ATTACHMENT B-2

DAILY SAFETY MEETING LOG

# DAILY SAFETY MEETING LOG

Project: _____ Location: _____

Date/Time: _____

1. Work Summary:

2. Physical/Chemical Hazards of Concern:

3. Protective Equipment/Procedures:

4. Emergency Procedures:

5. Signatures of Attendees

| | |
|---|---|
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| | |

ATTACHMENT B-3

INCIDENT REPORTING FORM

# CONESTOGA-ROVERS & ASSOCIATES (CRA) INCIDENT REPORTING FORM

**Incidents must be called into Incident Hot Line: 1-866-529-4886**

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Instructions: For Personal Injuries, Occupational Illnesses, and Property Damage, complete Sections 1 and 2. For Vehicle Accidents, Complete Sections 1, 2, and 4. **Initial report must be submitted within 24 hours.**

| Report Status (insert date) | | | | | |
|---|---|---|---|---|---|
| | Initial Report | Update Report | Final Report | Verification/Validation | Report Input into SMART Database |

## SECTION 1

**A. Employee Identification** ☐ **CRA Employee** ☐ **Temporary Employee** ☐ **Subcontractor**

| Employee No. | Last Name | First Name | Middle Name/Initial | ☐ Male ☐ Female |
|---|---|---|---|---|
| Area Code ( ) | Telephone Number | Employee Home Address (Street, City, State, Province, Zip Code) | | |
| Date of Hire / / | Position/Title | Supervisor | Employee's Company/Home Office Location | |

**B. General Information**

| Where did the Incident occur and which country? | Type of incident (Check all that apply) |
|---|---|
| ☐ Office ☐ Project Site ☐ Other _____<br>☐ Canada ☐ United States ☐ UK | ☐ Employee Injury/Illness ☐ Vehicle Accident<br>☐ Property Damage Only |
| Address of Incident (City, State, Providence, Zip Code) | Specific Location of incident (e.g., where on site) |

| Date and Hour of Incident | | Date and Hour Reported to Employer | | Date and Hour Last Worked | | Time Employee Began Work |
|---|---|---|---|---|---|---|
| MM/DD/YYYY | a.m. p.m. | MM/DD/YYYY | a.m. p.m. | MM/DD/YYYY | a.m. p.m. | a.m. p.m. |

| Normal Work Hours | Witnesses? | Witness Name and Telephone Number |
|---|---|---|
| From: To: | ☐ Yes ☐ No | |

**C. Project Information (Project Related Incident Only) Project Related?** ☐ Yes ☐ No

| Project # | Project Name | Project Manager | Site Telephone Number ( ) | Project Manager Cell Number ( ) |
|---|---|---|---|---|
| Client Name | | Was the Client Advised of the Incident? ☐ Yes ☐ No | Name | Date and Time |

## SECTION 2

**A. Details of the Incident**

1. What job/task was being performed when the incident occurred? (Example: collecting groundwater samples).

2. Provide a detailed description of the employee's specific activities at the time of the incident. Include details of equipment/materials being used, including the size and weight of objects being handled, and weather conditions at time of the incident. If necessary, attach additional pages to the report.

3. For injuries, identify the specific part of body injured, and specify left or right side. For illnesses, identify and describe the affected area/body part.

4. Identify the object or substance that directly injured the employee and how. Include size, weight, and shape of object, quantity of substance, etc.

5. Identify property damaged and how it was damaged (include owner of property, nature and source of damage, and model and serial number, if appropriate).

**B. Health Care/Medical Treatment**

| Employee received health care? | Identify the type of health care provided and where it was perfomed. **(Check all that apply).** |
|---|---|
| ☐ Yes ☐ No | ☐ First Aid ☐ Medical treatment other than first aid (sutures, etc.) ☐ Hospitalized<br>☐ Clinic ☐ Hospital emergency room ☐ On location by self or CRA employee) ☐ On site by EMT |

Name of Health Care Provider, Physician's Name, Phone Number, Address (Street, City, Province/State, and Postal/Zip Code)

SECTION 2 (continued)

**C. Incident Investigation**

☐ **5 Why Root Cause Analysis Investigation [Non-OSHA Recordable, <$5,000 damage]**
☐ **Tap Root Cause Analysis [OSHA Recordable, and/or >$5,000 damages]**

| | |
|---|---|
| HASP prepared?<br>☐ Yes ☐ No ☐ N/A<br>Submit a PDF of HASP and relevant JSA(s) to Investigation Team.<br>If yes, was the HASP on site?<br>☐ Yes ☐ No | Did the safety plan identify and provide safety procedures for the specific tasks the employee was conducting when injured?<br>☐ Yes ☐ No If no, why not? (Explain) _____<br>Did the employee utilize the STAR process before initiating the task?<br>☐ Yes ☐ No If no, why not? (Explain) _____<br>Was the employee drug & alcohol tested post incident? ☐ Yes ☐ No |

| 5-Why Root Cause: Incident Statement | Additional information: Attach photos, witness statement(s), affected employee statement, accident diagrams, as applicable, to the end of this document. |
|---|---|
| **1. Why did "above" happen?** | |
| **2. Why did "1" happen?** | |
| **3. Why did "2" happen?** | |
| **4. Why did "3" happen?** | See *Corrective Actions/Verification and Validation* Section (Page 4) |
| **5. Why did "4" happen?** | |
| **6. Why did "5" happen?** | |

**D. Accountability**

| | | |
|---|---|---|
| Initial Report Date<br>Month Day Year | Initial Report Prepared by: (please print) | Initial Report Prepared by: (signature) |
| Investigation Team | Company | Position/Title |
| | | |
| | | |
| | | |
| Final Report Date<br>Month Day Year | Final Report Prepared by: (please print) | Final Report Prepared by: (signature) |

**E. Stewardship**

| | | |
|---|---|---|
| Will an Incident Summary be Prepared? ☐ Yes ☐ No<br>By: | Disciplinary Action Taken? ☐ Yes ☐ No | |
| Quality Review By: | Date: | Findings: |

**Fax Completed Form to CRA's Incident Reporting Fax: (832) 485-5259**
**Send Original to CRA's Incident Reporting Department, Houston, Texas**

SECTION 3

| A. Agency Reporting and Recording Information (To be completed by the Regional Safety and Health Manager) | | | |
|---|---|---|---|
| **CANADA** | | | |
| Form 7 Sent to WSIB?<br>☐ Yes ☐ Not required | Employee Injury Information (Injury met the following criteria)<br>☐ First Aid ☐ Medical Treatment ☐ Critical Injury ☐ Modified Duty ☐ Lost Time Injury<br>If medical treatment, what? | | |
| Joint Safety and Health Committee Notified?<br>☐ Yes ☐ No | Total days of modified duty<br>If exceeds 7 days, report to WSIB | Total days of lost time (if any) | Date employee returned to work<br>Month Day Year |
| **UNITED STATES** | | | |
| OSHA Recordable Injury?<br>☐ Yes ☐ No | Employee Injury Information (Injury met the following OSHA 300 Log criteria)<br>☐ First Aid ☐ Medical Treatment ☐ Restricted Duty ☐Lost Time Injury<br>If medical treatment, what? | | |
| Total days of restricted duty | Total days of lost time (if any) | | Date employee returned to work<br>Month Day Year |

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## VEHICLE ACCIDENT SECTION

(Complete this Section for all Vehicle Accidents)

**SECTION 4**

### A. CRA Vehicle

| | | | |
|---|---|---|---|
| icense Plate No. | State/Province | Police Department City | State/Province |
| ehicle Year/Make/Model | Odometer Reading at Time of Accident | Police Report Number | Weather Conditions |

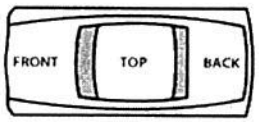
Name of Person Operating Vehicle

Address

City State/Province Zip Code

Telephone: Area Code ( )

"X" IN AREA OF VEHICLE DAMAGE




CIRCLE
0 No Damage
1 Light
2 Moderate
3 Heavy
4 Rolled
5 Burned

Vehicle Type: ☐ Personal ☐ Rental ☐ CRA-Own

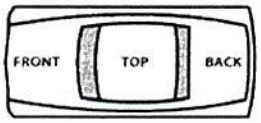
Description of Vehicle Damage:

### B. Other Vehicles Involved

| | | | |
|---|---|---|---|
| Name of Owner | Address | City/State/Prov./Zip | Area Code and Telephone Number ( ) |
| Operator's Name (if different from above) | Address | City/State/Prov./Zip | Area Code and Telephone Number ( ) |

| | |
|---|---|
| Year/Make/Model | Description of Property Damage: |
| Insurance Co. Name & Telephone | |
| License Plate No./State/Province | |

"x" IN AREA OF VEHICLE DAMAGE




CIRCLE
0 No Damage
1 Light
2 Moderate
3 Heavy
4 Rolled
5 Burned

### C. Injured Persons

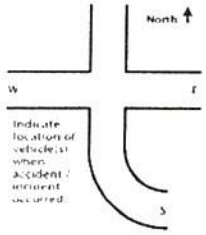
| Name | Address Street, City, State/Prov./Zip Code | Phone Number | Nature of Injury | Indicate if Injured was a Vehicle Driver/ Passenger, CRA Employee, Other, or Pedestrian |
|---|---|---|---|---|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |

### D. Witnesses

| Name | Address Street, City, State/Prov./Zip Code | Area Code and Telephone Number |
|---|---|---|
| 1. | | ( ) |
| 2. | | ( ) |

### E. Description of Accident

PLEASE COMPLETE OR ATTACH SEPARATE DIAGRAM




Was Ticket Issued? Reason:

☐ Other Operator

☐ CRA Operator

| | | |
|---|---|---|
| Report Date Month Day Year | Report Prepared by: (please print) | Report Prepared by: (signature) |

Note: If Additional Space is Required to Complete this Report, Use Separate Sheet of Paper and Attach.

**Fax Completed Form to CRA's Incident Reporting Fax: (832) 485-5259**
**Send Original to CRA's Incident Reporting Department, Houston, Texas**

# INCIDENT REPORT
# CORRECTIVE ACTIONS/VERIFICATION AND VALIDATION

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Causative Factors and Corrective Actions | | | | | | Verification (Did we do what we said we would do?) and Validation (Is it working?) | | |
|---|---|---|---|---|---|---|---|---|
| Item No. | CF | Corrective Actions (Must match Causative Factor) | Responsible Party | Date Due | Date Completed | Verified By/ Validated By | Date | Details |
| | | | | | | Verified By:<br>Validated By: | | |
| | | | | | | Verified By:<br>Validated By: | | |
| | | | | | | Verified By:<br>Validated By: | | |
| | | | | | | Verified By:<br>Validated By: | | |

## CRA 10 CAUSATIVE FACTORS

| Personal Factors | | Company Factors | | External Factors | |
|---|---|---|---|---|---|
| 1 | Insufficient training for task | 5 | Incomplete or no procedures | 10 | Exposure to conditions |
| 2 | Hurrying to complete the task | 6 | Procedures not known or enforced | | |
| 3 | Easier if proper process not followed | 7 | Improper PPE | | |
| 4 | Took shortcuts without prior incident | 8 | Improper tools | | |
| | | 9 | Improper workplace layout | | |

ATTACHMENT D B-4

JOB SAFETY ANALYSIS

# JOB SAFETY ANALYSIS (JSA)

## Chipper Operation

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Environmental/Remediation/Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Feeding 18-inch chipper with logs and brush | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Chipper, first aid kit, fire extinguisher | | |
| **Task-specific Training:** | [Identify any special/additional training necessary to safely complete this task] | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☒ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Chainsaw Chaps | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Leather gloves, protective hard toe type logging boots, properly fitted clothing, full-face respirator and particulate/organic vapor cartridges if action level for dust achieved or exceeded.

