

**California Regional Water Quality Control Board
San Francisco Bay Region
EXECUTIVE OFFICER'S REPORT
A Monthly Report to the Board and Public**

June 2010

The next regular scheduled Board meeting is June 9, 2010.

See <http://www.waterboards.ca.gov/sanfranciscobay/> for latest details and agenda

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Four New Grant Projects Approved (Leslie Ferguson, Susan Gladstone)

Each year, a team of Board staff work with stakeholders to develop competitive grant proposals for implementing Total Maximum Daily Loads (TMDLs) by addressing non-point sources of pollution. Last December, about 60 grant applications from around the state were submitted to compete for \$4.5 million from the federal Non-Point Source 319(h) grant program. By March 1st, details from 22 of the most compelling proposals were sent to the final round for statewide review. Leslie Ferguson represented the Board at two rounds of intense grant panel reviews that culminated in State Board approval of four grant proposals from our Region on April 29th.

A total of \$225,000 will go toward planning and assessment activities to address sediment TMDLs: one to the Napa Resource Conservation District for sediment monitoring, and the other to the Sonoma Ecology Center for developing criteria to prioritize erosion control projects. Another \$753,000 will go toward implementing farm or ranch plans to address sediment and pathogens; one to the Fish Friendly Farming program for vineyards in Napa, and another to the National Park Service for grazing lands at the Pt. Reyes National Seashore.

Enforcement – Complaints and Settlements (Brian Thompson)

The Board's Prosecution Team has issued a revised administrative civil liability (ACL) complaint to the California Water Service Company. The revised complaint includes additional violations, an increased penalty, and it considers the California Water Service Company's cooperation in addressing potable water discharges to Polhemus Creek. A Copy of the revised complaint can be found on our web site:
http://www.waterboards.ca.gov/sanfranciscobay/public_notices/pending_enforcement.shtml

Updates on the status of ACL complaints issued to industrial facilities for failing to submit annual reports required by the Statewide Industrial Storm Water General NPDES Permit include seven dischargers agreeing to pay liabilities proposed in the ACL complaints and six dischargers entering settlement agreements to resolve the ACLs. Only two of the original 47 ACL complaints remain to be resolved through settlement or a Board hearing.

- Discharges Paying Proposed Liabilities

The following dischargers did not contest ACL complaints issued by the Board's Prosecution Team and have either paid or are in the process of paying the proposed liabilities: Durham Trans, Inc. (2 facilities, \$3,500 each), and Marinemax, Inc. (\$13,300) in Alameda County; Durham Trans, Inc. (\$3,500) in Contra Costa County; Lunny Grading and Paving, Inc. – Nicasio Rock Quarry (\$4,250) in Marin County; and Durham Trans, Inc. (\$3,500) and Fireclay Tile (\$3,125) in Santa Clara County

- Settlement Agreements

I have publicly noticed tentative orders for the following ACLs in which the Board's Prosecution Team reached settlement with the dischargers: E D Coat (\$1,750), Garda (\$13,300), and Norcal Metal Fabricators (\$7,550) in Alameda County; Greg S Trucking (\$1,425) in San Mateo County; JT Truck Center (\$2,950) in Santa Clara County; and Fairvac A T Wrecking (\$4,725) in Solano County. I intend to sign the settlement agreements and issue ACL orders if no significant comments are received within the 30-day comment period. Copies of the tentative orders can be found on our web site at:
http://www.waterboards.ca.gov/sanfranciscobay/public_notices/pending_enforcement.shtml

Recycled Water Policy – Blue Ribbon Advisory Panel Recommendations on Emerging Contaminant Monitoring (Naomi Feger)

In February 2009, the State Board approved its statewide policy for water quality control of recycled water. This recycled water policy required the creation of a "blue ribbon" panel of scientific experts to guide future actions relating to constituents of emerging concern (CECs).

The panel of six nationwide experts was appointed in May 2009 and was tasked to submit, within one year of its appointment, a report describing the current state of scientific knowledge regarding the risks of CECs to public health and the environment. The following questions were to be answered: What are the appropriate constituents to be monitored in recycled water, including analytical methods and method detection limits? What is the known toxicological information for these constituents? Would the list of CECs

to be monitored change based on the level of treatment and use? If so, how? What are possible indicators that represent a suite of CECs? What levels of CECs should trigger enhanced monitoring of CECs in recycled water, groundwater and/or surface waters?

