



Texas Commission on Environmental Quality  
Texas Risk Reduction Program

# Response Action Effectiveness Report

## Purpose

The purpose of this form is to provide a standard format for the Response Action Effectiveness Report (RAER).

## Objectives

These instructions provide information on the following topics:

- To whom does RAER form apply?
- When is the RAER submitted?
- How is the RAER submitted?
- How do I obtain more information?
- How do I complete the RAER?

## Regulatory Citation

30 TAC §350.93

## Abbreviations and Acronyms

**AMSL** – above mean sea level

**APAR** – Affected Property Assessment Report

**BMSL** – below mean sea level

**COC** – chemical of concern

**ESA** – ecological services analysis

**ID No.** – Identification number assigned by the program area to the facility/site. Appropriate case/tracking numbers include Solid Waste Registration (SWR) ID Number, VCP ID Number, etc.

**LNAPL** – light non-aqueous phase liquids

**MC** – mail code used by TCEQ for routing mail within the agency

**MQL** – method quantitation limit

**NAPL** – non-aqueous phase liquids

**PCL** – protective concentration level

**PCLE** – protective concentration level exceedance

**POE** – point of exposure

**PMZ** – plume management zone

**PRP** – potential responsible party

**QC** – quality control

**RACR** – Response Action Completion Report

**RAER** – Response Action Effectiveness Report

**RAP** – Response Action Plan

**SIN** – Self-Implementation Notice

**SQL** – sample quantitation limit

**SWR** – solid waste registration

**TCEQ** – Texas Commission on Environmental Quality  
**TRRP** – Texas Risk Reduction Program  
**VCP** – Voluntary Cleanup Program

## **General Instructions**

Read these instructions carefully because the form itself does not contain all the instructions. You cannot adequately complete the RAER without following these instructions. The RAER is not a guidance document. You must consult the TRRP rule and associated guidance documents to complete your response action.

### **To whom does the RAER form apply?**

Persons who are conducted response actions under TRRP and who have not completed the response action within three years after submitting a self-implementation notice (SIN), or from the date of the TCEQ approval of the Response Action Plan (RAP), must submit the RAER.

### **When is the RAER submitted?**

Submit the RAER every three years following:

- submittal of the SIN,
- the date of approval of the RAP, or
- other schedule specified by the program area.

### **How is the RAER submitted?**

Submit a copy of this form to both the applicable TCEQ program area in the Austin Central Office and to the appropriate TCEQ Region Office. The mailing address and phone number for each of the Regional Offices may be found at <http://www.tceq.state.tx.us/AC/about/directory/region/reglist.html>. The TCEQ mailing address should include the appropriate TCEQ program name and the corresponding mail code (MC). The address for the Central Office is:

TCEQ  
[specify program area], MC-\_\_\_\_  
P.O. Box 13087  
Austin, Texas 78711-3087

### **How do I obtain more information?**

The TRRP rule and guidance are available at <http://www.tnrc.state.tx.us/permitting/trrp.htm>. You will have to use the rule and associated guidance to complete this form. Questions regarding your affected property should be addressed to the program area that is handling your case. Phone numbers for the TCEQ programs are listed below.

Voluntary Cleanup Section	512/239-5891	Corrective Action Section	512/239-2276
Superfund Cleanup Section	512/239-2486	Municipal Solid Waste Permits	512/239-6784
RPR Section	512/239-2200		

## How do I complete the RAER?

Carefully review these instructions and all instructions on the worksheets themselves. Failure to complete the report as indicated may result in return of your report or a notice of deficiencies. **Please note that except for expanding the narrative boxes with text, the form must not be modified in any way. Do not change the numbering or the order of submittal of the worksheets, attachments, and appendices even when portions are not included.** When possible, please print the report on both sides of the pages. Be sure to always include appropriate units of measurement in your answers.

**All data must be supported with references and documentation. Unsubstantiated information may be considered invalid.**

The form is designed so that only the relevant worksheets are submitted depending on the site-specific conditions. Complete only the portions applicable to your response action. Complete the Checklist for Report Completeness to determine which sections are applicable for your report. Arrange the worksheets, attachments, and appendices as specified in the RAER Contents list below. Please note that the form does not include many of the attachments and appendices because they do not have prescribed formats (for example, laboratory reports). Place tabs in your bound report to clearly identify each major section of the report.

If the on-site property is covered under a permit, any permit requirements that conflict with the information in this document supercede these instructions.

