

**CENTRAL MARIN SANITATION AGENCY
CAPITAL IMPROVEMENT PROGRAM - ACCOUNT / PROJECT DESCRIPTIONS
PROPOSED FY 12 BUDGET AND 10-YEAR PROJECTION**

Facility Improvements		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-103-00	Effluent Storage Pond Rehabilitation	See Full Page Description
7300-674-00	CMMS and AM Systems	<p>Over the past several years the Agency has been implementing a Strategic Asset Management Plan, and has been using a subscription based software package (Nexgen™) to incorporate key elements of the Plan: critical asset condition assessment, inventory control, procurement management, and time and budget tracking by asset or process. This has been a multiphase project, and there is one more phase to be implemented in upcoming years. Full implementation will realize overall cost savings for the Agency by facilitating the identification and application of needed preventive maintenance with associated reduction in numbers of failure - drive repair tasks coupled with better time- and inventory tracking.</p> <p><u>FY 12</u> Nexgen™ Subscription Fees and begin implementing Asset Management Phase III <u>FY 13</u> Nexgen™ Fees and complete implementing Asset Management Phase III <u>FY 14 - FY 21</u> Nexgen™ Fees</p>
7300-690-00	Elevator Repairs	Scheduled routine maintenance and repair of elevator in solids handling building to meet OSHA requirements
7300-956-00	General Industrial Coating/Sealing	<p>Scheduled industrial coating repair program for process structures and metal equipment, and treatment plant deck traffic coatings. Projects aligned with other equipment upgrades (see Primary Clarifier Improvement and Secondary Clarifier Turntable Drive projects), with actual schedule subject to annual coating condition assessments</p> <p><u>FY 12</u> Primary Clarifier #2 <u>FY 13</u> Primary Clarifier #3 <u>FY 14</u> Primary Clarifier #4 <u>FY 15</u> Primary Clarifier #5 <u>FY 16</u> Secondary Clarifier #4 <u>FY 17</u> Secondary Clarifier #1 <u>FY 18</u> Secondary Clarifier #3 <u>FY 19</u> Secondary Clarifier #2 <u>FY 20</u> Headworks equipment <u>FY 21</u> Repair wear coats on Headworks and Secondary Clarifier decks</p>
7300-966-00	Facility Security	Maintenance and upgrades as needed for security systems at the treatment plant has been moved to 7300-672-00. This line remains for future facility security projects, such as adding or replacing existing security cameras, replacing existing entry card readers, etc.
7300-979-00	Concrete Corrosion Inspection/Repairs	See Full Page Description

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ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-987-00	Outfall Inspection & Repairs	Ongoing underwater inspection and maintenance of the marine outfall diffuser section, inspecting diffusers and risers, including survey of diffuser risers above shifting bay floor sediments, extending or replacing risers and diffusers as needed, and monitoring and periodically removing solids deposition inside diffuser section <u>FY 15</u> Plan for outfall diffuser section cleaning based on apparent rate of solids buildup since duckbill check valve retrofit in 2002, based on escalating the \$300,000 costs in FY 09
7300-988-00	Cathodic Protection	Periodic cathodic protection monitoring of the land portion of the Marine Outfall, sections of the Ross Valley force main (including the tunnel section), the San Rafael interceptor, the South Francisco Pump Station conductor casing, various buried pipelines at the treatment plant, and offsite monitoring of San Rafael's Simms Force Main. Also includes routine adjustment of, and minor repairs to, impressed-current cathodic protection systems. Costs vary from year to year due to varying monitoring and testing frequencies for different facilities.
7400-101-10	Administration Building Modifications	See Full Page Description
7400-102-10	Maintenance Building Modifications	See Full Page Description
7400-956-00	Facility Paving/Site work	Annual site condition assessments, minor paving repairs, and associated site work on internal plant roads and walkways, parking lots, other pavement, and regarding, cleaning, and replacing gravel in drainage ditches
7400-960-00	Facility Roofs Rehabilitation	See Full Page Description
7400-961-00	ADA Improvements	Ongoing ADA improvements to the facility - signage, supplies, etc. - as required by changes in statutes. ADA assessment and improvements that are triggered by remodeling or other upgrades to existing facilities (e.g. Administration and Maintenance Facilities Modification) will be included in the projects' capital budget.
7400-963-00	Facility Seismic Analysis (formerly Administration Building Fire Alarms)	CMSA's original buildings, structures, and equipment support systems were constructed to 1980 building code seismic standards. WWIP facilities are designed to site specific seismic standards, which is 10% more conservative than the 2007 building code seismic requirements. Per their 2010 CIP Planning Assistance Report, Kennedy/Jenks Engineers' performed seismic analyses of the secondary clarifier center column anchorages, electrical conduit bracing in the Effluent Pump Station (which was not specifically detailed as part of the WWIP design), and the Maintenance Building covered portico's cantilevered columns. This task also includes design of reinforced concrete slabs to replace two asphalt-paved bays in the covered portico, which are failing due to subsiding soil beneath them, and which will be replaced as an early element of the Maintenance Facility Modifications Project (see full page description, GL 7400-102-10)

