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:	**Cycle Chem, Inc.**
Facility Address:	**550 Industrial Drive Lewisberry, PA 17339**
Facility EPA ID #:	**PAD067098822**

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.

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., 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 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): During the September 27, 2012 groundwater sampling event several constituents were detected at the Main Gate Well MW-2 location as follows: chloroform (6.4 µg/L), 1,2-dichloroethane (1.1 µg/L), 1,1,1-TCA (29.1 µg/L), tetrachloroethene (1.2 µg/L) and TCE (86.3 µg/L). 2014 groundwater sampling event revealed no TCE detection at wells MW-2 (192 µg/L) and MW-8 (169 µg/L). (Source: Final EI Inspection Report prepared by PADEP and BAKER, September 29, 2016.)

Footnotes:

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

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

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

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

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

Rationale and Reference(s): Laboratory results indicate similar constituents of potential concern were detected in each of the soil gas samples as noted above during the 2014 sampling events in addition to: 1,2-dichlorobenzene, cis-1,2-dichloroethene, di-isopropyl ether, ethyl acetate, Freon 113, MTBE Trichloroethene and/or Tetrachloroethene. All of the detected concentrations were below the applicable PADEP Act 2 Statewide Health MSC_{SG} for each constituent in all three soil gas samples during both sampling events. For comparison purposes, outdoor soil gas sample location V-1 on the east side of the property was non-detect for TCE (<0.001 mg/m^3) during both soil gas sampling events. In regards to the indoor CCI office building subslab soil gas samples: Location V-2 revealed TCE concentrations at 0.0023 mg/m^3 and 0.0039 mg/m^3 and Location V-3 revealed TCE concentrations at 0.0056 mg/m^3 and <0.001 mg/m^3. Based on the inferred groundwater flow directions, and the measured TCE concentrations in soil gas samples V-2 and V-3 collected on 12/21/15 and 3/17/16, the intrusion of VOC vapors to indoor air is not an exposure pathway of concern for Cycle Chem's office building. Additionally, based on the results of the soil vapor samples collected at outdoor soil gas sample location V-1, along the eastern edge of the Cycle Chem property, the TCE groundwater plume is not presenting any offsite exposure risks of potential concern with respect to vapor intrusion. (Source: Final EI Inspection Report prepared by PADEP and BAKER, September 29, 2016.)

[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.

__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): The facility is situated approximately 2,000 feet east of Fishing Creek and adjacent to an old historic stream which drains into an unnamed tributary to Fishing Creek. The NPDES outfall drains into the area of the old historic stream. Drainage from the facility does not reach Fishing Creek as sheet flow. Wetlands were not identified onsite during a Preliminary Wetlands Assessment conducted for REMTECH by RTES in 1991. During this time period, a possible wetland area was noted within 300 feet of the facility's eastern property boundary that received discharge from the facility's stormwater collection system; however, the facility indicated that this was a man-made area that spanned a 10-foot-diameter area around the NPDES outfall pipe. This area did not qualify as an important wetland as rated by PADEP regulatory criteria based on the Preliminary Assessment. This area is not included on the National Wetlands Inventory database (accessed on March 4, 2015). A wetland was identified approximately 700 feet northeast of the CCI facility as noted on Appendix B: Figure 18 via the National Wetlands Inventory GIS layer; however, this area does not receive surface water sheet flow from CCI waste handling areas. (Source: Final EI Inspection Report prepared by PADEP and BAKER, September 29, 2016.)

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[1] 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[1] 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[1] 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[1] 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): _____
_____
_____
_____

[1] 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" statuscode.

Rationale and Reference(s):_____

_____
_____
_____
_____
_____
_____

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

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

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

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

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

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

Rationale and Reference(s): 560 Industrial Drive: As a result of these downgradient wells not revealing any concerns, there is no reason to believe there is a groundwater issue at the 560 Industrial Drive property. Based on this information it is not expected that groundwater is contaminated at the 560 Industrial Drive property as a result of past or present facility operations. Therefore, no controls are deemed necessary for this facility.

550 Industrial Drive: *Hydrogeology Assessment – First Quarter 2013 to Present-Day*, two onsite CCI shallow groundwater monitoring wells have documented concentrations of TCE above the 5 µg/L PADEP Act 2 Residential/Nonresidential MSC_{GW} (as high as 418 µg/L at Well MW-2 and 169 µg/L at Well MW-8). (Source: Final EI Inspection Report prepared by PADEP and BAKER, September 29, 2016.)

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 Cycle Chem, Inc., PAD067098822, located at Lewisberry, PA. 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) Michael P. Crawer Date 08 AUG 17
(print) MICHAEL P. CRAWER
(title) Environmental Scientist

Supervisor (signature) Paul Hentschel Date 10 AUG 17
(print) _____
(title) _____
(EPA Region or State) R3 EPA

Locations where References may be found:

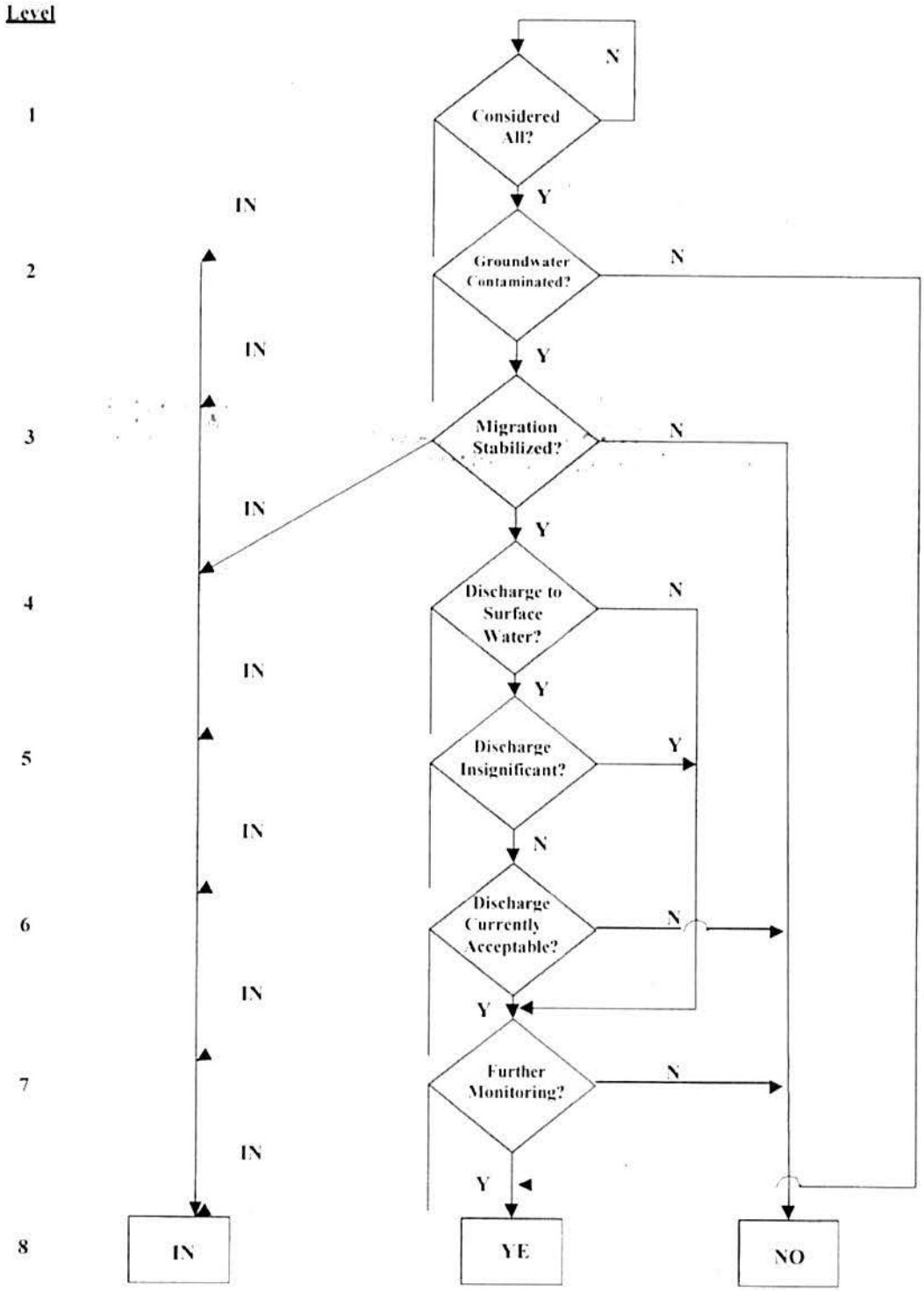
EPA files PAD067098822

Contact telephone and e-mail numbers

(name) _____
(phone) _____
(e-mail) _____

Facility Name: Cycle Chem, Inc.
EPA ID#: PAD 067098822
City/State: Lewisberry, PA 17339

MIGRATION OF CONTAMINATED GROUNDWATER UNDER CONTROL (CA 750)



//Signed 2/5/9//

MEMORANDUM

SUBJECT: Interim-Final Guidance for RCRA Corrective Action Environmental Indicators

FROM: Elizabeth Cotsworth, Acting Director
Office of Solid Waste

TO: RCRA Senior Policy Managers
Regions I-X

The RCRA corrective action program and achievement of its Government Performance Results Act (GPRA) goals are of highest priority for the national RCRA program. The RCRA program is using two Environmental Indicators (EI) to measure program performance for GPRA purposes: (1) Current Human Exposures Under Control (CA725), and (2) Migration of Contaminated Groundwater Under Control (CA750).

With this memorandum I am transmitting revised guidance on how to determine if a facility has met the RCRA corrective action Environmental Indicators (EI). This Interim-Final guidance will replace the existing EI guidance (from 1994 and 1995) and will remain the working guidance for at least one year. The Interim-Final guidance is similar to the earlier guidance but has been modified to facilitate more consistent determinations (across regions and states) and to be more explicit with regard to the minimum level of documentation required to ensure that the determinations will be verifiable.

This guidance has been developed with the cooperation and input of representatives from all ten EPA regions and at least one state from each region. The guidance is in the form of questions to be answered in making an EI determination. The questions and answer options express the minimum criteria for EI determinations and are not to be modified for regional, state or site-specific conditions. The "Rationale" portion of the forms can be filled in to explain unique situations to any length necessary. While the signed hard-copies of these forms should reside in the facility's administrative files, these forms should also be kept in electronic format that can be posted on an "EI database" web site to be developed by the Office of Solid Waste in the near future. The "EI database" will help communicate successes and provide examples for overcoming barriers to progress.

Thank you for your assistance with this important effort. If you have any questions, please call Bob Hall or Henry Schuver of my staff at (703) 308-8432 or 308-8656 respectively.

Attachment