

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

Revised 9/20/02

**RCRA Corrective Action
Environmental Indicator (EI) RCRA Info code (CA750)
Migration of Contaminated Groundwater Under Control**

Facility Name: Lockwood Corporation
Facility Address: 220757 Highway 92 East, PO Box 160, Gering, NE 69341
Facility EPA ID #: NED044101442

DETERMINATION RESULT: YE

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.

The Lockwood Corporation (Lockwood) facility is at 220757 Highway 92 East in Gering, Nebraska (see Figure 1), 0.5 mile east of Gering. The facility is located on 80 acres in an industrial park and is bounded on the north by Nebraska Highway 92, on the east by several private residences, on the south by farmland, and on the west by a rail spur and additional industrial facilities (HWS Technologies Inc. [HWS] 1992). The Lockwood facility has been used by several corporations to manufacture farm machinery and irrigation equipment. Currently, no manufacturing operations are conducted at the facility. The main warehouse in the northern portion of the facility now is leased by the Western Sugar Company for storage of raw sugar and packaging materials. This is the only ongoing operation. Agromac International, Inc. (Agromac) owns all of the 80-acre facility except for: 3 acres owned by the City of Gering for use as an electrical substation; and a closed, 1-acre surface impoundment (closed waste lagoon) still owned by Lockwood and subject to a Resource Conservation and Recovery Act (RCRA) Post Closure Permit issued by the Nebraska Department of Environmental Quality (NDEQ) on December 16, 1994 (Tetra Tech EM Inc. [Tetra Tech] 2002).

Several sampling events have been conducted at the Lockwood facility. A RCRA facility assessment (RFA) was conducted in September 1987 by Versar, Inc. The resulting RCRA Facility Investigation (RFI) was conducted in two phases, with sampling occurring in April 1992 and June 1994. Two rounds of groundwater sampling were also conducted from designated RFI monitoring wells in 1992 and 1993 (Tetra Tech 2002). In September 1999, the U.S. Geological Survey (USGS) performed additional groundwater sampling at the Lockwood facility in an effort to determine if contaminated groundwater had impacted off-site private wells (USGS 2000).

From 1996 to 1999, Agromac leased the southern portion of the Lockwood facility, including the galvanizing building, to Powerhorse, a manufacturer of irrigation equipment. Due to financial insolvency of Powerhorse, the Lockwood facility was referred to the Region 7 Superfund Program in August 1999. In February 2000, a water pipe burst in the galvanizing building, flooding the vats and secondary containment areas (Tetra Tech 2001). An action memorandum requesting a Superfund-led Removal Action was issued on August 16, 2000 (Tetra Tech 2001). On

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December 11, 2000, the EPA On-scene Coordinator (OSC) and the emergency response and removal contractor began a Superfund time critical removal action. When they arrived they encountered seven 5,000-gallon treatment vats inside the galvanizing building, some of which contained corrosive liquids. Ice had formed on five of the vats, and heaters were placed around them to thaw the ice and allow the liquids to be pumped out. Five tanker loads of acid (17,000 gallons) and two tanker loads of caustic (8,000 gallons) were removed from the site in December 2000. On June 4, 2001, the spent acid pit south of the galvanizing building was pumped out for off-site disposal. The empty treatment vats inside the galvanizing building were then removed. The secondary containment around the treatment vats was then used for neutralizing water from the rinse vats. Lime was added to the rinse water, the rinse water was pumped into two 25,000-gallon tanks, and the solids were allowed to settle out. The treated rinse water was then pumped from the tanks to a sanitary sewer manhole. Approximately 30,000 gallons of treated rinse water was discharged to the Gering Public Treatment Works.

In January 2002, the EPA Region 7 Superfund Technical Assistance and Response Team (START) contractor conducted an integrated site assessment (ISA) at the Lockwood facility (also known as the Agromac-Lockwood Site). The ISA was a combination of a preliminary assessment and site inspection and a removal assessment (RA). The purpose of the RA was to define the nature and extent of contaminants at the site that could warrant followup response under a removal action. The ISA included extensive soil, sludge, groundwater, and wastewater sampling.

In April 2004, the EPA START contractor conducted further soil and groundwater sampling as an addendum to the January 2002 RA. Additional sampling was required to delineate arsenic contamination in groundwater, and lead and zinc contamination in soils, detected in January 2002. Numerous groundwater samples were collected from municipal, private, and monitoring wells; and soil samples were collected from the site.