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TBD	Primary Clarifier Improvements	See Full Page Description

General Equipment		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-672-00	Process Control & Security Systems	Scheduled upgrade/improvements to the plant's process control system, including new instrumentation and computers, upgrade and replacement of PLC and HMI hardware and software, web cams for control, and replacement of SCADA servers. Regular maintenance and upgrades of security systems at the treatment plant, including access cards, readers and controllers, alarms, cameras, and data storage <u>FY 12</u> Investigate HMI software alternatives <u>FY 13</u> Replace HMI software
7300-683-00	Above Ground Fuel Storage Tanks	Treatment and filtration equipment for petroleum based fuels stored for long times to remove contamination by bacterial byproducts or other matter that would cause increased maintenance to engines, allowing longer-term storage of such fuels. Experience has shown that the entire contents of the aboveground storage tank for the Effluent Pump Station are unlikely to be used in a single season, so this filtration equipment is needed to prevent damage to the pump drive engines. Also includes a contingency should one or both of the existing underground fuel storage tanks need replacement in F& 15. <u>FY 12</u> Purchase and install fuel treatment and filtration system for the Effluent Pump Station diesel fuel tank. This system will service both the bulk fuel as well as the five day tanks installed at the pumps themselves <u>FY 15</u> Possible replacement of underground gasoline and diesel fuel storage tanks with above ground tanks, if needed
7410-603-00	Telephone System	In FY 11, the Agency researched alternatives to its obsolete analog telephone system, and purchased, configured, and installed a new, digital switch and telephone system. This line item is for ongoing hardware and software maintenance for the new system.
7410-851-00	IT Hardware and Communication Equip	Routine maintenance repairs, and regular replacement of Information Technology (IT) hardware (office computers, printers, scanners, servers, and other IT hardware and software) and Radio Equipment (communication radios - which are critical for Operations and Maintenance - and the data radios which transmit data and alarms into the Process Control System at the Treatment Plant.

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General Equipment		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7420-701-00	Vehicle, Equipment Replace, Hybrid Batteries	<p>Purchase of new equipment or vehicles as required (passenger vehicles, trucks, forklift, and electric carts as they reach or exceed 20 years' age), and the scheduled minor and major maintenance of as they reach or exceed 20 years age (begun in FY 11), hybrid batteries, utility vehicles, portable electric generator, etc. This line also covers the cost of repairs, maintenance and replacement batteries (for carts and hybrids).</p> <p><u>FY 12</u> Purchase hybrid service vehicle for Environmental Services Department, replace one cart and add one to the fleet for Maintenance Department needs, and paint the Environmental Services Department vehicle to extend its useful life.</p> <p><u>FY 13</u> Replace the Crown Victoria and one cart. Replace batteries in carpool Honda 11(carpool)</p> <p><u>FY 14</u> Replace F150 pickup and one cart. Replace batteries in Honda 12 (carpool)</p> <p><u>FY 15</u> Replace carpool Honda (11) (carpool) and one cart</p> <p><u>FY 16</u> Replace Honda (12) (carpool)</p> <p><u>FY 17</u> Replace General Manager's vehicle</p> <p><u>FY 18</u> Replace Pump Station Ford Ranger</p> <p><u>FY 19</u> Replace Environmental Services Ford Explorer</p> <p><u>FY 20</u> Replace Maintenance Department Ford Ranger and replace one cart</p> <p><u>FY 21</u> Replace the E/I Ford E450, and replace one cart</p>
7430-958-00	Laboratory Equipment	<p>Scheduled routine replacement of laboratory equipment (autoclaves, pumps, collection/sampler systems, washers, incubators, bioassay system, etc.) together with specific equipment items planned in the years indicated below</p> <p><u>FY 12</u> New laboratory-grade glassware washer and enterococcus testing equipment.</p> <p><u>FY 13</u> Replace ammonia distillation apparatus</p> <p><u>FY 14</u> Replace influent samplers and final effluent composite sampler</p>

