



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

November 15, 1999

Commanding Officer
Engineering Field Activity, West
Naval Facilities Engineering Command
Attn: Mr. Stephen Chao
900 Commodore Drive
San Bruno, CA 94066-2402

Dear Mr. Chao:

The U.S. Environmental Protection Agency has conducted an inspection of the West Side Aquifer Treatment System (WATS) at Moffett Federal Airfield. This inspection was performed by TRC, a subcontractor to TechLaw Inc., under an EPA contract. EPA performed this inspection to assess whether the remedial action is consistent with the Remedial Design.

Based on the inspection, one deviation from the design was observed. The backup system did not include the R301 Backup Air Stripper and P305 Backup Stripper effluent pump as shown in the design drawings. Please provide an explanation as to why this design change was made.

In addition, as we have discussed recently, pumping at one of the extraction wells, EA1-1, has been below the flow rate anticipated in the design documents. As a result, additional work will be needed at EA1-1 to ensure that capture of the source area will be maintained.

If you have any questions regarding the inspection or our concerns, please call Roberta Blank at (415) 744-1685. Thank you for your continued cooperation.

Sincerely,

A handwritten signature in black ink that reads "Roberta Blank".

Roberta Blank
Remedial Project Manager, Moffett

A handwritten signature in black ink that reads "Eugenia Chow".

Eugenia Chow
Remedial Project Manager, MEW

cc: Joseph Chao, RWQCB

INSPECTION OF WEST-SIDE AQUIFER TREATMENT SYSTEM AT MOFFETT FEDERAL AIR FIELD, MOUNTAIN VIEW, CALIFORNIA

Groundwater Treatment Plant Process Description

1. The groundwater treatment plant utilizes an oxidation system coupled with an air stripper and a catalytic oxidizer to remove a mixture of petroleum hydrocarbons, polycyclic aromatic hydrocarbons, and chlorinated solvents from the groundwater extracted from 8 extraction wells and to treat storm drain water. A backup treatment system consists of two bag filters that are installed in-parallel and a liquid phase granular activated carbon (LGAC) system. This backup system is used to treat the water generated from the Storm Drain Action Equalization System (SDA) from the Hanger 1 sump and the Electrical Vault 5 when the main system is not in operation.
2. The flow from the extraction wells, that located within various impacted areas, is mixed with the water from the SDA and is filtered through three parallel bag filters. Hydrogen peroxide is then mixed with the groundwater prior to entering three oxidation tanks. The oxidation tanks are installed in-series and hydrogen peroxide is added to the treatment flow before entering each oxidation tank. Ozone, produced on-site through an ozone generator, is introduced into the bottom of each oxidation tank. Vapors that form in the three oxidation tanks are routed to a catalytic oxidizer prior to discharge to the atmosphere. The liquid effluent from the oxidation process flows through a plate (i.e. low profile) air stripper for removal of any residual volatile organic compounds. Prior to entering the air stripper, anti-scalant chemicals are added to the liquid effluent to prevent fouling of the stripper. The treated water is then discharged to the Moffett Federal Airfield storm sewer system under a National Pollutant Discharge Elimination System (NPDES) permit.
3. Ambient air is pumped to the air stripper to remove residual volatile chlorinated solvents from the groundwater. The air containing chlorinated solvent vapors is then discharged to the atmosphere without further treatment. Sampling of the effluent air is not required because the facility operates under an exemption from the Bay Area Air Quality Management District since the daily emissions of chlorinated solvents are below one pound per day.
4. The flow from the SDA from Hanger 1 and Electrical Vault 5 is initially directed into a 3,000-gallon equalization tank. When the main treatment system is operational, the SDA water is mixed with the influent groundwater from the extraction wells. When the main system is shutdown for maintenance or repair, the SDA water bypasses the equalization tank and flows through the backup treatment system. The backup treatment system consists of two bag filters that are installed in-parallel and two LGAC tanks that are installed in-series. The SDA water is pumped through the two parallel particulate filters to the two 2,000-pound LGAC tanks. The liquid effluent from the LGAC units is then discharged to the Moffett Federal Airfield storm sewer system.
5. According to the Definitive Design Report, the maximum influent flow rate for the main system is anticipated to be 70 gallons per minute (gpm). The system design flow rate of 120 gpm was selected to provide additional capacity in the event of unexpectedly high well yields

and to accommodate future additional extraction wells, if necessary. During the inspection, it was observed that the system was operating at 70 gpm without problems. The backup treatment system is designed for a flow rate of up to 25 gpm.

