U.S. ENVIRONMENTAL PROTECTION AGENCY
POLLUTION/SITUATION REPORT
Bennett Landfill Fire - Removal Polrep
Initial Removal Polrep

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region IV

Subject: **POLREP #4**
Initial POLREP - Time Critical Removal Action
Bennett Landfill Fire
B44Y
Chester, SC
Latitude: 34.7874300 Longitude: -81.4502500

To:
From: Perry Gaughan, OSC
Date: 6/5/2015
Reporting Period: 5/26/2015 - 6/5/2015

1. Introduction

1.1 Background

Site Number:	B44Y	**Contract Number:**	EP-S4-07-02
D.O. Number:	0134	**Action Memo Date:**	4/30/2015
Response Authority:	CERCLA	**Response Type:**	Time-Critical
Response Lead:	EPA	**Incident Category:**	Removal Action
NPL Status:	Non NPL	**Operable Unit:**	
Mobilization Date:	5/26/2015	**Start Date:**	5/26/2015
Demob Date:		**Completion Date:**	
CERCLIS ID:	SCN000402727	**RCRIS ID:**	
ERNS No.:	1100014	**State Notification:**	11/2/2014
FPN#:		**Reimbursable Account #:**	

1.1.1 Incident Category
Time-critical removal action.

1.1.2 Site Description
The Bennett Landfill Fire Site is a former construction debris and nonhazardous industrial waste landfill (defined by state regulations as a Class II landfill) that was additionally permitted to accept certain types of asbestos waste. The landfill ceased accepting waste in 2014 after South Carolina Department of Health an Environmental Control (SCDHEC) issued a cease and desist order due to improper disposal practices and failure to meet compliance requirements.

On November 2, 2014, the landfill was found to be on fire by the local fire department. Several local and state agencies responded to the fire. SCDHEC requested assistance from the EPA. On November 3rd, a Federal On-Scene Coordinator (OSC) and the EPA's Superfund Technical Assistance, Response and Training (START) contractor responded with air monitoring equipment. The following day EPA's Emergency and Rapid Response Services (ERRS) contractor was mobilized to assist with firefighting operations. The fire was believed to have been extinguished by November 7th

Due to increasing smoke concentrations in January 2015, SCDHEC requested that the EPA conduct a Removal Site Evaluation (RSE).

1.1.2.1 Location
The Site is located at 4399 Pinkney Road, Chester, Chester County, South Carolina. The geographic coordinates of the Site are 34.7874300 degrees north and 81.4502500 degrees west.

The Site is bordered to the east by Highway 9 and undeveloped land. To the north, approximately 250 feet from the Site property and 850 feet from the actively burning fire, is a gas station and restaurant. To the west, the Site is bordered by undeveloped land but is only 650 feet from the Broad River, which serves as a recreational waterway and eventually contributes to the drinking water source for the City of Columbia, SC. Two small drainage creeks flow towards the Broad River along the north and south borders of the Site property.

The nearest residence in Lockhart, SC is located 1,650 feet from the Site. The town of Lockhart, with a population of approximately 500, is located on the west side of the Broad River with many residences within the narrow river valley and other residences on the bluff to the west.

1.1.2.2 Description of Threat

The fire at the Bennett Industrial Landfill is actively releasing chemical compounds into the air, including benzene and formaldehyde, which are measured near the fire at concentrations exceeding industrial RMLs for air and concentrations within the surrounding community that are greater than three times the residential RSL. Observations during the RSE illustrate that the fire is expanding its footprint and measurements of the landfill indicate that up to 714,000 cubic yards of potential fuel is available to the fire, which will persist for several years if not immediately addressed. The Site is geographically located at an elevation above the nearby town of Lockhart, SC, which sits in a narrow river valley between two bluffs; regular inversion patterns in this area can cause particulates, including airborne asbestos fibers, to become “trapped” for a period of time at the lower elevations. The improper disposal and material management activities at the landfill have left significant quantities of waste and debris (19,500 cubic yards) that contain high concentrations of asbestos (Chrysotile and Crocidolite Asbestos at varying concentrations of up to 18% and 7%, respectively) which are actively being broken and transported by weather conditions. Additionally, activities by operators at the Site have left quantities of waste and debris that contain high concentrations of asbestos (Crysotile at concentrations ranging from 5% to 50%) scattered across the surface site over an area of approximately 4,000 to 7,000 square yards. Conditions at the Site, if not addressed, will continue to deteriorate over time and resulting in increasing quantities of exposed asbestos which are susceptible to transport by wind and other weather conditions to the nearby population.

