Natural Resources Commission
Minutes
March 23, 2009

Commissioners:

Present:	Charles Ehrlich, Doug Fetterly, Jennifer Holman (Chair), Kris Kordana (Planning Commission Liaison), Dean Newberry (Vice-Chair)
Absent:	Herman Boschken (excused), Brook Gale (unexcused), Adrienne Kandel (unexcused), Mark Lubell (excused)
Staff:	Sue Gedestad, Assistant Public Works Director John McNerney, Wildlife Resource Specialist Martin Guerena, IPM Coordinator Linda Cano, Administrative Aid
Council Liaison:	Stephen Souza and Lamar Heystek

1. Roll Call

2. Approval of Agenda
Agenda was approved by consensus with the following revision: Long Range Agenda was moved to item 11.

3. Approval of Minutes
Minutes of **February 23, 2009** were approved by consensus.

4. Commission and Staff Announcements
Doug Fetterly shared that he had recently attended a tour of the City Wastewater Treatment Plant and the Bay-Delta Plant tour and found them both informative.

Dean Newberry also attended an energy tour of UCD's Biogas Center that demonstrates the emerging technology of recycling food and organic waste.

5. Council Liaison Comments
Stephen Souza also attended the tours shared above and described them as both interesting and insightful; each with their problems and benefits. He invited the Commission to attend a tour of the Woodland Wastewater Treatment Plant on April 6 and to take a tour of our facility.

6. Public Communications: None

Consent Calendar

7. A. Long Range Calendar

Action: This item was moved to the end of the calendar, Item 11.

- Jennifer Holman would like an update from the Climate Action Team.
- Charles Ehrlich relayed a perceived misunderstanding on the Water/Wastewater issues and would like clarification when this item is on the agenda.

Regular Calendar

8. Integrated Pest Management (IPM) Update

Martin Guerena, IPM Coordinator, went over his 2008 IPM Annual Report explaining some history and how we arrived at our current practices, as well as the future direction of the program. He emphasized that the City is reducing pesticide and herbicide usage by turning to "green" alternatives, such as: mechanical control, mulching, grazing, biological, flaming, solarization and flooding on city properties as appropriate.

IPM program achievements in 2008 include the "IPM Innovator Award" from the Department of Pesticide Regulation and the IPM Comic "The Exterminator" which demonstrates least toxic approaches to managing urban household pests.

After review of the report with the Commission, the floor was opened to the public. Five citizens addressed the Commission expressing their concerns for safety of applicators and the public when pesticides are in use as well as a concern that the City is not going far enough to eliminate the use of Class 1, 2 and 3 pesticides. There was also an expression of appreciation for the City's efforts in pesticide and herbicide reduction.

The full report will go the City Council as an attachment to the minutes of this meeting.

9. Select Environmental Recognition Award (ERA) Recipients

After discussion of award intent and current process the Commission selected the following:

- Business – KiwiTree with an Honorable Mention to Nugget
- Individual – Sid England and John Mott-Smith jointly
- Non-Profit – Solano County Water Agency

10. Review Final Draft of 2008 Hazardous Waste Sites Report

After review of format of report and clarification on purpose of highlights, the Commission decided that the current format of the report is good. The full report will go the City Council as an attachment to the minutes of this meeting.

Adjourn – 9:07 PM

NRC Agenda
Date: 3/23/09
Item # 8

City of Davis

Integrated Pest Management Program

2008 Annual Report

Submitted to the Natural Resource Commission on March 23, 2009
Prepared by: Martin Guerena, IPM Specialist and
John McNerney, Wildlife Resource Specialist.

1.0 Overview

The purpose of this report is to provide the Natural Resource Commission (NRC) with an overview of City efforts to control pests in a variety of settings in and around the community. As outlined in the report, staff employs a number of methods to achieve the functional, public safety, and aesthetic vegetation control standards that have been established for City managed areas. The report also reviews the policy decisions that shaped the City's current approach to weed management and provides analysis of several factors that influence program decisions.

2.0 Introduction and Background

In the 1980's the City of Davis' pesticide use was similar to other cities and agricultural operations. Much of the maintenance of park, greenbelts, landscaping, bike paths, streetscapes and open space consisted of scheduled applications of fertilizers and pesticides. The pesticides used were a mixture of Category I (Danger), II (Warning) and III (Caution) compounds.

In 1989 the city established an Integrated Pest Management (IPM) program where new methods of managing public landscapes were imposed, these included:

- First IPM Policy developed by the Parks and Community Services department.
- First IPM specialist hired by the City of Davis.
- Issuing written pesticide recommendations.
- Consolidate and centralize pesticide storage in upgraded facilities.
- Cooperating with UCD in experimenting and utilizing beneficial insects and other practices.
- Minimize toxic pesticide use.
- Increased staff training and education on IPM.

Seven years later in 1996, the city council approved the creation of an IPM task force which was made up of UCD experts including IPM specialist, entomologist, weed scientist and plant pathologist as well as representatives of the US Forest Service and private landscapers. The task force primary goals were to:

- Reduce the pollution load of pesticides within the City of Davis
- Increase awareness and use of IPM by citizens via education & outreach
- Provide recommendations that will assist in improving the IPM program
- Reduce the use of pesticides within the city, by businesses and retail operations via technical assistance and education programs

The IPM task force report was completed in 1998 with the following conclusions:

- Identify the conditions causing pest problems.
- Devise ways to change conditions so as to discourage reoccurrence of pests.
- Select least hazardous combination of strategies to control the pests.
- Conduct on going training and IPM advisory assistance.

In 1998 the Environmental Protection Agency (EPA) awarded the City of Davis a PESP (Pesticide Environmental Stewardship Program) Grant Award for IPM Education. The IPM demonstration signs and "garden friendly" posting throughout the parks and greenbelts are remnants of that funding.

The IPM program came under review in 2000 by the Natural Resources Commission with the following recommendations:

- Continue reducing category II applications.
- Continue posting for pesticide applications.
- Continue the native grasses area conservation.
- Study the IPM coordinator option.
- Continue training efforts with citizens and staff.

2000 – 2007 Environmental resource supervisors (Open Space), wildlife resource specialist and the environmental compliance coordinator oversaw and reported on the IPM program.

2001 Local interest group requested the County Agricultural Commissioner to investigate herbicide use and reporting within the city. The investigation revealed only minor deficiencies with recordkeeping due to the size of the three departments. Each department would maintain records and coordinate IPM activities.

2005 Public Works develops an IPM plan, which includes:

- Less reliance on chemical controls.
- Maintenance of positive relations between the city's departments, regulatory agencies, and concerned public entities.
- Balancing weed controls within departmental economic constraints.

2007 Citywide pesticide use policy developed and IPM specialist hired.
2008 IPM Policy developed.

The citywide IPM Specialist position was staffed in the fall of 2007. The IPM Specialist coordinates citywide IPM activities, evaluates and trains field staff on alternative pest control methods, and keeps records for all departments. The position is currently funded between Parks & General Services (PGS) and Public Works (PW) departments.

Parks maintenance personnel in the PGS department as well as contractors are involved in pest control activities, mostly weed control throughout the parks, greenbelts, open space, and landscaped street medians. Public Works has three divisions involved in pest control activities. The Wastewater Treatment Plant (WWTP) personnel maintain the grounds around the plant, lagoons, overland flow, associated open space and treatment wetlands. Challenges posed here are maintaining the function of the overland flow process by controlling broadleaf weeds like curly dock, mustards and perennial pepperweed. The wetlands are constantly threatened by the spread of invasive weeds such as star thistle (*Centaurea solstitialis*) and perennial pepperweed (*Lepidium latifolium*). The transportation division maintains streets, roadsides, bike paths, and the old landfill/ pistol range site. Most weed control is done by a contractor who treats problem roadsides and non-landscaped traffic medians with herbicides in the late fall. The Collections division is in charge of maintaining stormwater flow within drainage channels, right of way

access and is responsible for maintaining the sanitary sewer system. Current pest control response is dictated by the results of pest population monitoring by field staff. Monitoring results are compared to action thresholds. Action thresholds include functional impairment, fire hazard, and aesthetic degradation. Functional impairments are infestations that impair the operation of a City facility, program, and/ or objective. Stormwater conveyance, for example, may be inhibited due to dense growth of invasive plants. In some instances aggressive pest species such as yellow starthistle (*Centaurea solstitialis*), and perennial pepperweed (*Lepidium latifolium*) are treated prior to threshold realization to prevent rapid colonization and habitat damage. Dense weed growth on City property, adjacent to private or public structures, creates a fire hazard. Weed infestations that occur in parks, bike or sidewalk paths, and road medians are considered hazardous and/ or of poor aesthetic value.

The following section presents the 2008 calendar year activities with regards to the City's IPM Program. IPM policies apply to all City departments. However, this report details P&CS and PW activities, as they have primary pest management responsibility.

3.0 Program Achievements in 2008

3.1 IPM Innovator Award

This award from the California Department of Pesticide Regulation (DPR) is given to organizations recognizing their efforts to reduce chemical pesticides via cultural, biological and mechanical control methods. Throughout the years DPR has given out more than 100 IPM Innovator awards to honor California organizations that emphasize pest prevention, favor least-hazardous pest management, and share their successful strategies with others. The awards are part of a comprehensive, reduced-risk pest management strategy aimed at homes, schools, farms, and the environment.

3.2 Our Water Our World (OWOW) Program

The OWOW program continued to be implemented at three pesticide retail stores in Davis (Davis Ace, Redwood Barn and Nursery, and Longs Drugs) in 2008. This program provides "Less Toxic" fact sheets and shelf tags set adjacent to pesticides. In addition to the written materials, store employees are given training regarding what products are environmentally conscience alternatives for pest control.

3.3 IPM Comic "The Exterminator"

The IPM and Stormwater Pollution Prevention Programs partnered to create a comic book for youth and young at heart that demonstrates least toxic approaches to managing urban household pests.

3.4 Alternative Pest Control Practices

Staff continued to work with alternative pest control methods including:

- **"Green pesticides"**: products derived from soap, acetic acid, herbal oils or microorganisms.
- **Biological control**: use of predatory organisms such as nematodes for grub controls on ball field turf, and promoting birds-of-prey to eat pest rodents.
- **Mechanical control**: removal of weeds by "weed wackers", tractor implements or hoes.
- **Grazing**: use of goats and sheep at Mace Ranch wildlife habitat.
- **Mulching**: use of wood chips to cover open ground, smothering weeds.
- **Sheet Mulching**: mulching but with cardboard or weed cloth barriers.
- **Flaming**: use of propane flamers to burn down broadleaf weeds.
- **Solarization**: use of clear plastic during the summer to pasteurize the soil, killing or debilitating most weed seeds.
- **Flooding**: use of flooding in the wetlands to deprive weeds of air.