<b>RAER Contents</b>	
	Cover Page
	Executive Summary
	Chronology
	Checklist for Report Completeness
<b>Worksheet 1.0</b>	Response Action Objectives
Attachment 1A	Maps and Cross Sections
Attachment 1B	Graphs
Attachment 1C	Response Action Diagrams
<b>Worksheet 2.0</b>	Plume Management Zone
Attachment 2A	Map of Plume Management Zone
<b>Worksheet 3.0</b>	Technical Impracticability
Attachment 3A	Map of Area of Technical Impracticability
<b>Worksheet 4.0</b>	Institutional Controls
<b>Worksheet 5.0</b>	Performance Measures and Problems
<b>Worksheet 6.0</b>	Operation and Maintenance
<b>Worksheet 7.0</b>	Post-Response Action Care
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Appendix 2	ESA and Compensatory Restoration
Appendix 3	Institutional Controls and Landowner Concurrence
Appendix 4	Data Tables, Boring Logs, and Well Completions
Appendix 5	Sampling Procedures
Appendix 6	Laboratory Data Packages and Data Usability Summaries
Appendix 7	Statistical Methodology
Appendix 8	Waste Disposition

## Worksheets and Appendices

The following instructions are listed in order of the worksheets, attachments, and appendices as specified in the RAER Contents list. All pages should include the regulatory ID number assigned to the on-site property, the date of the report, and page numbers.

**Cover Page** - Specify the regulatory ID number assigned by the program area to the on-site property. Appropriate ID numbers include Solid Waste Registration (SWR) ID Number, VCP ID number, or other assigned number. If you do not know your regulatory ID number, contact the appropriate program area to obtain that number before submitting this report. Identify the TCEQ Region in which the affected property is located. The list of region numbers is located at the end of the instructions.

Check the appropriate box to indicate the specific TCEQ program to which the report is submitted. The TCEQ mailing address should include the appropriate TCEQ program and the corresponding mail code (MC). If the report is being submitted to more than one program area, mail the reports separately and address one copy to each program with that program indicated on the cover page.

### On-Site Property Information

Indicate the address of the on-site property (the area at which the assessment took place). Do not list a P.O. Box or a rural route as the physical address. Include the following information for the on-site property address. (example: **814 North 35<sup>th</sup> Street West**)

- street number (example: **814**) Leave blank if none.
- street predirectional - compass direction of the street address that occurs before the street name (example: **North**). Leave blank if none.
- street name (example: **35<sup>th</sup>**) Leave blank if none.
- street type (example: **Street**) Leave blank if none.
- street postdirectional - compass direction of the street address that occurs after the street name (example: **West**). Leave blank if none.
- city
- county
- county code (see list at end of instructions)
- zip code

Specify the nearest street intersection or location description. For example, a location description may be: "On FM 1055, 1 mile south of the intersection of FM 1055 and US Highway 57" or "On Main Street at the northwest corner of Main Street and Broad Street."

Specify the latitude and longitude near the center of the on-site property, either in terms of degrees, minutes, seconds or decimal degrees. Indicate the units used. Please refer to the definition of on-site property in §350.4(a)(60). Horizontal positions collected using certified GPS units or by interpretation from 1-meter Digital Orthophoto Quarter Quads (DOQQs) must maintain a minimum level of accuracy of at least 25 meters. Use of GPS equipment is strongly encouraged in the acquisition of coordinates for all affected property and sampling locations tracked by the TCEQ. Refer to the TCEQ document *Attribute Standards for TCEQ Geographic Locational Data* and the TCEQ policies 8.11 and 8.12, available on the agency's web page at <http://www.tnrcc.state.tx.us/gis/gisplcy.html>.

### **Affected Off-Site Property Information**

Include the address information in the format specified above for any affected off-site property(ies). If there is more than one affected off-site property, attach additional pages to list the same information for all affected off-site properties.

### **Contact Person for On-Site Property Information and Acknowledgement**

Provide the identity and address of the person undertaking the response action (not the consultant). Please refer to the definition of “person” in §350.4. The person should review the acknowledgement carefully and must sign and date this form. The consultant is not allowed to sign this form.

**RAER Executive Summary** – Complete this information to summarize the report.

**Chronology** – Attach a chronology, listed in chronological order beginning with the most recent activity, of all major response actions conducted at the affected property and all reports submitted. Include the date of actions taken and a brief description of all release abatement activities, assessment activities, and response actions conducted. Illustrate and label all locations of relevant information on the site map in Attachment 1A. List all references, including the date, title, and preparer of previously submitted reports, in the reference list in Appendix 1.

**Checklist for Report Completeness** - Use this checklist to identify the applicable portions of the response action completion report by answering all questions. Indicate which components are included in your report.

**Worksheet 1.0 –Response Action Objectives** – Complete this worksheet to document the response action and compliance with all response action objectives.

**Attachment 1A Maps and Cross Sections** – Unless the most recent and current data was included in a previously submitted report, provide the following to document the most current and recent data:

**Affected Property Map** – Include a large-scale map that illustrates all aspects of the affected property. Indicate the original affected property boundary (this is not the legal property boundary) as defined by the assessment levels, the maximum overall PCLE zone, and any current PCLE zone as defined by the critical PCLs. Include legal property boundaries, buildings and other structures, adjacent roads, all potential source areas and known release areas, land uses, type of surface cover, subsurface utilities, surface drainage, surface water bodies, boring and monitor well locations, other sampling points, cross-section lines, water supply wells, and any other potential receptors. Required legend information: north arrow, fractional and bar scales, map source and identification of all symbols used on the map.