1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results

On January 13, 2015, OSC Huyser met with SCDHEC as well as Chester County EMA to discuss past and current conditions at the Site. A walkthrough was conducted, and visible smoke was observed on the western edge of the primary waste pile. Erosion was observed throughout the asbestos disposal cell; deep rills had formed across the entire surface of the cell, which cut through the soft non-vegetated cover thereby exposing asbestos waste at the bottom of the rills. Pieces of torn asbestos disposal bags and broken pieces of bulk material, likely to contain asbestos, were observed scattered throughout the Site.

On January 27, 2015, OSC Huyser and START mobilized to deploy four particulate monitoring stations to measure respirable particulate matter sized below 2.5 microns (PM2.5) and augment monitoring stations that had been deployed by SCDHEC several days earlier. By February 11, a total of seven monitoring stations had been deployed (four by the EPA and three by SCDHEC). All stations consisted of MetOne EBAM units set to monitor for PM2.5 and record both 15-minute and 1-hour time-weighted averages. Five of the stations were outfitted with metrological sensors that included wind speed and direction. Four of the stations were also outfitted with data transmission systems that allowed both the EPA and SCDHEC to remotely observe live data feeds. Results from these instruments were compared to the EPA’s Air Quality Index (AQI) and National Ambient Air Quality Standards (NAAQS). Six stations yielded no more than 70.7% and as few as 44.6% of their 24-hour average results within a “Good” AQI range and yielded as much as 54.2% of their 24-hour averages in the “Moderate” AQI range. One station yielded 1.2% of its 24-hour averages in the “Unhealthy for Sensitive Groups” range (the last range is consistent with the NAAQS 24-hour average for PM2.5). Twenty-four-hour averages for the seventh station, which was located the furthest away from the Site, were 91.9% “Good” and 8.1% “Moderate”. By comparison, 24-hour averages for the AQI station in Spartanburg, SC were 91.8% “Good” and 8.2% “Moderate”. Elevated particulate concentrations are typically measured overnight and into early morning hours; these measurements are consistent with both anecdotal reports from residents and visual observations from time-lapse photography, and are caused by reduced wind speeds at night as well as morning temperature inversions which trap smoke close to the ground.

On February 11, 2015, OSC Huyser met with SCDHEC and Chester County to examine the Site with the presence of a landfill firefighting specialist with American Engineering Group LLC. Recommendations for addressing the fire from a response standpoint included three primary actions: 1) Cover; 2) Monitor; and 3) Closure. Advanced firefighting techniques involving the injection of various materials such as nitrogen or traditional firefighting techniques involving water application were not recommended and are unlikely to be successful.