3.5 City of Davis IPM policy incorporating Pesticide Hazard Avoidance and Exposure Reduction (PHAER) zones.

The city IPM Specialist revised the citywide IPM policy with the incorporation of the Pesticide Hazard and Exposure Reduction (PHAER) zones program. This strategy gives structure to the implementation process of the IPM policy in parks and greenbelts by allowing supervisors the needed flexibility in their management options and informing the citizens about the general level of pesticide hazard present on a site-by-site basis. These zones are designated as Green, Yellow and Special Circumstance Zones, with Green Zones providing the lowest potential for pesticide hazard and exposure. Each Zone has a corresponding pesticide list determined by existing toxicological data. Mace Ranch and Central Park are the first parks in the city to have the PHAER zone program implemented. Contracted landscape maintenance and pest control companies have been presented with this program and are expected to abide by it. Staff training of contracted company employees regarding this policy and project has been conducted in Spanish.

3.6 City partnership with the UC Davis Arboretum and volunteers on the Central Park demonstration garden project.

In 2007, city staff from both PW and P&GS participated in the design and development of the Central Park demonstration garden project. This project demonstrates the use of drought tolerant and native plants, zone irrigation, and alternative pest control. The city continues to collaborate with the arboretum with public outreach events related to the garden.

3.7 PW and PGS field staff received Pesticide Applicator Certificates

Developed and conducted preparatory courses for City of Davis staff seeking Qualified Applicators Certificates. Lead a class once a week for a month before the scheduled exams covering materials such as pesticide safety, laws and regulations, and IPM practices.

3.8 City of Davis IPM Web Site

Online information on the City's IPM program including access to the city's IPM and pesticide use policies, details on how to deal with local pests, links to other useful sites as well as details on the Pesticide Hazard and Exposure Reduction (PHAER) zones program. The Exterminator comic is also available to download.

4.0 Alternative Pest Control Activities

Several alternative pest control methods were continued in 2008 to reduce reliance on pesticides and meet IPM objectives.

4.1 *Weed management*

Mechanical Removal: Mowing, weed trimming, and tilling continued to be utilized by City crews to control weeds and stimulate native grass growth. Extensive mowing and tilling were used in 2008 at the WWTP, Davis Wastewater Treatment Wetlands (Wetlands), park and greenbelt facilities and various open space areas. Some of these efforts resulted in higher costs associated with labor and equipment maintenance, but helped to reduce herbicide use. Feasibility of future reliance on these methods may be reduced due to budgetary constraints.

Hand Removal: Seasonal employees and volunteers were utilized at the WWTP, Wetlands, and community garden sites to pull weeds from around landscaping and native plant restoration areas. Similar to mechanical removal this control method increases labor. Cuts in City labor force could reduce feasibility of this method; however, volunteer service may help to reduce costs.

Flooding: Water level management continued to be effective at controlling weeds and Canada goose nest density at the local stormwater detention basins and the Wetlands. Water levels were raised onto the seasonal benches during winter months and allowed to remain into spring.

Rx Burning: Prescribed fire was used at the Wetlands to stimulate native grasses and reduce weed seed production.

Grazing: Livestock grazing is utilized at the Mace Ranch Community Park habitat area and Yolo County Grasslands burrowing owl preserve to meet burrowing owl habitat objectives. Livestock are free ranged for 2 months to meet this goal.

Use of Native Vegetation in New Landscaping Projects: The City continued to utilize native trees, shrubs, and grasses in municipal landscape projects. Native plants were included in the landscaping of the new Central Park Garden. Native grasses were seeded along several pond benches at the Wetlands. Once established native vegetation can successfully out compete weed species. This helps to reduce weed management activity. Native plants also require less irrigation, which reduces risk of offsite movement of fertilizers or pesticides into the stormwater system. The use of native plantings increases the costs of the project. Reliance on the use of native plants may be reduced due to budgetary constraints.

Weed Habitat Removal: P&GS landscape contractors and park field staff continued to maintain mulch around landscaped areas. Mulch helps to smother weeds and reduces the need for fertilization and water.

Proper Timing of IPM Control Activities: Continued monitoring of weed development led to proper timing of weed management. Growth stage of weeds often dictates type of management method to be used.

Organic Herbicide: Trials with these products continue be tested and are showing promising results. Concentrated acetic acid (vinegar) in combination with a soap based herbicide or with the herbal oil based herbicides have shown promise in burning down annual broadleaves. This is encouraging for areas that are sensitive to conventional pesticide use due to human and pet exposure or wildlife habitat. Work will continue in other areas as well, especially those that relate to water quality issues.

Weed Flaming: Propane flamers are utilized when conditions of high humidity reduce the options for other forms of weed control. This technique is effective on small, recently germinated broadleaf weeds.

4.2 *Other Pest management*

City Stormwater Basins and Wetlands Pest Control: Mosquito control within the local stormwater retention basins and at the Wetlands continued to be through water level manipulation and biological control only. Bringing water levels down during the peak mosquito production time allows predatory species to access larvae. All areas continued to support sufficient populations of predatory mosquito fish (*Gambusia affins*).

Rodents were controlled in a couple of parks by placing secure baiting stations in strategic areas. Results were achieved in a couple of weeks. Musk rats and ground squirrels within stormwater basins, WWTP, Wetlands and parks were removed as needed via both non-lethal/non-toxic live trapping and least toxic baiting. The city has also implemented a barn owl nest box installation program in parks and neighborhoods. The program aims to increase the population of natural predators to help regulate rodent pest species within the city planning area.

Hackberry tree aphid control on some parks and parking lots are preformed using imidacloprid to control the aphid and thus the production of honeydew. This product is also occasionally used to

control beetle grubs on the fields at Playfields Park. Predatory nematodes are used as a preventative on these grubs but if population thresholds are exceeded the insecticide is used.

Sewer line root control is conducted by the Collections division of PW as part of a comprehensive sanitary sewer maintenance program. This regulatory mandated program aims to prevent sanitary system overflows or system failure by controlling, among other things, root intrusion. Root control includes, but is not limited to, the use of Vaporooter, a class one category pesticide. Prior to 2008, this product was not included in pesticide use reporting due to a misunderstanding of product registration. Since becoming aware of this error, changes have been made to include the product in pesticide reporting and ensure that it is used in accordance to the City's pesticide application policy. Mechanical methods as well as alternative herbicides will be evaluated to determine the most efficient and safe way to control root intrusion in the sewer lines.

5.0 Public Outreach and Education

The City continued to provide public outreach and education on pesticides using several forms of communication. City staff was also educated on weed and pest control techniques and current trends in IPM. Outreach and education efforts included:

- Development of City of Davis' IPM website.
- Development of IPM comic "The Exterminator".
- Notification of City herbicide application activities in parks and greenbelts via the Pesticide Hotline.
- Tips and alternatives to pesticide use provided in the annual PW sponsored "Utility Connections" and citywide "Focus" newsletters.
- Distribution of IPM educational literature at community events. The city partnered with the Master Gardener Program to provide free advice at the Celebrate Davis event. The Davis Green Home and Garden Expo provided opportunities to display the city's effort at least toxic pest control. Tables featured the OWOW program, bat and owl boxes as well as pamphlets and handouts on our pest control programs among other things.
- Periodic presentations at local schools regarding stormwater quality including tips and alternatives to pesticide use.
- Presentations on least toxic pest control at the community gardens, Central park garden and the Mace Channel Herb Garden.
- City sponsored annual Horticulture Pest Control Seminar where continuing education units are available to city staff and other pest control professionals from the school district and surrounding communities.
- Pesticide safety training for City field staff.
- Attendance at IPM conferences by departmental staff involved with IPM coordination.
- Annual presentations to the city council and citizen advisory commissions.
- Encouraging local pesticide venders to participate in the OWOW program.
- Use of positive posting at location where alternatives to chemical pest control were in use.

6.0 2008 Pesticide Use

TABLE 1: Summarizes pesticide use[1] by product for calendar year 2008 with comparison to 2005 through 2008.

Product	EPA Category	2005 Use	2006 Use	2007 Use	2008 Use
Round-up [3]	III	101 gal	100 gal	180 gal	127 gal
Vaporooter [7]	I	No data	No data	No data	19.5 gal
Surflan As	III	0 gal	0 gal	0 gal	0 gal
Prepair	III	0 lbs	7.7 gal	0 gal	0 lbs
Atrimec	III	13.5 gal	0 gal	0 gal	0 gal
Safer Soap	III	0 gal	2.7 gal	6.1 gal	0 gal
Garlon 4	III	3.7 gal	20.8 gal	22 gal	1.1 gal
Goal [1]	II	17.8 gal	100 gal	180 gal	21.2 gal
Manage	III	2.2 lbs	0.006 lbs	0.9 g	1.3 g
Turflon	III	1.1 gal	0.2 gal	0.03 gal	3.1 gal
Transline	III	0.26 gal	1 gal	0.3 gal	1.3 gal
Telar	III	10.8 oz	17 oz	36.1 oz	8.7 oz
Fusilade	III	0 gal	0.02 gal	0.06 gal	0.25 gal
Aquamaster [8]	III	13.3 gal	1.5 gal	3.9 gal	1.8 gal
Merit	III	8.4 gal	8.5 gal	0 gal	0 gal
Direx 4L	III	6.8 gal	2.5 gal	4.7 gal	0.5 gal
Snapshot	III	4825 lbs	2922 lbs	3325 lbs	5900 lbs
Shark	III	0 gal	0.03 gal	0 gal	0 gal
Clarity [2]	I	1 gal	2.6 gal	1.1 gal	0.7 gal
Weedar 64 [2]	I	5 gal	1.9 gal	3.4 gal	2.2 gal
Barricade	III	0 gal	0.2 gal	5.2 gal	2.3 gal
Greenmatch [6]	III	0 gal	0 gal	1.3 gal	0 gal
Zenith 75WSP	III	0 gal	0 gal	0.3 gal	0.4 gal
Sedgehammer	III	0 lbs	0 lbs	3.8 g	104.3 g
Payload	III	0 gal	0 gal	2.7 gal	2.5 gal
Pendulum	III	0 gal	0 gal	0 gal	500 lbs
Scythe	II	0 gal	0 gal	0 gal	1.3 gal
Landmark	III	0 gal	0 gal	2.3 gal	0.9 gal
Milestone	III	0 gal	0 gal	2.9 gal	0.5 gal

Notes:

[1] Used primarily in native grass restoration sites with limited public access (e.g. outlying open spaces and Davis Wetlands). Includes Goaltender.