Summary of Observations

1. The backup system did not include the R301 Backup Air Stripper and P305 Backup Stripper effluent pump as shown in the design drawings. When the backup system is active, the piping from the SDA bypasses the equalization tank and flows directly through two bag filters to the LGAC system. According to Mr. Ramirez, the backup air stripper and backup air stripper effluent pump were eliminated in January 1999 during construction. Mr. Ramirez further indicated that the pumps in the Hanger 1 and Electrical Vault 5 provide sufficient head to overcome the losses due to the filters, LGAC and the additional piping.
2. The treatment system appeared to be installed properly. With the exception of the items identified above, the treatment train followed the design schematics provided to TRC. An adequate number of sampling ports to sample the influent and effluent groundwater was installed.
3. According to Mr. Ramirez, the influent and effluent water is sampled and analyzed for volatile organic compounds, petroleum hydrocarbons and polycyclic aromatic hydrocarbons prior to discharge. The sampling is performed to verify system performance and to ensure compliance with the NPDES permit.
4. The treatment plant (with the exception of the LGAC system) is located inside a secondary containment area. The water inside the secondary containment is collected through a sump and pumped to the influent line of the system for treatment. The LGAC system is located outside the secondary containment area as outlined in the Definitive Design Report.

PHOTOLOG

TRC

5052 Commercial Circle
Concord, California 94520
(925) 688-1200
Fax: (925) 688-0388

Photographer: Mohammad Bazargani Dates: September 8, 1999

Weather: Partly cloudy

Location: Moffett Field Air Base

Purpose: Site Inspection of West-Side Aquifer Treatment System

Photo	Time/Date	Direction	Description
1	9/8/99 11:20 a.m.	NW	View of the WATS system
2	9/8/99 11:21 a.m.	N	Influent 3,000-gallon equalization tank
3	9/8/99 11:21 a.m.	NW	Catalytic oxidizer in the front and left. To the right is the air compressor and ozone generator.
4	9/8/99 11:21 a.m.	SW	Influent bag filter in foreground with the hydrogen peroxide tank in the background to the right
5	9/8/99 11:25 a.m.	S	Hydrogen peroxide tank in the foreground with the three oxidation tanks and air stripper in the background
6	9/8/99 11:28 a.m.	SW	Two 2,000-pound LGAC canisters that are part of the backup system
7	9/8/99 11:30 a.m.	W	Ozone generator in the foreground, the first two oxidation tanks in the background
8	9/8/99 11:35 a.m.	W	Plate air stripper and effluent discharge location

