and the Clean Water Act. The federal government's present approach is to allow states considerable leeway in enforcing and complying with these statutes. However, should states and local governments fail to act decisively to comply with

Table 12-2

SURFACE WATER CLASSIFICATIONS

Streams	Classification				
Grouse Creek and tributaries, Box Elder County		2B		3C	4
Muddy Creek and tributaries, Box Elder County		2B		3C	4
Dove Creek and tributaries, Box Elder County		2B		3C	4
Pine Creek and tributaries, Box Elder County		2B	3A		4
Rock Creek and tributaries, Box Elder County		2B	3A		4
Fisher Creek and tributaries, Box Elder County		2B	3A		4
Dunn Creek and tributaries, Box Elder County		2B	3A		4
Donner Creek and tributaries, Box Elder County		2B	3A		4
Betteridge Creek and tributaries, Box Elder County		2B	3A		4
Indian Creek and tributaries, Box Elder County		2B	3A		4
Tenmile Creek and tributaries, Box Elder County		2B	3A		4
Curlew Creek, Box Elder County		2B	3A		4
Blue Creek and tributaries, from GSL to Blue Creek Reservoir		2B		3D	4
Blue Creek and tributaries, from Blue Creek Reservoir to headwaters		2B	3B		4
All perennial streams on the east slope of the Pilot Mountain Range		2B	3A		4
North Willow Creek and tributaries, Tooele County	1C	2B	3A		4
South Willow Creek and tributaries, Tooele County		2B	3A		4
Hickman Creek and tributaries, Tooele County		2B	3A		4
Barlow Creek and tributaries, Tooele County		2B	3A		4
Clover Creek and tributaries, Tooele County		2B	3A		4
Faust Creek and tributaries, Tooele County		2B	3A		4
Vernon Creek and tributaries, Tooele County		2B	3A		4
Ophir Creek and tributaries, Tooele County		2B	3A		4
Settlement Canyon Creek and tributaries, Tooele County		2B	3A		4
Middle Canyon Creek and tributaries, Tooele County		2B	3A		4
Tank Wash and tributaries, Tooele County		2B	3A		4
Basin Creek and tributaries, Tooele and Juab Counties		2B	3A		4
Thomas Creek an tributaries, Juab County		2B	3A		4
Indian Farm Creek and tributaries, Juab County		2B	3A		4
Cottonwood Creek and tributaries, Juab County		2B	3A		4
Red Cedar Creek and tributaries, Juab County		2B	3A		4
Granite Creek and tributaries, Juab County		2B			4
Trout Creek and tributaries, Juab County		2B			4
Birch Creek and tributaries, Juab County		2B			4
Deep Creek and tributaries, Juab County and Tooele Counties		2B	3A		4
Cold Spring, Juab County		2B		3C	3D
Cane Spring, Juab County		2B		3C	3D
Lake Creek, from Garrison (Pruess Reservoir) to Nevada state line		2B	3A		4
Snake Creek and tributaries, Millard County		2B		3B	4
Salt Marsh Spring Complex, Millard County		2B	3A		
Twin Springs, Millard County		2B		3B	
Tule Spring, Millard County		2B		3C	3D
Coyote Spring Complex, Millard County		2B		3C	3D
Hamblin Valley Wash and tributaries, Nevada state line to headwaters		2B			3D 4

Class 1 Culinary raw water source
Class 1C Domestic use with prior treatment
Class 2 Instream recreational use and aesthetics
Class 2A Primary human contact: swimming
Class 2B Secondary human contact: boating, wading, etc
Class 3 Instream use by aquatic wildlife
Class 3A Habitat maintenance for cold water game fish, water-related wildlife and food chain organisms
Class 3B Habitat maintenance for warm water game fish, water-related wildlife and food chain organisms
Class 3C Habitat for non game, water-related wildlife and food chain organisms.
Class 3D Habitat for water fowl, shore birds, water-related wildlife, and food chain organisms.
Class 4 Agricultural-livestock and irrigation water.
Class 5 Great Salt Lake general use: primary and secondary human contact, water related wildlife, and mineral extraction
Class 6 General use restricted and/or governed by environmental and health standards and limitations

the laws, the federal government may assert a more active role in the enforcement of federal water quality standards.

The federal government has also been involved in funding numerous water quality projects through the Superfund Cleanup Program. The primary agencies involved in water quality issues are: the U.S. Bureau of Reclamation, the U.S. Geological Survey, the Natural Resources Conservation Service and the Environmental Protection Agency.

Federal standards for solid waste and hazardous material are set forth under the Comprehensive Environmental Response and Comprehensive Liability Act (CERCLA). These standards are regulated by the Environmental Protection Agency. Compliance is verified through the local agencies:

Bureau of Reclamation - The bureau's water quality objective is to collect baseline data to be used in assessing the impact of potential projects on the water quality of streams.