[2] Use of this material is restricted to the Overland Flow process of the Wastewater Treatment Plant. Public access is prohibited.

[3] Combined Round-up products (Ultra, Pro, Weather max).

[6] Organic herbicide

[7] Used in sewer lines to remove intruding roots

[8] Includes Rodeo, the old name for Aquamaster (aquatic glyphosate formulation)

[1] Includes City contracted pest control applications.

6.2 *Comparison of 2008 Usage to 2007 Usage*

Use of liquid products in 2008 was 45% lower than in 2007 (416 gallons vs. 187 gallons). Solid products were used more (56%) in 2008 than in 2007 (5900 pounds vs. 3325 pounds). The data suggests that in years where pre-emergence herbicides increases, post emergence use decreases. This year the use of pre emergence is lower in the first two months and is expected to reduce for the rest of the year. The use of post emergence herbicide is also expected to decrease somewhat because of the increased use of "green herbicides" as a substitute in some situations.

6.3 *Pesticide Use by Management Area*

The City currently manages 1736 acres of land that are subject to IPM. This acreage is divided into 6 major management areas including: Parks, greenbelts, and streetscapes (528 ac.); Open Space (548 ac.); Transportation System (30 ac.): Stormwater System (101 ac.); Wastewater System (489 ac.); and Facilities (40 ac.). The 6 major areas are further divided into sub areas. Table 3 details the sub areas and offers a percentage of total annual use by major area,

Table 2: Percentage of total pesticide use by major area in 2008 with 2007 comparison.

Major Area	Sub Area	Acres	% of Total Use 2008/ 2007
Parks, greenbelts, and streetscapes		**528**	**46/ 60**
Open Space		**548**	**2/ 2**
	Agricultural buffers		
	Restoration areas		
	Mitigation habitat		
Transportation System		**30**	**7/ 8**
	Street median and Shoulders		
	Sidewalks		
	Bike paths		
Stormwater System		**101**	**<1/ <1**
	Detention/habitat ponds		
	Drainage stations		
	Conveyance channels		
Wastewater System		**489**	**34/ 28**
	Wastewater Plant		
	Davis Wetlands		
	Sewerline Root Control		**10/NA**
Facilities		**40**	**1/ 2**
	Old landfill/ pistol range		
	Corp yards, facility parking and landscaped areas		
		1736	**100**

7.0 Program Goals and Challenges for 2009

7.1 IPM Goals for 2009

PW and P&GS will continue to investigate and utilize feasible alternative pest control methods as directed by the IPM Specialist. PW will continue to implement its herbicide reduction plan to further refine pest control activities for less reliance on conventional pesticides.

The following parks will be included in the PHAER zones program:

- Winter of 2009: Central Park and Mace Ranch Park
- Spring of 2009: Arroyo Park, Walnut Park and Community Park.
- Summer 2009: Pioneer Park, Slide Hill Park, Chestnut Park, Sandy Motley Park.
- Fall 2009: Westwood Park, Barovetto Park, North Star Park and Sycamore Park.

The IPM Coordinator will continue to work on outreach such as an "Adopt-a-Park" program that recruits volunteers to participate in alternative weed control at select parks in Davis.

Public outreach and education on IPM will continue through literature and staff presentations at various public events.

Trainings will continue for P&GS and PW staff on pesticide safety and IPM practices.

Crew supervisors from PW will continue to test alternatives to current sewer line root control methods. Tests on alternative herbicides and methods will continue in order to find a less toxic alternative.

7.2 Anticipated Challenges for 2009

Pest control strategies are dictated by weather, pest persistence and staff availability to implement management techniques. Persistence of infestations and budgetary constraints may hinder alternative control methods and cause an increased reliance on conventional methods primarily because of the service level standards expected by the community. While the majority of staff has accepted and works with IPM practices, some concern of effectiveness of alternative methods continues. The IPM specialist will continue to work with staff and management to keep them informed on pesticide regulation updates, safety, and conduct field trial to demonstrate alternatives, their effectiveness, limitations and costs.

Natural Resources Commission
City of Davis, California

NRC Agenda
Date: March 23, 2009
Item: 10

2008 Annual Hazardous Waste Sites Report

Introduction

One of the functions of the Natural Resources Commission (NRC) is to periodically investigate the status of cleanup activities at hazardous waste-contaminated sites in the City, and to report on the results of those investigations, with recommendations as appropriate, to the Davis City Council. This task, which has been performed by the NRC since 1988, has evolved into an "Annual Hazardous Waste Sites Report." In conducting this task, Commission members typically consult with staff from the cognizant regulatory agencies; they also review pertinent technical reports and correspondence, review online information, and run queries on available hazardous waste databases. This report is the NRC's Annual Hazardous Waste Sites Report for 2008.

Regulatory Sources

Various government agencies are involved with contaminated site identification, characterization, monitoring, and cleanup. At the State level, primary responsibility for the enforcement of water quality regulations rests with the Regional Water Quality Control Board. For Davis and much of the Central Valley, the responsible regional board is the Central Valley Regional Water Quality Control Board (RWQCB). Another State agency with hazardous waste-related functions is the State Department of Toxic Substances Control (DTSC), a branch of the California Environmental Protection Agency (CalEPA). The DTSC regulates hazardous waste, conducts and oversees cleanups, and promotes pollution prevention.

In the City of Davis, the Central Valley RWQCB is generally the responsible agency for managing the characterization and cleanup at most contaminated sites. Also there are two designated "Superfund" sites in Yolo County – the Frontier Fertilizer Site in East Davis and the LEHR Site on the UC Davis campus; cleanup of these federally designated sites is managed by the US Environmental Protection Agency (USEPA). The Yolo County Health Department also provides environmental health information and services throughout the County, including the City of Davis; among their related programs are storage tank programs and a hazardous material program.

Initial List of NRC Hazardous Waste Sites for 2008

The current members of the Natural Resources Commission accepted assignments to investigate the following nineteen hazardous waste sites in 2008; these site-specific reports are first listed and then presented below:

- Frontier Fertilizer Superfund Site – 4303 Second Street
- Former Texaco Station – 712 G Street
- Fifth and G Streets
- Lewis Cleaners – 670 G Street
- Former Shell Station – 435 G Street
- Davis Liquor & Food – 4810 Chiles Road
- Munich Amalgamated (Court Galvanizing) – 2500 Fifth Street
- 203 J Street
- Davis Amtrak Station – 840 Second Street
- Cable Car Wash – 904 Third Street
- Old Davis Landfill – Pole Line Road
- Union 76 Service Station – 2002 Lyndell Terrace
- Timperly Property – 1700 Olive Drive
- Arco Station – 705 Russell Blvd.
- George Jandera Property (Mobile Service Station) – 1600 8th Street
- Chevron Station 9-1420 – 1935 Anderson Road
- Shell Station – 1944 Anderson Road l
- Circle K – 1930 Lake Blvd.
- Lehr Site

Date: Revised, February 2009

Site Name & Location: **Frontier Fertilizer Superfund Site**
The approximately 8-acre Frontier Fertilizer Site is located at 4303 Second Street, on the north side of Second Street, southeast of the Mace Ranch residential subdivision, in East Davis. Land north of the site is planned for development as the Mace Ranch Light Industrial/Business Park. Fertilizer Superfund Site includes a triangular shaped 11.43-acre parcel, Assessor's Parcel Number 071-412-031, owned by Pine Tree Properties; and an adjacent 7-acre parcel which is part of a 10.98-acre parcel, Assessor's Parcel Number 071-411-07, known as the "Remainder Parcel." The National Superfund Database Number (CERCLIS) is # CAD071530380

Commissioners Name: Bruce Kemp (2006 material); Mark Lubell (2009 update)

City Contact Name and Number: Bob Weir, Public Works Director, 530-757-5686; bweir@cityofdavis.org

Federal Agency Contacts: Bonnie Arthur, U.S. Environmental Protection Agency (EPA), Region 9, San Francisco, 415-972-3030, arthur.bonnie@epa.gov

Mary Simms, USEPA, Region 9, San Francisco. 415-947-4270, simms.mary@epa.gov

State Agency Contact: Steve Ross, California Environmental Protection Agency, Department of Toxic Substances Control (DTSC), Sacramento, 916-255-3694; sross@dtsc.ca.gov

Community Contact: Pam Nieberg, Frontier Fertilizer Superfund Oversight Group (FFSOG), 3010 Loyola Drive, Davis, CA 95616, 756-6856; pnieberg@dcn.davis.ca.us

Contaminants of Concern: The main contaminants in the soil and groundwater at the Frontier Fertilizer Site are chemicals that were formerly used as pesticides and soil fumigants: ethylene dibromide (EDB); 1,2-dichloropropane (DCP); and 1,2-dibromo-3-chloropropane (DBCP). The contaminant 1,2,3-trichloropropane (TCP) has also been detected. The solvent carbon tetrachloride is also present in an apparently separate plume. EPA has found that exposure to EDB, DCP, DBCP, and TCP can have a variety of adverse effects to human health, including cancer and damage to various organs and systems, including the reproductive system. Carbon tetrachloride (also known as tetrachloromethane), has been found to cause damage to organs and to be a human carcinogen.

In 2008, there was *new contamination detected* outside of the monitoring wells that previously marked the edge of the plume. Specifically, a one-time groundwater sampling test called a "cone penetrometer" detected TCP about 150 feet northeast of the Target footprint in both of the top two aquifers, at levels high enough to pose a cancer risk. Whether this detection was just a one-time incident or indicative of further spreading of the groundwater contamination is unknown at this time; the groundwater generally moves to the NE so it is possible that contamination has spread. As a response, EPA developed a work plan in February 2009 to complete a range of more intensive monitoring; the Frontier Fertilizer Superfund Oversight Group (FFSOG) citizen's group (see more detailed discussion below) is currently satisfied with this monitoring plan. The surprise detection also increased the involvement of both Yolo County and City of Davis in the remediation process; County Supervisor Jim Provenza and City Councilmember Don Saylor are attending citizen group and other related meetings.

Background: Two former businesses operated pesticide and fertilizer sales and distribution businesses on the site: the Barber-Rowland Company from 1972 to 1982 and the Frontier Fertilizer Company from 1983 to 1987. The businesses operated primarily on four acres on the west side of the property where they stored, mixed, and sold pesticides, herbicides, and non-bulk chemicals in cans, drums, and other containers. Both companies used a 4,000-cubic-foot, unlined disposal basin in the northwest portion of the site to dispose of residual and unused pesticides and fertilizers.