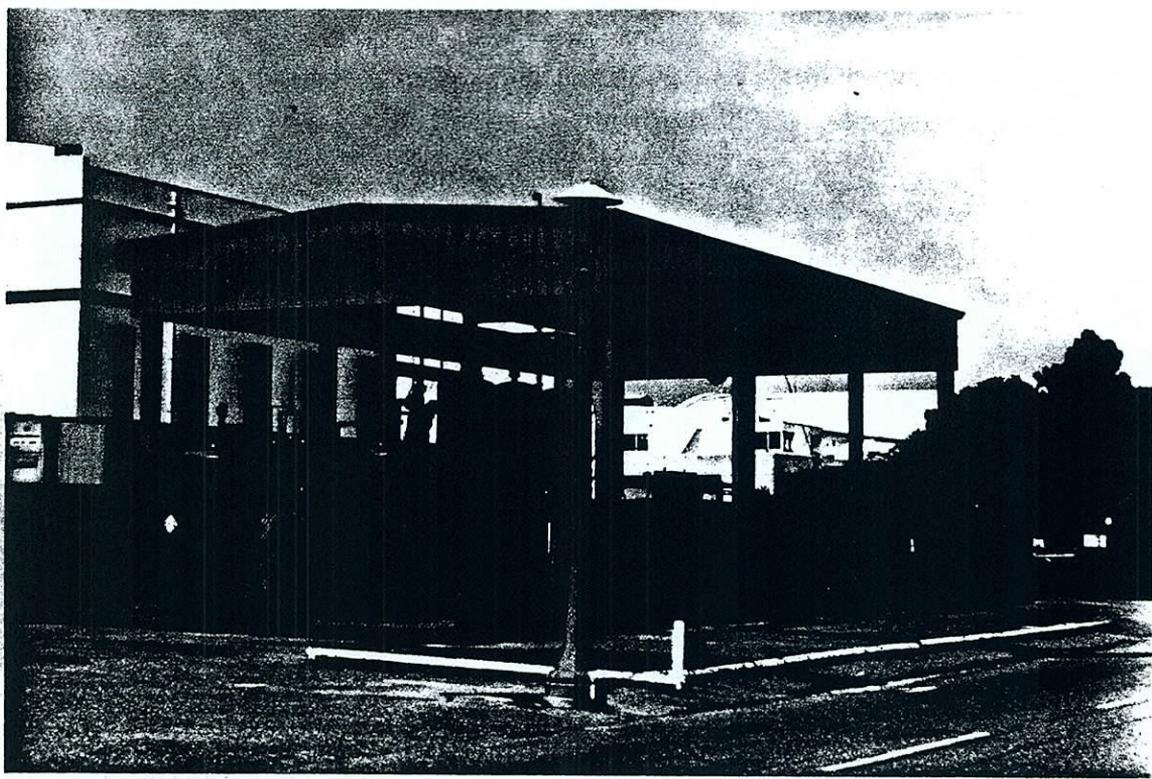


Photo 1. 9/8/99, 11:20 a.m. (northwest)
View of the WATS system

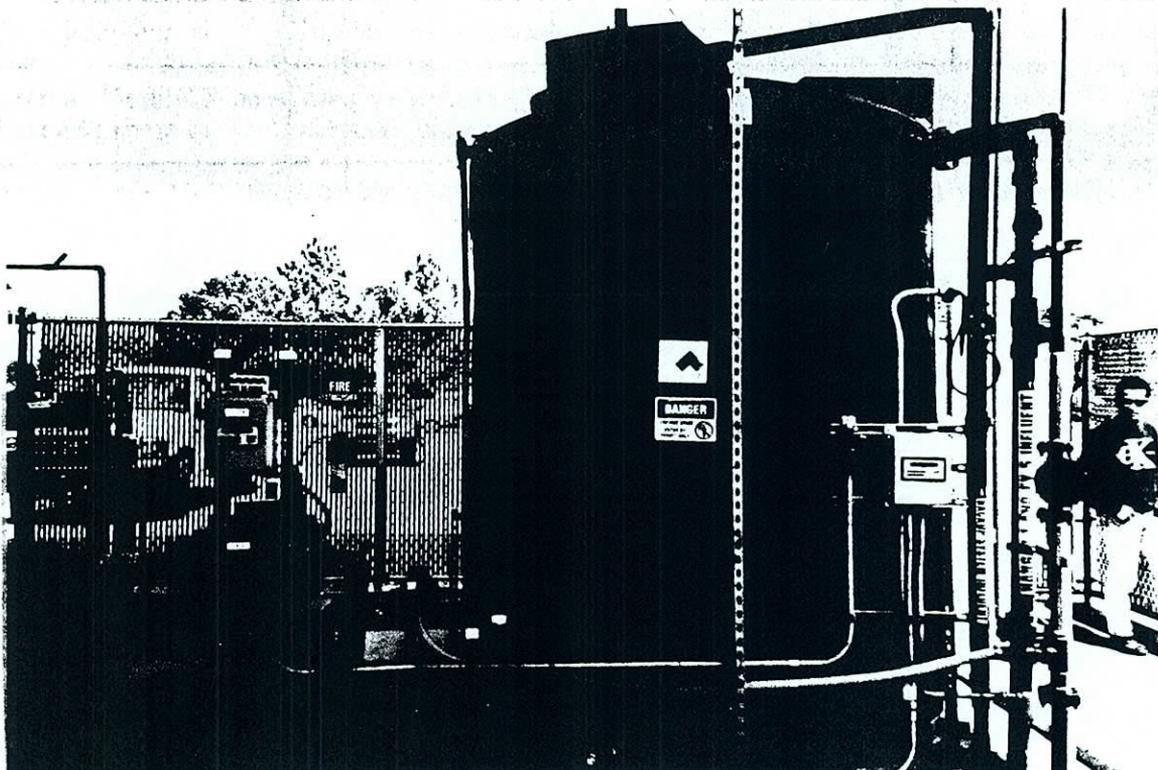


Photo 2. 9/8/99, 11:21 a.m. (north)
Influent 3,000-gallon equalization tank

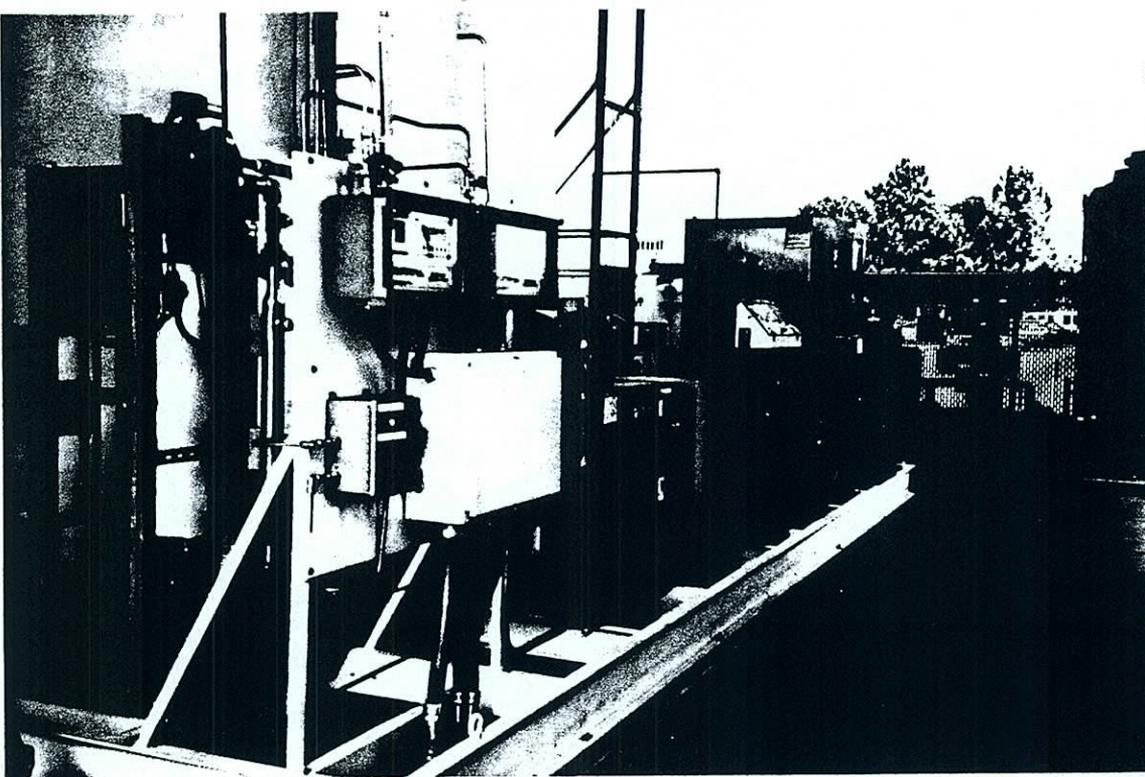


Photo 3. 9/8/99, 11:21 a.m. (northwest)
Catalytic oxidizer in the front and left. To the right is the air compressor and ozone generator.

