This document is released for the purpose of information exchange review and planning only under the authority of Hugh Steve McDonald, December 2015, State of California, PE No. 44074 and Tracy Anne Clinton, December 2015, State of California, PE No. 48199

City of Oxnard

Public Works Integrated Master Plan

WASTEWATER

PROJECT MEMORANDUM 3.5
CONDITION ASSESSMENT

FINAL DRAFT
December 2015

2700 YGNACIO VALLEY ROAD, SUITE 300 • WALNUT CREEK, CALIFORNIA 94598 • P. 925.932.1710 • F. 925.930.0208

City of Oxnard

Public Works Integrated Master Plan

WASTEWATER

PROJECT MEMORANDUM 3.5
CONDITION ASSESSMENT

TABLE OF CONTENTS

Page No.

1.0 INTRODUCTION 1
2.0 APPROACH 1
2.1 Asset Registry 1
2.2 Asset Risk 2
2.2.1 Vulnerability 2
2.2.2 Criticality 2
2.2.3 Risk 4
3.0 ABOVE-GROUND ASSET ASSESSMENT 4
3.1 Above-ground Overview 4
3.2 Above-ground Vulnerability 4
3.2.1 OWTP Visual Condition Assessment Findings 4
3.2.2 Headworks 5
3.2.3 Primary Clarification 5
3.2.4 Biofilters (Trickling Filters) 7
3.2.5 Interstage Pumping Station 7
3.2.6 Secondary Treatment 8
3.2.7 Disinfection Facilities 8
3.2.8 Effluent Pumping 9
3.2.9 Thickening 9
3.2.10 Digestion 10
3.2.11 Dewatering 10
3.2.12 Cogeneration 11
3.2.13 Main Electrical Building 11
3.2.14 North Area Electrical Building 12
3.2.15 All Other Electrical 12
3.2.16 OWTP Seismic Evaluation 13
3.2.17 OWTP Cathodic Protection System Evaluation 14
3.2.18 Lift Station Visual Condition Assessment Findings 14
3.2.19 Remaining Useful Life Calculations 14
3.2.20 Original Useful Life 14
3.2.21 Evaluated Remaining Useful Life 16
3.2.22 Economic Remaining Useful Life 17
3.2.23 Vulnerability Summary 18
3.3 Above-ground Criticality 18
3.4 Above-ground Risk 18

4.0 BELOW-GROUND ASSET ASSESSMENT 18
4.1 Below-ground Overview 18
4.2 Below-ground Vulnerability 24
4.2.1 Desktop Evaluation 24
4.2.2 Collection System Cathodic Protection Findings 24
4.3 Below-ground Criticality 28
4.4 Below-ground Risk 28

APPENDIX A - OWTP AND LIFT STATIONS CONDITION ASSESSMENT FINDINGS AND RISK SCORES
APPENDIX B - OWTP AND LIFT STATIONS CRITICALITY SCORES

LIST OF TABLES

Table 1 Criticality Scoring Matrix for Assets 3
Table 2 Asset Condition Ranking 5
Table 3 Seismic Findings Summary for OWTP Structures 13
Table 4 Lift Stations: Condition Assessment: Valve Vault 15
Table 5 Lift Stations: Condition Assessment: Wet Well Structure 15
Table 6 Original Useful Life Based on Asset Category 16
Table 7 Condition Fraction 17
Table 8 High Risk Assets at the OWTP 18
Table 9 High Risk Assets at Lift Stations 20
Table 10 Original Useful Life Expectancies for Below-Ground Assets 25
Table 11 Below-ground Criticality Ranking Scale 29

LIST OF FIGURES

Figure 1 OWTP Site Map 6
Figure 2 Collection System Diameter (Pie Chart) 21
Figure 3 Collection System Material (Pie Chart) 22
Figure 4 Collection System Age (Pie Chart) 23
Figure 5 Map of Collection System Unknown Age 26
Figure 6 Map of Collection System Vulnerability 27
Figure 7 Map of Collection System Criticality 30
Figure 8 Map of Collection System Risk 31

CONDITION ASSESSMENT

1.0 INTRODUCTION

This purpose of this report is to present and summarize the condition assessment of wastewater assets conducted for the City of Oxnard (City) by Carollo Engineers (Carollo) as part of the Public Works Integrated Master Plan. This assessment was conducted to identify rehabilitation and replacement (R&R, or renewal) needs. The effort included using asset management methodology to identify the existing wastewater assets and to conduct a visual condition assessment of above-ground assets, a seismic evaluation of structures, a desktop evaluation of below-ground assets, and a cathodic protection system evaluation.

To prioritize the R&R needs, a risk assessment was conducted that examined the vulnerability, or likelihood of failure, and criticality, or consequence of failure for each asset. Consistent risk scoring methodology was applied to both above- and below-ground assets to allow for prioritization across these varied asset types.

The findings from this report will be incorporated into a detailed and comprehensive capital improvement program (CIP) that summarizes all Public Works Integrated Master Plan recommendations. The CIP will reflect the combined planning considerations of the R&R needs identified here, as well as regulatory-driven needs, growth-driven needs, and other enhancements.

2.0 APPROACH

2.1 Asset Registry

Using multiple references provided by the City, Carollo compiled an inventory of above- and below-ground assets with the appropriate level of detail for a visual condition assessment and system-wide capital planning projects. An asset was defined as a functional component valued at $10,000 or more, or one critical to plant performance. Equipment such as smaller valves, sump pumps, and local control panels were not included as individual assets, rather were addressed as ancillary items. Assets were classified by facility type, unit process, and discipline. Assets at the lift stations were classified by facility type, site location, and discipline.

Carollo reviewed the history of replacements and major rehabilitations with City staff and identified data gaps or areas of uncertainty for focus during the field assessment. Where possible, existing references were used to identify design and sizing criteria, age, capacity, and other information prior to the assessment.

2.2 Asset Risk

Risk of an asset is a measure of the impact of asset failure on the overall system. By quantifying and assessing the risk of failure or inability of an asset to meet its intended function, R&R projects can be selected and implemented to mitigate the risk. The following sections detail the calculation used to estimate risk for both above- and below-ground assets.

2.2.1 Vulnerability

The vulnerability metric reflects the "likelihood of asset failure." Failure can occur from physical failure, performance failure, or technological obsolescence. The vulnerability of an asset is inversely proportional to the Evaluated Remaining Useful Life (EvRUL), which is determined as part of the condition assessment. The vulnerability expresses the likelihood of failure of an asset in the next year. Because the vulnerability was calculated with a slightly different approach for above- and below-ground assets, the details on this methodology are presented in the respective sections for these different asset types.

2.2.2 Criticality

The criticality scoring system divides probable "consequences of failure" into four categories:

- Public Health and Safety.
- Financial Impact.
- Effect on Customers/Public Confidence.
- Cost of Repairs.

The criticality scoring scale used in the assessment of each facility is shown in Table 1. This scale is adapted from the *International Infrastructure Management Manual, New Zealand National Asset Management Steering Group, and the Institute of Public Works Engineering of Australia* (2011). The criticality of an asset is the sum of the score from each of the four categories multiplied by the category weighting factor. Because the approach for below-ground assets included pipe size and geospatial factors, additional details on the criticality methodology for below-ground assets can be found in Section 4.3.

Table 1 Criticality Scoring Matrix for Assets
Public Works Integrated Master Plan
City of Oxnard

Criticality Category	Weight	Negligible = 1	Low = 4	Moderate = 7	Severe = 10
Public and Employee Health and Safety	30%	No injuries or adverse health effects	Minor injury with no lost-time or medical attention	Lost-time injury or medical attention	Multiple persons' lost-time injury or medical attention
Financial Impact	20%	Absorbed within current budget and under GM signature authority < $25,000	Requires Council approval $25,000 to $150,000	Requires Council approval $150,000 to $250,000	Requires Council approval > $250,000
Environment or Regulatory Compliance	30%	Overall compliance with permits	Sustained odor issue Loss of expected efficiency	Bypass or overflow event Solids not meeting 503 regulations Hazardous material release	Single permit violation
Customer Service (Ability to Respond)	20%	Function restored within 8 hours	Function restored in 8 to 24 hours	Function restored in more than 24 hours but less than 3 days	Function restored in more than 3 days

2.2.3 Risk

Just as risk is expressed as the economic cost or as the product of cost and chance, risk is calculated in this analysis as the product of the consequence of the failure and the likelihood of failure, or:

$$\text{Risk} = \text{Criticality} \times \text{Vulnerability}$$

At a minimum, assets with higher risk ratings must be closely monitored and targeted for corrective or preventative action, including maintenance, rehabilitation, or replacement.

3.0 ABOVE-GROUND ASSET ASSESSMENT

3.1 Above-ground Overview

Above-ground assets included structures and equipment owned and operated by the City. A consistent approach was used for assessing and valuing all above-ground assets, regardless of whether they were within the treatment or collection system. The above-ground asset inventory included approximately 26 structures, 160 pumps, 15 wet wells, and a variety of other assets across the Oxnard Wastewater Treatment Plant (OWTP) and collection system. The recorded age of each asset varied from 1955 to the present.

3.2 Above-ground Vulnerability

The above-ground vulnerability is addressed based on visual condition assessment findings, as well as the seismic evaluation summarized in Section 3.2.2 and the cathodic protection system evaluation summarized in Section 3.2.3.

The condition of each asset was evaluated on a one-through-five ranking scale, based on the International Infrastructure Management Manual (IIMM). In the IIMM, condition is expressed in terms of the amount of repair needed to bring an asset to “like new” condition. The definitions for the one-through-five condition ranking system from the IIMM are presented in Table 2. The assessment included inquiries into maintenance and performance history as well as design criteria, installation date, and typical condition parameters that could be used to standardize the procedure for future assessments. These inquiries helped inform condition scores for each asset. It should be noted that the assessment was visual only and did not include testing such as concrete core sampling.

3.2.1 OWTP Visual Condition Assessment Findings

The OWTP is designed to currently treat an average dry weather flow (ADWF) of 31.7 million gallons per day (mgd) and a peak wet weather flow (PWWF) of 68.2 mgd. The OWTP began operation in 1955, with major expansions in 1975 and 1985. Figure 1 presents the site map for the OWTP.

Table 2	Asset Condition Ranking Public Works Integrated Master Plan City of Oxnard	
Score(1)	**Description(1)**	**Required Rehabilitation Percentage(1,2)**
1	Very Good	0%
2	Good	1-10%
3	Fair	11-20%
4	Poor	21-50%
5	Very Poor	>50%

Notes:
(1) Adapted from the International Infrastructure Management Manual.
(2) Percentage of asset requiring rehabilitation: The percentage of the asset value needed to return the asset to a condition ranking of one.

Significant findings are summarized below for the OWTP in order of process flow. Findings for the visual condition assessment of the lift stations are summarized following the OWTP sections.

3.2.2 Headworks

3.2.2.1 Structural

No issues were noted with the structural assets at the Headworks during the condition assessment evaluation. However, in 2013-2014 plant staff identified significant concrete and coating deterioration below the Vortex Drop Structure No. 1 cover when this asset was taken out of service for cleaning. Additionally, plant staff noted in 2013-2014 that there is moderate deterioration of concrete and coating below and above the inlet junction structure covers, influent screens channels, grit chamber, and influent pump station. These conditions were identified via opening of cover hatches and visual inspections.

3.2.2.2 Mechanical/Process

Light corrosion of the screening compactors and mechanical bar screens was observed. The sodium hypochlorite pumps were found to be nearing the end of their useful life.

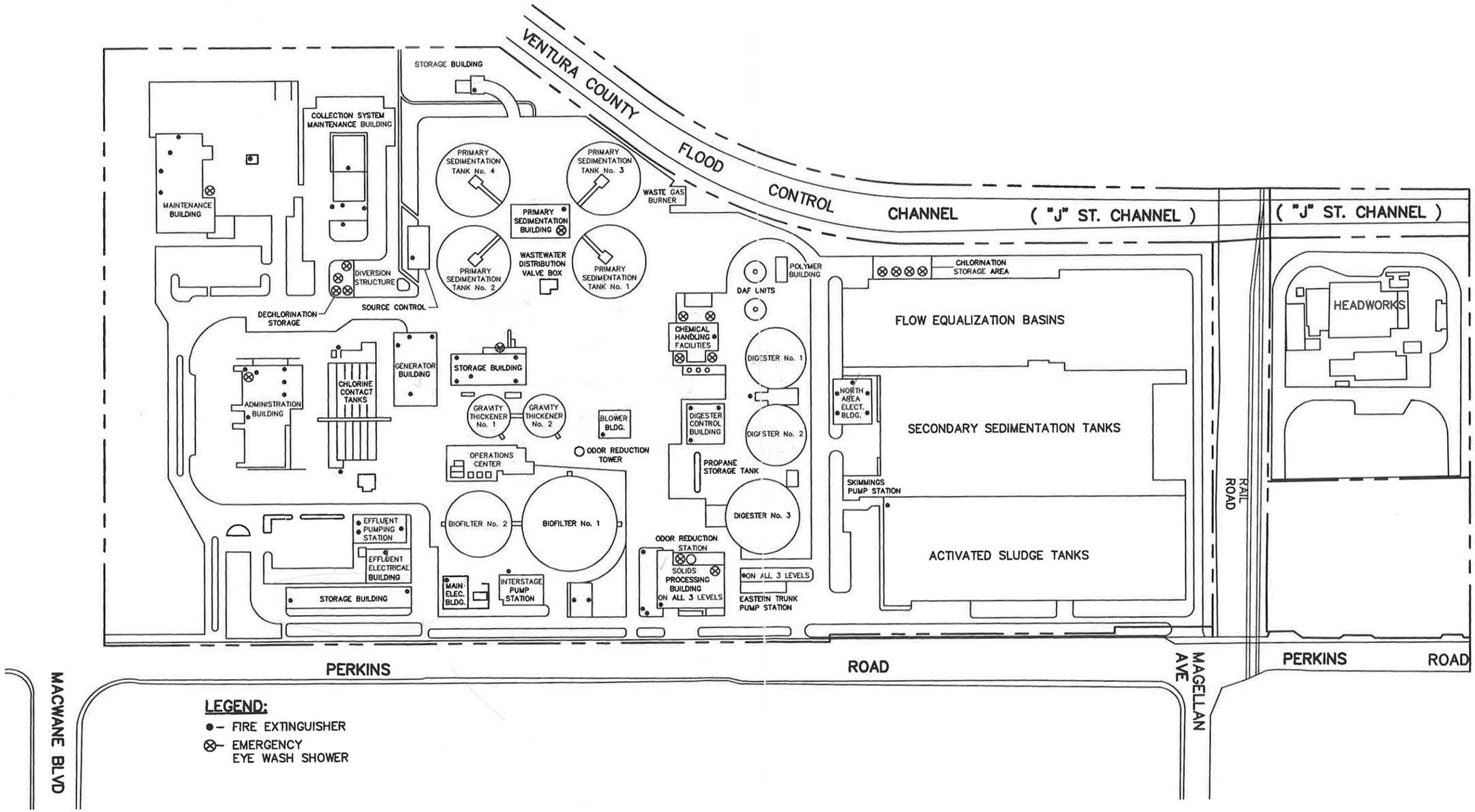
3.2.2.3 Electrical and Instrumentation/Controls

No Electrical and Instrumentation/Controls (E&IC) issues were noted at the Headworks.

3.2.3 Primary Clarification

3.2.3.1 Structural

Structural assets at the primary clarifiers, including the clarifier basins and the Primary Sedimentation Building were found to be in fair to poor condition. Concrete core samples were not taken for subsequent physical or chemical testing.



OWTP SITE MAP

FIGURE 1

CITY OF OXNARD

PM NO. 3.5 – CONDITION ASSESSMENT

PUBLIC WORKS INTEGRATED MASTER PLAN

CITY OF OXNARD CALIFORNIA

carollo Engineers...Working Wonders With Water®

ox0715f38-9587(PM3-5 FIG1).ai

3.2.3.2 Mechanical/Process

Mechanical assets at the primary clarification tanks were found to be in poor or very poor condition and were found to be nearing the end of their useful life. The clarifier mechanism walkways, especially the walkway on Clarifier 4, were observed to present a significant safety hazard to operators. Furthermore, the sludge pump tanks and scum ejectors were in very poor condition. The scum ejector in Primary Clarifier 1 was converted to an electrical float ejector. It is recommended that the remaining scum ejectors also be converted to electrical float ejectors or that new scum injectors be installed.

3.2.3.3 Electrical and Instrumentation/Controls

E&IC assets in the primary clarification process were found to be nearing the end of their useful life and in very poor condition. Replacement is recommended for motor control center (MCC) MCC-DPIA and MCC-DPIB.

3.2.4 Biofilters (Trickling Filters)

3.2.4.1 Structural

The biofilters were found to be in very poor condition. The condition has been discussed in further detail in the Biotower 1 Structural Analysis Report, prepared by Penfield and Smith Engineers, January 2014.

3.2.4.2 Mechanical/Process

Severe issues were noted at the biofilters. There include concerns about the mechanical distributor mechanism, namely the failed distributor seal. The distributor tube seal has failed in each biofilter, resulting in significant short-circuiting of primary effluent through the biofilter and poor observed treatment efficiency. In addition, the trickling filter media was installed in the late 1970s and portions of the media were replaced in 1985. The media is in poor condition.

3.2.4.3 Electrical and Instrumentation/Controls

No E&IC issues were noted at this location at the time of the condition assessment. City noted in November of 2015 that the E&IC assets are nearing the end of their useful life.

3.2.5 Interstage Pumping Station

3.2.5.1 Structural

The Interstage Pumping Station is in acceptable condition, with no significant issues noted at the time of the condition assessment. City noted in November of 2015 that the wet well is in poor condition.

3.2.5.2 Mechanical/Process

The pumps at this location were found to be in poor to fair condition based on observed corrosion, vibration, and noise.

3.2.5.3 Electrical and Instrumentation/Controls

No significant E&IC issues were present here at the time of the condition assessment. City noted in November of 2015 that the E&IC assets are nearing the end of their useful life.

