Bridgeton Landfill, LLC

Preliminary After-Action Review Prepared for the Missouri Department of Natural Resources on the Surface Fire in the South Quarry of the Landfill on February 16, 2014

Introduction

At the request of the Missouri Department of Natural Resources (MDNR), Bridgeton Landfill, LLC ("Bridgeton Landfill") has prepared this Preliminary After-Action Review of the February 16, 2014 surface fire that impacted a limited portion of the southern edge of the South Quarry. The purpose of this review is to summarize the immediate response to the surface fire as well as post-event actions, and their compliance with the Bridgeton Landfill's Incident Management Plan (IMP). In addition, this review provides an overview of ongoing investigative and response actions.

The safety of the public, employees and contractors, and first responders is the highest priority for the Bridgeton Landfill team, and the successful implementation of the IMP is the foundation for the team's safety goals. The IMP is a living document that should and will be updated as time, circumstances and lessons learned necessitate.

Originally drafted in 2012, the IMP was modified in 2013 based upon input from local first responders, to include the Pattonville and Robertson Fire Departments. The plan details the measures that will be taken to minimize consequences from, and respond to, a short-notice or no-notice event that could pose a risk to the public, on-site workers or first responders. It details a variety of incident scenarios, to include surface fires, personal injury, extreme gas release, and ongoing subsurface oxidation or the subsurface smoldering event (SSE) which is in the South Quarry of the landfill. For each scenario, the plan classifies the severity of an event as either a Level 1, 2 or 3 incident. In addition, the IMP includes preventative information such as an inventory of on-site equipment and available resources for use during an emergency, details of these resources, site maps, and a table of key response personnel with contact information, such as regulatory authorities, first responders and the on-site team.

Executive Summary

The February 16 surface fire was designated by the site's environmental manager as a Level 1 incident, as defined in the IMP, because the surface fire was capable of being handled entirely by on-site personnel and with on-site equipment, and because the duration of the incident was less than four hours. According to the IMP, the steps required for a Level 1 surface fire include notifying on-site personnel, extinguishing the fire with dirt or water, monitoring the affected area

once the fire is extinguished, assessing any potential damage, and entering the incident in the landfill's daily log. As part of the ongoing investigation, the Landfill team and local first responders are reviewing whether the surface fire briefly became a Level 2 incident during the response.

The February 16 incident was the first occasion in which the IMP was implemented in response to a real-world incident. To date, all evidence indicates that response actions taken were in compliance with the requirements for a Level 1 incident as established in the IMP, and consistent with the Landfill team's safety goals. Response highlights include: the surface fire was extinguished within approximately 21 minutes of initial notification; first responders were on the scene within approximately 16 minutes of initial notification; and public communication occurred within approximately 45 minutes of the all clear order.

The Landfill team continues to review the incident in coordination with local first responders in order to identify lessons learned and to determine if any adjustments to the IMP are needed. While this review is ongoing, potential lessons learned include the need to strengthen communication at the leadership level between the Landfill team and local first responders, and potential improvements in the timeliness of public communication about the nature of and response to the incident.

This report includes three attachments: Attachment A, the timeline of the incident and response; Attachment B, the Incident Checklist completed in accordance with the Incident Management Plan; and Attachment C, a copy of the current Incident Management Plan.

The Incident - Initial Detection and Response

The following provides a summary of the detection of and initial response to the February 16 surface fire incident. A detailed timeline is included in Attachment A.

At approximately 9:14 a.m. on Sunday, February 16, 2014, a Landfill team field technician was notified by a third party contractor that there was a potentially compromised well in the South Quarry. This technician responded to the well in question and noted that steam and smoke were visible and emerging from the cap near the southern edge of the South Quarry. Consistent with the IMP, the technician notified the Landfill environmental specialist and began to assess the incident. During the technician's assessment, another site contractor arrived at the well and contributed to the assessment. At approximately 9:25 a.m., a neighbor who was traveling to an adjacent business notified the technician and contractor that he had called 9-1-1 after seeing what he thought was smoke. Approximately three minutes later, at roughly 9:28 a.m., Bridgeton Police and Pattonville Fire arrived on-site on Boenker Lane.