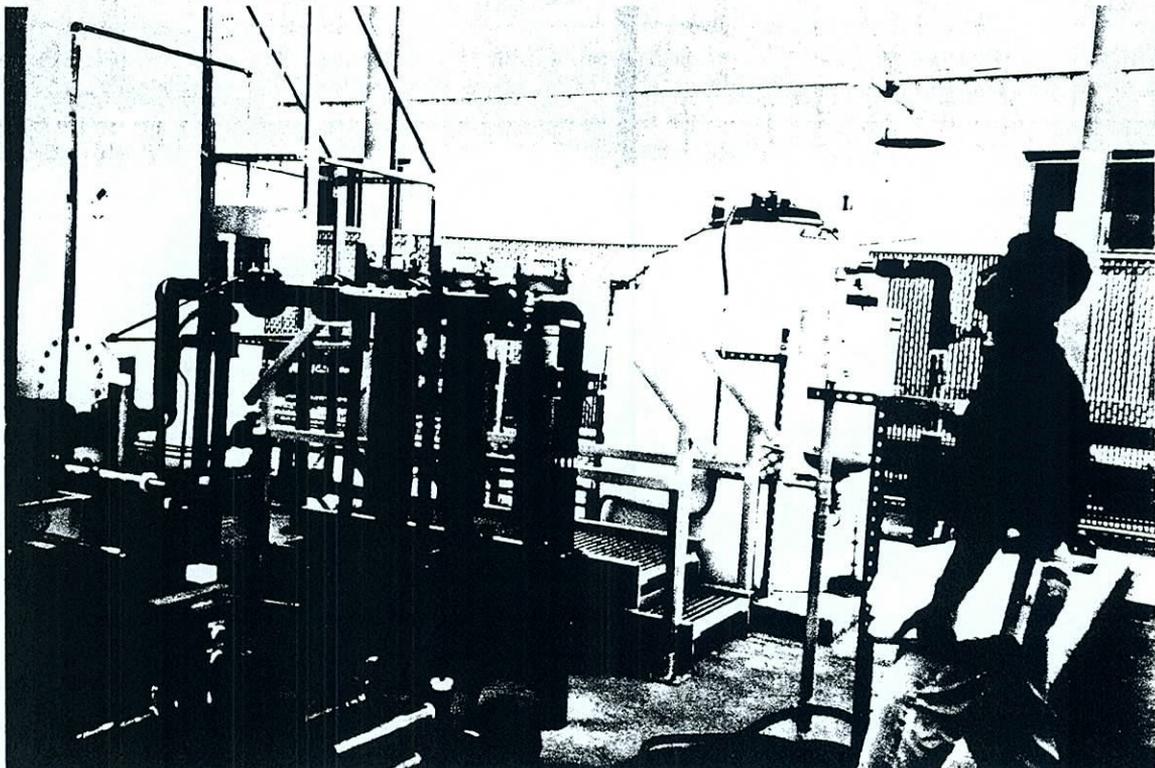


Photo 4. 9/8/99, 11:21 a.m. (southwest)
Influent bag filter in foreground with the hydrogen peroxide tank in the background to the right

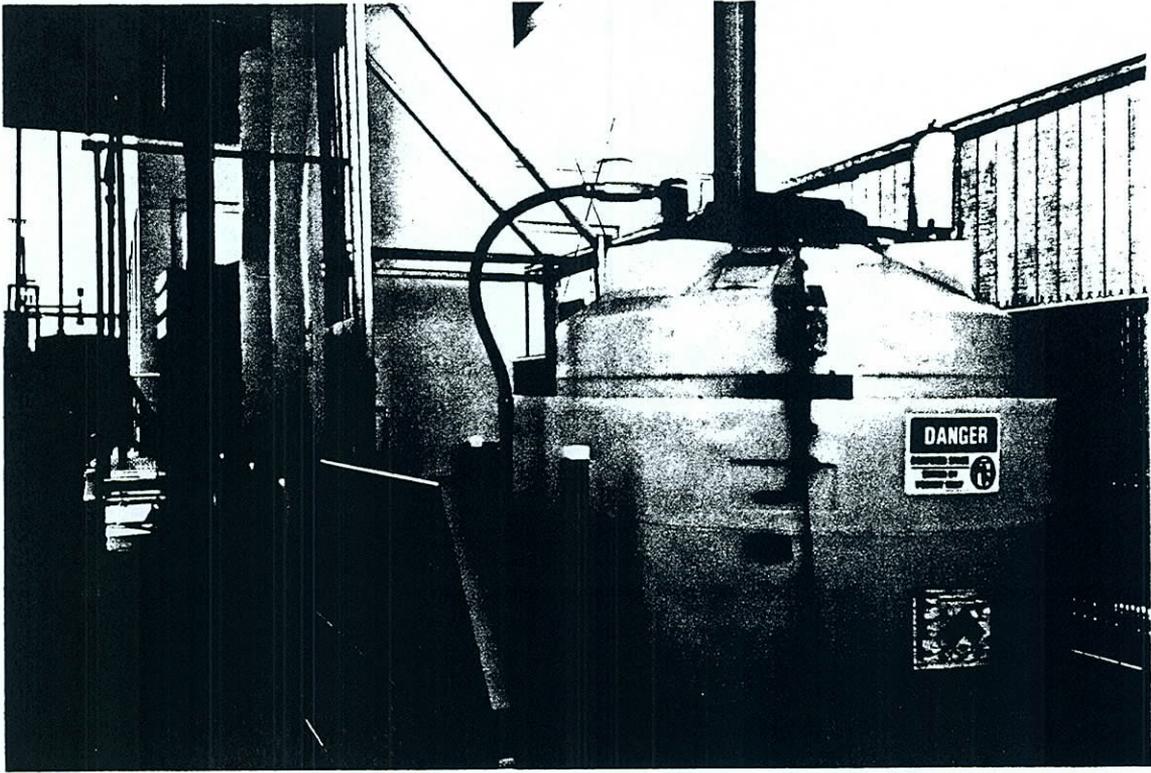


Photo 5. 9/8/99, 11:25 a.m. (south)
Hydrogen peroxide tank in the foreground with the three oxidation tanks and air stripper in the background