In the early 1980s, following the discovery of toxic chemicals, Yolo County and then the State of California began to pursue corrective and remedial actions. In 1985, the Regional Water Quality Control Board (RWQCB) and the California Department of Toxic Substances Control (DTSC) authorized the removal of approximately 1,100 cubic yards of contaminated soil from the disposal basin area, to a depth of 20 feet. The State installed a small extraction and treatment system in 1983; the first groundwater monitoring wells were installed in 1985 and 1986. The site was placed on the California State Priorities List of hazardous waste sites in 1987. Various contamination assessments, remedial investigations, feasibility studies, and risk assessments were conducted between 1987 and 1992, and additional monitoring wells were installed.

In 1994, the U.S. Environmental Protection Agency (EPA) assumed responsibility for investigation and cleanup efforts after the site was added to the National Priorities List (Superfund). The Frontier site is somewhat unique because the money is coming directly from EPA, not from a "potentially responsible party" that owns the land. This is because the previous

owners are no longer in business and thus cannot pay for clean-up. The Frontier Fertilizer Superfund Oversight Group (FFSOG), a community group, was also formed at that time. Since 1995, EPA has been operating a groundwater extraction and treatment system with periodic upgrades and expansions. Over the years, the contamination plumes have evolved, but so has the interim extraction and treatment system. More recent work during 2004 and 2005 included expansion and improvement of the groundwater pump-and-treat system, including the installation of high capacity extraction wells south of Mace Ranch and a new extraction well near the old disposal basin. The new system appears to be extracting contaminants at a substantially higher rate than before. The improved and maximized pump-and-treat system continues to operate 24 hours per day.

CERCLA and Remediation Plan Implementation: The major developments at this site are primarily related to milestones in the CERCLA process. The Final Feasibility Study was issued in June, and a public comment period for EPA's Proposed Remedial Action Plan was held in June and July. The preferred remedy calls for in-place heating (thermal treatment) with vapor controls for about one year. The actual number of electrodes or heating wells and the operating temperatures for treatment will be determined in the design stage. The plan also calls for continued groundwater pumping and removal of contaminants. Biological treatment of nitrates would be a secondary priority; the treatment involves injection and land application of beer fermentation wastes to stimulate microbial activity.

A Final Record of Decision for the remedial plan was signed on September 28, 2006. The ROD included the expected remediation technology—in-place heating of 89,000 cubic yards of soil, plastic cover over the source area for vapor control, and the ground-water extraction and monitoring system. Groundwater treatment will continue until monitoring indicates that the Federal and California Maximum Contaminant Levels (MCLs) for groundwater are achieved. The MCLs, which are Safe Drinking Water Act regulatory standards, are established in the ROD as the cleanup levels for groundwater. The final ROD contains several elements not mentioned in the 2006 NRC update. Although not a primary contaminant of concern, the remediation plan will evaluate the possibility of biological controls for nitrates (the city of Davis may have set a standard for this?). There continues to be scientific debate about the effectiveness of any bioremediation components of the plan. Restrictions are going to be built into the property deeds requiring any development to take into account the remediation plans, and public access to the site is restricted. A cap of appropriate materials will be placed over the site after clean-up to prevent further ecological contact. The total cost of the remediation is expected to be $18,413,000 (ROD), but the price tag could increase depending on how much residual contamination is left after in-situ heating.

The remedial plan is currently in the design stage (the ROD lays out the basic goals of the plan, but the official "Remedial Action Plan" or RAP is created by the contractors), and CH2M Hill is the contractor with another company to implement the heat treatment. Implementation of in-situ heating is expected to begin in the summer 2009. The basic idea behind the in-situ heating is to remove the source of the contaminants, and then to continue monitoring and extracting groundwater until the water quality standards are met. The groundwater has a 20 year residence time, so removing the sources will require multiple years of continued extraction. The

effectiveness of the in-situ heating is not completely certain; they may not be able to meet the MCL standards and so the clean-up standards could change in the future and monitoring and extraction may continue for years.

Other "changes" regarding the site have to do with surrounding land use, specifically the Second Street Crossing (Target Store) Project proposal on the adjacent property, which is the subject of Measure K on the November ballet. A number of groundwater monitoring wells, piezometers, and extraction wells associated with remediation of the Frontier Fertilizer Site are located on or immediately adjacent to the proposed Target Project site.

In 2008, EPA signed an Agreement on Consent (Agreement) with Target to enable redevelopment of land adjacent to the Site while not impeding cleanup efforts. Under the Agreement, Target, with EPA oversight, will fund and perform the movement of eight ground water monitoring wells at privately-owned parcels lying to the north and west of the Frontier Fertilizer Superfund site. This Agreement directs Target to perform certain activities related to relocation and abandonment of ground water monitoring wells on the Target property at Second Street near Faraday Avenue. At the time of this writing, Target has completed the abandonment and relocation of these wells. The agreement also required Target to install "soil gas" monitoring pipes, which has also been done. Although not in the formal agreement, EPA has asked Target to implement several mitigation measures at the time of building construction, including piping underneath the building, a gravel layer, and air monitoring. Target has given written confirmation of these actions to EPA, according to Bonnie Arthur (see attachments).

Community involvement: A citizen oversight committee, Frontier Fertilizer Superfund Oversight Group (FFSOG), has been actively involved with monitoring cleanup efforts for this site since 1994. The FFSOG has received grants from EPA and has a paid technical advisor, Steve Deverel, Ph.D. FFSOG's main concerns are the continued migration of contamination in groundwater, land development in the area that could impede or delay cleanup efforts, and health and economic risks potentially associated with the contamination.

It the 2006 update, the FFSOG expressed technical concerns regarding some aspects of the process and the proposed plan. The group believes that EPA is attempting to rush ahead toward a Record of Decision. They also question the efficacy of biological treatment for the nitrate contaminants. FFSOG submitted comments on the proposed plan. The group has also developed a set of proposed community acceptance criteria.

In 2009, the FSSOG is still active with monthly meetings and is preparing to monitor the implementation of the remedial plan, especially the beginning of the in-situ heating process. EPA is currently working on community outreach plans (due March/April 2009) to enable public participation and education during the treatment process, because especially the neighboring citizens are concerned about possible toxic air releases from the site. As mentioned earlier, one aspect of the remedial plan is a plastic cover for vapor control. Pam Nieberg of the FFSOG said they are generally satisfied with progress at this point; EPA and Target appear to be cooperating. Of course they are keeping an eye on things and working to update the community.

Conclusion: Contaminants from the Frontier Fertilizer Site have infiltrated the groundwater

underlying the area and migrated north to include a portion of Mace Ranch and the currently vacant property to the north where the Target Store Project is proposed, with the possibility of further migration to the northeast. The contamination is comparatively shallow, and does not affect the City's drinking water, which is derived from a deeper aquifer. Recent improvements in the EPA system have substantially increased the treatment rate. EPA is continuing to work toward a long-term remedial solution and has identified a preferred remedy.

The 2006 update identified two concerns that remain valid in 2009. The first is that the city should continue to monitor the schedule for implementing the remedial plan. EPA's schedule for getting to the Record of Decision slipped in the past; the proposed plan and Record of Decision were expected in 2005, with remedial action getting underway in April of 2006. But the actual final ROD was not signed until 2006 and the treatment will only begin in summer 2009. Why exactly these delays have occurred is unclear; delays due to bureaucratic hurdles and funding issues are typical in these types of projects. Furthermore, some of the citizen participation comments criticized EPA for moving too fast in the development of the plan. Regardless of these delays, the ROD is now in place, the RAP is being designed, and treatment is expected to begin in the summer. So the focus should now shift to monitoring implementation.

The second concern is whether the proposed Target Store Project (or, for that matter, any major development on the adjacent light industrial / business park) would have any indirect or direct effects in terms of delaying or interfering with remediation efforts at the Frontier Fertilizer Site. Steps have now been taken to deal with these issues, including an agreement between EPA and Target to reconfigure the monitoring system at the Target site, and also the promised implementation of mitigation measures during the Target construction. Obviously, the city should continue to monitor this situation to make sure Target lives up to its commitments.

Specific Recommendations: As noted in our last update, the NRC continues to recommend that the City monitor the EPA's CERCLA process. In addition, the City should continue to recognize and commend the Frontier Fertilizer Site Oversight Group for its efforts in overseeing the cleanup.

2006: The NRC's comments on the Draft EIR for the Target Project provided several additional recommendations. The NRC recommended that the EIR include documented statements from EPA to confirm that development of this project as proposed will not interfere, delay, or otherwise adversely affect ongoing remediation. Any conditions, specifications, or recommendations identified by EPA should be incorporated into the proposed project design. The NRC also recommended that mitigation measures involving any aspect of the Frontier Fertilizer Site monitoring and cleanup specify that coordination is required with the FFSOG. The NRC also recommended that additional language be added to the mitigation measures stating that any replacement wells and other equipment relocation found to be necessary to avoid significant adverse effects of the proposed development on the ongoing remediation of the Frontier Fertilizer Site shall be installed and proven operational to the satisfaction of EPA prior to the removal or abandonment of any existing wells and equipment. All costs associated by such relocation and replacement shall be borne solely by the project proponent.

2009: The NRC recommends ascertaining the extent to which the Target agreement is being implemented, including the construction mitigation. Also, the NRC recommends development of a "milestone" checklist with expected dates of completion, which can be easily monitoring on an annual basis. The biggest threat to this project is delays due to funding. The NRC recommends inviting the technical coordinator of the project to a hearing to provide an update on the scientific underpinning of the clean-up process and also any new information about the plume, since debate continues about both the extent of the plume and the effectiveness of treatment. Probably the most important concern is whether or not the clean-up process will meet MCL standards, and NRC recommends maintaining a preference for those higher standards.

Sources:

- EPA websites, including http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/vwsoalphabetic/Frontier+Fertilizer?OpenDocument (up-to-date until 5/1/2008; the Record of Decision is available here)
- Bonnie Arthur, EPA, personal communications
- Frontier Fertilizer Superfund Site Oversight Group website http://yvm.net/go/pnieberg/
- UCD websites including http://www.lib.ucdavis.edu/dept/govinfo/news/frontier.php
- City of Davis 2006. Second Street Crossing (Target Store) Project Draft Environmental Impact Report.

