DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Updated 9/1/99

RCRA Corrective Action

Environmental Indicator (EI RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Novartis Crop Protection, Inc.
Facility Address: PO Box 11, St. Gabriel, LA 70776
Facility EPA ID #: LAD053783445-MO-1

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. AD 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 be 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., nonaqueous 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'** 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): Location 4- Novartis has removed the contaminated area soils to a cleanup level of 7.7 mg/Kg for O-toluidine and 1.2 mg/Kg for 5-chloroaminotoluene (5-CAT) (average of two final sampling events). This cleanup level in soil is below the LDEQ approved cleanup levels of 23.9 mg/Kg for both O-toluidine and 5-CAT. O-toluidine concentration in one monitor well (L4USS-7R, 16 ft.bls) exceeds risk- based level. Novartis is presently evaluating LDEQ approved remedial alternatives to address the o-toluidine levels in Monitor Well L4USS-7R. O-toluidine is readily biodegradable, and since the contaminated soil has been removed, long term Natural Attenuation monitoring may be a viable remedial alternative. A report will be submitted to LDEQ by September 30, 1999 which will include Novartis' proposed corrective action for this well. The Location 4 area is monitored by clean, plume defining wells and future monitoring of these wells will verify that there has been no significant migration of contamination.

Tank 112F Area- Surface soils to approximately 2 feet below the tank have been removed and treated in the onsite incinerator. Novartis has an LDEQ approved corrective action plan to remove subsurface soils which exceed the MO-1 levels for toluene and carbon tetrachloride. The soils will be removed in July/August 1999. Novartis also has an LDEQ approved corrective action plan to remediate toluene and carbon tetrachloride concentrations in groundwater via a pump and treat or a pump and treat/ vacuum extraction system. This phase of the corrective action is planned for implementation within the next 180 days. As a part of the corrective action for this area, Novartis will also install a system of perimeter plume defining wells, and future monitoring of these wells will verify that there has been no significant migration of contamination.

References: *Phase II RCRA Facility Investigation Report*, August 1996; *Status Update Tank 112F*, Including Corrective Action Plan, dated April 1999 and approved by LDEQ on May 20, 1999; *Status Update for Location 4*, dated February 18, 1998 and approved by LDEQ on July 9, 1998.

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").

_____ 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): Location 4- Novartis has removed the contaminated area soils to a cleanup level of 7.7 mg/Kg for O-toluidine and 1.2 mg/Kg for 5-chloroaminotoluene (5-CAT) (average of two final sampling events). This cleanup level in soil is below the LDEQ approved cleanup levels of 23.9 mg/Kg for both O-toluidine and 5-CAT. This will stabilize/reduce the contaminant plume. In addition, the primary constituent of concern, o-toluidine is readily biodegradable. Plume defining wells have been installed around the perimeter of the plume to verify that the contamination is not migrating.

Tank 112F Area- The toluene and carbon tetrachloride contamination has been shown to be confined to the upper water bearing units at the site (<20 feet below land surface). Novartis has an LDEQ approved corrective action plan for this area which includes removal of subsurface soils below the tank to toluene and carbon tetrachloride levels below RECAP MO-1 levels. In addition, a pump and treat or combination pump and treat/vacuum extraction system will be installed to recover contaminated groundwater. The groundwater recovery system will be operated until risk-based levels for toluene and carbon tetrachloride are attained. Plume defining wells will be installed around the perimeter of the plume to verify that the contamination is not migrating.

References: *Phase II RCRA Facility Investigation Report*, August 1996; *Status Update Tank 112F*, Including Corrective Action Plan, dated April 1999 and approved by LDEQ on May 20, 1999; *Status Update for Location 4*, dated February 18, 1998 and approved by LDEQ on July 9, 1998.

[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 determined 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): Location 4- The Location 4 area is situated at the northern end of the St. Gabriel plant. The Location 4 area plume has been defined and is several hundred feet away from the property boundary. There are no surface water bodies between the Location 4 area and the property boundary other than stormwater ditches in the Location 4 area which divert stormwater through a permitted NPDES outfall. Therefore, it can be concluded that the contamination does not discharge to a surface water body.

Tank 112F Area- The Tank 112F area is situated in the central portion of the St. Gabriel plant. The Tank 112F area plume has been defined and is several thousand feet away from the property boundary. There are no surface water bodies between the Tank 112F area and the property boundary other than stormwater ditches in the Tank 112F area which divert stormwater through a permitted NPDES outfall. Therefore, it can be concluded that the contamination does not discharge to a surface water body.

References: *Phase II RCRA Facility Investigation Report*, August 1996; *Status Update Tank 112F*, Including Corrective Action Plan, dated April 1999 and approved by LDEQ on May 20, 1999; *Status Update for Location 4*, dated February 18, 1998 and approved by LDEQ on July 9, 1998.

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)?

N/A _____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional 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.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentrahon[3] of <u>each</u> 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.

<u>Rationale and Reference(s):</u>

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

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented')?

N/A _____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment, [5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be **"currently acceptable") - skip** to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

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

Rationale and Reference(s):

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

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

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

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

Rationale and Reference(s): Location 4- Plume defining wells have been installed around the perimeter of the plume to verify that the contamination is not migrating. The wells will be monitored on a quarterly basis for the first year and on a semiannual basis thereafter until risk-based levels are attained for all monitor wells.

Tank 112F - Plume defining wells will be installed around the perimeter of the plume to verify that the contamination is not migrating. After initiation of the groundwater recovery system, these wells will be monitored on a quarterly basis for the first year and on a semiannual basis thereafter until risk-based levels are attained for all monitor wells and recovery wells.

References: *Phase II RCRA Facility Investigation Report*, August 1996; *Status Update Tank 112F*, Including Corrective Action Plan, dated April 1999 and approved by LDEQ on May 20, 1999; *Status Update for Location 4*, dated February 18, 1998 and approved by LDEQ on July 9, 1998.

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 **Novartis Crop Protection, Inc.-St. Gabriel, LA**. facility , EPA ID # **LAD 053 783 445** , located at **3905 Hwy 75, St. Gabriel, LA 70776**. 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) Luzma Mata de Leder Date September 17, 1999
(print) Luzma Mata de Leder
(title) Geologist

Supervisor (signature) Narendra Dave Date September 17, 1999
(print) Narendra Dave
(title) Geology Supervisor
(EPA Region or State) Louisiana Department Of Environmental Quality

Locations where References may be found:

1) Novartis Crop Protection, Inc., St. Gabriel, LA. Environmental Regulatory Affairs Group files.
2) LDEQ- Office of Environmental Assessment- Environmental Technology Division files

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