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General Equipment		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7450-002-00	Electrical Equipment	<p>Scheduled annual maintenance and replacement of treatment facility main breakers, switches, relays, MCC components, motors, control panels and conductors to maintain facility electrical system. Implement phased replacement of outdoor lighting fixtures (5 – 10% per year), and continue upgrading variable frequency drives for Return Activated Sludge (RAS) pumps.</p> <p><u>FY 12</u> Replace Control Room UPS, phased replacement of one 3-water or carrier water pump motor and MCC. <u>FY 13</u> Rebuild/replace two plant sump pump panels, phased replacement of outdoor lighting, 3-water or carrier water pump motor and MCC. Install hydrogen sulfide filter/ air conditioner on centrifuge control panels <u>FY 14</u> Rebuild / replace two plant sump pump panels, phased replacement of outdoor lighting, one 3-water or carrier water pump motor and MCC. <u>FY 15</u> Rebuild / replace two plant sump pump panels, phased replacement of outdoor lighting, one 3-water or carrier water pump motor and MCC. <u>FY 16</u> Rebuild / replace two plant sump pump panels, phased replacement of outdoor lighting, one 3-water or carrier water pump motor and MCC. <u>FY 17</u> Rebuild / replace two plant sump pump panels, phased replacement of outdoor lighting, one 3-water or carrier water pump motor and MCC. <u>FY 18</u> Rebuild / replace two plant sump pump panels, phased replacement of outdoor lighting. <u>FY 19</u> Rebuild / replace two plant sump pump panels, phased replacement of outdoor lighting. <u>FY 20</u> Phased replacement of outdoor lighting. <u>FY 21</u> Phased replacement of outdoor lighting.</p>
7450-102-00	Process Instrumentation	<p>Ongoing replacement or upgrade of obsolete meters or sensors for locally monitoring and transmitting to the Plant's Process Control System (PCS) information on critical equipment and processes, including: centrifuges, engines, primary and secondary clarifiers, Waste Activated Sludge (WAS) at Dissolved Air Flotation (DAF) Thickeners, and digested sludge feed lines, as well as one-time replacement of critical cogeneration engine analyzer</p> <p><u>FY 13</u> replace Ecom™ gas analyzer for cogeneration engine</p>
TBD	Electrical System Testing	<p>Per recommendations included in the 2010 CIP Planning Assistance Report by Kennedy/Jenks Engineers, perform condition testing on the original Treatment Plant wiring, breakers, and motor control centers (MCCs) that have not been inspected and/or upgraded as part of other recent projects to determine their current condition.</p>

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Liquid Treatment Processes and Equipment		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-641-00	Effluent Pump Station Maintenance	<p>Costs for routine equipment maintenance at the Effluent Pump Station constructed as part of the Wet Weather Improvements Project, and for resolving unforeseen problems that arise as it is used</p> <p><u>FY 11 (completed)</u> Purchase and install Caterpillar™ engine diagnostic software</p> <p><u>FY 12</u> Install shrouds and heat isolating blankets on the engine turbo blowers for safety of personnel working near the equipment when it is running.</p> <p><u>FY 12-21</u> Regular maintenance and repair</p>
7300-680-00	Grit Systems	<p>The grit system is subject to a very corrosive and erosive environment. Routinely replacement of smaller elements of the grit system, which operates in a very corrosive and erosive environment, together with scheduled refurbishment or replacement of individual larger items (hopper gates, classifier troughs, augers)</p> <p><u>FY 12</u> Assess piping, tank gates, hoppers, hopper gates. Replace valve tree</p> <p><u>FY 13</u> Refurbish Grit Classifier GC 04.04 and grit pump P 04.04</p> <p><u>FY 14</u> Refurbish Grit Classifier GC 04.03 and grit pump P 04.05</p> <p><u>FY 15</u> Refurbish Grit Classifier GC 04.02 and grit pump P 04.02</p> <p><u>FY 16</u> Refurbish Grit Classifier GC 04.01 and grit pump P 04.01</p> <p><u>FY 17</u> Replace Grit Classifier Auger GC 04.01. and grit pump P 04.04</p> <p><u>FY 18</u> Replace Grit Classifier Auger GC 04.02 and grit pump P 04.05</p> <p><u>FY 19</u> Replace Grit Classifier Auger GC 04.02 and grit pump P 04.02</p> <p><u>FY 20</u> Refurbish grit pump and Grit Classifier GC 04.04</p> <p><u>FY 21</u> Refurbish grit pump and Grit Classifier GC 04.03</p>
TBD	Bio-Tower Rotary Distributor Replacement	See Full Page Description

