



City of Sacramento Department of Utilities

SRWTP and EAFWTP Capacity Optimization,  
Remaining Life, and Reliability Improvement Study

**PHASE II CONDITION ASSESSMENT**

**Technical Memorandum No. 5**

**FINAL**  
June 2008



**CITY OF SACRAMENTO  
DEPARTMENT  
OF UTILITIES**



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## **1.0 PURPOSE**

The purpose of this technical memorandum (TM) is to present the findings and recommendations of the City of Sacramento's (City) Phase II Condition Assessment. Phase II utilized the City's Condition Assessment/ Risk Analysis (CARA) criteria, which was then compared to the Phase I Condition Assessment findings (TM No. 4). The Phase I findings and recommendations focused on the general, overall conditions of assets (i.e. unit processes) at each plant where as the Phase II CARA criteria focused on the conditions of the asset while detailing conditions of associated process equipment. The major tasks completed as part of this effort were:

- Reviewed the City's existing 2004 Plant CARA criteria and evaluations.
- Added additional assets to be evaluated in 2007, based upon plant expansion projects.
- Gathered input from plant staff on current condition of assets.
- Collected detailed information to support ranking of assets.
- Produced a 2007 CARA spreadsheet to be used in this project and future evaluations.

The goal of the Phase II Condition Assessment was to utilize the information gathered to develop recommendations for the 20-year planning period Capital Improvement Project (CIP) list and make recommendations for the Operations and Maintenance (O&M) Project list. The CIP list is for larger items that will require design, budgetary planning, and construction efforts. The O&M project list is for smaller items the City may want to proceed with independent of the CIP process.

Each plant is discussed separately followed a summary of the recommended CIP and O&M projects for each plant and items identified for further investigation. Assets that ranked 3, 4, or 5 during the Phase II Condition Assessment have been incorporated into the recommended CIP or O&M project lists discussed herein. A summary of the assets found to be in the worst condition, ranked 4 or 5, during the Phase II Condition Assessment is contained herein. Assets that were ranked 3 are included in the summaries if they have been placed on the list of recommended CIP or O&M projects. The remaining assets ranked 3 are not critical at this point and will be revisited during the next assessment. The entire 2004/2007 CARA assessment spreadsheets with all assets ranked 1-5 are contained in Appendix A.

## **2.0 CONDITION ASSESSMENT FORMAT**

The City conducted the Phase II Condition Assessment for each water treatment plant in May 2007. Several meetings were held with key O&M staff to gain their input and knowledge as

to the condition of each asset. The condition assessment format was based on the original CARA Condition Assessment the City had performed in 2004. Much of the 2004 Assessment was performed before plant expansion projects were completed. Now that the expansion projects have been complete for several years, it is expected that the Phase II Condition Assessment will be representative of the current, post-expansion conditions, and that most of the 2004 Assessment is no longer applicable.

The 2007 Condition Assessment format was simplified slightly, because of personnel time constraints and was limited to the actual condition rankings of separate assessment parameters. The separate assessment parameters include: pumps, motors, electrical, mechanical/piping, structural/buildings, generators, roadways, gate/valves, fencing/security, chemical system, and instrumentation. The 2004 Assessment included additional rating parameters (e.g. piping small, piping large) and inputs for estimated remaining functional years, treatment capacity, and other operational conditions (e.g. running at inspection, excessive noise, unusual smell or heat, etc.). The original 2004 CARA spreadsheet was updated with 2007 information, while still maintaining the 2004 ranking information (e.g. 2004 Intake identification number 6, 2007 Intake identification number 6A). Since the 2004 Assessment was pre-expansion, the 2007 Assessment contains many additional assets (labeled as “new”). The assets, parameters, and ratings, along with comments generated by the City, are contained in Appendix A. The asset condition ranking scale from the Phase I Condition Assessment (TM No. 4) was used for Phase II (Table 5.1). The City’s 2004 CARA rankings do not utilize the exact same ranking descriptions, but are similar. For comparison, Phase I ranking definitions are shown in normal font and the City’s are shown in italicized font in the table.

<b>Table 5.1      Asset Condition Ranking Scale                      SRWTP and EAFWTP Capacity Optimization,                      Remaining Life, and Reliability Improvement Study                      City of Sacramento Department of Utilities</b>		
<b>Ranking</b>	<b>Description</b>	<b>Percentage of Asset Requiring Repair<sup>(1)</sup></b>
1	Very Good Condition - <i>Routine Maintenance, 0% Maintenance needed to keep running</i>	0%
2	Minor Defects - <i>Routine Maintenance, minor 5% Maintenance needed to keep running</i>	0-10%
3	Maintenance Required to Return to Accepted Level of Service - <i>Routine Maintenance, moderate 10-20% Maintenance needed to keep running</i>	10-20%
4	Requires Rehabilitation - <i>Routine Maintenance, renewal 20-40% Maintenance needed to keep running</i>	20-40%
5	Asset Unserviceable - <i>Completely Failed, Unserviceable, &gt;50% Maintenance needed to keep running</i>	>50%
Note: 1. Percentage of asset requiring repair” is percentage of value of asset needed to return asset to ranking of one.		

### 3.0 SRWTP PHASE II CONDITION ASSESSMENT

The assets in the worst condition (rankings of 4 or 5) at Sacramento River Water Treatment Plant (SRWTP) are summarized in Table 5.2. Each asset is discussed separately below to highlight comments and recommended projects for the CIP and O&M project list. In some cases 2004 Assessment rankings and comments are included for comparison. The table also includes a reference to the page number where the detailed highlights are provided for each asset discussed.

<b>Table 5.2 SRWTP Phase II Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>			
<b>Asset</b>	<b>CARA Assessment Parameter</b>	<b>Ranking</b>	<b>TM Page No.</b>
Intake Plaza/Fountain Fountain	Structural/Building	4	5-4
	Pumps	4	
	Motors	4	
Grit Basin	Mechanical/Piping	4	5-5
Coagulation Building	Structural/Building	4	5-5
	Roadways	4	
Basin 1	Mechanical/Piping	4	5-6
	Structural/Building	5	
	Gates/Valves	5	
Basin 2	Mechanical/Piping	4	5-7
	Structural/Building	4	
	Gates/Valves	4	
Old Filters 1-16	Mechanical/Piping	4	5-7
	Structural/Building	5	
	Gates/Valves	5	
	Instrumentation*	5	
Headhouse	Structural/Building	4	5-8
	Gates/Valves	5	
9.5 MG Reservoir	Structural/Building	4	5-9
5.0 MG Reservoir	Structural/Building	4	5-9
	Gates/Valves	5	
High Service Pump Station	Motors	4	5-9
	Mechanical/Piping	4	
	Structural/Buildings	5	
	Gates/Valves	5	
	Fencing/Security	4	

<b>Table 5.2 SRWTP Phase II Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>			
<b>Asset</b>	<b>CARA Assessment Parameter</b>	<b>Ranking</b>	<b>TM Page No.</b>
North Vault	Electrical	5	5-10
	Mechanical/Piping	5	
	Structural/Buildings	5	
	Gates/Valves	5	
SMUD Elec. Substation	Generators	5	5-11
Plant SCADA System	Instrumentation	4	5-12
*Analyzers are all new. Ranking of 5 if for the effluent valve controllers.			

**3.1 Intake**

Table 5.3 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the intake. The original ranking of the gates/valves was based on the screen wash air actuated pinch valves being inadequate, which have been replaced with air-actuated butterfly valves. The gates/vales ranking was decreased in 2007 since the valves have been functioning correctly.

<b>Table 5.3 SRWTP Intake Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Gates/Valves	4	1
Structural/Buildings	Not Rated	4

The intake plaza has experienced settling of the concrete slab, which is causing problems with security gate operation and maintenance and fountain piping. City Engineering has established several survey points to monitor the slab settlement.

During the assessment, other improvements to the intake were identified. All of the existing pumps are fixed speed; installing variable speed pumps may help trim intake flows into the plant and help prevent large fluctuations in flash mix level. Additionally there is a need for more security cameras and relocation of some of the existing cameras to improve security at the intake.

The recommended follow up investigations include:

1. Slab settlement monitoring should continue to be performed by City Engineering.

The recommended CIP projects include:

1. Grouting or other control measure to control further settlement, if settlement is found to still be occurring. This project may include replacement of some damaged slabs.
2. Change two of the small fixed speed intake pumps to variable speed to help trim flow. This project could also be a partial or complete O&M project.

The recommended O&M projects include:

1. Add cameras and relocate some of the existing cameras to improve security.
2. Install two air release valves on the 54-inch raw water vent piping above the Intake Plaza canopies. The open vents spout water when all low lift pumps are operating. Spouting may spill onto visitors under the canopies.

### **3.2 Intake Plaza/Fountain**

Table 5.4 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the intake fountain. The 2007 CARA Assessment ranked the pumps and motors 4, due to O&M trouble with several piping leaks, clogging of fountain filters, and fountain pump/motor replacement. Further evaluation of the pumping and filtering system may be needed.

<b>Table 5.4 SRWTP Intake Fountain Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Pumps	1	4
Motors	1	4

The recommended follow up investigations include:

1. Further evaluate pumping and filtering system.

The recommended CIP projects include: None

The recommended O&M projects include:

1. Repair and replace leaking piping as needed.
2. Replace filter system with more and/or larger filters to prevent damage.