On February 17, 2015, OSC Huyser and START mobilized to collect air, soil and surface water samples as well as conduct an asbestos debris survey and collect aerial imagery. Air sampling within the smoke plume directly above the burning area identified 13 compounds with peak concentrations that exceeded their respective long-term exposure Regional Screening Levels (RSL) and Removal Management Levels (RML) : Benzene, 1,3-Butadiene, Chloromethane, Cumene, Ethyl Benzene, Formaldehyde, Naphthalene, Styrene, and Xylene. These values were compared to Acute Exposure Guideline Levels (AEGL), which are published by the EPA Office of Pollution Prevention and Toxics and are used for emergency exposure conditions. None of the 13 chemicals exceeded the lowest AEGL threshold. Hydrogen cyanide (HCN) and carbon monoxide (CO) were also detected within the smoke plume directly above the burning area; neither has a corresponding RSL or RML for ambient air exposure, but both have AEGL criteria. Both HCN and CO peak concentrations in the plume exceeded their respective AEGL-2 (8-hour) time-weighted-average (TWA) value which means that health effects may occur in the general population if exposed to the contaminant at that concentration over that corresponding time period. On April 9, 2015, off-site air samples were collected. Of the 13 compounds identified above risk levels in the plume, benzene and formaldehyde were found to exceed residential RSLs in the community. Benzene was found in the fire at concentrations up to 29,000 µg/m3, more than two orders of magnitude above the Industrial RML of 157 µg/m3. Benzene was found in the surrounding community at concentrations up to 0.91 µg/m3, nearly three times greater than the Residential RSL of 0.36 µg/m3, and also found at the office trailer of the Site at concentrations up to 9.9 µg/m3. Formaldehyde was found in the fire at concentrations up to 197 µg/m3, double the Industrial RML of 94.3 µg/m3. Formaldehyde was found in the community at concentrations up to 1.52 µg/m3, five times greater than the Residential RSL of 0.216 µg/m3, and also found at the office trailer of the Site at 3.24 µg/m3.

Respirable (PM2.5) particulates measured in samples from the smoke plume directly above the burning area peaked at 4,500 µg/m3. For comparison, the EPA AQI classifies a 24-hour average of PM2.5 above 250.5 µg/m3 as “Hazardous”. Measurements from monitoring stations near the Site and throughout the town of Lockhart recorded 4-min-average readings in excess of 250.5 ug/m3 at a frequency of 0.1% and recorded one 1-hour average reading in excess of this level. Ninety percent of all 4-min-average particulate monitor readings and 97.8% of all 1-hour average particulate monitor readings are below 45µg/m3 which are two orders of magnitude below the peak PM2.5 measurement sampled from the burning area. On April 9, 2015, off-site air samples were collected and yielded a 24-hour reading for PM2.5 of 78 µg/m3 in downtown

Lockhart, which exceeds the EPA 24-hour NAAQS for PM2.5 and is within the EPA AQI range of “Unhealthy” for the general public. However, no PM2.5 detections were found above reporting limits on concurrent samples collected at the gas station close to the Landfill or at the office trailer of the Landfill during the same time period, so it is uncertain whether the value measured in downtown Lockhart is directly related to the smoke plume from the fire.

A survey was conducted on the Site to identify asbestos materials in areas outside of the designated asbestos disposal cell. The survey encompassed 125 grids sized 40 by 40 feet (total survey size of more than 4.5 acres) and identified, described, and counted suspected ACM in 42 of the grids (an area of more than 1.5 acres). Samples of suspected ACM were collected in 22 of the grids and PLM analysis showed that 10 of those grid samples contained Crysotile asbestos at concentrations ranging from 5% to 50%. The designated asbestos disposal cell, which covers approximately 1.6 acres, was not included in the survey since it is known and recognized that the cell area contains exposed ACM. These materials were sampled following the emergency response in November 2014 and identified Chrysotile and Crocidolite Asbestos at varying concentrations of up to 18% and 7%, respectively.

An aerial survey was conducted on February 19, 2015, to conduct volumetric measurements of waste material at the Site. A digital topographic surface was built using photogrammetry from the aerial survey and high accuracy ground control points of known location and elevation. This surface was measured against: 1) the original grade based on the U.S. Geological Service (USGS) 1972 Lockhart, SC quadrangale; and 2) the August 31, 1999, Bennett Industrial Landfill design plans which were digitized and geo-rectified. The survey estimates that there is approximately 19,500 cubic yards of waste in the designated asbestos disposal cell. The remaining landfill waste volume is estimated at 381,000 cubic yards of waste in the last active disposal area, as well as an additional 333,000 cubic yards of waste in the cell on the south side of the Site where operations ceased sometime between 2005 and 2008. The fire is occurring in the last active disposal cell but there is no visible barrier separating the active cell from the previously used cell. As a result, there are approximately 714,000 cubic yards of waste that is at risk of burning. Disposal records that were submitted by Bennett Industrial Landfill, Inc. to SCDHEC for annual reporting, which are incomplete and have not been verified, report that a known minimum of 423,713 tons of waste was received, at least 3,252 tons of which is known to be asbestos. This number includes only reports from 1999 to 2006, after which regulatory requirements changed and asbestos waste was not stated as a separate line item in annual reports. A common density for waste materials received by the landfill is within the range of 0.6 – 0.5 tons per cubic yard. For the known minimum waste received that was reported to SCDHEC, this density provides a volume range of 706,000 cubic yards to 847,000 cubic yards. The volume range is consistent with the calculated measurements from the aerial survey of 714,000 cubic yards. Therefore, the estimated volume of waste in the designated asbestos disposal cell of approximately 19,500 cubic yards is considered reliable.

