1.2 Chollas Creek Watershed Overview

This section presents an overview and characterization of the Chollas Creek Watershed. The successful application of BMPs in the Chollas Creek Watershed will depend on the TMDL constituents, the physical characteristics of the watershed, and the regulatory requirements. Therefore, understanding the watershed characteristics is important in the watershed activity selection process.

The Chollas Creek Watershed encompasses approximately 16,270 acres consisting predominately of urbanized land located within the San Diego County (Figure 1-4). The drainage area to the northern fork of the watershed (9,276 acres) is larger than that to the southern fork (6,997 acres). The drainage area of the Chollas Creek Watershed originates in the cities of Lemon Grove and La Mesa. Chollas Creek flows through the City of San Diego and empties to the eastern shoreline of San Diego Bay. Though much of the creek has been channelized, there have been efforts to restore natural flow in the watershed (Figure 1-5 and Figure 1-6).

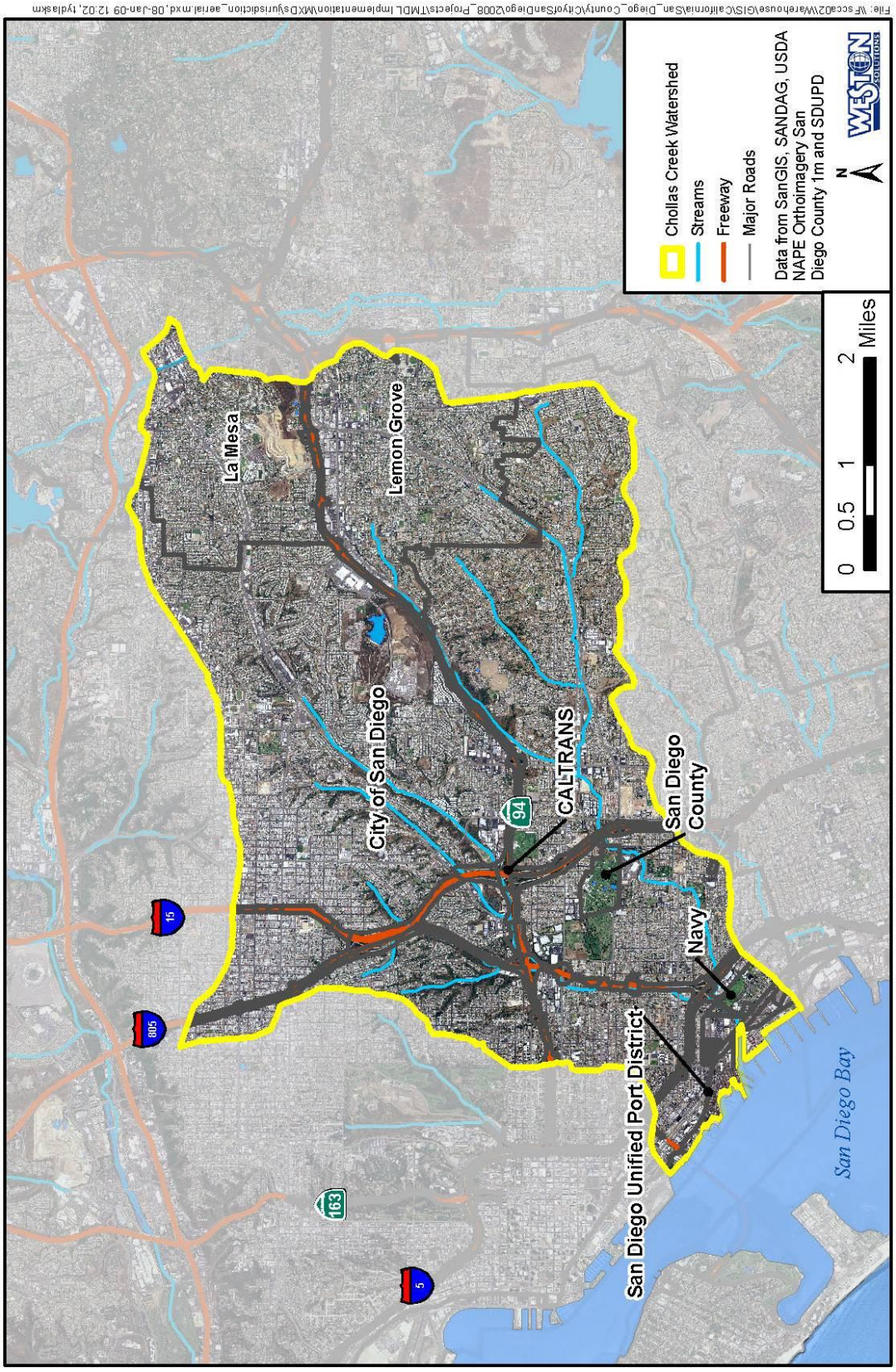

Figure 1-4. Aerial View of the Chollas Creek Watershed

Northern Branch of Chollas Creek at Hilltop Drive

Northern Branch of Chollas Creek at Site SD(8)

Figure 1-5. Channelization of the Chollas Creek Watershed

Overgrown Channel (pre-construction)

