DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 07/01/05

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

Migration of Contaminated Groundwater Under Control

Facility Name:	Union Carbide Corporation - Private Trucking Operation Facility
Facility Address :	State Route 25 Nitro, West Virginia
Facility EPA ID#:	WVD000739722

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

The following discussion provides a brief background and overview of information collected to date regarding known or reasonably suspected releases to groundwater media.

The Union Carbide Corporation (UCC) Private Trucking Operation (PTO) Facility is located on State Route 25 in Nitro, West Virginia, which is approximately 2 miles west of Institute, West Virginia. The Norfolk Southern Railroad, which parallels the Kanawha River, is located to the south, State Route 25 and a tributary of Gabbert's Branch are to the north, and Ryan's Branch and the Institute Wastewater Treatment Plant are located to the east. The location of the PTO Facility is shown on Figure 1.

Between 1942 and the early 1970's, prior to construction of the PTO Facility, the site was used for the disposal and storage of chemicals, chemical by-products, and construction debris mainly by the UCC Institute Plant. These disposal units reportedly extended 10 to 15 feet below the surface. Portions of this area have been leveled and capped to prevent ponding and subsurface migration. Associated with these units were two clay-lined ponds. These ponds are discussed in "Facility Investigations" paragraphs below.

In 1976, the PTO Facility was constructed; operations involved cleaning tank trucks and rail cars.. The cleaning facilities were constructed over the eastern portion of the disposal area. Cleaning fluids and waste material flowed into channel drains and to an on-site wastewater pre-treatment facility, consisting of three RCRA-regulated surface impoundments. The PTO Facility was taken out of service in 1985.

RCRA Corrective Action activities are currently being performed as part of a Facility Lead Agreement with EPA Region III, which was signed on December 15, 1999. A strategy and schedule for addressing corrective action at PTO Facility was approved by EPA on June 15, 2000. This strategy and schedule is updated annually. Several investigations have been conducted at the PTO Facility as described in the paragraphs below.

Facility Investigations

A RCRA Facility Investigation (RFI) was conducted for the PTO Facility in 2001. The purpose of the RFI was to characterize the nature and extent of contamination at seven of thirteen previously identified Solid Waste Management Units (SWMUs). The other six SWMUs had been satisfactorily characterized as part of the pre-RFI activities documented in an Interim Measures Report submitted to EPA on September 1, 2000. The locations of the SWMUs are shown on Figure 2. Based upon the results of the RFI, it was determined that further sampling was required to

adequately characterize groundwater conditions at the PTO Facility. The results of this investigation are provided in the RFI Report, Private Trucking Operations Facility, Nitro, West Virginia (Kemron Environmental Services, January 2002).

An additional RFI was conducted in 2002 in order to characterize the nature and extent of contamination at the former clay-lined ponds, drum disposal area, incinerator/drum storage area, and the western landfills at the PTO facility. The results of this investigation are provided in the Additional RFI Report, Private Trucking Operations Facility, Nitro, West Virginia (Kemron Environmental Services, December 2003). The results determined that further investigation of the groundwater was required in the western landfill area. This investigation also determined that sufficient data was obtained to adequately characterize the former clay-lined ponds and the incinerator/drum storage area. In order to demonstrate control of contaminated groundwater migration, monitoring was continued in the former clay-lined pond area and incinerator/drum storage area.

A supplemental RFI was conducted in 2004 in order to further investigate soil, groundwater, surface water, and sediment at the PTO Facility. The results of this investigation are provided in the Supplemental RFI Report, Private Trucking Operations Facility, Nitro, West Virginia (CH2M HILL, April 2005). Two additional piezometers were installed in the western landfill area to further investigate groundwater as recommended in the Additional RFI Report. A monitoring well was installed near SWMU 7 (Figure 2), which was determined to extend farther west than was initially determined.

Definition of Environmental Indicators (for the RCRA Corrective Action)

EIs 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 Determination 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) 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 providing or 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)

Groundwater monitoring has been conducted at the PTO Facility since 1982. To more directly address question 2, groundwater analytical results from the most recent groundwater sampling event conducted in the fourth quarter of 2004 and the first quarter of 2005, as part of the Supplemental RFI and the semi-annual sampling, were compared to the drinking water maximum contaminant level (MCL) or the Region III risk-based concentration (RBC) for tap water, in the event that no MCL exists, for each constituent. Groundwater monitoring conducted during the most recent sampling event included sampling fifteen pre-existing wells, two new piezometers, and one new monitoring well. Samples were analyzed for the following parameters:

- *Volatile organic compounds (VOCs) – All wells/piezometers*
- *Semi-volatile organic compounds (SVOCs) – All wells/piezometers*
- *Total metals – OW-1, OW-3 through OW-6, OW-8 through OW-12, TW-01 through TW-03*
- *Dissolved metals – All wells/piezometers*
- *Polychlorinated Biphenyl (PCBs) – OW-11 and OW-12*

Table 1 below shows the VOCs detected in groundwater at concentrations above MCLs or RBCs. The most frequently detected VOCs include 1,2-dichloroethene (total), 1,4-dioxane, and trichloroethene. 1,2-dichlorethene and trichloroethene are mostly associated with the area in and around the western landfill (SWMU 1) shown on Figure 2. 1,4-dioxane is found in the western landfill and in areas downgradient of the former clay-lined ponds (SWMU3) shown on Figure 2. Table 2 below shows the SVOCs present in groundwater at levels above MCLs or RBCs. The most frequently detected SVOCs was bis (2-ethylhexyl) phthalate (BEHP). The maximum detection of BEHP is 1,790 ug/L at sample location OW11. The other detections of BEHP, ranging from 5.5 to 186 ug/L, are relatively low in comparison to this sample result. The clay-lined ponds are suspected to be the source of BEHP contamination at the Facility. The metals detected most frequently (total and dissolved) include antimony, barium, selenium, and thallium. Barium, selenium, and thallium were not detected above their respective MCLs during the 2004 sampling event. In general, it appears that higher metals concentrations are associated with former fill located near the western landfill and former clay-lined pond areas. As shown on Table 4, one PCB, aroclor 1260, was present above the MCL at sample location OW11.

The conclusion from this evaluation is that groundwater at the PTO Facility is contaminated with VOCs, SVOCs, and metals at concentrations that exceed applicable groundwater criteria (MCLs or RBCs). Figure 3 shows the groundwater sampling locations identified in the tables below.

Table 1
VOC - Constituents of Concern
Maximum Groundwater Concentrations Compared to Screening Criteria

Volatile Organic Compounds	Maximum Concentration (ug/L)	Sample Location (PTO-)	Number of Detections/Number of Samples	MCL/RBC (ug/L)	
1,2-Dichloroethane	11.9	TW01	3/18	5	MCL
1,2-Dichloroethene (total)	90	OW06	8/18	90	MCL
1,4- Dioxane (p-Dioxane)	4100	TW03	4/18	6.1	RBC
Benzene	88.3	OW10	3/18	5	MCL
Carbon Tetrachloride	458	OW10	2/18	5	MCL
Chlorobenzene	477	TW03	2/18	100	MCL
Chloroform	1180	OW10	2/18	80	MCL
Methylene Chloride	7.52	TW03	1/18	5	MCL
Tetrachloroethene	53.2	OW14	2/18	5	MCL
Trichloroethene	406	PZ02	8/18	5	MCL
Vinyl Chloride	18.8	PZ02	3/18	2	MCL
Xylenes (total)	36	TW03	2/18	10	MCL

Table 2
SVOC- Constituents of Concern
Maximum Groundwater Concentrations Compared to Criteria

Semivolatile Organic Compounds (ug/L)	Maximum Detection (ug/L)	Sample Location (PTO-)	Number of Detections/Number of Samples	RBC (ug/L)	
Bis (2-chloroethyl) ether	255	OW10	5/18	0.0096	RBC
Bis (2-chloroisopropyl) ether	6.56	OW04	2/18	0.26	RBC
Bis (2-ethylhexyl) phthalate	1790	OW11	7/18	6.0	MCL
Naphthalene	1530	TW03	3/18	6.5	RBC

