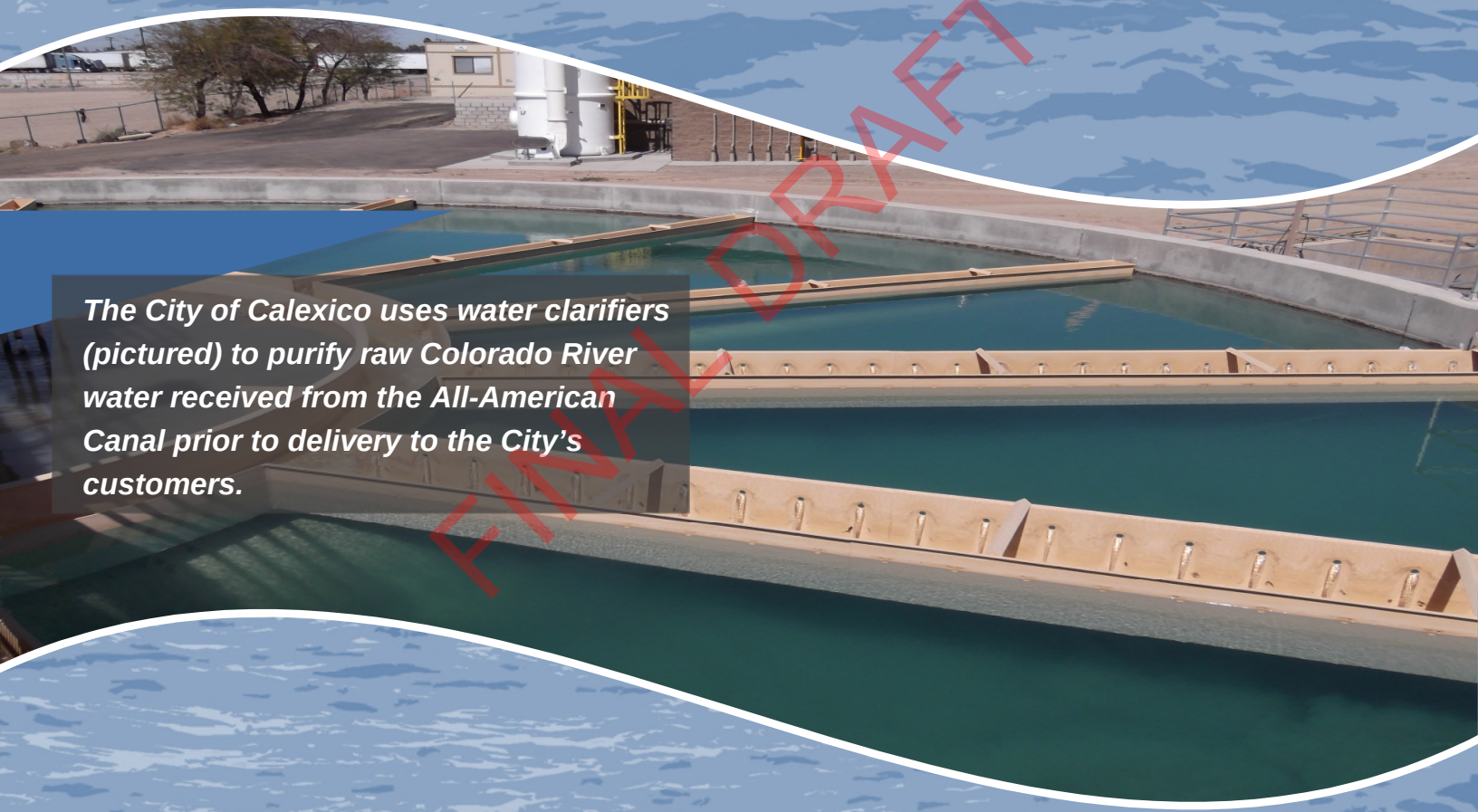
SECTION 4: WATER QUALITY



The City of Calexico uses water clarifiers (pictured) to purify raw Colorado River water received from the All-American Canal prior to delivery to the City's customers.

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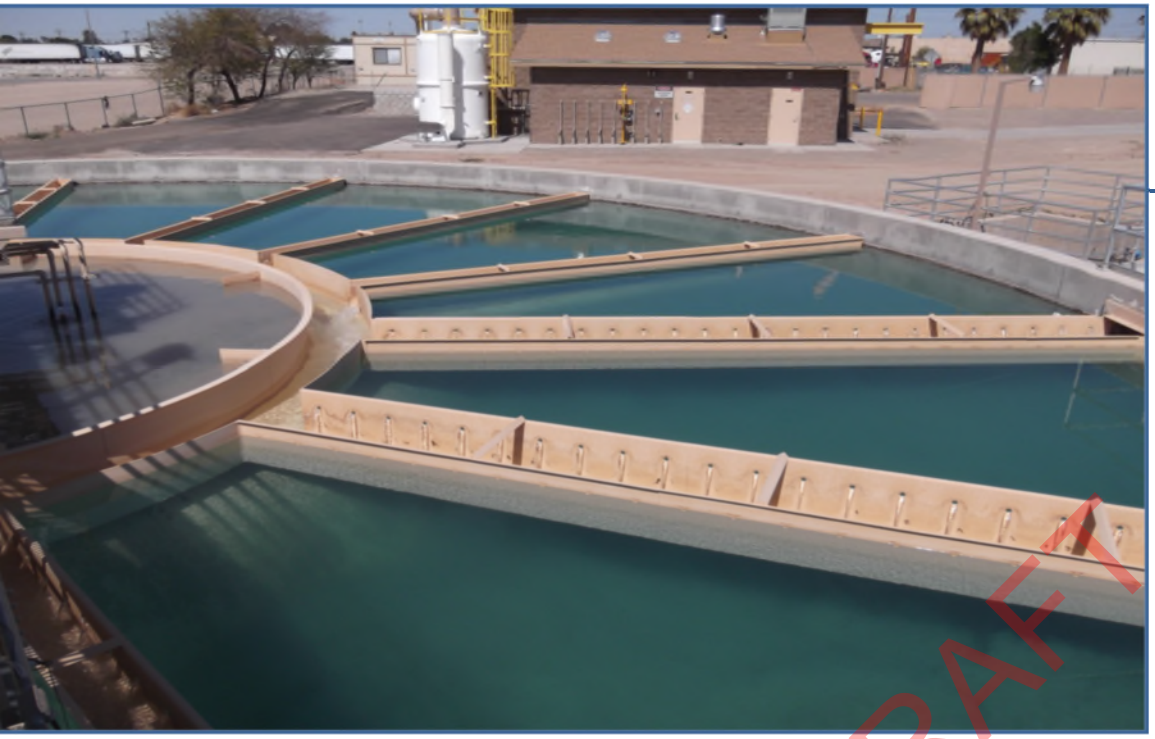

Section 4

WATER QUALITY

Treatment of Colorado River water (pictured) helps ensures high quality drinking water for the City.

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4.1 OVERVIEW

The quality of any natural body of water is dynamic in nature. During periods of intense rainfall or snowmelt, routes of surface water movement can change; new constituents are then mobilized and enter the water while other constituents are diluted or eliminated. Conversely, during times of drought, contaminants may increase in concentrations without additional new flows to offset their levels. Like surface water, as groundwater levels rise and fall, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. Thus, the quality of water changes over the course of a year, and these dynamic variables must be recognized by water agencies.

This section provides a general description of the water quality of Colorado River water in IID's canals. A discussion of potential water quality impacts on the reliability of these supplies is also provided.

4.2 WATER QUALITY STANDARDS

4.2.1 FEDERAL STANDARDS

In 1974, Congress passed the Safe Drinking Water Act (SDWA) in order to protect public health by regulating the nation's drinking

water supply. As part of the SDWA, powers were given to the Environmental Protection Agency (EPA) to regulate the nation's drinking water. The SDWA includes a process for identifying and regulating contaminants. The EPA currently has identified over 90 contaminants in its National Drinking Water Regulations (NPDWR or "primary standards"). The main categories that the EPA has identified include: biological microorganisms, disinfectants, disinfection byproducts, inorganic chemicals, organic chemicals, and radionuclides. As required by the SDWA, water agencies must provide annual Water Quality Reports to its customers.

