DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99
Revised 11/8/00

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

Migration of Contaminated Groundwater Under Control

Facility Name: **Iowa State University (ISU) Chemical Waste Handling Facility (CWHF)**
Facility Address: **Ames, Iowa**
Facility EPA ID #: **IAT200010601**

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.

SWMUs IDENTIFIED AT THE ISU CWHF

SWMUs identified at the ISU CWHF are listed and described below. SWMU descriptions were obtained from documents referenced in this EI.

The 32 SWMUs for the ISU CWHF were designated in the ISU Resource Conservation and Recovery Act (RCRA) Permit for the CWHF. Permit conditions required that ISU conduct a RCRA Facility Investigation (RFI) to address 12 of the SWMUs. The remaining 20 SWMUs were eliminated from the RFI. The SWMU descriptions below are organized by exclusion or inclusion in the RFI.

In 1997, the U.S. Environmental Protection Agency (EPA) approved the RFI Report. EPA did not require the facility to perform corrective action at the CWHF (EPA 1997). Two figures from the RFI Report, a site location map and a map of SWMUs addressed by the RFI, are provided in Appendix A.

It should be noted that the two Fire Training Facility (FTF) SWMUs described below are not considered in this EI evaluation. The FTF SWMUs originally were listed in ISU's RCRA Permit for the CWHF (EPA Identification No. IAT200010601). Later, the FTF was determined to be noncontiguous with the CWHF and was issued its own identification number (EPA Identification No. IAD984621383). Because the FTF is not contiguous with the CWHF and because the FTF is identified as a separate facility by EPA, the FTF is not included in this EI evaluation. Only the CWHF and contiguous units under IAT200010601 are considered.

Units Excluded from the RFI

Under conditions of the RCRA Permit for the facility, the following SWMUs were not required to be part of the RFI. A SWMU was excluded from the RFI either because EPA and the facility determined that the likelihood of release from the SWMU was low, or because other agencies were investigating or had addressed the SWMU. Examples of other agencies investigating or having addressed SWMUs include the Department of the Environment (DOE), in the case of the Ames Research Laboratory (ARL) SWMUs, or the Iowa Department of Natural Resources (IDNR) in the case of the FTF SWMUs:

Waste Transfer Vehicle
Waste Unloading Dock
Waste Classification and Staging Area
Waste Chemical Shelves
Temporary Drum Storage Area
Filter Press and Tank
Chemical Treatment Area
Safety Cabinets
Empty Drum Collection Area
Building Drain and Sewer Line
Radioactive/Mixed Waste Storage
Hazardous Waste Storage Area
Polychlorinated Biphenol (PCB) Storage Area
Waste Drum Off-Loading Vehicle
Waste Loadout Dock
Non-Usable Drum Storage Area
Waste Detonation Area
ARL Underground Storage Tanks (UST)
DOE Landfill
ISU FTF
ISU FTF USTs

Waste Transfer Vehicle. The waste transfer vehicle is a cargo van used by ISU to transport hazardous wastes from generator locations on campus to the CWHF. Wastes in the vehicle are fully contained, and spills, should they occur, should be contained in the vehicle. No releases from this unit have been documented.

Waste Unloading Dock. Wastes transported to the CWHF are unloaded at this location. All wastes unloaded at the dock are contained, and the driveway outside of the dock is paved with concrete. No releases have been documented for this SWMU, and effective implementation of waste management practices specified in the permit should mitigate the potential for releases at this unit in the future. ISU evaluated design plans for a secondary containment system around the CWHF. The purpose of this system was to comply with building code requirements to provide containment of fire suppression water and to provide the added benefit of further mitigation of the potential for contaminant releases from the CWHF to surface waters in the area.

Waste Classification and Staging Area. This SWMU is located inside of the CWHF and within the internal containment system for the facility. No releases have been documented from this unit.