Except where noted, descriptions of the following solid waste management units (SWMU) and regulated units (RU) are derived from the RFI workplan (HWS 1992).

Hazardous Waste Storage Area. In this gravel-covered portion of the original hazardous waste storage area, located just south of the galvanizing plant, hazardous wastes were stored in 55-gallon drums in the 1980s. Waste solvents from Lockwood's painting operation and corrosive sludges generated during acid tank cleanout were stored in this area. Soil samples did not exceed EPA action levels, but elevated levels of lead and zinc were noted in comparison to the background concentrations established during the RFA for soil and water (ENSR 1994). Based on overall facility groundwater and soil concentrations, this SWMU does not appear to be a major source of groundwater contamination at the facility.

Waste Oil Storage Area. The waste oil storage area was located in the southeast corner of the facility along the perimeter chain-link fence. Waste oils and solvents were stored in drums on pallets in this area prior to transport for disposal. Zinc and lead were detected in soil samples at 4 to 5 feet below ground surface (bgs) during the RFI, at concentrations that exceeded RFA background concentrations but not EPA Region III action levels (ENSR 1994). Soil samples from this area were also analyzed for semi-volatile organic compounds (SVOC). No detections of SVOCs were reported. Soil samples were also analyzed for volatile organic compounds (VOC). One sample contained 1,1,1-trichloroethane (1,1,1-TCA) at a concentration of 56 micrograms per kilogram ($\mu\text{g}/\text{kg}$). High concentrations of oil and grease were detected in surface soil samples collected in the waste oil storage area, and elevated concentrations were detected in samples collected outside the area. Based on overall facility soil concentrations, this SWMU does not appear to be a major source of contamination at the facility.

Scrap Metal Waste Bin Area. In this fenced area located east of the machine shop (see Figure 1), three waste bins were used for nonhazardous waste materials, primarily scrap metal, from the former Lockwood operations. Evidence of rust-colored and oil-stained soil around the bins was noted in the RFA. Soil samples collected during the RFA indicated several metals at concentrations above background levels. Based on overall facility soil concentrations, this SWMU does not appear to be a major source of contamination at the facility.

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Raw Product Storage Area. This area was a concrete pad located south of the main plant (southwest of the shipping docks). It was used to store chemical products, including paints, gear oils, lubricants, and various solvents. These materials were stored in drums, cans, or tanks. Visual discoloration of the surface soil and oil residues surrounding some of the drums were noted in the RFA in 1987. Several contaminants, including arsenic, chromium, lead, and zinc, exceeded the levels detected in the background soil sample for this area during the RFA sampling. Later sampling activities in this area found lead was the only metal detected at concentrations that significantly exceeded the RFA background concentrations. However, the maximum soil lead concentration of 410 mg/kg did not exceed the EPA action level (Tetra Tech 2002). Based on overall facility soil concentrations, this SWMU does not appear to be a major source of contamination at the facility.

Solvent Recycling and Paint Mixing Shed. The solvent recycling facility located along the southern side of the northern warehouse is an Area of Concern (AOC). A solvent recycling still formerly was housed in this concrete block addition. Solvents used in painting operations were brought here for regeneration. These solvents included methyl ethyl ketone (MEK), toluene, and xylene. According to former Lockwood employees, no other solvents (such as trichloroethylene [TCE] or perchloroethylene [PCE]) were used (Tetra Tech 2001).

Closed Waste Lagoon. The closed waste lagoon, or waste acid impoundment, is a regulated unit (RU) now monitored by NDEQ. The closed waste lagoon was constructed by Lockwood in the 1970s as two surface impoundments for neutralizing spent acid waste from galvanizing and chain manufacturing operations. The southern impoundment was constructed in 1972 and was unlined. It was used until 1978, when it was replaced by the northern impoundment. The northern impoundment was constructed with a 0.25-inch bentonite liner and was used until 1984, when it was closed under an Administrative Order from the Nebraska Department of Environmental Control (the previous name of the NDEQ) (HWS 1989). Closure of the impoundments was conducted in November 1986. Based on results of continued semi-annual monitoring, the closed waste lagoon does not appear to be a major source of constituents in groundwater at the facility.