3.2.6 Secondary Treatment

3.2.6.1 Structural

The secondary treatment structures including aeration basins, secondary sedimentation tanks, and flow equalization were found to be in medium to poor condition. Additional information can be found in the Seismic Assessment Report prepared by Carollo Engineers in October 2014, summarized below.

3.2.6.2 Mechanical/Process

Aeration basin diffusers and piping were found to be in very poor condition. Cracking is visible in multiple areas.

Secondary sedimentation collectors, skimmers, and drives in basin 17 and 18 were found to be in very poor condition and requiring significant rehabilitation. The return activated sludge (RAS), waste activated sludge (WAS), and high pressure 3 water pumps (3WHP) were found to be in poor condition and require rehabilitation. Select pumps at the secondary treatment facilities require new impellers due to their age and O&M staff conversations. Motorized skimmers in the secondary sedimentation basins 1 through 16 were found to be in poor condition, and non-functional. While these skimmers were not directly observed during the condition assessment, their condition assessment was based on their age and conversations with operating staff. City noted in November of 2015 that the 3 WHP strainers need to be replaced as well.

3.2.6.3 Electrical and Instrumentation/Controls

The secondary treatment processes are powered by electrical equipment discussed elsewhere in this report.

3.2.7 Disinfection Facilities

3.2.7.1 Structural

Concrete repairs are needed at the disinfection facilities. A replacement of the handrails and grating is also recommended.

3.2.7.2 Mechanical/Process

No significant mechanical issues noted here. The mechanical assets were found to be in fair condition and showing regular wear and tear for their age. There are six pumps that were assessed as being in medium condition but are no longer in use. The dechlorination storage area was also included in the assessment but was rated a low criticality because they are no longer in use.

3.2.7.3 Electrical and Instrumentation/Controls

No significant E&IC issues were observed at this location.

3.2.8 Effluent Pumping

3.2.8.1 Structural

The effluent pumping station is in poor condition and in need of replacement or rehabilitation. Additional information can be found in the Seismic Assessment Report prepared by Carollo Engineers in October 2014, summarized below.

3.2.8.2 Mechanical/Process

Mechanical assets were observed to be mostly in fair condition. However, pump number 2 was recently replaced, and because of this has a condition score of good. Also, Pump 5 known as “Big-Red,” was found to be in poor condition. The engine drive at this location was rebuilt more than 10 years ago, and appeared to be in fair condition.

3.2.8.3 Electrical and Instrumentation/Controls

The electrical assets at the effluent were observed to be in very poor condition with both MCCs showing significant need for replacement.

3.2.9 Thickening

3.2.9.1 Structural

The gravity thickeners and dissolved air flotation thickeners (DAFTs) were all found to be in poor condition. Additional information can be found in the Seismic Assessment Report prepared by Carollo Engineers in October 2014, summarized below.

The mechanical assets at the DAFT tanks were found to be in fair condition. Vibration and noise were observed in the collectors and drives.

3.2.9.2 Mechanical/Process

The fans/louvers at gravity thickener 1 were found to be in poor condition. The fans/louvers at gravity thickener 2 were replaced five years ago and are in good condition. The fans/louvers at both gravity thickeners need to be serviced every other month. A majority of

the mechanical assets including the collectors, drives, launders, pumps, and walkways were found to be in poor or very poor condition as they are reaching the end of their useful life.

The odor reduction tower at this location was also assessed, and is in poor condition.

3.2.9.3 Electrical and Instrumentation/Controls

The MCCs at the gravity thickener location were observed to be in very poor condition, replacement of MCC-DP3C and MCC-DP3D is recommended.

3.2.10 Digestion

3.2.10.1 Structural

Digesters 1 and 2 were built in 1975 and originally both had floating covers. The cover on Digester 1 was subsequently replaced with a fixed cover when the original cover tilted. However, Digester 2 still has the original floating cover. Due to the cover age and corrosion under the cover, Digester 2 is out of service with its roof in need of replacement. Digester 1 has a crack running up the side of the tank. Additional information can be found in the Seismic Assessment Report prepared by Carollo Engineers in October 2014, summarized below.

3.2.10.2 Mechanical/Process

The digester gas piping has temporary seals in multiple places. The digester gas compressors, heat exchangers, and mixing tubes were found to be in poor condition and in need of replacement. Heat Exchanger 2 was out of service during the site visit. Operations staff noted that the heat exchangers do not appear to remove sufficient excess heat during the summer months for flexible operation within the mesophilic range. However, the heat exchanger water pump at the chlorine contact tank was recently replaced.

3.2.10.3 Electrical and Instrumentation/Controls

MCCs located at the digester control building were observed to be in poor condition, this includes MCC-DP2C, MCC-GH, MCC-GF, and MCC-EDPIC. For all electrical assets in poor condition, replacement is recommended.

3.2.11 Dewatering

3.2.11.1 Structural

Per the seismic evaluation, the Solids Processing Building is in need of further Tier 2 Evaluation.

3.2.11.2 Mechanical/Process

The sludge dewatering belt filter presses and conveyers were found to be corroded and in need of rehabilitation or replacement.

3.2.11.3 Electrical and Instrumentation/Controls

The eastern trunk dewatering building contains both old and new electrical equipment. The older switchboard is in fair condition and may require replacement in the near future.

3.2.12 Cogeneration

3.2.12.1 Structural

The Cogeneration Building was observed to be in fair condition, with some deterioration observed on wood members and masonry units. Additional information can be found in the Seismic Assessment Report prepared by Carollo Engineers in October 2014, summarized below.

3.2.12.2 Mechanical/Process

The cogeneration units are more than twenty years old but are rebuilt regularly. They were observed to be in fair condition. The cogen blowers were observed to be in poor condition based on age and deterioration.

3.2.12.3 Electrical and Instrumentation/Controls

The MCCs in the Cogeneration Building were observed to be in poor to very poor condition due in part to weathering in the building. City noted in November of 2015 that the HVAC also should be replaced.

3.2.13 Main Electrical Building

3.2.13.1 Structural

The Main Electrical Building was observed to be in very poor condition. Additional information can be found in the Seismic Assessment Report prepared by Carollo Engineers in October 2014, summarized below.

3.2.13.2 Mechanical/Process

No mechanical assets were observed at this location.

3.2.13.3 Electrical and Instrumentation/Controls

The electrical assets at this location including MCC-GB, MCC-DP4B, MCC-DP4, MCC-CG, and MCC-GD, were all observed at poor condition. All of these assets were built by Federal Pacific in 1978 and thus are the oldest MCC assets onsite. Because of their age and poor condition, they are in need of replacement.

3.2.14 North Area Electrical Building

3.2.14.1 Structural

The North Area Electrical Building was observed to be in fair condition. Additional information can be found in the Seismic Assessment Report prepared by Carollo Engineers in October 2014, summarized below.

3.2.14.2 Mechanical/Process

No mechanical assets were observed at this location.

3.2.14.3 Electrical and Instrumentation/Controls

The electrical assets at this location were found to be in fair condition and mostly likely will not require rehab in the near future.

3.2.15 All Other Electrical

Switchgear located in the Effluent Electrical Building was observed to be in good condition.

The condition of MCCs is not only based on the age of the equipment, but also the weathering from the conditions of the rooms in which the MCCs reside. MCCs from the same install year may have different condition assessment scores. This is due to lack of air condition in many rooms and/or direct exposure to outside weather from doors left open. Specifically, the MCCs in each of the following buildings have clearly been influenced by weathering, some to a greater degree than others: Cogen Building, Digester Control Building Eastern Trunk Pump Station (Sampling Station), Old Blower Building, Old Headworks Building, Plant Control Center, Effluent Pump Station, and the DAF Building. Many of these MCCs have been discussed in other sections; however, MCCs in the Old Headworks Building and Old Blower Building are discussed here. The Old Headworks Building contains MCC-HC and MCC-EDPIB, both of these were observed to be in fair condition. The Old Blower Building contains MCC-DP2B, which was observed to be in poor condition, requiring replacement.

In addition to MCCs affected by weathering conditions, the Admin Building contains MCC-EDPIE, MCC-DP3A, and MCC-DP2D. All three of these MCCs were observed to in poor to fair condition, eventually requiring replacement. MCCs located at the generator building were also observed to be in poor to fair condition depending on the manufacturer and age. For all electrical assets in poor condition, replacement is recommended.

For master planning perspective, an issue noted is the lack of emergency power. There is only one power feed to the plant. While the generators have adequate capacity, these cannot be brought on line quickly enough to serve as emergency power. In the event of power loss, influent is directed to a primary clarifier. This allows for a half hour detention time until power can be brought online. Reserving clarifier capacity for emergency use,

however, means that many maintenance and rehabilitation activities cannot be conducted routinely. The Master Plan will therefore include recommendations for replacement of the generators or addition of emergency power equipment.

3.2.16 OWTP Seismic Evaluation

A concurrent seismic evaluation was conducted on the OWTP structures and is presented in a separate report titled Seismic Assessment of OWTP Structures, dated October 2014. A summary of the findings is shown in Table 3.

Table 3 Seismic Findings Summary for OWTP Structures
Public Works Integrated Master Plan
City of Oxnard

Structure/Component	Recommendation
Headworks Building	Further Evaluation Not Required
Grit Screening Building	Further Tier 2 Evaluation(1)
Primary/DAFT Building	Further Tier 2 Evaluation(1)
Main Switchgear Building	Replace/Retrofit(2)
Blower Building	Replace/Retrofit(2)
North Area Electrical Building	Further Tier 2 Evaluation(1)
Digester Control Building	Replace/Retrofit(2)
Solids Processing Building	Further Tier 2 Evaluation(1)
Plant Control Center Building	Replace/Retrofit(2)
Effluent Pumping Station	Replace/Retrofit(2)
Co-Generation Building	Replace/Retrofit(2)
Maintenance Building	Further Tier 2 Evaluation(1)
Collection System Maintenance Building	Further Tier 2 Evaluation(1)
Chemical Handling Building	Further Tier 2 Evaluation(1)
Vacuum Filter Building	Replace/Retrofit(2)
Butler Building	Replace/Retrofit(2)
16 KW Switchgear Building/Effluent Pump Station VFD Building	Replace/Retrofit(2)
Administration Building	Further Tier 2 Evaluation(1)
Aeration Basin/Activated Sludge	Concrete Testing(3)
Secondary Sedimentation Basin	Concrete Testing(3)
Flow Equalization Basin	Concrete Testing(3)
Primary Clarifier Tanks	Concrete Testing(3)
Gravity Thickener Tanks	Concrete Testing(3)
Digester Tanks	Concrete Testing(3)
DAFT Tanks	Concrete Testing(3)
Chlorine Contact Tank	Concrete Testing(3)

Notes:
(1) Further Tier 2 Evaluation will be completed by December 1, 2014.
(2) Retrofit versus replacement decisions will be made in conjunction with the Integrated Water Management Plan alternatives analysis.
(3) Testing of the concrete in the basins and tanks will follow next. This task effort was approved on Nov 25, 2014 with Amendment 1 to the PWIMP. A separate report will be developed that will document those conclusions.

3.2.17 OWTP Cathodic Protection System Evaluation

A cathodic protection system evaluation of the OWTP was conducted and is presented in a separate report titled Asset Corrosion Assessment and CP Evaluation Survey, dated September 2014. Corrosion protection of below grade pipes, valves, and fittings included protective coatings, double polyethylene wrapping, and petroleum wax tape wrapping. The design life for the galvanic (sacrificial anode) cathodic protection systems at the OWTP failed and require immediate replacement. The cathodic protection system at most locations is now exceeded, and the overall condition of the cathodic protection systems is unsatisfactory for protection of the subject structures. A few systems were found to be operational and are providing an adequate level of protection, but most were either non-operational or totally depleted and in need of complete overhaul.

3.2.18 Lift Station Visual Condition Assessment Findings

The collection system includes fifteen (15) lift stations, all of which were visually assessed. Each lift station was found to have two submersible pumps except for Lift Station 29, which had four submersible pumps. When a pump fails, it is typically switched out with a replacement from the storage facility building back at the OWTP facility. Because these are replaced with spares as needed, the submersible pumps were not considered capital assets in this study. Assets found at the lift stations and included in the registry were:

- Wet Well Structure.
- Valve Vault.
- Electrical Panel.
- Generator (if present).

Tables 4 and 5 summarize the condition of the valve vault and wet well structure for all of the lift stations. The lift stations were assessed for the condition of concrete, anchorage, and coating. Details from the visual condition assessment of the lift stations can be found in Appendix A.

3.2.19 Remaining Useful Life Calculations

The following sections detail the approach for calculating remaining useful life for above-ground assets, which in turn is used to calculate vulnerability. The values calculated for each asset can be found in Appendix A for the OWTP and lift stations.

3.2.20 Original Useful Life

Original Useful Life is the number of years an asset is expected to be in service as a function of asset type (i.e., mechanical, structural, electrical, instrumentation and control). Original Useful Life is used to develop different estimates of remaining useful life, described below. The Original Useful Life estimates for different types of assets are presented in Table 6. These estimates were based on industry standard guidelines (e.g., American

Water Work Association (AWWA), Water Environment Federation (WEF), American Society of Civil Engineers (ASCE), and the International Infrastructure Management Manual (IIMM)).

Table 4 Lift Stations: Condition Assessment: Valve Vault
Public Works Integrated Master Plan
City of Oxnard

Lift Station: Location	Condition Rating			
	Concrete	Anchorage	Coating	Overall
Lift Station 1: Colony	4	3	3	3
Lift Station 2: Harbor	3	1	2	2
Lift Station 4: Mandalay & Wooley	4	4	5	4
Lift Station 6: Canal	2	2	2	2
Lift Station 7	3	3	2	2
Lift Station 8	1	1	1	1
Lift Station 9: Merion Way	2	2	2	2
Lift Station 15: Cascade	3	2	3	3
Lift Station 20: Beardsley	3	4	3	3
Lift Station 23: Wagon Wheel	1	2	1	1
Lift Station 24: Handyman	5	4	5	5
Lift Station 27: Launch Ramp	3	3	3	3
Lift Station 28: Hueneme	2	2	2	2
Lift Station 29: Patterson & Hemlock	2	2	3	2
Lift Station 30: Colony	4	4	4	4

Table 5 Lift Stations: Condition Assessment: Wet Well Structure
Public Works Integrated Master Plan
City of Oxnard

Lift Station: Location	Condition Rating			
	Concrete	Anchorage	Coating	Overall
Lift Station 1: Colony	3	3	4	3
Lift Station 2: Harbor	2	2	3	2
Lift Station 4: Mandalay & Wooley	2	3	2	2
Lift Station 6: Canal	4	3	4	4
Lift Station 7	3	3	2	2
Lift Station 8	1	1	1	1
Lift Station 9: Merion Way	3	3	3	3
Lift Station 15: Cascade	3	2	3	3
Lift Station 20: Beardsley	3	4	4	4
Lift Station 23: Wagon Wheel	1	2	1	1
Lift Station 24: Handyman	5	4	5	5
Lift Station 27: Launch Ramp	2	3	2	2
Lift Station 28: Hueneme	2	2	3	2
Lift Station 29: Patterson & Hemlock	2	2	3	2
Lift Station 30: Colony	3	3	3	3

Table 6 Original Useful Life Based on Asset Category Public Works Integrated Master Plan City of Oxnard	
Asset Category	**Original Useful Life(1)**
Civil/Sitework	50
Structural	
General	50
Concrete	50
Fiberglass	25
Steel	25
Plastic	10
Mechanical	
General/Other	20
Valves	35
Pumps – Water	20
Pumps – Wastewater	20
Chemical Feed Pumps	10
Coolers/ACs/Fans	15
Electrical	
General	20
VFDs	15
Instrumentation	
General	10
RTUs	15

Note:
(1) These defaults are based on values from the International Infrastructure Management Manual, Edition 2006, USEPA guides, other industry references, and Carollo project experience.

3.2.21 Evaluated Remaining Useful Life

The EvRUL is based on the current condition of the asset and is the estimated remaining number of years until the physical failure of the asset. EvRUL does not take into account the actual age of the asset; rather it reflects an estimate of remaining useful life based on the observed condition alone. EvRUL was calculated as:

$$(1 - \text{Condition Fraction}) \times \text{Original Useful Life}$$

Condition fractions are shown in Table 7. The relationship between condition ranking and condition fraction reflects the logic that once an asset deteriorates to a below-average condition, its probability of failure increases and its remaining years in service decline more rapidly than for assets that are maintained in good condition. The rehabilitation percentages associated with each condition ranking were used to estimate the condition fractions.

Table 7 Condition Fraction Public Works Integrated Master Plan City of Oxnard	
Condition as Defined in Table 2	**Condition Fraction**
1 (Very Good)	0
2 (Good)	0.10
3 (Fair)	0.20
4 (Poor)	0.40
5 (Very Poor)	0.90

3.2.22 Economic Remaining Useful Life

The Economic Remaining Useful Life (EcRUL) aims to indicate the cost-based optimum time to rehabilitate an asset. EcRUL is an estimate of the point in an asset's service life before the maintenance costs and the likelihood of failure substantially increase, when the asset could still be restored to like-new condition with reasonable reinvestment or be replaced with a newer model offering improved efficiency. For example, a pump that has been overhauled at the right time with new bearings, gear shaft, and impeller may have a fully renewed service life. If the rehabilitation were postponed too late, however, the pump may no longer be serviceable with routine restoration methods. Likewise, a concrete structure in average condition can often be rehabilitated with crack sealing and coating, but if the structure is allowed to deteriorate too far, corrosion may extend to its members and require a rehabilitation effort with costs similar to that of a new building.

Based on Carollo observation of utilities and the management/reinvestments in assets, this period of time often occurs after the asset value reaches approximately half of its original value, when the cost for maintenance or rehabilitation of the asset begins to increase considerably. EcRUL is therefore calculated in from the following equation, which begins with half of the original useful life:

(Original Useful Life / 2) - (Original Useful Life * Condition Fraction)

The precise optimum time for reinvestment or asset renewal cannot be predicted for any asset. Nevertheless, rehabilitation activities that extend beyond typical maintenance activities incur a cost, and this cost is usually less than the cost to replace the asset entirely. Therefore, a utility that wants to ideally optimize expenditures needs to examine rehabilitation opportunities prior to incurring the capital expenditures. EcRUL provides the City with a "trigger point" to conduct rehabilitation versus replacement analysis. EcRUL values are presented in Appendix A.

