South Bayside System Authority

Providing wastewater services to residents and businesses in
Redwood City, San Carlos, Belmont, and West Bay Sanitary District

SBSA Commission

Jeff Ira Chair
Redwood City Council Member
Ronald W. Shepherd Vice Chair
West Bay Sanitary District Member
Robert Grassilli Secretary
San Carlos Council Member
Warren Lieberman
Belmont Council Member
Board Member

SBSA Offices

1400 Radio Road
Redwood City, CA 94065
Phone: 650-591-7121
Fax: 650-591-7122
E-mail: dchild@sbsa.org

SBSA Staff

Daniel T. Child
Manager
Kenneth Kaufman
Technical Services Manager
Linda Bruemmer
Support Services Manager
Andrew Baker
Operations & Maintenance Manager
Teresa Herrera
Engineering Manager
Donna Allen
Environmental Health & Safety Manager

Visit Our Website
www.sbsa.org

Manager's Corner

By Daniel Child, SBSA Manager

Why We Are Cleaning Our Freshwater Lagoon

We are pleased that the freshwater lagoon cleaning project is underway. The Commission in May approved a contract in the amount of $437,433 for Aquatic Environments, Inc. to perform the project.

SBSA's freshwater lagoon is located along the north-eastern edge of the plant and receives flows from the plant storm drain system, including rainfall onto the general plant site and return flows from the landscape impoundment and, on rare occasions, from the biosolids drying beds.

The water flows by gravity to the stormwater pump station. It is then pumped to the Influent Lift Station Overflow Box and into the Primary Sedimentation Tanks. The lagoon provides SBSA temporary storage capacity for storm water to avoid overloading the lift station and primary sedimentation tanks during times of high influent flow.

Over the years, sediment in the water that is sent to the lagoon has settled to the bottom. On average, between six and 12 inches of sediment deposits are currently on the lagoon bottom, which has never been cleaned. Due to the sediment deposits, the original storage capacity of the lagoon has been reduced by approximately 750,000 gallons (or an estimated 27 percent).

The intent of this project is to remove the sediment deposits from the lagoon bottom in order to increase the storage capacity of the lagoon. The end result will be a lagoon with a capacity approximately equal to the original design capacity. The Lagoon Cleaning Project consists of the following task items:

- Removal of approximately 3,800 cubic yards of sediment deposits from the lagoon bottom.
- Pre- and post- surveys of the lagoon bottom to confirm the depth and volume of material removed.
- Off-site disposal of the removed sediment. The contractor is responsible to complete all testing and sediment dewatering as required for off-site disposal.

The estimated construction time for the project is up to 90 days.

Update on Force Main Replacement Project

The SBSA Commission has authorized another step toward the replacement of the entire SBSA conveyance system by retaining Whitley Burchett & Associates for engineering design support services, leading the selection process for CEQA/NEPA and permitting firms, and cost control oversight for the 48-inch force main repair project.

Replacement of the entire SBSA conveyance system (Influent Force Main (IFM) and the pump stations), is a critical upgrade of SBSA's facilities and was included in 10-Year Capital Improvement Program (CIP) as a high priority effort. A Conveyance System Master Plan (CSMP) that will provide a roadmap for SBSA to follow in replacing the conveyance system will be completed in the fall of 2010 and a presentation of results will be presented to the Commission for final acceptance.

In 2005, prior to the full development of the SBSA CIP, the US Fish and Wildlife Service (USFWS) approached SBSA with notification that Inner Bair Island was going to be flooded and converted to a tidal marsh wildlife refuge. SBSA concluded it would be in the Authority's best interest to replace the section of the pipe system that lies within Bair Island prior to the conversion of the area to a wildlife refuge.

During subsequent discussions with USFWS, it became apparent that all construction "on island" should be concluded as soon as practical and work has been proceeding to that end. The section of force main that runs across Inner Bair Island is a 48-inch diameter concrete pipe and is one segment of the overall length of 48-inch diameter force main. The entire 48-inch section of the IFM extends from the Redwood City Pump Station to the San Carlos Booster Station. It is approximately 13,000 feet in length, or approximately 27% of the total length of the IFM.

A preliminary cost estimate of the project to replace the entire section of 48-inch diameter portion of the IFM is approximately $53 million.

To effectively complete this project, SBSA has been actively assembling a project team to move each segment of specialty tasks forward. The first part of building the project team was to hire the engineering design firm and to that end the Commission retained Kennedy Jenks on January 21, 2010. This task order will take the pipe design to the 30% design level and will provide engineering support to complete the environmental review and easement negotiations.

