7 Utilities

The utilities on MCAS Miramar are owned, maintained and operated by the station's Public Work Center. The Southwest Division (SOUTHWESTDIV), Naval Facilities Engineering Command, Public Works Support and Utilities Management Branch are currently exploring the potential for privatization of the utility systems. Privatization would include the construction, ownership, operation and maintenance of the utility systems by the local utility company. There are a variety of utility systems that criss-cross through the RCW. Some of these systems, such as the high-voltage electrical lines, provide opportunities for habitat protection as the parcels they own or the easements they maintain are often in natural habitats. Other systems, such as the sewer system, can acts as constraints when considering habitat creation or restoration opportunities as the main trunk lines are often aligned in the bottom of finger canyons or cross main tributaries making significant grading impracticable. Other utility systems within the RCW include fiber optic lines, television cable and phone lines. Whether they provide opportunities or constraints, understanding the utility systems occurring within the RCW and their locations are important aspects to understand before making recommendations about restoration opportunities.

7.1 Water Systems

The San Diego County Water Authority maintains a portion of its second aqueduct across MCAS Miramar and through the base of the foothills in the upper portion of the RCW. The aqueduct provides interconnections with Olivenhain Reservoir, Lake Hodges, and Miramar Reservoir in the north with Lake Murray and its associated filtration plant in the south. Additionally, the City of San Diego operates 24 miles of reclaimed water distribution lines within the RCW that provide landscape irrigation and some industrial supply water to users throughout its service area. Both of these systems are depicted in Figure 7-1.

Potable water for Miramar is obtained from the City of San Diego under contract. The main connection to the City of San Diego water system is located along the northwest side of MCAS Miramar near Miramar Road and Bauer Road. The City of San Diego, through the Clean Water Act, has installed reclaimed water distribution lines along Miramar Road for use by MCAS Miramar and other organizations.

7.2 Sewer System

The Metropolitan Waste Water Department of the City of San Diego operates and maintains over 322 miles of sewer trunk lines, and another .13 miles of laterals or overflows (Figure 7-2). The watershed is sewered in areas located almost solely south of the Highway 52 and west of Interstate 805. The area above this location lies MCAS Miramar where sewer lines are not shown in the city data. The sewer trunk lines run along main arterials such as Interstate 5, Interstate 805. Starting from Mission Bay Drive, the outwash point, trunk sewers run north along Moraga Blvd and Interstate 5. Along Moraga Boulevard, the trunk sewers end just before Clairemont Mesa Boulevard. Along Interstate 5, sewers run north until Highway 52 diverts a trunk line east into San Clemente Canyon which ends at Genesee Avenue. Beyond Highway 52 the trunk sewer runs north until it intercepts La Jolla Colony Drive which takes the line east into north Rose Canyon. The Interstate 5 trunk sewer ends at Gilman Drive and La Jolla Village Drive which brings the line back to Interstate 5's west border. The trunk sewer that begins at La Jolla Colony Drive extends east into north Rose Canyon well into the MCAS Miramar Air Station. Prior to reaching MCAS Miramar, the sewer is diverted twice to the north, the first location is just prior to reaching Genesee Avenue and the second is just beyond Genesee Avenue. Sewer laterals or Sewer Overflows only occur in two locations in the RCW. They are located within 100 feet of each other on the western border of the RCW off of Desert View Drive which is approximately 1,000 feet from Soledad Road north of on Soledad Mountain Road.

The sewer wastewater on MCAS Miramar is collected on base and discharges to the City of San Diego system. MCAS Miramar's sewer system consists of approximately 38 miles of 6" to 15" vitrified clay lines built from 1953 to 1960.

7.2.1 Sewer Overflows

Since 1995, there have been 57 sewer overflow spills throughout the RCW recorded by the San Diego Regional Water Quality Control Board (Figure 7-3). Of these spills, 57% have been caused by root intrusion and 19% by grease buildup and remaining 24% by other factors. Almost 70% of these spills have at one point reached the surface water instead of being diverted into storm drains. In 1995-1996 there were 14 recorded spills in City of San Diego owned land of the RCW. Another 14 spills were recorded in between 1996-1997 throughout the same area. The San Diego Regional Water Quality Control Board has been aggressively addressing sanitary sewer overflows for several years now. In

May of 1996, the Regional Board adopted Order No. 96-04 which are waste discharge requirements prohibiting sanitary sewer overflows by sewage collection agencies. This order was adopted in response to what the Regional Board had been seeing as a serious and growing sewage problem in the region. The Board was very concerned and wanted a way to reduce the number and volume of spills and protect water quality, the environment and public health. Table 7-1 summarizes each years spills since 1995 Sewer Spills have occurred in other parts of the City due to vandalism, but vandalism has not been a problem so far in San Clemente Canyon. MWWD recently installed locking covers on all the manholes in San Clemente Canyon to reduce the possibility of spills due to vandalism.

