{In Archive} Vogel ESD
Bob.Drustrup to: Jim Colbert
Cc: Geotek

10/30/2000 12:22 PM

From: Bob.Drustrup@dnr.state.ia.us
To: Jim Colbert/SUPR/R7/USEPA/US
Cc: Geotek@ideasign.com
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Jim,
Attached is a final version of the Vogel ESD that has been revised per your suggestions. The document should highlight only the changes since the version I e-mailed you on 10/18/00 and should print a clean copy. Thanks for all your help.

Bob Drustrup
Contaminated Sites Section
IDNR

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EXPLANATION OF SIGNIFICANT DIFFERENCES
VOGEL PAINT AND WAX COMPANY SITE

INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

As provided by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, the Iowa Department of Natural Resources (DNR) is issuing an *Explanation of Significant Differences* (ESD) for groundwater cleanup actions at the Vogel Paint and Wax Company (VPW) site near Maurice, Iowa. In part, this ESD describes significant differences in actions and conditions at the site from those described in the September 1989 *Record of Decision* (ROD) and an earlier ESD issued on July 20, 1994. In addition, a purpose of this ESD is to describe in greater detail how provisions of the ROD and the 1994 ESD will be achieved.

The DNR has served as lead agency for this project, with support from the United States Environmental Protection Agency (EPA). The EPA concurs with this ESD.

CERCLA section 117(c) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 CFR 300.435(c)(2)(i) provide that after adoption of a final remedial action plan, if an activity occurs or new information develops which may cause significant changes in the final plan, but which do not fundamentally alter the selected remedy with respect to scope, performance, or cost, the lead agency shall publish an explanation of significant differences and the reasons for such differences.

The selected remedy in the ROD consisted of a groundwater operable unit and a soils operable unit. The soils operable unit has been completed in accordance with the ROD and July 20, 1994 ESD. The groundwater operable unit is being implemented, in accordance with the ROD and July 20, 1994 ESD.

This ESD describes additional actions that will be taken to enhance free product recovery and criteria for ~~terminating~~ evaluating future groundwater actions. It also describes changes regarding the fate of treated groundwater, clean-up standards, and institutional controls.

This ESD along with other pertinent documents will be included in the Administrative Record file. The Administrative Record file is available for public review at the Orange City Public Library, 112 Albany Avenue SE, Orange City, Iowa, and the Iowa Department of Natural Resources Record Center, Wallace State Office Building, Fifth Floor, 502 East 9th St., Des Moines, Iowa. Additional information may be obtained by contacting Robert Drustrup at the DNR at (515) 281-8900.

SITE HISTORY, CONTAMINATION PROBLEMS, AND SELECTED REMEDY

The VPW site is located on an 80-acre tract of land in rural Sioux County, Iowa, about two miles south of Maurice, Iowa, and three miles north of Struble, Iowa. The site was used by the Vogel Paint and Wax Company, Inc. (hereinafter referred to as Vogel) for disposal of paint manufacturing wastes from 1971 to 1979. Wastes included paint sludge, solvents, resins, filled or partially filled drums, and other debris. The disposal area encompasses about two acres of the 80-acre site. The waste trenches were covered with a foot or two of soil. A clay cap was placed over the entire disposal area in 1984.

The site was proposed for the National Priorities List (NPL) in 1984, and became final on the NPL in June 1986. Vogel conducted numerous remedial investigation activities beginning in 1979 which concluded with a ROD being issued on September 20, 1989. An Explanation of Significant Differences (ESD) to the ROD

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was issued in July 1994.

The selected remedy for soils/source material has been completed as prescribed in the ROD, as modified in the July 20, 1994 ESD. The soils remedy consisted of excavating the former disposal trenches and surrounding soils down to the water table. Solid and liquid wastes were separated from the excavated soils for off-site disposal. The soils were then placed in 4 one-acre treatment beds for bioremediation/landfarming. A total of 65,000 cubic yards of soil were treated. Treated soils were backfilled into the original excavation. Twenty-two hundred cubic yards of soil containing high levels of lead and chromium were isolated, stabilized with lime, and placed in the excavation five feet above the high groundwater level and five below the final cover. Soil remediation was initiated in October 1991 and was completed in May of 1999.

The selected remedy for groundwater prescribed in the ROD, as modified in the July 20, 1994 ESD, consists of pumping, air stripping, and discharge to surface water. Five on-site recovery wells were installed to draw water from the entire area of groundwater contamination. Water is pumped to an air stripper for treatment of volatile organic compounds to health-based standards. Treated water was to be discharged to the nearby stream. Groundwater remediation was initiated in April of 1991 and is ongoing..