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ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-700-00	Plant Pumps	<p>Scheduled replacement of plant pumps including Moyno™ sludge pumps (used for primary sludge, waste activated sludge and contact tank scum), polymer pumps, and sump pumps (especially large site sump pumps).</p> <p><u>FY 12</u> Refurbish one Biotower pump, one RAS pump, replace three sludge pumps, two hot water pumps.</p> <p><u>FY 13</u> Refurbish one Biotower pump, one RAS pump, replace three sludge pumps, three hot water pumps, two sump pumps.</p> <p><u>FY 14</u> Refurbish one Biotower pump, one scum pump, one carrier water pump, one plant water pump and one RAS pump, replace three sludge pumps, two site sump pumps, two plant sump pumps</p> <p><u>FY 15</u> Refurbish one tank drain pump, one plant water pump, one scum pump, one plant water pump, one carrier water pump, and one RAS pump, replace three sludge pumps, one Headworks sample pump, two sump pumps</p> <p><u>FY 16</u> Refurbish one RAS pump, replace three sludge pumps, one plant water pump, one carrier water pump, and one Headworks sample pump, replace two sump pumps</p> <p><u>FY 17</u> Refurbish one RAS pump and one plant water pump, replace three sludge pumps, two sump pumps</p> <p><u>FY 18</u> Refurbish one Vaughn™ chopper pump, replace two sample pumps, three sludge pumps,</p> <p><u>FY 19</u> Refurbish one Vaughn™ chopper pump, replace three sludge pumps, replace</p> <p><u>FY 20</u> Refurbish one Biotower pump, one RAS pump, replace three sludge pumps, two hot water pumps,</p> <p><u>FY 21</u> Refurbish one Biotower pump, one RAS pump, replace three sludge pumps, three hot water pumps, two sump pumps</p>
7300-709-00	Odor Control	<p>Increased preventive maintenance work (pumps, piping, blower motors and fans) for the four odor existing control scrubber units until they are replaced as part of the Odor Control System Improvements Project (GL 7300-981-00 – full page description)</p> <p><u>FY 12</u> Refurbish odor scrubbers OS 04.01 (Headworks) and OS 12.01 (Solids Handling Building)</p> <p><u>FY 13</u> Refurbish odor scrubbers OS 06.01 and OS 06.02 (Biotowers)</p>

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ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-719-00	Chemical Pumps	<p>Regular repair or replacement, based on condition assessments, of chemical mixing and pumping systems controlling the injection of specific chemicals (e.g. ferric chloride, hydrogen peroxide, calcium nitrate, sodium hypochlorite emulsion polymer, and sodium bisulfite pumps) at various treatment process phases</p> <p><u>FY 12</u> Refurbish four sodium hypochlorite pumps (P 10.211 – P 10.214), replace two ferric chloride pumps</p> <p><u>FY 13</u> Refurbish four sodium hypochlorite and three sodium bisulfite pumps (P10.215 – P10.219 and P10.311-P10.312)</p> <p><u>FY 14</u> Refurbish five sodium bisulfite pumps (P10.313-P10.317)</p> <p><u>FY15</u> Refurbish seven hydrogen peroxide pumps (P52.01-P52.04 and P51.01-P51.03)</p> <p><u>FY 16</u> Refurbish three mixed polymer feed pumps (P12.11-P12.13)</p> <p><u>FY 17</u> Refurbish two polymer activation units PAU 12.31 and PAU 12.32</p> <p><u>FY 18</u> Refurbish polymer activation unit PAU 06.10, refurbish four sodium hypochlorite pumps (P 10.211 – P 10.214), and replace two ferric chloride pumps.</p> <p><u>FY 19</u> Refurbish four sodium hypochlorite and three sodium bisulfite pumps (P10.215 – P10.219 and P10.311-P10.312)</p> <p><u>FY 20</u> Refurbish five sodium bisulfite pumps (P10.313-P10.317)</p> <p><u>FY 21</u> Refurbish seven hydrogen peroxide pumps (P52.01-P52.04 and P51.01-P51.03)</p>