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Chipper Operation

CRA SMART PROGRAM

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Perform STAR process; refer to chippers manufacturer's operators manual before operating any chipper | • Slip/trip/fall hazards<br>• Situational risks | • Verify personnel training is sufficient for scheduled task(s)<br>• Is Job Instruction (hands-on) Training necessary?<br>• Review JSA - Chipper Operation - General prior to beginning operations | All Personnel |
| 2 | Inspect and use equipment and PPE | • Equipment failure<br>• PPE failure | • Don all necessary PPE<br>• Provide training to personnel on inspection procedures | All Personnel |
| 3a | Set up for chipping operations; clear the area around the chipper of brush and other obstructions | • Cuts<br>• Poisonous plants<br>• Biting/stinging insects<br>• Poisonous snakes<br>• Wind<br>• Slippery conditions | • Inspect the area for hazards<br>• Provide training to personnel on hazard recognition which includes identifying animals, plants, and hazardous situations | Chipper Operator |
| 3b | Continue area setup; inspect each tree noting lean, limbs, shape, crook, wind direction, butt defects, dead limbs, lodged limbs | • Cuts<br>• Poisonous plants<br>• Biting/stinging insects<br>• Poisonous snakes | • Inspect the area for hazards<br>• Provide training to personnel on hazard recognition which includes identifying animals, plants, and hazardous situations<br>• Observe and allow for hazards in surrounding area which may be triggered by chipping procedures | Chipper Operator |
| 4 | Have the skid bring the logs and brush to be chipped into position | • General chipping hazards<br>• Tree kickbacks<br>• Tree jamming<br>• Slippery conditions<br>• Flying debris<br>• Atmospheric hazards | • Review JSA - Chipper Operation - General<br>• Initiate Level C if Action Level as indicated in Table 6.2 is exceeded | Chipper Operator |
| 5 | After tree has been inserted into the chipper have personnel move away to ensure that pinch points and grab points are clear | • General chipping hazards<br>• Slippery conditions | • Always keep to the side of tree being chipped<br>• **Never turn your back on the machine while the tree is being chipped**<br>• Do not allow personnel within 300 feet of chipper operations | Chipper Operator/ Equipment Operator |
| 6 | Inspect area for potential hazards (whip hazards, lodged trees, biting/stinging insects nests, etc.) | • Cuts<br>• Sprains/strains<br>• Slips/trip/fall hazards<br>• Hazards from other equipment<br>• Biting insects | • Never leave a tree in the chipper because it may kick back or lodge in the chipper unexpectedly<br>• Never work in the area of a lodged tree | Chipper Operator and Site Supervisor |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Stump Grinder Operation

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction/Demolition |
| **Work Type:** | Environmental/Remediation/Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Grinding stumps: basic use procedures and refueling equipment | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Skid steer stump grinder attachment | | |
| **Task-specific Training:** | [Identify any special/additional training necessary to safely complete this task] | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Full-face respirator with organic vapor/particulate filters if Action Level exceeded

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Stump Grinder Operation

CRA SMART PROGRAM

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Perform STAR process; refer to the equipment manufacturer's operating manual before using any machinery | • Slip/trip/fall hazards<br>• Situational risks<br>• Short service employees | • Verify personnel training is sufficient for scheduled task(s)<br>• Is Job Instruction (hands-on) Training necessary? | All Personnel |
| 2 | Completion of daily inspection report while inspecting machine | • Equipment problems<br>• PPE failure | • Don all necessary PPE<br>• Trained on inspection procedures | Skid Steer Operator |
| 3 | Transporting equipment to the work area | • Backing into or running over objects | • Walk around the equipment or use a spotter when necessary | Skid Steer Operator |
| 4 | Hooking up to the necessary attachment | • Cuts<br>• Pinched fingers/limbs | • Don all necessary PPE<br>• Use a spotter to help hook up the attachment<br>• Shut down equipment when hooking up hydraulic hoses | Skid Steer Operator and Laborer |
| 5 | Operating equipment - after ensuring the area is cleared of all unnecessary personnel | • Flying debris from stump grinding<br>• Running over unseen objects<br>• Backing into objects<br>• Atmospheric hazards | • Don all necessary PPE<br>• Keep attachments as close to the ground as possible<br>• Shut down operation and use a spotter when needed<br>• Keep personnel 300 feet or more from grinding operations<br>• Initiate Level C if Action Level as indicated in Table 6.2 is exceeded | Skid Steer Operator and Laborer |
| 6 | Shutdown and exiting of equipment | • Slip/trip/fall hazards<br>• Situational risks | • Perform STAR process<br>• Keep all attachment on the ground when the machine is not running<br>• Maintain three points of contact when entering or exiting | Skid Steer Operator |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## All-Terrain (ATV) Utility Vehicle (UTV) Use

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Off Road and Rough Terrain Driving |
| **Work Type:** | Vehicle use | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Operating an ATV or Utility vehicle - [indicate type] | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Gator, 4-wheeler | | |
| **Task-specific Training:** | Utility vehicle-specific training; Operator's Manual including general operation, safety, and inspection procedures | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Helmet | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Full-face respirator with organic vapor / particulate cartridges if Action Level exceeded

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## All-Terrain (ATV) Utility Vehicle (UTV) Use

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Routine operation – pre-use procedures | • Equipment failure (brakes/ accelerator sticking, fuel leaks) | • Complete ATV Pre-Use Daily Inspection Form<br>• Modify CRA Inspection Form to include manufacturer's specific recommended procedures<br>• Do not use equipment if not safe<br>• Follow manufacturer's recommendations during equipment failure/emergency situations<br>• Know and understand actions to take during equipment failure events (stuck throttle, braking issues, tire blowout, etc.)<br>• Report to site supervisor immediately and tag vehicle out of service if any problems are present | Operator<br>Project Manager<br>Site Supervisor |
| 2 | Routine operation | • Noise<br>• Roll-over injuries<br>• Entrapment/pinned<br>• Collision<br>• Atmospheric hazard | • Wear hearing protection as necessary<br>• Operate equipment in accordance with manufacturer's specifications<br>• Set up traffic control plan(s) for site to indicate safe travel areas for site vehicle/equipment traffic<br>• Survey area to determine if ground conditions are suitable for safe operation<br>• Only qualified operators may use equipment<br>• Operate at safe speeds<br>• Initiate Level C if Action Level as indicated in Table 6.2 is exceeded | Operator<br>Project Manager<br>Site Supervisor |
| 3 | Routine operation | • Unexpected ATV movement | • Leave in neutral and set park brake when not in use | Operator |
| 4 | Routine operation | • Contact/collision with other mobile or heavy equipment | • Ensure marker flags are in proper position<br>• Ensure warning lights are functioning<br>• Use headlights while operating<br>• Operate at safe speeds and in pre-determined traffic routes | Operator |
| 5 | Fueling | • Fire/explosion | • Fuel in a well ventilated area<br>• Never fuel while engine is running<br>• Wipe spilled fuel immediately and wait for fumes to disperse before starting engine | Operator |
| 6 | Troubleshooting/maintenance checks | • Overexertion<br>• Pinch points<br>• Entanglement<br>• Burns/scalding | • If pull starting is required, pull once slowly followed immediately with a fast pull.<br>• Stop engine and remove key before performing pre-use checks or troubleshooting<br>• Keep all guards and shields in place<br>• Keep hands, hair, and clothing away from moving parts<br>• Wear appropriate gloves when reaching near hot areas<br>• Do not open radiator cap on liquid cooled engines when engine is hot<br>• Only qualified individual is authorized to perform maintenance or repairs | Operator<br>Qualified Person |

# JOB SAFETY ANALYSIS (JSA)

## All-Terrain (ATV) Utility Vehicle (UTV) Use

Safety Means Awareness Responsibility Teamwork

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Earthwork Trenching

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Trench excavation | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Excavator; backhoe | | |
| **Task-specific Training:** | Excavation Safety Training; Excavation Competent Person (for supervisors); Heavy Equipment Safety; Trench Box Setup/Entry/Egress | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☒ Lifeline/Harness* | ☐ Hearing Protection* | ☒ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☐ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Trench box (as necessary) | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Lifeline and harness will be used in deep excavations.; tabulated data sheet for trench box must be on site with box(es); Level C if Action Level exceeded.

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Earthwork Trenching

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Verify Utility Clearance procedures completed (overhead and underground); verify excavation trench layout | • Underground utility strike<br>• Overhead utilities | • QSF-019 on file?<br>• Utility Locate Ticket number on file within 10 days of excavation startup?<br>• Mark work area and safe distances for overhead lines<br>• use spotter as necessary | Site Supervisor<br>Project Manager |
| 2 | Setup necessary work area and traffic controls | • Fall-in<br>• Caught-between and struck-by hazards | • Demarcate site and work areas to ensure that personnel and truck/equipment traffic is maintained safely and smoothly<br>• Stockpile and laydown area are setup properly | Site Supervisor<br>Laborers |
| 3 | Hand digging and pot holing activities conducted (where/if necessary based on utility locates) | • Underground utility strike | • Use preventive techniques<br>• Maintain proper utility clearances with heavy equipment and use hand digging/pot holing when necessary | Site Supervisor<br>Laborers<br>Operator |
| 4 | Heavy equipment operations to excavate and handle soils and spoils | • Caught-between and struck-by hazards<br>• Underground/overhead utilities<br>• Atmospheric hazards | • Stay out of swing radius<br>• Use spotters to verify clear route of travel and work area; maintain eye contact with operator and/or signal operator; keep soil 2 feet from edges<br>• Inspect heavy equipment – document inspection<br>• Ensure above utility clearances and safe work protocols are followed<br>• Initiate Level C/B if Action Level as indicated in Table 6.2 is exceeded | All Affected Personnel |
| 5 | Trenching activities | • Soil cave-in; noise<br>• Struck-by/against<br>• Encountering impacted soils | • Keep proper distances from edge of excavation<br>• Limit equipment operations in trench area<br>• Keep work area free of trip hazards<br>• Perform necessary soil classification<br>• Use hearing protection as necessary<br>• Follow air monitoring protocols<br>• Contact site supervisor if odors and/or discolored soils are encountered | Operator<br>Radiation Contractor<br>Laborers<br>Site Supervisor |
| 6 | Trench entry activities | • Soil cave-in<br>• Struck-by/against<br>• Encountering slag<br>• Hazardous atmospheres<br>• Slip/trip/fall hazards<br>• Emergency egress<br>• Atmospheric hazards | • Keep proper distances from edge of excavation<br>• Limit equipment operations in trench area<br>• Keep work area free of trip hazards<br>• Perform necessary soil classification<br>• Use daily inspection form to document/meet competent person inspection requirements<br>• Inspect trench after any change in conditions (rain, equipment vibrations, etc.)<br>• Utilize trench box properly; ensure that tabulated data sheet is on site<br>• Ladder safety and proper slope of ladder<br>• If necessary based on air monitoring and/or other site conditions use harness and lifeline when entering trenches over 5 feet deep | Site Supervisor<br>Operators<br>Laborers |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Equipment Fueling

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Environmental/Remediation/Construction/General Industry | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Pumping fuel into equipment | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Pickup truck with fuel tank | | |
| **Task-specific Training:** | [Identify any special/additional training necessary to safely complete this task] | | |

| **MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)** | | | | | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☐ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☐ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☐ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |
| **ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)** | | | | | |
| | | | | | |
| | | | | | |

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Equipment Fueling

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Perform STAR process; refer to the equipment manufacturer's operating manual before using any machinery | • Slip/trip/fall hazards<br>• Situational risks<br>• Short service employees | • Verify personnel training is sufficient for scheduled task(s)<br>• Is Job Instruction (hands-on) Training necessary? | All Personnel |
| 2 | Place nozzle in tank | • Property damage and personal injury from fire<br>• Fire potential from static/contact spark | • No cell phones allowed on site<br>• No cell phones in fueling areas<br>• No smoking<br>• No fueling during storm events<br>• Meet with owner's representative to determine appropriate area for fueling<br>• Have two 20-pound fire extinguishers within 25 feet of the fueling area | All Personnel |
| 3 | Turn on pump and dispense fuel into equipment | • Property damage and personal injury from fire<br>• Fire potential from static/contact spark<br>• Personal injury due to skin /eye contact with fuel due to splash/ spills of fuel | • No cell phones allowed on site<br>• No cell phones in fueling areas<br>• No smoking<br>• No fueling during storm events<br>• Meet with owner's representative to determine appropriate area for fueling<br>• Have two 20-pound fire extinguishers within 25 feet of the fueling area<br>• Ensure the end of the nozzle is secured in the tank before turning on the pump and dispensing fuel<br>• Wear proper PPE<br>• Stay upwind when fueling equipment<br>• Remain in attendance of the nozzle at all times during fueling<br>• Avoid overfilling of the equipment | All Personnel |
| 4 | Turn off pump and return nozzle to the fuel tank | • Property damage and personal injury from fire<br>• Fire potential from static/contact spark<br>• Slip trip/fall hazards<br>• Pinch points | • No cell phones allowed on site<br>• No cell phones in fueling areas<br>• No smoking<br>• No fueling during storm events<br>• Meet with owner's representative to determine appropriate area for fueling<br>• Have two 20-pound fire extinguishers within 25 feet of the fueling area<br>• Ensure the end of the nozzle is secured in the tank before turning on the pump and dispensing fuel<br>• Wear proper PPE<br>• Stay upwind when fueling equipment<br>• Remain in attendance of the nozzle at all times during fueling<br>• Avoid overfilling of the equipment<br>• Pay attention to surroundings<br>• Pick up tools, equipment, and trash in the fueling area<br>• Pay attention to the surroundings<br>• Wear gloves<br>• Do not rush | All Personnel |