Table 7-1: Sanitary Sewer Overflows

Year	Total Volume (Gallons)	Recovered Volume (Gallons)	Percent Recovered	Primary Cause
1995-1996	121,090	90,450	75%	Root blockage and grease buildup
1996-1997	20,793	3,942	19%	Root blockage and grease buildup
1997-1998	82	0	0%	Root blockage
1998-1999	9,797	3,125	32%	Root blockage and construction
1999-2000	16,808	4,959	30%	Root blockage and grease buildup
2000-2001	4,100	3,895	95%	Root blockage
2001-2002	874	300	34%	Root blockage and construction
2002-2003	8,830	8,730	99%	Root blockage
2003-2004	1,962	1,625	83%	Root blockage and

7.3 Storm Water Conveyance

Most of the storm drain systems servicing the developed areas of the watershed have their outfalls in tributary canyons that then drain into Rose or Sycamore creek (Figure 7-4). In certain locations, the storm drain systems have their outlets directly into the Rose or Sycamore Creek. This is particularly true within the lower portions of the watershed. The Stevenson Canyon drainage did not naturally converge with Rose Creek but has been connected via storm drains along Balboa Ave. Historically, Stevenson Canyon drained directly to Mission Bay near De Anza Cove. However, in 1981 the City of San Diego implemented a new storm drain program to ensure the water quality and habitat protection for Mission Bay. To address the problem of water quality in Mission Bay the City retained the services of Tetra Tech, Inc. of Pasadena, California to conduct a comprehensive study of pollution sources within the bay and to analyze circulation and tidal flushing action for improving the dispersal of pollutants- especially coming from dry weather runoff. Computer and physical modeling of the bay as performed by Tetra Tech indicated that the major reconfiguration of Fiesta Island or the removal of the causeway would not significantly improve the tidal flushing of the bay. Interception of pollutants before they reach the Bay was predicted to provide the most effective means of long-term improvement of bay water quality (Figure 7-4). This recommended approach was subsequently implemented with the construction of eight diversion systems on two contributory drainage control channels (Rose and Tecolote Creeks) and nine storm drains on the east side of Mission Bay.

These first diversion projects were simple gravity and pumped systems which allowed a controlled amount of low-flow runoff from the storm drains to enter an existing trunk sewer and to then be transported to the Point Loma Treatment Plant for treatment. The East Bay project was completed in 1986 at a cost of $1 million and provided low flow storm drain diversion of runoff from 90 percent of the area tributary to Mission Bay and the San Diego River Channel west of Interstate 5.

Two other diversion projects were undertaken by the City of San Diego. In 1987, the City committed to expand the low flow diversion system around Mission Bay with the Mission Bay Sewage Interceptor System (MBSIS) project. The project provided interception capability for 65 drain outlets within the remaining 10 percent of the tributary drainage basin. At a cost of $9 million, the project was completed in 1994 and expanded the number of facilities to 46 (14 pump stations and 32 gravity systems). In 1997, the Beach Area Low Flow Diversion Project was created at the request of Council members Wear and Mathis. Storm drain outfalls along the coastline were inventoried and each drain outfall was rated for the potential for human contact with the flow from the drain (i.e. flow crosses the beach). As a result, low flow diversion facilities became operational in 1998 and 1999 at a cost of $1 million dollars.

The main objectives of a storm drain system implementation are erosion control, sediment control, tracking control, wind erosion control, non-stormwater management control, waste management and materials pollution control which target constituents in sediment, nutrients, trash, metals, bacteria, oil and grease, as well as organics. There are potential alternatives to a storm drain intercept system which re-direct flow when the water has not reached flood potential. Potential alternatives consist of silt fences, fiber rolls, gravel bag berms, sandbag Barrier, straw bale barrier, and cobble fenced embankments. Storm drain inlet protection consists of a sediment filter around an impounding area upstream of a storm drain. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction. An important limitation of flood drains should be noted in that sediment removal may be difficult in high flow conditions or if runoff is heavily sediment laden. If high flow conditions are expected, the use of other onsite sediment trapping techniques in conjunction with inlet protection can be implemented.