The field technician cleared the affected area of any employees or contractors who were not immediately engaged in responding to the incident. At approximately 9:30 a.m., a flame became visible at or above ground surface level. By approximately 9:35 a.m., an environmental specialist responding to the scene was contacted by Bridgeton Police Department. The environmental specialist confirmed that both Bridgeton Police and Pattonville Fire were already on scene. The specialist concurred with the Police Department's recommendation to close Boenker Lane, east of the South Quarry, in order to secure the area in the event of any possible emergency response requirements.

By approximately 9:45 a.m., the on-site technician extinguished the flame using a dry chemical fire extinguisher kept at the facility, consistent with IMP protocols. Although the flame was extinguished, there continued to be limited smoldering and visible smoke emanating from the burned liner.

At approximately 10:30 a.m., the environmental specialist confirmed that the flame had been extinguished and began directing additional response measures. This included shutting down all air lines within a 500 foot radius of the affected area, as a protective measure, in order to ensure that any potential sources of air that could reach the impacted area were closed.

During this time, several contractors were mobilized to the site to assist with repairs, as directed by the environmental specialist. Their work included surface repairs, identification of and repairs to damaged collection components, and the capture and management of the limited volume of leachate released from pipes damaged within the area affected by the surface fire. These immediate monitoring and assessment actions were consistent with the defined response protocols for a Level 1 incident in the IMP.

Post-Incident Actions

The Landfill's environmental manager met with environmental specialists, technicians and response teams at approximately 11:05 a.m. The manager subsequently met with first responders in the Command Center to provide a status report and coordinate ongoing response measures. In this meeting, first responders determined that the situation on-site was under control and that there were no public safety concerns. First responders left the scene at approximately 12:00 p.m.

Consistent with Landfill Standard Operating Procedures, wells within a 500 foot radius of the surface fire are monitored for Carbon Monoxide, temperature and gas quality. This data confirmed that the surface fire had no effect on or relationship with the SSE occurring in the South Quarry. As part of the ongoing investigation, the Landfill team identified some

compromised piping, to include vacuum lines and leachate conveyance lines. Leachate released as a result of the damaged lines was contained within the lined southern edge of the South Quarry. Onsite personnel mobilized vacuum trucks down-gradient of the area to remove leachate from the liner, as well as cleaning the affected area as necessary. These post-incident actions occurred within hours of the surface fire event.

Also that day, the Landfill team repaired 80 feet of two-inch and four-inch conveyance piping to reestablish full functionality of the leachate and gas collection systems. During the weeks of February 17 and February 24, the team and contractors made additional repairs to restore functionality to components affected by the fire, to include gas extraction wells and surface collection sumps. The area of the EVOH liner damaged by the surface fire was repaired and replaced on February 26.

On February 28, the environmental manager met with the Pattonville Fire Protection District. This meeting was the continuation of a meeting earlier in the month regarding the IMP. The meeting served as a forum to specifically examine the combined response to the February 16 surface fire in the context of the IMP, and to discuss any lessons learned or necessary modifications to the plan as a result of the incident. Both the Landfill team and Pattonville Fire Protection District members identified and agreed to process improvements which will be incorporated into an updated version of the IMP.

Assessment of the Cause

During the initial response and investigation, the Landfill team identified a break in an airline which provides the air needed to operate the pneumatic pumps that are part of the liquid extraction system. This airline was isolated to prevent further air intrusion, and a new section of airline was installed above the cap to allow for restoration of pump operation. The cause of the break and source of ignition has not been identified throughout the repair process, however the investigation is ongoing. As part of the ongoing investigation, the Landfill team has asked MDNR to identify or recommend fire-investigation experts.