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ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-720-00	Gates Rehabilitation	<p>Maintenance and / or replacement of large gates and operators used to control flow into, through and between processes, and isolate processes for repair or maintenance (schedule and level of work based on condition assessment and ongoing inspection results)</p> <p><u>FY 12</u> Assess all Aeration Basin and Primary Clarifier influent gates, replace two Aeration Basin influent gates, one Primary Clarifier influent gate, and one Secondary Clarifier effluent gate.</p> <p><u>FY 13</u> Assess all Aeration Basin effluent gates, replace up to two Aeration gates, replace one Primary Clarifier influent gate, refurbish two Plant Influent gate operators</p> <p><u>FY 14</u> Replace up to two Aeration Basin gates (influent or effluent), replace one primary clarifier influent gate, refurbish up to two Primary Clarifier influent gate operators</p> <p><u>FY 15</u> Replace up to two Aeration Basin gates (influent or effluent), replace one Primary Clarifier influent gate, refurbish up to two Primary Clarifier influent gate operators</p> <p><u>FY 16</u> Replace up to two Aeration Basin gates (influent or effluent), replace one Primary Clarifier influent gate, refurbish up to two Primary Clarifier influent gate operators</p> <p><u>FY 17</u> Replace one Primary Clarifier influent gate, refurbish two Primary Clarifier influent gate operators</p> <p><u>FY 18</u> Replace one Primary Clarifier influent gate, refurbish two Primary Clarifier influent gate operators</p> <p><u>FY 19</u> Replace one Primary Clarifier influent gate, refurbish two Primary Clarifier influent gate operators</p> <p><u>FY 20</u> Replace one Primary Clarifier influent gate, refurbish two Primary Clarifier influent gate operators</p> <p><u>FY 21</u> Replace one Primary Clarifier influent gate, refurbish two Primary Clarifier influent gate operators</p>
7300-727-00	Headworks Equipment	<p>Repair and replacements of headworks equipment, including the hydraulic power unit that controls the Plant Influent gates for the Headworks, Primary Clarifiers 1 through 5, and the barscreens and washer/compactors.</p> <p><u>FY 12</u> Assess hydraulic system (hydraulic lines, valves, controls). Assess Grit Tank gates and gate operators. Refurbish Influent gate and operator SGH 04.01</p> <p><u>FY 13</u> Refurbish hydraulic system. Refurbish Grit Tank gate operator SGH 04.03. Refurbish Influent gate and operator SGH 04.02</p> <p><u>FY 14</u> Refurbish Grit Tank gate operator SGH 04.04 & SGH 04.05</p> <p><u>FY 15</u> Refurbish Grit Tank gate operator SGH 04.06 & SGH 04.07</p> <p><u>FY 16</u> Complete five year preventive maintenance on Barscreens and Washer Compactor</p> <p><u>FY 17 - FY 21</u> Ongoing preventive maintenance and repair</p>
7300-981-00	Odor Control System Improvements	See Full Page Description

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ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-982-00	Aeration Blower Replacement	See Full Page Description
7300-983-00	Process Tank Maintenance	<p>Maintenance and parts for all process tanks and systems throughout the plant, including: replacement of the primary scum collectors, secondary clarifier launders improvements for algae reduction (weir brushes), maintenance of collector mechanisms, and bio-tower rotating arms.</p> <p><u>FY 12</u> Assess TA 04.06 & TA 04.07, refurbish Channel Air Blower B04.01 & B04.02, replace Hydrostatic Drive HD 08.07, refurbish critical collector mechanisms in Dissolved Air Flotation (DAF) tanks to extend their life until the Sludge Thickening Project (GL 7300-964-10 – see full page description) is completed, other tank related preventive maintenance repair parts supplies</p> <p><u>FY 13</u> Refurbish Channel Air Blower B04.03 & B04.04, install brushes on two Secondary Clarifiers, replace Hydrostatic Drive HD 08.08 and HD 08.09, tank related periodic and preventive maintenance repair parts and supplies</p> <p><u>FY 14</u> Refurbish Grit Air Blowers B04.05, B04.06 & B04.07, replace Hydrostatic Drive HD 08.10 and HD 13.01, tank related periodic and preventive maintenance repair parts and supplies, replace five check valves in Gallery A</p> <p><u>FY 15</u> Replace guide rails in site sump. Replace Hydrostatic Drive HD 13.02 and HD 13.03, tank related periodic and preventive maintenance repair parts and supplies, replace five check valves in Gallery A</p> <p><u>FY 16</u> Tank related periodic and preventive maintenance repair parts and supplies, replace five check valves in Gallery A</p> <p><u>FY 17</u> Refurbish Channel Air Blower B04.01 & B04.02, tank related periodic and preventive maintenance repair parts and supplies, replace five check valves in Gallery A</p> <p><u>FY 18</u> Refurbish Channel Air Blower B04.03 & B04.04, tank related periodic and preventive maintenance repair parts and supplies, replace five check valves in RAS basement</p> <p><u>FY 19</u> Refurbish Grit Air Blowers B04.05, B04.06 & B04.07, tank related periodic and preventive maintenance repair parts and supplies, replace five check valves in RAS basement</p> <p><u>FY 20</u> Tank related Maintenance repair parts and preventive maintenance supplies, replace three check valves in Digester basement</p> <p><u>FY 21</u> Tank related Maintenance repair parts and preventive maintenance supplies, replace five Plant water check valves</p>