Other project team members include legal services, environmental review, financing services and permitting. Legal services will be provided by Mr. David Schricker, environmental review management will be handled by Ms. Valerie Young, and financing tasks will be managed by Ms. Teresa Herrera.

Firms to provide CEQA/NEPA services and permitting services will be determined through a consultant-selection process involving issuance of a Request for Proposals from firms expert in these respective service areas. The selection process will commence in June and the Commission will be presented with the results and recommendations to enter into Master Services Agreements with the selected firms at a subsequent Commission meeting.

Demonstrating 'The Water Cycle' at Earth Day & Sandpiper School

SBSA attracted more than 300 youngsters plus many of their parents to its educational tent display at the Marine Science Institute's Earth Day Fair in Redwood City in April.

To give students a colorful visual to connect the concepts of the water cycle, SBSA Pollution Prevention Specialist, Maya Slocum created 22 linked panels with a 2 x 3 foot board for each location in the water cycle. Each board was color-coded so that visitors could relate them to beads and make their own water cycle bracelet. A key difference between this activity and other similar presentations was that human systems were included, such as: the tap water system, wastewater treatment plants, recycled water pipes, storm drains, etc.

"I want kids to focus on the water cycle, not the beads," Slocum said. "When I took the activity to our local elementary school in May, to accomplish that I had them play a game where they became water droplets, evaporating and condensing to locations in the water cycle which gave them a much more nuanced, understanding of how the water cycle works.

"Each time they moved position I had the students draw a line on the diagram of the water cycle circle (which corresponded to the bracelet), so each student ended up with a unique pattern as a water droplet," Slocum said. "In this way each bead was better associated with the graphics, and it became more like collecting a pebble from each location visited, rather than buying something from the souvenir shop."

When students finally did make the bracelet, they could actually relate to having been in the clouds, the reservoir, the wastewater treatment plant, or stuck over and over again in groundwater.

At the Earth Day Fair, which attracted 1,500 visitors, Slocum and SBSA colleagues Norm Domingo and Luke Castell set out petri dishes of each color bead underneath the matching station and guided visitors through the places they could find water droplets. It would have been chaos to play the game, so Norm, Luke and I took the kids on a guided Water Cycle Tour instead. "

"Our booth was very popular and the three of us helped 300 young people, with help from their parents, make water cycle bracelets," Slocum said. "The wastewater treatment plant bead (the silver one) is right at the center of the bracelet. This activity also gave us an opportunity to answer questions about how wastewater treatments work, point out where we are located, and in general let people know that we are there 24-7 cleaning the water."

Photos: Top left: "Water Cycle with Human Intrastructure" presentation panels. Top right: Children interacting with the panels; Also top right: SBSA's Maya Slocum, mom and son that made the 300th bracelet, and SBSA's Norm Domingo. To the left: SBSA's Norm Domingo "Water Cycle Tour Guide," guiding a mom and her young son.

Fiber Optics Communications Network Update

The SBSA Commission has approved a $295,000 contract with Albany-based Nema Construction to install the SBSA Fiber Optic Communications Network.

The SCADA (Supervisory Control and Data Acquisition) System Master Plan identified communication system improvements as a necessary component for future automation projects. These improvements are needed now to upgrade the basic communications infrastructure to support all the new Capital Improvement Project automation projects.

In addition, the SCADA computer network architecture will be changed to allow for optimized performance in the upcoming automation projects

As an added value, this project incorporates needs of the IMS (IP Multimedia Subsystem) network to new facilities at the warehouse and eventually the replacement administration/control building.

Currently, the SCADA network needs are met through utilization of a 10-Mbps thin-net Ethernet network installed in 1991 for the SCADA and Programmable Logic Controllers (PLCs). This original Ethernet system is not capable of meeting SBSA's networking and automation needs and is becoming obsolete; some of the equipment, such as the existing Ethernet repeater, is operating well beyond expected service life.

Why New Water-Cooled Chillers Are Needed

SBSA has issued a contract to Norman S. Wright Mechanical Equipment Corporation in the amount of $156,938 for purchasing three water-cooled chillers.

A chiller is a machine that removes heat from a liquid via a vapor-compression or absorption refrigeration cycle. A vapor-compression water chiller comprises the four major components of the vapor-compression refrigeration cycle (compressor, evaporator, condenser, and some form of metering device). These machines can implement a variety of refrigerants

Currently, two chillers provide cold water to the HVAC systems for the Lab Building, the Maintenance Building, and the Administration Building. The chillers were installed in 1993 and are at the end of their useful service lives. Typically, this type of equipment has a service life of approximately 20 years. However, the corrosive ambient conditions have accelerated the deterioration of the equipment, and they require frequent maintenance in order to stay in service.

The chillers provide air conditioning for the server room which is located in the Laboratory Building and there are often times when the chillers break down and the server room is left without cool air. This situation puts SBSA's entire IT services in jeopardy each time it occurs and the occurrence is happening too often.

The new Administration Building, currently under construction, is larger than the old Administration Building, and will call for a higher capacity air conditioning system, requiring a higher volume of chilled water. Additionally, the new server room in the Administration Building will require cooling 24 hours a day, seven days a week, and will require 100% redundancy, due to the large amount of heat produced by the servers. Due to these additional HVAC demands, a system of chillers with larger capacity is required.

Due to the fact that the chillers require a long lead time for manufacture (approximately 16 weeks), it is beneficial from a scheduling standpoint that SBSA pre-purchase the chillers to allow for the supplier to begin manufacturing the chillers while the design is completed and the bidding process goes forward for awarding the construction portion of the work. After a construction contractor is awarded a contract and does the necessary preliminary site work, the chillers will be onsite and ready to be installed.

A Week in the Life

A WEEKLONG CLASS ON WASTEWATER SCIENCE HELPS ACQUAINT HIGH SCHOOL STUDENTS WITH THE WASTEWATER PROCESS FROM START TO FINISH

By Diane Gow McDilda
Treatment Plant Operator Magazine

Reprinted with permission from Treatment Plant Operator Magazine (TPO™ / June 2010 / © 2010); COLE Publishing Inc., P.O. Box 220, Three Lakes, WI 54562 / 800-257-7222 / www.tpomag.com

One of Maya Slocum's favorite student testimonials is: "Now I know there are people at the other end of the toilet."

Slocum, pollution prevention specialist for the South Bayside System Authority (SBSA) in Redwood City, Calif., says the Sewer Science course she teaches is "definitely an eye-opening experience" for students.

Sewer Science is a weeklong, hands-on program that takes simulated wastewater processes into the classroom. Students learn what goes on in the collection and treatment processes by making their own "wastewater" samples and then cleaning the water using specially designed tanks. They perform analytical tests and are responsible for meeting quality standards.

It's like experiencing a week in the life of a wastewater treatment operator.

Science teacher Johnny DeSollar at Redwood High School in Redwood City leads a Sewer Science class.

THE LITTLE THINGS

Sewer Science was developed in nearby Palo Alto by staff at the Regional Water Quality Control Plant. Slocum, who was a science teacher, brought it into her classroom in 1997. Over the years, the program has blossomed and is now taught in a number of schools. And after 17 years of teaching, Slocum now works full-time with SBSA.

Schools pick up the class largely because it meets science curriculum standards, but also because SBSA staff provides technical support for teachers as well as equipment and workbooks, free of charge. The program fits well with any high school class, but Slocum and her crew prefer freshman science classes. Sometimes they're asked to run it for an environmental studies class, usually for seniors.

A specially designed tank mimics secondary treatment in a wastewater treatment plant to show students.

The seven-day program includes one final day of wrap up and review. The day before SBSA educators arrive in the classroom, the teacher gets students prepared.

"They have a brainstorming session," says Slocum. "The teachers ask them to think of everything that goes down the drain. Some students are modest; some go a little further and mention mucus and blood."

RECIPE FOR LEARNING

With workbooks open, the students begin their education in wastewater treatment. They start with an introduction to treatment plants and processes, then learn about ammonia, pH, turbidity and chemical oxygen demand (COD) and how to measure them.

By day three, they are stirring up a brew of “wastewater,” mixing dried coffee grounds, broken up breakfast cereal and pet food, cut up pieces of plastic, baking soda, torn up toilet paper, ammonia and vegetable oil in 1-liter beakers. Then they run their concoctions through simulators.

Throughout the program, they are asked to hypothesize outcomes. If the mixture rests for 20 minutes, what will float and what will sink? Are the pH and other parameters affected if floaters and sinkers are removed?

To Slocum, looking for water bears in a sample of activated sludge from the aeration basin is a high point in the program. “Water bears are Tardigrada,” says Slocum. “They look like little teddy bears, but they have eight little legs instead of four. They have claws and can hold onto stuff and suck things out. They’re omnivorous hunters.”

“Effluent” from the different treatment processes.