7.3.1 Hydromodifications

As part of this assessment, existing hydromodification projects are being mapped and characterized. Initial data collection efforts have identified four concrete stormwater channels that discharge to Rose Creek between Interstate 805 and the confluence with Sycamore Creek. Additionally, there are approximately 3,000 feet of concrete trapezoidal channels, with both natural and concrete beds, from the confluence to the outlet at Mission Bay. Based on field work in both Rose and San Clemente Canyons, there are three man-made cobble embankments. The three implemented in the RCW are approximately 6 feet high and range in lengths of 30 to 69 feet. These three man-made embankments help reinforce and stabilize the RCW in high water events. In evaluation of the storm drains, diameters range from 6 inches to 180 inches. The 6 inch storm drains are all located west of Interstate 805 and compose 9% of the total storm drains in the RCW and total 7,960 feet or 1.5 miles. Eighteen inch (18”) drains are the predominant pipe used throughout the RCW and compose 40% of the drainage pipes and total 118,692 feet in length or 22.5 miles. The 24 inch storm drains compose 12% of the storm drains and total 49,906 feet in length or 9.5 miles. Thirty inch (30”) drains compose 4% of the total storm drain pipes and total 17,379 feet in length, or 3.3 miles.

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Figure 7-1: Reclaimed Water and SDCWA Aqueduct

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Figure 7-2: Sewer System

Back of Figure 7-2

Figure 7-3: Sanitary Sewer Overflows

Back of Figure 7-3

Figure 7-4: Storm Water Conveyance and Hydromodifications

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7.4 Electrical Distribution

San Diego Gas and Electric (SDG&E) operates and maintains a couple of high-voltage distribution lines that cross the RCW. The high voltage electric lines run predominantly east – west throughout the watershed with one main line running north – south along Interstate 805 and at Miramar Road directs east towards a SDG&E Substation just across the road from MCAS Miramar. A second SDG&E Substation is located in the northwest portion of the watershed in Sycamore Canyon off of Spring Canyon Road. The approximate length of the electrical lines that distribute power to the watershed totals 77,016 feet or 14.6 miles (Figure 7-5).

The electrical distribution system at MCAS Miramar contains more than 90 miles of transmission lines. The older high voltage distribution lines are typically wood pole construction. Newer electrical distribution lines are generally installed underground in concrete encased ducts.

7.5 Gas Distribution

San Diego Gas & Electric (SDG&E) operates and maintains a number of gas lines that distribute gas across the RCW. The main operating location of the gas lines is almost entirely between Interstate 5 and Interstate 805 excluding one line that runs west underneath Interstate 805 near Miramar Ranch North and re-directs to directly south expanding beyond the RCW. The approximate length of gas lines that distribute gas to the watershed totals 77,496 feet or 14.7 miles.

Natural gas is supplied to Miramar by SDG&E from it distribution main on station. Gas is distributed by buried pipes. All lines are located on the northern part of the Station. The total length of natural gas lines at Miramar is approximately 11 miles. Propane gas is limited to two propane gas tanks and associated distribution systems.

7.6 Flood Hazards

Flood hazard areas are determined using statistical analyses of records of river flow, storm tides, and rainfall. This information is obtained through consultation with the community, use of floodplain topographic surveys, and hydrologic and hydraulic analyses. The Flood Insurance Study (FIS) developed by Federal Emergency Management Agency covers those areas subject to flooding from rivers and streams, along coastal areas and lakeshores, or shallow flooding areas. Flood Insurance Studies use detailed hydrologic and hydraulic analyses to model the 1% annual chance flood event or 100-year storm event to determine Base Flood Elevations (BFE), and designate floodways and risk zones (Zones AE, A1-30, AH, AO, VE, and V1-30). The flood hazard data are portrayed in tabular fashion in the FIS narrative and graphically as flood profiles that are attached to the narrative.

Floodplain mapping and management within the RCW is divided along the jurisdictional lines of the City of San Diego and MCAS Miramar. Both jurisdictions have relied on the Army Corps of Engineers to analyze and map the floodplains within their jurisdictions, but have done so at different points in time and have not collaborated to develop a comprehensive map of the floodplains within the RCW using consistent methodologies and data inputs. According to the 1997 FIS study that covers the City's jurisdictional area, only about 1% of the RCW lies within the 100 Year Flood Zone or Zone A (Table 7-2). Forty-four percent occurs in the undetermined category where there are possible yet undetermined flood hazards. The remaining 55% of the RCW falls outside the 100 Year Flood Zone (Figure 7-6). Twenty five percent of MCAS Miramar owned land within the RCW is under a Zone A category. Based on the 1997 FIS, the peak flow of a 10-year flood in Rose Creek is 2,700 cubic feet per second (cfs). During a 50-year flood event, the rate is 8,100 cfs and 12,000 cfs during a 100-year flood event.