3.2.23 Vulnerability Summary

The highest vulnerability assets at both the OWTP and lift stations were those that have a poor condition and shorter original useful life. Vulnerability scores can be found in Appendix A for the OWTP and lift station assets.

3.3 Above-ground Criticality

As noted in Section 2.2.2, a criticality matrix was developed for scoring the consequence of failure of assets. Criticality scores are detailed in Appendix A for the OWTP and lift station assets. In general, assets with the highest criticality scores were structural or electrical assets. These have a high criticality score in all categories, and electrical assets in particular have a have a high health and safety factor due to hazards associated with troubleshooting these assets.

3.4 Above-ground Risk

Risk scores can be found in Appendix A for the OWTP and lift station assets. Assets were sorted by risk, and the data set was examined for logical break points. The assets with risk greater than 0.5 are either highly critical or have condition concerns. Assets with risk below 0.46 were grouped in large numbers and were found to be less of concern. Therefore everything above 0.46 is high risk and shown in these tables.

A summary of the highest risk assets at the OWTP is presented by unit process in Table 8. A summary of the highest risk assets among the lift stations is presented by lift station in Table 9.

4.0 BELOW-GROUND ASSET ASSESSMENT

4.1 Below-ground Overview

Figures 2, 3, and 4 show the collection system by diameter, material, and age respectively.

Table 8 High Risk Assets at the OWTP
Public Works Integrated Master Plan
City of Oxnard

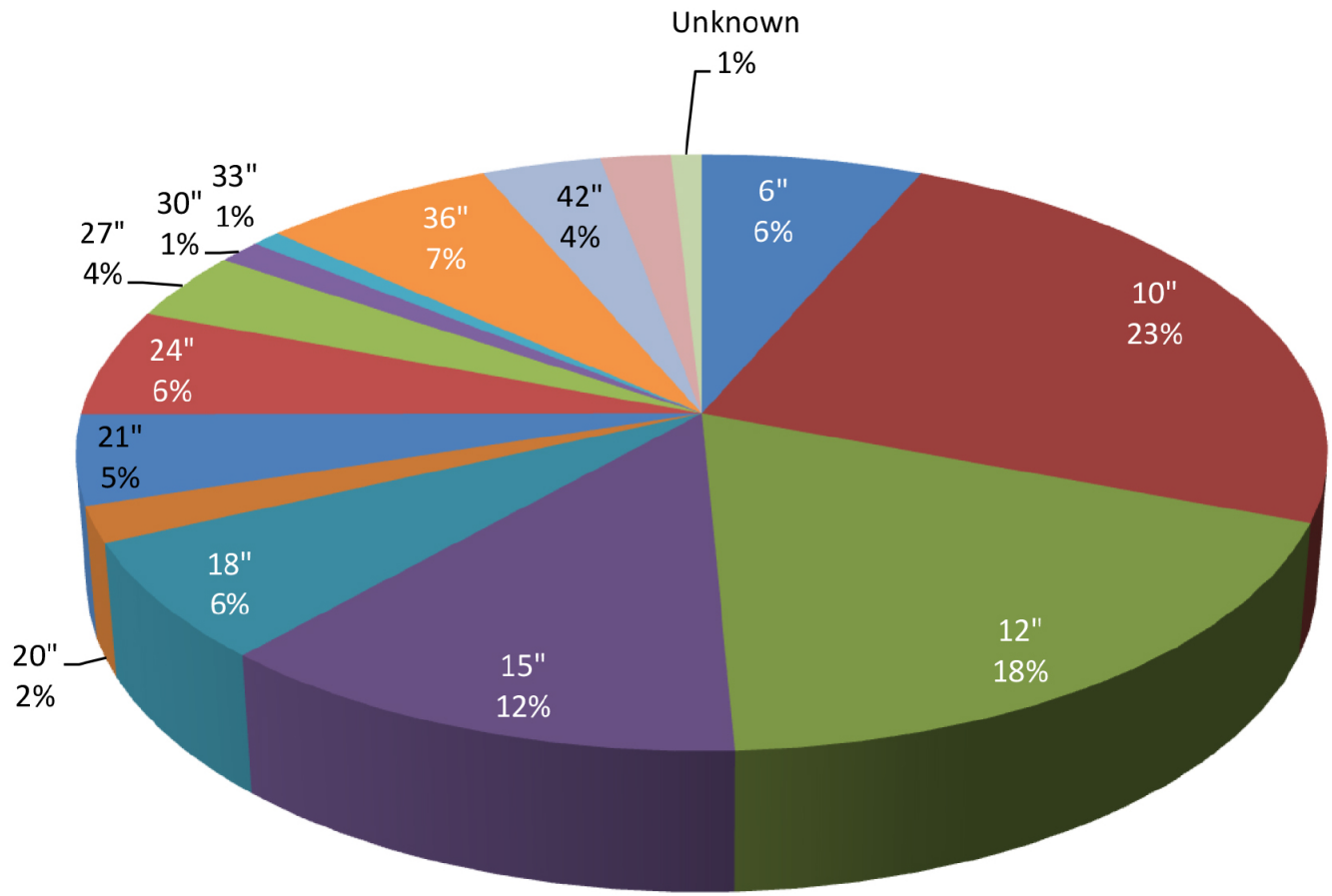
Process/Asset	Risk
Primary Treatment	
Primary Clarifiers (1-4) Collector Drive, Walkways, and Launders	4.48
Sludge Pump Tanks (1-4)	3.85
MCCs-DPIA, DPIB, DP2B, EDPIA	3.85
Scum Ejectors	3.22
Primary Clarifiers (2 & 4)	1.7
Large Isolation Valves	1.04

Table 8	**High Risk Assets at the OWTP Public Works Integrated Master Plan City of Oxnard**
Process/Asset	**Risk**
Biofilters	
Recirculation Pumps Mag Drive 1 and 2	3.4
Distributors and Drives	2.17
Biofilter Tanks 1 and 2	1.7
Biofilter Media Tanks (1 & 2)	0.8
Secondary Treatment	
Collector, Skimmer, and Drives (17-18)	1.54
Effluent Pump Station	
MCCs	3.85
Gravity Thickening	
MCCs-DP3C, DP3D	3.85
Thickened Sludge Pumps (1-3)	0.51
Digestion	
Digester Head Exchanger No. 2	3.22
Digester No. 2 Tank	1.52
Digested Sludge Pumps (1-3)	0.51
Digester Control Building	1.46
Digester Hot Water Pump 1	0.51
Digester Mixing Equipment and Draft Tubes Nos. 1-3	0.51
MCCs (DP2C, EDPIC, GF)	0.46
Dewatering	
Conveyors	2.8
Belt Filter Press 1-4	2.8
Dewatering Feed Pump 5	0.51
Washwater Booster Pumps (1-4)	0.51
Electrical	
Effluent Electrical Building Switchgear	5.11
Main Electrical Building Large Standby Generators	4.69
Effluent Electrical Building (DP2A, EBPIB)	3.85
Main Electrical 500 kW Generator	0.7
Older Transformers (1 & 2)	0.51
Main Electrical Building MCCs (DP4, DP4B, GB, GC, GD)	
Administration Building MCCs (DP2D, DP3A, EDPIE, HG)	
Buildings	
Main Switchgear Building	(1.46) Seismic(1)
Plant Control Center Building	(1.46) Seismic(1)
Vacuum Filter	(1.46) Seismic(1)
Blower Building	(1.1) Seismic(1)

Note:
(1) Indicates a seismic deficiency that requires concrete testing, further Tier 2 evaluation, or replacement. Refer to Table 3.

Table 9 High Risk Assets at Lift Stations Public Works Integrated Master Plan City of Oxnard	
Site/Asset	**Risk**
Lift Station 23 Wagon Wheel	
Submersible Pumps (1-2)	4.27
MCC	3.85
Wet Well Structure	2.56
SCADA Panel	2.25
Valve Vault	0.68
Lift Station 6 Canal	
Submersible Pumps (1-2)	0.51
MCC	0.46
Lift Station 04 Mandalay & Wooley	
SCADA Panel	0.51
MCC	0.46

PIPE LENGTH BY DIAMETER



COLLECTION SYSTEM DIAMETER

FIGURE 2

CITY OF OXNARD

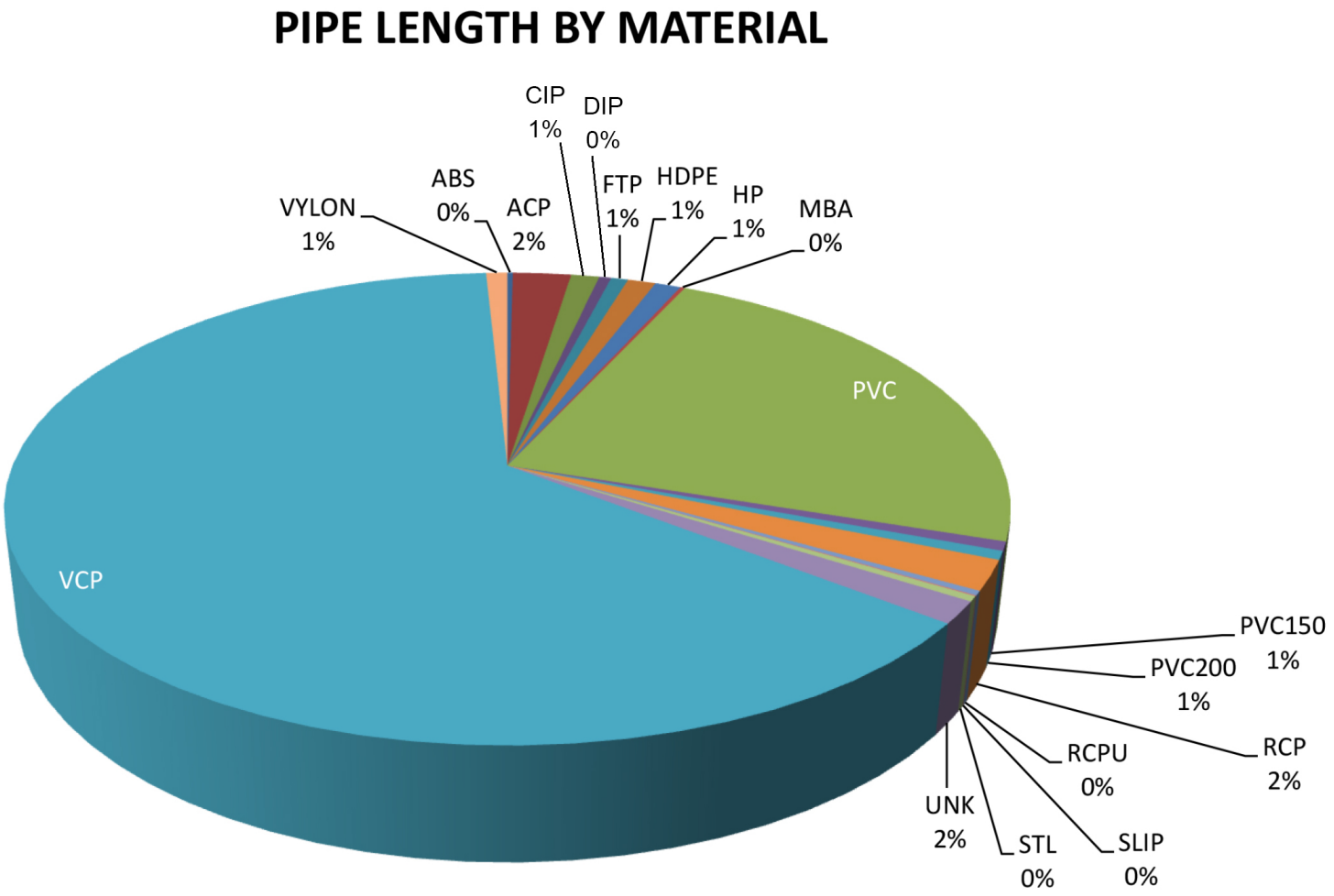
PM NO. 3.5 – CONDITION ASSESSMENT

PUBLIC WORKS INTEGRATED MASTER PLAN

CITY OF OXNARD CALIFORNIA

carollo Engineers...Working Wonders With Water®

ox0715f39-9587(PM3-5 FIG2).ai



COLLECTION SYSTEM MATERIAL

FIGURE 3

CITY OF OXNARD

PM NO. 3.5 – CONDITION ASSESSMENT

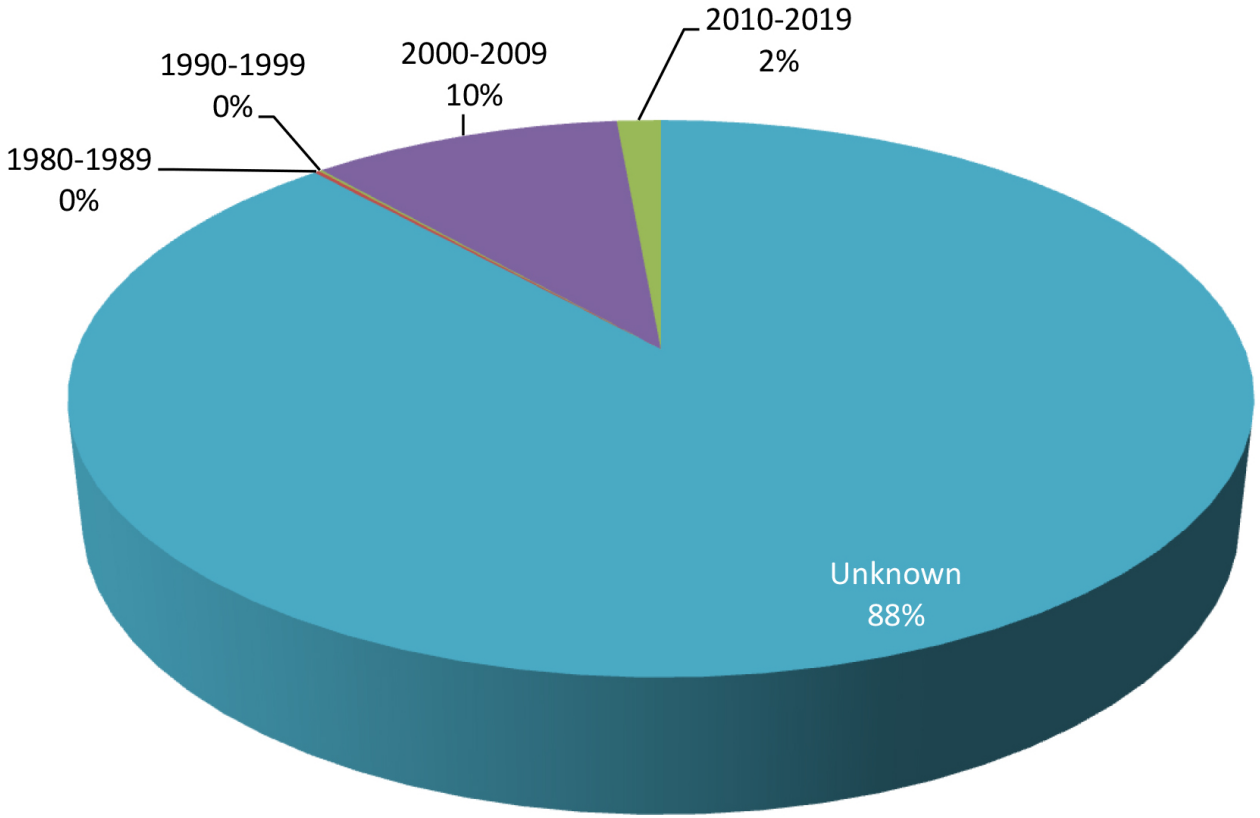
PUBLIC WORKS INTEGRATED MASTER PLAN

CITY OF OXNARD CALIFORNIA

carollo Engineers...Working Wonders With Water®

ox0715f40-9587(PM3-5 FIG3).ai

PIPE LENGTH BY DECADE INSTALLED



COLLECTION SYSTEM AGE

FIGURE 4

CITY OF OXNARD

PM NO. 3.5 – CONDITION ASSESSMENT

PUBLIC WORKS INTEGRATED MASTER PLAN

CITY OF OXNARD CALIFORNIA

carollo Engineers...Working Wonders With Water®

ox0715f41-9587(PM3-5 FIG4).ai

4.2 Below-ground Vulnerability

The useful life of pipes varies based on several factors other than pipe age and material, but these other factors are often difficult to quantify. Other factors affecting pipe failures include:

- Pipe bedding that is substandard.
- Loading from traffic above pipes in the street.
- High groundwater levels.
- Freeze and thaw action of surrounding soils.
- Soil conditions and corrosivity.
- Construction methods, primarily poor quality work.
- Pipe lining issues.
- Level of and need for cathodic protection.
- Operating beyond recommended limitations of material.

Given the complexity of pipe failure prediction, age is typically used as an indicator of condition and therefore remaining useful life. Table 10 shows the reported original useful life expectancies of different pipe materials and the value chosen for input into the desktop evaluation model.

4.2.1 Desktop Evaluation

The desktop evaluation relied on GIS data of the Oxnard collection system. Installation year was not available for 206 of the 263 segments for sewer force mains and 7123 of the 8686 segments for sewer gravity mains. Thus collectively only 18 percent of the collection system piping had a known installation year. Figure 5 shows a map of the collection system assets for which installation year was not indicated.

For the purpose of the analysis, an installation year of 1965 was assumed for these pipes, based on data conservative estimate of development in the area. Figure 6 shows the estimated vulnerability within the collection system based on this assumption.