Waste Chemical Shelves. This SWMU is located inside the CWHF and within the internal containment system for the facility. No releases have been documented from this unit, and the potential for a future release is low. In addition, the RCRA Closure Plan for the CWHF includes decontamination procedures for the Waste Chemical Shelves. Recently, the original shelves were replaced as part of routine maintenance. The old shelves were cleaned thoroughly prior to disposal. No evidence of contamination existed on the original shelves. Most of the shelves were replaced with steel fire safety cabinets.

Temporary Drum Storage Area. The Temporary Drum Storage Area is located inside of the CWHF and within the internal containment system for the facility. The current location of the Temporary Drum Storage Area is in the new addition of the CWHF. The SWMU identified in the RCRA Facility Assessment report was located in the original portion of the CWHF, where safety cabinets are now located. No releases have been documented from this unit.

Filter Press and Tank. This SWMU is located inside of the CWHF and within the internal containment system for the facility. No documentation was provided about the materials pressed and filtered. No documented releases exist from this unit.

Chemical Treatment Area. This SWMU is located inside of the CWHF and within the internal containment system for the facility. No documented releases exist for this unit.

Safety Cabinets. The safety cabinets are located in the original portion of the CWHF and are used to store a wide range of wastes in small containers. The cabinets are located within the internal containment system for the facility. No documented releases exist from this unit.

Empty Drum Collection Area. This SWMU is located inside of the CWHF and within the internal containment system for the facility. No documented history of release exists for this unit.

Radioactive/Mixed Waste Storage Area. This SWMU is located inside of the CWHF and within the internal containment system for the facility. The Radioactive/Mixed Waste Storage Area is further contained from other storage areas at the CWHF to prevent spreading or mixing of mixed waste from accidental spills or releases and to prevent escape of mixed waste to the floor drain system for the CWHF. No releases from this unit were documented.

Hazardous Waste Storage Area. The Hazardous Waste Storage Area is located inside of the CWHF and within the internal containment system for the facility. While occasional, accidental spills have occurred at the CWHF, none have ever exceeded the containment capacity for the facility. Operational procedures in the RCRA Permit for the CWHF include provisions for immediate response, containment, and cleanup of spills and releases. No documented releases have occurred to the environment from this SWMU.

PCB Storage Area. This SWMU is located inside of the CWHF and within the internal containment system for the facility. The PCB Storage Area is further contained from other storage areas at the CWHF to prevent spreading or mixing of PCB-contaminated waste from accidental spills or releases and to prevent escape of PCBs to the floor drain system for the CWHF. No documented releases exist for this unit.

Waste Drum Off-Loading Vehicle. This vehicle (forklift) is used to move closed drums containing wastes to and from loading areas within the CWHF. The vehicle is used inside of the CWHF within the internal containment system for the facility. No releases from this unit have been documented.

Waste Load-Out Dock. Wastes to be transported from the CWHF are removed from the facility at this location. All wastes handled at the dock are contained, and the driveway outside the dock is paved with concrete. No documented releases exist at this SWMU, and effective implementation of waste management practices specified in the permit should mitigate the potential for releases at this unit in the future. ISU evaluated design plans for a secondary containment system around the CWHF. The purpose of this system was to comply with building code requirements to provide containment of fire suppression water and to provide the added benefit of further mitigation of the potential for contaminant releases from the CWHF to surface waters in the area. It is not know whether any secondary containment actually was installed.

Non-Usable Drum Storage Area. This area, located outside of the CWHF, was used to store unusable 55-gallon drums. The drums were determined to be unusable, either because of damage or deterioration. In all cases, the unusable drums were decontaminated with a triple rinse prior to storage in the area. Use of the area for storage of unusable drums was discontinued in 1989. No history of release exists for this area, and the potential that a release occurred was determined to be extremely low, because no wastes were stored in the area and the drums were empty and decontaminated. Because the area is no longer used, little potential exists for future releases. ISU evaluated design plans for a secondary containment system around the CWHF. The purpose of this system was to comply with building code requirements to provide containment of fire suppression water and to provide the added benefit of further mitigation of the potential for contaminant releases from the CWHF to surface waters in the area. It is not known whether any secondary containment actually was installed.