Table 7-2: 100 Year Flood Zone

Flood Zone	Clairemont Mesa	Kearny Mesa	La Jolla	MCAS Miramar	Mira Mesa	Mission Bay Park	Pacific Beach	Scripps Miramar Ranch	University	Totals
100 Year Flood Zone: A flood having a 1% chance of being equaled or exceeded in any given year	131	7		3,059		10	19		117	3,343
Undetermined: Areas where there are possible, but undetermined flood hazrds.		288		7,324	11			21	3	7,647
Outside Flood Zone: Areas outside the 100-year floodplains, areas of 100-year sheet flow flooding where average depths are less than 1 foot, areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile or areas protected by levees.	2,909	574	823	1,818	75	43	502	800	4,894	12,438
Totals	3,040	869	823	12,201	86	53	522	821	5,014	23,428

7.7 Vehicular Transportation System

There are a total of 307 miles of road right-of-ways throughout the RCW which include freeways, major arterial streets and local streets. Local streets are the dominant form and total 264 miles, or 86 percent of the transportation system. Major arterial roads occupy 23 miles and freeways occupy 20 miles throughout the RCW. Interstate 5 (I-5) is the main north-south corridor on the western portion of the RCW that intersects with State Route 52 at the confluence of the San Clemente Creek and Rose Creek. This ten lane freeway (five northbound and five southbound) is the boundary separating the communities of Pacific Beach, La Jolla and Clairemont Mesa and the southwestern portion of University and roughly traverses 6 miles through the watershed . Interstate 805 (I-805) is also a ten lane north-south corridor that eventually merges with I-5 just north of the RCW and acts as westernmost boundary between the City of San Diego and MCAS Miramar. I-805 also separates the communities of Kearny Mesa and Clairemont Mesa. (Figure 7-7)

The easternmost freeway that crosses the RCW is Interstate 15 (I-15), also a north-south corridor. This ten to twelve lane freeway traverses 2.7 miles through the RCW in MCAS Miramar. State Route 163 (SR-163) is an eight lane freeway that connects to I-15 just inside the southern boundary of the RCW and still within MCAS Miramar. State Route 52 (SR-52), is the only east-west freeway within the RCW. This freeway begins as a four lane freeway from I-5 to I-805 then expands to an eight lane freeway and back to a four lane after it crosses I-15. SR-52 intersects with all the major freeways within the RCW except for I-15.

The average daily trips (ADT) of the freeways through the RCW are approximately over 187,000 trips per day. The ADT for arterial roads with roughly 50,000 trips per day and local streets are usually less than 10,000 trips per day. Of the all the freeways through the RCW, I-5, I-805, I-15 and SR-163 are the most heavily used averaging over 208,000 per day while SR-52 averages over 102,000 trips per day. The north-south freeways experience the most traffic due to their connection with the growing population of San Diego's North County and downtown San Diego. The highest ADT of the major freeways within the RCW is I-15 with over 305,000 trips per day.

7.8 Rail Service

Within San Diego County the coastal rail travels to and from Oceanside and follows the coast southward and eventually into Mexico. The railroad system traverses roughly 10 miles within the RCW through MCAS Miramar and predominantly through Rose Canyon. The railroad then follows the I-5 corridor south through the communities of University and Clairemont Mesa on its way to downtown San Diego. This coastal rail corridor, a predominantly double-track railway throughout the RCW, is shared by commuter, intercity passenger and freight rail services. On an annual basis, 1.8 million commuters ride Coaster trains south or Metrolink trains north from Oceanside using the coastal rail corridor. The corridor is part of Amtrak's second busiest intercity rail corridor nationwide (carrying another 1.8 million annual passengers). It comes second only to the Northeast Corridor. The coastal corridor is also served by the Burlington Northern Santa Fe freight rail service. The 2030 Regional Transportation Plan from SANDAG includes substantial improvements to the corridor including the completion of double tracking the rail line between Orange County and Center City San Diego and tunnels at Del Mar and University with a new Coaster station off Nobel Drive. These proposals are conditional upon appropriate environmental impact analysis.

Figure 7-5: Gas and Electrical Distribution

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Figure 7-6: FEMA/FIRM Flood Zones

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Figure 7-7: Major Transportation Systems

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