



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

22 MAY 2007

MEMORANDUM

SUBJECT: Quality Assurance Project Plan for the Greensburg Tornado Response,
Greensburg, KS – Approved

FROM: Diane Harris *Diane Harris*
Regional Quality Assurance Manager
ENSV/IO

TO: Eric Nold
EPA Project Officer
SUPR/EFLR

The review of the subject document has been completed according to "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations," EPA QA/R-5 March 2001. The document was also reviewed for consistency with the site addendum template included as Appendix A to the "Generic Quality Assurance Project Plan for the Superfund Integrated Site Assessment and Targeted Brownfields Assessment Programs," July 2005 (QA document number: 2005103).

The document, in combination with the generic QAPP, complies with R-5, is consistent with the site addendum template, and is approved.

If you have any questions, please contact me at x7258 or the Lead Reviewer, Leslye Werner at x7858.

R7QAO Document Number: 2007149



TETRA TECH

May 21, 2007

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

**Subject: Quality Assurance Project Plan
 Greensburg Tornado Response, Greensburg, Kansas
 U.S. EPA Region 7 START, Contract No. EP-S7-06-01, Task Order No. 0072
 Task Monitor: Eric Nold, EPA On-Scene Coordinator**

Dear Mr. Crossland:

Tetra Tech EM, Inc., is submitting the attached Quality Assurance Project Plan (QAPP) for Emergency Response activities at the Greensburg Tornado Response site in Greensburg, Kansas. If you have any questions or comments, please contact me at (913) 495-3930.

Sincerely,

Jeff Pritchard, CHMM
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

**QUALITY ASSURANCE PROJECT PLAN
FOR EMERGENCY RESPONSE ACTIVITIES
GREENSBURG TORNADO REPOSE
GREENSBURG, KANSAS**

**Superfund Technical Assessment and Response Team (START) 3 Contract
Contract No. EP-S7-06-01, Task Order 0072**

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
901 North 5th Street
Kansas City, Kansas 66101

May 21, 2007

Prepared By:

Tetra Tech EM Inc.
8030 Flint Street
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Region 7 Superfund Program
Addendum for the Generic QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the Greensburg Tornado Response Site

Project Information:

Site Name: Greensburg Tornado Response		City: Greensburg	State: Kansas
EPA Project Manager: Eric Nold		START Project Manager: Jeff Pritchard	
Approved By: <i>[Signature]</i>	Title: START Project Manager	Prepared For: EPA Region 7 Superfund Division	
	Date: 5/21/07		
Approved By: <i>[Signature]</i>	Title: START Program Manager	Prepared By: Jeff Pritchard	
	Date: 5/21/07	Date: 5/21/07	
Approved By: <i>[Signature]</i>	Title: START QA Manager	Tetra Tech START Project Number: X9004.07.0072.000	
	Date: 5/21/07		
Approved By: <i>[Signature]</i>	Title: EPA Project Manager		
	Date: 5/21/07		
Approved By: <i>[Signature]</i>	Title: EPA Region 7 QA Coordinator		
	Date: 05/22/2007		

1.0 Project Management:

1.1 Distribution List

EPA—Region 7: Eric Nold, EPA Project Manager
Diane Harris, Region 7 QA Coordinator

START: Jeff Pritchard, Project Manager

1.2 Project/Task Organization

Eric Nold, of the EPA Region 7 Superfund Division, will serve as the EPA Project Manager for the activities described in this QAPP. Jeff Pritchard, of Seagull Environmental Technologies, Inc. (SETI), will serve as the START Project Manager.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated: July 2005) and the Quality Assurance Project Plan for Emergency Response Activities, Region 7 Superfund Division (June 21, 2000), and contains site-specific data quality objectives for the sampling activities described herein.

☒ Description attached.

☐ Description in referenced report: _____
Title Date

1.4 Project/Task Description:

☐ CERCLA PA ☐ CERCLA SI ☐ Brownfields Assessment
☒ Other (description attached): ☐ Pre-CERCLIS Site Screening ☐ Removal Assessment

Schedule: Field work will begin in May 2007, and is anticipated to take approximately 3-4 weeks to complete.

☐ Description in referenced report: _____
Title Date

1.5 Quality Objectives and Criteria for Measurement Data:

a. Accuracy:	<input checked="" type="checkbox"/> Identified in attached table.
b. Precision:	<input checked="" type="checkbox"/> Identified in attached table.
c. Representativeness:	<input checked="" type="checkbox"/> Identified in attached table.
d. Completeness*:	<input checked="" type="checkbox"/> Identified in attached table.
e. Comparability:	<input checked="" type="checkbox"/> Identified in attached table.

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data.

1.6 Special Training/Certification Requirements:

☒ OSHA 1910
☒ Special Equipment/Instrument Operator: START personnel familiar with air monitoring/sampling instrumentation and field screening equipment and procedures will be required for this project.
☐ Other (describe below):

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1.7 Documentation and Records:

☒ Field Sheets ☒ Site Log ☐ Trip Report ☒ Site Maps ☒ Video
☒ Chain of Custody ☒ Health and Safety Plan ☒ Letter Report ☒ Photos

☒ Sample documentation will follow EPA Region 7 SOP 2420.05D.

☒ Other: Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ☒ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☒ Definitive Sampling
☒ Screening w/ Definitive Confirmation ☒ Screening w/ Definitive Confirmation
☒ Sample Map Attached

The proposed sampling scheme for this project will include: biased/judgmental sampling, screening with and without definitive confirmation, and sampling for definitive analysis. All sampling activities will be conducted in accordance with procedures included in the *Guidance for Performing Site Inspections Under CERCLA*, OSWER Directive #9345.1-05, September 1992, and *Removal Program Representative Sampling Guidance*, Volume 1: Soil, OSWER Directive 9360.4-10, November 1991. All samples will be submitted for analysis at the EPA Region 7 laboratory and/or pre-approved START-contracted or ERRS-contracted laboratories. See Appendices A and B for additional site-specific information and maps. The proposed number of samples is a balance between cost and coverage, and represents a reasonable attempt to meet the objectives of the emergency response tasks.

Sample Summary Location	Matrix	# of Samples*	Analysis
Areas where transformer oil was potentially released	Soil	100	PCBs
Transformers	Transformer Oil	300	PCBs
Burn pits and household hazardous waste staging areas	Soil	18	SVOCs, VOCs, TPH, PCBs, total metals, pesticides, and herbicides
Commercial buildings destroyed by storm damage	Structural Debris	25	Asbestos (PLM)
Burn pit and other areas throughout Greensburg	Air	20	Asbestos (TEM)
Burn pit area	Air	5	Metals & PAHs

*NOTE: Background/QC samples are not included with these totals. See Table 1 for a complete sample summary.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA SOP(s)/Methods
Soil – Potential spill areas	Soil samples will be collected from the upper 6 inches of the ground surface with dedicated sampling equipment (spoons and pie pans) and transferred to the appropriate sample containers.	SOP 4231.2012
Transformer Oil	Samples will be collected with dedicated glass thieving rods and transferred to the appropriate sample containers.	SOPs 4231.2009 and 4231.2010
Soil – Burn pits and household hazardous waste staging areas	Soil samples will be collected from the upper 6 inches of the ground surface with dedicated sampling equipment (spoons and pie pans) and transferred to the appropriate sample containers.	SOPs 4231.2012 and 4230.03B
Structural Debris	Samples of structural debris will be cut, broken, or torn using hand tools and placed directly into sample containers.	SOP 4231.2015
Air	Samples of ambient air will be collected using battery-operated low-volume and high-volume sampling pumps with in-line sample collection media (filter papers, sorbent tubes).	NIOSH Methods 7402, 7300, and 5506

2.3 Sample Handling and Custody Requirements:

☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06E.
☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04C.
☒ Samples will be accepted according to Region 7 EPA SOP 2420.01E.
☒ Other (Describe): Samples will be accepted according to procedures established by START-contracted or ERRS-contracted laboratories.

2.4 Analytical Methods Requirements:

☒ Identified in attached table.
☒ Rationale: The requested analyses have been selected based on the historical information on the site and program experience with similar types of sites.
☐ Other (Describe):

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2.5 Quality Control Requirements:

- ☐ Not Applicable
☒ Identified in attached table.
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated: July 2005).

Describe Field QC Samples to be collected: For this investigation, soil trip blanks may be submitted for the laboratory analyses indicated in Table 1, if determined necessary by EPA. In addition, field blanks of air sample collection media (filters, sorbent tubes) will be submitted for analysis. Analytical results of the blank samples will be evaluated on a qualitative basis by the EPA Project Manager and EPA contractor(s) to determine a general indication of transportation-related, field-related, and laboratory-related contamination. Determination of total method precision is not required for this event; therefore, field duplicates will not be collected.

- ☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements:

- ☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated: July 2005).
☒ Other (Describe): Testing, inspection, and maintenance of field instruments (field screening equipment, etc.) will be performed in accordance with manufacturers' recommendations. Testing, inspection, and maintenance of analytical instrumentation will be performed in accordance with the previously referenced SOPs and/or manufacturers' recommendations.

2.7 Instrument Calibration and Frequency:

- ☐ Not Applicable
☒ Inspection/acceptance requirements are in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated: July 2005).
☒ Calibration of laboratory equipment will be performed as described in the previously referenced SOPs and/or manufacturers' recommendations.
☒ Other (Describe): Calibration of field instruments (field screening equipment, etc.) will be performed daily, as described in the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables:

- ☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated: July 2005).
☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers*.
☐ Other (Describe):

2.9 Data Acquisition Requirements:

- ☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated: July 2005).
☒ Previous data/information pertaining to the site (including other analytical data, reports, photos, maps, etc., which are referenced in this QAPP) have been compiled by EPA and/or its contractor(s) from other sources. Some of that data has not been verified by EPA and/or its contractor(s); however, the information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data/information.
☐ Other (Describe):

2.10 Data Management:

- ☒ Laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01E.
☒ Other (Describe): Laboratory data acquired will be managed in accordance with procedures established by START-contracted or ERRS-contracted laboratories.

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3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

- ☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit
- ☒ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.05C and 2430.12E.
- ☐ Other (Describe):

3.1A Corrective Action:

- ☒ Corrective actions will be taken at the discretion of the EPA project manager whenever there appear to be problems that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.
- ☐ Other (Describe):

3.2 Reports to Management:

- ☐ Audit Report ☒ Data Validation Report ☐ Project Status Report ☐ None Required
- ☒ Reports will be prepared in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated: July 2005).
- ☐ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements:

- ☐ Identified in attached table:
- ☒ Data review and verification will be performed in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated: July 2005).
- ☒ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.05C and 2430.12E.
- ☒ Other (Describe): Data review and verification will be performed in accordance with procedures established by START-contracted or ERRS-contracted laboratories.

4.2 Validation and Verification Methods:

☒ Identified in attached table.

- ☐ Identified in attached table:
- ☒ The data will be validated in accordance with Region 7 EPA SOPs 2430.05C and 2430.12E.
- ☒ The EPA and START Project Managers will inspect the data to provide a final review. The EPA and START Project Managers will review the data, if applicable, for laboratory spikes and duplicates, laboratory blanks, and the field blank to ensure that they are acceptable. The EPA and START Project Managers will also compare the sample descriptions with the field sheets for consistency and will ensure that any anomalies in the data are appropriately documented.
- ☒ Other (Describe): Data provided by START-contracted and ERS-contracted laboratories will be validated by START and/or ERRS personnel in accordance with EPA-approved procedures.

4.3 Reconciliation with User Requirements:

- ☐ Identified in attached table:
- ☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA site manager.
- ☐ Other (Describe):

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Table 1: Sample Summary

Site Name: Greensburg Tornado Response				Location: Greensburg, Kansas			
START Project Manager: Jeff Pritchard				Activity/ASR #: To be determined		Date: 5/21/2007	
No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Method	Analytical Method/SOP
100	Soil	Areas where oil was potentially released from transformers	To assess levels of PCBs in soil prior to and following excavation activities	0-6 inches and greater depths as excavation requires	PCBs	EPA SOP 4231.2012	3240.02F
18	Soil	Burn pits and household hazardous waste staging areas	To determine contaminant levels prior to and following use as burn pits and staging areas	0-6 inches	VOCs, SVOCs, TPH, PCBs, total metals, pesticides, and herbicides	EPA SOPs 4231.2012 and 4230.03B	EPA SOPs 3230.01E, 3230.02E, 3240.02F, 3122.03B, 3121.14E, & 3240.06C; Methods OA-1 and OA-2.
300	Transformer Oil	Transformers	To identify the presence of PCB-contaminated oil	N/A	PCBs	EPA SOPs 4231.2009 and 4231.2010	3240.02F
25	Structural Debris	Commercial buildings destroyed by storm damage	To identify asbestos-containing materials in the debris	N/A	Asbestos	EPA SOP 4231.2015	NIOSH Method 9002
20	Air	Burn pits and other areas throughout Greensburg	To determine airborne levels of asbestos produced by cleanup activities	N/A	Asbestos	NIOSH AHERA Method and NIOSH Method 7402	NIOSH Method 7402
5	Air	Burn pit areas	To determine airborne levels of metals and PAHs produced by burning storm debris	N/A	Metals & PAHs	NIOSH Methods 7300 and 5506	NIOSH Methods 7300 and 5506
Background Samples							
1	Soil	Surface soil not impacted by PCB spill	To assess background concentrations of PCBs in soil	0-6 inches	PCBs	EPA SOP 4231.2012	3240.02F
2	Air	Area upwind of cleanup activities	To assess background levels of asbestos in ambient air	N/A	Asbestos	NIOSH AHERA Method and NIOSH Method 7402	NIOSH Method 7402
2	Air	Area upwind of burning activities	To assess background levels of metals & PAHs in ambient air	N/A	Metals & PAHs	NIOSH Methods 7300 and 5506	NIOSH Methods 7300 and 5506
QC Samples							
As required by EPA	Soil	Trip blank	To assess transportation-related contamination	N/A	VOCs and TPH-purgeables	N/A	EPA SOP 3230.01E; Method OA-1
2	Air Filter	Field blank	To assess field-related and laboratory-related contamination	N/A	Asbestos	N/A	NIOSH Method 7402
2	Air Filter/Sorbent Tube	Field blank	To assess field-related and laboratory-related contamination	N/A	Metals & PAHs	N/A	NIOSH Methods 7300 and 5506

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Table 2: Data Quality Objective Summary

Site Name: Greensburg Tornado Response				Location: Greensburg, Kansas					
START Project Manager: Jeff Pritchard				Activity/ASR #: To be determined				Date: 5/21/2007	
Analysis	Analytical Method	Data Quality Measurements					Sample Handling Procedures	Data Management Procedures	
		Accuracy	Precision	Representativeness	Completeness	Comparability			
SOIL									
VOCs, SVOCs, TPH, PCBs, total metals, pesticides, and herbicides	See Table 1	Per analytical method	Per analytical method	Biased/judgmental sampling based on professional judgment of the sampling team	100%; All soil samples are critical samples.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.	
TRANSFORMER OIL									
PCBs	See Table 1	Per analytical method	Per analytical method	Biased/judgmental sampling based on professional judgment of the sampling team	100%; All oil samples are critical samples.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.	
STRUCTURAL DEBRIS									
Asbestos	See Table 1	Per analytical method	Per analytical method	Biased/judgmental sampling based on professional judgment of the sampling team	100%; All debris samples are critical samples.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.	
AIR									
Asbestos, metals, and PAHs	See Table 1	Per analytical method	Per analytical method	Biased/judgmental sampling based on professional judgment of the sampling team	100%; All air samples are critical samples.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.	

APPENDIX A

**SITE-SPECIFIC INFORMATION FOR EMERGENCY RESPONSE ACTIVITIES
AT THE GREENSBURG TORANDO RESPONSE SITE**

INTRODUCTION

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to assist with emergency response activities at the Greensburg Tornado Response site in Greensburg, Kansas. On May 4, 2007, an F5 tornado destroyed a majority of the town of Greensburg, requiring followup investigations to evaluate the nature and extent of releases, including potential releases, of hazardous materials.

SITE LOCATION/DESCRIPTION

Greensburg is located in south-central Kansas, approximately 100 miles west of Wichita, with a population of about 1,800. The town is located about 1 mile east of the intersection of U.S Highway 183 and U.S Highway 54. The approximate geographic coordinates for the central portion of the town are 37° 36' 7.88" north latitude and 99° 17' 31.94" west longitude.

SAMPLING STRATEGY AND METHODOLOGY

Sampling for field screening and laboratory analysis will be conducted as requested by EPA. Analytical data obtained for all samples collected during this project will be compared to all applicable or relevant and appropriate requirements (ARAR) to assess whether further response is warranted.

Soil Sampling

Burn Pit and Staging Areas

Surface soil samples will be collected from several locations identified by EPA that may be used by response personnel during recovery and cleanup operations. Those locations include two burn pits (not owned by Kiowa County) located at the "North" landfill, a household hazardous waste staging area at the "County Road and Bridge" facility, and another staging area at the "South" landfill. The sampling will determine the nature and type of contaminants in soils in those areas. Soil samples will be analyzed for volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides, herbicides, polychlorinated biphenyls (PCB), total analyte list (TAL) metals, and total petroleum hydrocarbons (TPH), as appropriate. This information will be used to help assess any impacts on those areas caused by their use during the response and recovery activities. Each of the identified areas will be divided into four equally divided quadrants, and a five-aliquot sample will be collected from each quadrant. The samples

will be collected prior to the response-related activities, and the sampling protocol will be repeated when site activities have been completed at these areas. For each sample, the aliquots will be collected with a dedicated stainless steel spoon, placed in an aluminum pie pan, and homogenized. Following homogenization, the samples will be transferred to the appropriate sample containers and placed in a cooler maintained at or below 4 degrees Celsius (°C). Samples will be submitted to the EPA Region 7 laboratory in Kansas City, Kansas, or to a START-contracted laboratory.

PCB Transformer Locations

Surface soil samples will be collected from areas where damaged transformers were recovered from storm debris. Numerous power poles were knocked over as a result of the tornado, damaging transformers that were mounted on many of the poles. During recovery of the transformers (by electrical service personnel), several were noted to be leaking or had released all of their oil. Based on a lack of historical documentation related to the transformers, a determination of which transformers contain PCBs cannot be accurately made. Therefore, to assess the potential for PCB contamination in soils, a visual reconnaissance of the former transformer locations (on power poles) and the areas where the transformers were recovered (based on global positioning system [GPS] locations recorded by recovery crews) will be conducted. From visible spill areas, a grab sample will be collected from the location most visibly contaminated by the released oil (worst case scenario). If determined necessary by EPA, soils in areas where transformers were recovered and do not appear to be visibly impacted by a release of transformer oil will also be sampled. A five-aliquot sample will be collected from a 10-foot by 10-foot area where each transformer was recovered or surrounding the former power pole location. Field screening of the soil samples for PCBs may be conducted by START with immunoassay kits (Dexsil® Clor-N-Soil kits or Strategic Diagnostics Inc. Ensyls® PCB soil test kits). All soil samples will be submitted for laboratory analysis by gas chromatography (GC) for final decisions regarding excavation of spill areas.

Soils determined by field screening or laboratory analysis to contain PCBs above 1 part per million (ppm) will be excavated during followup cleanup activities. During those cleanup activities, PCB-contaminated soils will be excavated to a cleanup goal of 1 ppm, as determined by field screening and/or laboratory analysis. Following excavation, a five-aliquot sample will be collected from each excavated area. All post-excavation soil samples will be submitted to a laboratory for GC analysis.

Transformer Oil Sampling

Additional activities will include sampling oil remaining in recovered transformers to determine the presence of PCBs. From each of the transformers, a dedicated glass thieving rod will be used to collect a sample of oil. The samples may be field screened with Dexsil® Clor-N-Oil kits to indicate whether PCBs are present at concentrations greater than 50 ppm. All oil samples will be submitted to a laboratory for GC analysis.

Structural Debris Sampling

Representative samples of structural debris (resulting from the storm damage) determined to be potentially asbestos-containing material (ACM) will be collected by EPA and/or Tetra Tech START personnel. Collection of these samples will be conducted by, or under the supervision of, a certified asbestos inspector. The samples will be collected primarily from the debris associated with approximately 25 commercial buildings identified as potentially containing ACM. These samples will be collected by cutting, breaking, or tearing small portions of the materials and placing them directly into the appropriate sample containers for laboratory analysis of asbestos by polarized light microscopy (PLM), according to procedures established by the National Institute for Occupational Safety and Health (NIOSH). The analytical data will assist with determining appropriate disposal options for the debris.

Air Monitoring and Sampling

Air samples will be collected for laboratory analysis of asbestos to determine the impact of cleanup-related activities on airborne asbestos levels. A combination of low-volume personal sampling pumps and high-volume area pumps will be used to collect 400 to 1,200 liters of air per sample. This sampling will require flow rates between 1.5 liters per minute (LPM) for the low-volume pumps and 10 LPM for the high-volume pumps, over sampling periods between 2 and 8 hours. Sampling locations will be determined during the site activities by EPA and START project management personnel, to obtain data that accurately represents on-site (worst-case) conditions, as well as conditions at nearby residences and other downwind locations. The samples (filter cassettes) will be submitted to a START-contract laboratory for analysis of asbestos by transmission electron microscopy (TEM), according to procedures established by NIOSH.

During burning of storm-related debris at the aforementioned burn pit at the North landfill, real-time air monitoring for VOCs will be conducted by START using hand-held photoionization detectors (PID)

and/or flame ionization detectors (FID). Also, real-time monitoring for airborne particulate levels will be conducted using MIE DataRAM aerosol monitors. These data will be used to assess risks posed to residents and workers in (and downwind of) the burn area. Site-specific information, National Ambient Air Quality Standards, and other health-based standards will be considered when evaluating the data. In addition, samples of ambient air will be collected at, and downwind of, the burn pit for laboratory analysis of metals and polynuclear aromatic hydrocarbons (PAH). These samples will be collected using low-volume sampling pumps, operated at a flow rate of 2 LPM for 8-hour periods. The samples (filter cassettes for metals and a combination of filter cassettes and sorbent tubes for PAHs) will be collected and analyzed (at a START-contracted laboratory) according to procedures established by NIOSH.

QUALITY CONTROL SAMPLES

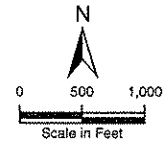
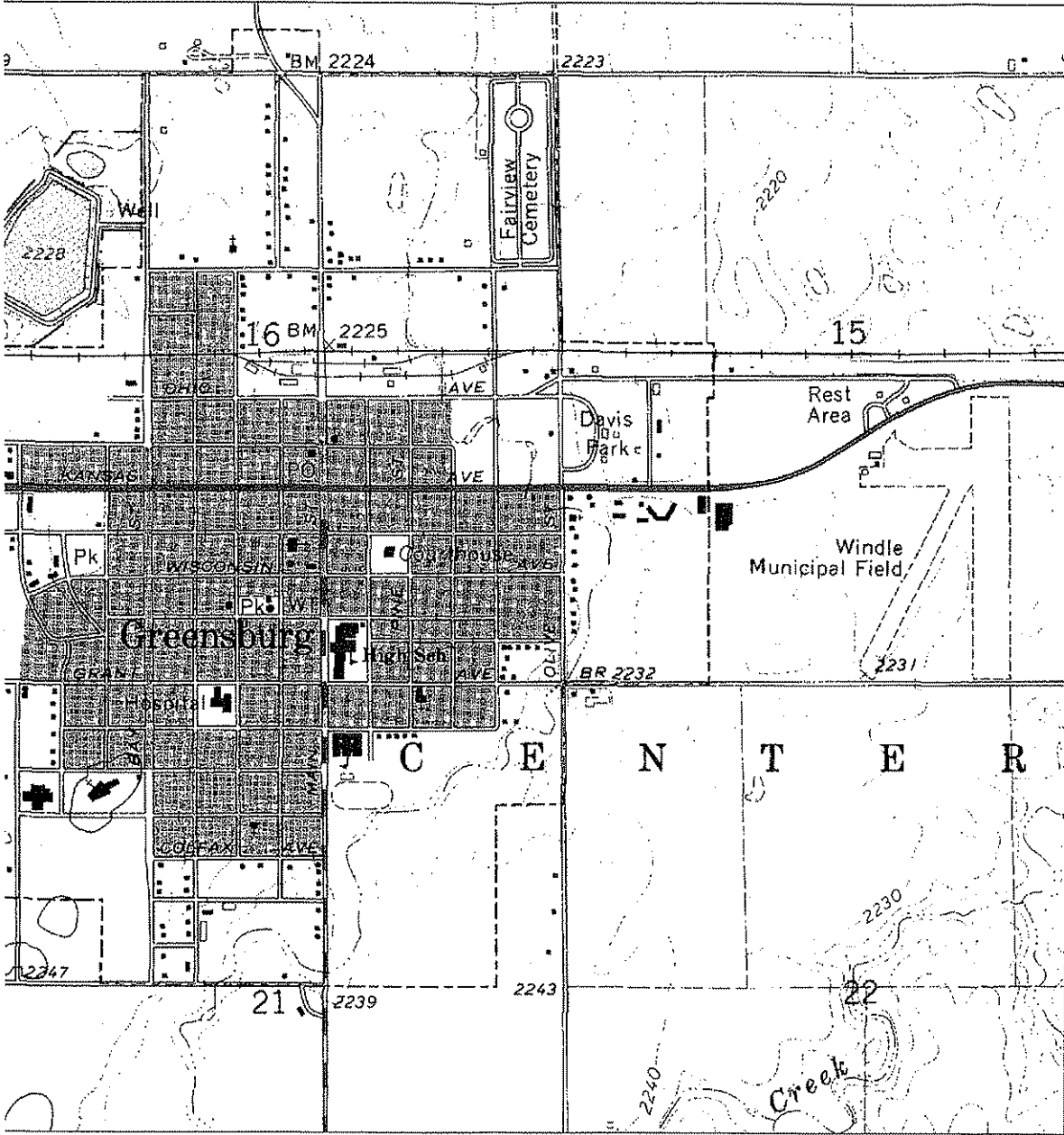
For this project, soil trip blanks may be submitted for analysis of VOCs and TPH-purgeables, if required by EPA, to assess transportation-related contamination. Field blanks of collection media for air samples (filter cassettes for asbestos and metals, and a combination of filter cassettes and sorbent tubes for PAHs) will also be submitted for analysis to assess field-related and laboratory-related contamination. In addition, background samples of soil and air will be collected to more accurately determine the impact of the storm and associated cleanup activities.

ANALYTICAL METHODS

All samples will be submitted to the EPA Region 7 laboratory in Kansas City, Kansas, or to START-contracted laboratories or laboratories contracted by EPA's Emergency and Rapid Response Services (ERRS) contractor. Soil samples collected from the staging areas and burn pit will be analyzed for TAL metals, SVOCs, VOCs, PCBs, TPH, pesticides, and herbicides, as appropriate. Soil samples collected from suspected transformer oil spill areas will be analyzed for PCBs. Transformer oil collected directly from the transformers will also be analyzed for PCBs. Samples of structural debris will be analyzed for asbestos, and ambient air samples will be analyzed for asbestos, metals, and PAHs. All samples will be analyzed according to SOPs and methods referenced in the QAPP. Standard detection limits for those methods will be adequate for this project. Appropriate containers and physical/chemical preservation techniques will be employed during the field activities to help verify that representative analytical results are obtained. An Analytical Services Request form will be completed by an EPA On-Scene Coordinator or the START Project Manager for samples submitted to the EPA Region 7 laboratory.

APPENDIX B


FIGURES



Source: USGS Greensburg, KS 7.5 Minute Topo Quad, 1969

Greensburg Tornado Response
Greensburg, Kansas

Figure 1
Site Topographic Map

 TETRA TECH EM INC.

Date: 01/07/07 Drawn By: Ed Sperry Project No: 00041, 07 0073 000