On February 25, the Missouri Attorney General's Office requested that Bridgeton Landfill engage a third-party expert to investigate the source of the fire. The immediate and short-term response actions needed to remediate the damage and restore system functionality have altered the area affected by the fire, which is located outside of the waste footprint. However, the Landfill team is currently evaluating how to involve an expert to assess all available information in order to provide additional insights into the cause, as well as to identify any possible steps that could further strengthen prevention measures.

Proposed Response Changes

The Landfill team believes that lessons can and should be learned from any incident. As part of the ongoing after-action review, the Landfill team and first responders met, discussed and identified ways to improve coordination during incident response. This includes updating the IMP with key site maps and figures, as well as improving on-site signage to facilitate site access for first responders. In addition, improvements are already underway to strengthen communication at the leadership level between the Landfill team and local first responders, and to accelerate the timeliness of public communication about the nature of and coordinated response to the incident.

Once the updated IMP has been finalized, Pattonville Fire Department has committed to developing an Emergency Response Plan and sharing a copy of the plan with the Bridgeton Landfill team. At a minimum, monthly meetings will be scheduled between both parties to share information and ensure sufficient site knowledge for future incident response.

Attachment A

Bridgeton Landfill, LLC Draft Timeline of Response to February 16 South Quarry Surface Fire Prepared on February 17, 2014, and Provided to the Missouri Attorney General's Office and Pattonville Fire Protection District on February 17, 2014 (All times approximate)

Saturday February 15

8:39 p.m.	Identified potential air loss in South Quarry
10:04 p.m.	Found the additional rental compressor was on low setting; site technician walked the entire South Quarry and North Quarry for air leaks and found none

Sunday February 16

12:45-3:00 a.m.	Backup compressor was hooked up in place of rental 900 unit at 97K tank
3:30 a.m.	Fabick Technician arrived on site to repair 900 rental compressor unit
3:45-8:00 a.m.	Air system was back on line, no indication of further difficulty; night technician returned to regular checks
8:00 a.m.	Field technician made site round and all conditions were normal
9:14 a.m.	Technician was notified by a third party that there was a potential compromised well on the South Quarry
9:23 a.m.	Technician contacted site environmental specialists (Mike Lambrich and Bryan Sehie) to notify of situation
9:25 a.m.	Contractor and Technician talk to Material Logic employee who called 911, thanked neighbor
9:28 a.m.	Bridgeton Police Department and Pattonville Fire Department arrived
9:30 a.m.	Flame becomes visible above ground; technician initiated IMP procedures to clear personnel from the South Quarry in cooperation with site contractor
9:35 a.m.	Environmental Specialist Mike Lambrich spoke with Bridgeton Police Department; Police Department confirmed they and Fire Department were on site; they were aware of situation; asked for cause of situation, still

	evaluating and investigating. Specialist Mike Lambrich gave authorization to block Boenker Road as a precaution.
9:35 a.m.	EPA representative James Johnson observes current condition and documents in report
9:45 a.m.	Technician used fire extinguisher to put out remaining flames on liner; mobilized 3 rd party contractors to relocate soil and clay to the location
10:20 a.m.	Mike Lambrich, Environmental Specialist, arrived on site
10:30 a.m.	No visible flames were present and Mike Lambrich began responsive measures including shutdown of all air lines to back of facility; gave direction to 3 rd parties, briefed MDNR on situation and remediation effort
10:40 a.m.	Bryan Sehie, Environmental Specialist, arrived on site
11:05 a.m.	Brian Power, Environmental Manager, arrived on site and mobilized the command center with emergency responders
11:15 a.m.	Brian Power met with on-site team, was briefed on status and evaluated situation
12:00 p.m.	Brian Power and Bryan Sehie met at Command Center with emergency response team and briefed on status and response. It was decided that the situation was controlled and no public safety concern existed. First responders deemed their on-site role complete.
12:40 p.m.	Bridgeton Landfill issues press release updating current status.