# JOB SAFETY ANALYSIS (JSA)

## Equipment Fueling

Safety Means Awareness Responsibility Teamwork

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Excavation Oversight

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Excavation |
| **Work Type:** | Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Excavation oversight | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Excavator; shoring with tabulated data sheet(s); ladder; air monitoring equipment (PID and 4-gas); Excavation Safety Checklist | | |
| **Task-specific Training:** | 40-Hour and 8-Hour HAZWOPER; PPE; Mobile Equipment Operations; Excavation Safety Training; Excavation Competent Person; Confined Space Entry | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☐ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

PPE upgrade of Action Level exceeded (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Excavation Oversight

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Perform the STAR process; discuss SWA; verify Permit to Excavate and Utility Clearance Form is completed (overhead and underground); verify excavation layout | • Underground utility strike<br>• Overhead utilities | • QSF-019 and Permit to Excavate Forms completed and signed off<br>• Utility Locate Ticket number on file within 10 days of excavation startup?<br>• Mark work area and safe distances for overhead lines; use spotter as necessary | CRA Construction Oversight Person |
| 2 | Set up necessary work area and traffic controls | • Fall-in<br>• Caught-between<br>• struck-by<br>• Lifting hazards<br>• Manual material handling<br>• Back injury | • Demarcate site and work areas to ensure that personnel and truck/equipment traffic is maintained safely and smoothly<br>• Stockpile and laydown area are set up properly<br>• Perform a pre-start meeting, inform subcontractor of safe lifting practices<br>• Reduce travel distance when there is a need to carry/lift materials<br>• Make sure grip is adequate; wear leather/cotton gloves when setting up barricades<br>• Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing | CRA Construction Oversight Person |
| 3 | Hand digging and potholing activities (where/if necessary based on utility locates) | • Underground utility strike | • Use preventive techniques<br>• Maintain proper utility clearances with heavy equipment and use hand digging/potholing when necessary<br>• Refer to step 2 and the HASP for additional lifting information | CRA Construction Oversight Person |
| 1 | Heavy equipment operations to excavate and handle soils and waste materials | • Caught-between and struck-by hazards<br>• Underground/overhead utilities<br>• Atmospheric hazards | • Stay out of swing radius<br>• Use spotters to verify clear route of travel and work area<br>• Maintain eye contact with operator and/or signal operator<br>• Keep soil 2 feet from edges<br>• Inspect heavy equipment and document inspection<br>• Ensure the above utility clearances and safe work protocols are followed<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | CRA Construction Oversight Person |
| 2 | Excavating activities | • Soil cave-in<br>• Noise hazard<br>• Struck-by/against hazards<br>• Potential contact with chemical waste material, organic vapors, and particulate | • Keep proper distances from edge of excavation<br>• Limit equipment operations in trench area<br>• Keep work area free of trip hazards<br>• Perform necessary soil classification<br>• Use hearing protection as necessary<br>• Wear designated PPE and conduct air monitoring | CRA Construction Oversight Person |

# JOB SAFETY ANALYSIS (JSA)

## Excavation Oversight

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 3 | Excavation entry activities (if required) | • Soil cave-in<br>• Struck-by/against hazards<br>• Hazardous atmospheres<br>• Slip/trip/fall hazards<br>• Emergency egress | • Keep proper distances from edge of excavation<br>• Limit equipment operations in trench area<br>• Keep work area free of trip hazards<br>• Perform necessary soil classification<br>• Use daily inspection form to document/meet competent person inspection requirements<br>• Inspect trench after any change in conditions (e.g., rain, equipment vibrations)<br>• Provide fall protection measures<br>• Utilize shoring equipment properly – ensure that tabulated data sheet is on site<br>• Use 4-gas monitor and PID to screen excavation air prior to and during entry<br>• Ladder safety and proper slope of ladder<br>• Use harness and lifeline when entering trenches over 5 feet deep | CRA Construction Oversight Person |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - [Articulated] Dump Truck

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Articulated dump truck operation and soil transport | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | [Articulated] dump truck; inspection checklist; driver's logbook; commercial driver's license | | |
| **Task-specific Training:** | Heavy Equipment Operation; Spotter Safety; Towing/Trailering | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Fire Extinguisher | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade PPE if Action Level exceeded (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - [Articulated] Dump Truck

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Discuss STAR and SWA | | • Determine the hazards of performing the task and survey the work area<br>• Consider weather conditions such as fog that could reduce visibility<br>• Always consider the worst-case scenario<br>• Analyze the hazards determined<br>• Decide a plan of action to eliminate or reduce the hazards and act on it | Site Supervisor on all |
| 2 | Equipment inspection/ maintenance | • Slip/trip/fall hazards<br>• Faulty equipment<br>• Pinch points/hot surfaces | • Inspect travel path for weather related hazards (i.e., wet, puddles, mud, obstacles)<br>• Use three points of contact<br>• Do not jump off of equipment<br>• Must pass equipment inspection checklist prior to operation<br>• Wear leather gloves<br>• Identify and avoid pinch points | Site Supervisor and Operator |
| 3 | Traveling around work area | • Overturning<br>• Steep grade collision<br>• Personnel struck by truck<br>• Atmospheric hazards | • Control speed<br>• Use proper gear for situation and use turn signals<br>• Monitor truck operation and braking abilities during operation<br>• Evaluate road for slippery conditions<br>• Follow established traffic patterns and instructions<br>• Be cautious of other personnel on site<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | Site Supervisor and Operator |
| 4 | Loading truck | • Overturning<br>• Collision/personnel struck by truck<br>• Contact with utilities<br>• Falling material from side of truck or swing of excavator<br>• Falling from truck/trailer<br>• Atmospheric hazards | • Evaluate surface behind truck<br>• Use spotter when backing<br>• position truck so that cab is away from the trackhoe bucket<br>• Stop truck completely prior to starting loading operations<br>• Be cautious of trackhoe operator signals (two honks to stop) for starting and completing loading ops<br>• Do not exit until signaled by operator or spotter<br>• spotter required within 100 feet of overhead utilities<br>• Maintain at least 10 feet from overhead lines and increase distance for high voltage<br>• Utilities (subsurface, power poles, etc) shall be identified, marked, and protected again contact with heavy equipment<br>• Load from the rear of truck and do not swing bucket over cab<br>• Spotter stays clear of truck while loading and pulling away from area<br>• If spotter/driver mounts truck to check load level, etc., always maintain three points of contact with truck/trailer<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | Site Supervisor and Operator |
| 5 | Transport of soils | • Contact with heavy equipment<br>• Overturning<br>• Contact with utilities | • Haul truck operators must slow down when approaching the excavation area<br>• Haul trucks shall follow the approved haul routes as determined by the supervisor and confirmed in the daily TGSM<br>• Maximum speed on site is 15 mph<br>• Excavator operator must ensure that the load on truck is evenly distributed prior to haul truck leaving area<br>• Load must be covered with a tarp per DOTD specifications<br>• Dirt must not be tracked into roadway | Site Supervisor and Operator |

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - [Articulated] Dump Truck

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 6 | Dumping load | • Overturning<br>• Collision, personnel struck by truck<br>• Contact with utilities | • Raise truck bed with truck completely stopped and parking brake in place<br>• Lower bed fully before moving vehicle<br>• Use caution when dumping loads of wet material as it may stick to the truck bed causing an imbalance of load | Site Supervisor and Operator |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - Bulldozer

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Bulldozer operation | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Bulldozer | | |
| **Task-specific Training:** | Heavy Equipment Operation | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Fire Extinguisher | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade PPE if Action Level exceeded (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
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# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - Bulldozer

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Discuss STAR and SWA | • Failing to identify hazardous conditions resulting in losses or near losses | • Determine the hazards of performing the task and survey the work area<br>• Consider weather conditions such as fog that could reduce visibility<br>• Always consider the worst-case scenario<br>• Analyze the hazards determined<br>• Decide a plan of action to eliminate or reduce the hazards and act on it | Site Supervisor on all |
| 2 | Inspect equipment | • Equipment malfunction or damage<br>• Hydraulic fluid, fuel, oil leaks/spills<br>• Loss of steering, loss of brakes, etc.; accidents, decreased visibility<br>• Fire<br>• Slip/trip/fall hazards<br>• Unexpected operation of equipment | • Follow CRA Equipment Inspection Form/Tag Out if malfunction found<br>• Grease moving parts<br>• Check all fluids<br>• Ensure that fluids are not too low or too full<br>• Walk around equipment and look for leaking fluids<br>• Ensure that dozer tracks are acceptable (no unacceptable wear and no objects present)<br>• Ensure that windows and mirrors are clean<br>• Remove trash or other debris from cab<br>• Ensure that back up alarm and horn are operational<br>• Correct any problems immediately and inform supervisor<br>• If equipment appears as though it has been tampered with or vandalized, do not start it<br>• Ensure that fire extinguisher is in place and functioning<br>• Inspect the fire extinguisher monthly<br>• Use three point mount/dismount at all times<br>• Be cautious of where you step and be aware of your surroundings<br>• Ensure that ignition key is in your pocket, equipment is in neutral and parking brake is engaged | Site Supervisor and Operator |
| 3 | Entering equipment | • Reduced visibility, uncomfortable seating - back strain<br>• Debris on floor getting stuck under pedals<br>• Unexpected movement of truck<br>• Unexpected movement of truck | • Adjust seat and mirrors so that you are able to see where traveling<br>• Adjust controls and seat to your comfort and safety<br>• Ensure that all materials inside dozer cab are secured<br>• Be cautious of where you step and be aware of your surroundings<br>• Ensure steps are clear of water, mud, and other debris<br>• Ensure parking brake is engaged and gear is in neutral | Site Supervisor and Operator |
| 4 | Configure controls and seating | • Ergonomics/unnecessary physical stress<br>• Incapable of reaching controls<br>• Visual blocks | • Upon sitting, adjust seat fully to accommodate reach and comfort zone<br>• Fasten seat belt<br>• Make certain all controls are set in neutral positions<br>• Adjust mirrors | Site Supervisor and Operator |
| 5 | Starting and warming up | • Unanticipated rolling or movement, engine fire, or mechanical/electrical faults | • Review operator's manual if new to this particular machine<br>• Start engine and check controls to ensure all are in working conditions<br>• Allow a minimum of 2 minutes to warm up | Site Supervisor and Operator |

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - Bulldozer

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 6 | Moving equipment work area | • Other equipment, personnel, or objects in work area<br>• Uneven terrain<br>• Atmospheric hazards | • Perform STAR<br>• Know the daily task and other people and equipment in the area<br>• Make eye contact with other operators and site personnel in the immediate vicinity<br>• Inspect pathway prior to moving equipment to ensure clear pathway<br>• Minimize dust<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | Site Supervisor and Operator |
| 7 | Performing tasks | • Other equipment (collision)<br>• Slopes, ground conditions possible injuries to personnel and equipment, buried obstacles, underground and overhead utilities<br>• Dust | • Perform STAR<br>• Know where utilities are located<br>• Be aware of the scope of work to be performed<br>• Know the paths of other equipment or persons entering and leaving your work area<br>• Communicate with supervisors and other operators throughout the day with any questions<br>• Stop work immediately and contact a supervisor if you are uncertain of your task, experience equipment failure, or personal injury or near loss<br>• Wear dust mask of conditions warrant | Site Supervisor and Operator |
| 8 | Stopping at end of day | • Slip/trip/fall hazards<br>• Overnight parking of equipment | • Be cautious of where you step and be aware of your surroundings<br>• Park in designated area<br>• Set brake/control locks<br>• Idle for 2 minutes if engine is hot<br>• Lower blade to ground<br>• Turn equipment off<br>• Use three-point dismount<br>• Secure inside instruments (i.e., fire extinguisher) | Site Supervisor and Operator |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation – Hydraulic Track Excavator

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Hydraulic Track Excavator | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Hydraulic excavator (appropriately sized); | | |
| **Task-specific Training:** | Heavy Equipment Operation; HASP; OQ training | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Fire Extinguisher | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade PPE if Action Level exceeded see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation – Hydraulic Track Excavator

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Discuss STAR and SWA | • Failing to identify hazardous conditions resulting in losses or near losses | • Determine the hazards of performing the task and survey the work area<br>• Consider weather conditions such as fog that could reduce visibility<br>• Always consider the worst-case scenario<br>• Analyze the hazards determined<br>• Decide a plan of action to eliminate or reduce the hazards and act on it | Site Supervisor on all |
| 2 | Inspect equipment | • Equipment malfunction or damage<br>• Hydraulic fluid, fuel, oil leaks/spills<br>• Loss of steering, loss of brakes, etc.; accidents, decreased visibility<br>• Fire<br>• Slip/trip/fall hazards<br>• Unexpected operation of equipment<br>• Swing radius signage missing | • Follow CRA Equipment Inspection Form/Tag Out if malfunction found<br>• Grease moving parts<br>• Check all fluids<br>• Ensure that fluids are not too low or too full<br>• Walk around equipment and look for leaking fluids<br>• Ensure that tracks are acceptable (no unacceptable wear and no objects present)<br>• Ensure that windows and mirrors are clean. Adjust mirrors!<br>• Remove trash or other debris from cab<br>• Ensure that back up alarm and horn are operational<br>• Correct any problems immediately and inform supervisor<br>• If equipment appears as though it has been tampered with or vandalized, do not start it<br>• Ensure that fire extinguisher is in place and functioning<br>• Inspect the fire extinguisher monthly<br>• Use three point mount/dismount at all times<br>• Be cautious of where you step and be aware of your surroundings<br>• Ensure that ignition key is in your pocket, equipment is in neutral and parking brake is engaged<br>• Use interlock safety mechanism any time equipment is not conducting a productive and/or controlled activity | Site Supervisor and Operator |
| 3 | Entering equipment | • Reduced visibility<br>• Uncomfortable seating - back strain<br>• Debris on floor getting stuck under pedals<br>• Unexpected movement of excavator | • Adjust seat and mirrors so that you are able to see where traveling<br>• Adjust controls and seat to your comfort and safety<br>• Ensure that all materials inside cab are secured<br>• Be cautious of where you step and be aware of your surroundings<br>• Ensure steps are clear of water, mud, and other debris<br>• Ensure parking brake is engaged and gear is in neutral<br>• Use interlock safety mechanism any time equipment is not conducting a productive and/or controlled activity | Site Supervisor and Operator |
| 4 | Configure controls and seating | • Ergonomics/unnecessary physical stress/ back injury<br>• Incapable of reaching controls<br>• Visual blocks | • Upon sitting, adjust seat fully to accommodate reach and comfort zone<br>• Fasten seat belt<br>• Make certain all controls are set in neutral positions<br>• Adjust mirrors | Site Supervisor and Operator |
| 5 | Starting and warming up | • Unanticipated rolling or movement; engine fire, or mechanical/electrical faults | • Review operator's manual if new to this particular machine<br>• Start engine and check controls to ensure all are in working conditions<br>• Allow a minimum of 2 minutes to warm up | Site Supervisor and Operator |

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation – Hydraulic Track Excavator

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 6 | Moving equipment work area | • Other equipment, personnel, or objects in work area<br>• Uneven terrain<br>• Atmospheric hazards | • Perform STAR – be aware of surroundings<br>• Know the daily task and other people and equipment in the area<br>• Make eye contact with other operators and site personnel in the immediate vicinity<br>• Inspect pathway prior to moving equipment to ensure clear pathway<br>• Minimize dust<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | Site Supervisor and Operator |
| 7 | Performing tasks | • Other equipment (collision)<br>• Slopes, ground conditions possible injuries to personnel and equipment, buried obstacles, underground and overhead utilities<br>• Dust | • Perform STAR<br>• Know where utilities are located – know where your bucket is in relation to any underground utilities at all times<br>• Be aware of the scope of work to be performed<br>• Use a spotter<br>• Know the paths of other equipment or persons entering and leaving your work area<br>• Communicate with supervisors and other operators throughout the day with any questions<br>• Stop work immediately and contact a supervisor if you are uncertain of your task, experience equipment failure, or personal injury or near loss<br>• Wear dust mask if conditions warrant | Site Supervisor and Operator |
| 8 | Stopping at end of day | • Slip/trip/fall hazards<br>• Overnight parking of equipment | • Be cautious of where you step and be aware of your surroundings<br>• Park in designated area<br>• Set brake/control locks<br>• Idle for 2 minutes if engine is hot<br>• Lower bucket to ground – zero energy state<br>• Turn equipment off; remove keys<br>• Use three-point dismount<br>• Secure inside instruments (i.e., fire extinguisher) | Site Supervisor and Operator |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - Loader

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Construction | **Client:** | |
| **Work Activity:** | Heavy equipment operation - loader | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Loader | | |
| **Task-specific Training:** | Heavy Equipment Operation | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Fire Extinguisher | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade PPE if Action Level exceeded (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - Loader

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Review JSA - General Site Activities | • Failing to identify hazardous conditions resulting in losses or near losses | • Conduct STAR<br>• Assess the risks<br>• Determine the hazards of performing the task and survey the work area<br>• Consider weather conditions such as fog that could reduce visibility<br>• Always consider the worst-case scenario<br>• Analyze the hazards determined<br>• Decide a plan of action to eliminate or reduce the hazards and act on it | Site Supervisor on all |
| 2 | Inspect equipment | • Equipment malfunction or damage<br>• Hydraulic fluid, fuel, oil leaks/spills<br>• Loss of steering, loss of brakes, etc.; accidents, decreased visibility<br>• Fire<br>• Slip/trip/fall hazards<br>• Unexpected operation of equipment | • Follow CRA equipment inspection form/tag out if malfunction found<br>• Grease moving parts<br>• Check all fluids<br>• Ensure that fluids are not too low or too full<br>• Walk around equipment and look for leaking fluids<br>• Ensure that loader tracks are acceptable (no unacceptable wear and no objects present)<br>• Ensure that windows and mirrors are clean<br>• Remove trash or other debris from cab<br>• Ensure that back up alarm and horn are operational<br>• Correct any problems immediately and inform supervisor<br>• If equipment appears as though it has been tampered with or vandalized, do not start it<br>• Ensure that fire extinguisher is in place and functioning<br>• Inspect the fire extinguisher monthly<br>• Use three-point mount/dismount at all times<br>• Be cautious of where you step and be aware of your surroundings<br>• Ensure that ignition key is in your pocket, equipment is in neutral and parking brake is engaged | Site Supervisor and Operator |
| 3 | Entering equipment | • Reduced visibility, uncomfortable seating - back strain<br>• Debris on floor getting stuck under pedals<br>• Unexpected movement of truck<br>• Unexpected movement of truck | • Adjust seat and mirrors so that you are able to see where traveling<br>• Adjust controls and seat to your comfort and safety<br>• Ensure that all materials inside dozer cab are secured<br>• Be cautious of where you step and be aware of your surroundings<br>• Ensure steps are clear of water, mud, and other debris<br>• Ensure parking brake is engaged and gear is in neutral | Site Supervisor and Operator |
| 4 | Configure controls and seating | • Ergonomics/unnecessary physical stress<br>• Incapable of reaching controls<br>• Visual blocks | • Upon sitting, adjust seat fully to accommodate reach and comfort zone<br>• Fasten seat belt<br>• Make certain all controls are set in neutral positions<br>• Adjust mirrors | Site Supervisor and Operator |
| 5 | Starting and warming up | • Unanticipated rolling or movement, engine fire, or mechanical/electrical faults | • Review operator's manual if new to this particular machine<br>• Start engine and check controls to ensure all are in working conditions<br>• Allow a minimum of 2 minutes to warm up | Site Supervisor and Operator |

# JOB SAFETY ANALYSIS (JSA)

## Heavy Equipment Operation - Loader

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 6 | Moving equipment work area | • Other equipment, personnel, or objects in work area<br>• Uneven terrain<br>• Atmospheric hazards | • Conducts SPSA<br>• Know the daily task and other people and equipment in the area<br>• Make eye contact with other operators and site personnel in the immediate vicinity<br>• Inspect pathway prior to moving equipment to ensure clear pathway<br>• Minimize dust<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | Site Supervisor and Operator |
| 7 | Performing tasks | • Other equipment (collision)<br>• Slopes, ground conditions possible injuries to personnel and equipment, buried obstacles, underground and overhead utilities<br>• Dust | • Perform SPSA<br>• Know where utilities are located. Be aware of the scope of work to be performed<br>• Know the paths of other equipment or persons entering and leaving your work area<br>• Communicate with supervisors and other operators throughout the day with any questions<br>• Stop work immediately and contact a supervisor if you are uncertain of your task, experience equipment failure, or personal injury or near loss<br>• Wear dust mask if conditions warrant | Site Supervisor and Operator |
| 8 | Stopping at end of day | • Slip/trip/fall hazards<br>• Overnight parking of equipment | • Be cautious of where you step and be aware of your surroundings<br>• Park in designated area<br>• Set brake/control locks<br>• Idle for 2 minutes if engine is hot<br>• Lower blade to ground<br>• Turn equipment off<br>• Use three-point dismount<br>• Secure inside instruments (i.e., fire extinguisher) | Site Supervisor and Operator |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Loading Soil with Excavator

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Environmental/Remediation/Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Loading soil with excavator | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | | | |
| **Task-specific Training:** | | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☒ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☐ Full Face APR | ☒ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Photoionization detector (PID) | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade PPE if Action Level exceeded. (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Loading Soil with Excavator

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Inspect work area | • Slip/trip/fall hazards<br>• Biological hazards | • Clear any hazards that are clearable<br>• Mark major obstructions with orange tape<br>• Exercise caution<br>• Pay close attention to the ground surface<br>• Inspect immediate surroundings<br>• Walk cautiously | |
| 2 | Inspect equipment | • Slip/trip/fall hazards<br>• damage to equipment or self if there is undetected equipment damage | • Use three points of contact<br>• Follow intact equipment inspection form<br>• Parking brake should be engaged and key in pocket<br>• Maintain a three-point mount/dismount<br>• Correct any matters immediately and/or report to supervisor | |
| 3 | Establish communication | • Know response for emergencies and accidents | • Hand and horn signals established<br>• Emergency signal established | |
| 4 | Begin excavation | • Equipment damage<br>• People/hazards in swing radius slides<br>• Cave-ins | • All operators must be trained, skilled, and experienced<br>• Operator must look around area and be aware of surroundings at all times<br>• Use proper sloping/shoring techniques<br>• Keep excavator on even or undisturbed surfaces | |
| 5 | Excavator loads soil into truck | • Truck running into excavator<br>• Tipping over | • Operators have stopping signal (two honks)<br>• Awareness of surroundings<br>• Do not overload truck or bucket to avoid spillage<br>• Spread the soil in the truck bed to avoid having one side heavier than the other<br>• Trucks need to remain on level ground | |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Silt Fence Installation

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 18/06/2008 | **JSA Type:** | Construction |
| **Work Type:** | Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Silt fence installation | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Excavator, backhoe, and ground labor | | |
| **Task-specific Training:** | Hand Tools, Heavy Equipment Safety | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☐ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☐ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Insect Repellant | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Silt Fence Installation

CRA SMART PROGRAM

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Equipment Inspection | • Hydraulic failure | • Inspect equipment lines and fluid reservoirs | Operator |
| 2 | Underground utilities | • Impact, breach, or rupture of underground utilities | • Inspect area<br>• Call underground utility locator and monitor locator during locating activities<br>• Ask questions<br>• Use CRA Underground Utility Clearance Form and verify all markings, locations, and procedures prior to installation work | Operator, Laborer, Superintendent, and all field personnel involved in operation |
| 3 | Installation zone inspection | • Underground Insects/hives<br>• Poisonous plants<br>• Stinging/biting insects | • Visually inspect area of fence installation for any activity regarding hornets, yellow jackets, bees, fire ants, or termites<br>• A slow walk or drive along the fence path prior to excavation to inspect for insects flying in and out or ground, ant humps or mounds, and trails | Operator, Laborer, Superintendent, and all field personnel involved in operation |
| 4 | Hand tool use | • Improper hammer selection<br>• Stapler use | • Use only a hammer of a weight and handle length appropriate to individual laborer's capability<br>• Inspect every stake for knots, splits, and fractures before impacting stake with hammer<br>• Knotty or split reinforcing stakes should be replaced without exception. Inspect stapler for correct staple installation<br>• Inspect stapler and test operation for gauging correct drive pressure<br>• Use staples of a length needed for the job<br>• Safety glasses and awareness of installer hand location during use of a hammer or staple gun | Operator, Laborer, Superintendent, and all field personnel involved in operation |
| 5 | Fence layout activities | • Lifting hazards<br>• Manual material handling<br>• Back injury | • Reduce distance traveled when carrying materials<br>• Make sure grip is adequate; use gloves to enhance grip when necessary<br>• Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing<br>• 100-foot fence rolls require a coordinated two-man effort to place fence correctly and according to manufacturer's requirements | Operator, Laborer, Superintendent, and all field personnel involved in operation |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Straw Matting or Ground Blanket Installation

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Straw matting or ground blanket Installation | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Ground labor and hand tools | | |
| **Task-specific Training:** | Hand Tools | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☐ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade to appropriate protection level if Action Level achieved (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
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# JOB SAFETY ANALYSIS (JSA)

