DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name:	**Valero St. Charles Refinery (Former GATX Tank Terminal)**
Facility Address:	**15292 River Road, New Sarpy, Louisiana 70078**
Facility EPA ID#:	**LAD062644778**

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.

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 EIs 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 objectives of the RCRA Corrective Action program, the EIs 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 groundwater 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 the 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).

Facility Information

The Valero St. Charles Refinery is a 997-acre facility located in New Sarpy just east of the town of Norco, St. Charles Parish, Louisiana. The site, at 29° 59' 12" north latitude and 90° 22' 38" west longitude, is situated on the east bank of the Mississippi River approximately 20 miles upstream of New Orleans, Louisiana. The facility is bordered by U.S. Highway 61 to the north, the Mississippi River to the south, and the Shell Oil Company/Motiva Enterprises Refinery to the west. This CA750 addresses a portion of the facility, as described below in more detail.

The refinery has a production capacity of 190,000 barrels per day (bpd) of American Petroleum Institute (API) gravity sour crude oil and 250,000 bpd of total throughput capacity. The production activities at the refinery include atmospheric and vacuum distillation, desalting, reforming, alkylation, desulphurization, fluid catalytic cracking, coking, light end processing, and sulfur recovery. Operations at the refinery are divided into the West Plant, East Plant, and various tank farms. A total of 19 SWMUs and six AOCs have been identified at the refinery.

GATX Terminals Corporation (GATX) operated a tank terminal at the site from 1925-1997. In 1997, the tank terminal was purchased by the TransAmerican Refining Corporation (TARC), an heir to the Good Hope Refinery that existed in the area from the 1940s through the early 1980s. TARC, which changed names to the Orion Refining Corporation (Orion), declared bankruptcy in 2003. On July 1, 2003, Valero Refining purchased the refinery assets of Orion.

A total of 19 SWMUs and six AOCs have been identified at the refinery. Separate CA725 and CA750 EI determinations were conducted for 17 SWMUs and six AOCs associated with EPA ID LAD000225862. Therefore, these SWMUs and AOCs will not be further discussed in this EI determination. This EI determination addresses the Former GATX Creosote Tanks Area (SWMU 18) and Former GATX Wastewater Impoundment Area (SWMU 19), which were subsequently purchased and redeveloped into Section 2- Tank Farm at the Valero St. Charles Refinery. These SWMUs have not achieved "no further action" (NFA) status. SWMU 18 stored creosote brought in by ship or barge on the Mississippi River. The creosote was stored in three tanks (two 25,000-barrel capacity tanks and one 37,500-barrel capacity tank) from 1918 to 1980. The creosote was transferred from the tanks to either trucks or rail cars; there are no records of creosote being used on the site. Two of the tanks were dismantled from 1980 to 1982 to allow for the construction of Section 2 - Tank Farm. The third tank was converted into an oil reuse tank and was demolished in 2006. SWMU 19 consists of three unlined surface impoundments located within Section 2 - Tank Farm to collect wastewater from the Good Hope Refinery's operations. The impoundments were apparently in use from the 1940s to at least 1969, and were dewatered, backfilled and closed from 1980 to 1981. It should be noted that Valero has conducted investigations at Section 2 - Tank Farm, but not on a SWMU-specific basis. Thus, this EI discusses the investigation on an area-wide basis (i.e., Section 2 - Tank Farm). SWMU 18 comprises the southern and central portion of the Section 2 – Tank Farm area and is shown in Figures 1 and 2. SWMU 19 comprises the north central portion the Section 2 – Tank Farm area. The locations of the former Waste Impoundments 1, 2, and 3 are shown in Figure 2 as adjacent and south of the Steam Methane Reformer (SMR) area, which is downgradient of both SWMU's.

