

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRA-INFO code (CA725)

Current Human Exposures Under Control

Facility Name: Tenneco Automotive
Facility Address: 121 Meridian Avenue, Cozad, Nebraska 69130
Facility EPA ID #: NE007263619

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, 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?

If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or

if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

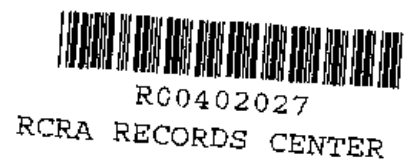
Definition of Environmental Indicators (for the RCRA Corrective Action)

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 "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "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 "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

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).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria such as the Maximum Contamination Levels [MCL’s]) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	X			
Air (indoors) ²		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		
Sediment	X			
Subsurface Soil (e.g., >2 ft)	X			
Air (outdoors)	X			

_____ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

___X___ If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter “IN” status code.

Rationale and Reference(s): A Stipulation (Case No. 656) between Tenneco Automotive (formerly Monroe Auto Equipment Company) and the Nebraska Department of Environmental Quality (formerly the Nebraska Department of Environmental Control) identified a list of specific contaminants defining both groundwater and soil contamination at the Cozad facility. These contaminants are Trichloroethylene (TCE), 1,1,1-Trichloroethane (TCA), 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, 1,2-Dichloroethene (Cis and Trans). Tetrachloroethane has also been detected in the groundwater. These contaminants are monitored periodically and are reported to both the NDEQ and the EPA. The results for the most recent comprehensive groundwater monitoring event, completed in October 1999, are discussed in the following paragraph. The results of this sampling event were transmitted to the EPA on January

31, 2000. The results are discussed in terms of total VOCs, which are the sum of the six contaminants previously identified.

The aquifer beneath the facility consists of an upper aquifer and a lower aquifer separated by an aquitard. There are 55 groundwater monitoring wells in the first formation encountered (this has been identified as the Grand Island formation and has been referred to as the alluvial aquifer). The deepest well is 32 feet below ground surface. The range of total VOCs detected in these wells is from non-detect to 13.9 ug/L. VOCs were only detected in 18 of the 55 monitoring wells. None of the shallow wells detected VOCs above an MCL for the compounds identified in the previous paragraph. There are 93 groundwater monitoring wells in the lower aquifer identified as the Ogallala aquifer. The Ogallala has been arbitrarily divided into three levels based on monitoring well screen depth below ground surface. The first level is from approximately 30' to 100'. The second level is from 101' to 200' and the third level is below 201'. The monitoring wells vary in depth from 44 feet to 464 feet below ground surface. The range of VOCs in these wells is from non-detect to 1371 ug/L. VOCs were in detected in 44 of the 93 monitoring wells. Of the 44 monitoring wells containing detectable levels of VOCs, only 19 wells contained VOCs above Safe Drinking Water Act MCLs. In the upper level, 25 of the 40 monitoring wells had detectable levels of VOCs ranging from 0.6 to 680 ppb. Of the 25 monitoring wells only 6 monitoring wells contained concentrations above an MCL (TCE). In the middle level, 25 of the 40 monitoring wells had detectable levels of VOCs ranging from 0.6 to 1371 ppb. Of the 25 monitoring wells 15 monitoring wells contained concentrations above an MCL (TCE and 1,2-DCA). In the lower level, 4 of the 14 monitoring wells had detectable levels of VOCs ranging from 1.1 to 4.4 ppb.

Tenneco Automotive performs indoor air monitoring annually for a number of parameters. Volatile organics are one of the parameters. In the most recent air sampling event, no chlorinated hydrocarbons were detected.

The courtyard area is paved so there are not accessible surface soils but the shallowest subsurface soil samples in the courtyard had detectable levels of the following compounds: 1,1-dichloroethane, 1,2-dichloroethane, 1,2-dichloroethene, 1,1,1-trichloroethane and trichloroethylene. These samples were collected in August 1985 and March 1986. Several samples were above the Region 9 soil screening level for inhalation for 1,2-DCA and TCE. However, the most recent soil sampling event in 2001, indicated only the presence of ethylbenzene, toluene, and xylene above Region IX industrial PRG's for soil. Although the contaminant levels will require remediation, the area is currently capped with pavement.

Sediment samples from the Borrow Pit contained arsenic and chromium above Region IX industrial PRG's. Sediment samples from the Dawson County Drainage ditch collected in 2001 did not contain contaminants of concern above Region IX residential PRG's

No samples have been obtained for outdoor air. However, emissions from the air stripping tower have always been below the threshold necessary for an air permit. Based on calendar year 1999 average influent and effluent concentrations, the annual TCE emission is less than one pound.

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 appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	Yes	Yes	No	No	No	No	No
Air (indoors)							
Soil (surface, e.g., <2 ft)							
Surface Water							
Sediment							
Soil (subsurface e.g., >2 ft)	No	No	No	Yes	No	No	No
Air (outdoors)							

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated”) as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

 x If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s): The potential human receptors for groundwater include: residents of Cozad and residents downgradient of the contaminant plume, workers which use the City and private water supply systems, and day-care facilities using this water supply and indoor air for on-site workers from volatilization of VOA's in groundwater.

Trespassers, recreation activities and consumption of food are not expected to be exposed to contamination. The most likely contact, construction workers, would be through excavation activities. VOC concentrations in shallow groundwater monitoring wells, both on-site and off-site, are not above health based concentrations. The only exposure scenario where a trespasser would have contact with groundwater would be at the borrow pit (assuming they climbed over the fence or cut a hole through it). Groundwater is directly connected to the borrow pit. However, groundwater VOC concentrations in monitoring wells directly upgradient of the borrow pit are below health based concentrations. Similarly, VOC concentrations in the surface waters at the Platte and the borrow pits east of the irrigation canal are also below health based concentrations. There are no food crops, in the Cozad area, being irrigated with water contaminated with VOCs. Since the borrow pit is completely surrounded by a locked, 6' chain link fence, human exposures to contaminated sediment is precluded.