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ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-990-00	Secondary Clarifiers Turntable Drives	<p>Replacement of the large turntable drives for the round secondary clarifiers, that are nearing the end of their expected life, one unit already purchased in FY 10 and installed in FY 11, with the other three are expected to last until the scheduled metal coating projects for their clarifiers</p> <p><u>FY 15</u> Replace main drive assembly TA08.04 <u>FY 16</u> Replace main drive assembly TA08.01 <u>FY 17</u> Replace main drive assembly TA08.03</p>
7400-964-00	3-Water System Improvements	See Full Page Description
7430-855-00	Chemical Tanks	<p>Replacement of chemical storage tanks used throughout the plant and in the collection system as they exceed their service life (Tank are of varying sizes, materials, and complexities of tanks and appurtenances, and include five sodium hypochlorite, two sodium bisulfite, two hydrogen peroxide, two polymer, four calcium nitrate and three ferric chloride), with replacement schedule subject to change based on during annual inspection results</p> <p><u>FY 12</u> Replace Hypochlorite Tank TA10.01 and assess condition of the steel ferric tanks (TA 04.06 and TA 04.07) at the Headworks <u>FY 13</u> Replace Sodium Bisulfite Tank TA 10.06, assess Nitrate Tanks TA 24.01, TA 26.01, TA 27.01 and TA 28.01, and Peroxide Tank TA 51.01 <u>FY 14</u> Replace Hypochlorite Tank TA 10.05 <u>FY 15</u> Replace Sodium Bisulfite Tank TA 10.07 <u>FY 16</u> Replace Hypochlorite Tank TA 10.06 <u>FY 17</u> Replace Peroxide Tank TA 52.01 <u>FY 18</u> Replace Nitrate Tank TA 24.01 <u>FY 19</u> Assess Polymer Bulk Tank, replace Nitrate Tank TA 26.01 <u>FY 20</u> Replace Hypochlorite Tank TA 10.02, replace Nitrate Tank TA 27.01 <u>FY 21</u> Replace Hypochlorite Tank TA 10.03, replace Nitrate Tank TA 28.01</p>

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ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7430-857-00	Piping, Valves & Operators	<p>Routine maintenance and periodic replacement of the more than 700 6" to 12" valves, operators, and pipes for process systems; the most current condition assessment indicates at least 50 valves are not functioning properly, and this schedule may change as ongoing condition assessments are completed</p> <p><u>FY 12</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 13</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 14</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 15</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 16</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 17</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 18</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 19</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 20</u> Replace the following valves: five 12", two 10", two 8", and ten 6" <u>FY 21</u> Replace the following valves: five 12", two 10", two 8", and ten 6"</p>
7450-104-10	Influent Flow Meter Improvement	<p>Both of the force mains influent flow meters serving the Treatment Plant replaced with insertion-type meters in FY 11 to improve their accuracy in measuring large flow variations; possible new technological solutions will be surveyed periodically</p> <p><u>FY 15</u> Study to survey available technologies for possible improvement in meter accuracy</p>
TBD	Critical Buried Pipe Inspection / Repairs	See Full Page Description

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Solids Treatment And Energy Generation Processes and Equipment		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-678-00	Emergency Generator Assessment & Improvement	<p>Identifiable incremental improvements (e.g., particulate filter with monitoring) implemented for the diesel-powered emergency generator to better align with current emissions control technologies and air quality standards; per Kennedy/Jenks' 2010 Capital Improvement Planning Assistance Report, placeholder for study, design services and installation of either a major emissions retrofit or an engine replacement in FY 16 - 18</p> <p><u>FY 12</u> Install minor emission system upgrades, such as particulate filters, and / or enhanced engine emissions monitoring</p> <p><u>FY 16</u> Survey current air quality regulatory environment and identify either needed major emissions equipment upgrades or need for a major engine replacement. If replacement is needed, balance of this funding would be used for design of the replacement</p> <p><u>FY 18 (if needed)</u>: This line item would fund installation of a replacement emergency generator if the current diesel engine cannot be made to comply with then-current air quality regulations</p>
7300-691-00	Digester Inspection & Cleaning	<p>Periodic cleaning and inspection of the Anaerobic Digesters every 7 – 10 years (subject to results of the Digester Improvements - FOG Facility Project, GL 7430-957-10 – see full page description), including: taking each digester out of service (about 6 weeks each), draining it, removing accumulated inorganic solids from it, purging the biogas and replacing it with nitrogen, inspecting and, if needed, repairing or replacing the interior surfaces, piping, coatings, and membrane cover, bringing the digester back into service (filling with plant water, purging the oxygen atmosphere with nitrogen, reintroducing sludge, and reestablishing stable operation)</p> <p><u>FY 19</u> If needed, clean and inspect Secondary Digester</p> <p><u>FY 20</u> If needed, clean and inspect Primary Digester</p>

