South Bayside System Authority

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

SBSA Commission

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Redwood City Council Member
Thomas J. Davids Vice Chair
San Carlos Council Member
Ronald W. Shepherd Secretary
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Board Member
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SBSA Saves Millions Through Innovative Energy Saving Programs:

See Details Inside.

Manager's Corner

By Daniel Child, SBSA Manager

Sometimes the old TV commercials are unsurpassed. Who can forget the Fram Oil Filter campaign in the 1970s with the tag line "Pay-me-now-or-pay-me-later?" The idea was that if you spend money on maintenance now, you might save a huge amount of money, replacing an entire engine, later.

The same holds true with America's infrastructure in general and, in this article, SBSA's in specific.

A biannual survey by the American Society of Civil Engineers, grading all categories of infrastructure from schools to sewers, indicates a gap of $1.6 trillion over five years between what is needed to bring national infrastructure up to reasonable standards and what is now in prospect. The study says California collectively has a $14.4 billion annual shortfall in wastewater infrastructure needs. Its report card for America's infrastructure gives wastewater a D-. You can read more yourself at **www.asce.org/reportcard/2005/index.cfm**

One needs only to look at the Gulf Coast, where the failure to invest adequately in the levees of New Orleans and to prepare for or manage the resulting disaster was obvious to the world.

For us at SBSA, our asset base includes:

- Cost of treatment plant
- Cost of pump stations and force main
- Cost of effluent disposal pipeline
- Cost of laboratory
- Cost of ancillary equipment
  - – Buildings
  - – Vehicles
  - – Office/Computer Equipment
  - – Miscellaneous Equipment

The cost of SBSA's Initial Asset Base broke down like this:

- Initial Cost of SBSA Facilities (1980 Approximate Costs)
- Treatment Plant - $52 Million
- Cost of Pump Station Updates - $11 Million
- Miscellaneous Equipment - $ 2 Million
- TOTAL INVESTMENT (1980) - $65 Million

Manager's Corner

What are the budgetary estimates if we were to start today and build a NEW wastewater treatment system:

–	Treatment Plant	$435 Million*
–	Pump Stations	$ 50 Million*
–	Force Main	$250 Million*
–	Outfall	$300 Million*
–	Miscellaneous Equip.	$ 5 Million*
–	Total Asset Value-	**$1.04 Billion***

* *Rough estimates based on current market trends for engineering and construction only – no land or permitting included. Not based on specifically engineered cost estimates.*

"So SBSA, like cities, counties, states, and a multitude of government agencies across the nation, are looking at vigorous capital improvement programs (CIPs) in order to modernize infrastructure and facilities. And in the case of SBSA, we want to protect the $1 billion asset we have today."

When SBSA was built in 1980, it did a great job with a brand new facility because it secured 87.5 percent of the costs in grant funds, with a local share of only $8,125,000. Consequently, service rates have been maintained very low for 25 years in part because the local start-up costs were low.

But just like most of America, SBSA is facing new challenges. These include:

1. Facilities and equipment are 25 to 40+ years old.
2. New and stricter regulatory requirements – water, air, safety, etc.
3. The workforce that grew with SBSA is retiring – there are limited recruitment options to hire replacement personnel.
4. Old and worn out equipment.
5. New technology allows easier/better management of facilities.
6. Life cycle costs were not used in past decisions.

So SBSA, like cities, counties, states, and a multitude of government agencies across this nation, are looking at vigorous capital improvement programs (CIPs) in order to modernize infrastructure and facilities. And in the case of SBSA, we want to protect the $1 billion asset we have today.

Our reasons to develop an aggressive CIP include these:

- A CIP defines the business needs, formulates project definitions, and initiates needed improvement.
- Properly planned and funded it will save money in the long run.
- Avoidance of catastrophic failures resulting in permit violations, property and employee injury.
- There was no long term CIP or road map to address a deteriorating infrastructure in place when I got here slightly less than a year ago.

In developing SBSA's CIP, we are following a basic problem solving outline by addressing the following areas:

- Formulate detailed requirements.
- Evaluate alternative solutions.
- Select solutions.
- Develop Costs and Schedules.
- Develop Financing alternatives.

Please stay tuned.