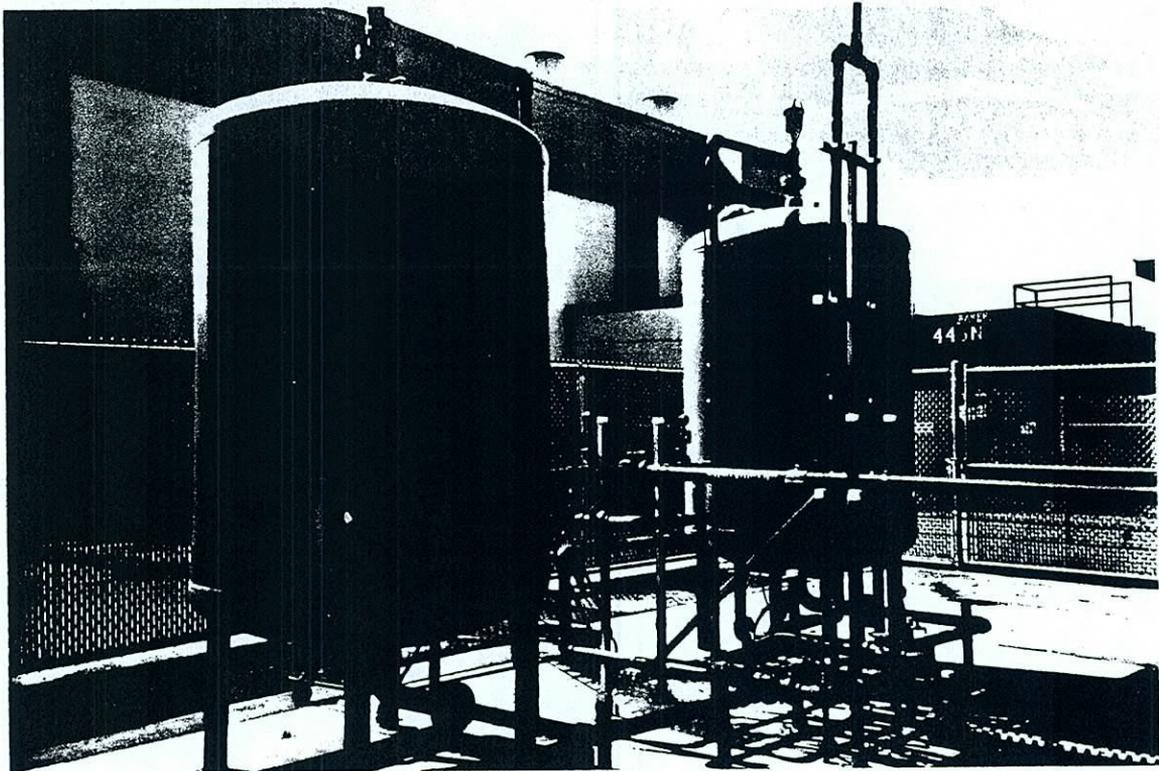


Photo 6. 4/12/99, 11:28 a.m. (southwest)
Two 2,000-pound LGAC canisters that are part of the backup system

