DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action
Environmental Indicator (EI) RCRIS Code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: **Fort Dodge Animal Health, Inc.**
Facility Address: **Charles City, Iowa**
Facility EPA ID #: **IAD005275540**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units [SWMU], Regulated Units [RU], and Areas of Concern [AOC]), been **considered** in this EI determination?

 __X__ If yes - check here and continue with #2 below.

 _____ If no - re-evaluate existing data, or

 _____ if data are not available, skip to #8 and enter "IN" (more information needed) status code.

Manufacturing of animal health biologics, pharmaceuticals, feed additives, and fine chemicals began at the Fort Dodge Animal Health, Inc. (FDAH) facility in 1951. The facility originally was owned by Salsbury Laboratories, Inc., and later by Solvay Animal Health, Inc. (Solvay). In 1991, Cambrex Corporation purchased the fine chemicals and feed additives manufacturing facilities identified as Salsbury Chemicals, Inc. (Salsbury), including Chemical Production I and II, the Wastewater Treatment Plant (WWTP), and 43 acres of associated property. American Home Products Corporation purchased the remainder of the Solvay facility in March 1997 and changed the name to FDAH. Facility location and layout maps are provided in Attachment 1.

Production facilities and storage structures on the FDAH and Salsbury properties include Pharmaceutical Production, Biological Production, Chemical Production I and II, the Extraction Plant, Warehouses 1 and 2, the Eastern Tank Farm (formerly identified as Storage Tank Area 1), the Southern Tank Farm (formerly identified as Storage Tank Area 2 and including Waste Sulfuric Acid Tanks 460, 630, and 631 and Waste Methanol Tank 153), and the Closed Waste Water Treatment Surface Impoundment. Also included are the facility product and waste lines, most notably an old sewer line running northeast from the facility and an 18-inch diameter sewer line running north to its outlet at Sherman Creek. Facility layout maps are provided in Attachment 1. Listed chemical constituents historically or currently managed in these locations are provided in Table 1 in Appendix 1.

Existing and historical SWMUs identified at FDAH are listed and described below.

- **Waste Sulfuric Acid Tanks 460, 630, and 631.** Tanks 630 and 631 are 20,255-gallon, fiberglass tanks located east of the wastewater treatment surface impoundment and south of the Chemical Production I building. These tanks are within the Southern Tank Farm area. Tank 460 is a 13,000-gallon, stainless-steel tank located immediately east of Tank 631. All of the tanks, which store spent sulfuric acid, are located within concrete secondary containment structures designed to prevent releases (Conestoga-Rovers & Associates [CRA] 1991). Waste Sulfuric Acid Tanks 460, 630, and 631 were identified as Interim Status Units (Ecology & Environment, Inc. [E&E] 1986).

- **Waste Methanol Tank 153.** Tank 153 is a 7,000-gallon steel tank located east of Tank 460. This tank is within the Southern Tank Farm Area. Tank 153, which stores waste methanol, is contained within a concrete secondary containment structure designed to prevent releases (CRA 1991). Waste Methanol Tank 153 was identified as an Interim Status Unit (E&E 1986).

- **Waste Container Accumulation Area.** The hazardous waste container accumulation area was located in Warehouse 1, an enclosed area with no floor drains. Warehouse 1 is the pharmaceutical building addition, located just south of the building's truck loading docks. The waste container accumulation area was identified as an Interim Status Unit (E&E 1986). In August 1994, the U.S. Environmental Protection Agency (EPA) certified that the waste container accumulation area had been closed in accordance with applicable requirements (EPA 1994).