SBSA Saves Millions of Dollars Through Energy Efficiency, Innovative Programs

Over the past 20 years, SBSA has saved several million dollars through energy efficiency and innovative programs.

Energy saving ideas have been part of the SBSA approach since the design of the plant. The Fixed Film Reactor Biological treatment system was added to the original design in the late '70s, before the plant opened, to lower the overall cost of treatment during the first energy "crisis." The co-generation unit that takes methane [a by-product of the anaerobic digestion process] and produces energy for the plant was part of the original design.

In 1986, SBSA began accepting restaurant grease trap waste as part of a first-in-the-nation pilot program to see if this waste could be digested in the anaerobic digesters; 21 years later the program revenue is more than $2 million and allows the co-generation unit to run 24/7 to produce about 20% of the plant's energy needs, resulting in savings of approximately $200,000 annually.

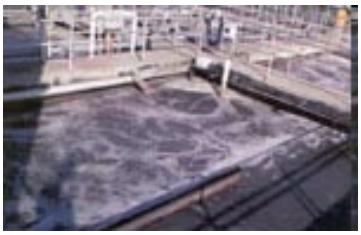
SBSA installed a heat recovery system in late 2006 that will greatly reduce the use of gas fired boilers to heat the digesters by using the waste heat off of the co-generation unit. The left over gas can now be used to produce even more energy for more savings.

The energy conservation program uses many techniques including but not limited to, shifting discretionary operations away from high cost peak power times, installation of premium efficiency motors, use of drying beds for biosolids dewatering [more on that later], operating wet pit levels for maximum energy reduction, and back flows in collection systems during peak power only to be released during off peak periods.

Energy saving ideas have been part of the SBSA approach since the design of the plant.

Cost Saving Ideas:

- In the late 1980's SBSA implemented a new process control theory that removed two aeration basins and four 100 HP turbines from service, reducing operating cost by approximately $300/day.
- SBSA started using unused land next to the plant in the mid '90's as drying beds allowing for diversion from the centrifuge dewatering system, reducing energy costs [as mentioned above] and reducing hauling and disposal costs by about $180,000 annually. This also presented an opportunity for landfill diversion credits [described below].
- SBSA implemented a task analysis system in the operations department in 1994, resulting in a reduction of 6,400 man-hours of labor. This effort resulted in the reduction of two positions for savings to date of about $1.6 million.
- SBSA created and began utilizing the Utility Worker position where low technology manual labor can be performed by lesser skilled and less expensive employees at a 25% cost savings.
- SBSA further implemented the task analysis system in the operations department in 1995. A reduction of an additional 900 man-hours of labor at the pump stations and 660 hours in the Operations Department preventative maintenance program resulted and allowed us to focus attention on new programs.
- All Stage II project bids to date have come



SBSA was first in the nation to convert grease to energy, both raising revenue and reducing energy costs.

in under their original Stage II budget. In the most recent Stage II project, findings from a pilot study have allowed improvements in filter media design, averting the need to construct two additional filters for a savings of $1.2 million.

- SBSA successfully tested and proved that fecal coliforms could be used for disinfection testing purposes, significantly reducing disinfection and dechlorination costs through reduced chemical usage.
- SBSA phased out the “chemist” position in the laboratory and shared labor savings with staff and increased the responsibility of lower level positions.
- SBSA leases property to two cell phone companies for antennas and to Redwood City for a landscape maintenance yard and their new recycled water facility, which combined result in annual income in excess of $60,000.
- In 1986, the unique application of sodium hydroxide to force main to reduce odors significantly and to reduce sodium hypochlorite use, saving more than $400,000 per year.
- Using nitrate in the place of sodium hypochlorite for reducing odors from Redwood Shores pump station #12 saves $100,000 annually.
- In the mid 1990s SBSA conducted a 16-month study which measured bacterial levels on S. F. Bay while reducing the chlorine dosage at the plant. Since no impact was found on the Bay, SBSA was able to successfully negotiate a new bacterial discharge limit from the Regional Water Quality Control Board. The reduced chlorine dosage has saved SBSA about $480,000 per year based on the 2007 cost of sodium hypochlorite. In addition, the reduced discharge of chlorination byproducts has improved local water quality.
- Designating the drying bed biosolids contract as having to meet Integrated Waste Management Board diversion credits whereby the cost of hauling and disposal was not increased yet Redwood City was able to then use this tonnage as a diversion credit.