Attachments:

- FFSOG Recommendations (2006)
- Notes from Mediation Sessions (2006)
- Frontier Fertilizer ROD (2009)
- CH2MHill Workplan and Target site analysis (2009)
- Target letter to EPA (2009)

Site Name & Location: Former Texaco - 712 G Street, Davis

Commissioners Name: Brook Gale

City Contact Name and Number:

Regulating Agency Contact Name & Number: Regional Water Quality Control Board (lead agency) Central Valley Region 5S, David Stavarek (916) 464-3291

We have requested that Chevron define and remediate gasoline hydrocarbons in groundwater. The latest work in June 2008 indicates that two additional shallow monitoring wells and two deep wells were installed onsite to further monitor the plume of hydrocarbons and to provide additional observation wells for proposed groundwater remediation. A plume of dissolved gasoline hydrocarbons is present in shallow groundwater (approximately 15 to 50 feet bgs), but not detected in deeper groundwater (65 to 75 feet bgs). The plume is defined and appears to be limited to the general central portion of the property.

recent groundwater data:
Concentrations of total petroleum hydrocarbons as gasoline were up to 68,000 micrograms per liter (ppb) Benzene up to 11,000 ppb Toluene up to 4,400 ppb Ethylbenzene up to 2,400 ppb Xylenes up to 6,900 ppb

Chevron will begin a pilot study of groundwater remediation using a ozone microsparge system after receiving RWQCB review of their proposal. A response letter regarding review of their proposal will be sent to Chevron in the next week.µ

Date: February 23, 2009

Site Name: 5th & G Street - USDA Site

Contaminant of concern: PCE

Commissioner's Name: Dean T. Newberry

Outside Agency: RWQCB Contact: Brian Taylor at betaylor@waterboards.ca.gov.. 916-464-3291

This Site (USDA) has been completed, closed and developed, and is not listed on the Geotracker at the California State Water Resources Control Board. Adjacent sites at 408 G Street and 435 G Street have been completed, closed and developed as well. This site should be removed from the Hazardous Waste Site Update List.

Background: The contamination (PCE) at this site is bounded by Fifth Street on the north, Fourth Street on the south, F Street on the west, and the railroad spur on the east.

The groundwater flow is toward the southeast. At this site, the City is responsible for compliance with the conditions of RWQCB Resolution 99-002, which requires that the City remove 75 percent of the PCE in the underlying groundwater and attain the groundwater cleanup goal of 5 ∝g/L. The cleanup is subject to a $500,000 spending cap, a substantial portion of which has been spent. A Groundwater Extraction Treatment System (GETS) has been in place since 2000 to attempt mass removal of contamination. Operation of the GETS is required by Resolution 99-002; quarterly groundwater monitoring is also conducted.

The GETS has been extracting groundwater at an average rate of approximately 1.5 gpm, which is approximately 25 percent of the rate required by Resolution 99-002, and this may not be effective at decreasing the concentrations in groundwater. The 3rd quarter monitoring report submitted in 2004 indicated PCE detected at 18 ∝g/L. RWQCB staff is of the opinion that, at this rate, the cleanup goal will not be reached, and they contend that the City is not meeting its obligations with respect to Resolution 99-002. City staff disagrees with this interpretation and have taken the position that the City's obligations are being met in compliance with Resolution 99-002 and the spending cap. The City completed a GETS Optimization Work Plan in January 2004, which evaluated several remedial options to supplement the current GET system. RWQCB staff reviewed this Work Plan and concurred with the City's proposal to redevelop the existing extraction well to improve the extraction rate. An additional extraction well has also been approved. RWQCB staff expects that the City will apply for a containment zone for this site, but they do not think that the site will comply with the requirements for a containment zone designation.

Date: February 23, 2009

Site Name: **Lewis Cleaners - 670 G Street**

Contaminant of concern: PCE

Outside Agency: SRWQCB Central Valley Region 5S

Contact: Duncan Austin, daustin@waterboards.ca.gov, telephone # 916-464-3291
Case#: SL186162974

Assessment: This site is a mess. Remediation is being blocked by an ongoing lawsuit. This site is not being remediated at this time, the extraction equipment is basically in place, but is missing a blower needed to operate extraction. Duncan Austin at the State Water Resources Control Board would like to proceed with cleanup. The property owners would like cleanup to proceed. However cleanup is in Federal Litigation. The previous owners, the Lewis family, attorney has made an undisclosed settlement offer. The City of Davis attorney seems to be blocking the city's participation in a settlement conference. Neighbors of the site have an active PCE leak under their house. The state has installed a ventilation system in their

house to protect the occupants.

I recommend that the NRC forward a recommendation to the City Council to ask the city to participate in a settlement conference with the other parties with the goal of continuing site remediation and cleaning up the site to protect the health and welfare of the residents of the City of Davis.

Date: February 23, 2009

Site Name: 5th & G Street - Shell Station Site – 435 G Street

Commissioner's Name: Dean T. Newberry

Contaminant of concern: Gasoline and Lead

Outside Agency: California Regional Water Quality Control Board Central Valley Region 4/5 May 2006 ITEM: 3 SUBJECT: Executive Officer's Report. Fresno (559) 445-5116, Redding (530) 224-4845, and Sacramento (916) 464-3291

This Site 434 G Street, Shell Station, has been completed, closed and developed. This site should be removed from the Hazardous Waste Site Update List.

Background: In January 2003, three 10,000-gallon USTs, dispensers, associated product pipelines, and site buildings were removed from this former Shell service station. Soil and groundwater investigations show that groundwater is not affected by petroleum hydrocarbons, but lead was detected at up to 82 milligrams per kilogram in soil and up to 470 ∝g/L in groundwater. Work to investigate the extent and potential environmental and health threat of the lead is scheduled. Quarterly monitoring of groundwater continues [RWQCB 2005].

This site was previously reported by the NRC as part of the "Davis Center Sites." This site has been developed with 5,000 sq. ft. of retail space on the first floor and eight townhouses on the second and third floors. The project was approved by the City Planning Commission hearing on January 26, 2005 and by City Council on February 15, 2005. A condition of approval requires the applicants to submit verification to the City that the onsite soils have been remediated to the satisfaction of the applicable regulatory agencies for the proposed use prior to the issuance of a building permit.

Yolo County
In January 2003, Shell removed the UST and associated system structures. Demolition of the station building and hydraulic lifts occurred in March 2004. Soil and groundwater investigations showed petroleum hydrocarbons were not of concern. Lead in soil above background concentrations was removed and disposed to an appropriate disposal facility. Lead was shown not to be a threat to groundwater or human health. A sensitive receptor survey showed the

nearest water supply well is 1,000 feet from the site.

Documentation submittal to Geotracker was completed and the four monitoring wells were destroyed according to Yolo County ordinances and under appropriate permits from Yolo County Environmental Health Services. A No Further Action Required letter was issued. (DFS)

Updates: **No Further Action Required - Underground Storage Tanks (UST)**

Date of Site Review: June 23, 2008

Site Name & Location: Davis Liquor and Food - 4810 Chiles Road (case #570302)

Commissioner's Name: Herman Boschken

City Contact: Unknown

Regulating Agency Contact Name & Number: Regional Water Quality Control Board (lead agency) – Central Valley Region 5S, David Stavarek (916) 464-3291

Contaminants: Gasoline (TPHg), benzene, and MTBE

Background: The site is an active retail station dispensing gasoline and diesel at a convenience store. In April 1999, two 10,000 gallon and one 12,000 gallon diesel USTs were replaced with three gasoline and two diesel USTs. Soil and groundwater investigations have defined an elliptical plume of gasoline hydrocarbons beneath the site that is approximately 50 feet trending northwest to southwest. The plume is centered beneath dispenser islands. The vertical limit of the plume is approximately 30 feet bgs. In March 2005, concentrations of TPHg, benzene and MTBE in shallow groundwater were as high as 6,500, 310 and 110 ug/l, respectively.

Changes Since Last Update: The site is currently in remediation after tests in December 2006 on the nearest water well (MW3) showed continued presence of TPHg, benzene and MTBE at levels of 5000 ug/l, 430 ug/l and 27 ug/l, respectively (deemed a serious condition). Between November 2006 and February 2007, a groundwater extraction system was utilized to reduce contaminant levels. Subsequent to the extraction procedure, three tests at MW3 were taken in 2007 (March, June and October) to determine concentrations of TPHg, benzene and MTBE. Results varied significantly, probably due to changes in the water table level corresponding to the season. In January, 2008, a fourth test showed no detection of these contaminants.

Conclusion: Although the three contaminants are present in the plume, the principal concern is with benzene. The most recent test which showed no detected contaminants is encouraging, but tests will continue for at least another year.

Specific Recommendations: Continue testing to confirm contaminants have not reappeared and affirm the plume is stable.

Date: February 5, 2009

Site Name & Location: **Munich Amalgamated / Court Galvanizing -** 2500 5th Street

Commissioner's Name: Charles Ehrlich

City Contact: Marie Graham, Public Works Department, 530-757-5686

State Agency Contact: California Regional Water Quality Control Board - Central Valley Region, Amy Terrell, Engineer, (916) 464-4680

Groundwater monitoring conducted in August 2008 show that the constituents of concern are predominately zinc and sulfate, which are mostly located on-site in the area of the former evaporation pond. The concentration of the pollutants chromium and nickel have declined to levels near or below their respective cleanup levels, as shown in the August 2008 groundwater monitoring results.

A groundwater extraction and treatment process that Mr. Munich operated between about 1994 and 2001 was responsible for reducing the extent and quantity of metal contaminants in groundwater.

A few sacks of dried metal hydroxide precipitate from this treatment process remained on-site after the treatment process stopped, and Mr. Munich is currently working with Yolo County Environmental Health to identify the appropriate disposal location for this precipitate.

Site Name & Location: **203 J Street**

Commissioners Name: Brook Gale

City Contact Name and Number:

Regulating Agency Contact Name and Number: California Regional Water Quality Control Board, Marie T. McCrink, PG, HG, Engineering Geologist, 916-464-4816

Contaminants: TCE

Background: 1970' - 1980's J. F. Wilson produced sheep castration devices. The solvent TCE was involved.

Changes since last update: Insurance company agreed to fund clean-up of site. Pilot testing of above soil vapor extraction system onsite and off site.

Planned activities for coming year: Waiting for additional information for liquid (below ground) extraction.