- **Wastewater Treatment Surface Impoundment.** The WWTP was an on-site chemical, physical, and biological treatment facility that received process wastewater from the organic chemical production operation. Chemical treatment consisted of precipitation and neutralization, physical treatment consisted of resin adsorption, and biological treatment consisted of extended aeration of activated sludge. The chemical treatment facility and equalization lagoon were constructed in 1965, the physical treatment facility in 1979, and the biological treatment facility in 1984. Wastes generated in association with the WWTP included process wastewater and sludges and *de minimis* amounts of off-specification commercial products. The wastewater treatment surface impoundment had a capacity of about 1,000,000 gallons. The impoundment handled 150,000 gallons of wastewater on a typical day; however, it was designed to handle up to 500,000 gallons on peak days (E&E 1986). In April 1985, releases to the environment from the wastewater treatment surface impoundment were reported. Hazardous constituents within the wastewater included arsenic, phenols, and 1,1,2-trichloroethane (TCA) (Salsbury 1985a). The wastewater treatment surface impoundment was identified as an Interim Status Unit (E&E 1986). In 1989, the wastewater treatment surface impoundment was closed in place as a landfill. Associated piping and manholes outside the impoundment perimeter were flushed and disposed of within the closed impoundment. Closure activities were completed on April 18, 1990 (CRA 1991).

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future. __

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is groundwater known or reasonably suspected to be "contaminated"[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria [e.g., Maximum Contaminant Levels (MCLs), the maximum permissible level of a contaminant in water delivered to any user of a public water system under the Safe Drinking Water Act]) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

__X__ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

<u>General Geology and Hydrogeology</u>
The uppermost stratigraphic unit beneath FDAH is a thin layer of glacial till overburden. Beneath the glacial till is the Upper Limestone Unit (ULU), an unconfined water-bearing unit up to 27 feet thick locally. Depth to groundwater in the ULU is generally between 15 and 25 feet below ground surface, and groundwater flow is historically to the northwest. Groundwater flow directions have been influenced by the FDAH groundwater extraction and treatment system. The Shale/Limestone/Siltstone Unit beneath the ULU provides a continuous aquitard about 6 to 21 feet thick beneath the site. Vertical migration of groundwater occurs across the Shale/Limeston/Siltstone Unit from the ULU to the Upper Cedar Valley Aquifer (UCVA). Groundwater occurs in the fractured aphanitic dolomite of the UCVA under confined conditions. Groundwater flow in the UCVA is historically to the north-northwest.

<u>Historical Groundwater Monitoring and Analysis</u>
In 1980, Salsbury submitted to EPA a Notification of Hazardous Waste Activity and a Resource Conservation and Recovery Act (RCRA) Part A Permit Application. The Notification of Hazardous Waste Activity acknowledged that Salsbury was generating, storing, treating, and disposing of hazardous waste at its facility, and the RCRA Part A Permit Application acknowledged that Salsbury was operating or would operate hazardous waste management units in the form of container and tank storage at the facility.

In 1982, EPA and the Iowa Department of Water, Air, and Waste Management (IDWAWM) conducted a Compliance Evaluation Inspection of the facility and detected elevated arsenic concentrations in samples collected from the wastewater treatment surface impoundment. IDWAWM required Salsbury to conduct groundwater monitoring at the facility. Salsbury installed Interim Status Wells 1 through 6 in 1983 and began quarterly groundwater monitoring in accordance with 40 Code of Federal Regulations (CFR) Part 265 in 1984. Groundwater samples revealed elevated levels of arsenic, total organic halides (TOX), specific conductance, and nitrate. As a result, Monitoring Wells 7 through 10 were installed downgradient of the impoundment.

In 1984, Salsbury submitted a RCRA Part B Permit Application to EPA and IDWAWM. EPA responded with a Notice of Deficiency and Letter of Warning, requiring the facility to establish compliance monitoring in accordance with 40 CFR Part 264.99 and provide additional information in accordance with 40 CFR Part 270.14(c)(7). Salsbury initiated semi-annual sampling in 1985, and groundwater samples revealed elevated levels of arsenic, TOX, specific conductance, total organic carbon, and orthonitroaniline. Downgradient Wells 3, 4, 6, 7, 8, 9, and 10 showed statistically significant increases in all analytical parameters, as compared to Background Well 5. Monitoring Wells 11 and 12 were installed in 1985.

EPA issued a draft Consent Order to the facility in 1986, requiring the facility to conduct groundwater quality assessment pursuant to 40 CFR 265 Subpart F. In 1986, the facility submitted draft and revised groundwater quality assessment plans and installed additional Wells 13 through 21. The final Consent Order became effective later in 1986 (Department of the Army 1994). In 1989 and 1990, the facility installed Monitoring Wells 22 and 23, respectively.