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:

The hydrogeology of the Valero site is characterized by 0 to 5 feet of silty, clayey fill material, underlain by natural levee deposits of the Mississippi River. The natural levee deposits are thicker and coarser near the river and thinner away from the river, where sediments grade to finer-sized backswamp clay, silt and peat deposits. Boring logs from the site indicate that the levee and backswamp deposits consist predominantly of clay and silt with organic matter in the upper permeable zone and some sand. The generalized shallow stratigraphy is described as follows. The uppermost clay is a brown to gray, soft to medium stiff silty clay layer extending to a depth of approximately 10 to 15 ft below ground surface (ft-bgs). Below the uppermost clay is the first permeable zone (Zone II) that consists of a loose gray silt layer with clayey silt, wood and organic matter encountered to a depth of approximately 20 to 25 ft bgs. The third zone consists of gray clay and silty clays and extends to approximately 25 to 30 ft bgs; this zone serves as an aquitard between the permeable zones, Zone II and Zone IV, but it is not continuous across the site and may not be present in some areas. Where it is not in direct contact with the first permeable zone, the second permeable zone consists of a permeable firm gray silt, sandy silt, and silty clay which extends to approximately 35 to 40 ft-bgs. Below this second permeable zone are soft gray clays that overlie the stiffer clays and cleaner sands of the Pleistocene deposits. The contact between the Holocene (Recent) and Pleistocene deposits occurs at approximately 60 to 70 ft-bgs beneath the site. Below the depth of approximately 100-120 feet bgs at the site is the Gramercy Aquifer. Soil boring locations and the line of geologic cross section are provided in Figure 3; a geologic cross section through the SMR and GATX SWMU area is provided as Figure 4.

Site investigations have concentrated on delineating contaminant concentrations in the Holocene (Recent) backswamp and levee deposits that comprise the shallow groundwater unit. The shallow unit beneath the refinery has been classified as Groundwater Class 3A (GW3A), which is a non-potable water unit that has low permeability and is able to transmit water to a well at a maximum sustainable yield of less than 800 gallons per day (LDEQ, 2003). All monitoring wells associated with the Section 2 - Tank Farm are screened within the two permeable zones in the shallow unit, Zone II and Zone IV. The upper zone generally extends from the water table to a depth of 20 feet bgs and is monitored by wells MW-2 through MW-4, MW-7 through MW-21, MW-24, and MW-26. The lower zone generally extends to a depth of 35 to 40 feet bgs and is monitored by wells MW-1, MW-2B, MW-3B, MW-5, MW-6, MW-7B, MW-8B, MW-25, and MW-27 (Conestoga-Rovers & Associates, 2003). Table 1 provides the monitoring well locations and screened intervals, and Table 2 lists the measured total depth, top of casing elevation, and general static water level of wells used for groundwater monitoring at the facility.

[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).

Depth to groundwater in the shallow unit in April 2004 was reported from approximately 2.3 feet to 5.3 feet (Valero, 2004a). Local groundwater flow direction in the shallow Holocene deposits is generally to the north across the property and away from the Mississippi River. A comparison of water level elevations reported for nested well pairs MW-24/MW-25 and MW-26/MW-27 located at the northern and northeastern boundaries of the SMR indicates very slight upward vertical gradients (Valero, 2004a), which is a finding consistent with previous observations for the area (Conestoga-Rovers & Associates, 2003).

The April 2004 sampling event and associated well installation were conducted in response to a Sampling and Analysis Plan (draft SAP, November 13, 2003) designed to address data gaps identified during the initial preparation of the CA750 (Booz Allen Hamilton, 2003). In response to the SAP requirements and in addition to a site-wide groundwater sampling event, groundwater monitoring wells MW-24/MW-25 and MW-26/MW-27 (two nested well pairs) were installed and sampled; three temporary borings (TDP-1, TDP-2, and TDP-3) were sampled between SWMUs 18 and 19 and the northeastern boundary (Figure 3); and five surface water samples were collected from Bayou La Branche, off site and downgradient of Section 2 (designated SW-1 through SW-5) (Valero, 2004a). The November 2004 groundwater data were obtained as grab samples of shallow groundwater from seven soil borings/temporary wells, designated SMR-1 through SMR-7, that were installed and sampled to provide soil and groundwater data to support the design of the Steam Methane Reformer (SMR) foundation (Conestoga-Rovers & Associates, 2005). SMR-1 through SMR-7 are shown in Figure 3, Figures 5a through 5e, and Figure 6.