Waste Detonation Area. This area, identified as SWMU No. 6 in the CWHF RCRA Permit, is located about 1,500 feet north of the CWHF. From 1983 to July 1987, the unit was used for the detonation of shock-sensitive and potentially explosive compounds (reactive wastes). In accordance with 40 Code of Federal Regulations (CFR) 265, Subpart G, ISU collected closure verification samples at this unit on March 28, 1995. Closure and associated sampling activities were conducted under a Closure Plan approved by EPA. Analytical results from the verification samples indicate that no contamination is present in soils at the former location of the SWMU. The unit was certified clean-closed by EPA in 1995.

ARL USTs. Four USTs associated with the ARL were included with the list of SWMUs in the CWHF RCRA Permit. Included were a 5,000-gallon diesel fuel tank, a 15,000-gallon tank containing sodium hydroxide, and two tanks (500- and 5,000-gallon) containing sulfuric acid. All four USTs were removed

under the review and approval of the UST Section of the IDNR. All four tanks were removed and cleaned between October 1989 and January 1990. None of the USTs showed signs of deterioration, and no indication of leakage or spillage existed in the excavations. Confirmatory samples were collected from each excavation to determine if any releases had occurred. None of the samples indicated the presence of contamination. Based on removal actions and confirmatory sampling done by ISU, it was determined by IDNR that no further action was required at the SWMU.

DOE Landfill. This landfill, also referred to as the Inactive Chemical Disposal Site, was located adjacent to the eastern side (across Scholl Road and north of the CWHF) of the ARL facility. The site was used for disposal of hazardous and radioactive materials generated at ARL between 1956 and 1966. Extensive soil and groundwater investigations have been conducted by DOE in the vicinity of the landfill. A removal action was conducted during 1995 at the site by OHM Corporation with DOE funding. ISU is involved in the project in an oversight and technical review capacity. Information pertaining to significant milestones associated with this project was to be forwarded to EPA Region 7. No documentation of DOE closure activities was found in the record for the CWHF, possibly because DOE was conducting the investigation, rather than ISU.

ISU FTF. The ISU FTF is located approximately 1 ½ miles east of the CWHF, near the intersection of Pammel Drive and Harber Road, north of the Chicago and Northwestern railroad tracks, in Ames, Iowa. The area consists of USTs for fuel storage, underground piping for fuel transfer, and a fire demonstration and training basin. Fire training activities have been conducted in this area since the mid-1960s and continue today. Current fire training exercises are conducted with propane and water instead of diesel and gasoline.

The FTF has undergone extensive investigation since the summer of 1993 as a result of hydrocarbon-impacted soil and groundwater discovered during the removal and investigation of the FTF USTs. A Site Cleanup Report (SCR) and SCR Addendum were prepared by ISU's consultant for the FTF site, ATC Blattert, Inc. (ATC), under direction of the IDNR Leaking Underground Storage Tank (LUST) program. ATC has installed 33 shallow monitoring wells in the vicinity. Analytical results of groundwater samples indicate the presence of a hydrocarbon plume beneath the former location of the FTF USTs and the Fire Demonstration and Training Basin (FDTB). Benzene appears to be the contaminant of most concern, with groundwater concentrations as high as 2,440 parts per billion (ppb). The IDNR action level is 5 ppb. The source of hydrocarbons in the soil and groundwater in the area appears to be leakage from the former USTs, leakage in the underground piping system from the USTs to the FDTB, and spills in the FDTB. The SCR states that the site is classified as a high-risk LUST site.

Prior to use as the FTF, the area appears to have been the location of a wastewater treatment facility. An Imhoff tank and dosing chamber were both present at the site. The FDTB was a sand filter bed for the treatment facility. The porous nature of the soils in the basin may have accelerated the migration of hydrocarbons released as a result of fire training exercises. Data presented in the SCR indicate that a hydrocarbon plume is present in the shallow, water-bearing unit beneath the basin.

Corrective action alternatives were evaluated in the SCR. Additional soil and groundwater sampling was conducted in 1999 and a Risk Based Corrective Action (RBCA) Tier II report was generated and

submitted to the IDNR and the Iowa Underground Storage Tank Board (IUSTB). IDNR assigned the FTF site a "No Action Required" classification in 2001 (IDNR 2001).

Although the FTF SWMUs are listed in ISU's RCRA permit for the CWHF (IAT200010601), the FTF was later determined to be noncontiguous with the CWHF, and the FTF was issued its own identification number (IAD984621383). Because the FTF is not contiguous with the CWHF and because the FTF is identified as a separate facility by EPA, the FTF is not included in this EI evaluation.

ISU FTF USTs. A total of seven USTs were located north of the FTF. The tanks were installed in 1980 and were used to store gasoline and diesel fuel used in fire training exercises. Underground piping was used to transfer the fuel to the FTF. Under review of the IDNR LUST Section, all seven USTs were removed by ISU in 1989. During removal of the USTs, hydrocarbon-impacted soils were observed. Subsequent investigation of the site was conducted under the IDNR LUST Program by ATC. ATC collected numerous soil and groundwater samples in the area. Analytical results from these soil and ground water samples indicate the presence of significant gasoline and diesel contamination in both media. The source of hydrocarbons in the area is attributed to leakage from the USTs and underground piping. An SCR was prepared by ATC and submitted to IDNR in March 1994. Subsequent sampling was conducted and an addendum to the original SCR was submitted in March 1995. Corrective action alternatives were included in the addendum. Additional groundwater and soil samples were collected in 1999 and a RBCA Tier II study was conducted. IDNR assigned the FTF site a "No Action Required" classification in 2001 (IDNR 2001).

Although the FTF SWMUs are listed in ISU's RCRA permit for the CWHF (IAT200010601), the FTF was later determined to be noncontiguous with the CWHF, and the FTF was issued its own identification number (IAD984621383). Because the FTF is not contiguous with the CWHF and because the FTF is identified as a separate facility by EPA, the FTF is not included in this EI evaluation.

Units Addressed by the RFI

The following SWMUs were included in the RFI, in accordance with the conditions of the RCRA Permit for the facility. SWMUs were included in the RFI because EPA and the facility determined that (1) a release had been documented, (2) some likelihood of release existed, or (3) insufficient information existed to make a determination.

Abandoned Sanitary Septic System
Applied Science Center (ASC) Acid Neutralization Tank
ASC Warehouse Septic System
Comfort Cooling Towers
Waste Handling Building
High Pressure Test Facility
Solar House
ASC Warehouse
Blockhouse

Former Evaporation Tray
Building Drain and Sewer Line
Wastewater Lift Station and Sump

Abandoned Sanitary Septic System. The Abandoned Sanitary Septic System was constructed in the 1960s and is located west of the ARL. The system was constructed of clay pipes, a concrete septic tank, and a sand filter. The tank is 24 feet 8 inches in diameter and 10 feet deep. It is buried 2 feet below the ground surface. The sand filter is 55 by 55 feet. The septic system discharged to Onion Gulch through a dedicated pipe system used for the Acid Neutralization Tank (ANT) (discussed below). The septic system received sanitary wastewater from toilets and bathroom sinks in the main ARL building and the Waste Disposal Building (discussed below). The system also received blowdown from the Comfort Cooling Towers (discussed below). In 1978, the septic system was abandoned in place when ARL began discharging to the Ames municipal sewer system. DOE completed decommissioning of the ARL in 1982. No documentation of DOE decommissioning or closure activities was found in the record for the CWHF, possibly because DOE was the responsible party, rather than ISU.

According to the RFI Work Plan, in 1993, RUST Environment & Infrastructure (E&I) collected samples for DOE in an area downgradient of the septic field. A surface gamma survey was conducted over the entire area west of the ARL. Subsurface soil samples were collected from an area downgradient of the septic system. In addition, sediment samples were collected from Onion Gulch, and a groundwater sample was collected from a monitoring well near the drain field. Samples were analyzed for radionuclides (Ac-228, Bi-214, Co-60, K-40, Pb-210, Pb-214, Ra-226, and T1-208) and chromium (a suspected contaminant from the Comfort Cooling Towers).

Based on the results of the chromium analysis, no evidence existed of chromium levels above action levels for soil and EPA maximum contaminant levels (MCL) for drinking water. The gamma survey indicated an anomalous area of slightly above background radioactivity downgradient of the septic system. Radionuclide results in soil and groundwater samples from the area were within naturally occurring ranges. Based on the results of the RUST E&I investigation, it was concluded that no public health threat exists from the Abandoned Sanitary Septic System under current land use.

ASC ANT. The ASC ANT accepted drainage from ARL sink drains. The drains were routed through a dedicated pipe system to an acid neutralizing tank on the western side of the facility. The ANT was constructed of poured concrete about 30 feet by 14 feet by 11 feet by 8 inches deep. The top is located 4 feet under the ground surface. The tank was constructed between 1961 and 1965 and was used until 1978, when the facility was connected to the sanitary sewers. The tank was used to neutralize wastewater (possibly containing acids, bases, metals, and organics) by flowing through a 5 foot-deep bed of pulverized limestone. The tank was abandoned in place, and the limestone was removed and used in an unpaved drive at the DOE landfill. Effluent from the ANT was drained into Onion Gulch through a dedicated pipe under a National Pollution Discharge Elimination System (NPDES) permit, which was held from 1975 to 1978.

ASC Warehouse Septic System. The ASC Warehouse Septic System received wastes from the sumps and sinks, lavatory, and other liquid collected in the warehouse/laboratories from 1965 until 1978, when the ASC was connected to the municipal sewer system. This dedicated septic system was located on the

northeastern side of the ASC. The septic system was abandoned in place. The septic system consisted of clay pipes, a 300-gallon steel septic tank, and a drain field. The drain field, which was allowed to percolate into the ground, consisted of 5-inch, perforated, agricultural tile in a 1-foot-thick gravel bed. The maximum depth of the bed was 30 inches. Presently, a gravel roadway and a maintained lawn overlie the system.

Comfort Cooling Towers. Comfort Cooling Towers for the ASC reactor building were located north of, and near, the reactor cooling towers. Chromates, at a concentration of 30 milligrams per liter, were used in the towers for corrosion inhibition. The chromates were used from the early-1960s until September 1987.

An area suspected of surface soil contamination, caused by drift of chromates from the Comfort Cooling Towers, was investigated during the 1993 RUST E&I investigation. In addition, the Abandoned Septic System, its outfall, and the sediment of Onion Gulch were also sampled, because both areas received blowdown from the Comfort Cooling Towers. Based on the results of chromium analyses, no indication existed of chromium levels above action levels for soil and MCLs for water in Onion Gulch. The RUST E&I investigation concluded that available data indicate that no public threat exists from residual contamination associated with the Comfort Cooling Towers under current land use.

Waste Handling Building. The Waste Handling Building (also known as the Waste Disposal Building) was used to store radioactive waste generated by ARL when the reactor was in operation. The Waste Handling Building was not decommissioned with other units and structures at ARL, because it was to be used for handling and temporary storage of radioactive waste in the future. Mixed wastes, composed of volatile organic liquids contaminated with depleted thorium and uranium generated in an attached, alpha, glove box facility, are stored in the building. Furthermore, holding tanks are used at the building to hold water from washing machines used to wash clothing suspected of radioactive contamination.

Soil and groundwater sampling west of the ARL, sediment and surface water sampling at Onion Gulch, and aerial gamma surveys at the ASC indicated that some contaminant were present at slightly elevated levels. Isolated anomolies were visible in the gamma surveys. The impact was mitigated with decontamination and decommissioning, as well as subsequent removal actions.

High Pressure Test Facility. The High Pressure Test Facility was built in the early 1970s and was used initially for hydrogen gas reactions. The facility was later used for thermite reduction of metals and for hydroxide activities. Use of the facility was discontinued in 1990, but the structure remains on the northern side of the Waste Handling Building.

Soil and groundwater sampling west of the ARL, sediment and surface water sampling at Onion Gulch, and aerial gamma surveys at the ASC indicated that some contaminant were present at slightly elevated levels. Isolated anomolies were visible in the gamma surveys. The impact was mitigated with decontamination and decommissioning, as well as subsequent removal actions.

Solar House. The Solar House was located at the ASC and used for research of solar energy technology during the mid- to late-1970s. Solar panels, energy-absorbing paints, and other energy-efficient materials were tested at the facility. The facility was permanently closed during ARL decontamination and

decommissioning activities. The building was demolished and removed from the ASC in 1987, when an addition to the ASC was constructed.

Because the former location of the Solar House is now under the ASC addition, no recent activities have investigated this area directly; however, the RUST E&I investigation included sampling activities at the entire ASC. Therefore, residual contamination associate with the Solar House would most likely have been discovered in the RUST E&I, and the investigation report concluded that no public health threat exists at the ASC under current land use.

ASC Warehouse. The ASC Warehouse was a combined reactor warehouse and laboratories. The laboratories were used by the radiochemistry group for 2 years during the mid-1960s. The warehouse did not undergo decontamination and decommissioning with the rest of the ASC complex sites, because it was anticipated that studies using radioactive materials would continue. Neutron diffraction equipment, which was removed from the face of the reactor, was also stored at the facility after the reactor was decommissioned. The neutron diffraction equipment was eventually shipped to Oak Ridge National Laboratory. The warehouse is currently used as a storage building and as graduate student offices.

Soil and groundwater sampling west of the ARL, sediment and surface water sampling at Onion Gulch, and aerial gamma surveys at the ASC indicated that some contaminant were present at slightly elevated levels. Isolated anomolies were visible in the gamma surveys. The impact was mitigated with decontamination and decommissioning, as well as subsequent removal actions.

Blockhouse. The Blockhouse site is located immediately east of the current ASC eastern boundary. The Blockhouse was a 240-square-foot, concrete block building. The building was constructed in the early- to mid-1960s and was used for the handling of radioactive wastes until the early 1980s. The building was demolished in June 1988; however, the concrete floor slab is still present at the site. Portions of the floor were contaminated radioactively at levels up to 3,000 disintegrations per minute per one hundred square centimeters. The isotopes present in these areas were Cobalt-60 and Cesium-137. ARL coordinated subsequent removal of residual radioactive material from the pad following destruction of the building. Contaminated block, floor, and soils were removed and disposed of at the DOE disposal site in Hanford, Washington.

In the fall of 1981, ARL collected samples form the ASC, including one sample from the Blockhouse. In addition, five samples were collected from control sites to determine whether radioactive contamination resulted from operation. The sample collected from the Blockhouse had a concentration of 8.6 picoCurie/gram (pCi/g) Cesium-137, which is elevated in comparison to the control samples.

No documentation of DOE closure activities was found in the record for the CWHF, possibly because DOE was the responsible party, rather than ISU.

During the RUST E&I 1993 investigation, a gamma survey was conducted at the site. The Blockhouse Site was included with this survey. Gamma radiation measurements at the Blockhouse Site were generally at background levels. Two anomalous readings were noted during the gamma survey. A cinder block, which was believed to have been from the old structure at the site, had a reading of approximately 15,000 counts per minute (cpm). This block was removed by ARL for off-site disposal. Another area at

the Blockhouse Site had gamma survey readings ranging from 9,000 to 13,000 cpm. A soil sample was collected from this area; however, the results of the radioactivity analyses of this sample indicated that levels are not elevated above naturally occurring levels. Based on the results of the RUST E&I investigation, it was concluded that no public health threat exists from the Blockhouse Site under current land use.