EPA issued the facility a Final Administative Order (FAO) in 1991, which required that the facility complete a RCRA Facility Investigation (RFI) and, if EPA deemed it necessary following review of the RFI, a Corrective Measure Study (CMS). EPA reviewed the RFI, and in 1996, determined that no additional investigatory work was necessary under the terms of the FAO. EPA stated that completion of a CMS for the facility would satisfy FAO requirements. EPA also approved the facility's implementation of Interim/Stabilization Measures (ISM) while the CMS was being completed (CRA 1998). ISMs included excavation and off-site disposal of impacted soils and on-site groundwater collection and treatment. The ISMs later were adopted as Corrective Measures for the facility. By December 2000, the facility had installed an additional 32 monitoring wells (24 through 55), including 22 ULU Monitoring Wells, 10 UCVA Monitoring wells, and an Extraction Well (EW-1). Additionally, FDAH converted ULU Monitoring Well 20 to Extraction Well EW-2 and installed Extraction Well EW-3. A figure of the current groundwater monitoring system is provided in Attachment 1. The soil and groundwater ISMs were adopted as Corrective Measures for the facility.

<u>Groundwater Contamination</u>
The RFI Report documents that historical facility operations have contributed to bedrock groundwater contamination at, and in the vicinity of, the FDAH facility (CRA 1993). The report identified two locations in the study area as exhibiting groundwater contamination: the production facility and an old sewer line in the northeastern corner of the study area. Beneath the FDAH and Salsbury production facilities are two groundwater plumes contaminated primarily with arsenic and 1,1,2-TCA. One plume is located in the ULU; the other plume is located in the UCVA. Beneath the old sewer line is a 1,1,2-TCA plume located in the ULU.

The RFI Report and subsequent data collected indicate that a number of facility-specific 40 CFR Part 261 Appendix VIII volatile organic compounds (VOC) historically have exceeded their respective MCLs or EPA Region 9 preliminary remediation goals (PRG) in ULU groundwater: benzene; 1,2-dichloroethane (DCA); 1,1,-dichloroethene (DCE); methylene chloride; tetrachloroethene; 1,1,2-TCA; trichloroethene (TCE); and vinyl chloride. Detections were compared to EPA Region 9 PRGs only where no MCL was established for a compound. The following base, neutral, and acid-extractable organic compounds (BNA) historically have exceeded their respective MCLs or PRGs in groundwater: aniline, methyl phenol (p-cresol), m-dinitrobenzene, 2-nitroaniline, and pentachlorophenol. Additionally, the following metals historically have exceeded their respective MCLs or PRGs in groundwater: arsenic, barium, cadmium, chromium, and lead. The RFI Report and subsequent data collected also indicate that a number of facility-specific 40 CFR Part 261 Appendix VIII VOCs, BNAs, and metals historically have exceeded their respective MCLs or PRGs in UCVA groundwater: 1,2-DCA; 1,1,-DCE; methylene chloride; 1,1,2-TCA; TCE; vinyl chloride; 2-nitroaniline; arsenic; and barium. Tables 2 and 3 in Appendix 1 identifies the facility-specific Appendix VIII constituents historically present in ULU and UCVA groundwater, respectively.

FDAH recently installed a groundwater extraction and treatment system which has reduced contaminant levels in groundwater. The first semiannual sampling event following installation of this system was conducted in January 2002. Samples collected during this event revealed that the following constituents exceeded their respective MCLs in ULU groundwater: 1,2-DCA; 1,1-DCE; 1,1,2-TCA; vinyl chloride; arsenic; and lead. In UCVA groundwater, 1,1,2-TCA, vinyl chloride, and arsenic exceeded their respective MCLs. Tables 2 and 3 in Appendix 1 identify the facility-specific Appendix VIII constituents present in ULU and UCVA groundwater, respectively.

In addition to groundwater analytical data, soil and sediment analytical data may be used to determine whether contamination at the FDAH is likely to leach from soil to groundwater. Two areas in the study area were identified as exhibiting soil contamination, with total arsenic concentrations above the EPA-specified soil action level of 80 milligrams per kilogram (mg/kg). The first area of soil contamination encompasses the overflow weir, the 18-inch-diameter sewer, and the 18-inch-diameter sewer outlet at Sherman Creek. Impacted soils are located south and north of Highway 14 and extend north of the facility to Sherman Creek. Impacted soils in this area cross FDAH property, the highway right-of-way, and City of Charles City property. The second area of soil contamination includes the East Tank Farm and South Tank Farm. Both tank farms are located on FDAH property and are part of active production facilities.

Historically, two 40 CFR Part 261 Appendix VIII constituents have been detected in facility soils above EPA Region 9 soil screening levels (SSL) for migration to groundwater. Arsenic and 1,1,2-TCA have exceeded their respective SSLs at dilution attenuation factors (DAF) of 1 and 20. However, only arsenic has exceeded an EPA-specified soil action level (80 mg/kg for arsenic). In samples collected from the vicinity of the South Tank Farm, arsenic was detected at concentrations up to 8,180 mg/kg in surface soil and 45,900 mg/kg in subsurface soil. Table 4 in Appendix 1 lists the facility-specific Appendix VIII contaminants historically detected in soil at FDAH.

In response to the above detections, FDAH implemented ISMs consisting of excavation and off-site disposal of contaminated soils in the above locations. Verification soil sampling in the excavated areas indicated that the bulk of the soil remaining had total arsenic concentrations below the EPA-specified 80-mg/kg action level. The exceptions included some sidewall verification samples with arsenic concentrations up to 267 mg/kg. These soils were considered to be impossible or impractical to remove.

Footnotes:

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the migration of contaminated groundwater stabilized (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

__X_ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):

A map of the groundwater contamination plumes based on data collected during the RFI is provided in Attachment 1. Since the RFI, FDAH has implemented a number of ISMs, adopted as Corrective Measures, at the facility:

- **Phase I Soil ISM.** FDAH excavated and properly disposed of contaminated soils located south and north of Highway 14 and extending off site to the north to Sherman's Creek. Between December 1996 and April 1997, about 3,648 tons of soil, with arsenic concentrations exceeding the EPA-specified 80-mg/kg action level, were excavated and disposed of at a Subtitle D landfill. Verification soil sampling of the excavated area indicated that remaining soil exhibited total arsenic concentrations below 80 mg/kg.

- **Phase II Soil ISM.** FDAH excavated and properly disposed of contaminated soils located in and around the East and South Tank Farms. The South Tank Farm was excavated between October and December 1997, with about 6,049 tons of soil disposed of at a Subtitle D landfill and another 2,323 tons of soil disposed of at a Subtitle C landfill. With a few exceptions, verification soil sampling of the excavated area indicated that remaining soil exhibited total arsenic concentrations below 80 mg/kg. The East Tank Farm was excavated between July and October 2000, with about 3,740 tons of soil disposed of at a Subtitle D landfill and another 340 tons of soil disposed of at a Subtitle C landfill. FDAH collected verification soil samples of the excavated areas to confirm that remaining soil exhibited total arsenic concentrations below 80 mg/kg. Where verification samples exceeded the EPA-specified action level, FDAH extended the excavation or excavated to bedrock.

- **Phase I Groundwater ISM.** FDAH completed the design, installation, and performance testing of an on-site groundwater collection system connected to both the ULU and UCVA. Phase I Groundwater ISM activities were conducted between October 1997 and January 1998 and consisted of installation and development of two ULU monitoring wells (52 and 53) and two UCVA monitoring wells (54 and 55). A limited seismic refraction survey also was conducted in the vicinity of the initially proposed horizontal extraction well alignments. Three vertical extraction wells (EW-1, EW-2, EW-3) were installed or converted from monitoring wells in 1999. Packer tests, pumping tests, hydraulic monitoring, dye trace tests, and sampling also were conducted on select wells.

- **Phase II Groundwater ISM.** FDAH completed installation and operation of an on-site groundwater treatment and discharge system.

Prior to activating the groundwater collection and treatment system, FDAH collected baseline groundwater samples in June 2001 and limited confirmation groundwater samples in July 2001. In October 2001, approximately 90 days after activation of the groundwater collection system, groundwater samples were collected from some monitoring wells. The first semi-annual groundwater sampling event was conducted in January 2002, and the extraction wells were sampled for the first time during this event. The above corrective actions have reduced groundwater contamination beneath the FDAH facility. While contaminant concentrations have decreased in some wells since the activation of the groundwater collection system, they have increased in others. The last round of sampling occurred in February 2003. The results, submitted in correspondence dated May 29, 2003, identified the extent of ground water contamination in the overburden, Upper Limestone Unit, and Upper Cedar Valley Aquifer. Ground water elevation data was also presented in the May 29, 2003 correspondence, and this data indicates that those portions of the contaminant plumes above MCLs are under hydraulic control of the ground water extraction system.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does “contaminated” groundwater discharge into surface water bodies?

___X_ If yes - continue after identifying potentially affected surface water bodies.

____ If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

The RFI Report, dated December 2, 1993 and Ground Water Monitoring Report, dated May 29, 2003 identify nearby surface water, Sherman Creek, as the only surface water body that may be potentially affected by the discharge of contaminated ground water into a surface water body.

5. Is the discharge of "contaminated" groundwater into surface water likely to be "insignificant" (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

__X__ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

The RFI Report, dated December 2, 1993 and Ground Water Monitoring Report, dated May 29, 2003 identify nearby surface water, Sherman Creek, as the only surface water body that may be potentially affected by the discharge of contaminated ground water into a surface water body. The information presented in the RFI Report, dated December 2, 1993 and Ground Water Monitoring Report dated May 29, 2003 show that 1,1,2-trichloroethane and arsenic are the contaminants of concern that could potentially enter into Sherman Creek. Monitoring Well WWLM-66 which is located approximately 50 feet up-gradient from Sherman Creek, on February 18, 2003, yielded ground water that contained 1.6 ug/l of arsenic and 1.7 ug/l of 1,1,2-trichloroethane. These contamination levels are below their respective MCLs. The activation of the ground water pump and treat system (an interim measure that is described earlier and which will be incorporated into the Statement of Basis) appears to contain the groundwater contamination plume. If not, additional ground water extraction wells will be installed so that the ground water contamination plume is contained. Monitoring of arsenic and 1,1,2-trichloroethane in the ground water will continue pursuant to 40 CFR Part 265 Subpart F and the Statement of Basis which should be final by 9/30/03. Given the aforementioned information, is not anticipated that arsenic or 1,1,2-trichloroethane will have an unacceptable impact on Sherman Creek.

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the discharge of "contaminated" groundwater into surface water be shown to be "currently acceptable" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

_____ If yes - continue after either:
1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "currently acceptable") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater monitoring / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

_X___ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Monitoring of arsenic and 1,1,2-trichloroethane in the ground water from numerous monitoring wells including WWLM-66, which is located approximately 50 feet upgradient of Sherman Creek, will continue pursuant to 40 CFR Part 265 Subpart F and the Statement of Basis which should be final by 9/30/03. If monitoring well WWLM-66 shows arsenic or 1,1,2-trichloroethane above an MCL periodic surface water monitoring of Sherman Creek will be conducted in order to assure that Sherman Creek is not adversely impacted. As stated earlier, a ground water pump and treat system has been installed and is being operated as an interim measure. This interim measure was designed to contain the ground water contamination plume. Should ground water sampling data, taken pursuant to 40 CFR Part 265 Subpart F or the Statement of Basis, which should be final by 9/30/03, indicate that the plume of contaminated ground water is expanding, additional extraction wells will be installed to contain the ground water contamination plume and additional monitoring wells installed to monitor the ground water contamination plume.

Rationale and Reference(s):

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the FDAH facility, EPA ID #IAD005275540, located in Charles City, Iowa. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

___ NO - Unacceptable migration of contaminated groundwater is observed or expected.

___ IN - More information is needed to make a determination.

Completed by __original signed by____________________ Date __6/19/03__
(signature)
Brian Mitchell
Project Manager, RCRA Corrective Action & Permits Branch
EPA Region 7

Completed by __original signed by____________________ Date __6/19/03__
(signature)
Chuck Williams
U.S. Army Corp of Engineers
Kansas City Missouri Office

Supervisor __original signed by____________________ Date __6/19/03__
(signature)
John Smith
Branch Chief, RCRA Corrective Action & Permits Branch
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Locations where References may be found:

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REFERENCES

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