The panel met three times during the past year and, in April, released a draft report entitled *Monitoring Strategies for Chemicals of Emerging Concern in Recycled Water* (ftp://ftp.sccwrp.org/pub/download/DOCUMENTS/CECpanel/CA_CEC_RW_Draft_Report_2010Apr15.pdf)

The draft report lays out an approach for prioritizing CECs in a monitoring plan for recycled water. The panel looked at the circumstances of use of recycled water in developing its approach and identifying compounds for monitoring. The approach was then applied to the use of recycled water as groundwater recharge for drinking water, specifically reviewing groundwater recharge via surface spreading operations and direct injection into groundwater, and recycled water use as irrigation water. The exposure potential for both surface spreading and direct injection into groundwater was determined to be pumping at a downgradient well and subsequent use as drinking water. The potential for human exposure to irrigation water was based on incidental human ingestion. It was determined that aquatic life exposure was negligible and human exposure minimal for irrigation water.

The panel's approach included compiling environmental concentration information, i.e., measured environmental concentrations (MEC) of known compounds in recycled water and comparing these to a monitoring trigger level (MTL) based on toxicological relevance. Chemicals with a MEC/MTL ratio greater than "1" would be prioritized for monitoring. Those chemicals identified as priorities would then be screened to ensure a commercially-available robust analytical method for monitoring exists. .

Using its approach and the use scenario of recycled water as groundwater recharge for drinking water, the panel identified which CECs to screen for monitoring. The resulting CEC screening list included 106 non-regulated compounds identified in USEPA's Candidate Contaminant List for drinking water (narrowed by USEPA from a list of more than 7,000 compounds). After screening, the panel identified three compounds as initial priorities for monitoring: 17beta-estradiol, caffeine, and triclosan. Some revisions to the draft report are planned based on comments received from the public. The final report will be completed by the end of June. A hearing is planned at the State Board in November to consider adoption of the panel's recommendations. The water recycling policy calls for the panel or a similarly constituted panel to update the report every five years.

Instream Flow Policy (Wil Bruhns)

On May 4, the State Board adopted a policy for water quality control titled "Policy for Maintaining Instream Flows in Northern California Coastal Streams". The policy contains principles and guidelines for maintaining instream flows for the purposes of water rights administration. The geographic scope of the policy encompasses coastal streams from the Mattole River to San Francisco Bay, and extends to five counties: Marin, Sonoma, and

portions of Napa, Mendocino, and Humboldt counties. The Policy must next be approved by the State Office of Administrative Law.

The Policy's primary objective is that the State Board's water rights program be administered in a manner that maintains instream flows needed to protect fishery resources. The Policy includes protective measures regarding seasons of water diversions, minimum bypass flows and maximum cumulative diversions in a watershed. It also limits the construction of new onstream dams and includes measures to assure any new dams do not adversely affect flows needed by fish.

The Policy focuses on measures to protect native fish populations, particularly salmon and steelhead trout. Populations of these fish have declined in north coast streams and a variety of factors pose an ongoing threat to their populations. These factors include climatic variation, disease, predation, loss of genetic diversity, harvesting, and land and water use. The Department of Fish and Game has stated that land and water use is a leading cause of the decline of the fish. Water diversions, the primary focus of this Policy, result in significant impacts to the aquatic environment, thus threatening fish survival.

This Policy fits well with TMDLs adopted by this Board for Sonoma Creek and the Napa River. Those TMDLs, while focused on sediment issues, also included habitat restoration plans. A major part of those plans called for increased base flows in order to improve fish habitat, which is exactly the goal of the Policy.

This issue of flows and fish survival is also of concern to federal agencies. In May the National Oceanic and Atmospheric Administration's Office of Enforcement issued a Notice of Violation and Assessment against a vineyard in Sonoma County calling for a fine of \$115,500. The fine is for removing water from Felta Creek (a tributary of the Russian River, just north of our region) for frost protection, thus causing the death of salmon in the creek.

2009 Wastewater Mercury Loads to San Francisco Bay (Robert Schlipf)

For 2009, municipal and industrial wastewater dischargers were well within the mass loading limits prescribed by the Board in its mercury watershed permit. This watershed permit implemented the Board's TMDL for mercury in San Francisco Bay for all municipal and industrial wastewater sources. The table below shows mercury loadings since the watershed permit became effective in 2008.