The surface of the designated asbestos disposal cell is entirely covered with evidence of erosion including rills in excess of 24 inches deep and 36 inches wide. Exposed ACM is observed throughout the floor of the eroded areas. Erosion features on the cell are less than 30 months old since they were last repaired on August 28, 2012, which was confirmed during a SCDHEC inspection on September 26, 2012. Large asbestos disposal bags and ACM objects are observed in the drainage path up to 350 feet from the disposal cell surrounded in sediment which indicates that washout of the cell is transporting waste downstream. The sedimentation pond, originally designed to a depth of five feet below the drainage riser surface, has filled with sediment to the riser inlet and within 2.5 feet of the riser overflow surface. The sedimentation pond was reportedly last cleaned out on August 27, 2012, but the SCDHEC inspection on September 26, 2012, reported that the claims of a cleanout action were either inadequate or false.

2. Current Activities

2.1 Operations Section

2.1.1 Narrative

During the week of May 25th, ERRS contractors (CMC Inc., Nicholasville, Kentucky) mobed to the Site and began site preparation activities. Work zones were established, a decontamination trailer was staged and required equipment for the first phase of the removal was mobilized. Access roads around the Site and to the fire area were re-graded as necessary because of recent heavy rains and erosion. The entrance to the site was widened and graveled for anticipated site traffic. Command post trailers were also set up and arrangements for power were made locally. A surveying company was subcontracted to mark property lines.

On Monday and Tuesday, June 1st and 2nd, ERRS contractors began grading and excavating operations on the landfill fire area in an effort to extinguish smoldering subsurface zones. The active fire area was approximately 0.5 acres with a 35 foot drop at the face along the southern edge. ERRS began grading the western edge of the fire area with a D-8 bulldozer to a manageable slope for soil and clay cover, approximately a 4:1 slope. Water was used intermittently to address hot zones which were uncovered during grading operations and dust which was lifted by equipment due to the dry material conditions. Once the western edge was sloped successfully the remainder of the 35 foot face was gradually sloped.

This operation proved to be successful over the first few days of grading and no smoldering or smoke was noted by Wednesday morning (June 3rd). Grading operations continued while incorporating some debris into the final desired slope of the landfill area. On Wednesday ERRS began moving cover soils from a borrow area to the work zone and continued grading and sloping operations. By Thursday (June 4th) no smoldering, smoke or burning odor was noted near the burn area. Large amounts of rain through the week (2.5 inches on Tuesday, June 2nd) most likely assisted in quenching the hot zones within the landfill. No significant smoke or volatile organic compounds (VOCs) were noted in ambient air during the first week of operations. During the remainder of the week, grading and sloping ops continued essentially expanding the working area to approximately 2.5 acres.

Media interest remained high through the first week. On Monday and Tuesday (June 1st and 2nd) four local news stations from Greenville SC, Columbia SC Spartanburg SC and Charlotte NC interviewed OSC Huyser. Lockhart Mayor Eileen Ashe was also interviewed and EPA Region 4 Community Involvement Coordinator (CIC) Kerisa Coleman was on site to assist the mayor as needed by addressing site related questions. On

Wednesday, June 3rd, EPA CIC Coleman planned to distribute site fact sheets door to door with South Carolina Dept Health and Environmental Control (SC DHEC) community representatives.