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, GPRRA). 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-

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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 RCRA Info national database ONLY as long as they remain true (i.e., RCRA Info 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 [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):

The facility lies within the North Platte Valley in Scottsbluff County, Nebraska. This area is within the High Plains division of the Great Plains physiographic province. The North Platte Valley was formed by dissection of the High Plains by the North Platte River, which has eroded more than 1,000 feet of Tertiary-age sediments. The facility is located about 2 miles south of the North Platte River in the Quaternary alluvium of the flood plain. The Cretaceous and Tertiary-age material underlying the Quaternary consists of semi-consolidated to consolidated gravel, sand, silt, and clay which were deposited as alluvial outwash from the Rocky Mountains. The bedrock formations in the High Plains in Scottsbluff vicinity consist of, in descending order, the Arikaree, Gering, Brule, Chadron, and Lance. The Brule underlies the facility and in the North Platte valley is covered with a mantel of unconsolidated terrace fill and recent alluvium that reaches a thickness of 200 feet in places (Hoskins-Western-Sondregger, Inc. [Hoskins] 1984). The Brule formation is a light-colored silt or sandstone, frequently massive in character without bedding or layering. Much of this formation was deposited by ancient streams. Some channel sands and volcanic ash accumulated locally within the Brule. Part of the Brule consists of eolian (windblown) sediments similar to loess (fairly uniform silt-sized deposits). The Brule is calcareous and has zones of lime-cemented materials that are less permeable. The Brule may weather into a blocky or slabby structure that may create secondary porosity in the formation. Secondary porosity in the Brule is also caused by piping, a process in which moving water opens channels and conduits in rocks with limited cohesion (Hoskins 1984).

The alluvium overlying the Brule is a complex mixture of sand and gravel and silts and clays. The depth to the Brule formation on site varies from 21 to 35 feet below ground surface (bgs). A silt loam material is found at depths between 5 to 12 feet bgs (ENSR 1994). Some of this silt loam may be fill material. File information suggested the facility may have been raised by the addition of 2 to 4 feet of fill prior to construction of the buildings on site (Hoskins 1984). The material underlying the silt loam is predominately a gravelly sand with varying amounts of silt and clay. The surface of the Brule dips gently to the northeast. Groundwater is encountered at depths of between 8.35 and 19.71 feet bgs (ENSR 1993). Groundwater flow is to the northeast (ENSR 1993).

A pilot boring for geotechnical analysis was conducted during the RFI. Particle size distribution analyses were performed on soil samples collected from depths of 16 to 18 feet, 36 to 37 feet, and 40 to 42 feet bgs. The percentages of fine materials increased with depth, with the upper samples consisting of mostly fine-to-medium sand

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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and the deeper samples consisting of silty sands. Slug tests were conducted on four wells, and the estimated hydraulic conductivities ranged from 8 to 42 feet per day. The average hydraulic conductivity was 3×10^{-3} , or 10 feet per day, which is consistent with a sandy aquifer (ENSR 1994).

Groundwater samples collected during investigations of the Lockwood facility have been collected from monitoring wells, temporary Geoprobe™ monitoring wells, off-site private wells, and City of Gering municipal wells. Numerous on-site monitoring wells were installed prior to the RFI— including 10 wells associated with the closed waste lagoon.

Two rounds of groundwater sampling were conducted as part of the RFI in 1992 and 1993. Samples in selected on-site monitoring wells were analyzed for various groundwater parameters—including various ions, pH, sulfates, nitrates, selected metals, and VOCs (ENSR 1993). Solvents and paints were used extensively during the former manufacturing operations at the facility; therefore VOCs were a potential concern. The analyses varied considerably from well to well. For example, only four on-site monitoring wells were sampled for VOCs. These wells were located to the west and southwest of the main plant (in the northern portion of the facility). Significant concentrations of VOCs were detected in all four wells. Also sampled as part of the RFI were three private wells and City of Gering municipal well 6. Most metals results for the off-site wells were non-detections, and no MCL exceedance was reported for any metals. No facility-related VOCs were detected in the off-site wells (ENSR 1993).