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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- 4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**^d (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

 X If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

 If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

 If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale and Reference(s): Tenneco currently has a mitigation program in place which prevents exposure of VOCs to both City and private residents using groundwater in the Cozad area. This program consists of four distinct elements. The first element is a groundwater recovery system, consisting of two recovery wells pumping a total of 1350 gpm. Recent comprehensive groundwater monitoring has demonstrated that the recovery system has contained both the on-site and off-site contaminant plume. The second element consists of providing carbon filtration systems for private residents that may be using contaminated groundwater. Pre and post filtration samples are collected quarterly to evaluate the effectiveness of the carbon systems. Those systems demonstrating potential breakthrough are replaced with new carbon systems. The third element consists of evaluating the pumping program for Cozad municipal supply wells. Because several municipal supply wells are adjacent to the contaminant plume, the usage from these wells is evaluated by Tenneco quarterly to detect any influence on the existing recovery system and to provide an immediate response, if necessary. Finally, the fourth element is the periodic groundwater monitoring program in effect. Municipal and private groundwater supply wells are sampled quarterly for VOCs, so that corrective action can be initiated if warranted. The combination of these four elements serve to eliminate any exposure to Cozad

area residents to acceptable limits.. The most probable contaminant above an MCL would be trichloroethylene. Concentrations above MCLs could exist for 20 years or more. However, Tenneco's recovery system is fully operational and precludes any exposure to drinking water with VOCs at concentrations greater than respective MCLs.

Tenneco Automotive performs indoor air monitoring annually for a number of parameters. Volatile organics are one of the parameters. In the most recent air sampling event, no chlorinated hydrocarbons were detected. In addition results from the Johnson-Ettinger model (copies attached) indicate the potential for volatilization of VOA's in groundwater to indoor air to be below levels of concern.

In 2001, Tenneco conducted facility investigations in the areas of concern (AOC) and at solid waste management units (SWMU) that were most likely to have had contaminant releases from past practices. Table 1.3-1 (attached) from the Voluntary RFI Report dated October 2001 describes the investigation rationale. Based on the results of the investigations, only one SWMU/AOC (the courtyard area) had soil contamination above levels of concern. This area is under pavement and Tenneco has a policy (institutional control) in place (copy attached) that requires notification of the environmental manager prior to any drilling or digging anywhere within the facility boundary. The combination of pavement and prohibitions on excavation preclude current exposures to contaminated soils.

Groundwater discharges to surface water at three locations. One location is groundwater that is extracted from the recovery system. This groundwater is pumped to an air stripping tower and is discharged west of the facility to the Dawson County Drainage Ditch via an NPDES permit. The discharge then flows to the Platte River, approximately one mile to the south. Since January 1999, the concentration of TCE in the air stripping tower effluent has been less than 5 ug/L. The second source is the borrow pit just to the west of the facility. The borrow pit does receive storm water runoff from the roof and parking lot areas. Three groundwater monitoring wells are hydraulically down gradient of the borrow pit. All three wells were non-detect for VOCs in 2001. The third source of groundwater discharge to surface water is from the upper most unconfined alluvial aquifer (the aquifer that rests on top of the Ogallala). Groundwater from this aquifer discharges to a series of abandoned borrow pits. A groundwater monitoring well (41-25) is located directly upgradient of these borrow pits. The last sampling event in which the groundwater concentration was above an MCL was October 1997 (5.7 ug/L for PCE). Subsequent sampling of this monitoring well (41-25) demonstrated that both TCE and PCE were below their respective MCLs.

Sediments have been sampled at two locations, the borrow pit and Dawson County Drainage Ditch. Samples from the borrow pit contained detectable levels of benzo(a)anthracene, benzo(b)fluoranthene and benzo(a)pyrene. These values were flagged "detected but below the level needed for accurate quantification." These sample concentrations were just above generic soil screening levels for ingestion. Samples analyzed for metals and metalloids contained elevated levels for arsenic, chromium and lead. The borrow pit is totally enclosed with a chain link fence and a locked gate. Samples from the Dawson County Drainage Ditch contained detectable levels of bis(2-ethylhexyl)phthalate and toluene. These sample concentrations were below their associated generic soil screening levels. Samples analyzed for metals and metalloids contained elevated levels for arsenic, chromium, copper and lead. One of three arsenic samples

was above the generic SSL for ingestion. Two of three chromium samples were above the generic SSL for ingestion and inhalation. All of the copper samples were below the Region 9 PRG's (note: there are no generic SSLs for copper). All of the lead samples were below the SSL.

NOTE: The most complete documentation on soil, sediment, and surface water investigations is the Voluntary RCRA Facility Investigation Report dated October 2001 (cover page attached). This report along with ongoing groundwater monitoring reports will provide supporting information for completion of this evaluation.

⁴ If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5 Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

_____ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

Rationale and Reference(s):

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

- YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the _____ facility, EPA ID # _____, located at _____ under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.
- NO - "Current Human Exposures" are NOT "Under Control."
- IN - More information is needed to make a determination.

Completed by (signature) William F. Lowe Date 9/4/02
(print) William F. Lowe
(title) Project Manager

Supervisor (signature) John Smith Date 9/9/02
(print) John Smith
(title) RCAP Manager
(EPA Region or State) _____

Locations where References may be found:

_____ EPA Region 7 RCRA Record Center

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