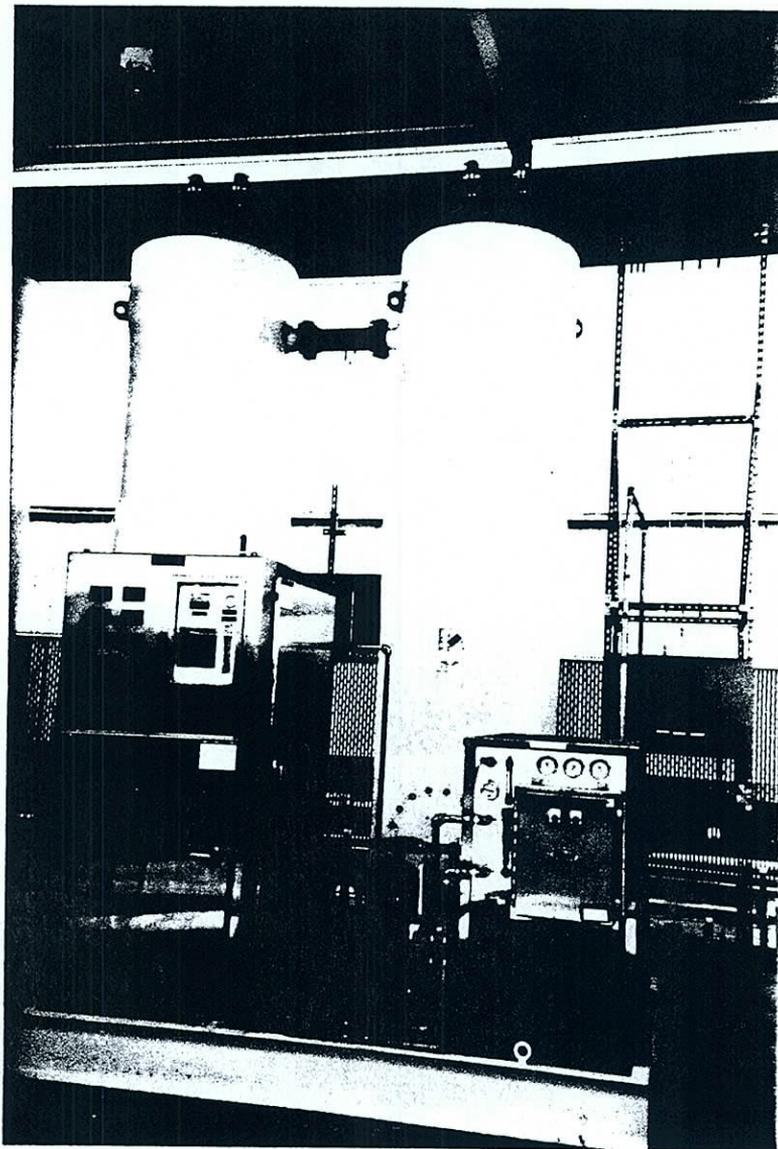


Photo 7. 9/8/99, 11:30 a.m. (west)
Ozone generator in the foreground, the first two oxidation tanks in the background

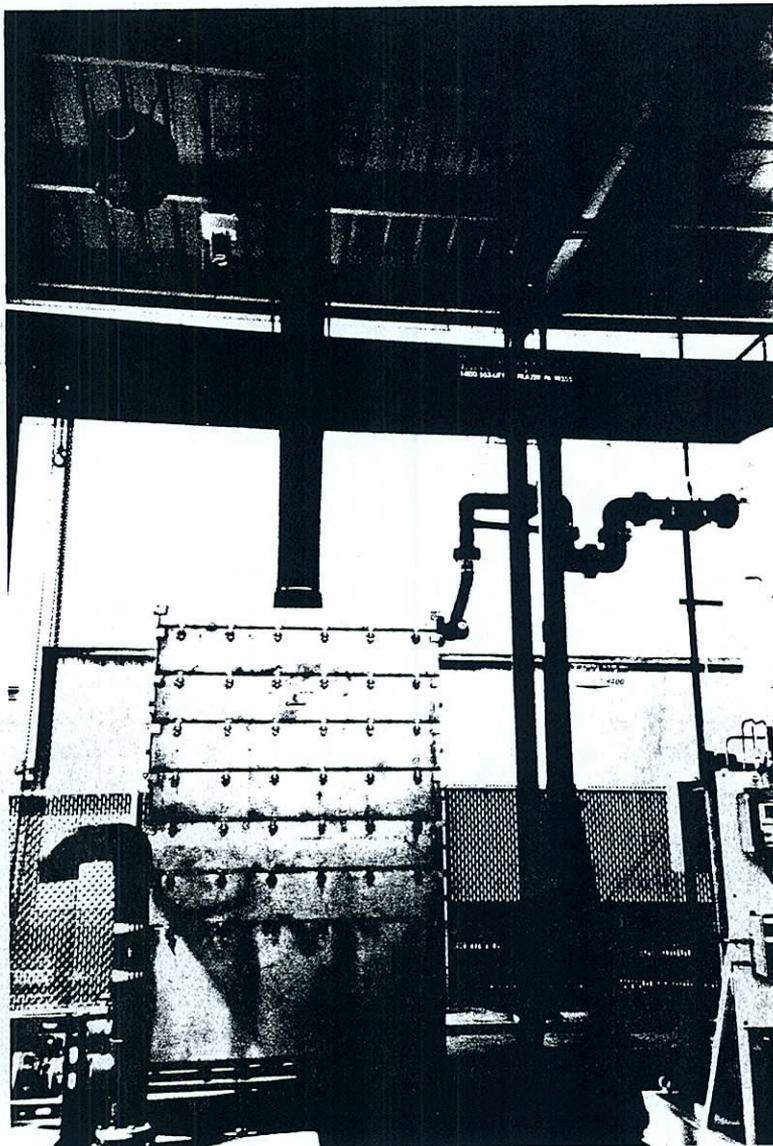


Photo 8. 9/8/99, 11:35 a.m. (west)
Plate air stripper and effluent discharge locations