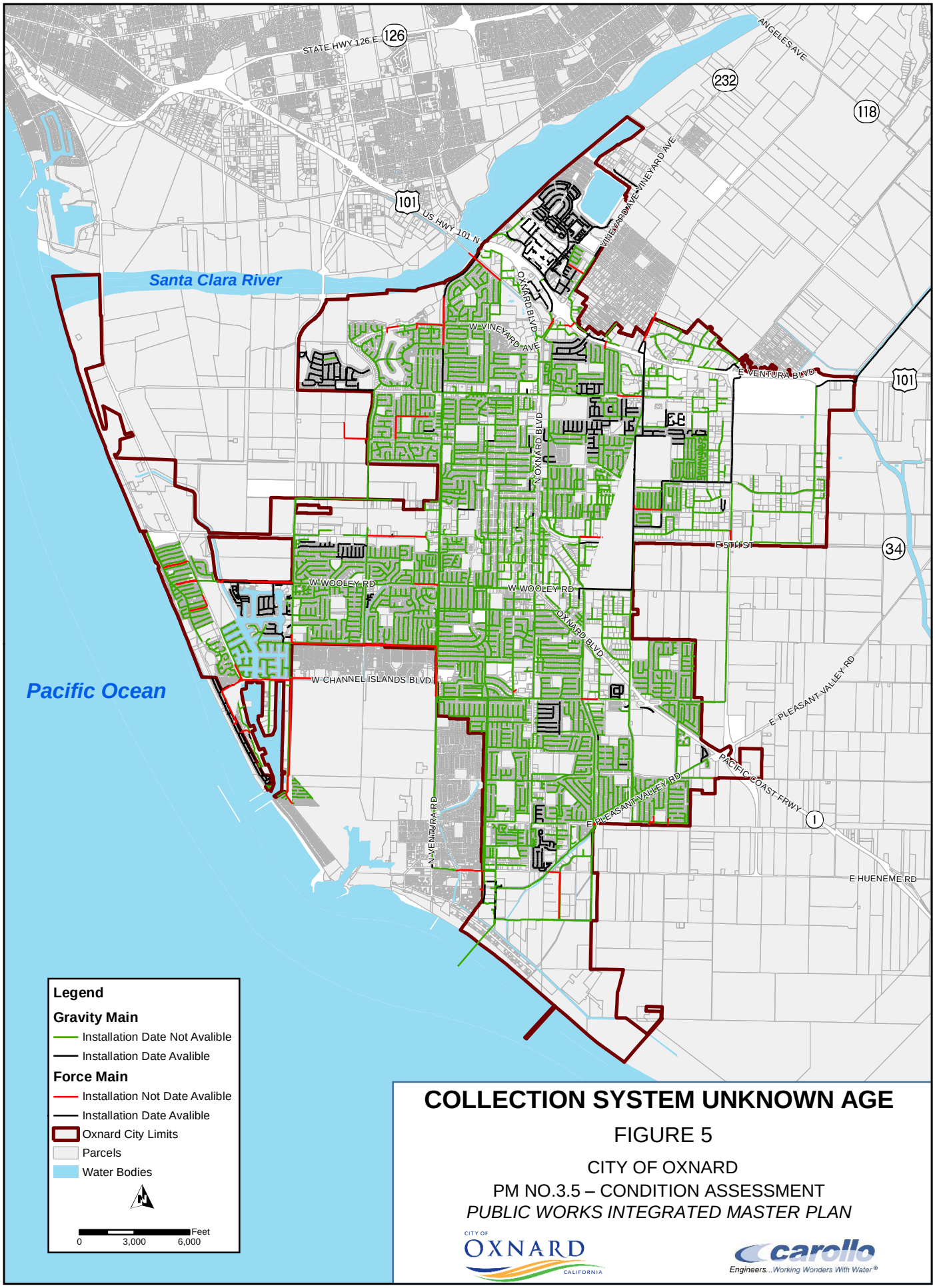
4.2.2 Collection System Cathodic Protection Findings

As noted in Section 3.2.3, a cathodic protection system evaluation was conducted and is presented in a separate report titled Asset Corrosion Assessment and CP Evaluation Survey, dated September 2014. This study includes findings on soil corrosivity applicable to the collection system evaluation. The soil corrosivity study included in situ conductivity measurements at multiple locations throughout the City, as well as twelve soil samples collected and analyzed in a certified laboratory. The findings of the corrosivity study were that the soil conditions range from “Corrosive” to “Severely Corrosive.” These conditions place a stronger emphasis on the need for working cathodic protection systems as well as protective coatings.

Table 10 Original Useful Life Expectancies for Below-Ground Assets
Public Works Integrated Master Plan
City of Oxnard

Material	Pipe Code	Generally (years)	Life Expectancy Range (years)			Chosen Value
			100%	50%	10%	
Unlined Cast Iron	CIU	20 to 150	20 to 90	30 to 115	50 to 150	70
Lined Cast Iron (original)	CIP	30 to 175	30 to 80	50 to 180	70 to 175	115
Lined Ductile Iron (original)	DIP	30 to 200	30 to 100	50 to 150	90 to 200	100
Steel	SCP	20 to 125	20 to 75	40 to 100	60 to 125	70
Asbestos Cement	ACP	20 to 135	25 to 80	35 to 100	50 to 135	65
Concrete	CONC	30 to 200	30 to 100	40 to 150	60 to 200	95
AWWA C900 PVC	C900	30 to 110	40 to 60	60 to 90	90 to 110	75
PVC	PVC	30 to 150	30 to 100	40 to 130	50 to 150	85
Vitrified Clay Pipe	VCP	100	N/A	N/A	N/A	100
Polyethylene	PE	50	N/A	N/A	N/A	50
Manholes	MAN	30 to 100	N/A	N/A	N/A	70

References:
1. AWWARF Report, *Quantifying Future Rehabilitation and Replacement Needs of Water Mains* (1998).
2. *AWWARF Report 91167, Installation, Condition Assessment and Reliability of Service Lines (2007).*



COLLECTION SYSTEM UNKNOWN AGE

FIGURE 5

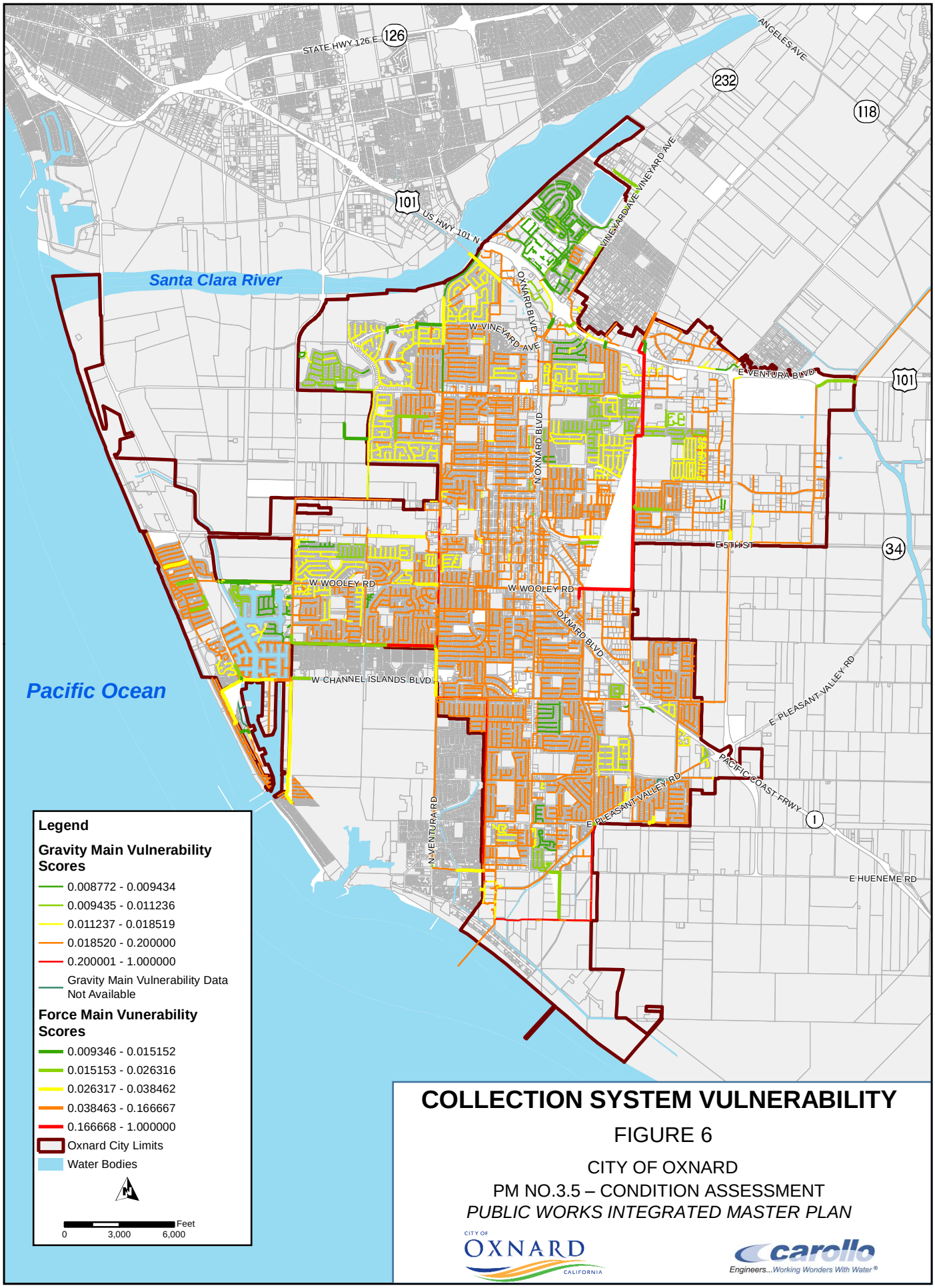
CITY OF OXNARD

PM NO.3.5 – CONDITION ASSESSMENT

PUBLIC WORKS INTEGRATED MASTER PLAN

CITY OF OXNARD CALIFORNIA

carollo Engineers...Working Wonders With Water®



COLLECTION SYSTEM VULNERABILITY

FIGURE 6

CITY OF OXNARD

PM NO.3.5 – CONDITION ASSESSMENT

PUBLIC WORKS INTEGRATED MASTER PLAN

CITY OF OXNARD CALIFORNIA

carollo Engineers...Working Wonders With Water®

4.3 Below-ground Criticality

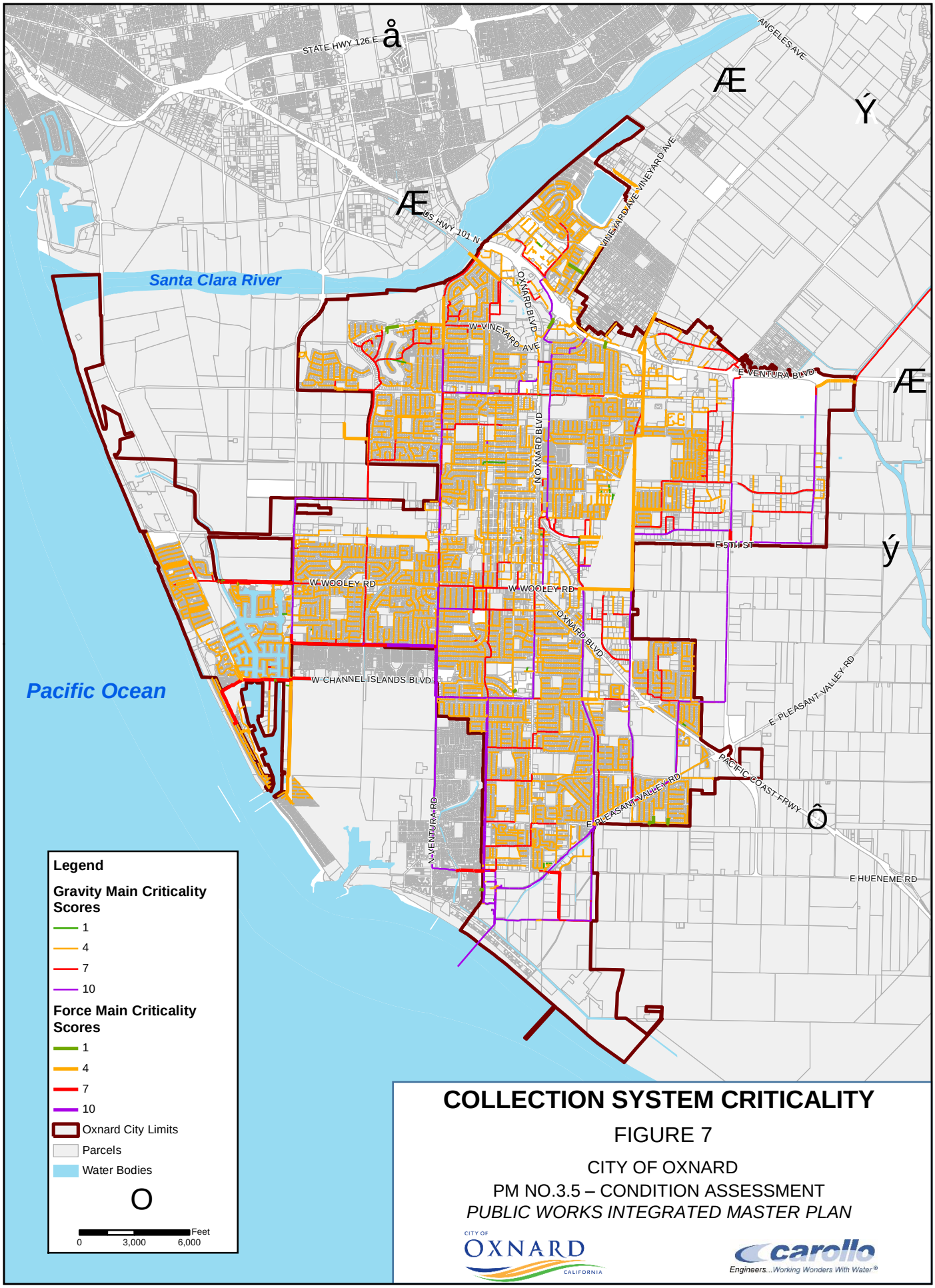
While the criticality scoring system for below-ground assets was structured similar to that used for above-ground assets, specific criteria were developed for each of the below-ground asset systems. These criteria are shown in Table 11. Several of the parameters in the criticality scoring matrix rely on data that is currently being developed in the Public Works Integrated Master Plans modeling efforts. Where data was not available, such as for the number of equivalent dwelling units (EDUs) served by a given segment of pipe, pipe diameter was used as a proxy for criticality. Figure 7 shows a map of the draft criticality scores of the Oxnard collection system, which will be updated when more information is available and following workshops with the City.

4.4 Below-ground Risk

Figure 8 shows a map of the City with the pipes color-coded to show the assets with the greatest potential risk of failure. These assets with the highest risk should be targeted for further inspection, repair, or replacement. As noted above, this figure will be updated when more information is available and following workshops with the City.

Table 11 Below-ground Criticality Ranking Scale
Public Works Integrated Master Plan
City of Oxnard

Criticality Category	Weight	Negligible = 1	Low = 4	Moderate = 7	Severe = 10
Public and Employee Health and Safety	30%	Pipes serving < 100 EDUs	Pipes serving 100-500 EDUs	Pipes serving 500-1,000 EDUs	Pipes serving > 1,000 EDUs or within 500 feet of critical facility
Financial Impact	20%	6” pipes	8” pipes	10” pipes	12” pipes and larger
Environmental or Regulatory Compliance	30%	No pipes	Pipes not within protected habitat or 250 feet of waterway	Uphill from waterway within 250 feet	Pipes in protected natural habitat
Customer Service (Ability to Respond)	20%	Pipes within 2 miles of maintenance headquarters	Pipes greater than 2 miles of maintenance headquarters	Pipes defined as hard to access	Pipes > 12’ deep or > 12” diameter