Table 3
Metals – Constituents of Concern
Maximum Groundwater Concentrations Compared to Criteria

Metals (mg/L)	Maximum Detection (mg/L)	Sample Location (PTO-)	Number of Detections/Number of Samples	MCL (mg/L)	
Antimony	0.0136(2)	TW01	13/13	0.006	MCL
Arsenic	0.16(2)/0.08(3)	OW11	9/18(2),(3)	0.01	MCL
Chromium	0.223(2)	TW02	5/13	0.1	MCL
Lead	0.212(2)	TW02	8/13	0.15 (1)	MCL

Footnotes:

1 EPA Safe Drinking Water Act Lead Action Level
2 Total Metals
3 Dissolved Metals

Table 4
PCBs – Constituents of Concern
Maximum Groundwater Concentrations Compared to Criteria

PCBs (mg/L)	Maximum Detection (mg/L)	Sample Location (PTO-)	Number of Detections/Number of Samples	MCL (mg/L)	
Aroclor-1260	3.51	OW11	1/2	0.5	MCL

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):

Based on data obtained during the RFI, Additional RFI, and Supplemental RFI, the groundwater contaminant plume at the PTO Facility is considered to be stabilized because it is expected to remain within the existing area of contaminated groundwater based on the existing monitoring locations. The following determinations have been made regarding groundwater conditions at the Facility:

- *Site geologic conditions and groundwater flow patterns have been characterized*
- *Groundwater from the Facility flows to the Kanawha River, Ryan's Branch, and Gabbert's Branch*
- *Interim Measures have been taken to address sources prominent of contamination*
- *Facility contaminants show decreasing or stable concentrations near the groundwater recovery system*

Site geologic conditions and groundwater flow patterns have been characterized

The geology beneath the PTO Facility consists of three distinct stratigraphic units. These units underlie a 5 to 8-feet thick fill material. The first unit beneath the fill material (Unit 1), which ranges in thickness from 15 to 35 feet, is gray to brown, silty-sandy clay, with increasing sand content and sand lenses near its base. Unit 1 is typically dry to moist with respect to water content in the upper part of the unit and becomes saturated in the lower 8 to 10 feet of the unit. Unit 2 ranges in thickness from 15 to 20 feet bgs. Unit 2 consists of brown, fine- to medium-grained sand, with silty sand and traces of fine gravel increasing with depth. Bedrock (Unit 3) is part of the Conemaugh Group from the Pennsylvania System and is located beneath Unit 2. Bedrock is generally encountered approximately at 50 feet bgs. Unit 3 is gray, fine- to medium-grained weathered sandstone. Groundwater occurs at approximately 15 to 20 feet bgs, within the sandy base of Unit 1. Site geologic conditions are further described in the RFI Report, Additional RFI Report, and Supplemental RFI Reports for the PTO Facility.

Groundwater from the Facility flows to the Kanawha River, Ryan's Branch, and Gabbert's Branch

Groundwater in the eastern and central portions of the Facility flows to the south-southeast toward the Kanawha River. In addition, Ryan's Branch, located in the southeastern portion of the Facility, appears to be a discharge area for some of the groundwater. In the western portion of the facility, there is a groundwater divide. Some groundwater flows north toward Gabbert's Branch/Tributary, and some flows to the south-southeast toward the Kanawha River. As a result, the Kanawha River, Ryan's Branch, and Gabbert's Brach/Tributary act as a barrier for the migration of contamination through the groundwater. Figure 4 shows the assumed potentiometric surface of the groundwater using water levels measured at the Facility in January 2004. This evaluation of groundwater flow patterns is further described in the RFI Report (Kemron, 2002), Additional RFI Report (Kemron, 2003), and Supplemental RFI Reports (CH2M HILL, 2005) for the PTO Facility.

Contaminated groundwater at the PTO Facility remains within the previously defined area of groundwater contamination at the Facility and discharges into one of the three adjacent surface water bodies, which are described further in response to Questions 4-6 below.

Interim Measures have been taken to address sources prominent of contamination

The following interim measures have been taken to help control plume migration at the PTO Facility:

- ***Groundwater Recovery System** – to prevent further migration of contaminants to Ryan's Branch, seven groundwater collection wells were installed in 1979 to pump groundwater from the southeastern portion of the Facility. In order to improve the performance of the groundwater recovery system, the following modifications have been made since the system was installed; two additional collection wells were installed along the eastern perimeter of the Facility in 1990; an existing wastewater collection sump was converted to a recovery well in 1998; and two additional collection wells were added, and a recovery trench was installed along Ryan's Branch, south of the groundwater recovery well system in 1999.*
- ***Landfill Capping** – In 1987, the three RCRA-regulated surface impoundments were dewatered, stabilized, solidified, and capped.*

Concentrations of facility contaminants in downgradient well locations are decreasing or stable near the groundwater recovery system

There are three wells located downgradient of the groundwater recovery system (OW-11, OW-12, and OW-13), however only two of the wells (OW-11 and OW-12) had sufficient data to evaluate temporal trends of concentrations. Results from monitoring wells OW11 and OW12, show that VOC and SVOC concentrations are generally decreasing or stable in this area of the PTO Facility. The decrease in VOC and SVOC concentrations seems to indicate that contaminated groundwater is being controlled by the recovery wells. OW-13 which has historically contained light non-aqueous phase liquid (LNAPL) has shown stable levels or LNAPL over the past year,

Footnotes:
[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 samples/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 location are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

X If yes – continue after identifying potentially affected surface water bodies.

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

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

Rationale and Reference(s):

As described above, groundwater in the eastern and central portions of the PTO Facility flows to the south-southeast toward the Kanawha River. In addition, Ryan's Branch, located in the southeastern portion of the Facility, appears to be a discharge area for some of the groundwater. In the western portion of the facility, there is a groundwater divide. Some groundwater flows north toward Gabbert's Branch/Tributary, and some flows to the south-southeast toward the Kanawha River. The locations of the Kanawha River, Ryan's Branch, and Gabbert's Branch/Tributary are shown on Figure 2.

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

X A,C If yes – skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonable 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 judgment/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.

X B 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.

A - Kanawha River
B - Ryan's Branch
C - Gabbert's Branch/Tributary

Rationale and Reference(s):
A summary of the 2004 surface water and sediment sampling conducted at the PTO Facility, and the analytical results, is provided below:

Kanawha River
Nine surface water samples were collected from locations along the Kanawha River, SW04 through SW12, and are shown on Figure 3. Five of the samples were collected from locations hydraulically and topographically downgradient of the Facility (SW04 through SW08), and spatially distributed along the river adjacent to the Facility. The remaining four surface water samples (SW09 through SW12) are representative of background conditions. These four samples are adjacent to the eastern (upriver) portion of the Facility and upstream of the discharge point of Ryan's Branch into the Kanawha River. These samples were analyzed for VOCs, SVOCs, and dissolved metals.

The surface water samples results in the Kanawha River showed no detections of VOCs or SVOCs. Only one dissolved metal, barium, was present at a detectable concentration. The highest barium concentration detected in the Kanawha River was 0.28 mg/l (dissolved) at sampling locations SW05 and SW07. There is no established Aquatic Water Quality Criteria (AWQC) for barium. The MCL for barium is 2 mg/L. Therefore, it is determined that discharge of contamination from groundwater is not causing unacceptable impacts to the Kanawha River.

Ryan's Branch
A total of four surface water and sediment samples were collected from Ryan's Branch, RB01 through RB04, as shown on Figure 5. Three of these locations were also sampled previously in 2001. The fourth location was

collected downstream of these locations near the mouth of Ryan's Branch to determine the extent of downstream contamination, if any, in Ryan's Branch[1]. These samples were analyzed for VOCs, SVOCs, and dissolved metals.

The results of this sampling showed that VOCs, SVOCs, and metals were detected in surface water samples collected from Ryan's Branch. The VOCs detected include 1, 2-dichloroethene, 1,4-dioxane, acetone, and toluene. Two SVOCs were detected including BEHP and isophorone. Only BEHP was present at a concentration above the AWQC as shown in Table 5 below. BEHP is also present at a concentration which exceeds 10X the MCL and 10X the AWQC for this compound. Barium was also detected in Ryan's Branch surface water. The highest barium concentration was 0.59 mg/l at sampling location RB03. There is no established Aquatic Water Quality Criteria (AWQC) for barium. The MCL for barium is 2 mg/L. Therefore, BEHP is considered to be the primary constituent of concern in Ryan's Branch surface water during the 2004 sampling event.

Surface water sampling conducted in Ryan's Branch in 2001 showed detectable concentrations of chlorobenzene and cis -1,2-dichloroethene. The concentrations of these constituents were below AWQC and MCLs. No SVOCs were detected during the 2001 sampling event. Arsenic, barium, and lead were also detected at levels below AWQC and MCLs. The concentrations of these constituents are decreasing in Ryan's Branch compared to previous sampling events. It is suspected that the impacts to Ryan's Branch from contaminated groundwater occurred prior to the operation of the recovery well system Feasible corrective measures will be evaluated to address Ryan's Branch as needed.

TABLE 5
Summary of Constituent Concentrations Discharging to Ryan's Branch
(using dilution factor of 10)

Constituent	MCL	AWQC	10 (MCL)	10(AWQC)	Maximum Conc. (ug/L)
Bis (2-ethylhexyl)phlalate (BEHP)	**5**	**2.2**	**50**	**22**	**169**

MCL - Maximum Contaminant Level
AWQC - Ambient Water Quality Criteria
(USEPA, National Recommended Water Quality Criteria: 2002)

Gabbert's Branch/Tributary

Three surface water samples and three sediment samples, SW01-SW03, were collected from Gabbert's Branch/Tributary as shown on Figure 3. Acetone, arsenic and barium were detected in surface water. Arsenic was not present at concentrations above the AWQC. There are no established AWQC for acetone or barium. The RBC for acetone is 5.5 mg/L and the MCL for barium is 2.0 mg/L. Therefore, it is determined that discharge of contamination from groundwater into Gabbert's Branch and Tributary from the PTO Facility is insignificant.

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

[1] Acetone, BEHP, and isophorone were detected at this location.

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])?

   X 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, us/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):

As shown in Question 5 above, discharge of contamination from groundwater at the Facility into the Kanawha River and Gabbert's Branch/Tributary is below acceptable AWQC and does not pose an unacceptable risk to these surface water bodies. One constituent was present, BEHP, in Ryan's Branch at a concentration above 10X the AWQC and 10X the MCL. However, Ryan's Branch is a small water body contained within the boundary of the PTO Facility which discharges to the Kanawha River. BEHP was not present at detectable concentrations in the Kanawha River samples during the 2004 monitoring event. Therefore, the occurrence of BEHP in Ryan's Branch surface water and adjacent well OW13, is considered to be currently acceptable because there is no observed impact to the Kanawha River. However, since the presence of NAPL has been identified in Ryan's Branch, and to reduce the presence of BEHP, and any other detected compounds, UCC has conducted an ecological risk assessment as documented in Supplemental RFI (CH2M HILL, 2005) and is currently evaluating corrective measures for Ryan's Branch.

[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 tot he surface waters, sediments or eco-systems.

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

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

   ____ If no – enter "NO" status code in #8.

   ____ If unknown – enter "IN" status code in #8.

Rationale and Reference(s):

The Supplemental RFI (CH2M HILL, 2005) recommended that a corrective measures evaluation be performed to determine the source of NAPL discharging into Ryan's Branch. Additional investigation will be conducted to verify the vertical migration of constituents in groundwater is controlled through discharge to the Kanawha River. Additionally, groundwater will continue to be monitored at the PTO Facility and corrective measures will be implemented as appropriate.

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 *Union Carbide Corporation - Private Trucking Operation Facility*, EPA ID # *WVD000739722* located at *State Route 25 Nitro, West Virginia*. 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) /s/ Date 8/25/05

(print) _____

(title) _____

Supervisor (signature) /s/ Date 8/25/05

(print) _____

(title) _____

(EPA Region or State) _____

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