## Straw Matting or Ground Blanket Installation

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Staple installation to secure matting, etc. | • Striking hand or wrist with hammer | • Use only hammer with weight and length within laborers' capability<br>• Use wide head hammers only for staple installation<br>• Take a break to relieve muscle fatigue in wrist, arm, and shoulders as accidental impact with wrist or hands most often results from inaccurate swing resulting from muscle fatigue | Operator, Laborer, Superintendent, and all field personnel involved in operation |
| 2 | Staple installation – continued | • Impact, breach, or rupture of underground utilities | • Inspect area<br>• Call underground utility locator and monitor locator during locating activities<br>• Ask questions<br>• Use CRA Underground Utility Clearance Form and verify all markings, locations, and procedures prior to installation work | Operator, Laborer, Superintendent, and all field personnel involved in operation |
| 3 | Installation zone inspection | • Underground insects/Hives | • Visually inspect area of fence installation for any activity regarding hornets, yellow jackets, bees, fire ants, or termites<br>• A slow walk or drive along the fence path prior to excavation to inspect for insects flying in and out or ground, ant humps or mounds, and trails | Operator, Laborer, Superintendent, and all field personnel involved in operation |
| 1 | Hand tool use | • Improper hammer selection<br>• Stapler use | • Use only a hammer of a weight and handle length appropriate to individual laborers' capability<br>• Inspect every stake for knots, splits, and fractures before impacting stake with hammer<br>• Knotty or split reinforcing stakes should be replaced without exception<br>• Inspect stapler for correct staple installation<br>• Inspect stapler and test operation for gauging correct drive pressure<br>• Use staples of a length needed for the job<br>• Safety glasses and awareness of installer hand location during use of a hammer or staple gun | Operator, Laborer, Superintendent, and all field personnel involved in operation |
| 2 | Mat orientation layout | • Lifting hazards<br>• Manual material handling<br>• Back injury | • Reduce distance traveled when carrying materials<br>• Make sure grip is adequate; use gloves to enhance grip when necessary<br>• Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing<br>• 100-foot fence rolls require a coordinated two-man effort to place fence correctly and according to manufacturer's requirements | Operator, Laborer, Superintendent, and all field personnel involved in operation |
| 3 | Mat orientation layout - continued | • Injuries typical of work on incline or slope | • Use buddy system during straw mat installation<br>• Maintain proper lifting techniques as discussed in step 2 and the HASP<br>• Buddy lifts on ramps, stairs or ladders: The tallest and/or strongest person should be situated at the bottom of the load, and use rope and /or other means to lower tools and equipment into the excavation)<br>• Snug high to work boots with correct lacing, tied boots<br>• Personnel stretching and preparing body for stresses typically endured by the foot, heel, ankle, leg muscles, knees, and hips<br>• Stretching the back and upper body for twisting and reaching on an incline or slope | Operator, Laborer, Superintendent, and all field personnel involved in operation |

# JOB SAFETY ANALYSIS (JSA)

## Straw Matting or Ground Blanket Installation

CRA SMART PROGRAM

Safety Means Awareness Responsibility Teamwork

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Trash Pump Setup and Operation

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Setup and operation of 2- and 3-inch trash pumps | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Trash pump, fittings, hose sections, safety fuel can and funnel | | |
| **Task-specific Training:** | Review the manufacturer's recommendations for each specific pump; hand tools | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☒ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☐ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade to appropriate PPE if Action Level achieved (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
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# JOB SAFETY ANALYSIS (JSA)

## Trash Pump Setup and Operation

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Use the STAR Process; refer to the specific pump's equipment manufacturer's operating manual before using the equipment. **Note the design of the pump and the configuration of the attachment points, as these may present unique hazards.** | • Slip/trip/fall hazards<br>• Situational risks | • Verify personnel's training is sufficient for the scheduled task(s)<br>• Is job instruction training (hands-on) training necessary?<br>• Employees should remove finger rings, necklaces, or jewelry, which may be hazardous in equipment operation | All Affected Personnel |
| 2 | Equipment safety checklist | • Faulty hose connections<br>• Damaged hoses and fittings | • Replace worn or damaged hoses and fittings<br>• Replace hose connections with operational connections<br>• Perform an overall inspection of the equipment for defects or signs of damage | All Affected Personnel |
| 3 | Pump and hose setup | • Slip/trip/fall hazards<br>• Uneven terrain<br>• Wet, icy, and muddy conditions<br>• Lifting hazards<br>• Manual material handling<br>• Back injury<br>• Struck-by and line of fire<br>• Pinch points | • Be aware of your surrounding conditions (footing, weather conditions, etc.)<br>• Reduce distance traveled when carrying materials<br>• Make sure grip is adequate; use gloves to enhance grip when necessary<br>• Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing<br>• Grab the equipment only at designated handles or, if none are available, at locations where the hands and fingers will not get caught in the equipment or smashed<br>• Test the weight of the equipment before lifting<br>• Straighten out hoses before connection and keep them out of high traffic areas<br>• Be aware of "stored energy" hazards presented by hoses | All Affected Personnel |
| 4 | Equipment fueling/refueling | • Fires<br>• Explosions<br>• Chemical hazard | • Turn off equipment before fueling<br>• No smoking while fueling<br>• Do not use cell phones while fueling<br>• Store fuel in proper safety containers only<br>• Always use a funnel when transferring fuel from can to tank on pump<br>• If transferring fuel from large vessels into portable cans, use proper grounding or bonding techniques<br>• Do not fuel the equipment when it is hot<br>• Wear gloves and wash hands after fueling | All Affected Personnel |
| 5 | Starting the pump | • Back strain<br>• Slippery conditions | • Make sure the starting cord is free pulling; test the cord before pulling<br>• Maintain straight posture when pulling the recoil starter cord<br>• Do not over exert when pulling the cord<br>• Be aware of your surrounding conditions<br>• Make sure slip/trip/fall hazards were properly identified and corrected | Assigned Laborer |

# JOB SAFETY ANALYSIS (JSA)

## Trash Pump Setup and Operation

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 6 | Pump operation | • Splash hazards<br>• Hot surfaces<br>• Noise | • Remove worn or damaged hoses until they can be repaired or replaced<br>• Keep hands away from the exhaust or hot components of the equipment<br>• Be aware of any unguarded moving parts on the equipment<br>• Wear required PPE (hearing protection, Tyvek, etc.) | Assigned Laborer |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Trenching/Excavating with Backhoe

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Environmental/Remediation/Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Excavation with backhoe | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Backhoe | | |
| **Task-specific Training:** | Heavy Equipment Safety | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade to appropriate PPE if Action Level achieved (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Trenching/Excavating with Backhoe

CRA SMART PROGRAM

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Set up traffic and site control | • Struck-by traffic hazards | • Refer to Traffic Control Plan and HASP<br>• Use buddy system when placing traffic control devices<br>• Always face traffic | Site Personnel |
| 2 | Site preparation (includes air monitoring, excavation layout, inspect work area, etc.) | • Chemical hazard<br>• Overhead/underground installations<br>• Biological hazards | • Follow air monitoring program in HASP<br>• Inspect work area for utilities, biological hazards, traffic hazards, off-site receptors<br>• Ensure One-Call Locate ticket number is current, QSF-019 is complete, and that all other relevant utility locate actions have been completed | Site Personnel |
| 3a | Position/set up backhoe | • Pedestrian and vehicular traffic<br>• Slip/trip/fall hazards<br>• Existing/overhead structures | • Always use a spotter to direct backhoe into position<br>• Set outriggers and make sure ground is solid; avoid soft terrain<br>• Set up exclusion work zone with traffic barricades and signage to secure work area<br>• Be aware of the height restrictions of the equipment<br>• Make sure work area remains clean and organized | Site Personnel |
| 3b | Inspect backhoe and surrounding area | • Hydraulic line failure<br>• pedestrian struck by equipment or debris<br>• Release to environment | • Visually inspect all components of equipment, no oil/fluid leaks, tires properly inflated, fluid levels and associated equipment in good condition<br>• Replace worn or damaged hoses<br>• Ensure barricades/work zone is setup to protect public | Site Personnel |
| 4 | Prepare surface for excavation activities: cut pavement at location (as necessary), etc. | • Moving blade<br>• Eye hazards<br>• Exhaust from motor<br>• Dust inhalation<br>• Noise – hearing impairment<br>• Back strain<br>• Traffic hazards | • Wear face shield, gloves, ear plugs or muffs, control dust with water or wear dust mask<br>• Employ proper lifting techniques or mechanical assistance<br>• Keep work area clear of debris<br>• Use buddy system or spotter when possible<br>• Maintain traffic control and face oncoming traffic<br>• Refer to TCP and/or HASP | Site Personnel |
| 5 | Backhoe operation | • Hitting an underground or overhead utility/structure<br>• Flying debris<br>• COC exposure<br>• Noise - hearing impairment<br>• Dust inhalation<br>• Back strain<br>• Traffic hazards<br>• Heat/cold stress<br>• Slip/trip/fall hazards | • Wear all required PPE by HASP<br>• Initiate air monitoring as necessary<br>• Watch overhead clearance at all times, use spotters as necessary<br>• Be aware of the height restrictions of the equipment<br>• Only those workers wearing proper PPE should be allowed near the excavation while backhoe is operating<br>• Use proper lifting techniques<br>• Ensure work area remains clean and organized<br>• Take breaks as necessary or as indicated in the HASP to avoid back strain (repetitive/vibration ergo issues and heat/cold stress)<br>• Perform periodic visual inspection of equipment<br>• Maintain traffic control and face oncoming traffic | Site Personnel |
| 6 | Backfill cleared excavations and mark cleared locations | • Back strain<br>• Eye injury<br>• COC exposure<br>• Slip/trip/fall hazards<br>• Struck-by hazards | • Avoid one-handed carrying if possible; maintain awareness of footing<br>• Make sure work area remains clean and organized<br>• Clearly mark cleared locations with a permanent method (e.g., paint, stakes)<br>• Map cleared locations, site structures, and location of wastes<br>• Keep clear of swing radius; demarcate safe work area/zone | Site Personnel |

# JOB SAFETY ANALYSIS (JSA)

## Trenching/Excavating with Backhoe

CRA SMART PROGRAM

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 7 | Site cleanup | • Slip/trip/fall hazards<br>• Back strain | • Use proper lifting techniques<br>• Make sure work area remains clean and organized<br>• Use buddy system, if possible, to remove traffic controls<br>• Leave site clean of debris and refuse | Site Personnel |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Hand Augering

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Drilling |
| **Work Type:** | Environmental | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Hand auger soil sampling | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Air monitoring equipment, PPE | | |
| **Task-specific Training:** | CRA Field Method Training on Soil Sampling Procedures | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☐ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☐ Hearing Protection* | ☒ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade to appropriate PPE if Action Level achieved (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Hand Augering

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Discuss STAR and SWA | • Site personnel not aware of STAR and SWA | • Project team (CRA) discusses importance of and documentation procedures for SWA during pre-job safety meeting<br>• Use SWA to stop any work that is unsafe | Site Personnel |
| 2 | Inspect and calibrate sampling and monitoring equipment | • Lost time from improperly functioning equipment<br>• Incorrect sampling procedures/ collection due to malfunctioning equipment | • Ensure all equipment is functioning properly; complete Quality Control documents | CRA Geologist |
| 3 | Advancing hand auger | • Overhead and underground utilities<br>• Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Improper hand auger operation<br>• Dust/flying debris/contaminants | • Inspect route to be traveled<br>• Avoid moving objects that block field of vision<br>• Use precaution when advancing hand auger tool<br>• Assess the potential for underground structures (i.e., utilities) at the sign of unusual resistance<br>• Do not work under overhead utilities<br>• Know the length of the hand auger tool and how close it could come to utilities<br>• Use proper bending/lifting techniques by bending and lifting with legs and not with back<br>• Do not twist at wait when turning the auger<br>• Dust particles may become airborne; if dust becomes excessive, use a dust mask<br>• When pulling the hand auger out of the boring, materials can become airborne<br>• Pull up slowly using your legs<br>• Do not jerk the hand auger out of the hole<br>• Get assistance if you cannot maintain proper posture by yourself<br>• Wear nitrile gloves under the leather gloves when advancing the hand auger to avoid dermal contact with potential contaminants<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | |
| 4 | Prepare to collect soil samples | • Back strain<br>• Pinch points<br>• Cuts<br>• Punctures<br>• Sample misidentification | • Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back<br>• If the object is in excess of 50 pounds (23 kg) then assistance (buddy lift) will be required<br>• Avoid placing hands/fingers in pinch point locations<br>• Use proper tools when opening container packaging<br>• Do not use fixed open blade knives when opening boxes or containers.<br>• Ensure the sample ID label matches sample location with site plan/CRA Site Supervisor/subcontractor | CRA Geologist |
| 5 | Sample collection | • Contaminant exposure<br>• Cuts from container breakage<br>• Sample misidentification | • Wear nitrile gloves and replace between soil samples<br>• Inspect glass bottles for breaks/cracks<br>• Do not attempt to use any suspect containers<br>• Close glass sample containers carefully to avoid breakage<br>• Check sample labels for accuracy prior to placing in cooler | CRA Geologist |

# JOB SAFETY ANALYSIS (JSA)

## Hand Augering

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 6 | Headspace screening of samples | • Contaminant exposure<br>• Incorrect headspace readings | • Wear nitrile gloves<br>• Ensure proper calibration of equipment | CRA Geologist |
| 7 | Sample selection | • Bottle breakage<br>• Contaminant exposure<br>• Pinch points<br>• Lost time due to incorrect sample selection | • Wear nitrile gloves when handling sample containers<br>• Confirm selected samples are correct based on work plan selection criteria, PID readings, and soil boring logs<br>• Avoid placing hands/fingers in pinch point locations (e.g., between cooler and lid) | CRA Geologist |
| 8 | Packing samples in cooler(s) | • Bottle breakage<br>• Contaminant exposure<br>• Cuts<br>• Pinch points<br>• Back strain<br>• Lost time due to incorrect sample packaging or hold time exceedances | • Wear nitrile gloves when handling sample containers<br>• Pack glass containers in bubble wrap<br>• Check COC against sample labels and SSOW for accuracy before shipping<br>• Avoid placing hands/fingers in pinch point locations (e.g., between cooler and lid)<br>• Refer to steps 3 and 4 and the HASP for additional lifting techniques<br>• Ensure equipment and supplies are loaded correctly and do not shift during transport | CRA Geologist |
| 9 | Investigation derived waste (IDW) management | • Contaminant exposure<br>• Heavy lifting<br>• Pinch points<br>• Slip/trip/fall hazards<br>• Mislabeled waste | • Wear nitrile gloves when handling IDW<br>• Use proper lifting techniques (mechanical or buddy system) to transport/dispose of IDW into drums<br>• Refer to steps 3 and 4 and the HASP for additional lifting techniques<br>• Avoid placing hands/fingers in pinch point locations<br>• Maintain awareness of walking surfaces<br>• Label IDW with generator, a contact number, identification of contents, and site location<br>• Specify IDW as either hazardous or non-hazardous material | CRA Geologist |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

CONESTOGA-ROVERS & ASSOCIATES

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www.CRAworld.com

# MEMORANDUM

TO: File

REF. NO.: 400012

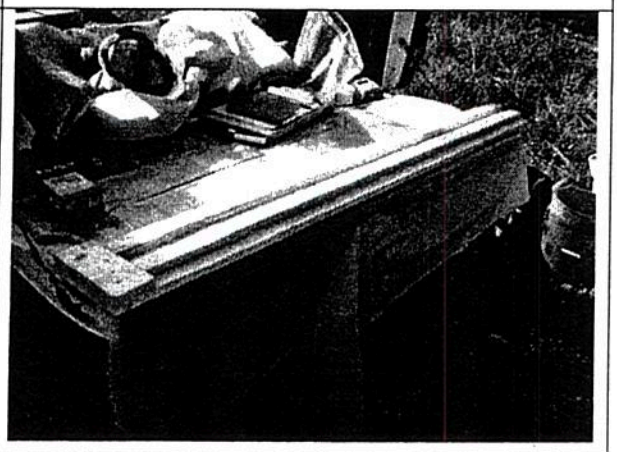
FROM: Bob Bonsall, Bill Doyle, Jon Greetis, Phil Harvey, Dave Millard, Walt Pochron, Sadie Punch, Brian Sandberg

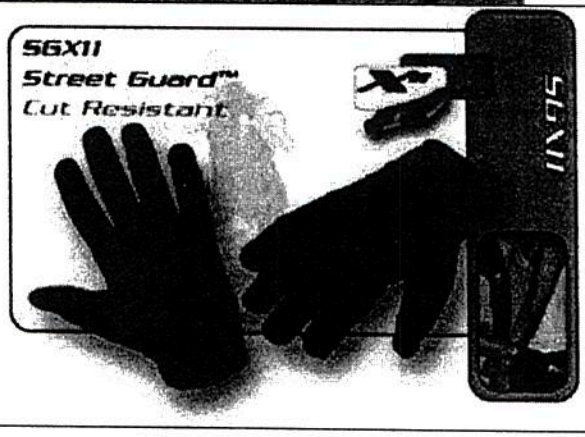
DATE: 10/31/2007

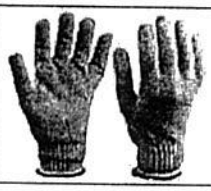
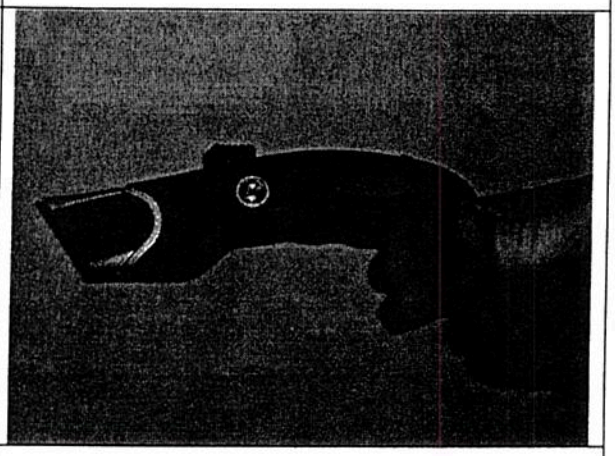
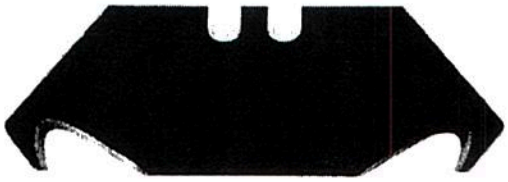
C.C.:

RE: **List of Equipment related to the Job Safety Analysis for Opening Acetate Liners (Direct Push Soil Sampling Operations)**

The following is a list of equipment listed in the Job Safety Analysis (JSA) for Opening Acetate Liners associated with direct-push hydraulic soil probing operations.

| Task: | Equipment Description: | |
|---|---|---|
| Opening the sample liner - securing the liner | Geoprobe® Universal Liner Holder<br>http://www.geoprobe.com<br>Part Number: 22734<br><br>Note: this photo shows a secure work surface, with the Liner Holder clamped in a vice mounted on the drilling rig.<br><br>Photo courtesy of Geoprobe®. Note that CRA's JSA for this task requires that the individual opening the liner wear protective gloves. | |
| | Liner holder constructed using 1" x 8" and 1" x 2" lumber. The gap between the two "rails" measures approximately 1.5" to fit liners used with the Geoprobe® Macro Core System. If the Geoprobe ® DT325 system is used, the liners are larger (1.85"), therefore, a different sized gap may be required.<br><br>What is not shown is an overhang built onto the bottom of the cutting board (on the right-side end in this photo) that anchors it to the truck tailgate, opposite the pulling motion of the cutting tool (in this photo, the liner would be cut from right to left). |  |

| Task: | Equipment Description: | |
|---|---|---|
| Opening the sample liner – use the correct tool for opening acetate liners | Geoprobe MC Liner Cutter for Macro Core soil sampling system (shown pictured) – 1.5" core diameter. Part Number: AT8010<br><br>Geoprobe DT325 Liner Cutter for DT325 sampling system– 1.85" core diameter. Part Number: 26155 | |
| Use proper work gloves | Kevlar Gloves<br>(http://www.seattlemarine.net/atlas_gloves/cut_resistant_gloves.htm) | |
| | Anti-puncture/cut Police Gloves<br>(http://www.red-diamond-unif.com/hatch3.htm) |  |

| Task: | Equipment Description: | |
|---|---|---|
| | Turtle Skin gripped gloves<br>https://www.turtleskin.com/store/category.aspx?categoryID=4 |  |
| | Leather work gloves (typ.) | |
| Cutting a resistant, crimped, or otherwise damaged acetate liner with a safety knife | Uline Comfort Grip Safety Knife, model H-1370<br>http://www.uline.com/ProductDetail.asp?model=H-1370<br><br>This knife is equipped with a self-retracting blade.<br><br>Martor USA also makes a self-retractable. |  |
| | Stanley 11-961 - Regular Hook Blades (5-Pack) |  |

# JOB SAFETY ANALYSIS (JSA)

## Opening Acetate Liners from Direct Push Probing

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction |
| **Work Type:** | Environmental/Remediation/Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Soil sampling | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Direct-push hydraulic soil probe, liner holder, cutting tools, extra blades | | |
| **Task-specific Training:** | Hand Tool Safety, Drilling Safety | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☐ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☒ PPE Clothing* | ☐ Airline Respirator (attach description) | ☒ Half Mask APR | ☐ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements. Upgrade to appropriate PPE if Action Level achieved (see Table B.6.2).

Cut-resistant gloves – see table below for specifications.

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Opening Acetate Liners from Direct Push Probing

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Discuss STAR and (SWA) | • Site personnel not aware of STAR and SWA | • Project team (CRA) discusses importance of and documentation procedures for SWA during pre-job safety meeting. Use SWA to stop any work that is unsafe. | All Staff |
| 2 | Unload equipment from vehicle | • Back strain<br>• Cuts<br>• Pinch points<br>• Hand/foot injury<br>• Damaged equipment | • Use proper lifting techniques and buddy system if needed.<br>• Wear leather/cotton gloves to minimize minor cuts/abrasions and avoid placing hands/fingers in pinch point locations.<br>• Wear steel toe boots.<br>• Be aware of equipment that may have shifted during transport. | All Staff – Consultant, Contractors |
| 3 | Inspect sampling equipment | • Lost time from improperly functioning equipment<br>• Incorrect sampling procedures/ collection due to malfunctioning equipment | • Ensure all equipment is functioning properly before mobilizing to job site.<br>• Review sampling procedures and sampling plan (if available). | Sampling Technician |
| 4 | General sample handling | • Exposure to contaminated materials/soils/groundwater | • Wear appropriate PPE including nitrile gloves, safety glasses and neck-to-toe clothing. Review HASP.<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | All Staff – Consultant, Contractors |
| 5 | Opening the sample liner | • Sharp tools | • Ensure that you have a steady work surface (e.g., tailgate of a pickup, sturdy portable folding table).<br>• Secure the liner prior to cutting<br>**Best Practice**:<br>- Use Geoprobe® Universal Liner Holder (catalog no. 22734)<br>• Use Correct Tools For Opening Acetate Liners<br>**Best Practice**:<br>- Use Geoprobe® DT325 Liner Cutter for DT325 soil sampling system (1.85" core diameter)<br>- Use Geoprobe ® MC Liner Cutter for Macro Core soil sampling system (1.5" core diameter) (AT8010)<br>• Ensure proper footing and lighting<br>• Use proper work gloves<br>**Best Practice**:<br>- Kevlar Gloves (http://www.seattlemarine.net/atlas_gloves/cut_resistant_gloves.htm)<br>- Anti-puncture/cut Police Gloves (http://www.red-diamond-unif.com/hatch3.htm)<br>- Turtle Skin gripped gloves (https://www.turtleskin.com/store/category.aspx?categoryID=4)<br>- Leather work gloves<br>• Cut the liner using the specialty cutting tool using a pulling motion to pull the tool across your body, but not directly toward it.<br>• Ensure that there are no bystanders or obstructions in the path of the cutting tool.<br>• If a cut cannot be started in the liner with the Geoprobe cutting tools STOP WORK and re-assess using the procedures listed below. | Contractor or Sample Technician |

# JOB SAFETY ANALYSIS (JSA)

## Opening Acetate Liners from Direct Push Probing

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 6 | Assess why cut cannot be started using specialized liner cutters | • Management of change | • Dull Blade - a dull blade(s) requires more force and is more likely to slip than a sharp one. Change the blade whenever it starts to tear instead of cut. See proper procedure below.<br>• Cut cannot be started due to soil conditions, or crimping or other damage to the acetate liner. See proper procedure below. | All Staff – Consultant, Contractors |
| 7 | Changing blades in the specialty cutting tool | • Cuts due to sharp edges<br>• Chemical hazard | • Use a proper tool (e.g. a screwdriver) to access the blades and ensure a good fit.<br>• Have a suitable surface to work on such as a table or tailgate.<br>• Ensure proper footing and lighting.<br>• Wear cut/puncture resistant gloves.<br>• Avoid holding on to other objects while changing the blades (such as the new blades) or for balance.<br>• Always hold the blade at the non-sharp side.<br>• Make sure to re-assemble the tool correctly. Make sure screws are tight.<br>• Clean/decon tool before performing maintenance. | Contractor or Sample Technician |
| 8 | Disposal of used blades | • Cuts due to sharp edges | • While wearing cut/puncture resistant gloves, carefully wrap a spent blade in several layers of tape to cover the sharp edges and points.<br>• Dispose of spent blades and associated litter so that the sharp edges do not puncture a trash bag. | Contractor or Sample Technician |
| 9 | Cutting a resistant, crimped, or otherwise damaged acetate liner with a safety knife. Assumes that the condition of the liner prevents the use of the specialty-cutting tool in its standard configuration | • Sharp tools<br>• Exertion<br>• Line-of-fire | • Remove one of the two blades from the specialty cutting tool, and then attempt to cut the liner. If successful, twist the liner approximately 60 to 90 degrees down the radial axis before making a second cut. It may be most appropriate to continue the job using the specialty cutting tool in this configuration, if site conditions are causing multiple liners to become damaged.<br>• If liners still cannot be cut with the specialty cutting tool, the most appropriate method is to use a safety knife with a self-retracting hook blade to cut through only the damaged/affected portion of the liner, then resume with the specialty-cutting tool as described above (with either one blade or two installed).<br>**Best Practice**<br>- Uline Comfort Grip Safety Knife, model H-1370 (http://www.uline.com/ProductDetail.asp?model=H-1370)<br>- Hook Blades: Stanley 11-961 - Regular Hook Blades (5-Pack)<br>• The safe procedure for cutting the liner with a safety knife is described below:<br>• Always be sure that blades are properly seated in knives and that knives are properly closed and/or fastened together before use.<br>• Always use sharp blades. A dull blade requires more force and is more likely to slip than a sharp one. Change the blade whenever it starts to tear instead of cut.<br>• Always wear a cut resistant glove on your free hand while cutting with a self-retracting hook bladed razor knife.<br>• Always keep your free hand (and other body parts) away from the line of the cut. Never cut towards yourself (body, hands, face, etc.).<br>• Always pull - never push the knife. The blade could break off, wedging in the material and cutting your arm severely as it passes over the broken blade.<br>• Blades are brittle and can snap easily. Do not bend or apply side loads to blades by using them to pry loose objects. | Contractor or Sample Technician |