COLLECTION SYSTEM CRITICALITY

FIGURE 7

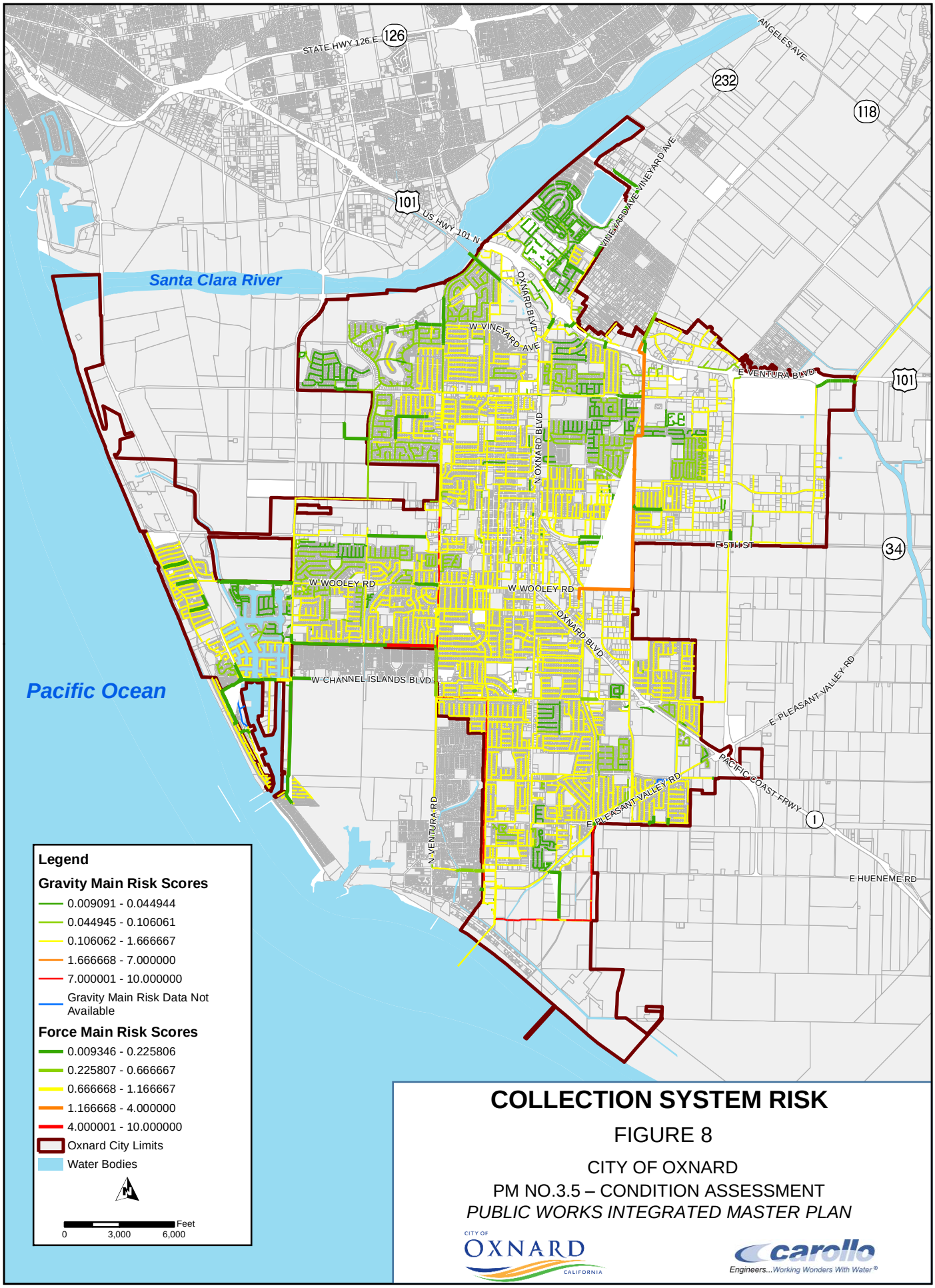
CITY OF OXNARD

PM NO.3.5 – CONDITION ASSESSMENT

PUBLIC WORKS INTEGRATED MASTER PLAN

CITY OF OXNARD CALIFORNIA

carollo Engineers...Working Wonders With Water®



COLLECTION SYSTEM RISK

FIGURE 8

CITY OF OXNARD

PM NO.3.5 – CONDITION ASSESSMENT

PUBLIC WORKS INTEGRATED MASTER PLAN

CITY OF OXNARD CALIFORNIA

carollo Engineers...Working Wonders With Water®

APPENDIX A – OWTP AND LIFT STATIONS CONDITION ASSESSMENT FINDINGS AND RISK SCORES

Condition Assessment Findings and Risk Scores

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
OWTP									
Headworks									
Bar Screen 1 (Mechanical)	2006.1	3	Light Corrosion on drive. Not in service.	23.2	18.6	7	0.0538	4	0.22
Bar Screen 2 (Mechanical)	2008	2		20	18	8	0.0556	4	0.22
Bar Screen 3 (Mechanical)	2008	3	Not in service.	20	16	6	0.0625	4	0.25
Bar Screen 4 (Mechanical)	2008	3	Light corrosion on drive belt, makes noise.	20	16	6	0.0625	4	0.25
Bar Screen 5 (Manual)	2008	2		20	18	8	0.0556	1.9	0.11
Bar Screen 6 (Manual)	2008	2		20	18	8	0.0556	1.9	0.11
Flowmeter	2008	2		10	9	4	0.1111	2.5	0.28
Grit Blower 1	2008	2		20	18	8	0.0556	2.5	0.14
Grit Blower 2	2008	2		20	18	8	0.0556	2.5	0.14
Grit Blower 3	2008	2		20	18	8	0.0556	2.5	0.14
Grit Blower 4	2008	2		20	18	8	0.0556	2.5	0.14
Grit Pump 1 (West)	2008	2		20	18	8	0.0556	2.5	0.14
Grit Pump 2 (West)	2008	2		20	18	8	0.0556	2.5	0.14
Grit Pump 3 (West)	2008	2		20	18	8	0.0556	2.5	0.14
Grit Pump 4 (West)	2008	2		20	18	8	0.0556	2.5	0.14

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Grit Pump 5 (East)	2008	2		20	18	8	0.0556	2.5	0.14
Grit Pump 6 (East)	2008	2		20	18	8	0.0556	2.5	0.14
Grit Pump 7 (East)	2008	2		20	18	8	0.0556	2.5	0.14
Grit Pump 8 (East)	2008	2		20	18	8	0.0556	2.5	0.14
Grit Separator/Classifier 1	2008	2		20	18	8	0.0556	2.5	0.14
Grit Separator/Classifier 2	2008	2		20	18	8	0.0556	2.5	0.14
Headworks Building	2008	2	100' x 20'.	50	45	20	0.0222	10	0.22
Headworks Grit Screens Building	2008	2	40' x 100'.	50	45	20	0.0222	5.2	0.12
Hypo Chemical Feed Pump (Sodium Hypo Pump 2)	2008	2		10	9	4	0.1111	4	0.44
Influent Check Valve 1	2008	2		35	31.5	14	0.0317	1.6	0.05
Influent Check Valve 2	2008	2		35	31.5	14	0.0317	1.6	0.05
Influent Check Valve 3	2008	2		35	31.5	14	0.0317	1.6	0.05
Influent Check Valve 4	2008	2		35	31.5	14	0.0317	1.6	0.05
Influent Check Valve 5	2008	2		35	31.5	14	0.0317	1.6	0.05
Influent Check Valve 6	2008	2		35	31.5	14	0.0317	1.6	0.05
Influent Pump 1	2008	2		20	18	8	0.0556	2.8	0.16
Influent Pump 2	2008	2		20	18	8	0.0556	2.8	0.16
Influent Pump 3	2008	2		20	18	8	0.0556	2.8	0.16
Influent Pump 4	2008	2		20	18	8	0.0556	2.8	0.16
Influent Pump 5	2008	2		20	18	8	0.0556	2.8	0.16

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Influent Pump 6	2008	2		20	18	8	0.0556	2.8	0.16
MCC- HW	2008	2	AB Centerline. Age assumed by manufacturer.	20	18	8	0.0556	10	0.56
Odor Control Ductworks & Vessels	1994	2		20	18	8	0.0556	5.8	0.32
Remote Telemetry Unit (RTU)	2008	2		15	13.5	6	0.0741	1.6	0.12
Screening Compactor 1	2008	3	Light corrosion. With replacement range.	20	16	6	0.0625	2.5	0.16
Screening Compactor 2	2008	3	Light corrosion. With replacement range.	20	16	6	0.0625	2.5	0.16
Sodium Hydroxide Pump 1	2008	3	Within replacement range.	10	8	3	0.125	4	0.5
Sodium Hydroxide Pump 2	2008	3	Within replacement range.	10	8	3	0.125	4	0.5
Sodium Hydroxide Storage Tank	2008	3	Within replacement range.	30	24	9	0.0417	5.8	0.24
Sodium Hypochlorite Pump 1	2008	3	Within replacement range.	10	8	3	0.125	4	0.5
Sodium Hypochlorite Storage Tank	2008	3	Within replacement range.	30	24	9	0.0417	4	0.17
Standby Generator	2008	2		20	18	8	0.0556	10	0.56
VFDs	2008	2		15	13.5	6	0.0741	4.9	0.36
Primary Treatment									
Clarifier 1 Collector Drive, Walkways, & Launders	1994	5		20	2	-8	0.7	6.4	4.48
Clarifier 2 Collector Drive, Walkways, & Launders	1994	5		20	2	-8	0.7	6.4	4.48
Clarifier 3 Collector Drive, Walkways, & Launders	1994	5		20	2	-8	0.7	6.4	4.48

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Clarifier 4 Collector Drive, Walkways, & Launders	1994	5		20	2	-8	0.7	6.4	4.48
Large Isolation Valve 1	1979	5		35	3.5	-14	0.2	5.2	1.04
Large Isolation Valve 2	1979	5		35	3.5	-14	0.2	5.2	1.04
MCC-DP2B	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
MCC-DPIA	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
MCC-DPIB	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
MCC-EDPIA	1994	5	Federal Pacific. 1988 Drawings. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Primary Clarification Tank 1	1972	4	Penfield and Smith reported cracking, abrasion at the effluent box, comprimised ladder anchorage, and corrosion of catwalk supports. Carollo recommends concrete testing to determine remaining useful life and rehabilitation strategy.	50	30	5	0.0333	8.5	0.28
Primary Clarification Tank 2	1972	5	Penfield and Smith reported cracking, abrasion at the effluent box, comprimised ladder anchorage, and severe corrosion of catwalk supports. Catwalk needs to be replaced. Carollo recommends concrete testing to determine remaining useful life and rehabilitation strategy. Nearing end of useful life.	50	5	-20	0.2	8.5	1.7

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Primary Clarification Tank 3	1972	4	Penfield and Smith reported cracking, abrasion at the effluent box, comprimised ladder anchorage, and corrosion of catwalk supports. Carollo recommends concrete testing to determine remaining useful life and rehabilitation strategy.	50	30	5	0.0333	8.5	0.28
Primary Clarification Tank 4	1972	5	Penfield and Smith reported cracking, abrasion at the effluent box, comprimised ladder anchorage, and severe corrosion of catwalk supports. Catwalk needs to be replaced. Carollo recommends concrete testing to determine remaining useful life and rehabilitation strategy. Nearing end of useful life.	50	5	-20	0.2	8.5	1.7
Primary Sedimentation Building	1972	4	Significant sign of decay, shrinkage, and other damage to the wood members, deteriation of masonry units and mortar. 75' x 35'.	50	30	5	0.0333	6.4	0.21
Scum Ejector 1	1994	5		20	2	-8	0.7	4.6	3.22
Scum Ejector 2	1994	5		20	2	-8	0.7	4.6	3.22
Scum Ejector 3	1994	5		20	2	-8	0.7	4.6	3.22
Scum Ejector 4	1994	5		20	2	-8	0.7	4.6	3.22
Sludge Pump Tank 1	1994	5	Nearing end of useful life.	20	2	-8	0.7	5.5	3.85
Sludge Pump Tank 2	1994	5	Nearing end of useful life.	20	2	-8	0.7	5.5	3.85
Sludge Pump Tank 3	1994	5	Nearing end of useful life.	20	2	-8	0.7	5.5	3.85

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Sludge Pump Tank 4	1994	5	Nearing end of useful life.	20	2	-8	0.7	5.5	3.85
Bio Filters									
Bio Filter Distributor & Drives Tank 1	1994	5	Distribution tube seal broken.	20	2	-8	0.7	3.1	2.17
Bio Filter Distributor & Drives Tank 2	1994	5		20	2	-8	0.7	3.1	2.17
Bio Filter Tank 1 Media	2014	5	Media falling apart. Concrete in bad condition.	50	5	-20	0.2	4	0.8
Bio Filter Tank 2 Media	2014	5	Center shaft shield broken.	50	5	-20	0.2	4	0.8
Bio Filter Ventilation Blower 1	1994	4		20	12	2	0.0833	4.9	0.41
Bio Filter Ventilation Blower 2	1994	4		20	12	2	0.0833	4.9	0.41
Bio Filter Ventilation Blower 3	1994	4		20	12	2	0.0833	4.9	0.41
Bio Filter Ventilation Blower 4	1994	4		20	12	2	0.0833	4.9	0.41
Biological Trickling Tank 1 Structure	2014	5	Approx. 643,398 sq. ft. (r=64' x 50').	50	5	-20	0.2	8.5	1.7
Biological Trickling Tank 2 Structure	2014	5	Approx. 392,699 sq. ft. (r=64' x 50').	50	5	-20	0.2	8.5	1.7
Recirculation Pump Mag Drive 1	2014	5		20	2	-8	0.7	4.9	3.43
Recirculation Pump Mag Drive 2	2014	5		20	2	-8	0.7	4.9	3.43
Recirculation Tank 1 Pump 1	1994	3	Noise vibration.	20	16	6	0.0625	6.1	0.38
Recirculation Tank 1 Pump 2	1994	3		20	16	6	0.0625	6.1	0.38
Interstage Pump Station									
Interstage Pump 1	1994	3		20	16	6	0.0625	4.3	0.27

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Interstage Pump 2	1994	4	Corrosion, noise, vibration.	20	12	2	0.0833	4.3	0.36
Interstage Pump 3	1994	4	Corrosion, noise, vibration.	20	12	2	0.0833	4.3	0.36
Interstage Well Structure	1977	3		50	40	15	0.025	8.2	0.21
Large isolation Valve 1	1979	3		35	28	10.5	0.0357	3.4	0.12
Large Isolation Valve 2	1979	3		35	28	10.5	0.0357	3.4	0.12
Large Isolation Valve 3	1979	3		35	28	10.5	0.0357	3.4	0.12
VFDs	1999	2		15	13.5	6	0.0741	4.3	0.32
Aerated Activated Sludge									
Aeration Basin 1 Structure	1990	3		50	40	15	0.025	3.7	0.09
Aeration Basin 2 Structure	1990	3		50	40	15	0.025	3.7	0.09
Aeration Basin 3 Structure	1990	3		50	40	15	0.025	3.7	0.09
Aeration Basin 4 Structure	1990	3		50	40	15	0.025	3.7	0.09
Aeration Basin 5 Structure	1990	3		50	40	15	0.025	3.7	0.09
Aeration Basin 6 Structure	1990	3		50	40	15	0.025	3.7	0.09
Blower 1	1994	2	6000 scfm, 9.6 psi, Single stage, Turblex blowers.	20	18	8	0.0556	2.8	0.16
Blower 2	1994	2	6000 scfm, 9.6 psi, Single stage, Turblex blowers.	20	18	8	0.0556	2.8	0.16
Blower 3	1994	2	6000 scfm, 9.6 psi, Single stage, Turblex blowers.	20	18	8	0.0556	2.8	0.16
Blower 4	1994	2	6000 scfm, 9.6 psi, Single stage, Turblex blowers.	20	18	8	0.0556	2.8	0.16

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Blower 5	1994	2	6000 scfm, 9.6 psi, Single stage, Turblex blowers.	20	18	8	0.0556	2.8	0.16
Diffusers & Piping Basin 1	1994	4		20	12	2	0.0833	3.7	0.31
Diffusers & Piping Basin 2	1994	4		20	12	2	0.0833	3.7	0.31
Diffusers & Piping Basin 3	1994	4		20	12	2	0.0833	3.7	0.31
Diffusers & Piping Basin 4	1994	4	Cracked air piping in some places. Pipe is very brittle.	20	12	2	0.0833	3.7	0.31
Diffusers & Piping Basin 5	1994	4		20	12	2	0.0833	3.7	0.31
Diffusers & Piping Basin 6	1994	4		20	12	2	0.0833	3.7	0.31
Sed/RAS/WAS/Flow Equal									
3WHP Facilities Pump 1	1994	4		20	12	2	0.0833	2.5	0.21
3WHP Facilities Pump 2	1994	4		20	12	2	0.0833	2.5	0.21
3WHP Facilities Pump 3	1994	4		20	12	2	0.0833	2.5	0.21
AST Drain Pump	1994	4		20	12	2	0.0833	1.6	0.13
Blowers (18)	1994	2		20	18	8	0.0556	1.6	0.09
Flow Equalization Basin Structure	1990	4	Penfield and Smith reported exposed rebar, cracking, and spalling.	50	30	5	0.0333	6.1	0.2
Flow Equalization Gates & Drives	1994	3		20	16	6	0.0625	1.6	0.1
Flow Equalization Pump 1	1994	3		20	16	6	0.0625	3.1	0.19
Flow Equalization Pump 2	1994	3		20	16	6	0.0625	3.1	0.19
Flow Equalization Pump 3	1994	3	Wobbling.	20	16	6	0.0625	3.1	0.19
RAS Pump 1	1994	4		20	12	2	0.0833	2.2	0.18

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
RAS Pump 2	1994	4		20	12	2	0.0833	2.2	0.18
RAS Pump 3	1994	4		20	12	2	0.0833	2.2	0.18
RAS Pump 4	1994	4		20	12	2	0.0833	2.2	0.18
RAS Pump Galley Ventilation Fan 1	1994	3		20	16	6	0.0625	6.1	0.38
RAS Pump Galley Ventilation Fan 2	1994	3		20	16	6	0.0625	6.1	0.38
Secondary Sed. Collector, Skimmer & Drives (1-16)	1994	3	Basin 13-16 have manual skimmers that work well. 1-12 have motorized skimmers that don't work.	20	16	6	0.0625	2.2	0.14
Secondary Sed. Collector, Skimmer & Drives (17-18)	1994	5	Mechanisms need to be completely rehabbed.	20	2	-8	0.7	2.2	1.54
Secondary Sed. Sludge Magnetic Flow Meters (18)	2004	3	Magnetic flow meter placed on every secondary sludge line (dwgs).	10	8	3	0.125	2.5	0.31
Secondary Sedimentation Skimmings Pumps (18)	1994	3	Change impeller on one pump.	20	16	6	0.0625	1.6	0.1
Secondary Sedimentation Tanks (18)	1990	3	Carollo recommends concrete testing to determine concrete condition and seismic strengthening opions.	50	40	15	0.025	2.8	0.07
VFDs	1999	3		15	12	4.5	0.0833	1.6	0.13
WAS Pump 1	1994	4		20	12	2	0.0833	3.7	0.31
WAS Pump 2	1994	4		20	12	2	0.0833	3.7	0.31
WAS Pump 3	1994	4		20	12	2	0.0833	3.7	0.31
Disinfection Facilities									
Chlorine Contact Gates, Supports & Operators	1994	4		20	12	2	0.0833	1.6	0.13

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Chlorine Contact Tank Structure	1972	3	Penfield & Smith reported minor cracks, staining, and spalling. Carollo advises concrete testing to confirm condition and determine long-term needs.	50	40	15	0.025	5.2	0.13
Hypo Pump 1	2004	3	Not in use.	10	8	3	0.125	1	0.13
Hypo Pump 2	2004	3	Not in use.	10	8	3	0.125	1	0.13
Hypo Pump 3	2004	3	Not in use.	10	8	3	0.125	1	0.13
Hypo Pump 4	2004	3	Not in use.	10	8	3	0.125	1	0.13
Hypo Pump 5	2004	3	Not in use.	10	8	3	0.125	1	0.13
Hypo Pump 6	2004	3	Not in use.	10	8	3	0.125	1	0.13
Hypo Tank 1	2000	3	Not in use.	30	24	9	0.0417	6.7	0.28
Hypo Tank 2	1990	3	In use for disinfecting 3WHP.	30	24	9	0.0417	6.7	0.28
Effluent - Pump Station (EPS)									
Effluent Pump Station Building	1972	3	Penfield and Smith reported minor cracking and shallow spalling in places, as well as timber joist checking. Building size is 25' x 25'.	50	40	15	0.025	7.3	0.18
Effluent - Pump Station (EPS)									
Engine Drive 2	2004	3	500 KW. Manifold replaced rebuilt more than 10 year ago.	20	16	6	0.0625	4	0.25
Effluent - Pump Station (EPS)									
Large isolation Valves (4)	1979	3		35	28	10.5	0.0357	3.4	0.12
Effluent - Pump Station (EPS)									