Previous investigations have identified two separate groundwater contaminant plumes in the upper zone of the shallow groundwater unit. These include a benzene plume underlying the former waste impoundments (SWMU 19), and a polyaromatic hydrocarbon (PAH) plume underling the area of the former creosote tanks (SWMU 18). The maximum contaminant concentrations in these two plumes in April 2004 are presented in the table below (page 5). The table was developed by first comparing contaminant concentrations in the Section 2 - Tank Farm to the Louisiana Department of Environmental Quality (LDEQ) Risk Evaluation/Corrective Action Program (RECAP) Groundwater Class 3A Non-Drinking Water (GW3NDW) values without applying an associated dilution and attenuation factor (DAF3). As indicated in the table, several PAHs, metals, and one volatile organic compound (VOC) (benzene) exceed GW3NDW. As a second step, the DAF3 under Management Option-1 (MO-1) and site-specific groundwater screening criteria were developed. The closest distance from impacted groundwater (well MW-10) and the first surface water body was estimated (approximately 2,200 feet) and the thickness of source area (Sd) was assumed to be equal to the screened interval (i.e., 20 feet). According to RECAP, the appropriate DAF3 under MO-1 for these conditions is 110. The MO-1 with DAF3 values were calculated as the product of the GW3NDW values and the DAF3. As presented in the following table, maximum benzene concentrations that exceed the MO-1 with DAF3 are reported at boring/temporary well SMR-4. Other wells that define the benzene plume (i.e., those wells whose concentrations have exceeded MO-1 with DAF3) include MW-7, MW-8, and MW-10 through MW-13. Maximum PAH concentrations that exceed MO-1 with DAF3 are reported in well MW-16 (benzo (a) anthracene, benzo (a) pyrene, benzo (b) fluoranthene, benzo (k) fluoranthene, chrysene, dibenzofuran, and flouranthene). Other wells that define the PAH plume include MW-2, MW-17, and MW-21. All concentrations are reported in milligrams per liter (mg/L).

Groundwater Concentrations Detected Above RECAP GW3NDW without DAF3 (mg/L) Compared to Site Specific MO-1 with DAF3

Constituent	Well I.D.	Concentration[1,2]	RECAP GW3NDW[3] w/out DAF3	Site-Specific Criteria Management Option 1[3] (MO-1) with DAF3
VOCs				
Benzene	SMR-4	**631**	0.013	1.43
SVOCs				
2-methylnaphthalene	MW-16	2.41	0.027	2.97
Acenaphthene	MW-16	3.45	0.54	59.4
Anthracene	MW-16	0.953J	0.11	12.1
Benzo(a)anthracene	MW-16	**0.782J**	0.00000038	0.0000418
Benzo(a)pyrene	MW-16	**0.222J**	0.0002	0.022
Benzo(b)fluoranthene	MW-16	**0.471J**	0.000091	0.01
Benzo(k)fluoranthene	MW-16	**0.244J**	0.00091	0.1001
Chrysene	MW-16	**0.767J**	0.000038	0.00418
Dibenzofuran	MW-16	**2.09**	0.015	1.65
Fluoranthene	MW-16	**4.14**	0.032	3.52
Fluorene	MW-16	3.16	0.078	8.58
Naphthalene	MW-16	9.27	0.22	24.2
Phenanthrene	MW-16	8.87	0.21	23.1
Pyrene	MW-16	2.67	1.4	154.0
Aromatics				
Aromatic >C8-C10	MW-21	82.3	31	3,410
Aromatic >C12-C16	MW-16	40.9	31	3,410
Aromatic >C16-C21	MW-16	55.8	24	2,640
Aromatic >C21-C35	MW-16	33.4	24	2,640
Metals				
Arsenic	MW-21	0.26	0.05	5.5
Cadmium	MW-13	0.025	0.01	1.1
Lead	TDP-2	0.18	0.05	5.5

1. Samples collected and laboratory analyzed in April 2004 (Valero, 2004), except for SMR-4, which was obtained as a grab sample collected in November 2004 from a soil boring completed as part of the SMR project (Conestoga-Rovers & Associates, 2005).
2. **Bold** formatting indicates that the reported concentration exceeds both the RECAP GW3NDW and MO-1 with DAF3. "J" qualifier indicates estimated concentration.
3. Criteria listed are the Risk Evaluation Corrective Action Program (RECAP Screening Standard (GW_{SS}) Groundwater Non-Drinking Water (GWNDW) without calculation of the dilution and attenuation factor for Class 3A groundwater (DAF3) and the RECAP site-specific criteria using Management Option 1 (MO-1) and calculated DAF3s based on aquifer thickness and distance to the nearest surface water body.

References:

Booz Allen Hamilton, 2003. *Draft Sampling and Analysis Plan, Orion Refining Corporation, Soil, Groundwater, and Surface Water Sampling, New Sarpy, Louisiana*, Booz Allen Hamilton for EPA Region 6, November 13, 2003.

Conestoga-Rovers & Associates, 2003. *Risk Evaluation Corrective Action Program (RECAP) Report, Section 2 Remediation Project, Orion Refining, Norco, Louisiana*, Conestoga-Rovers & Associates, March 2003.

Conestoga-Rovers & Associates, 2005. *Groundwater Certification Request, Stream Methane Reformer (SMR)*, Conestoga-Rovers & Associates, May 2005.

LDEQ, 2002. Letter from LDEQ to Robert Gross, Orion Refining Company. Re: Evaluation of Groundwater Classification, Louisiana Department of Environmental Quality (LDEQ), March 4, 2002.

LDEQ, 2003. *Risk Evaluation/Corrective Action Program (RECAP)*, Louisiana Department of Environmental Quality (LDEQ), October 2003.

Valero, 2004a. Letter from Robert Gross, Valero, to Keith Casanova, LDEQ. Re: Environmental Indicators Conceptual Site Model Data Gaps, May 13, 2004.

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.

<u>Rationale</u>:

The benzene and PAH groundwater plumes have not migrated off site. Downgradient monitoring wells and borings located within along the northern and northeastern boundary of the SMR unit (nested pairs MW-24/MW-25 and MW-26/MW-27, MW-4, MW-6, temporary borings TDP-1 through TDP-3) do not exceed MO-1 with DAF3 values for any constituents in the shallow or deep zones of the shallow groundwater unit, with the exception of an estimated concentration of benzo(a)anthracene (concentration = 0.00026J mg/L; MO-1 with DAF3 = 0.0000418 mg/L) in temporary boring TDP-3 (Valero, 2004a).

To assess whether the lateral migration of contaminants in the benzene and PAH plumes can be considered stabilized, historic (1999/2000/2001) groundwater quality data (Conestoga-Rovers & Associates, 2003) were compared with the most recent complete set of data (2004) (Valero, 2004) in monitoring wells located within the leading edge portions of the contaminant plumes. For the benzene plume, benzene concentration trends were assessed in wells MW-7, MW-10, and MW-11; for the PAH plume, trends were assessed in well MW-2 for select PAH constituents. The results of the comparison, presented in the following table (page 8), indicate that concentrations in downgradient wells within the benzene and PAH plumes generally demonstrate declining trends through time. Groundwater concentrations and the benzene isopleth for the April 2004 sampling are provided in Figure 5b, and dissolved aliphatics and aromatics for the SMR area are shown in Figures 5c and 5d. Based on these observed declining contaminant trends, it is apparent that the existing area of contamination is not expanding and that the lateral migration of contaminated groundwater can be considered to be stabilized.

The vertical extent of contamination appears to be confined to the upper zone of the shallow groundwater unit, which generally extends from the water table to a depth of 20 feet bgs. The lower zone, which generally extends to a depth of 35 to 40 feet bgs, is not impacted at concentrations that exceed relevant criteria, with the majority of the concentrations reported below laboratory detection limits. The lack of significant downward migration is likely attributed to the substantial thickness of low conductivity clayey silts and clays that comprise the lower zone and to the slight upward vertical gradients in the shallow groundwater unit. Based on these observations, it is apparent that the vertical migration of contaminated groundwater can be considered to be stabilized.

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[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.

Comparison of Contaminant Concentrations Over Time in Section 2 - Tank Farm Downgradient Wells (mg/L)

Well I.D.	Contaminant	MO-1 with DAF3	July 1999[1]	November 2000[1]	December 2001[1]	April 2004[2]
Benzene Plume						
MW-7	Benzene	1.43	186	144	147	125
MW-10			104	66.8	70.5	40.5
MW-11			4.04	15.5	2.02	0.388
PAH Plume						
MW-2	Benzo(b)-fluoranthene	0.1001	NS	0.0068J	< 0.01	<0.00024
MW-2	Chrysene	0.00148	NS	0.0077	< 0.01	0.0087J

[1] Conestoga-Rovers & Associates, 2003. 2000 data are presented where laboratory reporting limits exceeded relevant criteria.
[2] Valero, 2004.
Concentrations denoted "J" indicates an estimated value, and "ND" indicates values below the laboratory reporting limit.
NS = not sampled in 1999.