Type of Discharge	Discharge Limit (kg/yr)	2008 Discharge (kg/yr)	2009 Discharge (kg/yr)
Municipal Wastewater	17	4.5	4.8
Industrial Wastewater	1.3	0.51	0.43

The 2009 loads are similar to those in 2008. Municipal wastewater dischargers continued to improve their efforts at reducing mercury through source control activities. For example, 84% of municipal dischargers (up from 56% in 2008) have implemented dental amalgam control programs. Additionally, they have continued to collect hazardous waste,

fluorescent lights, thermometers, and batteries, which do not typically affect wastewater but could improve urban stormwater. Finally, they continue to engage in public outreach to reduce mercury in laboratory waste. The above efforts have helped municipal dischargers keep mercury loadings well below their annual effluent limit.

Because industrial dischargers were below their annual effluent limit and their sources are more varied, few source control projects were implemented in 2009. The mercury loadings from industrial dischargers may have continued to be low because of drought conditions, which may have contributed to a lack of effluent variability from slug loadings.

Reissued Construction Stormwater Permit (Christine Boschen)

Following up on the Board's questions on the reissued Statewide Construction Stormwater Permit:

More details regarding risk calculation at construction sites

Risk level is calculated up front, at the time that a developer applies for permit coverage. A site's overall risk is determined by two elements:

- Project Sediment Risk – this is the relative amount of sediment that can be discharged from the site (assuming the site has implemented no erosion control measures). Sediment risk is driven largely by scheduling and site characteristics.
- Receiving Water Risk – this is determined by how sensitive the receiving water would be to additional sediment load.

Sediment risk calculation is based on the Revised Universal Soil Loss Equation (RUSLE), an equation that has been in use for a long time in agriculture to estimate soil loss from crop lands and help farmers predict how much. It is a useful tool for estimating erosion from construction sites as well.

The RUSLE Equation is as follows:

$$A = (R)(K)(LS) (C)(P)$$

Where A = estimated average soil loss in tons per acre per year, R = rainfall-runoff erosivity factor, K = soil erodibility factor, L = slope steepness factor, C = *cover management factor*, and P = *support practice factor*. For our purposes, we do not use the C and P factors, because we want to know what the risk is assuming no Best Management Practices are in place (i.e., the worst case scenario).

Calculation of sediment risk is easy if one uses the online tools provided by US EPA and the State Water Board:

- US EPA has an online R factor calculator:
<http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm>
- State Water Board provides Risk Determination Worksheet for the determination of the K and LS factors:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

So, it takes about ten minutes to calculate a site's sediment risk. However, a developer may also do a site-specific analysis of K and LS factors if it elects; that takes more expertise and time but may result in more accurate risk calculation.

Receiving Water Risk is determined by 303(d) listing and beneficial uses

If a site discharges to a receiving water that is on the 303(d) list for sediment impairment, has an approved TMDL for sediment impairment, OR has the beneficial uses of COLD, SPAWN, and MIGRATORY, that site has a high receiving water risk.

Overall site risk is determined by the following table:

		Project Sediment Risk		
		Low	Medium	High
Receiving Water Risk	Low	Level 1	Level 2	
	High	Level 2		Level 3

Thus, with Risk Level calculated, a developer then knows which level of effort, as well as scrutiny, it will be held to under the permit.

Customer service this summer

About a month and a half ago, all parties currently covered by the Construction Stormwater Permit received a letter explaining the requirement to reenroll under the reissued permit or terminate permit coverage if their project had already finished. This has flushed many finished projects "out of the woodworks". We are fielding many phone calls and e-mails from parties who need to terminate coverage. We have adjusted our work load to accommodate this increase in customer service.

Golden Guardian Spill Drill (David Elias and Laurent Meillier)

On May 18, Laurent Meillier and David Elias of the Board staff participated in the sixth annual Golden Guardian Statewide Exercise Series, which was first initiated by the State in 2004. The drill has become an annual event conducted to coordinate the prevention, preparation, response and recovery mechanisms of both public and private entities. The goal of the exercise is to build a synergistic approach to emergency response. Golden Guardian is currently the largest statewide exercise program of its kind in the country.