START contractors continue air monitoring, drafting final capping and runoff plans and providing technical assistance. No significant smoke, air or technical issues have been encountered to date. .

2.1.2 Response Actions to Date
See above Narrative.

2.1.3 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)
The original permit for a landfill at the Site was issued on October 29, 1999. This permit was transferred and issued to Bennett Industrial Landfill, Inc. on January 21, 2005. Between January 17, 2012 and August 21, 2012, SCDHEC conducted several inspections at the landfill and recorded consistent violations of failure to install monthly cover, unmanaged erosion in several areas including the asbestos disposal cell, exceedance of permitted 3.5-acre active exposed area limit and exceedance of a 3:1 working face slope limit. During this time, the landfill operator failed to meet a deadline to provide certification of active exposed area, and SCDHEC issued a Notice of Alleged Violation/Notice of Enforcement Conference.

On August 28, 2012, SCDHEC held an enforcement conference with Bennett Industrial Landfill representatives and a deadline of September 21, 2012, was set to meet slope and cover requirements. An inspection conducted on September 26, 2012, reported that the Bennett Industrial Landfill failed to meet this deadline. On October, 3, 2012, Bennett Industrial Landfill proposed a compliance plan for installing measures to meet the regulatory requirements. SCDHEC executed a Consent Order on January 11, 2013, which detailed actions for installing monthly cover, closing excessively exposed areas, certifying exposed areas and correct the active working face. Bennett Industrial Landfill failed to meet the deadlines for each of the required actions of the Consent Order and failed to meet the terms of the Order.

In December of 2013, SCDHEC discovered that the financial assurance fund required by regulations governing the operation of a Class II landfill in the State of South Carolina had been withdrawn by the owner several years prior and was not replaced. The bank that previously held the financial assurance funds confirmed that they had been withdrawn in 2008. On January 27, 2014, a SCDHEC inspector observed a large uncovered debris pile of asbestos-containing material outside the asbestos storage cell and near the office trailer of the landfill. SCDHEC collected samples from the material and found debris contained asbestos concentrations of up to 20%. Three following inspections confirmed that the violations continued. Due to repeated failures to comply with compliance requirements, SCDHEC issued a Cease and Desist Order on April 15, 2015, which terminated all waste receipts until financial assurance was obtained and uncovered asbestos debris was moved and covered in the designated cell. The order provided a deadline of 30 days which was not met.

During the emergency response in November of 2014, EPA's responding OSC informed the owner of the landfill that an emergency action would be necessary to address the on-going fire and potential hazardous substance as well as pollutant and contaminant releases at the Site. The landfill owner declined to undertake an action.

2.1.4 Progress Metrics

Waste Stream	***Medium***	***Quantity***	***Start Date***	***Treatment***	***Est. % Complete***
Burning Area	Debris	Approx 0.5 acres	6/1/2015	Cover	no evidence of smoldering - 5% cover complete- initial efforts
Asbestos Cell	Debris	Approx 19,500 CY	n/a	Regrade & Cover	n/a

2.2 Planning Section

2.2.1 Anticipated Activities
The first priority of the removal action will be to address the burning debris pile by installing a soil cover. Isolation of the burning material and reduction of oxygen supply will significantly reduce emissions from the smoldering fire. The second priority of the removal action will be to address the eroding asbestos disposal cell by re-grading and covering the area.

Air sampling and monitoring activities will be conducted on-site for worker health and safety and continued site investigation purposes. Air monitoring for respirable particulate matter (PM2.5) will continue off-site outside the fenceline and in downtown Lockhart, SC for the duration of the action.

Soil for cover and encapsulation will be obtained from on-site sources to the greatest extent possible. The disturbed areas of the Site will be secured with vegetation to provide a stable erosion-resistant surface. Total project time is estimated at approximately 3 months.

2.2.1.1 Planned Response Activities

- Isolation of burning material by removal and relocation of available fuel path and installation of earthen cover; ***(ONGOING)***
- Isolation of designated asbestos disposal cell through the installation of earthen cover;
- Re-grading waste materials and native soils for purpose of cover installation; ***(ONGOING)***

- Installation of temporary measures to prevent off-site migration of dust or contaminants as removal operations are conducted; and, ***(ONGOING)***
- Continue sampling and monitoring, as needed, for site safety purposes and to further delineate or identify contaminants. ***(ONGOING)***

2.2.1.2 Next Steps

During the week of June 8th, ERRs will be tasked to continue covering operations and excavating for soil and clay from borrow areas as site operations require. The OSC anticipates coordinating with adjacent property owner, Milliken Pacolet Inc to begin assessing the property line for potential borrow soils if needed. The OSC's (Huyser/Gaughan) met/conference called Pacolet officials on Friday, June 5th to discuss potential needs for borrow material.

2.3 Logistics Section

No pertinent information to report at this time.

2.4 Finance Section

No information available at this time.

2.5 Other Command Staff

OSC Matthew Huyser
OSC Perry Gaughan

3. Participating Entities

SCDHEC continues to provide technical assistance and information regularly

South Carolina Forestry Commission has offered to provide assistance with tree removal, if necessary

Chester County EMA and Union County EMA will provide technical assistance and information, as needed

4. Personnel On Site

EPA (1)
SCDHEC (varies)
County EMA (varies)
ERRS (12)
START (2)

5. Definition of Terms

µg/m3	Micrograms per cubic meter (= 0.001 mg/m3)
AEGL	Acute Exposure Guideline Levels
AQI	Air Quality Index
C	Celsius
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
Conc	Concentration
ConcHR	Hourly (HR) average value recorded by an EBAM instrument
ConcRT	Real time (RT) concentration recorded by an EBAM instrument based on a rolling four-minute average
DHEC	South Carolina Department of Health and Environmental Control
EMA	Emergency Management Agency
EPA	U.S. Environmental Protection Agency
ERRS	Emergency and Rapid Response Services
mg/kg	Milligram per kilogram (= 1 ppm)
mg/L	Milligram per liter
mg/m3	Milligram per cubic meter (= 1000 µg/m3)
NAAQS	National Ambient Air Quality Standard (primary and secondary NAAQS for PM2.5 24-hour average is 35 µg/m3)
NPL	National Priorities List
OAQPS	EPA Office of Air Quality Planning and Standards
OSC	On-Scene Coordinator
PM2.5	Airborne particulate matter with particle diameters below 2.5 microns
ppb	Part per billion (cannot be used to describe a mass per volume unit such as µg/m3)
ppm	Part per million (cannot be used to describe a mass per volume unit such as mg/m3)
RML	Removal Management Level
RSL	Regional Screening Level
SCDHEC	South Carolina Department of Health and Environmental Control
START	Superfund Technical Assessment and Response Team
TWA	Time-weighted average

5.1 Regional Screening Levels (RSL) and Removal Management Levels (RML)

Regional Screening Levels (RSL) are conservative risk-based screening values developed by the U.S. EPA to help identify contaminants of potential concern. Contaminants that exceeded a RSL in at least one sample are then screened against industrial air Removal Management Levels (RML) that were calculated for this evaluation. RMLs are risk-based screening values developed by the U.S. EPA to determine whether sample concentrations are sufficiently elevated that they may warrant a removal action. Exceedance of a RML by itself does not require a removal action, nor does it imply that adverse health effects will occur.

6. Additional sources of information

6.1 Internet location of additional information/report

Site updates will be provided to the "Bulletins" section of epaosc.org/bennettlandfill

Documents, reports, and videos for public release will be posted to the "Documents" section of epaosc.org/bennettlandfill

Photos of site conditions and progress will be posted to the "Images" section of epaosc.org/bennettlandfill

6.2 Reporting Schedule

New POLREPS will be issued weekly on Fridays for the duration of on-site activities.

7. Situational Reference Materials

No pertinent information to report at this time.