FRONTIER FERTILIZER SUPERFUND SITE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY • REGION 9 • JUNE 2001

Next Phase of Field Activities to Expand the Groundwater Extraction and Treatment System at the Frontier Fertilizer Superfund Site

The Environmental Protection Agency (EPA) is proposing to install a new set of extraction wells at the intersection of Arroyo Avenue and Caricia Drive and at the location of the former waste disposal pits on the Frontier Fertilizer Superfund site. In addition, EPA is proposing to map subsurface soil and collect groundwater samples in the Mace Ranch subdivision to better define the geology and extent of groundwater contamination. Groundwater samples will also be collected south of the former waste pits to better define the extent of contaminated groundwater in the A-1 aquifer (approximately 100 to 130 feet below ground surface (bgs). The groundwater samples will be collected using a drilling method called Cone Penetration Testing (CPT). Figure 2 illustrates the proposed locations of the extraction wells and the CPT borings.

You are invited to a public meeting to discuss the proposed extraction well and CPT locations as well as EPA's future plans for expansion of the existing groundwater extraction and treatment system.

Background

Installation of these groundwater extraction wells and the CPT sampling is part of ongoing work by EPA at the Frontier Fertilizer Superfund site located along Second Street south of Mace Ranch Park. Beginning in the 1970s, a fertilizer and pesticide distribution business operated on the western four acres of the site. This business sold bulk and pre-mixed fertilizers and pesticides to local farmers. Fertilizer and pesticide storage and application operations stopped at the site in March 1987. Prior to 1983, unused chemicals were routinely washed off machinery and disposed of on the ground or in one or more shallow, unlined ponds near the northwest corner of the facility. Soil in the vicinity of the former disposal ponds and groundwater beneath the ponds are contaminated as a result of past pesticide disposal activities. Contaminated groundwater has migrated north of the Frontier site and is beneath the Mace Ranch Park subdivision. Figure 1 shows the approximate boundary of the contaminated groundwater plume as of December 2000. The principal chemicals in groundwater are three pesticides: ethylene dibromide (EDB), 1,2-dichloropropane (DCP), and 1,2-dibromo-3-chloropropane (DBCP) and the solvent carbon tetrachloride. The solvent perchloroethylene (PCE) was detected for the first time in the Mace Ranch subdivision in 1999, and

PUBLIC MEETING

Please Come!

7:00 to 9:00 p.m.
Thursday, June 28th, 2001
Police Department Training Room
2600 Fifth Street, Davis, CA 95616

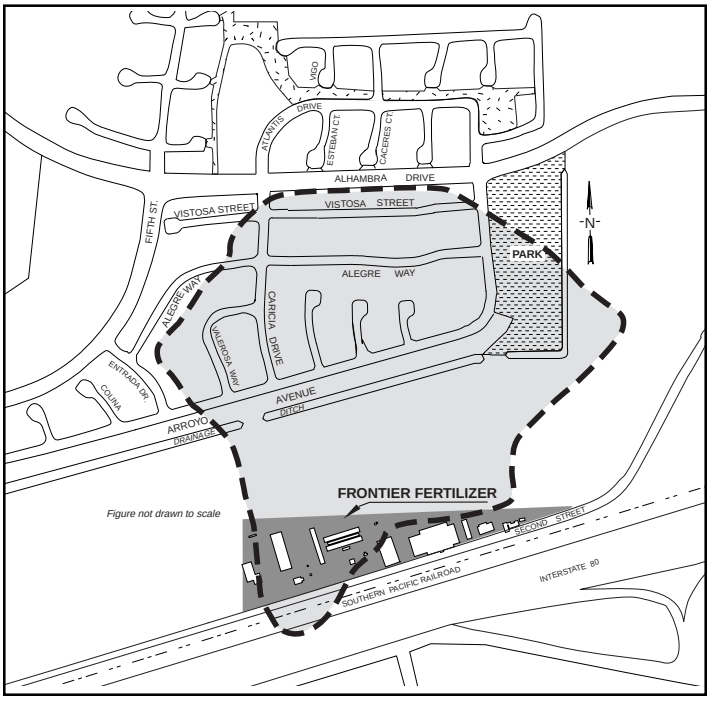

Figure 1: Approximate boundary of contaminated groundwater as of December 2000.

has not been detected in any of the monitoring wells south of the subdivision.