**COC Concentration Maps** - Provide affected property map(s) to visually present analytical data. The maps, typically one map per significant and representative COC per medium, drawn to scale, should illustrate all sampling points, COC concentrations, isoconcentration contours including a contour of the critical PCL to delineate the PCLE zone, sample depth intervals, and relevant surface and subsurface features. When there is sufficient time series data, also construct maps for significant COCs using previous sampling dates to illustrate PCLE zone changes over time. Required legend information: north arrow, fractional and bar scales, and identification of all symbols used on the map.

**Parameters Maps** - Provide maps as necessary to effectively illustrate the distribution of geochemical and geotechnical parameters (such as fraction organic carbon and dissolved oxygen) when such information is collected. Illustrate on maps drawn to scale all sampling points,

geochemical and geotechnical concentrations and values, isoconcentration contours as appropriate to accurately depict the data in each medium, sample depth intervals, and relevant surface and subsurface features. Required legend information: north arrow, fractional and bar scales, and identification of all symbols used on the map.

**Groundwater Gradient Map** - Provide a groundwater gradient map, drawn to scale, illustrating all monitoring wells, groundwater surface elevation in feet AMSL or BMSL, labeled groundwater elevation contours, and groundwater flow direction. If groundwater elevation data has been collected at several times and the groundwater flow magnitude or direction has changed over time, submit a sufficient number of maps to illustrate these changes. Required legend information: north arrow, fractional and bar scales, and identification of all symbols used on the map.

**Cross Sections** - If new data results in modification of data from that provided in the APAR, provide a minimum of two cross-sections perpendicular to each other through the source area and affected property. For sites with monitor wells, construct one cross section approximately parallel to the groundwater flow direction and one approximately perpendicular to flow direction. Illustrate site stratigraphy using the boring logs through the total depth of the borings/monitor wells or water well if used in the cross section. Indicate all groundwater-bearing units, lithologies, designated surface and subsurface soils, areas exceeding the assessment level and critical PCL (PCLE zones) for each media, including the location, depth, and extent of NAPL, static groundwater level, monitor well screened intervals, aquitards, migration pathways, subsurface conduits and the compass directions of the cross sections. Required legend items: horizontal and vertical scales and identification of all symbols used in the cross section. Indicate the cross section lines on the affected property map. Additional cross sections should be submitted as needed to effectively portray subsurface conditions.

**Attachment 1B Graphs**– Provide graphs of concentration versus time for significant COCs in critical monitor wells or other media sampling points. The most recent and current data must be used in the graphs.

Construct graphs showing time versus COC concentration in each affected media for representative monitoring points from the initial sampling event to the most recent and current sampling event.

**Attachment 1C Response Action Diagrams** - Illustrate in maps, drawings, and diagrams the design and layout of equipment and components. The plan should clearly show: the location of all key equipment; the location and coverage of any physical control; the area in which the response action occurred; recovery, monitoring, or injection wells; buildings; surface cover types; and surface drainage. Required legend information for maps: north arrow, fractional and bar scales, map source and identification of all symbols used on the map.

**Worksheet 2.0 Plume Management Zone** – Use this worksheet to document the use of a plume management zone as part of the response action. If a plume management zone is not used as part of the response action, then do not submit this worksheet or Attachment 2A.

**Attachment 2A Plume Management Zone Map** - Provide a map that illustrates the area of the plume management zone, the attenuation monitoring points, alternate groundwater POEs, and the initial, maximum, and any current groundwater PCLE zones. Note all receptors within the PMZ and any potentially threatened receptors outside the PMZ. Illustrate major buildings, structures, roads, and other major site features. Required legend information: north arrow, fractional and bar scales, map source and identification of all symbols used on the map.

**Worksheet 3.0 Technical Impracticability** – Use this worksheet to document that a portion or all of the groundwater PCLE zone could not be remediated due to technical impracticability. If technical impracticability was not used as part of the response action, then do not submit this worksheet or Attachment 3A.

**Attachment 3A Map of Technical Impracticability Area** - Provide a map that illustrates the area of technical impracticability, the groundwater flow direction, the initial, maximum, and any current groundwater PCLE zone, and all major site features. Required legend information: north arrow, fractional and bar scales, map source and identification of all symbols used on the map.

**Worksheet 4.0 Institutional Controls** - Complete this worksheet if an institutional control will be or has been used as part of the response action. Repeat this worksheet for each property that requires an institutional control. Refer to *Institutional Controls* (RG-366/TRRP-16) for further information on institutional controls.

**Worksheet 5.0 Performance Measures and Problems** - Describe the performance measures that were used to determine if reasonable progress is being made by the response action and document that the performance measures are being met. If statistical or geostatistical methods were used as part of the effectiveness measures, discuss the assumptions and provide the equations for statistical or geostatistical methodology(ies) in Appendix 7. Describe any problems that have occurred with, or during, the response action.