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
MCC-DP4A	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Effluent - Pump Station (EPS)									
MCC-EDPID	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Effluent - Pump Station (EPS)									
Pump 1	1994	3		20	16	6	0.0625	6.1	0.38
Effluent - Pump Station (EPS)									
Pump 2	2006	2	Brand new.	20	18	8	0.0556	6.1	0.34
Effluent - Pump Station (EPS)									
Pump 3	1994	3		20	16	6	0.0625	6.1	0.38
Effluent - Pump Station (EPS)									
Pump 4	1994	3		20	16	6	0.0625	6.1	0.38
Effluent - Pump Station (EPS)									
Pump 5 - Big Red	1994	4		20	12	2	0.0833	1	0.08
Effluent - Pump Station (EPS)									
VFDs	1999	2		15	13.5	6	0.0741	3.4	0.25
Gravity Thickeners & Blower Building									
Blower Building	2008	5	36' x 18'.	50	5	-20	0.2	5.5	1.1
Gravity Thickeners & Blower Building									
Blower Building Remote Telemetry Unit (RTU)	1999	3		15	12	4.5	0.0833	3.4	0.28
Gravity Thickeners & Blower Building									
Fans/ Louvers Tank 1	1994	4	Needs service every other month.	20	12	2	0.0833	4.9	0.41

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Gravity Thickeners & Blower Building									
Fans/ Louvers Tank 2	2009	4	New service every other month.	20	12	2	0.0833	4.9	0.41
Gravity Thickeners & Blower Building									
Collector Drive, Walkways, Launders Tank 1	1994	4		20	12	2	0.0833	5.2	0.43
Gravity Thickeners & Blower Building									
Collector Drive, Walkways, Launders Tank 2	1994	4		20	12	2	0.0833	5.2	0.43
Gravity Thickeners & Blower Building									
Gravity Thickening Tank 1	1964	4	Approx. 47,557 sq. ft. (r=29, h=18).	50	30	5	0.0333	8.5	0.28
Gravity Thickeners & Blower Building									
Gravity Thickening Tank 2	1964	4	Approx. 47,557 sq. ft. (r=29, h=18).	50	30	5	0.0333	8.5	0.28
Gravity Thickeners & Blower Building									
MCC -DP3C	1994	5	Federal Pacific. Should move to own building- sludge dew. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Gravity Thickeners & Blower Building									
MCC -DP3D	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Gravity Thickeners & Blower Building									
MCC-NG	1994	4	Westinghouse. Age assumed by manufacturer.	20	12	2	0.0833	5.5	0.46
Gravity Thickeners & Blower Building									
Odor Reduction Tower	1977	4	25' x 25'.	50	30	5	0.0333	7.3	0.24
Gravity Thickeners & Blower Building									

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Thickened Sludge Pump 1	1994	4		20	12	2	0.0833	6.1	0.51
Gravity Thickeners & Blower Building									
Thickened Sludge Pump 2	1994	4		20	12	2	0.0833	6.1	0.51
Gravity Thickeners & Blower Building									
Thickened Sludge Pump 3	1994	4		20	12	2	0.0833	6.1	0.51
DAF									
DAF Air Saturation Tank #1	2014	3		20	16	6	0.0625	6.7	0.42
DAF Air Saturation Tank #2	2014	3		20	16	6	0.0625	6.7	0.42
DAF Collectors Drives Tank 1	1994	3	Vibration and noise present.	20	16	6	0.0625	3.7	0.23
DAF Collectors Drives Tank 2	1994	3	Rebuilt inside baffle of piping 7 years ago.	20	16	6	0.0625	3.7	0.23
DAF Compressor 1	1999	3		15	12	4.5	0.0833	1.9	0.16
DAF Compressor 2	1999	3		15	12	4.5	0.0833	1.9	0.16
DAF Compressor 3	1999	3		15	12	4.5	0.0833	1.9	0.16
DAF Compressor 4	1999	3		15	12	4.5	0.0833	1.9	0.16
DAF Starter Rack	1994	3		20	16	6	0.0625	4	0.25
DAF Tank 1	1990	4	Penfield & Smith reported cracks, and delaminated and spalled concrete. Carollo recommends concrete testing to determine condition and long-term needs. Approx. 115,812 sq. ft. (r=48', h=18').	50	30	5	0.0333	8.5	0.28

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
DAF Tank 2	1990	3	Penfield & Smith reported cracks, and delaminated and spalled concrete. Carollo recommends concrete testing to determine condition and long-term needs. Approx. 115,812 sq. ft. (r=48', h=18'). Rebuilt interiors.	50	40	15	0.025	8.5	0.21
DAF TWAS Sludge Pump 1	1994	3		20	16	6	0.0625	6.1	0.38
DAF TWAS Sludge Pump 2	1994	3	Replaced parts once.	20	16	6	0.0625	6.1	0.38
DAF Underflow Recirculation Pump 1	1994	3		20	16	6	0.0625	6.1	0.38
DAF Underflow Recirculation Pump 2	2014	3		20	16	6	0.0625	6.1	0.38
DAF VFDs	1999	3		15	12	4.5	0.0833	3.4	0.28
Polymer Blending Unit 1	1994	3		20	16	6	0.0625	4	0.25
Polymer Blending Unit 2	1994	3		20	16	6	0.0625	4	0.25
Polymer Building	2014	3	25' x 20'.	50	40	15	0.025	7.3	0.18
Polymer Bulk Building Storage Tank	1990	3		30	24	9	0.0417	7.3	0.3
Polymer Solution Pump 1	1994	3		20	16	6	0.0625	6.1	0.38
Polymer Solution Pump 2	1994	3		20	16	6	0.0625	6.1	0.38
Polymer Solution Pump 3	1994	3		20	16	6	0.0625	6.1	0.38
Polymer Transfer Pump	1994	3		20	16	6	0.0625	6.1	0.38
Digestion									
Digested Sludge Pump 1	2014	4	Progressive Cavity Pump.	20	12	2	0.0833	6.1	0.51

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Digested Sludge Pump 2	2014	4		20	12	2	0.0833	6.1	0.51
Digested Sludge Pump 3	2014	4		20	12	2	0.0833	6.1	0.51
Digestor Blower 1	1994	4		20	12	2	0.0833	4.9	0.41
Digestor Blower 2	1994	4		20	12	2	0.0833	4.9	0.41
Digestor Blower 3	1994	4		20	12	2	0.0833	4.9	0.41
Digestor Blower 4	1994	4		20	12	2	0.0833	4.9	0.41
Digestor Blower 5	1994	4		20	12	2	0.0833	4.9	0.41
Digestor Blower 6	1994	3	Big.	20	16	6	0.0625	4.9	0.31
Digestor Blower 7	1994	3	Big.	20	16	6	0.0625	4.9	0.31
Digestor Control Building	1977	5	Significant signs of decay, shrinkage, and other damage to the wood members, deterioation of the masonry units. 35' x 50 '.	50	5	-20	0.2	7.3	1.46
Digestor Flares	1984	3	Used only when cogen is out of service. Installed new igniters 2 months old.	30	24	9	0.0417	3.4	0.14
Digestor Heat Exchanger 1	1994	4	Corrosion and noise present.	20	12	2	0.0833	4.6	0.38
Digestor Heat Exchanger 2	1994	5	Out of service.	20	2	-8	0.7	4.6	3.22
Digestor Heat Exchanger 3	1994	4		20	12	2	0.0833	4.6	0.38
Digestor No. 1 Hot Water Pump 4	1994	4		20	12	2	0.0833	6.1	0.51
Digestor No. 1 Mixing Equipment & Draft Tubes	1999	4	Gas piping. Installed temporary seals at multiple places.	15	9	1.5	0.1111	4.6	0.51

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Digestor No. 1 Tank	1977	4	Diameter = 45, height 50'. Roof was redone to a fixed roof. Digestor has a crack on the side all the way to the top.	50	30	5	0.0333	7.6	0.25
Digestor No. 2 Mixing Equipment & Draft Tubes	1999	4		15	9	1.5	0.1111	4.6	0.51
Digestor No. 2 Tank	1977	5	Diameter = 45, height 50'. Not in service. Roof in bad condition. Out of service.	50	5	-20	0.2	7.6	1.52
Digestor No. 3 Mixing Equipment & Draft Tubes	1999	4	Piping corrosion, sediment trap is corroding.	15	9	1.5	0.1111	4.6	0.51
Digestor No. 3 Tank	1990	4	Diameter = 55, height 50'.	50	30	5	0.0333	7.6	0.25
MCC-DP2C	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
MCC-EDPIC	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
MCC-GF	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Petroleum Gas Tank	1984	3		30	24	9	0.0417	7.3	0.3
Remote Telemetry Unit (RTU)	1999	3		15	12	4.5	0.0833	3.4	0.28
SCADA System Terminal	2004	3		10	8	3	0.125	2.5	0.31
Dewatering									
Air Handling Unit and Odord Control	2014	4		20	12	2	0.0833	1	0.08
Belt Filter Press 1	1994	5	Corroded. Have not rebuilt in a long time.	20	2	-8	0.7	4	2.8
Belt Filter Press 2	2014	5		20	2	-8	0.7	4	2.8

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Belt Filter Press 3	2014	5		20	2	-8	0.7	4	2.8
Belt Filter Press 4	2014	5		20	2	-8	0.7	4	2.8
Conveyers	1994	5	System is corroded, needs replacement. Drive noise and vibration.	20	2	-8	0.7	4	2.8
Dewatering Feed Pump 1	1994	3		20	16	6	0.0625	6.1	0.38
Dewatering Feed Pump 2	1994	3		20	16	6	0.0625	6.1	0.38
Dewatering Feed Pump 3	1994	3		20	16	6	0.0625	6.1	0.38
Dewatering Feed Pump 4	1994	3		20	16	6	0.0625	6.1	0.38
Dewatering Feed Pump 5	1994	4		20	12	2	0.0833	6.1	0.51
Dewatering Feed Sludge Grinder	1994	4		20	12	2	0.0833	4	0.33
Eastern Trunk Pump Station	1990	4	Westinghouse.	50	30	5	0.0333	7.3	0.24
Fans/ Louvers	1994	3		20	16	6	0.0625	4.9	0.31
Gravity Thickener Scrubber	1999	4		15	9	1.5	0.1111	4	0.44
MCC-SH	1994	4	Westinghouse. Age assumed by manufacturer.	20	12	2	0.0833	5.5	0.46
Odor Control Ductworks & Vessels	1994	3		20	16	6	0.0625	4.9	0.31
Polyblend Unit 1	2014	4		20	12	2	0.0833	4	0.33
Polyblend Unit 2	2014	4		20	12	2	0.0833	4	0.33
Polyblend Unit 3	2014	4		20	12	2	0.0833	4	0.33
Polyblend Unit 4	2014	4		20	12	2	0.0833	4	0.33

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Solids Processing Building	1990	3	Penfield and Smith reported cracks, spalling, and corrosion to struts. 60' x 75'.	50	40	15	0.025	7.3	0.18
Solids Processing Polmer Storage Addition Tank	1990	3		30	24	9	0.0417	7.3	0.3
Solids Processing Polymer Chemical Storage eq	1994	3		20	16	6	0.0625	4	0.25
VFDs	1999	3		15	12	4.5	0.0833	3.4	0.28
Washwater Booster Pump 1	2014	4		20	12	2	0.0833	6.1	0.51
Washwater Booster Pump 2	2014	4		20	12	2	0.0833	6.1	0.51
Washwater Booster Pump 3	2014	4		20	12	2	0.0833	6.1	0.51
Washwater Booster Pump 4	2014	4		20	12	2	0.0833	6.1	0.51
Cogen/Generator Building									
Cogen Air Handling Unit	2010	4	15 hp. Vibration and noise present. Ducting replaced 4 years ago.	20	12	2	0.0833	4	0.33
Cogen Blended Gas Blower	1994	4		20	12	2	0.0833	4.9	0.41
Cogen Blower 1 DG	1994	4		20	12	2	0.0833	4.9	0.41
Cogen Blower 1 NG	1994	4		20	12	2	0.0833	4.9	0.41
Cogen Blower 2 DG	1994	4		20	12	2	0.0833	4.9	0.41
Cogen Blower 2 NG	1994	4		20	12	2	0.0833	4.9	0.41
Cogen Engine Generator 1	1994	3	500 KW. Rebuilt regularly. Some corrosion on roof, paint peeling.	20	16	6	0.0625	6.7	0.42
Cogen Engine Generator 2	1994	3	500 KW. Rebuilt regularly. Some corrosion on roof, paint peeling.	20	16	6	0.0625	6.7	0.42

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Cogen Engine Generator 3	1994	3	500 KW. Rebuilt regularly. Some corrosion on roof, paint peeling.	20	16	6	0.0625	6.7	0.42
Cogen Switchgear	1994	3		20	16	6	0.0625	4	0.25
Cogen/Generator Building	1977	3	Significant decay, shrinkage, damage to wood members, deterioration of masonry units. Building size approx. 1500 sq.ft.	50	40	15	0.025	7.3	0.18
MCC-DP3B	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
MCC-GA	1994	4	Westinghouse. Age assumed by manufacturer.	20	12	2	0.0833	5.5	0.46
Electrical - Main Electrical Building									
Large Standby Generator 1	1994	5	1.5 MW. Tested 20 minutes a month. Burns 75 gallons per hour. Parts Available. Condition 5 based on inability to bring emergency power on line in short time. Overall emergency power system needs to be improved.	20	2	-8	0.7	6.7	4.69
Electrical - Main Electrical Building									
Large Standby Generator 2	1994	5	1.5 MW. Tested 20 minutes a month. Burns 75 gallons per hour. Parts Available. Condition 5 based on inability to bring emergency power on line in short time. Overall emergency power system needs to be improved.	20	2	-8	0.7	6.7	4.69
Electrical - Main Electrical Building									

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
500 kW Generator	2006	5	Caterpillar 500 kW generator, located at Old Headworks. Diesel. Condition 5 based on inability to bring emergency power on line in short time. Overall emergency power system needs to be improved.	20	2	-8	0.7	1	0.7
Electrical - Main Electrical Building									
Main Electrical/Switchgear Building	1977	5	Significant sign of decay, shrinkage, and other damage to wood members noted. 31' x 47'.	50	5	-20	0.2	7.3	1.46
Electrical - Main Electrical Building									
MCC-DP4	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Electrical - Main Electrical Building									
MCC-DP4B	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Electrical - Main Electrical Building									
MCC-GB	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Electrical - Main Electrical Building									
MCC-GC	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Electrical - Main Electrical Building									
MCC-GD	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Electrical - Main Electrical Building									
Older Transformer 1	1994	4	This one is older.	20	12	2	0.0833	6.1	0.51
Electrical - Main Electrical Building									

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Older Transformer 2	1994	4		20	12	2	0.0833	6.1	0.51
Electrical - Main Electrical Building									
Switchboard MA-MB	1994	3		20	16	6	0.0625	4	0.25
Electrical - Main Electrical Building									
Switchgear 1	1994	3		20	16	6	0.0625	4	0.25
Electrical - Main Electrical Building									
Switchgear 2	2014	4		20	12	2	0.0833	4	0.33
Electrical - Main Electrical Building									
Switchgear HW	1994	3		20	16	6	0.0625	4	0.25
Electrical - Main Electrical Building									
Transformer A	1994	1	2000 KVA.	20	20	10	0.05	6.1	0.31
Electrical - Main Electrical Building									
Transformer B	1994	1	2500 KVA.	20	20	10	0.05	6.1	0.31
Electrical - North Area Electrical Building									
MCC-NA	1994	4	Westinghouse Series 2100. Activated sludge blower motor control center.	20	12	2	0.0833	5.5	0.46
Electrical - North Area Electrical Building									
MCC-NC	1994	4	Westinghouse Series 2100. VFD motor control center.	20	12	2	0.0833	5.5	0.46
Electrical - North Area Electrical Building									
MCC-ND	1994	4	Westinghouse Series 2100. Age assumed by manufacturer.	20	12	2	0.0833	5.5	0.46
Electrical - North Area Electrical Building									

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
MCC-NE	1994	4	Westinghouse Series 2100. Age assumed by manufacturer.	20	12	2	0.0833	5.5	0.46
Electrical - North Area Electrical Building									
MCC-NF	1994	4	Westinghouse Series 2100. Age assumed by manufacturer.	20	12	2	0.0833	5.5	0.46
Electrical - North Area Electrical Building									
North Area Electrical Building Structure	1990	2	No signficant signs of deterioration. 50' x 40'.	50	45	20	0.0222	7.3	0.16
Electrical - North Area Electrical Building									
Remote Telemetry Unit (RTU)	1999	3		15	12	4.5	0.0833	3.4	0.28
Electrical - North Area Electrical Building									
Switchboard-NB	1994	2		20	18	8	0.0556	4	0.22
Electrical - North Area Electrical Building									
Switchgear	1994	3		20	16	6	0.0625	4	0.25
Electrical - North Area Electrical Building									
Swithcboards Large	1990	2		30	27	12	0.037	4	0.15
Electrical - North Area Electrical Building									
Transformer TC	1994	3	1000KVA, 2300/480V.	20	16	6	0.0625	6.1	0.38
Electrical - North Area Electrical Building									
Transformer TD	1994	2	1000KVA, 2300/480V.	20	18	8	0.0556	6.1	0.34
Electrical - North Area Electrical Building									
VFDs (13)	1999	2		15	13.5	6	0.0741	3.4	0.25
General - Administration Building									
Administration Building	1977	3	100' x 150'.	50	40	15	0.025	7.3	0.18