The selected remedy also includes free-product recovery until no appreciable amounts can be recovered and an institutional control consisting of what is now called the State Registry of Hazardous waste or Hazardous Substance Disposal Sites.

The selected remedy calls for pumping and treatment of groundwater to continue until groundwater standards (i.e., ARARs) are met. Criteria for ceasing remedial action based on monitoring results were to be established as part of a groundwater-monitoring program.

BASIS FOR THE DOCUMENT

With the completion of the soil operable unit, attention has focused on groundwater remediation and ultimate resolution of the groundwater operable unit. It has been recognized for some time (e.g., in the 1994 ESD) that a substantial volume (i.e., 80,000+ gallons) of free product exists south of the area that was excavated. The two recovery wells within this area were retrofitted to recover free product as described in the 1994 ESD. However, the rate of free product recovery has been relatively slow, i.e., 14,000 gallons in 9 years. Despite removal of an estimated 150,000 gallons of contaminants by the soil operable unit, the levels of contaminants entering the groundwater treatment system have not decreased, due to this residual free product. Therefore, additional efforts to enhance free product removal are being taken to expedite groundwater remediation.

~~This ESD describes the measures that will be taken to enhance removal of free product. This will involve a significant effort that was not described in the ROD or 1994 ESD. This ESD also explains how compliance with groundwater clean-up standards will be determined — something that was not described in detail in the ROD or 1994 ESD. The proposed responses for these two items are consistent with the ROD and 1994 ESD; however, the ROD and 1994 ESD described them only in general terms. An ESD was determined to be an appropriate instrument for presenting a more detailed explanation of these significant aspects of the Vogel site remediation.~~ An ESD is the appropriate method to document the changes to the selected remedy at the Vogel site. This ESD describes a secondary technology for free product removal that enhances the primary technology of the existing pump and treat groundwater system. The pump and treat system was described in the September 1989 ROD. The secondary technology consists of excavation and replacement of contaminated soil, with subsequent soil vapor extraction and bioventing treatment. Under this ESD, the groundwater pump and treat system will be discontinued only after a determination that groundwater cleanup goals have been met.

This ESD is also being used to identify other less significant changes and provide an update of costs.

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DESCRIPTION OF SIGNIFICANT DIFFERENCES

The ROD called for continued free product recovery. The July 1994 ESD stated that free product recovery was considered to be a more important factor in the ultimate site cleanup and indicated that other actions to enhance free product recovery were being considered. This ESD describes the enhanced free-product removal measures that will be taken and clarifies how compliance with groundwater requirements will be determined. In addition, this ESD describes: how the discharge from the air stripper is now infiltrated back into the aquifer in lieu of being discharged to the nearby stream, minor changes in clean-up standards since the ROD, a change in the form of institutional control, and updated costs.

Enhanced Free Product Removal: Free product recovery has been conducted at the Vogel site since 1984. Initially free product was bailed by hand from two monitoring wells. Shortly after the groundwater pump-and-treat system was put into operation in 1991, two of the five recovery wells began to draw in free product. Both wells were retrofitted with free-product recovery equipment and have collectively captured about 14,000 gallons of free product since 1991. About 4.25 gallons per day of free product has been recovered from these wells when the water air stripper is operating. Subsequent investigations by Vogel revealed an area of free product occurrence about 600 feet long by 300 feet wide immediately south of the original disposal site. An estimated 80,000 to 150,000 gallons of free product exists in this area. At the current rate of removal by the two wells that are recovering free product, it would take over 50 years and likely much longer, to recover the bulk of the residual free product.

The free product that exists in this area is largely tied up in the soils and does not drain easily from the formation. The enhanced free-product removal will be an aggressive approach that involves excavating of the soils containing free product. An area roughly 500 feet by 200 feet will be excavated to a depth of about 37 feet. The topsoil in the area to be excavated will first be stripped and stockpiled for final cover. Excavation will be done in ten sections. Soils from the first section will be excavated, and contaminated and clean soils will be stockpiled separately for later use. Clean soils to a depth of about 19 feet from the next section will be placed at the bottom of the first section with the deeper contaminated soils from the second section being placed on top. This process will continue with progressive sections. Only soils from the initial section will be taken out of the excavation and moved twice — being used to backfill the final section. A three-foot thick cover of clean soil will be placed over the entire area using the stockpiled topsoil. A comprehensive air sampling and monitoring strategy will be developed and implemented at the site to assure that the excavation/construction phase of free product removal activities is protective of human health and the environment.

The actual zone of contamination in the deep soil-excavation zone is expected to be less than 10-foot thick. The soils in this zone will be mixed as they are placed at the higher elevation resulting in dispersion of free product and adsorption by the soils with which they are mixed. A series of vent pipes will be installed in the newly repositioned zone of soil contamination and a soil vapor extraction (SVE)/bioventing system will be operated to strip contaminants from the soil and enhance natural degradation of organic contaminants by providing more oxygen (i.e., bioventing). The shallow, clean soil that will be moved to the bottom of the excavation is high in clay content and should reduce vertical migration of free product to the water table. An SVE/bioventing pilot study will be conducted on the first cell for use in designing the final system and determining air emissions. A comprehensive air sampling and monitoring strategy will be developed and implemented at the site to assure that the operation phase (i.e., SVE/bioventing) of free product removal activities is protective of human health and the environment.

Air emissions from the SVE/bioventing will be exhausted from a stack that is the same height as the air stripper tower, i.e., 56 feet above the ground surface. Air emissions will comply with the same air ARARs as specified in the ROD and July 1994 ESD. Any additional measures necessary to comply with air ARARs

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will be determined based on the SVE/bioventing pilot study. In addition, measures will be taken during this action to manage and prevent odor problems.

The free-product soil excavation will take an estimated 3 months to complete. Upon completion of the soil excavation, the SVE/bioventing process will need to be operated for an estimated 12 months. The estimated cost of the excavation SVE/bioventing actions is about $700,000.

Groundwater Compliance: The ROD states that active groundwater remediation will continue until groundwater applicable or relevant and appropriate requirements (ARARs) are met. The ROD also states that criteria for ceasing remedial action based on monitoring results will be developed. Such criteria have not been developed previously.

The ROD lists federal drinking-water maximum contaminant levels (MCLs) and Iowa groundwater action levels as ARARs. In 1998 Iowa adopted new rules that establish another potential groundwater ARAR, i.e., statewide standards pursuant to 567 Iowa Administrative Code 137.5 (455H). Statewide standards are specified for groundwater in a protected groundwater source and non-protected groundwater source based on aquifer permeability and dissolved solids content. Protected groundwater source statewide standards would apply to the Vogel site. The statewide standards are the same as MCLs, if MCLs exist. If not, they are computed in a manner similar to that used to establish MCLs. Statewide standards will now be used as ARARs for all groundwater contaminants. This change does not affect contaminants with MCLs, other than contaminants for which the MCLs have changed since the ROD (i.e., lead and toluene). It also affects contaminants in which ARARs were based on Iowa groundwater action levels (i.e., benzene and methyl ethyl ketone).

While the ROD called for development of criteria for ceasing remedial action based on monitoring results, no such criteria have previously been established. Therefore, it might be inferred that compliance with chemical-specific groundwater ARARs was applicable to all groundwater at the site. In the more than a decade of time that has elapsed since the original ROD, it has become apparent that such a goal is not reasonable. Despite the removal of over a million pounds of source material that has been completed by the soil clean-up actions, groundwater contaminant levels have remained fairly stable. The additional free-product removal described in this ESD is expected to eliminate the bulk of the remaining source material. Even with that, localized groundwater contamination in excess of ARARs is anticipated to exist for the foreseeable future.

The remedial action objective (RAO) for groundwater prescribed in the ROD is to reduce contaminants in groundwater to established health-based standards for drinking water. This ESD clarifies this RAO by specifying *where* health-based standards must be achieved. With institutional controls applicable to the site property, the use of on-site groundwater for drinking water will be prohibited. However, the potential exists for contaminants migrating off-site to enter a drinking-water supply, even if such a water supply does not currently exist. By ensuring that groundwater does not leave the site with contaminants at levels in excess of drinking-water standards, off-site exposure to contaminants from the site in groundwater at concentrations in excess of health-based standards will not be possible. Therefore, the site property boundary is being designated as the point of compliance for groundwater ARARs.

The existence of contaminants in groundwater above health-based standards at the site boundary or off-site has never been identified. Natural processes appear to be limiting contaminant movement in groundwater — even before remedial actions were initiated at the site. With the substantial removal of contaminant-source material already accomplished with the completion of the soils/solid waste operable unit plus the

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additional source-material removal that will be accomplished with the planned free-product area excavation and SVE/bioventing actions, the magnitude and extent of groundwater contamination are expected to decrease substantially. Therefore, the potential for off-site exposure to groundwater with contaminants from the site in excess of health-based levels is unlikely. The existing groundwater monitoring plan will be revised to provide a groundwater monitoring strategy that will be used to verify that migration of contaminated groundwater from the site is not occurring. Revisions will include criteria to determine if, and when, discontinuation of active groundwater remediation (i.e., the ongoing pump and treat) is warranted. The criteria will include:

- no exceedence of chemical-specific ARARs at the property boundaries,
- no expansion of groundwater contamination as demonstrated by stable or decreasing groundwater contaminant levels throughout the site, and
- no other evidence that suggests the potential for migration of groundwater from the site at levels in excess of chemical-specific ARARs.