EPA installed an interim groundwater extraction and treatment system in 1995 using emergency response authority. The system was upgraded in Fall 2000. Groundwater data show that the system is not capturing the plume in the subdivision. Therefore, the system will be expanded beginning in Summer 2001 so that the entire contaminated groundwater plume is captured and treated.

There are four water-bearing zones beneath Frontier Fertilizer and the Mace Ranch Park subdivision. These zones are separated by layers of clay which act as an impediment to groundwater movement between the zones. The shallow zone, called the S-1, extends from approximately 25 to 50 feet bgs. The S-2 zone extends from approximately 60 to 90 feet bgs. The A-1 aquifer extends from approximately 110 to 130 feet bgs. Groundwater in the S-1 and S-2 zones flows northeast, while groundwater in the A-1 aquifer flows southeast. The drinking water supply for the City of Davis comes from the deeper A-2 aquifer which begins at approximately 180 feet bgs and is not contaminated.

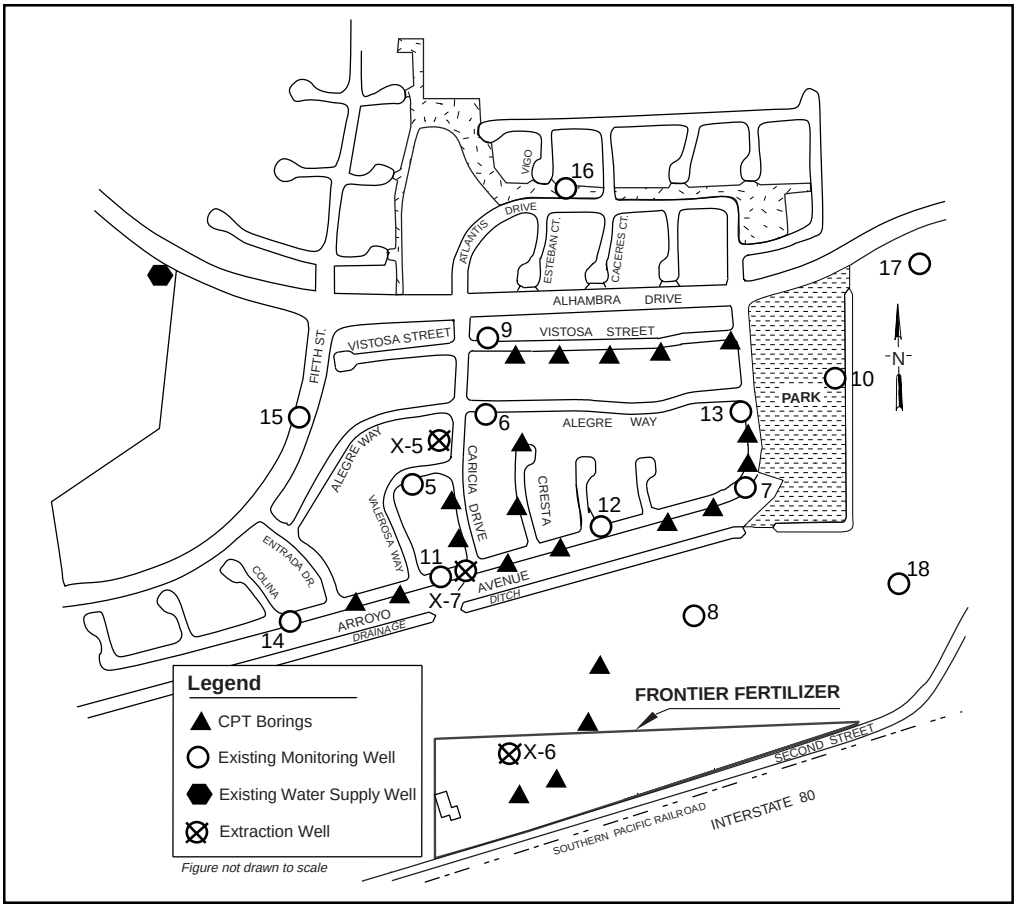

Figure 2: Locations of Groundwater Monitoring, Extraction Wells and CPT borings. Additional monitoring wells are located in the field to the south of the subdivision and on the Frontier Fertilizer property.