In September 1999, the USGS performed additional groundwater sampling in an effort to determine if contaminated groundwater had impacted off-site private wells. Three on-site monitoring wells and six off-site private wells were sampled. The three monitoring wells selected were those where VOCs were detected during the RFI. The concentrations of VOCs in samples from these wells were significantly lower during the USGS sampling than the concentrations detected during the RFI. PCE was detected in samples from three monitoring wells: LW-3 (2.1 µg/L), LW-7 (0.98 µg/L), and RF-5 (1.3 µg/L). TCE was detected in samples from two of the monitoring wells, LW-3 (3.8 µg/L) and LW-7 (0.95 µg/L). One off-site well, PW-3, contained PCE at an estimated concentration of 0.27 µg/L. No other VOCs were detected. Nitrate concentrations in samples from the on-site monitoring wells and one off-site well, PW-3, exceeded the MCL. The USGS report noted that most of the private wells sampled were located crossgradient of the facility with respect to groundwater flow. However, the private well directly in line with the anticipated direction of groundwater flow was not sampled because the owner refused permission (USGS 2000).

Samples were also collected during an integrated site assessment (ISA), including a removal assessment (RA), conducted in 2002. The purpose of the RA was to define the nature and extent of contaminants at the Lockwood facility that would warrant followup response under a removal action (Tetra Tech 2002). Maximum concentrations of arsenic, chromium, and zinc detected in groundwater during the 2002 ISA all exceeded MCLs (or PRGs where MCLs were not available). These detections were in Geoprobe™ temporary well samples. The Geoprobe™ temporary well samples contained a significant amount of silt, which was thought to have led to the high metal concentrations. The detections are considered insignificant because their concentrations were very similar to background concentrations detected in Geoprobe™ temporary well samples (Tetra Tech 2002).

The EPA START contractor conducted sampling at the Lockwood facility in April 2004 to delineate arsenic contamination in groundwater, and lead and zinc contamination in soils, which were identified in January 2002. Groundwater samples were collected from monitoring wells, a municipal well, and private wells. Total and dissolved arsenic were detected above the PRG for tap water in the municipal well sample, at concentrations of 6.00 µg/L and 7.00 µg/L, respectively. Total and dissolved arsenic exceeded the PRG for tap water and MCL in all samples collected from the private wells, at concentrations ranging up to 28.0 µg/L and 32.0 µg/L, respectively. Only one soil sample contained lead and zinc at concentrations exceeding their respective PRGs for industrial soil. That sample contained lead at 1,720 mg/kg and zinc at 103,000 mg/kg (Tetra Tech 2004).

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The sources of arsenic groundwater contamination are likely naturally occurring in the soil and/or pesticides applied to nearby agricultural fields. The source of the soil contamination was likely zinc plating operations in the galvanizing building, which have ceased (Tetra Tech 2004).

For the purposes of the RFI (ENSR 1993), the USGS sampling, and the RA (Tetra Tech 2002, 2004), groundwater was considered contaminated with a compound if concentrations exceeded the MCL. If a compound did not have an EPA MCL, the Region 9 preliminary remediation goal (PRG) was used. Results of comparing screening levels to groundwater concentrations are summarized in Table 1.

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Table 1 – Compounds Detected in Groundwater Samples

Compound	Maximum Concentration Reported in RFI (ppb)[†]	Maximum Concentration in September 1999 (ppb)	Maximum Concentration in January 2002 (ppb)	Maximum Concentration in April 2004 (ppb)	MCL or PRG (ppb)^{††}	Exceeded MCL or PRG?
Volatile Organic Compounds						
Benzene*	NA	NA	1.20	NA	5	N
2-Butanone	NA	NA	26	NA	1,900	N
Chloroform*	NA	NA	2.20	NA	100	N
2-Hexanone	NA	NA	4.10	NA	N/A	N/A
4-Methyl-2-Pentanone	NA	NA	5.80	NA	N/A	N/A
Tetrachloroethene*	36	2.1	2.30	NA	5	Y ^{†††}
Trichloroethene*	16	3.8	NA	NA	5	Y ^{†††}
Metals						
Iron	4,400	NA	NA	28,400	N/A	N/A
Manganese	2,000	NA	3,840	2,780	880	Y
Arsenic**	ND	28.3	242	113	10	Y
Barium	NA	NA	136	140	2,000	N
Cadmium**	<5	NA	1.83	ND	5	N
Chromium**	<100	17.8	266	9.0	100	Y
Copper**	<100	18.1	NA	21	N/A	N/A
Lead	<3	4.4	33.3	9.0	15	Y
Nickel**	<2	NA	NA	111	N/A	N
Mercury	NA	NA	ND	ND	11	N
Selenium	NA	10.3	13.5	ND	50	N
Silver**	<100	NA	2.95	ND	180	N
Potassium	N/A	N/A	N/A	48,000	N/A	N/A
Magnesium	N/A	N/A	N/A	38,300	N/A	N/A
Silica	N/A	N/A	N/A	94,200	N/A	N/A
Sodium	N/A	N/A	N/A	320,000	N/A	N/A
Strontium	N/A	N/A	N/A	590,000	2,200	Y
Titanium	N/A	N/A	N/A	291	N/A	N/A
Lithium	N/A	N/A	N/A	90	730	N
Boron	N/A	N/A	N/A	500	7,300	N
Aluminum	N/A	N/A	N/A	7,660	36,000	N
Zinc**	<200	NA	15,400	251	11,000	Y