Natural Bottom Channel (post-construction)

Figure 1-6. South Bank of Chollas Creek (Station 5 – Chollas Creek Enhancement Project – 2004–2007)

1.2.1 Land Use

The Chollas Creek Watershed is highly urbanized. Land use in the Chollas Creek Watershed is predominantly residential (48%), roads (22%) and freeways and highways (5%), as shown on Figure 1-7. The remaining watershed land uses consist of commercial and industrial facilities and landfills (7%), open space (7%), schools (3.5%), cemeteries (1.5%), and other miscellaneous land uses. The Chollas Lake is a 16-acre water body located north of Highway 94, in the northeastern portion of the watershed.

Caltrans is responsible for the California State Highway System, which possesses its own Municipal Separate Storm Sewer System (MS4) Permit (Order No. 99-06-DWQ) (Regional Board, 2005). Portions of the cities of San Diego, Lemon Grove, and La Mesa are also located within the watershed. The Port, the Navy, and the County of San Diego each hold jurisdiction over approximately 1% of the Chollas Creek Watershed. A small portion of the watershed consists of tidelands immediately adjacent to San Diego Bay. Some of this tideland area is under the jurisdiction of the Port, and the remainder falls under the jurisdiction of the Navy. The apportionment of Chollas Creek Watershed by Discharger is presented in Table 1-1.

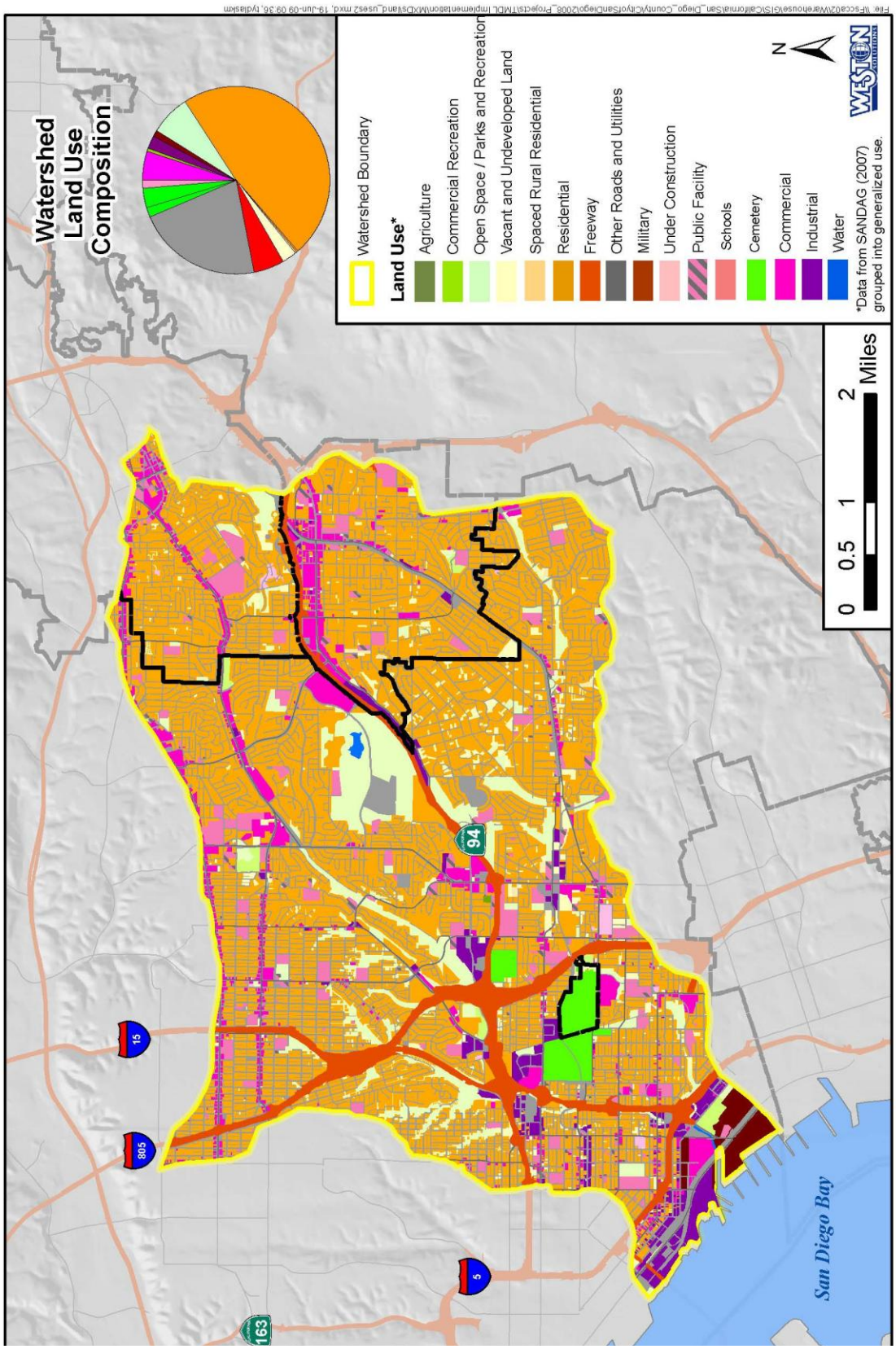

Figure 1-7. Chollas Creek Vicinity and Land Use Map

Table 1-1. Jurisdictional Apportionment of the Chollas Creek Watershed

Discharger	Portion of the Chollas Creek Watershed (1)
Caltrans	5%
City of San Diego	72%
City of Lemon Grove	12%
City of La Mesa	9%
County of San Diego	1%
Port of San Diego	1%
Navy	1%

(1) Approximately 3.5% of the Chollas Creek Watershed is under the jurisdiction of other agencies not named in the 2007 version of the Dissolved Metals TMDL. This Table has not distinguished the jurisdictions of the Dischargers named in the Dissolved Metals TMDL and other agencies.

1.2.2 Rainfall

The annual rainfall at Lindberg Field, a rain gauge located outside of the Chollas Creek Watershed, averages 10.23 inches. This historical record began in 1909 and represents the best data currently available. Chollas Creek is a dry channel between storm events with intermittent flows of urban runoff. During rainfall events in the Chollas Creek Watershed, flows respond in a relatively short time frame (i.e., within hours). Peak flows occur rapidly (short time of concentration) during the rainfall event and then return back to little or no flow usually within two days. The *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay Technical Report* does not provide guidance on a design storm event for the current TMDLs (Regional Board, 2007). A recommended design storm is presented in Section 2.0 based on wet weather pollutograph studies by the City of San Diego and the Southern California Coastal Waters Research Project (SCCWRP).

1.2.3 Watershed Soils and Topography

The Chollas Creek Watershed is generally characterized by poorly draining soils and compacted urban lands based on United States Department of Agriculture Natural Resources Conservation Service surveys, as shown on Figure 1-8. These characteristics limit the application of BMPs that require high-permeability soils for redirecting runoff back into the ground through infiltration without the modification of existing soils. Given the large data gaps in the existing survey data, the City of San Diego began implementing site-specific geotechnical investigations in 2007 as part of the conceptual design of several low impact development (LID) infiltration BMPs. These investigations have provided information about the actual infiltration properties of the soils and siting constraints. The geotechnical investigations in the Chollas Creek Watershed indicated that soils within the upper 10–20 ft of the surface in the mesa areas generally have a very low permeability, whereas soils along the creek were found to have higher permeability. The existing soils found in the mesa tops of the Chollas Creek Watershed may make infiltrating storm water cost prohibitive in some cases due to the necessity to incorporate additional engineering components, as described in Section 3.0.

As shown on Figure 1-9, the topography of the watershed is characterized by generally built-out urbanized mesas that drain to open canyons. The heavy urbanization of the mesas has altered flow characteristics to these canyons through the significant increase in impervious surfaces. These conditions have increased both the volume and velocity of storm water flows, and in addition, have limited the opportunities for storage and retention of these flows in the mesas. The

canyon areas are characterized by steep side slopes where many of the MS4 outfalls are located. Due to development on the mesas, aging storm drain systems, and deferred maintenance issues, increased peak flows into these canyon areas have resulted in erosion of earthen channels and potential impact to the habitat and existing infrastructure (Figure 1-10). Freeway infrastructure that passes directly through the Chollas Creek Watershed also presents significant stretches of impervious surfaces. When considering the density of the existing development, watershed topography, and low-infiltrating soils in combination, Dischargers were presented with a challenge when identifying opportunities for implementation of structural treatment BMPs on the built-out mesas, as described in Section 3.0.

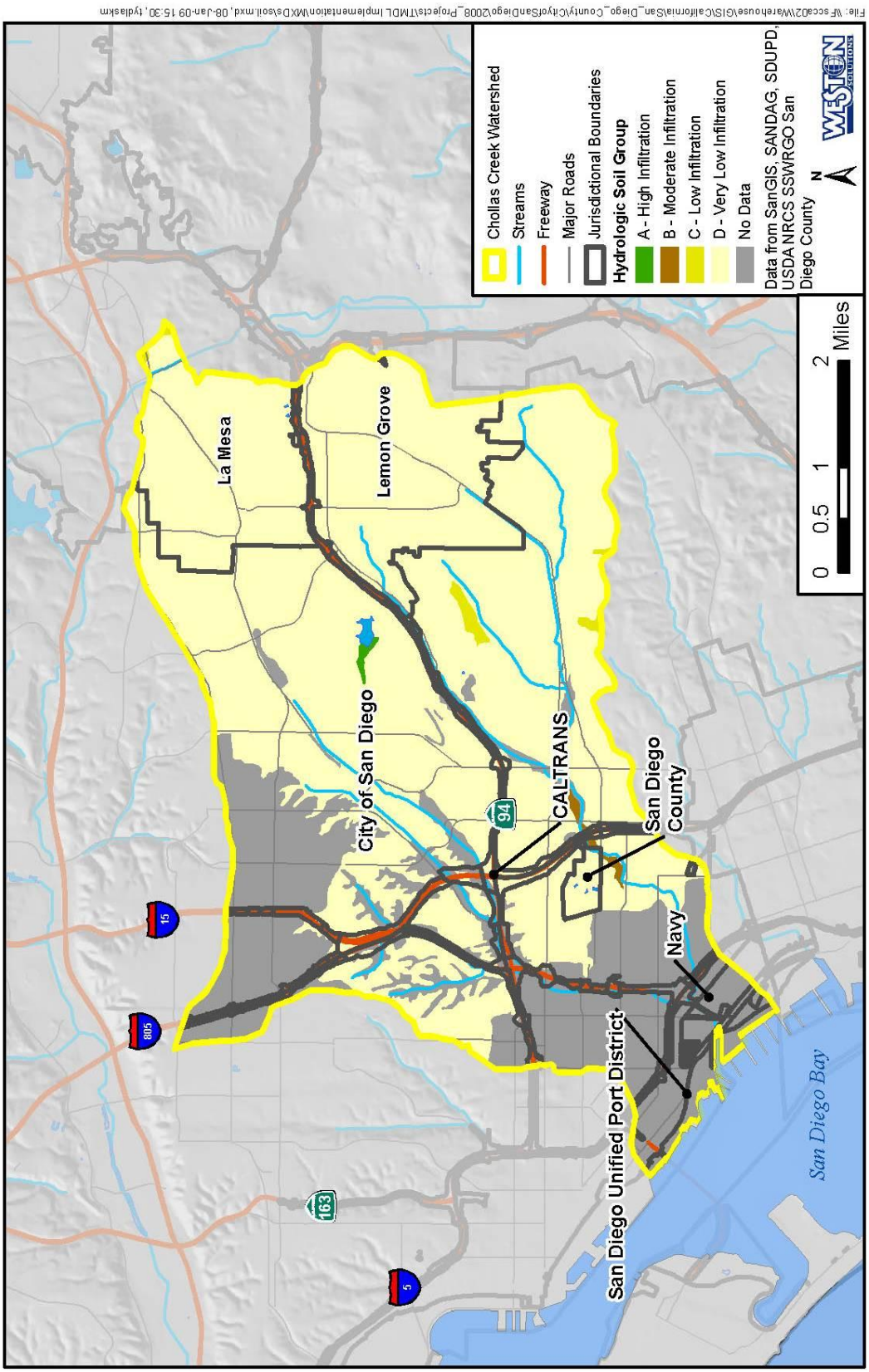

Figure 1-8. Chollas Creek Watershed Soil Permeability

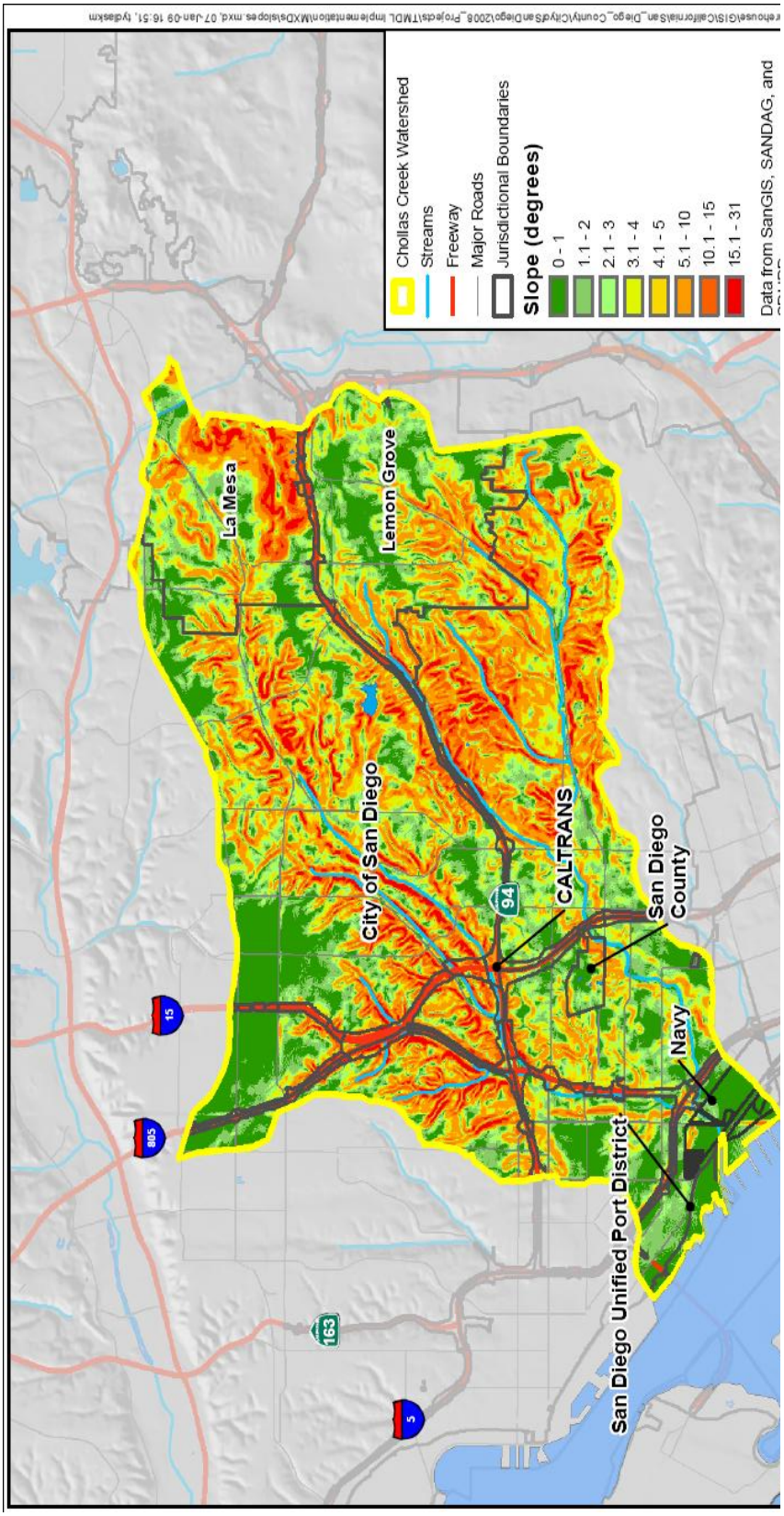

Figure 1-9. Chollas Creek Watershed Slopes

Extensive Erosion of Natural Channels Due to Increased and Sustained Peak Flows from the Surrounding Developed Mesas - City Heights neighborhoods of Castle and Azalea Park (Lexington Creek Tributary)

Erosion of Canyon Side Slopes Below Municipal Separate Storm Sewer System Outfall with Potential Impact to Existing Infrastructure and Canyon Habitat – 32nd Street Canyon

Figure 1-10. Erosion in the Chollas Creek Watershed

1.2.4 Chollas Creek Modifications and Channelization

Over the past 68 years, Chollas Creek has been modified, diverted, channelized, and concrete lined in several locations, primarily for flood control purposes. Approximately 30% of the creek was channelized prior to the November 28, 1975 adoption of the Basin Plan, as illustrated on Figure 1-11. The most significant alteration is evident in north fork of Chollas Creek in the 1949 large scale channel change plans depicted in yellow. The concrete channelization that has occurred over the past 68 years over a significant portion of the Chollas Creek Watershed is depicted in green. Channel re-alignments, slope lining, and box culverts that have been installed are also shown. These channel modifications were identified as waters of the United States when beneficial uses were first designated in 1975. Currently, the designated beneficial uses of all streams in the Chollas Creek Watershed (Hydrologic Unit No. 8.22) are identified in the Basin Plan as Non-Contact Water Recreation (REC-2), Warm Freshwater Habitat (WARM), and Wildlife Habitat (WILD). Contact Water Recreation (REC-1) is a potential beneficial use.

Chollas Creek Modifications and Channelization 1938-1970

Prior to the Clean Water Act of 1972, many modifications were made to Chollas Creek. This map highlights some of those changes, especially those involving concrete channelization.The text boxes provide the year, a description, and the location of change.

This map depicts only a portion of alterations made to Chollas Creek between 1938-1970, and should not be considered a full representation of all channelization or modification.

Legend

Chollas Creek

CHANNEL

CULVERT

Rose text boxes generally refer to box culverts.

Orange text box refers to a section of channel near Wabash and Main that is unlined, except for some slope lining.

Yellow text boxes generally refer to large scale channel change plans from1949.

Green Text boxes generally refer to lined channels.

Purple text boxes generally refer to channel re-alignments.

Mauve text boxes generally refer to locations under bridges or at intersections.

Prepared by the City of San Diego
Metropolitan Wastewater Department
Storm Water Program

Map Not To Scale

N

1960-Plans indicate creek is channelized here.
1958- double box culvert.
1959- Plans show PCC channel along Auburn between Corliss and Loris.
1960-Plans show a rip-rap lined channel.
1956-Double box culvert between 60th and College.
1956- Plans show a PCC channel along Home Ave at Fairmount.
1956- Shows a double box culvert west of 60th.
1956-Box culvert under Spillman Rd, changes to open channel.
1956- Chollas Road & Chollas Creek Improvement plans show a double box culvert.
1956- PCC lined channel.
1960- Plans show a double box culvert opening to an open channel and rip-rap.
1957- Shows (unlined?) ditch and a 48", 450' RCP. Creek underground?
1953- Shows lined channel, rip-rap/gunite at Euclid.
1949- Plans for channel changes in Wabash Canyon, from Landis to Main.
1965- PCC lined ditch/channel along Chollas Parkway, NE of Fairmount. Distance unknown.
1949- Wabash Canyon Creek channel change plans show cross-section of channel at the Wabash and Federal interchange.
1965-Shows existing channel.
1954-Concrete channel shown from Market St extending to I-15.
1970-PCC lined channel
1966- Lined Channel between Lenox and Geneva along Elwood.
1952- J St Bridge over Las Chollas Creek Channel. Plans to excavate flood control channel.
1947- PCC Culvert under 60th St.
1953- Plans show concrete channel from "stations 10-64"- or from approximately Newton to Market Sts.
1964- Plans show typical section of lined channel from Hilltop to Guymon.
1952- plans show the Las Chollas Creek Flood Control Channel at the Ocean View Blvd bridge. Appears cemented.
1959- Plans show a concrete lined ditch betweeen Jamacha and Jacmar.
In 1938, the Chollas Creek Alignment project plans for the relocation of the creek from its original course, aligning it with Wabash Blvd, now the I-15.
1964- Plans show a lined channel near Market and Euclid.
1962- Shows cross-section of possible PCC lined channel from6
1945- The channel under the National Ave Bridge is shown to have rip-rap sides.
1958- Unlined ditch at 54th and Market.
1970- Lined channel between 54th and Pitta along Imperial.
1951-Plan for PCC culvert at 62nd St north of Akins, draining to PCC lined creek.
1960- Plans for 6' cement treated channel.
1946- Plans indicate channel changes near 33rd St from Greely to Boston
-1961- Plans show a double box culvert under Imperial Ave.
1948- Realignment of Imperial Ave between 55th and Merlin. Imperial used to follow Chollas Creek. Both Imperial Ave and Chollas Creek were moved north.
1953- Plans show channel from "stations 6-10" or approximately Newton to 32nd St.
1953- Rough concrete slope noted at Wabash and Main
1959- Plans show PCC lined channel on south branch from Wabash to 40th St.

Figure 1-11. Chollas Creek Modifications and Channelization from 1938–1970