**Worksheet 6.0 Operation and Maintenance** – Provide a brief overview of the operation and maintenance activities. List the key operating parameters considered important to the proper operation of the response action and critical to its effectiveness.

**Worksheet 7.0 Statistical or Geostatistical Methodologies** - Define the statistical or geostatistical methodology(ies) applied in the data collection or data evaluation process. Discuss the basis for assumptions and provide all equations that will be used.

**Appendix 1 Reference List** – In order to document the sources of information included in this report, provide a complete list of references, including personal communications, reports, books, published and unpublished documents, databases, maps, and any other source of information used in this report. Each reference should specify, as applicable, the author, date, title of article, title of book, periodical, or report, publisher, date of publication, issue information (edition, volume, issue number, date); page reference, and URL. Database references should include the source of the database, the name of the database, and the date the information was acquired. Personal communication references should include the name of the person contacted, the date of contact, and the method of contact (phone, letter, etc). Clearly identify each item in the report that has a reference in this appendix using either superscript numbers or author-date citation (for example, Adams 1999). List references in the order in which they appear in each worksheet and attachment, clearly identifying on which worksheet or attachment the item appears. Please note that unsubstantiated information may be considered invalid.

**Appendix 2 Ecological Services Analysis and Compensatory Restoration Plan** – Use this attachment to provide documentation of the status of an ecological services analysis (ESA) and compensatory restoration if used as part of the response action. Guidance discussing ESAs and compensatory restoration is provided in *Guidance for Conducting Ecological Risk Assessments in Texas*, available on the TCEQ web page.

**Appendix 3 Institutional Control and Landowner Concurrence** – Attach copies of filed or proposed institutional controls if not previously submitted. Also attach any landowner concurrence documentation as appropriate.

**Appendix 4 Data Tables, Boring Logs, and Well Completions**– Use this attachment to provide tables of data, boring logs and well completion information.

**COC Data Tables** - Provide summary tables of all media sample screening and analytical results. Include the following: COC, the critical PCL for each COC, method quantitation limit, sample ID no., sample date, sample depth, and concentration in mg/kg, mg/L, or other appropriate measure. Highlight the individual results that exceed the critical PCL. If the result was not quantifiable, specify that the concentration was less than the SQL for that sample (for example, <0.01 mg/kg). Results of field screening of soil samples should be specified in a separate table in this attachment. The SQL may be used in place of the MQL if it is satisfactorily demonstrated that all reasonably available analytical technology has been used to show that the COC cannot be measured to the MQL due to sample specific interferences. If such a demonstration is made, include all supporting information in this appendix.

**Parameters Data Table** - Provide summary tables of the results of any geochemical or geotechnical analyses. The tables should include the parameter analyzed, sample date, method quantitation limit (MQL), analytical method, type of media, sample ID no., sample depth, and result. If the result was nondetect, specify the SQL for that parameter (do not only write “ND”).

**Groundwater Measurements Table** - Include in this attachment a summary table of all monitor well and water well gauging data. The table should include: depth to groundwater, NAPL thickness, groundwater elevation in relation to mean sea level, top of casing and/or ground surface elevations (specify measuring point), corrected water level and well screen interval. The table should be organized with all results for each monitor well or water well listed in date order (oldest first). If measurable LNAPL is present, provide the specific gravity of the LNAPL and the equation used to calculate the corrected groundwater elevation.

**Boring Logs and Monitor Well Completions**- If any borings or monitor wells were installed and the documentation has not been previously provided, provide soil boring logs which include lithology, identification of groundwater-bearing units, field-screening results, sample locations, sample type (discrete, composite), total depth, sampling tool, boring diameter, depth at which groundwater was encountered while drilling, drilling method, and, if applicable, monitor well completion details including screened interval, diameter, and slot size, casing interval and diameter, cement and grout intervals.

**Appendix 5 Sampling Procedures** - Attach a written description of sample collection and handling procedures if the procedures are different from the procedures previously provided (if so, specify the report name and submittal date in which the sample collection and handling procedures are described). Identify and describe the field screening and/or sampling method(s) to be used, the method of sample collection and preservation, and sample handling procedures. Discuss the site-specific reasons for choosing the sample collection and handling method(s). Include a discussion of the data quality objectives for the project.

**Appendix 6 Laboratory Data Packages and Data Usability Summaries** – Provide copies of analytical reports for all media samples, including samples collected for background determinations, and associated chain-of-custody and quality assurance/quality control documentation. Lab reports must include the following information: name and address of the laboratory, name and address of client, project name,



sample results, detection levels, sample ID number, lab ID number, sample matrix, date and time of sample collection, date of receipt of sample, date of sample preparation and extraction, date of analysis, preparation and analytical method numbers, method quantitation limits, analytical results, signature of laboratory personnel, issue date, QC documentation as appropriate for that analysis, and any other information necessary to convey the results of the analyses. Chain of custody documentation must include: affected property name, address, and regulatory identification number, name of person who collected the samples, date of sample collection, type of analyses requested, sample matrix, sample ID number and sampling location, sample preservation method(s), date(s) and time(s) of transfer to other person, date and time received by lab, signatures of collector, lab, and any intermediary persons, lab assigned job number and sample numbers, and any other pertinent log-in information. If necessary, include the project data quality objectives (DQOs) for media samples in this appendix.

***Appendix 7 Statistical or Geostatistical Methodologies*** - Discuss the data collection effort for each environmental media (e.g., judgmental samples, random sampling design, etc.). Describe the statistical or geostatistical methodology applied. Include all assumptions used in the statistical/geostatistical method, and how those assumptions are met.

***Appendix 8 Waste Disposition*** - Use this appendix if waste characterization and disposition information has not previously been provided or reported through the State of Texas Environmental Electronic Reporting System (STEERS). Describe the wastes generated and the results from all completed waste classification and disposal/treatment activities. Provide copies of all waste characterization sample analytical reports, chain-of-custody, and quality assurance/quality control documentation. Refer to Appendix 6 for information required in lab reports and chain-of-custody documentation. If soil was removed for reuse, provide documentation that the landowner of the property accepting the soil consented to the relocation for reuse. If soils were used as an asphalt or road base mix, provide documentation that the material meets the required user specifications.

**County Codes and TCEQ Region Numbers**

County	County Code	Region No.	County	Code	Reg No.	County	Code	Reg No.	County	Code	Reg No.	County	Code	Reg No.
Anderson	1	5	Comal	46	13	Grayson	91	4	Kinney	136	16	Orange	181	10
Andrews	2	7	Comanche	47	3	Gregg	92	5	Kleberg	137	14	Palo Pinto	182	4
Angelina	3	10	Concho	48	8	Grimes	93	9	Knox	138	3	Panola	183	5
Aransas	4	14	Cooke	49	4	Guadalupe	94	13	Lamar	139	5	Parker	184	4
Archer	5	3	Corvell	50	9	Hale	95	2	Lamb	140	2	Parmer	185	1
Armstrong	6	1	Cottle	51	3	Hall	96	1	Lampasas	141	9	Pecos	186	7
Atascosa	7	13	Crane	52	7	Hamilton	97	9	La Salle	142	16	Polk	187	10
Austin	8	12	Crockett	53	8	Hansford	98	1	Lavaca	143	14	Potter	188	1
Bailey	9	2	Crosby	54	2	Hardeman	99	3	Lee	144	11	Presidio	189	6
Bandera	10	13	Culberson	55	6	Hardin	100	10	Leon	145	9	Rains	190	5
Bastrop	11	11	Dallam	56	1	Harris	101	12	Liberty	146	12	Randall	191	1
Baylor	12	3	Dallas	57	4	Harrison	102	5	Limestone	147	9	Reagan	192	8
Bee	13	14	Dawson	58	7	Hartley	103	1	Lipscomb	148	1	Real	193	13
Bell	14	9	Deaf Smith	59	1	Haskell	104	3	Live Oak	149	14	Red River	194	5
Bexar	15	13	Delta	60	5	Hays	105	11	Llano	150	11	Reeves	195	7
Blanco	16	11	Denton	61	4	Hemphill	106	1	Loving	151	7	Refugio	196	14
Borden	17	7	De Witt	62	14	Henderson	107	5	Lubbock	152	2	Roberts	197	1
Bosque	18	9	Dickens	63	2	Hidalgo	108	15	Lynn	153	2	Robertson	198	9
Bowie	19	5	Dimmit	64	16	Hill	109	9	McCulloch	154	8	Rockwall	199	4
Brazoria	20	12	Donley	65	1	Hockley	110	2	McLennan	155	9	Runnels	200	3
Brazos	21	9	Duval	66	16	Hood	111	4	McMullen	156	16	Rusk	201	5
Brewster	22	6	Eastland	67	3	Hopkins	112	5	Madison	157	9	Sabine	202	10
Briscoe	23	1	Ector	68	7	Houston	113	10	Marion	158	5	San Augustine	203	10
Brooks	24	15	Edwards	69	13	Howard	114	7	Martin	159	7	San Jacinto	204	10
Brown	25	3	Ellis	70	4	Hudspeth	115	6	Mason	160	8	San Patricio	205	14
Burleson	26	9	El Paso	71	6	Hunt	116	4	Matagorda	161	12	San Saba	206	9
Burnet	27	11	Erath	72	4	Hutchinson	117	1	Maverick	162	16	Schleicher	207	8
Caldwell	28	11	Falls	73	9	Irion	118	8	Medina	163	13	Scurry	208	3
Calhoun	29	14	Fannin	74	4	Jack	119	3	Menard	164	8	Shackelford	209	3
Callahan	30	3	Fayette	75	11	Jackson	120	14	Midland	165	7	Shelby	210	10
Cameron	31	15	Fisher	76	3	Jasper	121	10	Milam	166	9	Sherman	211	1
Camp	32	5	Floyd	77	2	Jeff Davis	122	6	Mills	167	9	Smith	212	5
Carson	33	1	Foard	78	3	Jefferson	123	10	Mitchell	168	3	Somervell	213	4
Cass	34	5	Fort Bend	79	12	Jim Hogg	124	15	Montague	169	3	Starr	214	15
Castro	35	1	Franklin	80	5	Jim Wells	125	14	Montgomery	170	12	Stephens	215	3
Chambers	36	12	Freestone	81	9	Johnson	126	4	Moore	171	1	Sterling	216	8
Cherokee	37	5	Frio	82	13	Jones	127	3	Morris	172	5	Stonewall	217	3
Childress	38	1	Games	83	7	Karnes	128	13	Motley	173	2	Stout	218	8
Clay	39	3	Garveston	84	12	Kaufman	129	4	Nacogdoches	174	10	Swisher	219	1
Cochran	40	2	Garza	85	2	Kendall	130	13	Navarro	175	4	Tarrant	220	4
Coke	41	8	Gillespie	86	13	Kenedy	131	15	Newton	176	10	Taylor	221	3
Coleman	42	3	Glasscock	87	7	Kent	132	3	Nolan	177	3	Terrell	222	7
Collin	43	4	Goliad	88	14	Kerr	133	13	Nueces	178	14	Terry	223	2
Collingsworth	44	1	Gonzales	89	14	Kimble	134	8	Ochiltree	179	1	Throckmorton	224	3
Colorado	45	12	Gray	90	1	King	135	2	Oldham	180	1	Titus	225	5

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	ID No.	Report Date:

## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY Response Action Effectiveness Report

### Cover Page

**Regulatory ID number** (Solid waste registration number, VCP ID number, etc) \_\_\_\_\_  
 check one: \_\_\_ Initial RAER submittal for this on-site property      \_\_\_ Subsequent RAER submittal  
 Report date: \_\_\_\_\_ TCEQ Region No.: \_\_\_\_\_

**TCEQ Program** (check one)

\_\_\_ Corrective Action (Mail Code 127)      \_\_\_ Superfund PRP Lead (Mail Code 143)  
 \_\_\_ Voluntary Cleanup Program (Mail Code 221)      \_\_\_ Municipal Solid Waste Permits (Mail Code 124)  
 \_\_\_ Petroleum Storage Tank Program (Mail Code 137)

**On-Site Property Information**

On-Site Property Name: \_\_\_\_\_  
 Street no. \_\_\_\_\_ Pre dir: \_\_\_ Street name: \_\_\_\_\_ Street type \_\_\_\_\_ Post dir: \_\_\_\_\_  
 City: \_\_\_\_\_ County: \_\_\_\_\_ County Code: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Nearest street intersection or location description: \_\_\_\_\_

Latitude: Degrees, Minutes, Seconds OR Decimal Degrees (circle one) North \_\_\_\_\_  
 Longitude: Degrees, Minutes, Seconds OR Decimal Degrees (circle one) West \_\_\_\_\_

**Off-Site Affected Property Information**

Off-Site Affected Property Name: \_\_\_\_\_  
 Street no. \_\_\_\_\_ Pre dir: \_\_\_ Street name: \_\_\_\_\_ Street type: \_\_\_\_\_ Post dir: \_\_\_\_\_  
 City: \_\_\_\_\_ County: \_\_\_\_\_ County Code: \_\_\_\_\_ Zip: \_\_\_\_\_

Check if no off-site properties affected

**Contact Person Information and Acknowledgement**

Person (or company) Name: \_\_\_\_\_  
 Contact Person: \_\_\_\_\_ Title: \_\_\_\_\_  
 Mailing Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ E-mail address \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

By my signature below, I acknowledge the requirement of §350.2(a) that no person shall submit information to the executive director or to parties who are required to be provided information under this chapter which they know or reasonably should have known to be false or intentionally misleading, or fail to submit available information which is critical to the understanding of the matter at hand or to the basis of critical decisions which reasonably would have been influenced by that information. Violation of this rule may subject a person to the imposition of civil, criminal, or administrative penalties.

Signature of Person \_\_\_\_\_ Name, print: \_\_\_\_\_ Date: \_\_\_\_\_



### Checklist for Report Completeness

Use this checklist to determine the portions of the form that must be submitted for this report. Answer all questions by checking Yes or No. If the answer is Yes include that portion of the report. If the answer is No, do not complete or submit that portion of the report. All form contents that are marked "Required" must be submitted. Form contents marked with an asterisk (\*) are not included in the blank form and are to be provided by the person.

		Report Contents														
	Required	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"><b>Cover Page</b></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><b>Executive Summary</b></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><b>Checklist for Report Completeness</b></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><b>Worksheet 1.0</b> Response Action Objectives</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><b>Attachment 1A*</b> Maps and Cross Sections</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><b>Attachment 1B*</b> Graphs</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><b>Attachment 1C*</b> Response Action Diagrams</td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	<b>Cover Page</b>	<input type="checkbox"/>	<b>Executive Summary</b>	<input type="checkbox"/>	<b>Checklist for Report Completeness</b>	<input type="checkbox"/>	<b>Worksheet 1.0</b> Response Action Objectives	<input type="checkbox"/>	<b>Attachment 1A*</b> Maps and Cross Sections	<input type="checkbox"/>	<b>Attachment 1B*</b> Graphs	<input type="checkbox"/>	<b>Attachment 1C*</b> Response Action Diagrams	<input type="checkbox"/>
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No <input type="checkbox"/>	Is there data or boring/monitor well information not previously submitted?	<input type="checkbox"/> Yes	→	<b>Appendix 4*</b> Data Tables, Boring Logs, and Well Completions	<input type="checkbox"/>
No <input type="checkbox"/>	Did sampling procedures differ from those described in the RAP?	<input type="checkbox"/> Yes	→	<b>Appendix 5*</b> Sampling Procedures	<input type="checkbox"/>
No <input type="checkbox"/>	Has any sampling been conducted for which the analytical results were not previously submitted?	<input type="checkbox"/> Yes	→	<b>Appendix 6*</b> Laboratory Data Packages	<input type="checkbox"/>
No <input type="checkbox"/>	Were statistics or geostatistics used in the response action?	<input type="checkbox"/> Yes	→	<b>Appendix 7*</b> Statistical Methodology	<input type="checkbox"/>
No <input type="checkbox"/>	Were any wastes generated that were not reported through STEERS?	<input type="checkbox"/> Yes	→	<b>Appendix 8*</b> Waste Disposition	<input type="checkbox"/>

<b>Response Action Objectives</b>	<b>RAER Worksheet 1.0</b> Page ___ of ___	
	ID No.	Report Date:

Use this worksheet to describe the response action objectives in each media.

**Response Action Objectives**

What is the selected remedy standard for this affected property?      \_\_\_ A      \_\_\_ B

List the environmental media to which this applies \_\_\_\_\_  
 Repeat this section for each medium that had a different response action objective.

Provide a detailed description of the response action. Describe the removal actions, decontamination actions, treatment system(s), and/or physical or institutional control actions that have been conducted in each media and indicate if there were any differences between the actions taken and the actions proposed in the SIN or RAP.

Describe how the response action has, or is working towards, achievement of the property-specific response objectives for the PCLE zone in each medium in the context of the response objectives set forth in §350.32 or §350.33, as applicable. Explain how the response action is appropriate based on the hydrogeologic and COC characteristics. Describe any unprotective conditions that continued or resulted from the remedial actions and the actions taken to mitigate unprotective conditions.

If different from the information provided in the RAP, explain how the COCs have been handled, treated, disposed, or transferred to another medium and document that the response action has not resulted in any additional exposure conditions due to response action activities.

Explain whether the response action is achieving, or will achieve, the objectives within the reasonable time frame.

Are physical controls part of the response action?      \_\_\_ Yes      \_\_\_ No

If yes, describe the type and purpose of the physical control and discuss how the physical control has proven effective.

**Soil Response Action Objectives**

When using removal and/or decontamination with controls or controls only, demonstrate that the physical control or combination of measures is reliably containing, and will continue to contain, COCs within and/or derived from the surface soil and subsurface soil PCLE zone materials over time.







<b>Technical Impracticability</b>	<b>RAER Worksheet 3.0</b> Page ___ of ___	
	ID No.	Report Date:

Use this worksheet to document the use of technical impracticability to modify the groundwater response objectives. Also complete Worksheet 2.0 to document the plume management zone for the area of technical impracticability. Include a map of the groundwater PCLE zone and area of technical impracticability in Attachment 3A. If technical impracticability is not being used as part of the response action, do not submit this worksheet.

If additional information beyond that provided in the RAP is available, describe how it was determined that it was technically impractical to reduce the COC concentrations in groundwater to the critical PCLs. Describe the response actions taken that did not prove effective. Provide graphs in Attachment 1B to illustrate COC concentrations over time and with distance from the source for each response action that did not prove effective. Describe in Worksheet 1.0 the removal/decontamination actions that are being conducted for any PCLE zone outside the area of technical impracticability.

Have COCs above the critical PCL migrated beyond the area of technical impracticability and/or beyond the initial boundary of the PCLE zone?

\_\_\_ yes      \_\_\_ no

If yes, explain the actions taken to mitigate the migration of COCs.

<b>Institutional Controls</b>	<b>RAER Worksheet 4.0</b>	Page ___ of ___
	ID No.	Report Date:

Complete this worksheet if an institutional control will be or has been used as part of the response action. Include in Appendix 3 copies of filed institutional controls and drafts of the proposed institutional controls, copies of landowner concurrences, and a list of landowners from whom landowner concurrence will be requested.

Specify the property for which this applies: \_\_\_\_\_  
 Repeat this worksheet for each different property for which an institutional control will be used.

Institutional Control	Type of Institutional Control <sup>3</sup>				Property Ownership		Anticipated or actual filing date <sup>4</sup>
	Deed notice	Restrictive covenant	VCP Certificate of Completion	Equivalent zoning or governmental ordinance	Check if pertinent tract of land is owned by the person	Check if the pertinent tract of land is owned by an innocent owner or operator	
Document use of commercial/industrial land use (§350.31(g))							
Document use of physical or institutional control under Remedy Standard B §350.31(g))							
Document notice of on-going long term response action (§350.31(h))							
Document use of occupational inhalation criteria as RBELs (§350.74(b)(1))							
Document variance from the default exposure factors (§350.74(j)(2)(L))							
Document the use of a non-default soil exposure area (§350.51(l)(3)&(4))							
Document WCU exclusion area (§350.33(f)(2))							
Document establishing a PMZ (§350.33(f)(4)(C)(I))							
Document the demonstration of technical impracticability (§350.33(f)(3)(F))							
Relocation of soils containing COCs for reuse (§350.36(b)(4) and (c)(4))							
Other (specify)							

<sup>3</sup> Check the appropriate box(es) to indicate the type of institutional control required for the response action.

<sup>4</sup> Specify date or amount of time after RAP approval.

<b>Performance Measures and Problems</b>	<b>RAER Worksheet 5.0</b> Page ___ of ___	
	ID No.	Report Date:

**Performance Measures**

List and describe the performance measures for each environmental medium containing a PCLE zone that are being used to determine if reasonable progress is being made by the response action in a timely manner. Provide documentation that these performance measures are being met. Attach additional information if necessary.

--

**Problems**

Complete the table for the response action. When the response action consists of several components or multiple actions, complete one table for each major component or action.

Response Action Name/Designation: \_\_\_\_\_

List the problems that have been encountered during the response action, describe the impact of each problem, and the response to the problem.

Description of the Problem	Impact	Did this cause a response action failure?		Corrective Response
		Yes	No	

<b>Operation and Maintenance</b>	<b>RAER Worksheet 6.0</b> <b>Page ___ of ___</b>	
	ID No.:	Report Date:

Use this worksheet to describe the operation and maintenance (O&M) activities conducted for each response action.

Response Action Name/Designation: \_\_\_\_\_  
 List all portions of the response action to which this information applies. Repeat this worksheet for each major component or operation.

Describe the O&M and inspection activities that have been conducted to operate and maintain response action components.

<b>Post-Response Action Care</b>	<b>RAER Worksheet 7.0</b>	Page ___ of ___
	ID No.	Report Date:

Complete this worksheet only if the information has changed from that submitted in the RAP. If the information does not apply or if the RAP contains the most current information, do not submit this worksheet.

What is the proposed initial post-response action care period? (default 30 yr.) \_\_\_ years

If the proposed initial post-response action care period is less than 30 years, provide a technical justification in accordance with §350.33(h).

What is the foreseeable land use during the post-response action care period? \_\_\_\_\_

Describe how the future use of the property will not compromise the integrity of the physical controls, will not interfere with the function of the monitoring systems, will not pose a threat to human health or the environment, and will be in accordance with any institutional controls.

Describe the proposed post-response action care activities. Describe the type of monitoring and/or inspections to be performed. Discuss the rationale for not including COC(s) analyzed during the response action, monitoring or sampling point location, frequency of monitoring and/or inspections, and the duration of the monitoring program.

Will PRAC sampling procedures be the same as those as previously documented for monitoring and/ or confirmation sampling? \_\_\_ Yes \_\_\_ No  
 If no, provide in Appendix 6 a description of the monitoring or sampling collection procedures to be conducted during the post-response action care period.

**Cost Estimate**

Complete this portion of the form only if this information has changed from that submitted in the RAP.

Specify the physical control to which this information applies: \_\_\_\_\_

Complete this worksheet for each physical control that will be used as part of the response action.

What is the total estimated annual cost of O&M for the PRAC period? \$ \_\_\_\_\_

What is the total estimated cost for a third party to perform PRAC activities? \$ \_\_\_\_\_

Identify the type of financial assurance mechanism to be used, and the contact person managing fiduciary responsibility, if known.

Does the person meet the criteria and definition of a small business? (see §350.33(n)) \_\_\_ Yes \_\_\_ No  
 If yes and the person desires to pursue the reduced amount of financial assurance, attach a legally binding affidavit. Include in the affidavit the information requested in 30 TAC §350.33(l), (m), and (n).