Response Team On-Site

- Bridgeton Landfill team: 8 employees
- All-Star (Vac Trucks): 7 contractors
- Fusion Solutions: 7 contractors
- Tri-Con: 5 contractors
- Feezor: 3 contractors
- Hunt Environmental: 3 contractors
- Cornerstone: 1 person

Attachment B

Bridgeton Landfill, LLC Incident Checklist Completed on February 16, 2014

BRIDGETON LANDFILL

Incident Management Plan

FACILITY COORDINATOR CHECKLIST



INCIDENT DETAIL

Date of Incident:	16	14
Facility Coordinator:	Brid	in Power
Description of Incident:	Sur	face Fire - Level 1

Date of Resume Normal Activity:

Attachment C

Bridgeton Landfill, LLC Incident Management Plan Drafted March 2013

INCIDENT MANAGEMENT PLAN BRIDGETON LANDFILL

Prepared for:

BRIDGETON LANDFILL, LLC 13570 St. Charles Rock Road Bridgeton, MO 63044

Prepared by:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC. ST. LOUIS, MISSOURI

CEC Project No. 121-337

March 2013

Updated "Responsibilities and Contacts" February 2014

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Attachment A – Facility Coordinator Checklist

1.0 INTRODUCTION

Like many industrial activities, operation and maintenance of municipal waste landfills includes risk. At the Bridgeton Landfill, these risks result from the use of large mobile and stationary equipment, handling of combustible materials, and the management of waste byproducts such as decomposition gases and liquid leachate.

This Incident Management Plan (IMP) describes plans to prevent incidents, required protocol for initial incident emergency calls, coordination of responses, and resumption of normal activities (in case of interruption). The IMP has been prepared by Bridgeton Landfill with the cooperation of appropriate regulatory and local emergency responders.

The remainder of this IMP is comprised of the following sections:

- 2.0 <u>Description of Bridgeton Landfill</u> Location, access, size, and facilities are described.
- 3.0 <u>Definitions</u> Defines significant terms used in the IMP.
- 4.0 <u>Incident Prevention</u> Describes measures for incident prevention, assignment of Emergency Coordinators, and communication and coordination with Regulatory and Local Authorities.
- 5.0 <u>Response and Incident Strategies</u> Presents response scenarios for a number of identified potential incidents.
- 6.0 <u>Resumption and Restoration</u> In the case of service interruptions, this section describes the process for resuming operations including regulatory approvals.

This IMP will be updated as needed to reflect changing site conditions and operations.

2.0 DESCRIPTION OF BRIDGETON LANDFILL

Bridgeton Landfill is a closed municipal solid waste landfill located at 13570 St. Charles Rock Road in Bridgeton, Missouri (see attached site location map, Figure 1). The site was formerly mined for limestone, resulting in large, open pits which were over 200 feet deep. Beginning in the 1940's or 1950's, the quarry pits and other parts of the property were backfilled with municipal wastes, industrial wastes, and construction and demolition debris. Landfill operations ceased in 2005.

The recent permitted disposal area (see Figure 2 for location) covers about 52 acres of the 214acre property and is the main focus of this IMP. In addition, a concrete mixing plant, a waste transfer station, two legacy disposal areas and many appurtenant features are present on the site property. See Figure 2 for the facility layout and access.

Although the landfill is closed, many activities are occurring at the facility including:

- Placement and maintenance of final cover,
- Collection, management, and destruction of landfill decomposition gas,
- Collection and disposal of landfill leachate, and
- Operation of a waste transfer station, at which waste is transferred from small local collection trucks into large long-haul trucks for transportation to a remote landfill.

When waste material decomposes, a biological process increases its temperature and produces combustible gasses (primarily methane). Portions of the Bridgeton Landfill are experiencing higher-than-typical temperatures resulting from a possible heat-generating (exothermic) event taking place within the waste. Many things can produce a heat-generating event, and heightened monitoring and maintenance of the facility is required to control the heat-generating event.