Notes:

- * Identified as a chemical of potential concern
- ** During RFI sampling in 1993, only one monitoring well was analyzed for these metals.
- † Only samples collected from April 12, 1993, were included in these results.
- †† MCLs from U.S. Environmental Protection Agency's (EPA) Safe Drinking Water Act Regulations and Health Advisories (EPA 1999; amended for arsenic January 22, 2001) or from EPA Region 9 PRG table (EPA 2002) for compounds with no MCL
- ††† MCLs were exceeded during the 1993 RFI only.

This table is derived from ENSR (1993), USGS (2000), Tetra Tech (2002), and Tetra Tech (2004).

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N	No
NA	Not analyzed
N/A	Not applicable
ND	Not detected
MCL	Maximum contaminant level
ppb	Parts per billion
PRG	Preliminary remediation goal
RFI	Resource Conservation and Recovery Act Facility Investigation (ENSR 1993)
Y	Yes

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 additional RA sampling conducting in 2004 indicates presence of arsenic in groundwater at concentrations that exceed EPA MCLs and/or EPA Region 9 PRGs (Tetra Tech 2004). Presence of arsenic contamination in the public water supply well (only used for backup purposes) and in numerous sampled private wells suggests that arsenic contamination of groundwater is a widespread concern in the community. This also suggests that arsenic contamination in groundwater surrounding the Lockwood facility is not the result of historic operations at the facility. Therefore, migration of groundwater contamination with regard to the Lockwood facility can be shown to be stabilized.

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.

 X 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):

No surface water bodies are present on the Lockwood facility or within a 0.5 mile radius of the property. The North Platte River is the closest surface water body. Groundwater contamination in the vicinity of the Lockwood facility appears to be the result of a widespread occurrence of arsenic from naturally occurring sources or from agricultural uses, not from historic operations at the facility. Therefore, it is reasonable to conclude that “contaminated” groundwater from the Lockwood facility does not discharge into the North Platte River.

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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-assessment⁵, 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.

⁵The 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 Lockwood facility is currently subject to semi-annual groundwater compliance monitoring in accordance with the requirements of the Part B Post Closure Permit Application of August 10, 1994 and the RCRA Post Closure Permit issued by NDEQ on December 16, 2004, for the closed waste lagoon located in the southwest corner of the facility (Sorensen 2001).

The “Addendum to Removal Assessment Report Agromac-Lockwood Site, Gering, Nebraska,” prepared by the EPA START contractor and dated June 22, 2004, included removal and pre-remedial considerations for the facility (Tetra Tech 2004). Based on information gained during the 2004 sampling and previous assessment activities, the report stated that a removal action may be warranted at the facility and that further pre-remedial investigations may be warranted to monitor the arsenic contamination in groundwater (Tetra Tech 2004). These on-going actions at the facility will ensure continued monitoring of the site conditions.

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8. Check the appropriate RCRA Info 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).

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 Lockwood Corporation facility, EPA ID # NED044101442, located at 220757 Highway 92 East, Gering, Nebraska. 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 / signed by Tina Lowery / Date 9-21-04
(signature)
Tina Lowery
Project Manager, RCRA Corrective Action & Permits Branch
EPA Region 7

Supervisor / signed by Pat Murrow for Jody Hudson / Date 9-21-04
(signature)
Jody Hudson
Associate Director of RCRA
EPA Region 7

Locations where References may be found:

EPA Region 7 Headquarters
RCRA Files
901 North 5th Street
Kansas City, Kansas 66101

Contact telephone and e-mail numbers

Tina Lowery
(913) 551-7627
lowery.tina@epa.gov

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FIGURES

(2 pages)