Quarterly Groundwater Monitoring Results for the Mace Ranch Subdivision

EPA collects groundwater samples from all of the monitoring and extraction wells on a quarterly basis. Year 2000 results show that concentrations are declining for PCE for almost all of the wells in the subdivision compared to 1999 results. For example, during 1999 PCE was detected in OW-5, OW-6, OW-7, OW-11 and OW-12 in the hundreds of parts per billion (ppb) range. With the exception of OW-11, PCE was not detected in 2000. Low levels of pesticides have sporadically been detected in monitoring wells in the subdivision since 1997. Again, the exception is OW-11, which consistently has high levels of DCP and EDB in the S-2 and A-1 zones. Carbon tetrachloride has consistently been detected in OW-6 in the S-1 zone. No chemicals have been detected in monitoring wells OW-10, OW-14, OW-15, OW-16, OW-17, and OW-18.

Installation of Extraction Well 5 and Results of Pump Testing

In EPA's July 2000 Fact Sheet and at our August 2000 Public Meeting, we stated that it might be necessary to install a total of six to eight additional groundwater extraction wells within the Mace Ranch subdivision. The first additional extraction well (X- 5) was installed in Fall 2000 on Caricia Drive between Alegre Way and Valerosa Way. We performed tests on the well called pump tests to determine how much water could be pumped from the well. This information would help us determine how closely extraction wells would need to be spaced and how much water would have to be pumped in order to prevent chemicals from moving past the extraction wells.

We found that far more water could be pumped from this well alone than from all of the extraction wells located in the field south of the subdivision. We were able to

pump an average flow rate of 145 gallons per minute (gpm) from all three water-bearing zones at X-5. We are presently pumping approximately 20 gpm from all of the other extraction wells combined (i.e. those wells in the field south of the subdivision). We are not certain to what extent this variability is caused by different hydrogeologic conditions and/or extraction well design. We hope to answer this question by installing X-6 and X-7.

Once we have observed the influence X-7 has on contaminated groundwater in the subdivision, we will determine whether it is necessary to operate X-5 as an extraction well or a monitor well.

Extraction Well X-7 and CPT Sampling in the Mace Ranch Subdivision

Based on the quarterly groundwater monitoring results which show high levels of contamination in the monitor well at the intersection of Arroyo and Caricia, and in order to prevent the possibility of extraction wells in the subdivision from pulling highly contaminated groundwater from the field into Mace Ranch, we have reconsidered the conceptual design. Rather than installing six to eight extraction wells in the subdivision, we are proposing to install extraction well X-7 at the intersection of Arroyo Avenue and Caricia Drive. Once the well is installed we will perform pump tests to determine how much water can be pumped from the well. This information will help us design the pumping rate for X-7.

In addition, we propose collecting groundwater samples using the CPT. The CPT drill is mounted on a large van, and samples will be analyzed in the field by a mobile lab. CPT boreholes are about 2 to 3 inches in diameter and will be filled in with grout after the data has been collected. Using the CPT and mobile lab will allow us to quickly define the geology and the distribution of chemicals in groundwater in the subdivision.

The CPT information along with the pump test data from X-7 will help us determine the need for additional extraction or monitoring wells and optimize the locations of the wells. If we believe additional wells are needed, we will hold another public meeting to discuss the proposed locations.

Extraction Well X-6 and CPT Sampling In Former Waste Pit Area

Extraction well X-6 will be installed in the former waste disposal pits to prevent the further migration of highly contaminated groundwater from the source area. A pump test will also be performed on this well. Since the flow of groundwater in the A-1 aquifer is to the south, we will also collect CPT groundwater samples at depths of 100 to 130 feet bgs to better define the leading edge of contaminated groundwater immediately south of the pits. We have never detected pesticides or carbon tetrachloride in MW-6, south of Second Street. We detected PCE in this well once in 1997.

MAILING LIST COUPON

If you did not receive this fact sheet in the mail and would like to be included on the mailing list for the Frontier Fertilizer Superfund site, please fill out this coupon and return it to the address below.

NAME: _____

ADDRESS: _____

Optional items:

PHONE: _____

FAX: _____

EMAIL: _____

ORGANIZATIONAL AFFILIATION (if applicable): _____

Please return to:

Angeles Herrera
Community Involvement Coordinator
75 Hawthorne Street (SFD-3)
San Francisco, CA 94105-3901
You may also provide the above information via email to: herrera.angeles@epamail.epa.gov

Pipeline Installation

In order to deliver contaminated groundwater from the extraction well on Caricia and Arroyo to the treatment system on the Frontier property, EPA will dig a trench and lay pipeline through the field south of the subdivision.

The pipeline through the field will be designed to convey contaminated groundwater from additional subdivision extraction wells if the pump tests and CPT results indicate that additional wells are needed.