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
MCC- DP2D	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
MCC-DP3A	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
MCC-EDPIE	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
Remote Telemetry Unit (RTU)	1999	3		15	12	4.5	0.0833	3.4	0.28
General - Plant Control Center									
Operations/Plant Control Center Building	1977	5	Significant sign of decay, shrinkage, and other damage to wood members and deterioation to masonry units was noted. Building size is 50' x 90'.	50	5	-20	0.2	7.3	1.46
Remote Telemetry Unit (RTU)	1999	3		15	12	4.5	0.0833	3.4	0.28
General - Collection System Maintenance									
Collection System Maintenance Building	1990	4		50	30	5	0.0333	7.3	0.24
General - Maintenance Building									
Maintenance Building	1990	3	Deterioration of wood members noted.	50	40	15	0.025	7.3	0.18
Truck Scale	1994	3		20	16	6	0.0625	4	0.25

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
General - Vacuum Filtration									
Vacuum Filtration Building	1964	5	Signicant sign of decay, shrinkage, and other damage to the wood members, deterioration of masonry masonry units and morotor, and significant wall cracks were noted. Buidling size is approx. 1000 sq. ft. Used as storage.	50	5	-20	0.2	7.3	1.46
General - Butler Storage Building									
Butler Building 1	1977	4	Significant corrosion noted on steel. Building size approx. 1500 sq.ft.	50	30	5	0.0333	7.3	0.24
Butler Building 2	2014	4		50	30	5	0.0333	1	0.03
MCC-HC	1994	4	Westignhouse. Age assumed by manufacturer.	20	12	2	0.0833	5.5	0.46
MCC-HG	1994	5	Federal Pacific. Age assumed by manufacturer.	20	2	-8	0.7	5.5	3.85
General - Chemical Handling Facilities									
Chemical Handling Facilities Building	2014	4	25' x 50'. Used as electrical shop.	50	30	5	0.0333	7.3	0.24
Ferric Chloride Pump 1	2014	3		20	16	6	0.0625	1	0.06
Ferric Chloride Pump 2	2014	3		20	16	6	0.0625	1	0.06
General - Effluent Electrical Building									
Effluent Electrical/16 kW Switchgear Building	2014	4	35' x 25'.	50	30	5	0.0333	7.3	0.24
Gym Switchgear	2014	5	Westinghouse.	20	2	-8	0.7	7.3	5.11
MCC- DP2A	2014	5	Federal Pacific.	20	2	-8	0.7	5.5	3.85

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
MCC- EBPIB	2014	5	Federal Pacific.	20	2	-8	0.7	5.5	3.85

WW Lift Stations

Lift Station 01 Cabezone

Flow Meter	2004	3	4" diameter.	10	8	3	0.125	2.5	0.31
MCC	1994	4		20	12	2	0.0833	5.5	0.46
SCADA Panel	2004	3		10	8	3	0.125	2.5	0.31
Submersible Pump 1	1994	3		20	16	6	0.0625	6.1	0.38
Submersible Pump 2	1994	3		20	16	6	0.0625	6.1	0.38
Valve Vault	1979	3		35	28	10.5	0.0357	3.4	0.12
Wet Well Structure	1984	3		30	24	9	0.0417	6.4	0.27

Lift Station 02 Harbor

MCC	1994	4		20	12	2	0.0833	5.5	0.46
Paving/Fencing	1986	3	12' x 20'. Some cracking on slab.	50	40	15	0.025	1.6	0.04
SCADA Panel	2004	3		10	8	3	0.125	2.5	0.31
Submersible Pump 1	2013	3	25 Amps - 240 V. Valve recently replaced. Medium corrosion in in lift station. Mild corrosion in valve box.	20	16	6	0.0625	6.1	0.38
Submersible Pump 2	1994	3	25 Amps - 240 V. Medium corrosion in in lift station. Mild corrosion in valve box.	20	16	6	0.0625	6.1	0.38
Valve Vault	1986	2		35	31.5	14	0.0317	3.4	0.11
Wet Well Structure	1986	4		30	18	3	0.0556	6.4	0.36

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Lift Station 04 Mandalay & Wooley									
MCC	1994	4	Shows significant corrosion on inside.	20	12	2	0.0833	5.5	0.46
SCADA Panel	2004	4		10	6	1	0.1667	2.5	0.42
Submersible Pump 1	1994	4	Operating at 35 Amps - 480 Volts. Medium corrosion in lift station. Mild corrosion in valve box.	20	12	2	0.0833	6.1	0.51
Submersible Pump 2	1994	4	Medium corrosion in lift station. Mild corrosion in valve box.	20	12	2	0.0833	6.1	0.51
Valve Vault	1986	4	Door is stuck shut.	35	21	3.5	0.0476	3.4	0.16
Wet Well Structure	1986	2		30	27	12	0.037	6.4	0.24
Lift Station 06 Canal									
MCC	1994	4		20	12	2	0.0833	5.5	0.46
SCADA Panel	2004	4		10	6	1	0.1667	2.5	0.42
Submersible Pump 1	1994	4	240 Volts, 15 hp. Medium corrosion in lift station, mild corrosion in valve box.	20	12	2	0.0833	6.1	0.51
Submersible Pump 2	1994	4	Medium corrosion in lift station, mild corrosion in valve box.	20	12	2	0.0833	6.1	0.51
Valve Vault	1984	2	Significant corrosion on valves.	35	31.5	14	0.0317	3.4	0.11
Wet Well Structure	1984	3		30	24	9	0.0417	6.4	0.27
Lift Station 07									
Generator	2002	2	CAT Generator, diesel.	20	18	8	0.0556	6.7	0.37
MCC	2002	2		20	18	8	0.0556	5.5	0.31
Paving/Fencing	2002	2	30' x 40' x 5' tall.	50	45	20	0.0222	1.6	0.04

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
SCADA Panel	2004	2		10	9	4	0.1111	2.5	0.28
Submersible Pump 1	2002	2	12.2 amps.	20	18	8	0.0556	6.1	0.34
Submersible Pump 2	2002	2	8.2 amps.	20	18	8	0.0556	6.1	0.34
Valve Vault	2002	2		35	31.5	14	0.0317	3.4	0.11
Wet Well Structure	2002	2	8' diameter.	30	27	12	0.037	6.4	0.24
Lift Station 08									
Generator	2002	1	40 kW valley power systems.	20	20	10	0.05	6.7	0.34
MCC	2002	1		20	20	10	0.05	5.5	0.28
Paving/Fencing	2002	1	30' x 40' x 6'.	50	50	25	0.02	1.6	0.03
SCADA Panel	2004	1		10	10	5	0.1	2.5	0.25
Submersible Pump 1	2002	1	17.2.	20	20	10	0.05	6.1	0.31
Submersible Pump 2	2002	1		20	20	10	0.05	6.1	0.31
Valve Vault	2002	1		35	35	17.5	0.0286	3.4	0.1
Wet Well Structure	2002	1	15' deep.	30	30	15	0.0333	6.4	0.21
Lift Station 09 Merion Way									
Generator	2002	2	16 kW.	20	18	8	0.0556	6.7	0.37
MCC	2002	2		20	18	8	0.0556	5.5	0.31
Paving/Fencing	2002	2	30' x 30' x 6' tall.	50	45	20	0.0222	1.6	0.04
SCADA Panel	2004	2		10	9	4	0.1111	2.5	0.28
Submersible Pump 1	2002	2		20	18	8	0.0556	6.1	0.34
Submersible Pump 2	2002	2		20	18	8	0.0556	6.1	0.34

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Valve Vault	2002	2		35	31.5	14	0.0317	3.4	0.11
Wet Well	2002	3	8' diameter x 25' deep.	30	24	9	0.0417	6.4	0.27
Lift Station 15 Cascade									
MCC	1994	4	Fairly old but in good condition.	20	12	2	0.0833	5.5	0.46
SCADA Panel	2004	3		10	8	3	0.125	2.5	0.31
Submersible Pump 1	1994	3	240 Volts, 13.5 Amps.	20	16	6	0.0625	6.1	0.38
Submersible Pump 2	1994	3	240 Volts, 13.5 Amps.	20	16	6	0.0625	6.1	0.38
Valve Vault	1979	3		35	28	10.5	0.0357	3.4	0.12
Wet Well Structure	1984	3		30	24	9	0.0417	6.4	0.27
Lift Station 20 Beardsley									
Generator	1997	3	CAT.	20	16	6	0.0625	6.7	0.42
MCC	1997	4		20	12	2	0.0833	5.5	0.46
Paving/Fencing	1997	3	40' x 30'.	50	40	15	0.025	1.6	0.04
SCADA Panel	2004	3		10	8	3	0.125	2.5	0.31
Submerisble Pump 1	1997	3	6" Discharge.	20	16	6	0.0625	6.1	0.38
Submersible Pump 2	1997	3	6" Discharge.	20	16	6	0.0625	6.1	0.38
Valve Vault	1997	3	Vault fills with water from adjacent irrigation, pipes and valves very corroded. Check valves tend to plug.	35	28	10.5	0.0357	3.4	0.12
Wet Well Structure	1997	4	10' diameter.	30	18	3	0.0556	6.4	0.36
Lift Station 23 Wagon Wheel									
MCC	1994	5	Old, some corrosion inside.	20	2	-8	0.7	5.5	3.85

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
SCADA Panel	2004	5		10	1	-4	0.9	2.5	2.25
Submersible Pump 1	1994	5	29 Amps - 480V, 8" discharge. Corrosion on lift pump station and valve box.	20	2	-8	0.7	6.1	4.27
Submersible Pump 2	1994	5	8" discharge. Corrosion on lift pump station and valve box.	20	2	-8	0.7	6.1	4.27
Valve Vault	1984	5	Corrosion on valve casing and valve vault.	35	3.5	-14	0.2	3.4	0.68
Wet Well Structure	1984	5		30	3	-12	0.4	6.4	2.56
Lift Station 24 Handyman									
MCC Box	1994	4	Has been hit by a vehicle in the past.	20	12	2	0.0833	5.5	0.46
SCADA Panel	2004	3		10	8	3	0.125	2.5	0.31
Submersible Pump 1	1994	3	Operating at 20 Amps - 480V. Some corrosion in lift station and valve box.	20	16	6	0.0625	6.1	0.38
Submersible Pump 2	2013	3	Operating at 20 Amps - 480V. Replaced recently.	20	16	6	0.0625	6.1	0.38
Valve Vault	1986	3	Significant corrosion on valves and hardware. Vault doors in good condition.	35	28	10.5	0.0357	3.4	0.12
Wet Well Structure	1986	3		30	24	9	0.0417	6.4	0.27
Lift Station 27 Launch Ramp									
MCC	1994	2	Old, some corrosion inside and out around bottom of hinges.	20	18	8	0.0556	5.5	0.31
Paving/Fencing	1977	2	15' x 20'.	50	45	20	0.0222	1.6	0.04
SCADA Panel	2004	2		10	9	4	0.1111	2.5	0.28

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Submersible Pump 1	1994	2		20	18	8	0.0556	6.1	0.34
Submersible Pump 2	1994	2		20	18	8	0.0556	6.1	0.34
Valve Vault	1979	2	Some corrosion on valves, significant corrosion on steel pipes.	35	31.5	14	0.0317	3.4	0.11
Wet Well Structure	1984	2	Doors hard to open.	30	27	12	0.037	6.4	0.24
Lift Station 28 Hueneme									
Generator	1994	2	80 kW Diesel. Kholer power systems.	20	18	8	0.0556	6.7	0.37
MCC	1994	2		20	18	8	0.0556	5.5	0.31
Paving/Fencing	1977	2	35' x 35' CMU Walls 8' high.	50	45	20	0.0222	1.6	0.04
SCADA Panel	2004	2		10	9	4	0.1111	2.5	0.28
Submersible Pump 1	1994	2	3100 gpm.	20	18	8	0.0556	6.1	0.34
Submersible Pump 2	1994	2	3100 gpm.	20	18	8	0.0556	6.1	0.34
Submersible Pump 3	1994	2	3100 gpm.	20	18	8	0.0556	6.1	0.34
Valve Vault	1979	2	8' x 16' x 6' deep. Good condition.	35	31.5	14	0.0317	3.4	0.11
Wet Well Structure	1984	2		30	27	12	0.037	6.4	0.24
Lift Station 29 Patterson & Hemlock (Large)									
Generator	1994	2	Cummins 275 hp, good condition.	20	18	8	0.0556	6.7	0.37
Generator Room Structure	1977	2	12' deep x 25'.	50	45	20	0.0222	7.3	0.16
MCC	1994	2	7 Sections.	20	18	8	0.0556	5.5	0.31
SCADA Cabinet	2004	2	3 Sections.	10	9	4	0.1111	2.5	0.28
Submersible Pump 1	1994	2	3500 gpm.	20	18	8	0.0556	6.1	0.34

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

Component	Year	Condition	Comments	OUL	EvRUL	EcRUL	Vuln	Criticality	Risk
Submersible Pump 2	1994	2	3500 gpm.	20	18	8	0.0556	6.1	0.34
Submersible Pump 3	1994	2	3500 gpm.	20	18	8	0.0556	6.1	0.34
Submersible Pump 4	1994	2	3500 gpm.	20	18	8	0.0556	6.1	0.34
Switchboard	1994	2		20	18	8	0.0556	4	0.22
Valve Vault	1979	2	12' x 25' x 8'. Very large	35	31.5	14	0.0317	3.4	0.11
Wet Well Structure	1984	2	Very large 12' x 25' x 40 ' deep.	30	27	12	0.037	6.4	0.24
Lift Station 30 Colony									
MCC	1994	2		20	18	8	0.0556	5.5	0.31
SCADA Panel	2004	2		10	9	4	0.1111	2.5	0.28
Submersible Pump 1	1994	3	27.9 A, 480 V.	20	16	6	0.0625	6.1	0.38
Submersible Pump 2	1994	3	27.9 A, 480 V.	20	16	6	0.0625	6.1	0.38
Valve Vault	1984	3		35	28	10.5	0.0357	3.4	0.12
Wet Well Structure	1984	4	Piping corroded.	30	18	3	0.0556	6.4	0.36

1. Original Useful Life.
2. Evaluated Remaining Useful Life.
3. Economic Remaining Useful Life.
4. Vulnerability.

APPENDIX B – OWTP AND LIFT STATIONS CRITICALITY SCORES

Crticality Scores

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
OWTP					
Headworks					
Bar Screen 1 (Mechanical)	No lost-time injuries or medical attention	Between $150,000 and $250,000	Minor	No impacts	4
Bar Screen 2 (Mechanical)	No lost-time injuries or medical attention	Between $150,000 and $250,000	Minor	No impacts	4
Bar Screen 3 (Mechanical)	No lost-time injuries or medical attention	Between $150,000 and $250,000	Minor	No impacts	4
Bar Screen 4 (Mechanical)	No lost-time injuries or medical attention	Between $150,000 and $250,000	Minor	No impacts	4
Bar Screen 5 (Manual)	No lost-time injuries or medical attention	Less than $25,000	No effect	No impacts	1.9
Bar Screen 6 (Manual)	No lost-time injuries or medical attention	Less than $25,000	No effect	No impacts	1.9
Flowmeter	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Grit Blower 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Blower 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Blower 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Grit Blower 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Pump 1 (West)	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Pump 2 (West)	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Pump 3 (West)	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Pump 4 (West)	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Pump 5 (East)	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Pump 6 (East)	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Pump 7 (East)	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Pump 8 (East)	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Separator/Classifier 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Grit Separator/Classifier 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Headworks Building	Potential for loss of life	More than $250,000	Major impact	Long-term impact	10
Headworks Grit Screens Building	No lost-time injuries or medical attention	More than $250,000	Minor	Minor disruption	5.2

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Hypo Chemical Feed Pump (Sodium Hypo Pump 2)	No lost-time injuries or medical attention	Less than $25,000	Minor	Short-term impact	4
Influent Check Valve 1	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Influent Check Valve 2	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Influent Check Valve 3	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Influent Check Valve 4	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Influent Check Valve 5	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Influent Check Valve 6	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Influent Pump 1	No effect	More than $250,000	No effect	No impacts	2.8
Influent Pump 2	No effect	More than $250,000	No effect	No impacts	2.8
Influent Pump 3	No effect	More than $250,000	No effect	No impacts	2.8
Influent Pump 4	No effect	More than $250,000	No effect	No impacts	2.8
Influent Pump 5	No effect	More than $250,000	No effect	No impacts	2.8

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Influent Pump 6	No effect	More than $250,000	No effect	No impacts	2.8
MCC- HW	Potential for loss of life	More than $250,000	Major impact	Long-term impact	10
Odor Control Ductworks & Vessels	No effect	More than $250,000	Major	Short-term impact	5.8
Remote Telemetry Unit (RTU)	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Screening Compactor 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Screening Compactor 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	No effect	No impacts	2.5
Sodium Hydroxide Pump 1	No lost-time injuries or medical attention	Less than $25,000	Minor	Short-term impact	4
Sodium Hydroxide Pump 2	No lost-time injuries or medical attention	Less than $25,000	Minor	Short-term impact	4
Sodium Hydroxide Storage Tank	Potential for loss of life	Less than $25,000	Minor	Short-term impact	5.8
Sodium Hypochlorite Pump 1	No lost-time injuries or medical attention	Less than $25,000	Minor	Short-term impact	4
Sodium Hypochlorite Storage Tank	No lost-time injuries or medical attention	Less than $25,000	Minor	Short-term impact	4
Standby Generator	Potential for loss of life	More than $250,000	Major impact	Long-term impact	10
VFDs	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	No impacts	4.9

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Primary Treatment					
Clarifier 1 Collector Drive, Walkways, & Launders	No effect	More than $250,000	Major	Long-term impact	6.4
Clarifier 2 Collector Drive, Walkways, & Launders	No effect	More than $250,000	Major	Long-term impact	6.4
Clarifier 3 Collector Drive, Walkways, & Launders	No effect	More than $250,000	Major	Long-term impact	6.4
Clarifier 4 Collector Drive, Walkways, & Launders	No effect	More than $250,000	Major	Long-term impact	6.4
Large Isolation Valve 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Long-term impact	5.2
Large Isolation Valve 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Long-term impact	5.2
MCC-DP2B	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC-DPIA	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC-DPIB	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC-EDPIA	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Primary Clarification Tank 1	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Primary Clarification Tank 2	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5
Primary Clarification Tank 3	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5
Primary Clarification Tank 4	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5
Primary Sedimentation Building	Potential for loss of life	More than $250,000	Minor	No impacts	6.4
Scum Ejector 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Short-term impact	4.6
Scum Ejector 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Short-term impact	4.6
Scum Ejector 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Short-term impact	4.6
Scum Ejector 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Short-term impact	4.6
Sludge Pump Tank 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Short-term impact	5.5
Sludge Pump Tank 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Short-term impact	5.5
Sludge Pump Tank 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Short-term impact	5.5
Sludge Pump Tank 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Short-term impact	5.5