When SBSA lowered its chlorine treatment, it resulted in an improved aquatic environment, which was hailed by windsurfers who use San Francisco Bay for their sport.

Regional Board Approves NPDES Permit; SBSA to Appeal Dioxin Limit

The California Regional Water Quality Control Board’s San Francisco Bay Region recently reissued SBSA’s National Pollutant Discharge Elimination System (NPDES) permit through 2011.

SBSA, however, is appealing a provision that requires a concentration limit of dioxin by 2011 that the plant cannot reach, according to Manager Dan Child and Technical Services Manager Ken Kaufman. The new level requirement is also being appealed by other Bay Area wastewater treatment facilities that have had it included in their recent permit reissuance.

Some dioxins and some “dioxin-like” PCBs are known to be harmful at extremely low concentrations and accumulate in the food chain after they are released to the environment. In 2004 natural forest fires produced 54% of the dioxin released into the environment in the United States, according to www.dioxinfacts.org; backyard trash burning accounted for 26% of the dioxin released. Neither of these is a significant source in the San Francisco Bay Area. Local sources include diesel engine emissions and residential wood burning. Chlorine bleaching of pulp and paper, certain types of chemical manufacturing and processing, and other industrial processes are smaller sources of dioxins. The U. S. Food and Drug Administration has measured dioxins in many foods eaten by humans, according to www.cfsan.fda.gov/~lrd/dioxdata.html the highest levels are normally found in beef and dairy products. Some dioxins are absorbed by the body; some are excreted and enter the wastewater

stream.

SBSA has been able to meet the higher dioxin limit in its previous permits. Wastewater treatment plants are not designed to specifically remove dioxin; reduction of dioxin at treatment plants is accomplished by the routine removal of solids from the wastewater. SBSA routinely removes 99% of solids from the wastewater treated at the facility, a level that exceeds the discharge permit requirements. Even with this extremely high level of solids removal SBSA does not and cannot meet the new dioxin requirements. At this time treatment strategies to eliminate dioxin to the required levels have not been proven in the wastewater industry. SBSA is required to comply with the new concentration limit by 2011 and the new permit requires SBSA to find a method of complying with the permit.

As authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters

SBSA is appealing a provision involving a concentration limit of dioxin by 2011. The new level requirement is also being appealed by other Bay Area wastewater treatment facilities that have had it included in their recent permit reissuance.

An NPDES permit specifies an acceptable level of a pollutant or pollutant parameter in a discharge (for example, a certain level of bacteria). NPDES permits make sure that a state's mandatory standards for clean water and the federal minimums are being met. There are various methods used to monitor NPDES permit conditions. The permit requires SBSA to sample its discharges and notify the state regulatory agency of these results.

Treated wastewater from SBSA is discharged from the plant in Redwood Shores through a submerged diffuser approximately 2.3 miles southeast of the center span of the San Mateo-Hayward Bridge into the Lower San Francisco Bay. The

diffuser is 6,700 feet offshore in the main shipping channel at a depth of 45 feet below the water surface at mean lower low tide.

In 2005, SBSA treated an average of 18.5 million gallons per day (mgd) with an average dry weather flow of 16.8 mgd and a peak wet weather flow rate of 71 mgd. The dry weather design flow for the facility is 29 mgd.

SBSA transports and treats domestic, commercial and industrial wastewater from a service area with a population of approximately 217,000. The following contributors and associated populations contribute to influent flows to the SBSA Wastewater Treatment Plant: West Bay Sanitary District (population 55,000), the cities of Belmont (25,123), San Carlos (22,718), Redwood City (75,402), Woodside (5,352), and San Mateo County (28,637).

SBSA's conveyance system consists of four pump stations, which receive wastewater from the satellite wastewater collection systems of four municipal jurisdictions (i.e., West Bay Sanitary District, City of Belmont, City of San Carlos and City of Redwood City), and approximately eight miles of force main that convey wastewater to the WWTP. Influent is gravity fed to the four pump stations located within the four municipal jurisdictions and conveyed through the force main to the SBSA influent pump station.

The SBSA has not had any significant NPDES permit violations.