Community involvement: None

Conclusion: Start Remediation

Specific Recommendation – as appropriate: None

Site Name & Location: **Davis Amtrak Station - 840 Second Street**

Commissioners Name: Brook Gale

City Contact Name and Number:

Regulating Agency Contact Name and Number: California Regional Water Quality Control Board, Marie T. McCrink, PG, HG, Engineering Geologist, 916-464-4816

Contaminants: Very Small PC plume. < 20 ppb

Background: RR Property difficult to determine source of contamination.

Changes since last update: Revised monitoring order.

Planned activities for coming year: Annual monitoring of 2 wells on site. Other wells are being monitored by Cable Car Wash. Continue annual monitoring. Monitor attenuation of plume.

Community involvement: None

Conclusion: Long term monitoring to continue.

Specific Recommendation – as appropriate: None

Date: September 18, 2008

Site Name & Location: **Cable Car Wash - 904 Third Street**

Commissioners Name: Jennifer Holman

City Contact Name and Number:

Regulating Agency Contact Name and Number: Regional Water Quality Control Board, David Stavarek, (916) 464-4673

Contaminants: MtBE, gasoline hydrocarbons

Background: Established in 1970 as a retail gasoline station and car wash, their three 10,000-gallon USTs were removed in 1998. Soil and groundwater investigations have defined a plume of gasoline hydrocarbons beneath the site that trends northwest-southeast approximately 400 feet and approximately 150 feet northeast-southwest. The center of the plume is approximately 15 feet east of the site. The vertical limit of the plume is approximately 85 feet bgs. In June 2004 MtBE was the only gasoline hydrocarbon detected at 0.51micrograms per liter (μg/L) at 85 feet bgs. In June 2004 concentrations of total petroleum hydrocarbons as gasoline, benzene, and MtBE in shallow groundwater were as high as 30,000, 6,000, and 740 μg/L, respectively. Quarterly groundwater monitoring is performed and shows the plume to be relatively stable. Remediation alternatives are currently being evaluated. [RWQCB 2005]

In September 2005 concentrations of total petroleum hydrocarbons as gasoline, benzene, and MtBE in shallow groundwater were as high as 15,000, 1,800, and 69 micrograms per liter (μg/L), respectively. Quarterly groundwater monitoring is performed and shows the plume to be relatively stable. Interim remediation, dual phase groundwater pumping and vapor extraction are being performed periodically. Preliminary results showed a reduction in gasoline hydrocarbons.

The responsible party conducted an enhanced fluid recovery pilot study, including vapor extraction, and groundwater extraction to lower ground water to allow more surface area for additional vapor extraction. He evaluated whether this would be a feasible method of remediation in the long or short term, and are continuing to look at additional remedial options.

Changes since last update: The responsible party has attempted two different remediation techniques, neither of which has been as effective as hoped.

Planned activities for coming year: The RWQCB is expecting a report soon (by October 10), which should include plans for a new pilot test injecting ozone or hydrogen peroxide. If the remediation seems effective, that will continue for at least 6 months. The RWQCB looks forward to a final report on that process in July 2009.

Community involvement: N/A

Conclusion: Site cleanup is ongoing.

Specific Recommendation – as appropriate: Continue monitoring progress of cleanup efforts.

Date: 19 January 2009

Site Name & Location: **Old Davis Landfill Site**
The Old Davis Landfill is located approximately one mile north of Covell Boulevard, west of Pole Line Road. The site is owned by the City of Davis.

Commissioner's Name: Doug Fetterly

City Contact: Marie Graham, Public Works Department, 530-757-5686

State Agency Contact: California Regional Water Quality Control Board - Central Valley Region, Mary Boyd. 916-464-4676

Contaminants of Concern: Since 1999, three organic compounds have been detected at the site: vinyl chloride, DCB (Dichlorobenzene), and Freon 12 (dichlorodifluoromethane). Vinyl Chloride was detected once at 2.8 ppb in 2001, and DCB has not been detected since 2000. Freon 12 continues to be detected in monitoring well DM1. In high concentrations, dichlorodifluoromethane can cause narcosis, unconsciousness, cardiac arrhythmias, cardiac arrest, and asphyxiation, either as a result of dichlorodifluoromethane's narcotic effects or as a consequence of its displacement of oxygen in the atmosphere. Elevated concentrations of selenium, chloride, and nitrate have been detected in some of the monitoring wells, possibly associated with background levels and the former treatment plant (see below).

Background: The Old Davis Landfill covers approximately 31 acres and was also the site of the former City of Davis Wastewater Treatment Plant. The site was used as a burn dump in the 1940s and 50s. Landfill operations began in 1969. The site was used for disposal of residential, commercial, industrial, and demolition-type wastes; detailed records were not kept for waste disposed at the site. The landfill consists of 5 inactive cells that were excavated 10 to 20 feet below grade. Cells were unlined, and no leachate collection systems were installed. The Old Davis Landfill has been inactive since 1975, when disposal operations were transferred to the present day site of the Yolo County Central Landfill. The landfill was capped with three to four feet of cover in the early 1980s.

In 1992, Dames and Moore conducted a Solid Wastewater Quality Assessment Test (SWAT) that consisted of drilling, installing, and sampling five monitoring wells – three on-site (DM-MW1 through 3) and two off-site (HLA-1 and HLA-2). They completed their investigation with an Evaluation Monitoring Report (EMP) in 1995 by drilling and sampling cone penetrometers at eight locations; installing and sampling two additional off-site monitoring wells, DM-4 and MD-5; and conducting slug tests to determine on and off site aquifer characteristics. The EMP was completed in 1996 and a Corrective Action Plan (CAP) was submitted to the Regional Water Quality Control Board (RWQQCB) in June 1997. Since 1999, the City has voluntarily monitored the site as proposed in the CAP (two times per year); the site is not under RWQQCB waste discharge requirements.

Changes since last update: Per the City of Davis "Final Sep 08" report, water quality results

for September 2008 are as follows: "Groundwater samples were collected from the dedicated sampling tube after each well was purged. No organic constituents were detected and the general inorganic geochemical profiles remained the same. Land use patterns have changed since Dames and Moore first started measuring groundwater elevations at the landfill. The agricultural land to the south and east of the site has been developed into the Wildhorse Subdivision and golf course. The field where monitoring well DM-4 is located had lain fallow for most of the nineties. Since the summer of 1999, the field has been planted each summer. Deep infiltration from agricultural and turf irrigation may be a possible source of influence upon the subsurface flow. This factor may also be the reason why the hydrographs for these deeper wells are now almost identical to the shallower wells."

Planned activities for coming year: The City will continue monitoring the site, taking samples and filing reports to the RWQCB twice a year. The next scheduled sampling is for next month (February 2009).

Community involvement: Other than occasional inquiries, there is no ongoing community involvement. Portions of the site are leased to the go-cart track and a paint ball gaming business.

Conclusion:
Overall, the concentrations of inorganic constituents at the Old Davis Landfill have not changed significantly over the last eight years. The site is monitored by the City and the RWQCB as an inactive site. The following data are from the October 2006 Hazardous Waste Site report: "Freon 12 continues to be detected in Well MW-1 (detected in February 2006 at 24 μg/L, an elevated level compared to previous years, but still well below the State Action Level water quality limit of 1,000 μg/L). Elevated general minerals also continue to be detected, including TDS, chloride, nitrate, sulfate, and alkalinity. Elevated nitrate levels are likely attributable to the former waste water treatment plant. The City should anticipate the possibility of an eventual order from the RWQCB, which could include a conceptual closure plan and implementation of an engineered cover for the final closure of the site."

Specific Recommendations: None

Sources:
- Marie Graham, Public Works Department, personal communication.
- California Regional Water Quality Control Board - Central Valley Region, Mary Boyd. 916-464-4676. Data from this source is pending a January 21, 2009 meeting, with an addendum to the above if necessary.

Date: February 17, 2009

Site Name & Location: **Former Texaco - 2002 Lyndell Terrace**

Commissioner's Name: Charles Ehrlich

City Contact: Marie Graham, Public Works Department, 530-757-5686

State Agency Contact: California Regional Water Quality Control Board - Central Valley Region, David Stavarek, P.G., Engineering Geologist, CVRWQCB R5S, UST Unit II, 916-464-4676

Concentrations of MtBE and Tertiary amyl methyl ether remain as high as 8,400 and 170 ug/L, respectively. The Responsible Party must complete offsite delineation of the vertical and lateral extent of the plume of gasoline hydrocarbons in groundwater for the property north of the site. Also, they must begin remediation of groundwater beneath the site, and beneath the property north of their site. However, remediation may be delayed because the SWRCB UST Cleanup Fund has stopped payment of reimbursements to the responsible party for this case. We will work with the responsible party to move remediation along at a pace that is reasonable for their financial resources.

Date: June 2008

Site Name & Location: **Timperley Property - 1700 Olive Drive,** Clean-up and Abatement Order 92-043

Regulating Agency Contact Name and Number: Regional Water Quality Control Board (Lead Agency) Case #570077, Central Valley Region 5S – David Stavarek – (916)464-4673, general number is 464-3291

Commissioner's Name: Adrienne Kandel

Contaminants: petroleum hydrocarbons, minimal MtBE,

Background: The site has had several automobile dealerships since 1967, and includes automobile and boat repair now. A 1000 gallon underground storage tank and associated piping were installed in 1966 and removed in 1988. Site investigations from 1989 to 1992 show gasoline hydrocarbons leaked into soil and groundwater, and subsequently migrated to the southwest. Gasoline constituents include carcinogenic and non-carcinogenic compounds (Benzene, Toluene, Ethyl benzene, and Xylene (BTEX)) and the gasoline oxygenate MtBE.

City water supply Well 24 is 330 southwest of the leakage site, and was initially sealed to prevent penetration of substances to a depth of 50 feet below ground surface (bgs). Shallow groundwater in the area is typically 20 feet bgs but can extend to 50 feet bgs during drought

periods. Accordingly the surface seal was deepened to 186 feet in 1993. Testing of this seal showed pumping from this well did not influence shallow groundwater beneath the site.

Because of the proximity to a water supply well, the Central Valley Regional Water Quality Control Board ("the Board") issued Cleanup and Abatement Order 92-043, to set a specific schedule for investigation and remediation of soil and groundwater.

For remediation, soil vapor extraction and groundwater pumping began in 1993 in the primary zone of contamination (20 -55 feet deep). Groundwater pumping continued through 1996 but soil vapor extraction ended in 1995 because rising water levels covered the well screens.

Under the Cleanup and Abatement Order the responsible party was required to define the vertical extent of contaminants. Monitoring wells were constructed with well screens from 66 to 81 feet bgs to define the vertical extent of gasoline hydrocarbons in groundwater.