As part of Federal EPA standards, water agencies are required to provide annual water quality reports

4.2.2 STATE & LOCAL STANDARDS

Statewide Standards

Water quality regulations have changed since the Safe Drinking Water Act in 1974. Several state, regional and county agencies have jurisdiction and responsibility for monitoring water quality. The actual regulations on water quality have also changed over the years. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the Federal Environmental Protection Agency (EPA) and the State Water Resources Control Board (SWRCB). The California Department of Public Health (CDPH) previously oversaw the water quality of the State's drinking water program and the environmental lab accreditation program. As of July 2014, those programs were transferred to the SWRCB. Under the SWRCB, the Division of Drinking Water (DDW) regulates public drinking water systems, including setting the maximum contaminant levels (MCLs) and regulating the operation of water systems. In addition to the SWRCB, several regional and county agencies have jurisdiction and responsibility for monitoring water quality and contaminant sites.

In 2014, the State's drinking water program was transferred to the State Water Resources Control Board

Local Standards (IID)

Under direction of the DDW, IID tests its water on an annual basis at several locations along the All-American Canal. The results are posted on IID's website. Further, IID requires that those who receive water

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from IID must first treat the water before using it for potable purposes (since IID only supplies raw water via its canal system). IID enforces this of all its customers, including the City.

4.2.3 CITY STANDARDS

The quality of water delivered to the City's customers is directly related to the quality of the supply sources from which the City obtains its water. Since the City's only source of supply is raw Colorado River water from IID's All-American Canal, the City treats its water before it enters its distribution system.

Figure 4.1: Health Standards Protect Drinking Water

To ensure quality of its water, the City is concerned with a number of threats to drinking water, including: microbial contaminants, inorganic contaminants, pesticides & herbicides, organic chemical contaminants, and other contaminants. The City's Annual Water Quality Reports identify regulated substances and secondary substances, as well as unregulated other substances. The City identifies both the categories and the concentrations of contaminants when preparing its Annual Water Quality Reports.

4.3 QUALITY OF SOURCES

4.3.1 SALINITY

The Colorado River System is naturally very saline. At the USGS gauge below Hoover Dam, roughly 9 million tons of salts have been measured in the river each year since the dam was constructed. The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the Colorado River Basin. They are easily eroded, dissolved, and transported into the river system.

Figure 4.2: Colorado River & Sedimentary Rock

Concern over salinity levels in the Colorado River has existed for many years. To foster interstate cooperation on this issue, the seven basin states formed the Colorado River Basin Salinity Control Forum (Forum)

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in 1973, and, in 1974, Congress passed the Salinity Control Act, which authorizes the Secretaries of the Interior and USDA to enhance and protect the quality of water available in the Colorado River for use in the United States and the Republic of Mexico.

In 1975, the Forum proposed, the states adopted, and the EPA approved water quality standards, including numeric criteria and a plan for controlling salinity increases. The standards require that the plan ensure that the flow-weighted average annual salinity remain at or below the 1972 levels, while the Basin states continue to develop their apportioned water supply. The Forum selected three stations on the main stream of the lower Colorado River as appropriate points to measure the river's salinity. These stations and numeric criteria are (1) below Hoover Dam, 723 mg/L; (2) below Parker Dam, 747 milligrams per liter (mg/L); and (3) at Imperial Dam, 879 mg/L. The numeric criteria are flow-weighted average annual salinity values. According to recent reports from the US Bureau of Reclamation, average annual flows tested for salinity at Imperial Dam were reported to have concentrations of about 700 mg/L, a 372 mg/L increase over the estimated natural salinity.

By some estimates, concentrations of salts in the Colorado River cause approximately $353 million in quantified damages in the lower Colorado River Basin each year. In response to this, IID has dedicated a chapter of its recent Integrated Reginal Water Management Plan (IRWMP) to the improvement of water quality.

4.3.2 OTHER WATER QUALITY CONCERNS

According to a recent USBR study, salinity is not the only water quality concern in the Colorado River Basin. Other issues include perchlorate contamination in both domestic water and crop irrigation as well as uranium.