References:

Conestoga-Rovers & Associates, 2003. *Risk Evaluation Corrective Action Program (RECAP) Report, Section 2 Remediation Project, Orion Refining, Norco, Louisiana,* Conestoga-Rovers & Associates, March 2003.

Valero, 2004a. Letter from Robert Gross, Valero, to Keith Casanova, LDEQ. Re: Environmental Indicators Conceptual Site Model Data Gaps, May 13, 2004.

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:

The shallow depths to groundwater recorded at the facility (approximately 2 to 5 feet) along with indications of upward hydraulic gradients (Conestoga-Rovers & Associates, 2003) and the net northerly groundwater flow direction suggest that groundwater underlying the facility discharges to the wetlands and Bayou La Branche that are located to the north and northeast of the facility. As discussed in the response to Question 3, results from samples from downgradient monitoring wells located along the northern boundary of the SMR Unit and fence line do not exceed MO-1 with DAF3 values for any constituents (except one minor exceedance) in the shallowest or deeper zones of the shallow groundwater unit (Valero, 2004a). This phenomenon indicates that the benzene and PAH plumes have not migrated off site to the wetlands and Bayou La Branche. In addition, surface water samples collected in Bayou La Branche in April 2004 (Valero, 2004a) indicate that concentrations are below the laboratory reporting limit for benzene and the PAH constituents that comprise the two on-site groundwater contaminant plumes.

References:

Conestoga-Rovers & Associates, 2003. *Risk Evaluation Corrective Action Program (RECAP) Report, Section 2 Remediation Project, Orion Refining, Norco, Louisiana*, Conestoga-Rovers & Associates, March 2003.

Valero, 2004a. Letter from Robert Gross, Valero, to Keith Casanova, LDEQ. Re: Environmental Indicators Conceptual Site Model Data Gaps, May 13, 2004.

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 ecosystems 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[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 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 ecosystem.

_____ 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.

Rationale:

[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 ecosystems 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 ecosystems), 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 specialist, including an ecologist) adequately protective of receiving surface water, sediments, and ecosystems, 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 ecosystem.

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

Rationale:

[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:

Future groundwater monitoring will consist of the ongoing permitted solid waste semi-annual monitoring programs and the monitoring program at the East Plant area (wells GDU-MW-1, -2, -3, and -5) that are west of and adjacent to the GATX SWMUs (SWMU 18, the former Creosote Tanks area; and SWMU 19, the three Closed Wastewater Impoundments); and the Steam Methane Reformer (SMR) Unit / Section 2 - Tank Farm monitoring wells that are within the area as well as east, north and downgradient from the GATX SWMUs. Groundwater conditions are currently under assessment with the continuing RCRA Facility Investigation (RFI) for the Section 2 - Tank Farm/SMR Area. Information resulting from the existing and future groundwater monitoring programs in the subject area will continue to verify that contaminated groundwater has remained within the delineated area of contamination and has not migrated.

Table 1 provides the monitoring well locations and screened intervals, and Table 2 lists the measured total depth, top of casing elevation, and general static water level of wells to be used for continued groundwater monitoring at the facility. Figure 3 provides the boring and monitoring well locations for the Section 2 - Tank Farm/SMR Area.

References:

Conestoga-Rovers & Associates, 2003. *Risk Evaluation Corrective Action Program (RECAP) Report, Section 2 Remediation Project, Orion Refining, Norco, Louisiana*, Conestoga-Rovers & Associates, March 2003.

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.

____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

____ IN - More information is needed to make a determination. Based on a review of the information contained in this EI determination, more information is needed to determine whether "Migration of Contaminated Groundwater" is "Under Control" at the **Valero St. Charles Refinery** facility, EPA ID #**LAD062644778**, located in **Norco, Louisiana**. This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

Rationale:

Completed by: [signature] Date 6/30/06
Jeffrey Jones, Geologist
Environmental Technology Division, LDEQ

Supervisor [signature] Date 6/30/06
Narendra M. Dave, Geologist Manager
Environmental Technology Division, LDEQ

Concur
[initials] GPD-M
1/11/07

Locations where references may be found:

LDEQ Public Records, 602 N. Fifth Street, Baton Rouge, LA 70802
Valero St. Charles Refinery, 15272 River Road, Norco, LA 70079

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