In September 2005 total petroleum hydrocarbons were at 4700 micrograms per liter, including 37 mcg/l of benzene and 4.4 mcg/l of MTBE in shallow groundwater. The vertical extent of the hydrocarbons appears to be limited to a smear zone from 20 to at least 55 feet bgs. However, MTBE was 0.9 mcg/l in a deep well screened 66.5 to 81.5 feet bgs. Concentrations may have fallen because of natural biological degradation and mineralization. As the plume does not appear to be migrating, it does not appear the drop in MTBE is due to dilution.

MTBE contamination is now below the action level of 5 micrograms/liter (5 ppb), a secondary action level based on taste and odor threshold. In its most recent sampling, Well 13 showed 2.9 micrograms/liter (mcg/l) of MtBE. This is a drop from 2002 MTBE measured levels of 13 mcg/l, which is the primary action level, water quality goal for MtBE.

As a requirement for closure, Board staff requested that the responsible party verify its claim that gasoline hydrocarbons in soil had degraded. Initial sampling of soil below 20 feet indicated relatively low concentrations remaining. In the Regional Board staff's 3 June 2008 letter to the responsible party, they are requested to verify degradation of gasoline hydrocarbons 10 to 20 feet bgs.

Accordingly, the Board is awaiting confirmation of degradation in that region. As part of the closure process a risk assessment was also completed.

The responsible party must also send a list of nearby property owners for the Public Participation Notification. Once these items are completed a closure memorandum will be submitted to senior staff for review and concurrence.

Changes since last update: Testing so far indicates gasoline constituents in groundwater are now below action levels.

Planned activities for coming year: The Regional Board staff will complete review of case to determine whether closure is acceptable. Prior to closing, the profiling of the soil remains

incomplete. Principal work remaining is shallow soil tests, and the workplan calls for that to be done July 25. Final decision for case closure is expected by October 1, 2008.

If closure is acceptable then the responsible party must destroy the wells according to Yolo County standards/permits, before a no further action required letter is issued.

Community involvement: Public participation comment period before closure, this will be enacted when it is determined by regional board staff that closure is acceptable. The closure letter is issued after the comment period.

Conclusion: Pollution has dropped to tolerable levels according to tests to date, and do not currently threaten the nearby City well because they do not go deep enough to contaminate the water bearing zones below the well seal.

Specific Recommendation: The City should check the water quality of this well regarding gasoline hydrocarbons before closure to demonstrate that gasoline hydrocarbons have not impacted this well, as previous and current data implies. If future water quality checks indicate gasoline hydrocarbons are present then the City can request that the Regional Board reopen the Timperley case, unless another source is identified as the source of new contamination.

Date: September 18, 2008

Site Name & Location: Arco Station - 705 Russell Blvd.

Commissioners Name: Jennifer Holman

City Contact Name and Number:

Regulating Agency Contact Name and Number: Regional Water Quality Control Board, David Stavarek, (916) 464-4673

Contaminants: TPHg, benzene, MtBE, TBA, 1,2-DCA

Background: This is an active ARCO service station. In December 1990 ARCO replaced the old USTs with four new 10,000-gallon USTs. Site investigations performed since 1990 show gasoline hydrocarbons in a circular plume centered beneath the site. In July 2005, TPHg, benzene, MtBE, TBA, and 1,2-DCA in shallow groundwater (56 feet bgs) were as high as 20,000, 11,000, 1,000, 5,200, and 0.51 μg/L, respectively. In July 2005, at 82 to 89 feet bgs, MtBE, TBA, and 1,2-DCA were as high as 1.2, 9.8, and 1.2 μg/L, respectively. TPHg and benzene in deeper groundwater are non-detect.

Changes since last update: Quarterly monitoring continues, remedial alternatives are being evaluated, and ARCO failed in its attempts to negotiate for offsite access to perform an additional investigation.

Planned activities for coming year: ARCO and the adjoining property owner are expected to renew negotiations on an agreement to allow ARCO right of access to investigate the plume. The RWQCB is following up with both owners to assist gaining access.

Community involvement: N/A

Conclusion: Site cleanup is ongoing.

Specific Recommendation – as appropriate: Continue monitoring progress of cleanup efforts.

Date of Site Review: June 12, 2008

Site Name & Location: George Jandera Property - 1600 8th Street

Commissioner's Name: Herman Boschken

City Contact: Unknown

Regulating Agency Contact Name & Phone Number: Regional Water Quality Control Board (lead agency) –Central Valley Region 5S, David Stavarek (916) 464-3291

Contaminants: TPHg, benzene, MTBE and 1,2-DCA

Background: Formerly operated as George Jandera Mobile Service Station, three fuel hydrocarbons USTs and one waste oil UST were removed in 1991. Soil and groundwater investigations have defined a plume of gasoline hydrocarbons beneath the site, and vertically the plume extends down to 90 feet bgs. In March 2004, concentrations of TPHg, benzene, MTBE, DIPE, and 1,2-DCA in shallow groundwater were as high as 61,000, 18,000, 680 and 180 ug/l, respectively. At 90 feet, these contaminants were as high as 280, 18, 0.93 and 2.4 ug/l, respectively.

In August 2005, concentrations of 4 contaminants in shallow groundwater were as high as 86,000, 19,000, 720 and 28 ug/l, respectively. At 70 feet bgs, the contaminants were as high as 220, 28, 22 and 40 ug/l, respectively, and at 90 feet bgs, were as high as 58, 3, <0.5 and 16 ug/l, respectively. Quarterly groundwater monitoring is performed and shows the plume to be relatively stable.

Changes Since Last Update: In 2006, the responsible party was undertaking efforts to determine the extent of the plume under adjacent properties as an initial phase of remediation. Along with this, the RWQCB is periodically retesting evaporation wells to determine the size of remediation that may be required to eventually close the case. Although the plume remains stabilized, the earliest closure is estimated to be a year or more away.

Conclusion: This is an active case site involving current remediation activities. Case closure

cannot be estimated at this time.

Specific Recommendations: Future updates should concentrate on remediation progress and results of periodic testing by the RWQCB.

Date: February 17, 2009

Site Name & Location: **Chevron 9-1420 - 1935 Anderson Road.**

Commissioner's Name: Charles Ehrlich

City Contact: Marie Graham, Public Works Department, 530-757-5686

State Agency Contact: California Regional Water Quality Control Board - Central Valley Region, David Stavarek, P.G., Engineering Geologist, CVRWQCB R5S, UST Unit II, 916-464-4676

Concentration of gasoline hydrocarbons include TPHG, benzene, and MtBE up to 890, 12, and 24 ug/L, respectively. Chevron is slated to do some short term active remediation of groundwater, but must first negotiate access to the site for the remediation system from the site owner/operator.

Date: June 2008

Commissioner's Name: Adrienne Kandel

Site Name & Location: **Shell Station, 1944 Anderson Road**, Davis

Regulating Agency Contact Name and Number: Regional Water Quality Control Board (Lead Agency) - Case #570077, Central Valley Region 5S – David Stavarek – (916)464-4673, general number 464-3291

Contaminants: petroleum hydrocarbons including MTBE, DIPE (di-isopropyl ether, one of several gasoline oxygenates replacing benzene), TBA (tertiary butyl alcohol, gasoline oxygenate and also a breakdown product of MTBE).

Background: This is an active Shell gasoline station. In October 1996, 3 old fuel underground storage tanks were replaced with 2 new ones. Regional Board staff has requested Shell to define the lateral and vertical extents of the plume. Soil and groundwater investigations have defined a plume of gasoline hydrocarbons in groundwater beneath the site that has migrated approximately 260 feet south of the site, beneath the parking lot of the supermarket on Anderson and Covell.

Shallow monitoring wells have screens from 30 to 45 feet below ground surface (bgs) and deep

wells are from 60 to 65 feet bgs. Monitoring well S-4B is screened from 15 to 25 feet. Groundwater has been 18 to 34 feet bgs since the wells were installed in 1999.

Data from other leaking underground fuel storage tank sites in the Central Valley indicate that groundwater plumes generally migrate no more than 50 to 150 feet from the source where they stabilize, then naturally degrade biologically and chemically over years to decades.

The nearest active drinking wells are all greater than 1000 feet from the site.

Regional Board staff requested that Shell evaluate some remediation options.

The 2 major compounds of concern are benzene and MTBE, a known carcinogen and suspected carcinogen, respectively. MtBE is the more mobile of these two compounds and generally defines the leading edge of gasoline hydrocarbon plumes in groundwater. MtBE may migrate up to three times the distance of the benzene portion of the plume.

The most current groundwater sampling results of February 2008 indicate that benzene is below detection limits in shallow groundwater beneath the property, and MtBE was only detected in monitoring well S1 in the southwest corner of the property at 4.0 mcg/l, and at 1.5 mcg/l at S-12, 60 feet south of the site. Benzene was only detected in monitoring well S-6 at 18 mcg/l, 60 feet west of the site, and is from a gasoline hydrocarbon plume that has migrated beneath Anderson Road from the Chevron Station site. The Chevron Station site is across Anderson Road to the west of the Shell site. Gasoline hydrocarbons have not been detected in the shallow monitoring wells on the Shell site indicating there is no current leakage.

Analytical results from the deep monitoring wells indicated that benzene is below detection limits in all onsite and offsite monitoring wells. MtBE was 9.2 mcg/l in S-9, located at the southwest corner of the site, 1.4 mcg/l in S-14 and 3.0 mcg/l at S-15, both located 75 feet south of the site, and 84 mcg/l at S-16 located approximately 240 feet south of the site. MtBE at S-16 indicates the downgradient extent of the MtBE plume has not been defined, and this downgradient portion of the plume exceeds water quality goal of 5 mcg/l. The MtBE in groundwater is most likely not a threat to human health through dermal contact and air inhalation, but a risk assessment will be necessary to determine whether there are any human health risks from the MtBE.

The February 2008 analytical results indicate that onsite well S-4A had 8.3 mcg/l of DIPE, following a general downward trend of concentrations, albeit with some fluctuation. Earlier readings were 36 mcg/l in Aug 2007, 2.1 mcg/l in Aug 2006, and 120 mcg/l in Feb 2007.

Offsite well S16 found 55/mcg/l of DIPE in Feb 2008, up from 39 mcg/l in Feb 2006. These differences most likely represent changes in the plume due to groundwater fluctuations, rather than new leakage.

