

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

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

Migration of Contaminated Groundwater Under Control

Facility Name: Blackhawk Foundry
Facility Address: 323 S. Clark Street, Davenport, Iowa 52808
Facility EPA ID #: IAD005264049

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?

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.

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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e.,



R00170894
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RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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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) 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): The key contaminants evaluated in groundwater at this facility are lead, cadmium, and total phenols. The Groundwater Protection Standards used in this evaluation for the metals contaminants are the Maximum Contaminant Levels for drinking water of 0.005 mg/L for cadmium and a treatment technology level of 0.015 mg/L for lead. The level established for phenols is 0.001 mg/L, which is a protective level for the majority of the phenolic compounds. The wells were sampled during closure activities of the surface impoundment on site when the shallow wells were installed in December 1985. Deeper wells were installed in 1988 and the shallow and deeper wells were sampled in July 1988. Five more rounds of groundwater samples were collected from the deep wells in 1989, and all analytical results found that both lead and cadmium were below the detection limits of 0.005 mg/L for dissolved and total cadmium analyses and 0.01 mg/L for dissolved and total lead analyses in all wells (both downgradient and upgradient); except for one sample where lead was found in well 2D at .03 mg/L. The report stated that this detection may have been a laboratory error. Total phenols were not detected in the monitoring wells at the facility. In 1996, the Closure Report for the surface impoundment was approved by EPA and stated that confirmation sampling of the surface impoundment soils left in place indicated that lead levels in the soils exceeded closure performance standards in some areas at the facility. Therefore, a Consent Order requiring an RFI and CMS was issued to Blackhawk Foundry. The highest level of subsurface soil contamination was found in one boring within the surface impoundment at a level of 1004 mg/kg. The RFI report was prepared and approved to focus on surface soil contamination and sediment contamination in the adjacent Blackhawk Creek. This determination was based on the analytical results from the groundwater sampling events mentioned above showing no significant contamination in the monitoring wells on site. The protection standards established in the RFI for metals in the surface soil at the facility are 400 mg/kg for lead and 39 mg/kg for cadmium. Based on RFI surface soil sampling, cadmium was found to be below the standard and one sample contained lead slightly above the standard at 491 mg/kg. The RFI report concluded that "no significant effects on groundwater have occurred at the facility". The RFI summarizes the 1989 sampling events in Appendix A and the analytical results are included in the October 31, 1989 Groundwater Quality Assessment Report. In 1996, groundwater samples were collected from the monitoring wells that showed cadmium and lead above the MCLs in all deep wells, including the background wells 1D and 1DD. No phenols were detected in the 1996 sampling event. The results of this sampling event is not mentioned in any report in the facility file. The data from the 1996 sampling event is currently being considered an anomalous detection of metals in groundwater at the facility because metals were not detected above the groundwater protection standards in the majority of the wells during several rounds of previous sampling and the 1996 data showing metals above MCLs could be a result of increased turbidity in the aquifer or insufficient purging of the wells prior to sampling. A draft CMS report was submitted in June 1998. The remedial options for surface soil contamination being evaluated include paving the site, covering the contaminated area with gravel, removing the contaminated area of soil where lead was found above 400 mg/kg, and institutional controls for future land use. The draft CMS report is being modified to include another round of sampling of the groundwater will be conducted to confirm the presence of metals above groundwater protection standards. If groundwater is contaminated, further groundwater investigation will be

necessary to determine the extent, and evaluate remedial options.

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).

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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): The analytical data results of groundwater sampling of both shallow and deep monitoring wells showed that contaminants of concern (lead, cadmium, and phenols) were not detected above groundwater protection standards. However, the last round of sampling conducted at the facility showed that lead and cadmium were detected above groundwater protection standards in deep wells, including both shallow and deep background wells. The last round of sampling is being considered an anomaly and could be a result of high turbidity (the dissolved metals analytical results were nearly as high as the total metals results) or improper sampling (even the background wells results were affected). The CMS is requiring that future groundwater sampling of all monitoring wells will be conducted to determine whether groundwater contamination exists and if so, then additional investigations will be necessary to determine the extent of

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.

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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): As previously stated, groundwater in the deep wells was not found to be contaminated above groundwater protection standards until the last round of sampling in 1996. Because the 1996 sampling results could be in error, future sampling of the monitoring wells is required to confirm groundwater contamination exists. Blackhawk Creek flows along the northwest corner of the facility, about 180 feet northwest of the former surface impoundment. Blackhawk Creek is an ungauged stream that U.S. Army Corps of Engineers personnel have estimated to have a year round average annual flow of about 2 to 8 cubic feet per second. Blackhawk Creek discharges to the Mississippi River about 1 mile south of the site. Sediment samples were collected from the adjacent Blackhawk Creek during the RFI. Sediment sampling results show that levels of total lead and cadmium do increase in the sediments in the creek from upstream to downstream of the facility; however, the lead and cadmium contamination is considered to be from surface run-off and not from groundwater discharging to surface water. Groundwater elevations measured in the monitoring wells at the facility in five measurements taken in 1989 indicated the groundwater within the upper bedrock is flowing south-southwest from the facility and not towards Blackhawk Creek.

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5. Is the discharge of "contaminated" groundwater into surface water likely to be "insignificant" (i.e., the maximum concentration³ 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 concentration³ 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 concentration³ 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 concentrations³ 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.

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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 implemented⁴)?

_____ 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.

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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.

Rationale and Reference(s): The CMS will require that an additional round of sampling of the deep monitoring wells on site will be performed to confirm groundwater contamination exists. If groundwater contamination does exist, an addendum to the CMS will be prepared to include a work plan for groundwater monitoring of all wells to determine if the contamination has stabilized or has moved beyond the existing area of groundwater contamination both horizontally and vertically. If groundwater contamination is migrating, investigations to determine the extent and remedial options to control and stabilize the plume will be evaluated and implemented.

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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).

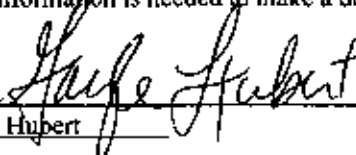
X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Blackhawk Foundry facility, EPA ID # IAD005264049, located at 323 S. Clark Street, Davenport, IA 52808. 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

(signature)
(print) Gayle Hubert



Date

10/14/99

(title) Environmental Scientist/Geologist

Supervisor

(signature) 

Date 10/14/98

(print) Bill Pedicino

(title) RCRA Corrective Action and Permits Branch Chief

(EPA Region or State) Region 7

Locations where References may be found:

Ground Water Monitoring Report, October 31, 1989
Closure Report for Blackhawk Foundry, March 2, 1990
Amended Closure Report for Blackhawk Foundry, September 17, 1990
RCRA Facility Investigation Report, October 1997
Draft RCRA Corrective Measures Study, June 1998.

Contact telephone and e-mail numbers

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The date that the environmental indicators was actually found to be controlled is prior to 9/30/99 and not the date this form was finally completed. GLH