3 SBSA Employees and Local Business Win Regional Honors for Excellence

Three SBSA employees and a local business were among the winners of major honors at the recent awards ceremonies of the Santa Clara Valley section of the California Water Environment Association (CWEA). The winners advance to statewide competition in April.

Winners were:

- **Luke Castell** – Electrical and Instrumentation Person of the Year.
- **Norman Domingo** – Supervisor of the Year.
- **Michael Li** – P3S Person of the Year (Pretreatment, Pollution Prevention, Stormwater)
- **WIT Plating** of Redwood City –P3S Facility of the Year.

Castell has been with SBSA since May of 1991. He started as a part-time lab analyst (now called a water quality specialist), later to become a regular full time appointment. He transferred to the maintenance department in October 2001 as a plant mechanic II, specializing in electrical and instrumentation.

In nominating him, Maintenance Manager V. Gary Storms credited Castell with researching, testing and installing new chlorine residual analyzers, which resulted in a significant savings and reduced chemicals and staff time. He also set up the instrumentation for the full scale test of the new dual media filter.

For the new recycled water facilities, Castell assisted in the design and installation of the recycled water facility's instrumentation systems and oversaw the contractors work.

Luke Castell

Though outside his job responsibilities, Castell participates in peer and other staff training, including electricians apprentice training. He also has kept abreast of requirements for underground tanks and gas detector use and care.

Castell also was lauded for becoming SBSA's expert on the Laboratory AA unit, which is no longer supported by a vendor. He performs component and board level repairs because replacement units cannot be purchased. He also fills in for the lab when requested. As a highly respected mathematician with a BS degree in chemistry, Luke is trained and experienced in laboratory procedures. He provides training to all departments and other staff in these specialties. He also writes standard operating procedures (sops).

Domingo has been with SBSA for nearly 19 years, the last 2 ½ as supervisor for technical services. His main focus is to coordinate the Pretreatment Program and Pollution Prevention Program. He also coordinates diverse activities in hazardous waste disposal, general regulatory compliance, groundwater discharge, miscellaneous waste disposal and desktop computer support.

"Norm has taken a lead to motivate department personnel in SBSA's Pollution Prevention Program," says Technical Services Manager Ken Kaufman, who nominated him. "He has mentored people in SBSA's Sewer Science program by providing the training to help them become program instructors and worked with scheduling and the day-to-day issues to ensure the program runs to the benefit of the all involved."

Domingo was the local champion of the Safe Medicine Day Event (2006) and is currently working with the Spanish Outreach group to produce a proper FOG disposal message for future holiday radio broadcasts.

The award criteria include providing safety at your workplace. Kaufman said Domingo has:

• Worked successfully to obtain crane lifts for the SBSA Source Control vehicles. These devices provide an ergonomic way to set samplers into monitoring locations and alleviate some of the back strain associated with lifting.

• Worked closely with an ergonomics specialist to produce a section of a safety video and poster about lifting techniques associated with sampling at industrial locations.

• Trained several SBSA department employees to perform industrial sampling and always makes it a point to make sure it is done safely. This may be the first time the employee may have been in these specialty industries and may not be aware of its unique safety concerns.

Kaufman added: “Norm’s broad-based technical competence is reflected by a wide range of abilities rarely present in a single individual: industrial chemical manufacturing, wastewater laboratory analysis, industrial waste monitoring, multi-disciplinary regulatory compliance, complex waste disposal, pollution prevention in the commercial and industrial sectors, computer hardware and software support, high school science teaching, and pollution prevention public outreach.”

Li, a water quality specialist, has been with SBSA since 1982. He won the same award in 2004. His duties include implementation of the SBSA Pretreatment, Pollution Prevention, and FOG programs. He was nominated by Domingo.

Li has been a member of the Santa Clara Valley Section of CWEA for 20 years. He is a regular attendee at the training meetings. He has been a member of the section Operations Challenge team, “The 24 hour Composites,” and as a member of a team that represented the section at the local and national levels of competition. He is a current member of the section safety committee and has volunteered at many of their training sessions.

Domingo said, “He has been instrumental in several enforcement actions which included joint action with the San Mateo County Departments of the District Attorney and Environmental Health. Currently he is performing restaurant grease inspections at problem spots in Redwood City. Part of that job has been to distribute Kitchen Best Management Practices and encourage food service establishments to implement them on a day to day basis.” He also is involved with the reduction of mercury from dentists and hospitals.

Before joining the SBSA Source control Department in 1995 Li had been a member of the SBSA lab staff for 13 years. He still uses that experience in the SBSA cross training program and can utilize his vast knowledge and experience to complete tasks in either the lab or as a SBSA

Norman Domingo to the right

Michael Li below

Source control inspector

Domingo added, “Mike has become very familiar with the industries in the SBSA service area and the type of industrial processes they perform. When unexplained analytical results cause concern and it appears to be a slug discharges into SBSA Mike has used this knowledge to search out the culprit.”

Li is a member of the SBSA Sewer Science team that goes to high schools in the SBSA service area to teach or assist the teacher with the Sewer Science Curriculum

Since 1971, the Pretreatment, Pollution Prevention, and Stormwater (P^3S) Committee (formerly known as the Industrial & Hazardous Waste Committee) of CWEA has been recognizing the achievement of high performing companies with an annual Facility of the Year Award. The awards are given to industrial dischargers with significant accomplishments in the area of environmental protection and industrial wastewater control. The purpose of the award is to create incentive on the part of dischargers taking proactive steps to meet current environmental pollution control standards.

The Santa Clara chapter winner was WIT Plating, of 1692 Tacoma, Redwood City. WIT Plating currently performs electroless nickel and gold plating on printed circuit boards. It is a job

shop that performs this service for other larger printed circuit board manufacturers in the San Francisco Bay Area.

"WIT Plating has implemented a wastewater zero discharge program," said SBSA's Kaufman. "The current owners voluntarily allowed SBSA to install a locked plug into the process wastewater discharge pipe in the plating shop then moved forward with the installation of a rinsewater recycling system that recycles all the rinsewater from their plating line. The system consists of an ion exchange resin system that is managed by a vendor, resin bottles are exchanged with the spent resin being regenerated offsite. Treated water is collected in clean water holding tank until it is needed by the rinse tanks."

As a result, nickel and copper which are pollutants of concern are no longer discharged to the sanitary sewer. Nickel drag out is hauled off for disposal or reclamation. Copper which is

"WIT Plating has implemented a wastewater zero discharge program."

etched from circuit boards and concentrates in drag out rinses is no longer discharged. Gold is reclaimed by WIT's parent company in San Jose.

"The new company attitude has allowed SBSA to reduce oversight to this facility," Kaufman said. "Before WIT Plating took ownership this facility required extra monitoring and inspection to ensure that it remained in compliance with applicable federal and local regulations. The reduction of the regulatory oversight at this facility has allowed SBSA to redirect resources to other activities."

Mathewson Replaces Feierbach as Belmont's Representative on SBSA Commission

Philip Mathewson has replaced Coralin Feierbach as Belmont's representative to the SBSA Commission. Each of the jurisdictions that own SBSA – the cities of Belmont, Redwood City, and San Carlos, and West Bay Sanitary District – appoint a member of their council/board to represent them on the SBSA Commission.

Feierbach, who had been SBSA chairperson, stepped down after she was elected mayor of Belmont, citing the time that her duties would consume. Mathewson, a former mayor, has been on the Council since 2003, when he ran unopposed. He also served two terms on the Belmont Planning Commission. He is a retired chief regulatory compliance officer at Bay View Federal Bank and a retired supervising examiner at the Federal Reserve Bank of San Francisco.

With Feierbach stepping down, the SBSA Commission elected Redwood City representative Jeff Ira chairman, San Carlos representative Tom Davids vice chairman, and West Bay representative Ron Shepherd secretary.

Philip Mathewson

South Bayside System Authority

Public Notice of

VIOLATION OF POLLUTION REGULATIONS

During the twelve month period ending December 31, 2006, the following industries were found in violation of local or federal regulations that control discharges into sanitary sewers. For additional information, please contact Norm Domingo, Technical Services Supervisor, South Bayside System Authority, at (650) 594-8411 ext. 140. This announcement satisfies the federal requirement for public notification in 40 CFR 403.8(f)(2)(vii).

Industry	Compliance Issue
B.F.I. California Ox Mountain	violation of permit local limit for phenols
MEMRY Corporation (located in Menlo Park)	violation of the federal daily and monthly average limit for nickel