This year the Golden Guardian mockup exercise was conducted and sponsored by the City and Port of Oakland. During the exercise Laurent and David interacted primarily with the California Environmental Protection Agency (CalEPA), the Department of Toxic Substances Control (DTSC), and the California Air Resources Board (CARB). While CalEPA manned the Emergency Operation Center (EOC) in Sacramento, we worked closely with DTSC and CARB at the Port of Oakland APL Terminal where the mock incident and spill occurred. The mock incident consisted of a vessel to vessel collision and subsequent explosion and hazardous materials release to both the dock and the Bay. Specifically, we were challenged to evaluate whether the acid releases (gaseous, liquid and solid forms) generated during the mock spill would partition into the Bay. Could the buffering capacity of Bay water mitigate the toxic impacts associated with very low pH

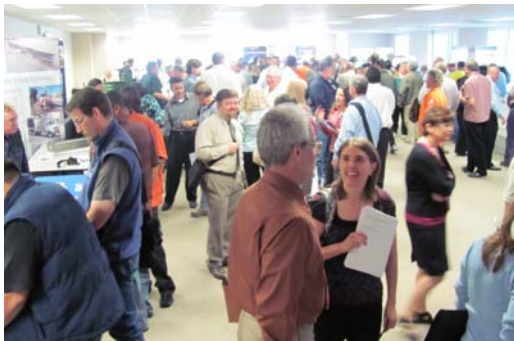
releases? In the end, after completion of the stoichiometric and volumetric calculations, we concluded that the Bay's buffering capacity would have restricted the impacts to within 50 ft of the spill. Communications with the EOC were successful, and overall we felt the drill was useful and informative.

SFEP launches Trash Capture Demonstration Project (Janet Cox)

The Bay Area-wide Trash Capture Demonstration Project kicked off on May 4 with a meeting where city and county staff learned about the project and heard speakers describe their experience with installation and maintenance of different types of trash capture devices. The panel included Board staff Dale Bowyer, and staff from San José, Sunnyvale, Oakland, and Dublin. In the afternoon, 15 manufacturers of trash capture devices participated in a "vendor fair" for the municipal representatives. More than 170 staff from 60 Bay Area towns, cities, and counties attended the day's events.



San Francisco Estuary Partnership (SFEP) staff, led by Janet Cox, is managing the project, which will provide trash capture devices worth more than \$4 million to municipalities that choose to participate. This winter, two requests for proposals to provide trash capture devices yielded proposals for almost 50 devices from 16 vendors. Devices reviewed by Board staff and certified as "full trash capture" are included in the project. Cities and counties will confer with vendors and order devices through SFEP; upon installation, the devices will become the property of the municipalities. The San Francisco Estuary Institute, with the Redlands Institute, is developing a monitoring website that municipal staff will use to report on performance of different devices and their cost of maintenance.



The project is funded by the State Water Board's Clean Water State Revolving Fund, with funds from the American Recovery and Reinvestment Act (the federal stimulus bill). It will facilitate early compliance with our region's Municipal Regional Stormwater Permit and anticipated general permit requirements for operators of small municipal separate storm sewer systems. Construction will start this summer, after both vendors and participating municipalities have contracted with the Association of Bay Area Governments, SFEP's parent agency.

Fish Friendly Farming (Mike Napolitano)

Since 2004, the Board has been a certifying agency in the Fish Friendly Farming Environmental Certification Program. In this capacity, Board staff have issued conditional letters of certification for farm plans that have been developed to protect water quality at more than 100 vineyard properties covering approximately 10,000 acres of vineyards, and 5,000 acres of adjacent rural lands in the Napa River watershed. Certification is based on review of the farm plan and a related site inspection to evaluate conditions and effectiveness of management practices.

Over a seven-day period in May, we certified an additional 45 vineyard properties covering approximately 6,000 acres as protective of water quality. We estimate that approximately 40 percent of the total acreage of vineyards in the Napa River watershed has now been certified. We are excited to report this progress, and we compliment the staff of the Fish Friendly Farming Program, and all of the vineyard managers that have worked so hard to achieve these results.

Development and implementation of farm plans that are protective of water quality is a key element of the Fish Friendly Farming Certification Program and is a required implementation action identified in the Board adopted Napa River sediment TMDL.