U.S. Geological Survey - The U.S. Geological Survey (USGS) has an established database on surface and groundwater quality in the basin. Although the major emphasis of the USGS program is flow measurement, some stations are routinely monitored for water quality. The USGS data can be accessed through either the EPA STORET system or the USGS WATSTORE system. Table 12-3 lists the discontinued surface water quality stations for which the U.S. Geological Survey has water quality data. Table 12-4 gives surface water quality of selected streams in the basin.

Environmental Protection Agency - The Environmental Protection Agency not only has responsibility to monitor compliance with the federal Clean Water Act, but also oversees the national Superfund Cleanup Project projects.

12.4 WATER QUALITY PROBLEMS AND NEEDS

Water quality can be impaired either by man or by natural causes. The West Desert Basin is free of any really significant water quality problems. Surface water streams arise in the mountains and remain relatively free of natural and man caused pollution to the point at which they are diverted for agricultural use. Groundwater tends to be high in TDS near the Great Salt Lake, but near the mountain benches where there is significant recharge, groundwater quality is generally good to excellent.

12.4.1 Surface Water

Irrigation water is typically diverted from mountain streams at or above the mouth of the canyon. The quality of water from these streams is generally high. The one exception is Deep Creek (Curlew Valley) which flows into Utah from Idaho. The water quality of this stream is low because much of the flow is return flow from agricultural use. The basin's stream channels below the points of diversion are often dewatered or can have a high salinity problem. Some riparian areas have been degraded but there is not a lot of man-caused water quality impacts within the basin.

12.4.2 Groundwater Pollution

Groundwater is one of the state's most valuable resources. In the West Desert Basin, groundwater accounts for virtually 100 percent of the municipal and industrial water supply. Magnifying the issue of groundwater quality is the concern with how easily an aquifer can be polluted and how difficult it can be to clean up. Additionally, groundwater contamination is not readily apparent or easily detected. Groundwater issues are discussed in detail in Section 19 of this report.

Table 12-3

DISCONTINUED SURFACE WATER QUALITY STATIONS

West Desert Basin

Number	Description	Years of record
172903	Great Salt Lake West Pond near Wendover	1988-90
172963	West Locomotive at Locomotive Spring near Snowville	1973-75
172964	Baker Spring at Locomotive Spring near Snowville	1969-70 & 1973-75
172965	Bar M Spring near Snowville	1969-70 & 1973-80
172967	Off Spring at Locomotive Spring near Snowville	1969-70 & 1973-80
172968	Sparks Spring at Locomotive Spring near Snowville	1969-70 & 1973-80

TABLE 12-4
SURFACE WATER QUALITY OF SELECTED STREAMS
West Desert Basin

Stream Gage Number - Name	Electro Conductivity (µmhos/cm @ 25°C)			Total Dissolved Solids (mg/l)			No. of Samples
	Max.	Min.	Ave.	Max.	Min.	Ave.	EC/TDS
10172700 - Vernon Creek near Vernon, Utah	650	140	424				158/
10172765 - Clover Creek above Big Hollow near Clover, Utah	350	290	323				15/
10172791 - Settlement Canyon above reservoir near Tooele, Utah	565	460	490				16/
10172795 - Box Elder Wash near Grantsville, Utah	560	455	509				6/
10172800 - South Willow Creek near Grantsville, Utah	430	160	260				131/
10172805 - North Willow Creek near Grantsville, Utah	350	0	244				58/
10172870 - Trout Creek near Callao, Utah	700	44	115				153/
10172952 - Dunn Creek near Park Valley, Utah	400	95	222				62/
10172963 - West Locomotive Spring at near Snowville, Utah	4230	4230	4230	2610	2610	2610	1/1
10172964 - Baker Spring at Locomotive Spring near Snowville, Utah	3250	3250	3250	1920	1920	1920	1/1
10172965 - Bar M Spring at Locomotive Spring near Snowville, Utah	5990	4870	5637	3290	2950	3100	34/22
10172967 - Off Spring at Locomotive Spring near Snowville, Utah	6300	5200	5854	3400	3090	3253	33/22
10172993 - Blue Spring Creek at Promontory Road	10500	8330	9552	6560	5140	5613	3/2
13077659 - Raft River near Yost, Utah	764	512	621				7/
13077690 - Johnson Creek near Yost, Utah	300	300	300				1/
13077700 - George Creek near Yost, Utah	410	60	138	191	63	70	85/6
13077710 - George Creek at Yost, Utah	235	235	235	146	146	146	1/1
13079000 - Clear Creek near Naf, Idaho	234	100	124	134	68	75	6/5
13078100 - Onemile Creek near Standrod, Idaho	270	270	270				1/