**CENTRAL MARIN SANITATION AGENCY
CAPITAL IMPROVEMENT PROGRAM - ACCOUNT / PROJECT DESCRIPTIONS
PROPOSED FY 12 BUDGET AND 10-YEAR PROJECTION**

Solids Treatment And Energy Generation Processes and Equipment		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-715-00	Centrifuge Maintenance	<p>Maintenance and repairs of the high speed centrifuges and supporting equipment (polymer and ferric chloride injection systems and the bio-solids hoppers); conversion of back drive controls and installation of weld-on tiles on scrolls was completed for all three machines, leaving ongoing preventive and routine maintenance tasks due to high utilization and harsh operating conditions</p> <p><u>FY 12</u> Rebuild Roto-DIF™ (hydraulic backdrive) CF 12.1, install air filtering system for centrifuge control panels <u>FY 13</u> 5-year preventive maintenance (repair / balance bowl and scroll assembly) CF 12.1, rebuild Roto-DIF™ CF 12.2 <u>FY 14</u> 5-year preventive maintenance CF 12.2, rebuild Roto-DIF™ CF 12.3 <u>FY 15</u> 5-year preventive maintenance, CF 12.3 <u>FY 16</u> Refurbish Hydraulic system CF 12.1, rebuild Roto-DIF™ CF 12.1 <u>FY 17</u> Refurbish Hydraulic system CF 12.2, rebuild Roto-DIF™ CF 12.2 <u>FY 18</u> Refurbish Hydraulic system CF 12.3, rebuild Roto-DIF™ CF 12.3, 5-year preventive maintenance CF 12.1 <u>FY 19</u> 5-year preventive maintenance and rebuild Roto-DIF™ CF 12.2 <u>FY 20</u> 5-year preventive maintenance CF 12.3, rebuild Roto-DIF™ CF 12.1 <u>FY 21</u> Rebuild Roto-dif CF 12.2</p>
7300-721-00	Cogeneration Heat Exchangers	<p>Inspection, repair or replacement of heat exchangers used to efficiently transfer waste heat from the cogeneration engine's coolant and oil into a hot water transfer loop, which is then used to heat the digesters and provide all other process and building hot water needs (schedule based on anticipated condition, may shift based on results)</p> <p><u>FY 12</u> Inspect and repair engine block main plate and frame cooling loop heat exchanger <u>FY 13</u> Inspect and repair engine oil cooling loop waste heat exchanger <u>FY 14</u> Inspect and repair engine block main plate and frame cooling loop heat exchanger <u>FY 15</u> Inspect and potentially replace main plate and frame of heat exchanger <u>FY 16</u> Inspect and repair engine oil cooling loop waste heat exchanger <u>FY 17</u> Inspect and repair engine block main plate and frame cooling loop heat exchanger <u>FY 18</u> Inspect and repair main plate and frame of heat exchanger <u>FY 19</u> Inspect and repair engine oil cooling loop waste heat exchanger <u>FY 20</u> Inspect and repair engine block main plate and frame cooling loop heat exchanger <u>FY 21</u> Inspect and repair main plate and frame of heat exchanger</p>

**CENTRAL MARIN SANITATION AGENCY
CAPITAL IMPROVEMENT PROGRAM - ACCOUNT / PROJECT DESCRIPTIONS
PROPOSED FY 12 BUDGET AND 10-YEAR PROJECTION**