Institutional Controls: The state registry of Hazardous Waste or Hazardous Substance Disposal Sites was the form of institutional control prescribed in the ROD. This registry listing requires that sale or significant change in use of the property must be approved by the DNR. The Vogel site has been on this registry since 1984. Subsequently Iowa Code section 455H.206 established a new form of institutional control called an environmental protection easement (EPE) — 567 IAC 137.7(3). The DNR now accepts the EPE in lieu of a registry listing and an EPE may be used in addition to (or in lieu of) the registry listing. An EPE would enable more specific restrictions on land use to be made. These restrictions would include no use of on-site groundwater for drinking water (or other unsafe use) and no excavation in the area of final placement of the soils containing high levels of lead and chromium. Vogel would file an EPE in the office of the Sioux County Recorder. Vogel would have to provide the DNR with sufficient documentation to determine if an EPE would serve its intended purpose and would be valid and enforceable.

Aquifer Infiltration of Treated Groundwater: The ROD called for discharge of treated water from the air stripper to the nearby-unnamed stream. As part of efforts to enhance free-product recovery in 1994, Vogel was allowed to infiltrate treated groundwater back into the aquifer via the north runoff lagoon that was originally installed to contain surface water runoff from the site. This change was made to create a steeper groundwater-head gradient towards the recovery wells, thereby enhancing free product recovery. The groundwater recovery wells provide hydraulic containment of groundwater at the site such that any contaminant the air stripper discharges will be drawn to a recovery well and will not leave the site. Additional monitoring wells were installed to confirm this. This change also eliminated the possibility of adverse impacts to surface water from the air stripper discharge. The same monitoring and treatment standards are being used as with the discharge to the unnamed stream. Only minimal costs were involved with this change.

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The following information summarizes the differences in scope, performance, and cost between the original remedy described in the ROD/ 1994 ESD and the modified remedy.

Original/7-94 Modified Remedy	Final/Modified Remedy
At least 50,000 gallons of free product estimated.	80,000 gallons + of free product estimated to be remaining.
Enhance free product recovery equipment added. Other actions to enhance free-product recovery being considered.	Excavation of free product area, moving soils containing free product to intermediate depth, installing lateral air piping within, and conducting soil vapor extration/bioventing.
Groundwater remediation (i.e., pump and treat) to until chemical-specific ARARs are met.	Groundwater pump and treat actions to continue continue until enhanced free-product removal is completed and it can be demonstrated by monitoring that chemical-specific ARARs will always be met at the site property boundary without additional active remedial measures.
Discharge of treated groundwater from the air stripper to the nearby stream.	Re-infiltration of treated water from the air stripper back into the site aquifer where it is drawn back to the site recovery wells.
Operation and maintenance (O&M) costs for groundwater remediation were estimated to be $200,000 per year for at least 10 more years.	Actual O&M costs for groundwater remediation have been $122,000 per year.
The present worth of future costs for groundwater remediation for 4+ more years (6 years have passed since the 10+ years estimated in the 1994 ESD) at $200,000 per year with a 5% discount rate is estimated to be $709,000+.	The present worth of future costs for groundwater remediation with enhanced free product recovery based on a capital cost of $700,000, $122,000 for one more year of O&M with the existing groundwater remediation system, and $10,000 per year for monitoring for 3 years thereafter, at a 5% discount rate is estimated to be $842,000.
Listing of the site on what is now called the state Registry of Hazardous Waste or Hazardous Substance Disposal Sites.	Placing an environmental protection easement on the site as an institutional control. The easement would prohibit use of on-site groundwater for drinking water (or other unsafe use) and would prohibit excavation in the area where soils containing high levels of metals were placed.

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SUPPORT AGENCY COMMENTS

EPA concurs with this ESD.

AFFIRMATION OF STATUTORY DETERMINATIONS

Considering the new information that has been developed and the changes that have been made to the selected remedy, the DNR and EPA believe that the remedy remains protective of human health and the environment, complies with federal and state requirements that were identified in the ROD as relevant and appropriate to this remedial action at the time the ROD was signed and as modified by the 1994 ESD and this ESD, and is cost-effective. In addition the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site.

PUBLIC PARTICIPATION ACTIVITIES

This ESD is being issued for informational purposes. A notice has been published in the Sioux County Capitol-Democrat that briefly summarizes this ESD and informs the public that the ESD and supporting information are in the Administrative Record File for the site. The Administrative Record File is available for public review at the Orange City Public Library, 112 Albany Avenue SE, Orange City, Iowa, and the Iowa Department of Natural Resources Record Center, Wallace State Office Building, Fifth Floor, 900 East Grand Avenue, Des Moines, Iowa.

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