Schedule

We anticipate that we will begin installing the extraction wells and perform the CPT sampling in August 2001. The extraction wells will be installed over a four week period. The pump tests are expected to take four to six weeks. The CPT sampling is expected to take two weeks.

Construction of the pipeline through the field will begin in September 2001 and should be completed by October 2001.

Future Work to Complete Expansion to Groundwater Extraction and Treatment System

If additional extraction wells are needed in the Mace Ranch subdivision, it will be necessary to dig trenches in the street to lay pipeline to convey contaminated groundwater from these wells to the treatment system on the Frontier property. EPA anticipates that the extraction well pipelines will be connected to a larger pipeline along Caricia Drive. The Caricia Drive pipeline will be connected to the pipeline in the field. The groundwater treatment system will also be expanded to accommodate the higher volume of contaminated groundwater.

We anticipate that this work will be performed in the Summer and Fall of 2002.

Health and Safety

Extraction well drilling, CPT sampling and pipeline installation will not pose a health risk to residents in the area. EPA will minimize disruptions to residents near the work, but a certain amount of traffic inconveniences and noise are inevitable. The well will be installed in the public right-of-way in a landscaped area. The well will be installed below ground and appear similar to a sewer manhole cover or a utility vault at the land surface. It will not interfere with vehicle or foot traffic.

Most of the personnel performing this work will be wearing protective clothing that is required by the Occupational Safety and Health Administration (OSHA) for this type of work. As an added precaution, workers installing the extraction well and collecting CPT data on the Frontier Property will also be wearing respirators with supplied air hoses unless air monitoring results indicate such protection is not necessary. The air quality at each borehole as well as air quality in the worker breathing zone will be monitored.

Action levels have been established that are protective of workers and residents. If vapor levels at the borehole exceed the action levels, work will stop and additional engineering controls along with continuous air monitoring will be implemented. Based on waste pits soils data and groundwater data from the "hot spot" just north of the pits, EPA does not expect vapor levels to be a risk to residents.

In conformance with a City of Davis ordinance, EPA will limit working hours in residential areas to Monday through Friday, 7:00 AM to 6:00 PM.

What Happens When Groundwater Extraction Wells are Drilled?

1. Drilling the Borehole for the Well. A drilling rig will drill a 16-inch diameter vertical hole to a pre-determined depth (as much as 140 feet below ground surface).

2. Construction. An 8-inch diameter steel pipe is placed in the 16-inch diameter borehole. Sections of the pipe are slotted to allow groundwater to flow into the pipe at locations that correspond to the S-1, S-2 and A-1 water-bearing zones. Sand is placed between the borehole and the slotted sections of the pipe to filter out rocks and clumps of clay that might otherwise flow into the well. A sanitary cement seal is then placed on top of the sand filter to the ground surface.

3. Development. Groundwater is pumped through the slotted sections to clean the clay, sand and gravel left in the well after it has been built.

4. Wellhead Completion. A locking cap will be placed over the top of the well, which will be below ground surface. A protective vault box, similar to a utility vault, will be constructed around the top of the wellhead.

If you have
Questions or Concerns
about EPA's cleanup efforts for the Frontier Fertilizer Site,
please contact:

Angeles Herrera (SFD-3)
Community Involvement Coordinator
U.S. EPA, Region 9
75 Hawthorne St.
San Francisco, CA 94105
(415) 744-2185

Janet Rosati (SFD-8-2)
Remedial Project Manager
U.S. EPA, Region 9
75 Hawthorne St.
San Francisco, CA 94105
(415) 744-2403

Messages may be left for Angeles Herrera by calling the Community Involvement Toll Free line:
1 (800) 231-3075

Information Repositories

Public information repositories have been established at the following locations to provide Davis community members and other interested parties with ready access to technical reports and other information regarding the Frontier Fertilizer site.

Yolo County Library, Davis Branch
Attn: Marilyn Cocoran
315 E. Fourteenth St.
Davis, CA 95616

Hours:

Monday	1:00 pm to 9:00 pm
Tuesday-Thursday	10:00 am to 9:00 pm
Friday	10:00 am to 6:00 pm
Saturday	10:10 am to 5:00 pm

Shields Library
Government Documents Department
Attn: Linda Kennedy
University of California
Davis, CA 95616
(916) 752-1624

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U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street (SFD-3)
San Francisco, CA 94105
Attn: Angeles Herrera

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Penalty for Private Use, $300

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