Former Evaporation Tray. The evaporation tray was located outside of the CWHF to the north. Until 1984, the tray was used to evaporate volatile liquids. The unit consisted of a metal tray on a stand, which sat outside of the facility. The ground beneath the tray was not covered or lined. After the unit was taken out of service, the associated equipment was decontaminated and disposed of. Although no remnants of the unit exist, documented releases occurred of small volumes of liquid from the tray. Because releases from the unit were small, and the nature of the liquid spilled would indicate that volatilization would have occurred before spills could have migrated any significant distance, it was determined to be unlikely that any residual hydrocarbons are still present in soils in the area.

Building Drain and Sewer Line. The Building Drain and Sewer Line convey treated wastewater and floor wash water from the CWHF to the Wastewater Lift Station and Sump and then to the City of Ames sewer system. ISU has a Pretreatment Agreement with the City of Ames for these discharges. The Pretreatment Agreement is maintained in the RCRA Permit. The drain is located in the Chemical Treatment Area, at the low point of the sloped concrete floor slab. The Building Drain and Sewer Line have been in service since 1979. The unit has accepted regulated discharges only, and no history of contamination exists for the drain or sewer line; however, the integrity of the system has never been tested. It is not known if a release from the sewer line has occurred previously.

Wastewater Lift Station and Sump. The Wastewater Lift Station and Sump is a covered, below-ground sump located about 70 feet west of the CWHF. It is used to collect wastewater and sanitary waste from the CWHF before it is pumped into the sanitary sewer. The Wastewater Lift Station and Sump was put into service in 1979. No history of contaminant release exists for the unit into soil or groundwater in the area; however, the integrity of the system has never been tested. It is not known if a release from the unit has occurred previously.

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?

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

__X__ 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):

No releases to groundwater are expected to have occurred. Groundwater is not known or reasonably suspected to be contaminated above appropriately protective levels from releases from the facility.

In addition to groundwater analytical data, soil and sediment analytical data may be used to show that contamination at the CWHF is not likely to leach from soil to groundwater. Contaminants detected in CWHF soil and sediment samples are below appropriate action levels or are within naturally occurring ranges. Thus, these trace levels of contamination are unlikely to leach to groundwater at or above levels of concern.

No groundwater samples were collected during the RFI for the CWHF. In 1993, however, RUST E&I collected samples from ASC sites at the request of the DOE. In support of this investigation, a groundwater sample was collected from a drain field monitoring well located west of the Radioactive Waste Disposal Building. The sample was analyzed for chromates and gross radioactivity. The chromium analysis revealed a total chromium concentration of 0.02 mg/l and a hexavalent chromium concentration below the detection limit. The radioactivity analysis revealed a gross alpha level of 34 pCi/g and a gross beta level of 163 pCi/g. Chromium concentrations did not exceed EPA MCLs for drinking water; however, radioactivity was elevated in comparison to EPA MCLs and in comparison to non-impacted groundwater samples collected adjacent to the site (RUST E&I 1995).

In December 1993 and February 1994, Ames Laboratory contracted Fox Engineering to conduct follow-up groundwater sampling from the drain field monitoring well. Gross alpha levels for the December 1993 and February 1994 sampling events were 2.1 pCi/L and 0.9 pCi/L, respectively, while gross beta levels were 8.0 pCi/L and 6.5 pCi/L, respectively. Both follow-up sampling events showed gross alpha levels within naturally occurring ranges and gross beta levels below EPA MCLs (RUST E&I).

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)?

_____ 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):

[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?

_____ 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):

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)?

_____ 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):

[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?"

_____ 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.

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 ISU CWHF, EPA ID #IAT200010601, located in Ames, 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 4/24/02
(signature)
Gayle Hubert
Project Manager, RCRA Corrective Action & Permits Branch
EPA Region 7

Supervisor Original signed by Date 4/25/02
(signature)
John Smith
Branch Chief, RCRA Corrective Action & Permits Branch
EPA Region 7

Locations where References may be found:

EPA Region 7 Headquarters
RCRA Files
901 North 5th Street
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Contact telephone and e-mail numbers

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