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Bio Filters					
Bio Filter Distributor & Drives Tank 1	No effect	Between $25,000 and $150,000	Minor	Minor disruption	3.1
Bio Filter Distributor & Drives Tank 2	No effect	Between $25,000 and $150,000	Minor	Minor disruption	3.1
Bio Filter Tank 1 Media	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Bio Filter Tank 2 Media	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Bio Filter Ventilation Blower 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Bio Filter Ventilation Blower 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Bio Filter Ventilation Blower 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Bio Filter Ventilation Blower 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Biological Trickling Tank 1 Structure	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5
Biological Trickling Tank 2 Structure	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5
Recirculation Pump Mag Drive 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Recirculation Pump Mag Drive 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Recirculation Tank 1 Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Recirculation Tank 1 Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Interstage Pump Station					
Interstage Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	No impacts	4.3
Interstage Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	No impacts	4.3
Interstage Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	No impacts	4.3
Interstage Well Structure	No lost-time injuries or medical attention	More than $250,000	Major impact	Long-term impact	8.2
Large isolation Valve 1	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Large Isolation Valve 2	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Large Isolation Valve 3	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
VFDs	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	No impacts	4.3
Aerated Activated Sludge					
Aeration Basin 1 Structure	No effect	More than $250,000	Minor	No impacts	3.7
Aeration Basin 2 Structure	No effect	More than $250,000	Minor	No impacts	3.7

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Aeration Basin 3 Structure	No effect	More than $250,000	Minor	No impacts	3.7
Aeration Basin 4 Structure	No effect	More than $250,000	Minor	No impacts	3.7
Aeration Basin 5 Structure	No effect	More than $250,000	Minor	No impacts	3.7
Aeration Basin 6 Structure	No effect	More than $250,000	Minor	No impacts	3.7
Blower 1	No effect	More than $250,000	No effect	No impacts	2.8
Blower 2	No effect	More than $250,000	No effect	No impacts	2.8
Blower 3	No effect	More than $250,000	No effect	No impacts	2.8
Blower 4	No effect	More than $250,000	No effect	No impacts	2.8
Blower 5	No effect	More than $250,000	No effect	No impacts	2.8
Diffusers & Piping Basin 1	No effect	More than $250,000	Minor	No impacts	3.7
Diffusers & Piping Basin 2	No effect	More than $250,000	Minor	No impacts	3.7
Diffusers & Piping Basin 3	No effect	More than $250,000	Minor	No impacts	3.7
Diffusers & Piping Basin 4	No effect	More than $250,000	Minor	No impacts	3.7

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Diffusers & Piping Basin 5	No effect	More than $250,000	Minor	No impacts	3.7
Diffusers & Piping Basin 6	No effect	More than $250,000	Minor	No impacts	3.7
Sed/RAS/WAS/Flow Equal					
3WHP Facilities Pump 1	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
3WHP Facilities Pump 2	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
3WHP Facilities Pump 3	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
AST Drain Pump	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Blowers (18)	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Flow Equalization Basin Structure	No effect	More than $250,000	Major impact	Minor disruption	6.1
Flow Equalization Gates & Drives	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Flow Equalization Pump 1	No effect	Between $150,000 and $250,000	Minor	No impacts	3.1
Flow Equalization Pump 2	No effect	Between $150,000 and $250,000	Minor	No impacts	3.1
Flow Equalization Pump 3	No effect	Between $150,000 and $250,000	Minor	No impacts	3.1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
RAS Pump 1	No effect	Between $150,000 and $250,000	No effect	No impacts	2.2
RAS Pump 2	No effect	Between $150,000 and $250,000	No effect	No impacts	2.2
RAS Pump 3	No effect	Between $150,000 and $250,000	No effect	No impacts	2.2
RAS Pump 4	No effect	Between $150,000 and $250,000	No effect	No impacts	2.2
RAS Pump Galley Ventilation Fan 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
RAS Pump Galley Ventilation Fan 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Secondary Sed. Collector, Skimmer & Drives (1-16)	No effect	Between $150,000 and $250,000	No effect	No impacts	2.2
Secondary Sed. Collector, Skimmer & Drives (17-18)	No effect	Between $150,000 and $250,000	No effect	No impacts	2.2
Secondary Sed. Sludge Magnetic Flow Meters (18)	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Secondary Sedimentation Skimmings Pumps (18)	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Secondary Sedimentation Tanks (18)	No effect	More than $250,000	No effect	No impacts	2.8
VFDs	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
WAS Pump 1	No lost-time injuries or medical attention	Less than $25,000	Major	No impacts	3.7
WAS Pump 2	No lost-time injuries or medical attention	Less than $25,000	Major	No impacts	3.7
WAS Pump 3	No lost-time injuries or medical attention	Less than $25,000	Major	No impacts	3.7
Disinfection Facilities					
Chlorine Contact Gates, Supports & Operators	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
Chlorine Contact Tank Structure	No lost-time injuries or medical attention	More than $250,000	Minor	Minor disruption	5.2
Hypo Pump 1	No effect	Less than $25,000	No effect	No impacts	1
Hypo Pump 2	No effect	Less than $25,000	No effect	No impacts	1
Hypo Pump 3	No effect	Less than $25,000	No effect	No impacts	1
Hypo Pump 4	No effect	Less than $25,000	No effect	No impacts	1
Hypo Pump 5	No effect	Less than $25,000	No effect	No impacts	1
Hypo Pump 6	No effect	Less than $25,000	No effect	No impacts	1
Hypo Tank 1	Potential for loss of life	Between $25,000 and $150,000	Major	Minor disruption	6.7

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Hypo Tank 2	Potential for loss of life	Between $25,000 and $150,000	Major	Minor disruption	6.7
Effluent - Pump Station (EPS)					
Effluent Pump Station Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Effluent - Pump Station (EPS)					
Engine Drive 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Effluent - Pump Station (EPS)					
Large isolation Valves (4)	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Effluent - Pump Station (EPS)					
MCC-DP4A	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Effluent - Pump Station (EPS)					
MCC-EDPID	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Effluent - Pump Station (EPS)					
Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Effluent - Pump Station (EPS)					
Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Effluent - Pump Station (EPS)					
Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Effluent - Pump Station (EPS)					
Pump 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Effluent - Pump Station (EPS)					
Pump 5 - Big Red	No effect	Less than $25,000	No effect	No impacts	1
Effluent - Pump Station (EPS)					
VFDs	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4
Gravity Thickeners & Blower Building					
Blower Building	Potential for loss of life	More than $250,000	No effect	No impacts	5.5
Gravity Thickeners & Blower Building					
Blower Building Remote Telemetry Unit (RTU)	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4
Gravity Thickeners & Blower Building					
Fans/ Louvers Tank 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Gravity Thickeners & Blower Building					
Fans/ Louvers Tank 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Gravity Thickeners & Blower Building					
Collector Drive, Walkways, Launders Tank 1	No effect	More than $250,000	Major	Minor disruption	5.2
Gravity Thickeners & Blower Building					

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Collector Drive, Walkways, Launders Tank 2	No effect	More than $250,000	Major	Minor disruption	5.2
Gravity Thickeners & Blower Building					
Gravity Thickening Tank 1	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5
Gravity Thickeners & Blower Building					
Gravity Thickening Tank 2	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5
Gravity Thickeners & Blower Building					
MCC -DP3C	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Gravity Thickeners & Blower Building					
MCC -DP3D	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Gravity Thickeners & Blower Building					
MCC-NG	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Gravity Thickeners & Blower Building					
Odor Reduction Tower	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Gravity Thickeners & Blower Building					
Thickened Sludge Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Gravity Thickeners & Blower Building					
Thickened Sludge Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Gravity Thickeners & Blower Building					
Thickened Sludge Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
DAF					
DAF Air Saturation Tank #1	Potential for loss of life	Between $25,000 and $150,000	Major	Minor disruption	6.7
DAF Air Saturation Tank #2	Potential for loss of life	Between $25,000 and $150,000	Major	Minor disruption	6.7
DAF Collectors Drives Tank 1	No effect	Between $150,000 and $250,000	Minor	Minor disruption	3.7
DAF Collectors Drives Tank 2	No effect	Between $150,000 and $250,000	Minor	Minor disruption	3.7
DAF Compressor 1	No effect	Less than $25,000	Minor	No impacts	1.9
DAF Compressor 2	No effect	Less than $25,000	Minor	No impacts	1.9
DAF Compressor 3	No effect	Less than $25,000	Minor	No impacts	1.9
DAF Compressor 4	No effect	Less than $25,000	Minor	No impacts	1.9
DAF Starter Rack	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
DAF Tank 1	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5
DAF Tank 2	Potential for loss of life	More than $250,000	Major	Short-term impact	8.5

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
DAF TWAS Sludge Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
DAF TWAS Sludge Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
DAF Underflow Recirculation Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
DAF Underflow Recirculation Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
DAF VFDs	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4
Polymer Blending Unit 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Polymer Blending Unit 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Polymer Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Polymer Bulk Building Storage Tank	Potential for loss of life	Between $25,000 and $150,000	Major	Short-term impact	7.3
Polymer Solution Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Polymer Solution Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Polymer Solution Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Polymer Transfer Pump	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Digestion					
Digested Sludge Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Digested Sludge Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Digested Sludge Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Digestor Blower 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Digestor Blower 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Digestor Blower 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Digestor Blower 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Digestor Blower 5	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Digestor Blower 6	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Digestor Blower 7	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Digestor Control Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Digestor Flares	No effect	Less than $25,000	Major	Minor disruption	3.4
Digestor Heat Exchanger 1	No lost-time injuries or medical attention	Between $150,000 and $250,000	Minor	Minor disruption	4.6
Digestor Heat Exchanger 2	No lost-time injuries or medical attention	Between $150,000 and $250,000	Minor	Minor disruption	4.6
Digestor Heat Exchanger 3	No lost-time injuries or medical attention	Between $150,000 and $250,000	Minor	Minor disruption	4.6
Digestor No. 1 Hot Water Pump 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Digestor No. 1 Mixing Equipment & Draft Tubes	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Short-term impact	4.6
Digestor No. 1 Tank	Potential for loss of life	More than $250,000	Minor	Short-term impact	7.6
Digestor No. 2 Mixing Equipment & Draft Tubes	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Short-term impact	4.6
Digestor No. 2 Tank	Potential for loss of life	More than $250,000	Minor	Short-term impact	7.6
Digestor No. 3 Mixing Equipment & Draft Tubes	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Short-term impact	4.6
Digestor No. 3 Tank	Potential for loss of life	More than $250,000	Minor	Short-term impact	7.6
MCC-DP2C	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
MCC-EDPIC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC-GF	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Petroleum Gas Tank	Potential for loss of life	Between $25,000 and $150,000	Major	Short-term impact	7.3
Remote Telemetry Unit (RTU)	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4
SCADA System Terminal	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Dewatering					
Air Handling Unit and Odord Control	No effect	Less than $25,000	No effect	No impacts	1
Belt Filter Press 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Belt Filter Press 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Belt Filter Press 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Belt Filter Press 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Conveyers	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Dewatering Feed Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Dewatering Feed Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Dewatering Feed Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Dewatering Feed Pump 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Dewatering Feed Pump 5	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Dewatering Feed Sludge Grinder	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Eastern Trunk Pump Station	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Fans/ Louvers	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Gravity Thickener Scrubber	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
MCC-SH	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Odor Control Ductworks & Vessels	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Polyblend Unit 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Polyblend Unit 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Polyblend Unit 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Polyblend Unit 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Solids Processing Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Solids Processing Polmer Storage Addition Tank	Potential for loss of life	Between $25,000 and $150,000	Major	Short-term impact	7.3
Solids Processing Polymer Chemical Storage eq	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
VFDs	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4
Washwater Booster Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Washwater Booster Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Washwater Booster Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Washwater Booster Pump 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Cogen/Generator Building					
Cogen Air Handling Unit	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Cogen Blended Gas Blower	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Cogen Blower 1 DG	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Cogen Blower 1 NG	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Cogen Blower 2 DG	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Cogen Blower 2 NG	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Minor disruption	4.9
Cogen Engine Generator 1	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
Cogen Engine Generator 2	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
Cogen Engine Generator 3	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
Cogen Switchgear	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Cogen/Generator Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
MCC-DP3B	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC-GA	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - Main Electrical Building					
Large Standby Generator 1	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
Electrical - Main Electrical Building					
Large Standby Generator 2	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Electrical - Main Electrical Building					
500 kW Generator	No effect	Less than $25,000	No effect	No impacts	1
Electrical - Main Electrical Building					
Main Electrical/Switchgear Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Electrical - Main Electrical Building					
MCC-DP4	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - Main Electrical Building					
MCC-DP4B	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - Main Electrical Building					
MCC-GB	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - Main Electrical Building					
MCC-GC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - Main Electrical Building					
MCC-GD	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - Main Electrical Building					
Older Transformer 1	Lost-time injury or medical attention	Between $150,000 and $250,000	Minor	Short-term impact	6.1
Electrical - Main Electrical Building					

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Older Transformer 2	Lost-time injury or medical attention	Between $150,000 and $250,000	Minor	Short-term impact	6.1
Electrical - Main Electrical Building					
Switchboard MA-MB	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Electrical - Main Electrical Building					
Switchgear 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Electrical - Main Electrical Building					
Switchgear 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Electrical - Main Electrical Building					
Switchgear HW	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Electrical - Main Electrical Building					
Transformer A	Lost-time injury or medical attention	Between $150,000 and $250,000	Minor	Short-term impact	6.1
Electrical - Main Electrical Building					
Transformer B	Lost-time injury or medical attention	Between $150,000 and $250,000	Minor	Short-term impact	6.1
Electrical - North Area Electrical Building					
MCC-NA	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - North Area Electrical Building					
MCC-NC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Electrical - North Area Electrical Building					
MCC-ND	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - North Area Electrical Building					
MCC-NE	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - North Area Electrical Building					
MCC-NF	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Electrical - North Area Electrical Building					
North Area Electrical Building Structure	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Electrical - North Area Electrical Building					
Remote Telemetry Unit (RTU)	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4
Electrical - North Area Electrical Building					
Switchboard-NB	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Electrical - North Area Electrical Building					
Switchgear	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Electrical - North Area Electrical Building					
Swithcboards Large	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Electrical - North Area Electrical Building					

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Transformer TC	Lost-time injury or medical attention	Between $150,000 and $250,000	Minor	Short-term impact	6.1
Electrical - North Area Electrical Building					
Transformer TD	Lost-time injury or medical attention	Between $150,000 and $250,000	Minor	Short-term impact	6.1
Electrical - North Area Electrical Building					
VFDs (13)	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4
General - Administration Building					
Administration Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
MCC- DP2D	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC-DP3A	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC-EDPIE	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Remote Telemetry Unit (RTU)	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4
General - Plant Control Center					
Operations/Plant Control Center Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Remote Telemetry Unit (RTU)	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	No impacts	3.4

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
General - Collection System Maintenance					
Collection System Maintenance Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
General - Maintenance Building					
Maintenance Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Truck Scale	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
General - Vacuum Filtration					
Vacuum Filtration Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
General - Butler Storage Building					
Butler Building 1	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Butler Building 2	No effect	Less than $25,000	No effect	No impacts	1
MCC-HC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC-HG	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
General - Chemical Handling Facilities					
Chemical Handling Facilities Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Ferric Chloride Pump 1	No effect	Less than $25,000	No effect	No impacts	1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Ferric Chloride Pump 2	No effect	Less than $25,000	No effect	No impacts	1
General - Effluent Electrical Building					
Effluent Electrical/16 kW Switchgear Building	Potential for loss of life	More than $250,000	Major	No impacts	7.3
Gym Switchgear	Potential for loss of life	More than $250,000	Major	No impacts	7.3
MCC- DP2A	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
MCC- EBPIB	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
WW Lift Stations					
Lift Station 01 Cabezone					
Flow Meter	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 02 Harbor					
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Paving/Fencing	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 04 Mandalay & Wooley					
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 06 Canal					
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 07					
Generator	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Paving/Fencing	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 08					
Generator	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Paving/Fencing	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Lift Station 09 Merion Way					
Generator	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Paving/Fencing	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 15 Cascade					
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 20 Beardsley					
Generator	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Paving/Fencing	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submerisble Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 23 Wagon Wheel					
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 24 Handyman					
MCC Box	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 27 Launch Ramp					
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Paving/Fencing	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 28 Hueneme					
Generator	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
Paving/Fencing	No effect	Between $25,000 and $150,000	No effect	No impacts	1.6
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 29 Patterson & Hemlock (Large)					
Generator	No lost-time injuries or medical attention	More than $250,000	Major	Short-term impact	6.7
Generator Room Structure	Potential for loss of life	More than $250,000	Major	No impacts	7.3
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
SCADA Cabinet	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 3	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 4	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Switchboard	No lost-time injuries or medical attention	Between $25,000 and $150,000	Minor	Minor disruption	4
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4

Component	Public and Employee Health and Safety	Financial Impact	Environmental or Regulatory Compliance	Customer Service	Total Criticality
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4
Lift Station 30 Colony					
MCC	No lost-time injuries or medical attention	Between $150,000 and $250,000	Major	Minor disruption	5.5
SCADA Panel	No effect	Between $25,000 and $150,000	Minor	No impacts	2.5
Submersible Pump 1	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Submersible Pump 2	No lost-time injuries or medical attention	Between $25,000 and $150,000	Major	Long-term impact	6.1
Valve Vault	No lost-time injuries or medical attention	Less than $25,000	Minor	Minor disruption	3.4
Wet Well Structure	Lost-time injury or medical attention	Between $25,000 and $150,000	Major	Short-term impact	6.4