Monterey Bay National Marine Sanctuary (MBNMS) MOA (Wil Bruhns)

On May 27 I signed an updated Memorandum of Agreement (MOA) with the MBNMS. The purpose of the MOA, as stated in it is, "to provide an ecosystem-based water quality management process that integrates the mandates and expertise of existing coastal and ocean resource and land-use managers and protects the nationally significant resources, qualities, and compatible uses of the MBNMS and the water quality in the watersheds that drain into the MBNMS." The MOA is designed to coordinate planning, permitting, and enforcement activities by various agencies with an interest in the Sanctuary. The agencies involved are National Oceanic and Atmospheric Administration (through the MBNMS), U.S. EPA, CalEPA, the State Water Board, the Central Coast Water Board, our Board, the California Coastal Commission, and the Association of Monterey Bay Area Governments. This MOA updates one that was signed by all the agencies in 1992. There is a long history of cooperation between all the agencies involved, and I fully expect this to continue. The MOA will become effective as soon as all participants sign it, at which point we will post it on our web page.

The Sanctuary extends along the coast from southern Marin County to just north of Morro Bay. It is the nation's largest marine sanctuary, encompassing over six-thousand square miles of marine waters, and is home to the nation's largest kelp forest, one of its largest underwater canyons, and an enormous diversity of fishes, birds, mammals and other species, twenty-one of which are listed as endangered or threatened. Recognizing this diversity of unique resources, Congress and NOAA assigned sanctuary managers a mandate of ecosystem protection, and protecting and enhancing water quality is central to meeting this mandate.

Updating this MOA provides an excellent opportunity for our agencies to leverage resources and re-commit to working together to achieve our shared goals of improved water quality in watersheds and the marine environment.

Interstate Technology Regulatory Council (Cleet Carlton, Alec Naugle)

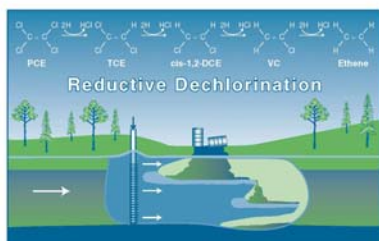
Last month Cleet Carlton and Alec Naugle attended the Interstate Technology Regulatory Council's (ITRC) spring meeting. Established in 1995, the ITRC is a state-led coalition of environmental regulatory personnel from over 40 states, federal agencies, tribes, and public and industry stakeholders. The ITRC's mission is to reduce technical and regulatory barriers to the use of innovative soil and groundwater cleanup methods for protection of human health, water quality and the environment. The ITRC includes 14 technical teams that develop technology overview and guidance documents to reduce barriers, foster consistency and enable effective use of cleanup technologies.

Cleet is a member of the Environmental Molecular Diagnostics (EMD) team. EMDs include the use of biological (e.g., bacterial analysis and gene sequencing) and chemical (e.g., compound-specific isotopic analysis) technologies to evaluate if multiple contaminant sources are present in groundwater and if contaminants are being destroyed versus simply being diluted and continuing to migrate. EMDs are forensic tools that can help solve responsible party controversies and assess groundwater cleanup effectiveness and cleanup time frame.



Technical/Regulatory Guidance

In Situ Bioremediation of Chlorinated Ethene: DNAPL Source Zones



June 2008

Prepared by
The Interstate Technology & Regulatory Council
Bioremediation of DNAPLs Team

At the meeting, Cleet presented the Board's Assessment Tool for Low-Threat Site Closure, which recommends use of innovative approaches like EMDs to reduce uncertainty and increase regulatory confidence associated with cleanup of subsurface contaminants. The assessment tool is available on the Water Board's website at: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/sitecleanup/Low_Threat_Closure_Assessment_Tool.pdf

A summary is included in the August 2009 Executive Officer's monthly report: http://www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2009/august/4_EOrpt.pdf

Alec is currently a member of the Integrated DNAPL Site Strategy (IDSS) team. DNAPLs (dense non-aqueous phase liquids) are typically associated with chlorinated solvent

spills/leaks at manufacturing, dry cleaner, military, and other industrial sites. The IDSS team is developing technical and regulatory guidance (due out in 2011) based on the latest conceptual understanding and lessons learned from over 30 years of DNAPL site cleanups. Alec is contributing sections on the "DNAPL dilemma", describing the disconnect between DNAPL source removal and the restoration of DNAPL-impacted groundwater to low, part-per-billion drinking water standards in a reasonable time frame. The dilemma is that it is very costly (and often technically infeasible) to achieve 100% DNAPL source removal, while even at 80 to 90% removal, groundwater concentrations typically remain 10 to 1000 times greater than the drinking water standard for decades for many chlorinated solvents. One solution is to use multiple cleanup technologies in series or in parallel to optimize removal efficiency. Another is to use various technologies to target specific areas for cleanup to prevent immediate human or ecological exposures and minimize further spreading (i.e., containment) while imposing land and water-use restrictions, vapor barriers, and other institutional or engineering controls, to minimize future risks. The IDSS guidance document will discuss these and other potential solutions to address DNAPL site management in the near and long-term.

In-house Training

Our May training comprised a field trip to the Guadalupe River watershed, where we observed mercury mine cleanup at the former New Almaden quicksilver mine, water and groundwater management activities by the Santa Clara Valley Water District, and salt pond restoration activities near Alviso. Our June training will address site inspections. Brownbag seminars included a May 27 session at which we showed "Saving the Bay – Part 3" (third of a four-part series that aired recently on KQED).

Staff Presentations

On April 15, Karen Taberski presented a webinar on regional monitoring. The webinar included a discussion of regional Surface Water Ambient Monitoring Program (SWAMP) monitoring, as well as monitoring conducted by the San Francisco Estuary Regional Monitoring Program (RMP). The webinar summarized water quality monitoring activities conducted by the regional SWAMP from 2000 – 2009, including a lakes study on fish contamination, water quality and trash assessments in creeks, and a reference site study. Our regional approach to monitoring and assessment and coordination with other programs was highlighted. The PowerPoint from the webinar is available at http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/presentations/webinar041510.pdf

On April 29 Andree Greenberg gave a presentation to the Restoration Ecology class at University of San Francisco entitled, "Wetland Protection in the San Francisco Bay Region".

On May 5, Carmen Fewless gave a presentation on the Tomales Bay Pathogen TMDL and the Tomales Bay Grazing Waiver at a workshop held in Shasta City by the Water Boards' Training Academy. The Workshop "A TMDL Road to Watershed Restoration - Doing Them, Implementing Them and Monitoring Their Effectiveness", focused on the

implementation of TMDLs from a non-point source pollution perspective, and provided a regional and statewide perspective on how TMDLs can be used to inform coordinated watershed planning and to promote the successful implementation of non-point source pollution-related projects.

Assistant Executive Officer, Thomas Mumley, gave the keynote presentation at the California Stormwater Quality Association quarterly meeting in Sacramento, on May 13. The focus of the meeting was on sources of pollutants in stormwater. Tom's presentation, "Accounting for Source Control in TMDLs and Stormwater Permits", covered the opportunities and challenges with recognizing source control in our regulatory actions using our urban creeks pesticide toxicity TMDL and pesticide and copper requirements in our Municipal Regional Stormwater Permit as examples.

On May 19, Stephen Hill participated in a "webinar" on vapor intrusion hosted by the law firm of Morgan Lewis ("vapor intrusion: impact of guidelines and implementation of guidelines by various state and local entities - legal and practical consequences - California's approach to the issue"). Stephen was one of three speakers; he presented a regulatory perspective, describing how the CalEPA agencies approach vapor intrusion. The session was presented using "WebEx" software and was viewed remotely by over 50 attendees, mainly environmental attorneys, consultants, and discharger representatives.

On May 20, Mark Johnson made a presentation before the Board of the Community Legal Services (CLS) in East Palo Alto. The CLS Board members had significant concerns over the potential environmental liabilities associated with acquiring a foreclosed property within the Ravenswood Industrial area of the City. At the request of the CLS Executive Director, Mark briefed the CLS Board with respect to redevelopment efforts in the area, our involvement of regulating investigation/cleanup of specific properties, the results of the investigation of this specific property, and further requirements of this Board. This property was not the source of soil or groundwater pollution but was impacted by a groundwater plume originating from an offsite source. Mark described this Board's policy with regard to properties that have been impacted from an offsite source of groundwater pollution. The CLS Board members appreciated receiving this information, which allowed them to decide to further pursue discussions to acquire the property. A letter of commendation was received from the Executive Director of the CLS and is contained in Agenda Item 8 (Correspondence).

On May 22, I participated in a seminar on "Wastewater as a Resource: Focus on the Bay", hosted by Stanford's Woods Institute for the Environment. I spoke on the goals of the next generation of wastewater treatment as part of a panel addressing resource recovery from wastewater in the Bay, noting that the next generation of treatment needs to look past compliance with secondary treatment requirements to consider, among others, the ability to treat key constituents, such as mercury, copper and nutrients, the need to monitor and potentially treat constituents of emerging concern, the ability to handle increasing levels of inflow and infiltration flows, and the need to optimize water recycling and stormwater treatment. This seminar was initiated to inform the Woods Institute's research priorities.