Perchlorate

The perchlorate ion is water soluble and environmentally stable. It has been found in surface and groundwater in the Colorado River basin, as well as some lettuce and milk samples collected in the lower basin.

Uranium

Due to past uranium mill activities near the Colorado River, a 16-million-ton pile of uranium mill tailings exists that has the potential for contamination. Ongoing remediation actions have been successful at removing the tailings and contaminated groundwater from the site. Although uranium levels have not yet been a concern for IID or the City, there is limited ability to treat Uranium in a cost-effective manner.

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Biological Growth

According to the 2010 Sanitary Survey, it appears that there is some correlation of high total coliform between the various locations. It also appears that the longer the water is in the IID canal system, the higher the Total Coliform counts. It appears that there is an additional coliform source or that the conditions support bacteria growth within the IID canal system. Temperature is widely recognized as an important controlling factor in influencing bacterial growth.

4.4 WATER QUALITY MONITORING

City Consumer Confidence Reports

Since 1990, community water systems in California have been providing an Annual Water Quality Report to customers under regulations adopted in 1989 by the CDPH. However, the 1996 amendments to the Federal Safe Drinking Water Act and recently adopted federal regulations now require a "Consumer Confidence Report". In addition, California law now requires a similar report to consumers. This report must contain information on the quality of water delivered by the system and characterize any risks from exposure to contaminants detected in the drinking water. The reports typical segregate the regulated substances into primary and secondary substances, and often include other unregulated substances detected in the water system.

Contaminant levels previously had an assigned Maximum Contaminant Level (MCL). The Federal Government has now established a Maximum Contaminant Level Goal (MCLG) for each constituent that has an MCL. The State of California is currently establishing their own Public Health Goal (PHG) for each of the same contaminants. Where the State has not yet set a PHG, the requirement levels noted in the tables on the following pages refer to the federal MCLG.

Water Quality Reports show regulated and unregulated substances detected in the water.

Per the reporting requirements, the City provides its customers with a Consumer Confidence Report that is prepared per the City's Water Treatment Plant Water Quality testing program, consistent with State and Federal Law and the City's commitment to inform customers. The Imperial Irrigation District (IID) and the City of Calexico tested over 314 contaminants to see how its water measures up to State and Federal Drinking Water Standards. Only the contaminants that had detectable levels are shown on the table.

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2010 Watershed Sanitary Survey

The quality of water sources can be negatively affected by development or other human activities in the overall watersheds which feed into those sources. A Watershed Sanitary Survey is a document that examines the potential sources of contaminants in the watersheds and includes recommendations for managing these effects. Per DDW guidelines, the Watershed Sanitary Surveys are supposed to be updated every five years.

In 2010, IID prepared a Watershed Sanitary Survey of the watershed that provides water for the City of Calexico and all Imperial Valley. This survey assessed the vulnerability of the Imperial Valley-Colorado River to potential forms of contamination. The survey concluded that there were mitigation measures were in place which helped offset any potential for contamination. For the City of Calexico, the raw 25 MG reservoir provides a means of mitigation since water can be drawn from it if there is a short-term contamination of the All-American Canal.

The 2010 IID Watershed Sanitary Survey concluded that the water sources and canals are fairly secure

The City anticipates that an update to the 2010 Watershed Sanitary Survey will be completed in 2018. The update will help provide the City with a means to assess the potential for contamination of its water supply and make planning decisions related to the management of contamination.

4.5 WATER QUALITY IMPACTS ON MANAGEMENT & SUPPLY RELIABILITY

The quality of water dictates numerous management strategies a water purveyor will implement, including, but not limited to, the selection of raw water sources, treatment alternatives, blending options, and modifications to existing treatment facilities. A direct result from the degradation of a water supply source is increased treatment cost before consumption. The poorer the quality of the source water, the greater the treatment cost. This in turn can decrease water supply reliability by potentially decreasing the total supply. As indicated in the 2010 Watershed Sanitary Survey, contamination of the City's supplies is not likely. Unlike many cities in California, the City only has one source of water supply, which actually helps to simplify the management of water quality (i.e. no direct-to-system groundwater supplies to manage). Since all of this water is treated and tested thoroughly, this helps ensure a high-quality supply of water. Thus, the City does not anticipate water quality affecting water supply.

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