### **3.3 Grit Basin**

Table 5.5 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the Grit Basin. Mechanical/piping was ranked 4, due to the worn and failing Polychain on the longitudinal chain and flight grit collection system. Also, the 403 stainless steel cross collector chain has stress cracking on the side bars of the chain caused by stress corrosion cracking from the City's current chlorination practice. These issues have been identified as a critical issue

requiring immediate action. Refer to TM No. 6 Critical Issues for a complete description of the problem and the recommended course of action.

<b>Table 5.5 SRWTP Grit Basin Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Mechanical/Piping	Not Rated	4

The recommended follow up investigations include: See TM No. 6.

The recommended CIP projects include: None.

The recommended O&M projects include: Replace Polychain (TM No. 6).

### **3.4 Coagulation Building**

Table 5.6 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the Coagulation Building. Ranking of the roadways in 2004 was based upon the loading dock being installed at an unsafe elevation. During the plant expansion the City elected to address this at a later date. The loading dock has not been modified, thus the ranking has remained unchanged. The structure was ranked 4 since it is original and has not had a seismic update. Additionally the roof of the coagulation building needs replacement.

<b>Table 5.6 SRWTP Coagulation Building Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Structural/Buildings	3	4
Roadways	4	4

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. Roof replacement project.
2. Seismic investigation, design, and retrofit.

The recommended O&M projects include:

3. Lower the dock approach level so the dock leveler works correctly.

### 3.5 Basin 1

Table 5.7 contains a comparison of the 2004 and 2007 CARA Assessment rankings for Basin 1. Ranking during Phase II was based on the following issues: gates/valves are original and the hydraulic gates are failing or have failed, structure has severe exposed aggregate, concrete cracks, rusting and failed rebar and reinforcing steel. In addition, a structural wall has settled on the west side and the sludge must be removed manually from a confined space. Additionally Basins 1, 2, and the Old Filters 1 through 16 have hydraulic flow constraints (refer to TM No. 3 Hydraulic Evaluation). To generate higher capacity flows may require the replacement of these facilities.

<b>Table 5.7 SRWTP Basin 1 Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Mechanical/Piping	4	4
Structural/Buildings	3	5
Gates/Valves	3	5

The recommended follow up investigations include:

1. Perform a detailed structural evaluation to determine, if any, life safety issues with continued use.

The recommended CIP projects include:

1. The Structure is not repairable. Based upon the Phase I and Phase II Condition Assessments, Basin 1 should be replaced or decommissioned.

The recommended O&M projects include: None.

### 3.6 Basin 2

Table 5.8 contains a comparison of the 2004 and 2007 CARA Assessment rankings for Basin 2. Basin 2 gates/valves and piping are original and the hydraulic gates are failing or have failed. The ranking of the structural/buildings decreased to 4 in 2007 due to some repairs, but was still based on exposed aggregate and concrete cracking. Additionally Basins 1, 2, and the Old Filters 1 through 16 have hydraulic flow constraints (refer to TM No. 3 Hydraulic Evaluation). To generate higher capacity flows may require the replacement of these facilities.

<b>Table 5.8 SRWTP Basin 2 Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Mechanical/Piping	4	4
Structural/Buildings	5	4
Gates/Valves	4	4
Instrumentation	4	3

The recommended follow up investigations include:

1. Perform a structural evaluation to determine if any, life safety issues with continued use.

The recommended CIP projects include:

1. Rehabilitate, replace, or decommission Basin 2.

The recommended O&M projects include: None.

### **3.7 Old Filters 1-16**

Table 5.9 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the Old Filters 1-16. From 2004 to 2007 the condition scorings have gotten worst due to the following issues: piping is original, old and failing influent/effluent valve controllers, positioners, and actuators, all filter effluent hydraulic gates have corroded and failed, underground filter effluent piping interior coating has failed, and the filter controls are manual. The filter structure is still settling as shown by existing window blocks popping out and/or breaking in the frames. The filters appear to be moving away from building and earthworms have been observed in several of the filters on the south side. Additionally Basins 1, 2, and the Old Filters 1 through 16 have hydraulic flow constraints (refer to TM No. 3 Hydraulic Evaluation). To generate higher capacity flows may require the replacement of these facilities.

<b>Table 5.9 SRWTP Old Filters 1-16 Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Electrical	4	3
Mechanical/Piping	4	4
Structural/Buildings	4	5
Gates/Valves	4	5
Instrumentation	3	5

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. Replace or decommission in entirety the old Filters 1-16 and the filter building.

The recommended O&M projects include: None.

### **3.8 Headhouse/Filter Washwater for Old Filters**

Table 5.10 contains the 2007 CARA Assessment rankings for the Headhouse; it was not ranked in 2004. The original hydraulic gates have corroded and failed and the master surface washwater butterfly valve leaks. A follow up seismic evaluation of the washwater tank may be needed.

<b>Table 5.10 SRWTP Headhouse Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Structural/Buildings	Not Rated	4
Gates/Valves	Not Rated	5

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. Replace 50-inch sluice gate and master surface washwater butterfly valve.
2. Replace existing electrical and instrumentation equipment.
3. Investigate/replace existing backwash tank cathodic protection.
4. Possibly perform a follow up seismic evaluation on backwash tank.

The recommended O&M projects include: None.

### **3.9 9.5 MG Reservoir**

Table 5.11 contains the 2007 CARA Assessment rankings for the 9.5 million gallons (MG) reservoir; it was not ranked in 2004. The roof of the 9.5 MG reservoir needs to be replaced and the walls need to be sealed to prevent infiltration/exfiltration. A CIP Project is in progress to address the replacement of the roof, infiltration/exfiltration, and seismic improvements.

<b>Table 5.11 SRWTP 9.5 MG Reservoir Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Structural/Buildings	Not Rated	4

The recommended follow up investigations include: None.

The recommended CIP projects include: None.

The recommended O&M projects include: None.

### **3.10 5.0 MG Reservoir**

Table 5.12 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the 5.0 MG reservoir. All of the inlet/exit hydraulic gates having failed in the 5.0 MG reservoir. Also there are several failing baffle walls.

<b>Table 5.12 SRWTP 5.0 MG Reservoir Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Structural/Buildings	3	4
Gates/Valves	4	5

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. Replace all hydraulic gates.
2. Rehabilitate or remove failed baffle walls.

The recommended O&M projects include: None.

### **3.11 High Service Pump Station**

Table 5.13 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the High Service Pump Station (HSPS). Based upon the 2007 scoring of mostly 4, and 5 there may be reason for ruling out the 2004 scoring due to possible different scoring criteria.

Repairs are ongoing on high lift pumps. All of the impellers were trimmed in the 60s and the pumps do not perform as originally installed. Most of the HSPS pump motors are original and replacement should be considered. HSPS pump switchgear needs preventative maintenance testing and may not be reliable (i.e. protective relay testing). All large valving (12- to 24-inch) is original and leaks. The corresponding valve actuators are original, old, and unreliable. Corrosion is severe at pipe penetrations thru the structure and just outside the structure. Old instrumentation like sump level control and Riverside transmission main flow monitoring is failing and needs replacement.

<b>Table 5.13 SRWTP HSPS Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Motors	2	4
Mechanical/Piping	2	4
Structural/Buildings	2	5
Gates/Valves	3	5
Fencing/Security	Not Rated	4

The structure has major concrete cracks and settlement issues, especially on the southeast corner. Groundwater leaks profusely thru cracks in the basement area and the roof needs replacement. The bridge crane is original and does not work properly. Interior paint is peeling and the building has no ventilation system, so the doors are left open which is a security problem. Stairs and other access points are not to current building code. There is no public announcement, fire, smoke, or gas detection system, which is a safety consideration. Some electrical conduits in the basement are rusting out. Old, outdated, and unused electrical and instrumentation should be properly demolished and removed.

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. The Structure is not repairable. Based upon the Phase I and Phase II Condition Assessments, the HSPS should be replaced.

The recommended O&M projects include: None.

### **3.12 North Vault**

Table 5.14 contains the 2007 CARA Assessment rankings for the North Vault; it appears that it was not ranked in 2004. All piping, valves, electrical, and the structure have experienced failure and need replacement. Piping has over 11 pinhole leaks and the large 30-inch gate valves have failed. The structure has concrete columns with exposed rusted through rebar and heavily spalled concrete. The ceiling area has temporary plywood shoring, which has rotted away. Electrical lighting conduits have rusted out.

<b>Table 5.14 SRWTP North Vault Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Electrical	Not Rated	5
Mechanical/Piping	Not Rated	5
Structural/Buildings	Not Rated	5
Gates/Valves	Not Rated	5

This issue has been identified as a critical issue requiring immediate action. Refer to TM No. 6 - Critical Issues for a complete description of the problem and the recommended course of action.

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. The North Vault structure is not repairable. Based upon the Phase I and Phase II Condition Assessments, the North Vault should be replaced.

The recommended O&M projects include: None.

### **3.13 SMUD Electrical Substation**

Table 5.15 contains the 2007 CARA Assessment rankings for the Sacramento Municipal Utility District (SMUD) electrical substation; it was not ranked in 2004. The substation ranking was due to the current outdated inadequate generator that does not function effectively. There is also a need for a security camera to monitor this area. A CIP is scheduled for the generator.

<b>Table 5.15 SRWTP SMUD Electrical Substation Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Generators	Not Rated	5

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. Replacement of emergency backup generator.

The recommended O&M projects include:

1. Install a security camera.

### 3.14 Plant SCADA System

Table 5.16 contains the 2007 CARA ranking for the existing plant supervisory control and data acquisition (SCADA) system. The SCADA system was not ranked in 2004. The SCADA system, which is common to both SRWTP and E.A. Fairbairn Water Treatment Plant (EAFWTP), has had reoccurring problems. The system periodically loses data, which is not recoverable, and sometimes City personnel make unauthorized and/or undocumented changes to the system.

<b>Table 5.16 SRWTP Plant SCADA System Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Plant SCADA System	Not Rated	4

The existing SRWTP and EAFWTP plant SCADA Control System HMI is a MS-DOS based computer control system developed by Intellution 1997. The system was updated to a window based Operator Interface in 2000. However, much of the server interfaces are still DOS based. The City took over the complete operation and maintenance of the SCADA System in 2004. This system has a very high priority and importance because of it is linked to total plant control and plant operational data documentation and recordation.

The application used by the City to collect and store plant operation data is a stand-alone application called Saber Squirrel. It was developed by Saber Engineering specifically to collect data from the Intellution FIX32 HMI and store it to a Microsoft SQL Server. The water plants and Sump 2 have redundant FIX32 HMI Servers. When one fails, the connected nodes “fail over” to the remaining server. Unfortunately, the Saber Squirrels were not designed with redundancy in mind. If the server that is operating Saber Squirrel stops functioning so does the historical data collection. Depending on the type of failure the Saber Squirrel will either, stop collecting data altogether, collect erroneous zero values, or transmit null information (blank fields). Sometimes data points that are being collected by the Saber Squirrel are deleted from the database. When this happens the Squirrels fill the destination tables with null values for that data point.

The proscribed configuration control procedure is to notify the configuration manager when changes of any type are being made but there is no way to enforce this with the existing system. In fact, there is no way to enforce configuration control at all except to limit access, which management is reluctant to do because other intermittent problems with the system often require administrator level access.

The server replacement should be implemented within 0 to 5 years and would involve replacing the existing SCADA HMI with a newer system that provides the following features:

- Dynamically synchronized redundant SCADA Servers.
- Dynamically synchronized redundant data collection system that is implemented with the HMI, not run as a separate application.

- Automatic change control, which would keep undocumented, changes from being deployed with approval or sanction.

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. Replacement of the plant SCADA HMI servers.

The recommended O&M projects include: None.

#### **4.0 EAFWTP PHASE II CONDITION ASSESSMENT**

The assets in the worst condition (rankings of 4 or 5) at EAFWTP are summarized in Table 5.17. Each asset is discussed separately below to highlight comments and recommended projects for the CIP and O&M project list. In some cases 2004 Assessment rankings and comments are included for comparison. The table also includes a reference to the page number where the detailed highlights are provided for each asset discussed.

<b>Table 5.17 EAFWTP Phase II Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>			
<b>Asset</b>	<b>CARA Assessment Parameter</b>	<b>Ranking</b>	<b>TM Page No.</b>
Grit Basin	Gates/Valves	4	5-14
Flocculation/Sedimentation Train 1/2	Electrical	5	5-15
	Structural/Building	4	
	Gates/Valves	4	
	Fencing/Security	4	
Clarifiers Train 1/2 Sludge Collection	Electrical	4	5-15
	Structural/Building	4	
	Gates/Valves	5	
	Fencing/Security	4	
Filters 1-8	Mechanical/Piping	4	5-16
	Structural/Building	4	
	Gates/Valves	4	
	Fencing/Security	4	
	Instrumentation	4	
Filter Gallery Train 1/2	Electrical	4	5-17
	Structural/Building	4	
	Instrumentation	4	
20 MG Reservoir	Gates/Valves	4	5-17
SMUD Electrical Substation	Electrical	4	5-18
	Generators	5	
Sludge Room Train 1/2	Electrical	4	5-18
	Structural/Building	4	
Administration Building	Structural/Building	5	5-19
Fluoride System	Mechanical/Piping	4	5-19
	Structural/Building	4	
	Gates/Valves	4	
Plant SCADA System	Instrumentation	4	5-20

#### **4.1 Intake**

Table 5.18 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the Intake. The 2004 CARA Assessment ranked the gates/valves due to inadequate screen wash

pinch valves, which have been replaced with air actuated butterfly valves and are now functioning correctly. There was a need for three additional pumps to provide more flow to the plant. Currently a CIP is scheduled to provide additional pumps. Many of the pumps are original and may need replacement in the future.

<b>Table 5.18 EAFWTP Intake Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Gates/Valves	4	1

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Continue with systematic pump replacement to achieve the desired capacity.

The recommended O&M projects include: None

#### **4.2 Grit Basin**

Table 5.19 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the Grit Basin. The increase in ranking is due to all eight-bypass sluice gates being severely corroded and leaking. Additionally the grit basin motor control center (MCC) 40T should be replaced.

<b>Table 5.19 EAFWTP Grit Basin Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Gates/Valves	4	5

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Replace all bypass sluice gates
2. Replace MCC 40T

The recommended O&M projects include: None

#### **4.3 Flocculation/Sedimentation Train 1/2**

Table 5.20 contains a comparison of the 2004 and 2007 CARA Assessment rankings for Flocculation/Sedimentation basins of Train 1/2. Electrical ranking was based on the motor

control center (MCC) panel being outdated. There is a CIP in progress to replace the MCC. Ranking of the gates/valves was based on the age of two sluice gates that are corroded and leak. Additionally the drain valves and piping are old and corroded. The fencing/security ranking was based on the handrail not meeting vertical code spacing requirements. Structural ranking was due to exposed aggregate.

<b>Table 5.20 EAFWTP Flocculation/Sedimentation Train 1/2 Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Electrical	4	5
Structural/Buildings	4	4
Gates/Valves	4	4
Fencing/Security	4	4
Instrumentation	4	1

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Replace old hydraulic sluice gates.
2. Replace handrail that does not meet code
3. Rehabilitate concrete surfaces with exposed aggregate
4. Replace drain valves and piping.

The recommended O&M projects include: None

#### **4.4 Clarifiers Train 1/2 Sludge Collection**

Table 5.21 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the clarifiers sludge collection in Train 1/2. Electrical ranking was based on the MCC panel being outdated. There is a CIP in progress to replace the MCC. Gates/vales ranking was based on the drain plug valves being completely corroded and leaking. Structural and fencing rankings were based on similar conditions mentioned in Train 1/2 above.

<b>Table 5.21 EAFWTP Clarifiers Train 1/2 Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Electrical	4	4
Structural/Buildings	4	4
Gates/Valves	4	5
Fencing/Security	4	4

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Replace old clarifier drain valves.

The recommended O&M projects include: None

#### **4.5 Old Filters 1-8**

Table 5.22 contains the 2007 CARA Assessment rankings for the old Filters 1-8; they were not ranked in 2004. Mechanical ranking was due to the existing surface wash piping and nozzles being ineffective. Gates/valves were ranked based of the age of all eight effluent and drain valves and that they are all leaking. The instrumentation filter controls are original and are not SCADA controlled. Crack repair is needed in filter effluent box structures and there is no handrail around the filters. In addition, the media and underdrains are old and need replacement.

<b>Table 5.22 EAFWTP Old Filters 1-8 Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Mechanical/Piping	Not Rated	4
Structural/Buildings	Not Rated	4
Gates/Valves	Not Rated	4
Fencing/Security	Not Rated	4
Instrumentation	Not Rated	4

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Completely rehabilitate old filters, including structural repairs and installation of an air scour system.
2. Replace all filter effluent valves
3. Install SCADA controlled filter controls. Particle counters should be considered as part of the installation.
4. Install hand railing around filters

The recommended O&M projects include: None

#### **4.6 Filter Gallery Train 1/2**

Table 5.23 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the filter gallery in Train 1/2. The drain channel conduit and disconnects have rusted away and some piping has exterior corrosion. The building roof leaks and needs replacement. All effluent valves and actuators are old and need replacement. SCADA control needs to be implemented. Particle counters should be considered as part of the installation.

<b>Table 5.23 EAFWTP Filter Gallery Train 1/2 Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Electrical	2	4
Structural/Buildings	4	4
Fencing/Security	4	2
Instrumentation	5	5

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Install SCADA controlled filter controls
2. Replace building roof
3. Replace drain channel conduit and disconnects

The recommended O&M projects include:

1. Replace corroded piping.

#### **4.7 20 MG Reservoir**

Table 5.24 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the 20 MG reservoir. All five sluice gates are old, corroded, and leaking.

<b>Table 5.24 EAFWTP 20 MG Reservoir Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Gates/Valves	4	4

The recommended follow up investigations include: None.

The recommended CIP projects include:

1. Replace all five hydraulic gates.

The recommended O&M projects include: None.

#### **4.8 SMUD Electrical Substation**

Table 5.25 contains the 2007 CARA Assessment rankings for the SMUD electrical substation; it was not ranked in 2004. The substation circuit breakers are old and need replacement. The existing 1 megawatt (MW) backup diesel generator is inadequate and not functioning effectively. A CIP is already scheduled for the generator.

<b>Table 5.25 EAFWTP SMUD Electrical Substation Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Electrical	Not Rated	4
Generators	Not Rated	5

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Replace substation breakers.
2. Replace backup emergency generator.

The recommended O&M projects include: None.

#### **4.9 Sludge Room Train 1/2**

Table 5.26 contains a comparison of the 2004 and 2007 CARA Assessment rankings for the sludge room in Train 1/2. Electrical ranking was based on the PLC/SCADA information from equipment in the sludge room not being relayed to the control room, allowing proper monitoring. Structural ranking was based on the train leaking into the sludge room caused by old, corroded drain valves. These leaks have caused conduits and electrical boxes to rust out.

<b>Table 5.26 EAFWTP Sludge Room Train 1/2 Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Electrical	4	4
Structural/Buildings	4	4

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Replace sludge room drain valves, electrical conduits and boxes.

The recommended O&M projects include:

1. Install PLC/SCADA instrumentation and controls.

#### **4.10 Administration Building**

Table 5.27 contains the 2007 CARA Assessment rankings for the Administration Building; it was not ranked in 2004. Ranking was due to the poor condition of the roof.

<b>Table 5.27 EAFWTP Admin Building Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Structural/Buildings	Not Rated	5

The recommended follow up investigations include: None

The recommended CIP projects include:

1. Replace old Administration Building roof.

The recommended O&M projects include: None

#### **4.11 Fluoride System**

Table 5.28 contains the 2007 CARA Assessment rankings for the fluoride system; it was not ranked in 2004. Ranking was due to the system (valves, piping, and tanks) reaching end of life.

<b>Table 5.28 EAFWTP Fluoride System Condition Assessment Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities</b>		
<b>CARA Assessment Parameter</b>	<b>2004</b>	<b>2007</b>
Mechanical/Piping	Not Rated	4
Structural/Buildings	Not Rated	4
Gates/Valves	Not Rated	4

The recommended follow up investigations include: None.

The recommended CIP projects include: None.

The recommended O&M projects include:

1. Replace entire fluoride system.

#### **4.12 Plant SCADA System**

Since the SCADA systems are common to both plants, refer to Section 3.14 for the SCADA system assessment and comment summary.

## **5.0 SUMMARY**

Table 5.29 and 5.30 contain a summary of the projects recommended at SRWTP and EAFWTP for the 20-year CIP planning period project list and the O&M project list, respectively. These projects will be used to develop improvement alternatives and ultimately the CIP plan.

Several additional projects for further investigation and the O&M project list were identified during the Phase II Condition Assessment Project and the contact time (CT) Tracer Studies at both plants.

The following is a list of these identified and recommended projects:

1. At SRWTP a prefilter chlorination point at the outlet of the Sedimentation Basin 1 and Basin 2 should be installed. Associated with this project, Sample Point No. 5 at the outlet of Basin 2 will be moved down stream to the Filter Gallery.
2. At both SRWTP and EAFWTP, level monitoring instrumentation equipment connected to the PLC/SCADA system for monitoring the level of the water level above the weir should be investigated upstream of the CT weir. As discussed in TM No. 6, this will aid the plants to receive the maximum CT credit for the additional volume of water that is not currently included.
3. At both SRWTP and EAFWTP install instrumentation hardware/software to allow PLC/SCADA data collection of the influent magmeter totalizers.

4. At EAFWTP perform new filter media sieve analysis on the anthracite and sand to determine if the installed media matches the specified media. The cost will be approximately \$2,200.
5. At EAFWTP when the plant is completely taken out of service, draining the process and finished water stored in the trains, CT basin, clearwell, and 20 MG storage reservoir can be a slow and problematic process. The plant is allowed to discharge only 200 gallons per minute (gpm) to the County's sanitary sewer by special permit and during rainy weather the County requests the discharge to be stopped. Draining the stored water can take many weeks or possibly months with wet weather. A temporary sewer discharge should be discussed and negotiated with the County to allow discharge into the large interceptor at the NW corner of the EAFWTP.

**Table 5.29 Phase II Condition Assessment Recommended CIP Project List Summary SRWTP and EAFWTP Capacity Optimization, Remaining Life, and Reliability Improvement Study City of Sacramento Department of Utilities**

Asset	Recommended CIP Projects
<b>SRWTP</b>	
Intake	Grouting for settlement and replace two small intake pumps
Coagulation building	Replace roof, seismic update
Basin 1	Replace
Basin 2	Replace or rehabilitate
Old Filters 1-16	Replace
Headhouse	Replace 50-inch sluice gate, existing electrical and instrumentation equipment, master surface washwater butterfly valve. Investigate/replace existing backwash tank cathodic protection and perform a seismic evaluation on backwash tank.
5.0 MG reservoir	Replace hydraulic gates and rehab failed baffle walls
HSPS	Replace
North Vault <sup>(1)</sup>	Replace
Plant SCADA System	Replace existing SCADA HMI server.
<b>EAFWTP</b>	
Intake	Systematic replacement of pumps
Grit Basin	Replace all bypass sluice gates and MCC 40T
Flocculation/Sedimentation Train 1/2	Replace old hydraulic sluice gates, handrail that meets code, and drain valves and piping. Rehabilitate concrete surfaces.
Clarifiers Train 1/2	Replace drain valves

**Table 5.29 Phase II Condition Assessment Recommended CIP Project List Summary  
SRWTP and EAFWTP Capacity Optimization,  
Remaining Life, and Reliability Improvement Study  
City of Sacramento Department of Utilities**

<b>Asset</b>	<b>Recommended CIP Projects</b>
Old Filters 1-8	Completely rehabilitate old filters, including structural repairs and installation of an air scour system. Replace all filter effluent valves. Install SCADA controlled filter controls and hand railing around filters.
Filter Gallery Train 1/2	Replace roof, drain channel conduit and disconnects, and corroded piping.
20 MG reservoir	Replace hydraulic gates
SMUD Elec Substation	Replace circuit breakers
SMUD Elec Substation	Replace backup emergency generator
Sludge room Train 1/2	Replace drain valves and electrical conduits and boxes.
Admin Building	Replace old Administration Building roof
Plant SCADA System	Replace existing SCADA HMI server
Note:	
1. This is a critical issue requiring immediate action; refer to TM No. 6.	

**Table 5.30 Phase II Condition Assessment Recommended O&M Project List Summary  
SRWTP and EAFWTP Capacity Optimization,  
Remaining Life, and Reliability Improvement Study  
City of Sacramento Department of Utilities**

<b>Asset</b>	<b>O&amp;M Project</b>
<b>SRWTP</b>	
Intake	Modifications to security cameras Install air release valves on 54-inch raw water vent piping
Intake fountain	Repair and replace leaking piping as needed. Replace existing filter system with more and/or larger filters.
Grit Basin <sup>(1)</sup>	Replace polychain
Coagulation building	Lower loading dock
SMUD elec substation	New security camera
<b>EAFWTP</b>	
Sludge room Train 1/2	Install PLC/SCADA instrumentation and controls.
Fluoride System	Replace entire fluoride system
Full Plant	Install sanitary sewer connection to County Interceptor for draining stored water when plant is completely off-line.
Note:	
1. This is a critical issue requiring immediate action; refer to TM No. 6.	

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**CARA PHASE II CONDITION ASSESSMENT SPREADSHEETS**

**City of Sacramento / Department of Utilities  
CARA/Phase II Water Treatment Plant Condition Assessment  
Condition Ranking Abbreviations and Score Criteria**

**Condition Ranking Abbreviations:**

NR	Not Rated	SW	Steve Willey
AK	Amy Kral	DP	Dave Phillips
CC	Craig Chalmers	RF	Ray Florez
DH	Dan Hixson	DK	Dale Kral
GD	Greg Dow	RA	Ron Adams
JL	John Lange	TV	Tedd Vallance
JP	Jim Pregent	KH	Katy Hexberg
JV	Jose Vega		
LV	Larry Valim		
MK	Mary Krizanosky		
MG	Mike Goulet		
ML	Mark Laurenzi		
RF	Rod Frizzel		
SJ	Scott Johnson		
TN	Tammy Newton		
JT	Jerry Tatum		

**Condition Ranking Score Criteria:**

- 1 Routine Maintenance, 0% maintenance needed to keep running
- 2 Routine Maintenance, minor, 5% maintenance needed to keep running
- 3 Routine Maintenance, moderate, 10-20% maintenance needed to keep running
- 4 Routine Maintenance, renewal, 20-40% maintenance needed to keep running, may be unreliable.
- 5 Completely Failed, Unserviceable, >50% maintenance need to keep running

rev. 6/1/07

City of Sacramento / Department of Utilities  
 CARA/Phase II Water Treatment Plant Condition Assessment  
 Condition Ranking Parameters Summary  
 Sacramento River WTP (SRWTP)

Seq. #	Rec ID	Facility	Assessment Yr.	Assessment Description	Assessors	Assessment Parameters										
						Pumps	Motors	Electrical	Mech./ Piping	Structural/BI dgs	Generators	Roadways	Gates/ Valves	Fencing/Se curity	Chem System	Instrumentation
1	6	SRWTP	2004	Intake	DK, DH, AK	1	1	2	2	NR	NR	1	4	1	NR	NR
2	6A	SRWTP	2007	Intake	*	1	1	1	1	4	NR	1	1	3	NR	2
3	14	SRWTP	2004	Intake Fountain	DK, TN, DH	1	1	1	2	2	NR	2	2	2	2	NR
4	14A	SRWTP	2007	Intake Fountain	*	4	4	1	2	1	NR	3	2	3	1	1
5	21	SRWTP	2004	Grit Removal & Pretreat	DK, DH, AK	2	1	1	NR	1	NR	1	2	1	2	NR
6	21A	SRWTP	2007	Grit Basin	*	1	1	2	4	2	NR	NR	2	NR	1	1
7	21B	SRWTP	2007	Grit Removal System	NR											
8	New	SRWTP	2007	Flash Mix System	*	1	1	1	2	NR	NR	NR	1	NR	NR	NR
9	New	SRWTP	2007	Caustic System	*	1	1	1	1	NR	NR	NR	1	NR	NR	1
10	New	SRWTP	2007	Alum System	*	1	1	1	1	NR	NR	NR	1	NR	NR	1
11	New	SRWTP	2007	Polymer System/Coag.	*	1	1	1	1	NR	NR	NR	1	NR	NR	1
12	29	SRWTP	2004	Coag. Bldg	DK, DH, AK	2	1	2	2	3	NR	4	2	3	2	2
13	29A	SRWTP	2007	Coag. Bldg	*	2	1	2	2	4	NR	4	2	3	NR	1
14	2	SRWTP	2004	Train 1	DK, LV, JL, ML	5	2	2	4	3	NR	1	3	NR	NR	3
15	2A	SRWTP	2007	Basin 1	*	1	1	2	4	5	NR	1	5	NR	2	2
16	19	SRWTP	2004	Basin 2	DK, DH, AK	2	2	2	4	5	NR	2	4	2	2	4
17	19A	SRWTP	2007	Basin 2	*	3	1	2	4	4	NR	2	4	2	2	3
18	23	SRWTP	2004	Basin 3	DK, DH, AK	1	1	2	2	1	NR	1	2	1	NR	NR
19	23A	SRWTP	2007	Basin 3	*	1	1	1	1	1	NR	1	1	1	1	1
20	16	SRWTP	2004	Old Filters 1-16	DK, DH, AK	3	2	4	4	4	NR	1	4	1	NR	3
21	16A	SRWTP	2007	Old Filters 1-16	*	3	3	3	4	5	NR	NR	5	1	NR	5
22	25A	SRWTP	2007	Headhouse/Filter WW System	*	2	2	2	3	4	NR	NR	5	NR	NR	2
23	New	SRWTP	2007	Old Filter Bldg	NR											
24	30	SRWTP	2004	New Filters 1-8	DK, DH, AK	2	2	2	2	1	NR	1	2	1	1	NR
25	30A	SRWTP	2007	New Filters 1-8	*	1	1	1	1	1	NR	3	3	1	1	1
26	New	SRWTP	2007	New Filter Wash Water Syst.	*	2	2	2	2	NR	NR	2	NR	NR	NR	2
27	New	SRWTP	2007	New Filter Air Scour System	*	2	2	2	2	2	NR	NR	2	NR	NR	2
28	New	SRWTP	2007	New Filter Bldg	NR											
29	New	SRWTP	2007	Lime System	*	1	1	1	1	1	NR	1	2	1	NR	2
30	New	SRWTP	2007	Polymer System/Floc	*	1	1	1	1	1	NR	NR	1	NR	NR	1
31	New	SRWTP	2007	Old Fluoride System	NR											
32	New	SRWTP	2007	New Fluoride System	*	1	1	1	1	1	NR	NR	1	NR	NR	1
33	New	SRWTP	2007	Chlorine System	*	1	1	2	1	1	NR	NR	1	NR	NR	2
34	New	SRWTP	2007	Utility Water System	*	NR	NR	NR	2	NR	NR	NR	1	NR	NR	NR
35	20	SRWTP	2004	New Chem Bldg	DK, DH, AK	2	1	2	2	1	NR	2	2	2	3	NR
36	20A	SRWTP	2007	New Chem Bldg	*	NR	NR	1	1	1	NR	NR	NR	2	NR	2
37	27	SRWTP	2004	New CT Reservoir	DK, DH, AK	1	1	2	2	2	NR	1	2	1	2	NR
38	27A	SRWTP	2007	New CT Reservoir	*	1	1	1	1	1	NR	NR	1	1	3	3
39	New	SRWTP	2007	9.5 Reservoir	*	NR	NR	1	1	4	NR	NR	1	2	NR	2
40	18	SRWTP	2004	5M Reservoir	DK, DH, AK	2	2	2	3	3	2	2	4	2	1	NR
41	18A	SRWTP	2007	5M Reservoir	*	1	1	2	2	4	NR	NR	5	2	1	1
42	1	SRWTP	2004	HSPS	DK, LV, JL, ML	2	2	2	2	2	2	2	3	NR	NR	3
43	1A	SRWTP	2007	HSPS	*	3	4	2	4	5	3	NR	5	4	NR	3
44	New	SRWTP	2007	HSPS North Vault	*	NR	NR	5	5	5	NR	NR	5	NR	NR	NR
45	New	SRWTP	2007	HSPS South Vault	*	NR	NR	2	2	1	NR	NR	1	NR	NR	1
46	New	SRWTP	2007	SMUD Elec. Sub Station	*	NR	NR	2	NR	1	5	NR	NR	2	NR	2
47	17	SRWTP	2004	WW Lagoon 1	DK, DH, AK	NR	NR	1	1	1	NR	1	2	1	NR	NR
48	17A	SRWTP	2007	FWW Lagoon 1/2	*	NR	NR	1	1	1	NR	NR	2	1	NR	NR
49	22	SRWTP	2004	Sludge Lagoon 1&2	DK, DH, AK	NR	NR	1	1	1	NR	1	2	1	NR	NR
50	22A	SRWTP	2007	Sludge Lagoon 1, 2, &3	*	NR	NR	1	1	1	NR	NR	2	NR	NR	NR
51	24	SRWTP	2004	South Pump Station	DK, DH, AK	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
52	24A	SRWTP	2007	South Pump Station	*	2	2	1	1	1	NR	NR	2	NR	NR	2
53	28	SRWTP	2004	New Chem Trench	DK, DH, AK	2	2	1	2	NR	NR	3	2	2	2	NR
54	28A	SRWTP	2007	New Chem Trench	*	2	2	1	2	3	NR	NR	2	3	2	2
55	25	SRWTP	2004	Old Control Room	DK, DH, AK	3	2	2	3	4	NR	1	4	2	NR	NR
56	26	SRWTP	2004	New Admin Bldg	DK, DH, AK	NR	1	NR	2	3	NR	2	2	2	NR	2
57	26A	SRWTP	2007	New Admin Bldg	*	1	1	1	1	2	NR	NR	NR	1	NR	NR
58	3	SRWTP	2004	SRWTP	DK, LV, JL, ML	2	NR	2	2	4	NR	1	4	4	NR	5
59	New	SRWTP	2007	SRWTP Roadways	*	NR	NR	NR	NR	NR	NR	2	NR	NR	NR	NR
60	New	SRWTP	2007	Electrical Vaults	*	2	2	2	2	2	NR	NR	2	NR	NR	2
61	New	SRWTP	2007	Electrical Loop	*	NR	NR	2	NR	NR	NR	NR	NR	NR	NR	2
62	New	SRWTP	2007	Plant Compressed Air	*	2	2	2	2	NR	NR	NR	2	NR	NR	2
63	New	SRWTP	2007	Master Sump	*	2	2	2	2	2	NR	NR	2	NR	NR	NR
64	New	SRWTP	2007	Plant SCADA Sytem	TV, KH	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	4

\* 2007 Assessment performed on 5/24/07 by SW, DK, RA, DP, RF, ML

**City of Sacramento / Department of Utilities  
 CARA/Phase II Water Treatment Plant Condition Assessment  
 Comment Section for Assessments 3, 4, 5  
 Sacramento River WTP (SRWTP)**

Seq. #	Rec ID	Facility	Assessment Yr.	Assessment Description	Assessors	Comments for Assessments 3, 4, and 5
1	6	SRWTP	2004	Intake	DK, DH, AK	Pinch valves on screen wash system are inadequate
2	6A	SRWTP	2007	Intake	*	Need additional cameras and relocate existing for improved security. Plaza concrete slab settling causing security gate and fountain piping to periodically fail. All Fixed speed pumps, several variable speed would help trim intake flows to the plant.
3	14	SRWTP	2004	Intake Fountain	DK, TN, DH	Needs cement walkway to pumps. Needs ladder inside pump vault.
4	14A	SRWTP	2007	Intake Fountain	*	Plaza concrete slab settlement causing failure to front gate, fencing, and security. Settlement causing fountain pipe failures. Fountain filters plug and pump/motors need replacing
5	21	SRWTP	2004	Grit Removal & Pretreat	DK, DH, AK	New piping to be added to pump grit and water to different location in emergency, when grit system fails. Sample pumps 2&3 cannot pump to lab by themselves too small.
6	21A	SRWTP	2007	Grit Basin	*	Chain and Flights failing and need replacing. Has temporary inlet baffling that needs replacing. Minor leaking at north center expansion joint
7	21B	SRWTP	2007	Grit Removal System	*	Include in above
8	New	SRWTP	2007	Flash Mix System	*	
9	New	SRWTP	2007	Caustic System	*	
10	New	SRWTP	2007	Alum System	*	
11	New	SRWTP	2007	Polymer System/Coag.	*	
12	29	SRWTP	2004	Coag. Bldg	DK, DH, AK	Alum and Poly running not caustic. Chem feed pumps cannot be locked out at pump 0-10. Roof and windows Roadways-(loading dock to high cannot use) Safety hazard
13	29A	SRWTP	2007	Coag. Bldg	*	Need to add sump pump. Damaged conduits to lighting, walls, and skylight leak. Loading dock too high causing safety hazard. Security Camera needs upgrading and relocating. Roof needs complete replacement. Structure is original and does not meet current seismic requirements which may not make it reliable esp. during a seismic event.
14	2	SRWTP	2004	Train 1	DK, LV, JL, ML	Sludge pump needs replacement. Asbestos panels present around tank bridge. Sludge piping sever corrosion.
15	2A	SRWTP	2007	Basin 1	*	Original piping, valves, and hydraulic gates failed and need replacing. Sludge removal all manual in below ground sedimentation which is confined space. All access ladders are not code. Major support columns and walls have exposed and completely rusted thru rebar. Major concrete cracks on separation and outside support walls. Deep exposed concrete aggregate. on first sedimentation areas. Steel support beams added at inlet/exits of sedimentations areas are severely corroded and some have failed. Structure does not appear in good reliable condition. Structure does not appear to look like it would meet seismic requirements. Hydraulic grade line does not match Basins 2 and 3. Hydraulic gradlines should match for a well operating plant.
16	19	SRWTP	2004	Basin 2	DK, DH, AK	Has severe concrete erosion and exposed rebar. Flash mixer very old and cannot find parts,*New inlet box breaks up floc so flow change from 50mgd to 20mgd max. Inadequate flow for accurate NTU readings.
17	19A	SRWTP	2007	Basin 2	*	Dewatering pump and piping is failing. Exposed rebar and sever concrete corrosion. Needs PLC to improve performance and monitoring. All hydraulic gates are original and are failing. Hydraulic grade lines of Basin 1 and 3 do not match. Sludge removal is manual thru approximately half of the sed. basin and that portion of the basin is shallow (approx. 10' so basin has large floc and sludge carry over at high flows.
18	23	SRWTP	2004	Basin 3	DK, DH, AK	
19	23A	SRWTP	2007	Basin 3	*	Some of the SS cross collector chain links have been discovered to have stress cracks in them. City Engineering is making an initial evaluation of these cracks using US Filter and the Grit Basin chain wear problem. Additional sedimentation basin lighting has been requested by operations to help optimize the flocculation process.
20	16	SRWTP	2004	Old Filters 1-16	DK, DH, AK	Filter beds sliding away from bldg. Bldg cracking and settling @ an angle causing window to break. Also water leaks in from sprinklers running. FACILITY IS OLD< ALL PIPING AND ELECTRICAL HAVE OUTLIVED THERE
21	16A	SRWTP	2007	Old Filters 1-16	*	The piping is original riveted steel and should be replaced. All Influent/Effluent valve controllers, positioners, and actuators are old and failing and should be replaced. All the filter effluent hydraulic gates have corroded and failed and need replacement. Underground filter effluent piping interior coating has failed requiring piping to be corroded and need replacement. Filter Controls are all manual and should be automated like new filters. Filter Structure is still settling as existing window block pop out and/or break in frames. Filters appear to be moving away from bldg. There has been periodic earthworm contamination several of the south side old filters. Filter controls should be automated like new filters.
22	25A	SRWTP	2007	Headhouse/Filter WW System	*	Surface wash (master) leaks out. Slide gate valve, separates #1 basin from filters is beyond repair, will not seat. Filter WW pumps are in basement of the HSPS and in danger of flooding. All valves and piping are old, corroded and leak and need replacement. A condition and seismic evaluation needs to take place on WW tank in the top of headhouse.
23	New	SRWTP	2007	Old Filter Bldg	NR	
24	30	SRWTP	2004	New Filters 1-8	DK, DH, AK	
25	30A	SRWTP	2007	New Filters 1-8	*	Sump pumps too small. A sink hole has developed on the NW corner of the Filter bldg due to leakage into the FW pipe. The pipe leak repair was completed in 2006 and the sink can be repaired. Limitorques on filter effluent valves may need to be upsized. Paint failing on interior ceiling galvanize roof decking and chemicals utilized by steel manufacture.
26	New	SRWTP	2007	New Filter Wash Water Syst.	*	
27	New	SRWTP	2007	New Filter Air Scour Syst.	*	
28	New	SRWTP	2007	New Filter Bldg	*	
29	New	SRWTP	2007	Lime System	*	Adding new level transmitter
30	New	SRWTP	2007	Polymer System/Filters	*	
31	New	SRWTP	2007	Old Fluoride System	*	
32	New	SRWTP	2007	New Fluoride System	*	
33	New	SRWTP	2007	Chlorine System	*	Okay for current production. Undersized for build out. Booster system needs VFD
34	New	SRWTP	2007	Utility Water System	*	
35	20	SRWTP	2004	New Chem Bldg	DK, DH, AK	Lime slakers cannot be locked out w/o opening electrical panel. Chem. Feed pumps cannot be locked out at pumps. Cl2 feed is inadequate capacity for max. demand. Lighting in the Cl2 storage room is inadequate(Tom Daizk)
36	20A	SRWTP	2007	New Chem Bldg	*	Needs additional security cameras. Fire Alarm is not audible inside bldg.
37	27	SRWTP	2004	New CT Reservoir	DK, DH, AK	Need a larger more powerful electric tool to actuate valves, opening and closing. Need power supply @ north end of res. #3
38	27A	SRWTP	2007	New CT Reservoir	*	Needs ventilation investigation by Engineer. CL2 gas is causing a lot of corrosion. Still need power to north end of res. #3. Level Instrumentation connected to SCADA needs to be added to the weir side of the CT tank to determine the height of the water flowing over the CT weir.
39	New	SRWTP	2007	9.5 Reservoir	*	Needs roof replaced and walls sealed to prevent infiltration/exfiltration
40	18	SRWTP	2004	5M Reservoir	DK, DH, AK	Valves leak and hard to open seats very poor condition. Connecting main to the 5mg Res. From the 9.5mg Res. Needs to be larger (differential problem)
41	18A	SRWTP	2007	5M Reservoir	*	Same issue with valves and piping. All inlet/exit hydraulic gates have failed and need replacing. Several baffle walls are failing. Differential Repaired.
42	1	SRWTP	2004	HSPS	DK, LV, JL, ML	No security at old pump structure. Paint on walls possibly lead and peeling badly. High lift pumps old and high maintenance. Excessive noise.
43	1A	SRWTP	2007	HSPS	*	Repairs are ongoing on high lift pumps. All fixed speed pumps, several variable speed pumps would help trim flows to distribution system. All the pumps have had heavy impeller trims in the 60's and don't perform as originally
44	New	SRWTP	2007	HSPS North Vault	*	All piping, valves, electrical, and structure have failed and need replacement. Piping has over 11 pin hole leaks. Large 30" gate valves have failed. Structure has concrete columns that have exposed rusted thru rebar and heavy spalled concrete. Ceiling area has plywood shoring which has rotted away. Electrical lighting conduits have rusted out. Immediate attention on this structure is needed.
45	New	SRWTP	2007	HSPS South Vault	*	
46	New	SRWTP	2007	SMUD Elec. Sub Station	*	Need security camera. Generator is inadequate and does not function effectively and needs replacement, a CIP id scheduled for the Generator
47	17	SRWTP	2004	WW Lagoon 1	DK, DH, AK	Needs screens in front of large/small decant gate and valves to protect pumps from debris and animals from getting trapped or killed (all lagoons) need a step on south side of FWW lagoon to step up to valve platform safely.
48	17A	SRWTP	2007	FWW Lagoon 1/2	*	
49	22	SRWTP	2004	Sludge Lagoon 1&2	DK, DH, AK	Need screens to all gate/weir valves openings for safety of animals and pumps from debris.
50	22A	SRWTP	2007	Sludge Lagoon 1, 2, &3	*	
51	24	SRWTP	2004	South Pump Station	DK, DH, AK	Sludge decant, wash water return and storm drain systems also plant drain "a little undersized"
52	24A	SRWTP	2007	South Pump Station	*	
53	28	SRWTP	2004	New Chem Trench	DK, DH, AK	Missing Components-Floor grates. Sink hole @ Nwcorner of new filter bldg/lawn Chem trench is sinking causing this problem.
54	28A	SRWTP	2007	New Chem Trench	*	Some settlement has occurred between pile founded and non-pile founded trench. May need to upgrade hatches because of egress safety issue.
55	25	SRWTP	2004	Old Control Room	DK, DH, AK	Surface wash (master) leaks out. Slide gate valve, separates #1 basin from filters is beyond repair, will not seat.
56	26	SRWTP	2004	New Admin Bldg	DK, DH, AK	Outside walk ways sinking, should be warranty item.
57	26A	SRWTP	2007	New Admin Bldg	*	
58	3	SRWTP	2004	SRWTP	DK, LV, JL, ML	Roof leaks need major repairs for sure. Asbestos in it. Security needs improvement Lots of Structural Cracking.
59	New	SRWTP	2007	SRWTP Roadways	*	A lot of settlement causing various sink holes
60	New	SRWTP	2007	Electrical Vaults	*	Fills Chem Trench and Basement with rain water
61	New	SRWTP	2007	Electrical Loop	*	
62	New	SRWTP	2007	Plant Compressed Air	*	
63	New	SRWTP	2007	Master Sump	*	
64	New	SRWTP	2007	Plant SCADA System	TV, KH	Need to replace the existing SCADA HMI with a system that provides dynamically synchronized redundant servers and data collection. Must have automatic change control to keep undocumented/unauthorized changes from occur

\* 2007 Assessment performed on 5/24/07 by SW, DK, RA, DP, RF, ML

**City of Sacramento / Department of Utilities  
CARA/Phase II Water Treatment Plant Condition Assessment  
Condition Ranking Parameters Summary  
E.A. Fairbairn WTP (EAFWTP)**

Seq. #	Rec ID	Facility	Assessment Yr.	Assessment Description	Assessors	Assessment Parameters										
						Pumps	Motors	Electrical	Mech/ Piping	Structural/ Bldgs	Generators	Roadways	Gates/ Valves	Fencing/S ecurity	Chem System	Instrumentation
1	4	EAFWTP	2004	Intake PS	JV, MK, JT	2	1	1	1	1	NR	2	4	1	NR	1
2	4A	EAFWTP	2007	Intake PS	JV, MK, CC, GD	3	1	2	1	1	NR	2	1	1	NR	2
3	5	EAFWTP	2004	Grit Basin	JV, MK, JT	2	2	3	2	2	NR	2	4	1	1	NR
4	5A	EAFWTP	2007	Grit Basin	JV, MK, CC, GD	1	1	3	3	2	NR	2	4	2	1	1
5	New	EAFWTP	2007	Grit System	JV, MK, CC, GD	1	1	3	3	2	NR	2	2	1	1	1
6	8	EAFWTP	2004	Flash Mix	JV, MK, GD	1	1	1	1	NR	NR	NR	1	NR	1	NR
7	8A	EAFWTP	2007	Old Flash Mix/Basin 1/2	JV, MK, CC, GD	1	1	2	1	NR	NR	NR	1	NR	1	1
8	8B	EAFWTP	2007	Flash Mix System/Basin 3/4	JV, MK, CC, GD	1	1	1	1	NR	NR	NR	1	NR	1	1
9	12	EAFWTP	2004	Old Polymer Rm	MK, DH, SJ	2	1	2	2	2	NR	NR	3	NR	2	2
10	12A	EAFWTP	2007	Polymer System	JV, MK, CC, GD	1	1	1	2	NR	NR	NR	1	NR	1	2
11	10	EAFWTP	2004	Old Alum System	JV, RF, GD	1	1	1	1	2	NR	NR	1	NR	1	2
12	10A	EAFWTP	2007	Alum System	JV, MK, CC, GD	1	1	1	1	1	NR	NR	1	NR	1	1
13	New	EAFWTP	2007	Caustic System	JV, MK, CC, GD	1	1	1	1	1	NR	NR	1	NR	1	1
14	11	EAFWTP	2004	Old Chlorine System	JV, MK, GD	2	2	3	3	2	NR	NR	4	NR	2	2
15	11A	EAFWTP	2007	Chlorine System	JV, MK, CC, GD	1	1	1	2	1	NR	NR	2	NR	1	2
16	New	EAFWTP	2007	Chem. Bldg	JV, MK, CC, GD	NR	NR	1	1	1	NR	NR	2	1	1	2
17	7	EAFWTP	2004	Floc/Sed 1/2	JV, MK, MG, JP	NR	1	4	1	4	NR	NR	4	4	2	4
18	7A	EAFWTP	2007	Train 1/2	JV, MK, CC, GD	2	2	5	1	4	NR	NR	4	4	2	1
19	New	EAFWTP	2007	Train 1/2 Flocculators	JV, MK, CC, GD	NR	3	3	3	NR	NR	NR	NR	NR	NR	3
20	9	EAFWTP	2004	Clarifiers 1/2	JV, MK, GD	NR	3	4	3	4	NR	NR	4	4	NR	4
21	9A	EAFWTP	2007	Clarifiers 1/2 Sludge Collection	JV, MK, CC, GD	NR	2	4	3	4	NR	NR	5	4	NR	2
22	New	EAFWTP	2007	Old Filters 1-8	JV, MK, CC, GD	NR	2	1	4	4	NR	NR	4	4	2	4
23	32	EAFWTP	2004	Filter Gallery	JV, MK	2	1	2	3	4	NR	NR	3	4	1	5
24	32A	EAFWTP	2007	Filter Gallery 1/2	JV, MK, CC, GD	2	1	4	3	4	NR	NR	3	2	1	4
25	7B	EAFWTP	2007	Train 3/4	JV, MK, CC, GD	1	1	1	1	1	NR	NR	1	1	1	2
26	New	EAFWTP	2007	Train 3/4 Flocculators	JV, MK, CC, GD	NR	2	2	2	NR	NR	NR	NR	NR	NR	2
27	New	EAFWTP	2007	New Filters 9-16	JV, MK, CC, GD	NR	1	1	1	1	NR	NR	2	1	1	2
28	32B	EAFWTP	2007	Filter Gallery 3/4	JV, MK, CC, GD	1	1	1	1	1	NR	NR	2	1	1	2
29	New	EAFWTP	2007	9M CT/Reservoir	JV, MK, CC, GD	NR	NR	NR	1	1	NR	NR	2	1	1	2
30	33	EAFWTP	2004	Old Reservoir	JV, MK	1	2	2	1	2	NR	NR	4	NR	1	1
31	33A	EAFWTP	2007	20M Reservoir	JV, MK, CC, GD	2	1	2	1	2	NR	NR	4	2	1	1
32	15	EAFWTP	2004	HSPS	JV, MK	1	1	1	1	1	NR	NR	1	NR	NR	1
33	15A	EAFWTP	2007	HSPS	JV, MK, CC, GD	2	2	3	1	2	NR	NR	1	2	NR	2
34	New	EAFWTP	2007	Lime System	JV, MK, CC, GD	2	2	1	1	NR	NR	NR	1	NR	2	3
35	New	EAFWTP	2007	Lime Bldg	JV, MK, CC, GD	1	1	1	1	2	NR	NR	NR	1	2	1
36	New	EAFWTP	2007	Utility Water System	JV, MK, CC, GD	1	1	1	1	NR	NR	NR	1	NR	1	1
37	31	EAFWTP	2004	Sludge Lagoons	JV, MK	1	1	1	1	1	NR	1	1	1	1	1
38	New	EAFWTP	2007	SMUD Elec. Substation	JV, MK, CC, GD	NR	NR	4	NR	2	5	2	NR	2	NR	NR
39	31A	EAFWTP	2007	Sludge Lagoons 1,2,&3	JV, MK, CC, GD	1	1	1	1	1	NR	1	1	1	1	1
40	New	EAFWTP	2007	Old Washwater Tank	JV, MK, CC, GD	NR	2	3	2	3	NR	2	2	1	NR	2
41	13	EAFWTP	2004	Sludge Room	MK, MG, SJ	2	2	4	2	4	NR	NR	3	NR	NR	2
42	New	EAFWTP	2007	Sludge Room/Basin 1/2	JV, MK, CC, GD	2	2	4	2	4	NR	NR	3	NR	NR	3
43	New	EAFWTP	2007	Sludge Room/Basin 3/4	JV, MK, CC, GD	2	1	1	1	1	NR	NR	1	NR	NR	1
44	13A	EAFWTP	2007	Sludge System	NR											
45	New	EAFWTP	2007	FWW Lagoons 1&2	JV, MK, CC, GD	1	1	1	1	1	NR	1	2	NR	NR	1
46	New	EAFWTP	2007	Admin Bldg	JV, MK, CC, GD	1	1	1	1	5	NR	NR	2	NR	NR	3
47	New	EAFWTP	2007	Control Bldg	JV, MK, CC, GD	NR	NR	1	1	1	NR	NR	1	1	NR	3
48	New	EAFWTP	2007	W.Q. Lab Bldg	JV, MK, CC, GD	1	1	2	1	3	NR	NR	1	1	2	2
49	New	EAFWTP	2007	Chlorine Scrubber	JV, MK, CC, GD	1	1	1	2	1	NR	NR	2	NR	3	3
50	New	EAFWTP	2007	Fluoride System	JV, MK, CC, GD	1	1	1	4	4	NR	NR	4	1	2	2
51	New	EAFWTP	2007	Plant SCADA Sytem	TV, KH	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	4

2007 Assessment performed on 5/24/07 by JV, MK, CC, GD



**City of Sacramento / Department of Utilities**  
**CARA/Phase II Water Treatment Plant Condition Assessment**  
**Comments Section for Assessments 3, 4, and 5**  
**E.A. Fairbairn WTP (EAFWTP)**

Seq. #	Rec ID	Facility	Assessment Yr.	Assessment Description	Assessors	Comments for Assessments 3, 4, and 5
1	4	EAFWTP	2004	Intake PS	JV, MK, RT	Need to add 3 intake pumps. Pinch valves need replacing
2	4A	EAFWTP	2007	Intake PS	JV, MK, CC, GD	Pinch valves replaced with air actuated butterfly which changed 4 to 1. Need additional pumps to provide more flow. A CIP is scheduled to provide additional pumps. Many of the existing pumps are original with original instrumentation.
3	5	EAFWTP	2004	Grit Basin	JV, MK, RT	Grit pump valves need replacing. Switch gear and grit collector 40 yrs old. Sluice gate east side leaks.
4	5A	EAFWTP	2007	Grit Basin	JV, MK, CC, GD	Sand pumps have been rebuilt. Grit Basin MCC 40T should be replaced. All 8 bypass sluice gates severely corroded and leak, all need replacement.
5	New	EAFWTP	2007	Grit System	JV, MK, CC, GD	Grit/Sand pumps and valves have been rebuilt. Grit piped to ground swale and then decants to storm drain system.
6	8	EAFWTP	2004	Flash Mix	JV, MK, GD	
7	8A	EAFWTP	2007	Old Flash Mix/Basin 1/2	JV, MK, CC, GD	
8	8B	EAFWTP	2007	Flash Mix System/Basin 3/4	JV, MK, CC, GD	
9	12	EAFWTP	2004	Old Polymer Rm	MK, DH, SJ	
10	12A	EAFWTP	2007	Polymer System	JV, MK, CC, GD	
11	10	EAFWTP	2004	Old Alum System	JV, RF, GD	
12	10A	EAFWTP	2007	Alum System	JV, MK, CC, GD	
13	New	EAFWTP	2007	Caustic System	JV, MK, CC, GD	
14	11	EAFWTP	2004	Old Chlorine System	JV, MK, GD	8-valves are old and need to be replaced
15	11A	EAFWTP	2007	Chlorine System	JV, MK, CC, GD	
16	New	EAFWTP	2007	Chem. Bldg	JV, MK, CC, GD	
17	7	EAFWTP	2004	Floc/Sed 1/2	JV, MK, MG, JP	3-MCC Panel outdated & rust in box & conduits, 5-Structure excessive exposed aggregate & leaks, 8-Drain valve, replace sluice gate, hard to operate, 9-railing not to code 10-high water level sensor needs updating or replacement
18	7A	EAFWTP	2007	Train 1/2	JV, MK, CC, GD	MCC panel is outdated but CIP is in progress to replace, 2 sluice gates for Basin old and corroded and leak and need replacing, hand rail does not meet vertical code spacing requirements, level sensor has been replaced. Concrete structure has excessive and deep exposed aggregate. Drain Valves and piping are old, corroded and need replacement.
19	New	EAFWTP	2007	Train 1/2 Flocculators	JV, MK, MG, JP	Flocculators, motors and drives are old and require more than 10% maintenance but they are reliable and function well
20	9	EAFWTP	2004	Clarifiers 1/2	JV, MK, GD	3- MCC has a lot of rust in the box and conduits, 5-many cracks and leaks in structure, 8-Valves hard to operate and are 40 yrs old, 9-handrail does not meet current codes, 11- level detectors out of date.
21	9A	EAFWTP	2007	Clarifiers 1/2 Sludge Collector	JV, MK, CC, GD	MCC panel is outdated, CIP in progress to replace, Clarifier drain plug valves completely corroded, leak, and need replacing.
22	New	EAFWTP	2007	Old Filters 1-8	JV, MK, CC, GD	Surface wash piping and nozzles ineffective need to be redesigned and replaced. All 8 effluent & drain valves old and leak, need replacement. Filter controls, original and are not SCADA controlled. All filter controls need replacement and full automation to match new. Crack repair needed in filter effluent boxes. Hand railing does not exist around filters and should be added. Media and possibly the underdrain needs replacement.
23	32	EAFWTP	2004	Filter Gallery	JV, MK	Media needs replacing. 4-excessive cracks in filters, 9-handrail does not meet code 11- effluent valve actuators need replacing, valve position and status need to be in SCADA
24	32A	EAFWTP	2007	Filter Gallery 1/2	JV, MK, CC, GD	Drain channel conduit and disconnects have rusted away and need replacement. Some piping had exterior corrosion and should be replaced. Bldg roof leaks and needs replacement. All effluent valves and actuators are old and need replacement. SCADA control needs to be implemented and particle counters added
25	7B	EAFWTP	2007	Train 3/4	JV, MK, CC, GD	
26	New	EAFWTP	2007	Train 3/4 Flocculators	JV, MK, CC, GD	
27	New	EAFWTP	2007	New Filters 9-16	JV, MK, CC, GD	
28	32B	EAFWTP	2007	Filter Gallery 3/4	JV, MK, CC, GD	
29	New	EAFWTP	2007	9M CT/Reservoir	JV, MK, CC, GD	Level Instrumentation connected to SCADA needs to be added to the weir side of the CT tank to determine the height of the water flowing over the CT weir
30	33	EAFWTP	2004	Old Reservoir	JV, MK	8-40 yr old sluice gates at high lift intake 4 need replacement
31	33A	EAFWTP	2007	20M Reservoir	JV, MK, CC, GD	All 5 sluice gates are old and corroded and leak and need replacement
32	15	EAFWTP	2004	HSPS	JV, MK	
33	15A	EAFWTP	2007	HSPS	JV, MK, CC, GD	Modified VFD Room HVAC System has a current CIP to move existing HVAC unit outside. Will be bid fall/winter 2007/2008. Most pumps are original and don't appear to pump at original capacity but at a lower capacity.
34	New	EAFWTP	2007	Lime System	JV, MK, CC, GD	Limited SCADA/PLC information incorporated need to investigate adding more information
35	New	EAFWTP	2007	Lime Bldg	JV, MK, CC, GD	Floor has some drainage problems. Maintenance has allotted some funds for some improvements.
36	New	EAFWTP	2007	Utility Water System	JV, MK, CC, GD	
37	31	EAFWTP	2004	Sludge Lagoons	JV, MK	7- limited asphalt limits capacity needs review
38	New	EAFWTP	2007	SMUD Elec. Substation	JV, MK, CC, GD	Substation circuit breakers old and need replacement, Generator is inadequate and does not function effectively and needs replacement, a CIP is scheduled for the Generator
39	31A	EAFWTP	2007	Sludge Lagoons	JV, MK, CC, GD	
40	New	EAFWTP	2007	Old Washwater Tank	JV, MK, CC, GD	Outdoor MCC is old and needs replacement. Cathodic protection needs replacement. Tank interior coating needs to be evaluated and possibly replaced.
41	13	EAFWTP	2004	Sludge Room	MK, MG, SJ	3- conduit rusty and old, 5 cracks and leaks on wall and ceiling
42	New	EAFWTP	2007	Sludge Room/Basin 1/2	JV, MK, CC, GD	SCADA/PLC information not relayed to control room for proper monitoring proposes this information is needed. Drain Valves are old and corroded and need replacement. Basin leaks water into this area, leaks need repair. Leaks have caused conduits and electrical boxes to rust out and need replacement.
43	New	EAFWTP	2007	Sludge Room/Basin 3/4	JV, MK, CC, GD	
44	13A	EAFWTP	2007	Sludge System	JV, MK, CC, GD	
45	New	EAFWTP	2007	FWW Lagoons 1&2	JV, MK, CC, GD	
46	New	EAFWTP	2007	Admin Bldg	JV, MK, CC, GD	Roofs are old and leak and are bad shape and need replacement and need to develop CIP to replace, HVAC control system has periodic problems
47	New	EAFWTP	2007	Control Bldg	JV, MK, CC, GD	HVAC control system periodically has problems.
48	New	EAFWTP	2007	W.Q. Lab Bldg	JV, MK, CC, GD	Roof is old and should be evaluated for replacement
49	New	EAFWTP	2007	Chlorine Scrubber	JV, MK, CC, GD	Caustic reacts to create solids which plug nozzles and media requires periodic cleaning by specialized contractor who must deal and dispose of as a hazardous waste. Instrument sensors must be periodically replaced and calibrated
50	New	EAFWTP	2007	Fluoride System	JV, MK, CC, GD	Valves, piping, and tanks are reaching the end of their life a CIP needs to be developed to replace.
51	New	EAFWTP	2007	Plant SCADA System	TV, KH	Need to replace the existing SCADA HMI with a system that provides dynamically synchronized redundant servers and data collection. Must have automatic change control to keep undocumented/unauthorized changes from occurring.

2007 Assessment performed on 5/24/07 by JV, MK, CC, GD