3.0 **DEFINITIONS**

Facility Coordinator	Bridgeton Landfill person identified with the responsibility for initial assessment and coordination of response activities with regulatory and local authorities.
<u>Incident Commander</u>	Representative of governmental emergency response agency to which all other responders report.
<u>Regulatory Authorities</u>	Governmental agencies responsible for permitting and regulation of activities associated with, or affected by, the landfill. These include: the MDNR, the St. Louis Metropolitan Sewer District (MSD), and the Federal Aviation Authority (FAA).
Local Authorities	Parties that have a role or interest in emergency response including: Local Fire Departments, St. Louis County Local Emergency Planning Committee, Lambert-St. Louis International Airport, and the City of Bridgeton.
<u>Level 1 Incident (Incident)</u>	An incident that can be handled entirely by on-site Bridgeton personnel and equipment and typically has duration of less than four hours.
<u>Level 2 Incident (Emergency)</u>	An incident that requires assistance of local authorities to remedy. May include potential harm to life, safety, or health of on-site personnel. An interruption in transfer station or other site or adjacent operations of up to 72 hours may result.
<u>Level 3 Incident (Disaster)</u>	An incident that requires public notification and assistance of local and regulatory authorities. May include potential harm to life, safety, or health of the public. A prolonged interruption of transfer station or other site or adjacent operations may result.
Emergency Operation Center	An off-site (disaster) location identified for use during a Level 3 Incident. The location would serve as the control center for the Emergency Coordinator, Regulatory Authorities, Local Authorities, and media relations.

4.0 INCIDENT PREVENTION

Bridgeton Landfill personnel work hard to prevent potential hazards from becoming incidents. Many voluntary and required programs and documents are used to minimize hazards and protect employee and public health and welfare. A partial list follows:

Missouri Department of Natural Resources Solid Waste Disposal Operating Permit #118912

This permit and referenced permit application documents govern the previous operation and the current closure and post-closure activities at the site. Compliance with the applicable strict state solid waste regulations ensures a high level of due care with respect to the landfill facility. These documents are contained at the site office.

Bridgeton Landfill Health and Safety Plan (HASP)

This site-specific plan details safety protocols. The HASP focuses on the specific health and safety hazards that are related to working in and around a landfill and requires landfill personnel be OSHA trained if performing certain tasks.

Bridgeton Landfill Operation and Maintenance Program (O&M Program)

A recognized heat-generating event is occurring within a portion of the solid waste disposal area. Such heat-generating events increase the potential hazards and the likelihood of an incident. The O&M Program was prepared as a voluntary measure by Bridgeton Landfill. Special observations and preventative maintenance procedures are required by the O&M Program, and Bridgeton Landfill personnel are implementing these procedures. The O&M Program requires that monitoring and work activity reports be generated and submitted to the MDNR, allowing constant tracking of the status of the heat-generating event.

In addition to the above documents, the facility is required to have various spill prevention plans, surface water management plans, and air quality plans. All of these plans can be found at the facility office.

5.0 RESPONSE AND INCIDENT STRATEGIES

An "incident" is a situation that is non-routine or is anomalous and which poses a threat to the health and safety of facility personnel or public, or which may develop into such. Bridgeton Landfill has designated a Facility Coordinator who is responsible for determining if a situation rises to the level of an incident (see Table 1 for Facility Coordinator designation as well as other responsible parties).

When an incident occurs, the Facility Coordinator will make an initial assessment of the severity of the incident and classify it as Level 1, 2, or 3 (see definitions in Section 3.0 of this report) based on the nature of the incident. Depending on the severity of the incident, regulatory and local authorities must be involved. A checklist of some of the important incident management steps to be taken by the Facility Coordinator is presented in Attachment A. At this time, identified potential incidents fall into one of the following categories:

- Surface fire,
- Oxygenated Subsurface Fire (Subsurface Oxidation),
- Personal injury man down,
- Extreme Gas/Odor Release,
- Collapse (mass movement within landfill limits), and
- Slope failure (waste movement outside limits).