TBA was detected at 75 mcg/l in S16 during February 2008, but has also fluctuated: in Nov 2005 it was 10mcg/l, in May 2006 it showed 5, in Nov 2006 it had 130 mcg/l, and in June 2007 it had

24 mcg/l. In August and November 2007 it showed < 10 mcg/l. The Board may choose to require a small amount of remediation.

Conclusion: The Regional Board staff believes the site does not pose an overly serious threat to groundwater because the plume is not near a water supply well, appears to be degrading, and based on concentrations and distribution doesn't appear to be large mass of contaminants.

Specific recommendation: The City should keep looking at this site.

Date: June 2008

Site Name & Location: **Circle K (Conoco Phillips) - 1930 Lake Blvd**

Commissioner's Name: Adrienne Kandel

Regulating Agency Contact Name and Number: Regional Water Quality Control Board (Lead Agency) - Case #570077, Central Valley Region 5S – David Stavarek – (916)464-4673, general number is 464-3291

Contaminants: MtBE, some xylene, total petroleum hydrocarbons as gasoline (TPHg), TBA (tertiary butyl alcohol), TAME (tertiary amyl methyl ether).

Cirlce K is an active gasoline station plus convenience store, with 3 underground storage tanks. City of Davis Well No. 30 is located approximately 300 feet southwest of the site, upgradient of the Circle K site. The well seal is over 150 feet deep on this well.

Soil and groundwater investigations have defined an elliptical plume of gasoline hydrocarbons in groundwater that trends northeast to southwest beneath the site, and extends about 100 feet northeast of the site. The highest concentrations of contaminants are at the northeast corner of the Circle K site, in shallow groundwater approximately 35 feet below ground surface. But in October 2005 3.9 mcg/l of MtBE and 0.57 mcg/L benzene were detected in a deep monitoring well screened at a depth of 135 to 140 feet below ground surface (bgs). Concentrations have decreased since October 2005 as groundwater is purged from this well before each groundwater sampling event (the groundwater purging may be removing a small amount of contamination that entered the deep water zone when the boring for this well was drilled).

In October 2005 concentrations of total petroleum hydrocarbons as gasoline (TPHg) and MtBE in shallow groundwater were as high as 3,000 and 7,200 mcg/l, respectively. MtBE is the main constituent of concern. BTEX contaminants (Benzene, Toluene, Ethyl benzene, and Xylene) have generally been below detection limits to occasional trace concentrations in all monitoring wells since the monitoring wells were installed in 1999. However, in April 2006, BTEX were 1,600, 230, 270, and 480 mcg/l, respectively, in MW-2. ConocoPhillips' consultant had no explanation for this anomalously high BTEX in MW-2.

The most recent groundwater monitoring data from January 2008 indicated total petroleum hydrocarbons as gasoline and MtBE were as high as 3,400 and 7,400 micrograms per liter, respectively. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) were not detected in any of the monitoring wells, except for 1.6 mcg/liter of xylenes in one well. TBA, and TAME were up to 580 and 130 mcg/l, respectively. Additional wells are planned to define the downgradient limits of the plume, northeast of the site (pending an access agreement with offsite property owners).

For remediation, Conoco Phillips intends to install a soil vapor extraction system and ozone sparging system. The soil vapor extraction system is designed to remove volatile and semi-volatile petroleum hydrocarbons from soil (vadose zone) above groundwater and the capillary fringe/top of the shallow groundwater zone. The ozone sparging system injects ozone gas into the groundwater to facilitate hydrocarbon degradation. The remediation will require use of 3 offsite properties. Conoco Phillips has obtained the needed right of access on one of the properties, and the project is being delayed as they negotiate right of access to two other properties. (Ultimately, the owners of those sites will have to accept access to which they can attach reasonable conditions, or be responsible for investigation and cleanup of the portion of the plume beneath their property).

Changes since last update: Remediation is planned, and will begin after negotiations for access conclude.

Planned activities for coming year:

Community involvement:

Conclusion: The City should remain appraised of progress on remediation.

Date: 19 January 2009

Site Name & Location: **LEHR Superfund Site**
The Laboratory for Energy Related Health Research (LEHR) Site occupies approximately 15 acres of land owned by University of California, Davis (UCD) in Solano County, north of the South Fork of Putah Creek, about 1.5 miles south of the main UCD campus.

Commissioner's Name: Doug Fetterly

City Contact: Bob Weir, Public Works Director, 530-757-5686.

Federal Agency Contact: Vijendra (Vijay) Kothari, Office of Legacy Management U.S. Department of Energy (DOE), Grand Junction, Colorado, 304-285-4579. Bob Darr, SM Stoller Corporation, DOE Legacy Management Support, 720-377-9672

University Contact: Sue Fields, Environmental Manager, Office of Environmental Health and

Safety University of California, Davis, 530-752-3044

Community Contact: Julie Roth, Davis South Campus Superfund Oversight Committee, 530-753-9446, JRoth916@aol.com

Contaminants of Concern: Constituents of concern at the LEHR Site include radionuclides, metals, volatile organic compounds, semivolatile organic compounds, and pesticides. The contamination comes from use of radioactive materials and disposal of radioactive wastes, and the use and disposal of laboratory, chemical, and other wastes in landfills.

Background: U.S. Department of Energy (DOE)-sponsored research was conducted at the former LEHR facility from the early 1950s until 1988. Research studies at LEHR included irradiation of laboratory animals (particularly beagles) to study the health effects of chronic exposure to radionuclides, including strontium-90 and radium-226. Other research involved a cobalt-60 irradiator facility and the use of americium-241 and plutonium-241. UCD operated two landfills within the boundaries of LEHR from the 1940s through mid-1960s.

Decontamination and decommissioning of the facility was begun by DOE in 1992. The site was placed on the National Priorities List (Superfund) in 1994 as the LEHR/South Campus Disposal Site. A group of Davis citizens obtained a grant from the U.S. EPA in 1995 and formed the Davis South Campus Superfund Oversight Committee (DSCSOC). The DSCSOC hired G. Fred Lee, Ph.D. as their technical advisor. Remediation under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) began in 1996. Responsibility for remediation at the LEHR Site is shared between DOE and UCD under a Federal Facilities Agreement. CERCLA-related documentation is for the most part separated between the two parties (i.e., separate feasibility studies, action plans, and records of decision). The federal area includes locations formerly used for irradiation, research, and disposal; DOE is also responsible for monitoring storm water runoff until remedial activities are complete. UCD is responsible for remediation of landfill areas, a former wastewater treatment plant, groundwater contaminated by leachate, and storm water runoff in the UCD portion of the site.

DOE reported in October of 2005 that remediation of the federal portion of the LEHR Site is essentially complete, and that all buildings on the site have been decommissioned and transferred to UCD for continued use. As part of initial actions, most of the radioactive and other contaminated materials and soils from the site have been removed to offsite disposal areas (including the DOE facility in Hanford, Washington). Part of DOE's cleanup area overlaps a former UCD landfill and will require future consideration as part of the final cover for the landfill.

There is ongoing monitoring of surface and groundwater in the area. A chloroform-contaminated groundwater plume has been identified migrating northeast from the site. Since 1998 UCD has operated and improved a groundwater extraction and treatment system, which has treated groundwater to remove chloroform by air stripping; other modifications were made to the system to reduce total dissolved solids and nitrate. UCD documents indicate that hexavaliant chromium continues to be present in concentrations above acceptable levels in monitoring well

samples in the area (this water is not used for drinking). The DSCSOC has raised questions regarding the effects of contaminated groundwater and runoff from the LEHR site on Putah Creek. Other issues regarding the site cleanup include questions on the methods used to detect, measure, and report harmful chemicals in runoff from the study area. Dr. Fred Lee has commented that methods used to evaluate the cleanup efforts do not meet industry standards.

Changes since last update: Legacy Management released the Proposed Plan for the final environmental cleanup of the DOE areas of the Laboratory for Energy-Related Health Research at the University of California, Davis, for public review and comment on Oct 15, 2008.

Planned activities for coming year: The next step in the regulatory completion process for the LEHR cleanup is the development and approval of the final Record of Decision (ROD) for the LEHR Site. Legacy Management is scheduled to deliver a draft ROD to the regulators in late February 2009. The final remedial alternative will be determined after consideration of public input and in consultation with federal and California state regulators. The proposed plan addressed only the soil cleanup in six DOE areas; UC Davis will issue a separate proposed plan for groundwater and other disposal units on the site in the future.

Community Involvement: Legacy Management conducted a 30-day public comment period for the Proposed Plan following its release to provide the public an opportunity to review the plan to and send written comments to DOE. The public was also given the opportunity to give verbal and written comments on the plan at a public meeting held Oct. 23, 2008 at the Davis Veterans Memorial Center. At the meeting, Legacy Management representatives discussed the site's background, summarized the Proposed Plan, answered questions and accepted comments." Also, a citizen oversight committee, the Davis South Campus Superfund Oversight Committee (DSCSOC), has been actively involved with the LEHR site cleanup since 1995.

Conclusion: The DOE Office of Legacy Management notes that groundwater modeling results indicate that residual subsurface contamination could affect groundwater. DOE and UCD are working on plans that will define the long-term remedial phase of site cleanup; it is likely that eventually all monitoring activities will be transferred to UCD. The following is a summary of DOE concerns:

Constituents of Concern by DOE Area

Area	Constituents of Concern Contained in Soil	
	Human Health Risk	Groundwater Impact
Domestic Septic System No. 1	None	None
Domestic Septic System No. 3	None	Formaldehyde, Molybdenum, Nitrate
Domestic Septic System No. 4	Polycyclic Aromatic Hydrocarbons	Selenium
Domestic Septic System No. 5	None	None
Domestic Septic System No. 6	None	None
Domestic Septic System No. 7	None	None
Dry Wells A-E Area	None	Chromium, Hexavalent Chromium, Mercury, Molybdenum, Silver, Cesium-137, Strontium-90
Radium/Strontium Treatment System	None	Nitrate, Carbon-14, Radium-226
Southwest Trenches	Strontium-90	Nitrate, Carbon-14
Western Dog Pens	None	None
Eastern Dog Pens	Dieldrin, Strontium-90	None
DOE Disposal Box	None	None

Specific Recommendations: The City should continue to monitor the results of DOE and UCD investigations and remedial activities, particularly those pertaining to groundwater conditions affected by the LEHR/South Campus Site. The City should continue to recognize and appreciate the participation of the Davis South Campus Superfund Oversight Committee.

Sources:

- Vijay Kothari, U.S. Department of Energy, personal communication
- Sue Fields, Environmental Manager, Office of Environmental Health and Safety University of California, Davis, personal communication.