Solids Treatment And Energy Generation Processes and Equipment		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-722-00	Cogeneration Maintenance	<p>Purchase of critical spare parts and scheduled routine and periodic major maintenance activities for the cogeneration system, including:</p> <ul style="list-style-type: none"> · an engine which runs 24 hours per day, utilizing plant biogas and natural gas to generate most of the facility's electrical power and heat needs (requires include monthly and annual routine maintenance, top end rebuilds, and a major maintenance involving taking the engine block offsite for a major top- and bottom-end rebuild); · biogas treatment, including filters to remove corrosive hydrogen sulfide, gas compressors, a refrigerator dryer and two carbon column filters to remove siloxane, which can damage the engine (requires regular preventive maintenance of the mechanical equipment and periodic replenishment of the filter media); <p><u>FY 12</u> Replace and relocate corroded coolant expansion tank, replace thermocouples and turbo chargers <u>FY 13</u> Relocate engine exhaust waste heat exchanger, major offsite overhaul for cogeneration engine, five year generator preventive maintenance, replace turbo chargers <u>FY 14</u> Replace thermocouples, air starter, turbo chargers <u>FY 15</u> Onsite rebuild of cogeneration engine upper end, replace turbo chargers <u>FY 16</u> Replace thermocouples and turbo chargers <u>FY 17</u> Major offsite overhaul for cogeneration engine, replace turbo chargers <u>FY 18</u> Replace thermocouples and turbo chargers. five year generator preventive maintenance <u>FY 19</u> Onsite rebuild of engine upper end, replace turbo chargers <u>FY 20</u> Replace turbo chargers <u>FY 21</u> Major offsite overhaul for cogeneration engine, replace turbo chargers</p>
7300-724-00	Hot Water Systems	<p>Routine inspections, repairs to and replacement of hot water system pumps, valves, flex fittings and piping as needed to maintain the hot water system that moves heat from the boilers and cogeneration unit to the digesters and Administration Building, including:</p> <p><u>FY 12</u> Replace two pumps, two expansion joints and two check valves <u>FY 13</u> Replace two pumps, two expansion joints and two check valves <u>FY 14</u> Replace two pumps, two expansion joints and two check valves <u>FY 15-FY 21</u> Ongoing preventive maintenance and repair on system</p>
7300-725-00	Boilers Rehabilitation or Replacement	<p>Scheduled inspection, repair and / or replacement of boiler tubes that produce heat for the Plant hot water systems when the cogeneration engine is offline (last completely overhauled in FY 09)</p> <p><u>FY 15</u> Inspect boilers and perform maintenance or minor upgrades as needed. <u>FY 18</u> Major maintenance (inspection, repair and replacement of boiler tubes as needed), and contingency planning for upgrade or replacement to meet anticipated new, more stringent emissions regulations.</p>

**CENTRAL MARIN SANITATION AGENCY
CAPITAL IMPROVEMENT PROGRAM - ACCOUNT / PROJECT DESCRIPTIONS
PROPOSED FY 12 BUDGET AND 10-YEAR PROJECTION**

Solids Treatment And Energy Generation Processes and Equipment		
ACCOUNT NUMBER	ACCOUNT / PROJECT TITLE	ACCOUNT / PROJECT DESCRIPTION
7300-726-00	Sludge Heat Exchanger	Condition assessment, repairs as needed, and possible future replacement of sludge heat exchangers used to keep Anaerobic Digesters at proper temperature <u>FY 15</u> Conduct condition assessment and repairs as necessary <u>FY 20</u> Anticipated replacement of heat exchanger system
7300-957-00	Waste Gas Burners	Condition assessment and repair or replacement of underground biogas piping serving the waste gas burners from the Solids Handling Building.
7300-977-00	Sludge Recirculating Pump Grinders	Annual factory inspection and repair of sludge grinders' high-wear cutter cassettes (one for centrifuges, two for digester recirculation systems), costs contained by using service agreements with refurbishment only as needed <u>FY 12</u> Upgrade grinder GR13.01, refurbish cassette GR 13.02, obtain service agreements for both grinders <u>FY 13</u> Repair and refurbish cutter cartridge and purchase service agreement for GR 13.03 <u>FY 14</u> Renew service agreements for GR 13.01 and GR 13.02, refurbish cutter cartridges GR 13.01 and GR 13.02 <u>FY 15</u> Renew service agreement for GR 13.03, refurbish cutter cartridge GR13.03 <u>FY 16</u> Renew service agreement for GR 13.01 and GR 13.02, refurbish cutter cartridges GR 13.01 and GR 13.02 <u>FY 17</u> Renew service agreement for GR 13.03, refurbish cutter cartridge GR13.03 <u>FY 18</u> Renew service agreement for GR 13.01 and GR 13.02, refurbish cutter cartridge GR 13.01 and GR 13.02 <u>FY 19</u> Renew service agreement for GR 13.03, refurbish cutter cartridge GR13.03 <u>FY 20</u> Renew service agreement for GR 13.01 and GR 13.02, refurbish cutter cartridge GR 13.01 and GR 13.02 <u>FY 21</u> Renew service agreement for GR 13.03, refurbish cutter cartridge GR13.03
7300-978-00	Biosolids Hoppers - Maintenance	Monitoring and smaller touchup repairs to biosolids hoppers, gates, and hydraulic actuators (following extensive repairs in 2010 - hopper gates and hydraulic actuators replaced, corrosion repaired and coating touched up)
7400-964-10	Sludge Thickening Improvements	See Full Page Description
7430-957-10	Digester-FOG-Food-to-Energy	See Full Page Description