The following pages contain the response and incident strategies for each of these potential incidents.

INCIDENT - SURFACE FIRE













INCIDENT – EXTREME GAS / ODOR RELEASE





*Waste movement within limits of landfill footprint

INCIDENT – SLOPE FAILURE*



*Waste movement outside limits of landfill footprint

6.0 **RESUMPTION AND RESTORATION**

Severe incidents could result in damage to facility infrastructure or an interruption in maintenance activities or operation of the transfer station. Bridgeton Landfill has ongoing retention agreements with a number of third-party contractors. These contractors can assist with restoration of critical site operation and maintenance functions.

In cases of disaster incidents, the Incident Commander will be involved in the decision and timing of resumption of activities. Restoration will be coordinated with the MDNR so that the landfill facility meets requirements.

TABLES

BRIDGETON LANDFILL

Incident Management Plan

TABLE 1

RESPONSIBILITIES AND CONTACTS* (updated February 2014)			
Site Personnel – 13570 St. Charles	Rock Road, Bridgeton, MO 63044		
Facility Coordinator	Brian Power		
	Office: (314) 744-8165		
	Cell: (618) 410-0157		
Alternate Facility Coordinator	Bryan Sehie		
	Office: (314) 744-8190		
	Cell: (314) 443-0179		
Alternate Facility Coordinator	Michael Lambrich		
	Office: (314) 744-8175		
	Cell: (314) 683-3921		
Regulatory Authorities			
Missouri Dept. of Natural Resources	Chris Nagel		
	Office: (573) 751-5401		
	Skip Rickets		
	Cell: (314) 608-5656		
MDNR Emergency Response Hotline	Hot Line: (573) 634-2436		
Local Authorities			
Robertson Fire Dept.	Maynard Howell – Asst. Fire Chief		
	Office (314) 575-5011		
Pattonville Fire Dept.	Office (314) 739-3118		
St. Louis County Local Emergency	Mark Diedrich – LEPC Coordinator		
Planning Committee (LEPC)	Office (314) 628-5400		
Other Contacts			
SSM DePaul Health Center	(314) 344-6000		
St. Joseph Health Center	(636) 947-5000		
National Response Center	(800) 424-8802		
EPA Region VII	(913) 236-3778		

*Where appropriate, the IMP has been developed in concert with all of the authorities listed on this table. A copy of this IMP has been provided to all parties listed hereon.

BRIDGETON LANDFILL

Incident Management Plan

TABLE 2

LIST OF AVAILABLE ON-SITE RESOURCES				
Resource	Quantity			
Fire Hydrants	5 (see Figure 2)			
Soil Stock Pile	10,000 cubic yards (see Figure 2)			
Bulldozer	1			
Front-end Loader	1			
Water Truck (3500 gallon with cannon)	1			
Water Truck (2000 gallon pump truck)	1			
Excavators	4			

FIGURES





28373 Beck Road · Suite H-10 - Wixom, MI 48393 248-374-8600 · 248-374-8599 www.cecinc.com

FACILITY MAP

www.cecinc.com							
DRAWN BY:	JM	CHECKED BY:	MB	APPROVED BY:	MB	FIGURE NO.:	
DATE:	2/21/13	DWG SCALE:	NONE	PROJECT NO:	121-337	2	

ATTACHMENT A

FACILITY COORDINATOR CHECKLIST

BRIDGETON LANDFILL

Incident Management Plan

FACILITY COORDINATOR CHECKLIST

Classify and categorize incident
Initiate proper response strategy (Section 5)
Account for facility personnel
If level 2 or 3 incident, assure access gates are open
Determine if environmental release is occurring and contain
Implement proper response strategy (Section 5)
Restore and resume normal operation

INCIDENT DETAIL

Date of Incident: _____ Facility Coordinator: _____

Description of Incident:

Date of Resume Normal Activity: