



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6

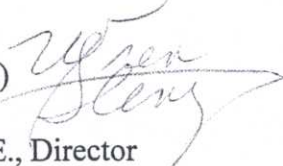
1445 ROSS AVENUE, SUITE 1200  
DALLAS, TX 75202-2733

September 21, 2000

MEMORANDUM

SUBJECT: Approval of the Second Five-Year Review at the South Valley Superfund Site for Edmunds Street OU # 3, General Electric Aircraft Engines OU #2, General Electric Aircraft Engines OU #5, and General Electric Aircraft Engines OU #6  
NMD 980745558

FROM:  Greg J. Lyssy  
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THRU: Wren Stenger, Chief  
LA/NM Branch (6SF-L) 

TO: Myron O. Knudson, P.E., Director  
Superfund Division (6SF)

This memorandum approves the September 2000 Five-Year Review reports for the South Valley Superfund Site Operable Unit (OU) # 2, # 3, # 5, and # 6. The second five-year review for OU #3 was prepared by ARCADIS Geraghty & Miller for Van Waters and Rogers Inc., (VW&R), and is included as Attachment A. The first five-year review for OU # 2, OU # 5, and OU #6 was prepared by Harding Lawson Associates for General Electric Aircraft Engines (GEAE), and is included as Attachment B. Based on the five-year review reports, the remedial actions are protective of human health and the environment.

This second five-year review for the Site is required by statute. This five-year review was conducted pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121(c), 42 U.S.C. § 9621(c), the National Contingency Plan (NCP) (40 CFR § 300.430 (f)(4)(ii)), Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-02 (May 23, 1991), OSWER Directive 9355.7-02A (July 26, 1994), OSWER Directive 9355.7-03A (December 21, 1995), and draft OSWER Directive 9355.7-03B-P (draft Comprehensive Five-Year Review Guidance).

Section 121(c) of CERCLA requires that, *"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented."* Under the NCP, the Federal regulations which implement

CERCLA, EPA is required to conduct five-year reviews of a remedial action whenever, under the remedial action, *"hazardous substances, pollutants, or contaminants are remaining at the site above levels that allow unlimited use and unrestricted exposure."*

This five-year review has been approved by the Director of the Superfund Division, U.S. EPA Region 6. Although CERCLA Section 121(c) authorizes "the President" to undertake five year reviews, the President's authority was delegated to the Administrator of the EPA by Executive Order 12580 (52 Fed. Reg. 2926, January 29, 1987), and this authority was further delegated to the EPA's Regional Administrators on September 13, 1987, by EPA Delegation No. 14-8-A. Finally, the authority was delegated to the Director of the Superfund Division by EPA Region 6 Delegation No. R6-14-8-A on August 4, 1995.

This review is required because hazardous substances, pollutants, or contaminants remain in the subsurface at concentrations that are above levels that allow for unlimited use and for unrestricted exposure.

Although the results of the review concluded that the overall remedy is protective of human health and the environment, several recommendations have been made pursuant to this five-year review, and are summarized below.

### **Summary and Recommendations at OU # 3**

The remedial action for the site was designed as specified in the Record of Decision (ROD) for the Edmunds Street Groundwater Operable Unit # 3, and consists of pumping and treating groundwater to remediate impacts of the following site-related volatile organic compounds (VOCs): 1,1-dichloroethene (1,1-DCE); 1,1,1-trichloroethane (1,1,1-TCA); trichloroethene (TCE); and tetrachloroethene (PCE). The treated water is returned to the aquifer through an infiltration system. The objective of the remedial action was to reduce the concentrations of the site-related VOCs in the groundwater to concentrations that meet the ARARs as established in the ROD.

Construction of the remedial system was completed in January 1990. The long term remedial system operation, maintenance, and monitoring program has been conducted at the site since January 1991. During operation of the remedial system from June 1990 through January 2000, more than 493 million gallons of groundwater have been recovered, treated, and returned to the subsurface at an average flow rate of 100 gallons per minute.

In addition to operation of the groundwater remedial system, the remedial action for the site includes a groundwater monitoring program, which was designed to monitor the effectiveness of the remedial action. The analysis of the data shows that the remedial system has contained the area of groundwater impacted by the site-related VOCs.

The remedial system has successfully treated site-related VOCs to below the groundwater discharge criteria. An evaluation of the analytical results for samples collected from the

treatment unit influent shows that the total concentration of site-related VOCs reached a maximum of 925 micrograms per liter ( $\mu\text{g/l}$ ) in October 1990 and have steadily declined to 86  $\mu\text{g/l}$  in October 1999, an overall decrease of 91 percent. Based on the annual average air emission rates calculated for the remedial system, approximately 713 pounds of the site related VOCs have been removed from the groundwater through January 2000. The results of the air emission calculations and the air dispersion modeling show that the air discharges from the remedial system were well below the air discharge criteria from June 1990 through January 2000.

In November 1998, a Vapor Extraction System (VES) was constructed at the site to improve effectiveness of the existing remedial system and more quickly reduce dissolved constituent concentrations to the maximum degree practicable. The VES appears to be reducing constituent concentrations in the groundwater. One of the requirements in the next five-year review should be to focus on the effectiveness of the VES.

In order to ensure that the remedial actions are as effective as possible, the following two recommendations are made for OU # 3:

- An additional groundwater monitoring well should be installed between monitoring wells GM-20 and GM-12R to ensure that the southern most component of the plume is being captured by the recovery system.
- The VES should be expanded to incorporate the area defined by monitoring wells GM-01 and GM-22R to the north, GM-12R to the south, and Interstate I-25 to the east.

The results of the review indicate that the remedy for OU # 3 has been, and is expected to continue to be, protective of human health and the environment. The remedial actions have been functioning as designed, and have been operated and maintained in an appropriate manner. Ongoing optimization of the remedial system is continuing. It is recommended that VW&R, continue to pursue the use of innovative technologies which may enhance future system performance of the remedial activities.

### **Summary and Recommendations at OU # 2**

The remedial action for the site was designed as specified in the ROD for the GEAE Operable Unit # 2, and consisted of addressing water supply issues, and required the appropriate plugging and abandonment of municipal wells SJ-3 and SJ-6. In addition, several private wells also had to be properly plugged and abandoned. Both municipal wells SJ-3 and SJ-6 were abandoned in October 1994. The private wells associated with OU # 2 were abandoned prior to 1994.

The requirements of the GEAE OU # 2 ROD also included performing groundwater monitoring for 30 years, which is being conducted. The groundwater monitoring program was designed to monitor the effectiveness of the remedial action. The analysis of the data shows that

the plugging and abandonment program was effective.

The results of the five-year review indicate that the remedy for OU # 2 has been, and is expected to continue to be, protective of human health and the environment.

### **Summary and Recommendations at OU # 5**

The remedial action for the site was designed as specified in the ROD for the GEAE Operable Unit # 5, and consisted of addressing the unsaturated and saturated portion of the shallow zone aquifer. The shallow groundwater remedial action consisted of pumping and treating groundwater to remediate impacts of the following Site related VOCs: TCE, PCE, 1,1-DCE, 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), and Vinyl Chloride. The shallow zone aquifer is primarily a perched groundwater aquifer that consists of layers of coarse-grained sands, silty sands, clays, and silty clays. The formation generally extends to a depth of approximately 20 to 25 feet below ground surface and is underlain by a relatively continuous silty clay layer.

The following remedial activities have occurred at GEAE OU # 5 in order to meet the requirements of the ROD:

- The shallow zone groundwater remediation system consists of eight extraction wells, thirty monitoring wells, and one injection well.
- Vapor phase VOCs in the unsaturated portion of the Shallow Zone Aquifer have been remediated to regulatory cleanup levels and pose no threat to human health or the environment.
- The shallow zone groundwater remediation system has mitigated the migration of VOCs in the saturated portion of the shallow zone aquifer and the size of the contaminant plume is decreasing.
- Flushing of the VOCs appears to be the primary mechanism by which VOC impacts to the shallow zone aquifer are being remediated. Flushing via the groundwater extraction system continues to reduce the concentration of VOCs in the saturated portion of the shallow zone aquifer. The concentrations of the contaminants in the groundwater monitoring wells are steadily decreasing.

The shallow zone aquifer contains perched groundwater that is recharged by precipitation and other naturally occurring events. As a result, complete dewatering of the shallow aquifer appears to be unlikely. As stated before, monitoring data indicate that flushing is the primary mechanism by which the VOCs are being reduced to levels below their respective ARARs. In order to facilitate the remedial action, GEAE installed another extraction well in the property north of the Plant 83 property boundary in February 2000 to increase the system efficiency and further reduce the VOCs to levels below ARARs in that area. Similarly, GEAE added an

injection well near the shallow zone groundwater treatment plant in May 2000 so that the groundwater extraction rate in the extraction wells can be maximized, as well as further enhance the flushing of the shallow aquifer system.

From system startup through June 2000, approximately 708,000 gallons of groundwater have been extracted and treated from the shallow zone aquifer. The aerial extent of the groundwater with VOC concentrations above ARARs is being reduced due to the continued groundwater extraction.

The results of the five-year review indicate that the remedy for OU # 5 has been, and is expected to continue to be, protective of human health and the environment. The remedial actions have been functioning as designed, and have been operated and maintained in an appropriate manner. On-going optimization of the remedial system is continuing.

### **Summary and Recommendations at OU #6**

The remedial action for the site was designed as specified in the ROD for GEAE Operable Unit # 6, and consisted of pumping, treating, and reinjecting groundwater to remediate impacts of the following Site related VOCs: TCE, PCE, 1,1-DCE, 1,1-DCA, and vinyl chloride. Groundwater is removed from the aquifer via three extraction wells and transported to the treatment plant. At the treatment plant, the water is pumped through two air stripping towers, through two granulated active carbon vessels, and finally through a filter system. The treated water is then returned to the aquifer through a series of ten injection wells down to the same elevation where it was extracted.

Construction of the remedial system was completed in April 1996. During operation of the remedial system from April 1996 through June 2000, over 1.4 billion gallons of groundwater have been recovered, treated, and returned to the subsurface at an average flow rate of 800 gallons per minute. Since the system was started, approximately 880 pounds of VOC mass have been removed.

In addition to the operation of the groundwater remedial system, the remedial action for the site includes a groundwater monitoring program, which was designed to monitor the effectiveness of the remedial action. The analysis of the data shows that the remedial system has contained the area of groundwater impacted by the site-related VOCs and is decreasing the size of the contaminant plume.

A complete lateral capture zone has been maintained from up-gradient near Well WB-07, eastward to I-25, and in the north-south direction between the injection wells. A complete vertical capture zone has been maintained from an elevation of 4,840 feet above mean sea level (msl) to an elevation of about 4,600 feet above msl. In other words, the deep groundwater remediation system has been effective in capturing the entire groundwater contaminant plume associated with OU # 6.

The deep zone remediation system has been effective in the following ways:

- The VOC plume has been captured by the deep zone remediation system. Flushing continues to reduce the concentrations of VOCs within the deep zone plume, as is evidenced by the decreasing constituent concentrations.
- There are no VOCs above ARARs in the down-gradient Well Cluster P83-19. As a result, the deep zone plume has been captured and the spread of the contaminant constituent plume has been mitigated.
- The treatment system has been effective in removing all VOC constituents to concentrations below the ARARs, and water injected back into the Deep Zone Aquifer is in compliance with the applicable discharge requirements. At the compliance sampling point prior to injection, the VOC concentrations continue to be below detection limits.

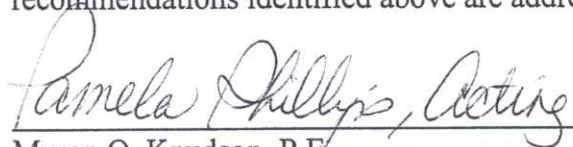
The deep zone groundwater remediation system is operating as designed, has maintained capture of impacted groundwater in the deep zone plume, and has reduced concentrations of VOCs within the area influenced by the remediation system. VOCs above ARARs have not been detected in any monitoring or water supply wells down-gradient of the remediation system.

The results of the review indicate that the remedy for OU # 6 has been, and is expected to continue to be, protective of human health and the environment. The remedial actions have been functioning as designed, and have been operated and maintained in an appropriate manner. It is recommended that GEAE continue to pursue the use of innovative technologies which may enhance future system performance of the remedial activities.

It should be noted that the groundwater remedial systems at the South Valley Superfund Site have been very effective in recovering and treating over 1.8 billion gallons of water since the remedial systems went on-line. Almost the entire amount of this large volume of water has been returned to the aquifer from which it was extracted, allowing the groundwater to be returned back to its beneficial use.

### Determinations

I have determined that the remedies for the South Valley Superfund Site are expected to be protective of human health and the environment, and will remain so provided the recommendations identified above are addressed.



Myron O. Knudson, P.E.  
Director  
Superfund Division  
U.S. Environmental Protection Agency  
Region 6

9/25/00  
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Date