# JOB SAFETY ANALYSIS (JSA)

## Opening Acetate Liners from Direct Push Probing

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| | | | • Do not overexert yourself – ensure you can maintain complete control of the knife throughout the cut. | |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Excavation Oversight - Confirmation Sample Collection

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | [Construction/Office Work/O&M/Drilling/Maintenance/Demolition/Decommissioning] |
| **Work Type:** | [Environmental/Remediation/Construction/General Industry] | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Excavation oversight - confirmation sample collection | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | | | |
| **Task-specific Training:** | Excavation Safety | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☒ Hard Hat | ☒ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☒ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☒ Other* Photoionization Protector | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade to appropriate PPE if Action Levels achieved (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Excavation Oversight - Confirmation Sample Collection

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | General site activities/traverse site to set up and remove sampling supplies at predetermined sampling location | • Property damage and personal injury from contact with heavy equipment (i.e., excavator, trucks, etc.)<br>• Slip/trip/fall hazards from uneven terrain, piping, weather conditions, and/or overloading/awkward load<br>• Injury from biological hazards<br>• Personal injury from poor ergonomics<br>• Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Personal injury from falling into excavation/ engulfment | • Keep visual contact with the operator at all times when approaching equipment; have a clear view of your surroundings<br>• Keep a clear view of other moving equipment on site to assure no unexpected movements<br>• Restrict dump trucks to designated roads and/or paths<br>• Recognize and identify surface anomalies caused by traffic, existing structures (i.e., piping), and vegetation (STAR)<br>• Use mechanical assistance or take multiple trips to carry equipment<br>• Inspect travel path for weather-related hazards (i.e., puddles and/or mud; use established path and/or access ways<br>• Lift with your legs when moving sampling supplies<br>• Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing<br>• Make sure grip is adequate; use gloves to enhance grip when necessary<br>• Reduce travel distance when carrying materials or equipment<br>• Personnel should stay at least 2 feet from edge of excavation<br>• Install orange construction fencing around excavated area if left unattended<br>• If temporary security fencing is utilized, inspect it and remove hazards related to protruding wire ties, fencing, etc.<br>• No personnel should enter a trench >4 feet in depth<br>• Trenches >4 feet should have the walls sloped backwards; note the competency of the soil to assess degree of slope<br>• Provide OSHA acceptable exits into trenches and excavations at an interval <25 feet<br>• Keep all excavated material a minimum of 2 feet from the edge of the excavation | |

# JOB SAFETY ANALYSIS (JSA)

## Excavation Oversight - Confirmation Sample Collection

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 2 | Collect soil sample from excavator bucket | • Hearing loss from excessive noise<br>Exposure to contaminates; soil, water, particulates and vapor<br>• Personal injury from broken glass container<br>• Personal injury from contact with excavator bucket | • When sound level exceeds 85 dB, wear hearing protection<br>• Rule of Sound: If you are normal conversation distance and need to raise voice, put on hearing protection<br>• Monitor breathing zone with PID and upgrade PPE as per HASP<br>• Wear nitrile gloves when handling impacted materials<br>• See General Site Activities Step 1<br>• Utilize dust mask to minimize inhalation of particulates<br>• Inspect container/cooler for broken glass<br>• Inspect glassware prior to filling for cracks<br>• Dispose of broken glassware in appropriate waste receptacle<br>• Make sure bucket is lowered to ground surface prior to approaching<br>• Do not approach bucket until the operator indicates it is safe<br>• Do not turn your back to the bucket until >10 feet out of swing radius of equipment<br>• Communicate to operator when safe to lift the bucket and proceed with work activities<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | |
| 3 | Decontaminate sampling equipment | • Exposure to contaminates; soil, water, particulates and vapor<br>• Personal injury from contact with sharp tools | • Wear nitrile gloves when handling impacted materials<br>• See General Site Activities Step 1<br>• Utilize dust mask to minimize inhalation of particulates<br>• Dispose of affected materials in designated containers that are labeled with type of waste<br>• Don leather gloves to prevent cuts from sharp or rough edges<br>• Place sampling tools with sharp or pointed edge down in decontamination container | |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Monitoring Well Sampling

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Operation & Maintenance |
| **Work Type:** | Environmental | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Monitoring well sampling/gauging | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | | | |
| **Task-specific Training:** | [Identify any special/additional training necessary to safely complete this task] | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | Supplied Air | APR | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☐ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade to appropriate PPE if action level achieved (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Monitoring Well Sampling

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Coordinate site access | • Delays or added work | • Notify Station Manager of schedule<br>• Notify other required personnel if applicable (city, regulators, private property owners, etc.) | |
| 2 | Mobilize with proper equipment/ supplies for sampling | • Delay or improper/unsafe performance of work due to improper equipment on site<br>• Cross-contamination of wells | • Review work plan to determine equipment/supply needs<br>• Make sure all sampling/gauging equipment is decontaminated<br>• Bring ice for sample storage<br>• Review THE HASP and gather necessary PPE | |
| 3 | Notify other personnel on site | • Unknown traffic or other work hazards<br>• Lack of communication between all interested parties | • Meet with station attendant or other site personnel and explain planned activities | |
| 4 | Determine sampling order | • Cross-contamination of samples and wells due to incomplete decontamination of sampling equipment | • Review prior analytical results and set sampling order from lowest to highest concentration wells | |
| 5 | Perform STAR and tailgate safety meeting upon arrival at site | • Consider worst-case scenario (including weather conditions) | • Review HASP with co-workers<br>• Highlight aspects identified by HASP and, if necessary, add to HASP<br>• Get signature of all co-workers on HASP | |
| 6 | Set up exclusion zone(s) | • Injury or exposure to public or other on-site personnel<br>• Slip/trip/fall hazards | • Implement exclusion zone setup instructions of THE HASP (barricades, caution tape, cones, etc.)<br>• Set up work area free of trip hazards | |
| 7 | Gauge water levels and product thickness (where applicable) in wells | • Back strain<br>• Inhalation or dermal exposure to chemical hazards | • Don any additional PPE and initiate air quality monitoring in accordance with the HASP<br>• Maintain safe distance from well head<br>• Bend at knees, not waist | |
| 8 | Purge well(s) and collect purge water | • Cross-contamination<br>• Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Inhalation or dermal exposure to chemicals<br>• Slip/trip/fall hazards<br>• Spilling contaminated water | • Decontaminate purging equipment between each sampling location<br>• Reduce travel distance when there is a need to carry/lift materials<br>• Make sure grip is adequate; wear leather/cotton gloves<br>• Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing<br>• Use PPE and monitoring in accordance with the HASP<br>• Keep work area clear of tripping or slipping hazards<br>• Store purge water in appropriate containers | |

# JOB SAFETY ANALYSIS (JSA)

## Monitoring Well Sampling

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 9 | Collect samples in accordance with sampling plan | • Cross-contamination<br>• Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Inhalation or dermal exposure to chemical hazards<br>• Slip/trip/fall hazards<br>• Improper labeling or storage<br>• Injury due to acid burn (unsealed or leaking sample bottle)<br>• Injury from broken sample bottle (cuts or acid burn) | • Use PPE in accordance with the HASP<br>• Use PPE whenever handling or labeling samples<br>• Decontaminate sampling equipment between each well (unless disposable)<br>• Refer to step 9 and the HASP for additional lifting methods<br>• Label samples in accordance with sampling plan<br>• Keep samples stored in proper containers, at correct temperature, and away from work area<br>• Wear nitrile gloves when handling bottles<br>• Handle bottles carefully | |
| 10 | Dispose or store purge water onsite | • Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Exposure to chemicals<br>• If disposing through on-site treatment system, damage or injury from improper use of equipment<br>• Improper storage or disposal | • Use proper equipment to transport water (pumps, drum dollies, etc.)<br>• Refer to step 9 and the HASP for additional lifting methods<br>• Where PPE in accordance with the HASP<br>• Review any necessary instructions for use of on-site treatment systems<br>• Label storage containers properly and locate in isolated area away from traffic and other site functions<br>• Coordinate off-site disposal (where applicable) | |
| 11 | Clean site/demobilize | • Traffic<br>• Nuisance or safety hazard left on site<br>• Back strain | • Use buddy system as necessary to remove traffic control<br>• Leave site clean of refuse and debris<br>• Notify station personnel of departure, and note any purge water left on site<br>• Exercise caution when lifting coolers out of the trunk of a car; use the buddy system if justified | |
| 12 | Package and deliver samples to lab | • Bottle breakage<br>• Improper temperature<br>• Exceeding hold times<br>• Improper completion of Chain of Custody (COC) | • Pack samples in ice, use bubble wrap/bags for sample bottles<br>• Use standard COC forms and labels<br>• Submit samples to lab as soon as possible (no more than 3 days, but check sampling plan for any special requirements such as rush turnaround or special hold time restrictions) | |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Soil Borings

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Construction/O&M/Drilling |
| **Work Type:** | Environmental/Remediation/Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Soil boring | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Air monitoring equipment, safety cones/fencing/barricades | | |
| **Task-specific Training:** | [Identify any special/additional training necessary to safely complete this task] | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | | |
|---|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate | ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined | |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas | |
| ☐ Other* | | | ☐ Other* | ☐ Other* | | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

See Table B.6.1 for Zone-specific PPE requirements

Upgrade to appropriate PPE if action level exceeded (see Table B.6.2)

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Soil Borings

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Markout underground utilities | • Property damage<br>• Explosion<br>• Electrocution<br>• Injury<br>• Death | • Call public underground utility agency (One-Call) at least 5 or more days prior to work activities<br>• Review state law pertaining to underground pipe line safety and have private utility mark-out performed<br>• Expose lines if warranted (i.e., hand dig, test pit, or daylight) | Project Manager and Site Supervisor |
| 2 | Conduct site walk, identify unsafe conditions, and determine sample point locations | • Traffic<br>• Slip/trip/fall hazards<br>• Biological hazard<br>• Overhead/underground hazards | • Maintain awareness of on-site traffic and walking surfaces<br>• When selecting soil boring locations, be aware of biological hazards (e.g., ants, poison ivy, wasps) and overhead/underground hazards (e.g., overhead utilities, concrete scarring, station canopy) | Site Personnel |
| 3 | Equipment inspection | • Pinch points<br>• Property damage<br>• Lost time due to damaged equipment/parts | • Discuss pinch points on equipment (e.g., drill rig, air knife, pressure washer, etc.)<br>• Familiarize all personnel with location/operation of fire extinguisher(s) and kill switch on drill rig<br>• Visually inspect equipment/parts for damage and document inspections | Site Personnel |
| 4 | Set up work zone for drilling | • Traffic<br>• Slip/trip/fall hazards<br>• Property damage<br>• Overhead hazards<br>• Environmental impact | • Maintain awareness of on-site traffic, work zones, walking surfaces, overhead hazards (e.g., canopy and low hanging overhead lines)<br>• Utilize barricades/cones/caution tape to define work zone and direct traffic<br>• Wear leather/cotton when setting up barricades<br>• Be aware of any potential sensitive receptors and verify all personnel are aware of the location of spill kit | Site Personnel |
| 5 | Set up staging area | • Traffic<br>• Slip/trip/fall hazards<br>• Lifting hazards<br>• Manual material handling<br>• Back injury<br>• Pinch points<br>• Heat/cold stress | • Maintain awareness of on-site traffic and walking surfaces<br>• Utilize barricades/cones/caution tape to define work zone and direct traffic<br>• Reduce travel distance when there is a need to carry/lift materials<br>• Make sure grip is adequate; wear leather/cotton gloves<br>• Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing<br>• Avoid placing hands/fingers in pinch point locations<br>• In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers) | Site Personnel |

# JOB SAFETY ANALYSIS (JSA)

## Soil Borings

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 6 | Contractor oversight/ management of hole clearance/drilling activities | • Traffic<br>• Slip/trip/fall hazards<br>• Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Underground utilities<br>• Contaminant exposure<br>• Heat/cold stress | • Maintain awareness of on-site traffic and practice good house keeping<br>• Ensure subcontractors don proper PPE (e.g., face shield, leather/cotton gloves, hearing protection) and utilize proper lifting techniques<br>• If non-native material (e.g., pea gravel, sand, fill material) or underground utilities are observed, utilize SWA and assess situation<br>• Perform a prestart meeting, inform the subcontractor of safe lifting practices<br>• Refer to the HASP for additional lifting information<br>• Monitor safe drill movement/positional setup<br>• Monitor breathing zone and refer to the HASP for action levels<br>• Monitor all personnel for signs and symptoms of heat/cold stress and refer to the HASP for recommendations<br>• Be aware of unsafe hoisting and material handling practices<br>• Be aware of proper augering and auger handling techniques<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | Site Personnel |
| 7 | Site/boring security | • Traffic<br>• Slip/trip/fall hazards<br>• Lifting hazards<br>• Back injury<br>• Manual material handling | • Wear leather/cotton gloves when moving barricades<br>• Maintain awareness of on-site traffic and walking surfaces<br>• Maintain proper lifting techniques as described in steps 5 and 6.<br>• Ensure good housekeeping methods are practiced and work area is kept clean of debris<br>• Secure boring location if open overnight | Site Personnel |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Soil Sampling

Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Drilling, Soil Sampling |
| **Work Type:** | Environmental/Remediation/Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Soil sampling | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | Air monitoring equipment, PPE | | |
| **Task-specific Training:** | CRA Field Method Training on Soil Sampling Procedures | | |

| **MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)** | | | | | |
|---|---|---|---|---|---|
| ☒ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☒ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☒ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☒ Hearing Protection* | ☒ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☒ Particulate/Organic Vapor Combined |
| ☒ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |
| **ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)** | | | | | |
| See Table B.6.1 for Zone-specific PPE requirements | | | | | |
| Upgrade to appropriate level of PPE if Action Level achieved (see Table B.6.2) | | | | | |

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Soil Sampling

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Discuss STAR and SWA | • Site personnel not aware of STAR and SWA | • Project team (CRA) discusses importance of and documentation procedures for SWA during pre-job safety meeting<br>• Use SWA to stop any work that is unsafe | Site Personnel |
| 2 | Inspect and calibrate sampling and monitoring equipment | • Lost time from improperly functioning equipment<br>• Incorrect sampling procedures/ collection due to malfunctioning equipment | • Ensure all equipment is functioning properly<br>• Complete Quality Control documents | Sampling Technician |
| 3 | Prepare to collect soil samples | • Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Pinch points<br>• Cuts<br>• Punctures<br>• Sample misidentification | • Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing<br>• No bending or twisting while under load<br>• Refer to the HASP for additional lifting information<br>• Avoid placing hands/fingers in pinch point locations<br>• Use proper tools when opening container packaging<br>• Do not use fixed open blade knives when opening boxes or containers<br>• Ensure the sample id label matches sample location with site plan/CRA site supervisor/subcontractor | Sampling Technician |
| 4 | Opening the sample sleeve (if applicable) | • Cuts due to sharp edges of sample sleeve<br>• Contaminant exposure | • Use sleeve cutter for opening the sample sleeves<br>• Keep hands clear of the sleeve when cutting<br>• Wear nitrile gloves<br>• Maintain awareness of sharp edges of sample sleeve | Sampling Technician |
| 5 | Sample collection | • Contaminant exposure<br>• Cuts from container breakage<br>• Sample misidentification<br>• Atmospheric hazards | • Wear nitrile gloves and replace between soil samples<br>• Inspect glass bottles for breaks/cracks<br>• Do not attempt to use any suspect containers<br>• Close glass sample containers carefully to avoid breakage<br>• Check sample labels for accuracy prior to placing in cooler<br>• Initiate appropriate PPE upgrade if Action Level as indicated in Table 6.2 is exceeded | Sampling Technician |
| 6 | Headspace screening of samples | • Contaminant exposure<br>• Incorrect headspace readings | • Wear nitrile gloves<br>• Ensure proper calibration of equipment | Sampling Technician |
| 7 | Sample selection | • Bottle breakage<br>• Contaminant exposure<br>• Pinch points<br>• Lost time due to incorrect sample selection | • Wear nitrile gloves when handling sample containers<br>• Confirm selected samples are correct based on work plan selection criteria, PID readings, and soil boring logs<br>• Avoid placing hands/fingers in pinch point locations (e.g., between cooler and lid) | Sampling Technician |

# JOB SAFETY ANALYSIS (JSA)

## Soil Sampling

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 8 | Packing samples in cooler(s) | • Bottle breakage<br>• Contaminant exposure<br>• Cuts<br>• Pinch points<br>• Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Lost time due to incorrect sample packaging or hold time exceedances | • Wear nitrile gloves when handling sample containers<br>• Pack glass containers in bubble wrap<br>• Check COC against sample labels and SSOW for accuracy before shipping<br>• Avoid placing hands/fingers in pinch point locations (e.g., between cooler and lid)<br>• Use proper lifting techniques as discussed in step 3<br>• If possible use a dolly or cart if cooler is heavy or has to be moved over a long distance<br>• Ensure equipment and supplies are loaded correctly and do not shift during transport | Sampling Technician |
| 9 | Investigation derived waste (IDW) management | • Contaminant exposure<br>• Lifting hazards<br>• Back injury<br>• Manual material handling<br>• Pinch points<br>• Slips/trips/fall hazards<br>• Mislabeled waste | • Wear nitrile gloves when handling IDW<br>• Use proper lifting techniques as discussed in step 3<br>• Avoid placing hands/fingers in pinch point locations<br>• Maintain awareness of walking surfaces<br>• Label IDW with generator, a contact number, identification of contents, and site location<br>• Specify IDW as either hazardous or non-hazardous material | Sampling Technician |

(1) Each Job or Task consists of a set of steps. Be sure to list all the steps in the sequence that they are performed. Specify the equipment or other details to set the basis for the potential (associated) hazards.

(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

(3) Aligning with the Job Steps, Task Activity Description, and Potential Hazard columns, describe what actions or procedures are necessary to eliminate or minimize the hazards. Be clear, concise and specific. Use objective, observable, and quantified terms. Avoid subjective general statements such as "be careful" or "use as appropriate".

# JOB SAFETY ANALYSIS (JSA)

## Mobilization-Demobilization

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

Field staff must review job-specific work plan and coordinate with project manager to verify that all up-front logistics are completed prior to starting work including, but not limited to, permitting, access agreements, and notification to required contacts (e.g., site managers, inspectors, clients, subcontractors, etc.). Additionally, a tailgate safety meeting must be performed and documented at the beginning of each workday. **Stop, Think, Act, Review (STAR)** must be used prior to any activity. All personnel must possess the appropriate training prior to initiating scheduled tasks. Also consider weather conditions. CRA personnel have the authority and responsibility to use **Stop Work Authority (SWA).**

| | | | |
|---|---|---|---|
| **Date Issued/Revised:** | 04/08/2009 | **JSA Type:** | Mobilization/Demobilization |
| **Work Type:** | Environmental/Remediation/Construction | **Client:** | Atkemix Ten Inc. |
| **Work Activity:** | Construction | | |
| **Work Site:** | Atkemix Ten Site 6100 Campground Road, Louisville, KY 40216 | | |
| **Key Equipment:** | | | |
| **Task-specific Training:** | | | |

**MINIMUM REQUIRED PERSONAL PROTECTIVE EQUIPMENT (see job steps for task-specific requirements)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Reflective Vest | ☐ Goggles | ☒ Gloves* | **Supplied Air** | **APR** | |
| ☐ Hard Hat | ☐ Face Shield* | ☐ Coveralls* | ☐ SCBA | ☐ Full Face APR | ☐ Particulate ☐ Organic Vapor |
| ☐ Lifeline/Harness* | ☐ Hearing Protection* | ☐ PPE Clothing* | ☐ Airline Respirator (attach description) | ☐ Half Mask APR | ☐ Particulate/Organic Vapor Combined |
| ☐ Safety Glasses | ☒ Safety-toed Boots | | | | ☐ Acid Gas |
| ☐ Other* | | | ☐ Other* | ☐ Other* | |

**ADDITIONAL PPE (*provide specific type(s) or descriptions of this item below)**

| Project Development Team Name | Signature | Position/Title | Modified By | Reviewed By | Position/Title | Date |
|---|---|---|---|---|---|---|
| Rob Dickson | | | | | | |
| Wayne St.Denis | | RSHM | | | | |
| | | | | | | |
| | | | | | | |

# JOB SAFETY ANALYSIS (JSA)

## Mobilization-Demobilization

CRA SMART PROGRAM
Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 1 | Discuss STAR and SWA | • Site personnel not aware of STAR and SWA | • Project team (CRA) discusses importance of and documentation procedures for SWA during pre-job safety meeting<br>• Use SWA to stop any work that is unsafe | |
| 2 | Check weather | • Unexpected storm<br>• Fog; rain; snow; lightening/thunder<br>• Heat/cold stress | • Check local weather forecast<br>• Discuss weather issues and precautions to take while driving and on site during the pre-job safety meeting<br>• If weather conditions (e.g., fog, rain, snow, etc.) impair the ability/vision of the driver, exit at nearest safe location and assess the situation<br>• While on site, at first sign of lightening/thunder utilize SWA and assess weather conditions<br>• In extreme temperatures, ensure all personnel have proper clothing, hydration, and heat/cold protection (e.g., canopy, fan, glove warmers) | |
| 3 | Load equipment into vehicle | • Lifting hazards<br>• Manual material handling<br>• Back injury<br>• Cuts<br>• Pinch points<br>• Hand/foot injury<br>• Forgotten or damaged equipment | • Reduce travel distance when there is a need to carry/lift materials<br>• Make sure grip is adequate; wear leather/cotton gloves<br>• Size up the load; if the object is too large or odd shaped OR is in excess of 50 pounds (23 kg) then assistance (mechanical or a buddy lift) will be required<br>• Lift with the legs (bend at the knees and use the leg muscles) to protect the lower back and keep lower back in a neutral position<br>• Avoid one-handed carrying if possible; maintain awareness of footing<br>• Avoid placing hands/fingers in pinch point locations<br>• Wear safety-toed boots<br>• Verify requested equipment against warehouse form<br>• Load equipment in an organized manner to prevent shifting during transport or use cargo netting | |
| 4 | Complete CRA Daily Operator Vehicle Checklist | • Damaged vehicle lights, tires, windows, mirrors, horn<br>• Inadequate vehicle documents and/or safety items | • Check for fluid leaks under vehicle<br>• Test operation of headlights, front/rear turn signals, backup lights, brake lights, and emergency flashers<br>• Visually check the pressure/wear of tires<br>• Ensure the vehicle has a spare tire<br>• Assure windshield and window glass is clean and free from obstructions<br>• Test the windshield wipers and horn<br>• Verify vehicle registration, insurance card, and inspection sticker is present and valid<br>• Ensure the vehicle contains a first aid kit, fire extinguisher, and road hazard kit | |
| 5 | Check and adjust seat, steering wheel, headrest, and mirrors | • Back/body strain<br>• Blind spot<br>• Impaired vision | • Adjust seat, headrest, and steering wheel height so body is fully supported/comfortable and pedals are within easy reach<br>• Ensure mirrors are properly adjusted | |
| 6 | Fasten seat belt(s) and ensure passenger(s) seat belts are fastened | • Serious injury, ejection, or death from collision and/or traffic citation | • Verify driver and passenger(s) seat belts are in good condition and properly latched | |

# JOB SAFETY ANALYSIS (JSA)

## Mobilization-Demobilization

Safety Means Awareness Responsibility Teamwork

| Job Steps[1] | Task Activity | Potential Hazard(s)[2] | Corrective Measure(s)[3] | Person Responsible |
|---|---|---|---|---|
| 7 | Ensure vehicle doors are locked | • Serious injury, ejection, or death from collision<br>• Unwanted intrusion<br>• Lost equipment | • Manually lock all doors to vehicle | |
| 8 | Start engine and check gauges and warning lights | • Vehicle breakdown | • Verify sufficient fuel and other hazard lamps (e.g., battery, oil, and temperature) are not lit | |
| 9 | Mobilize to site | • Arriving late<br>• Collision<br>• Injury or death to occupants or other parties | • Do not use cell phones or perform other distracting activities while vehicle is in motion<br>• Constantly scan intersections, move eyes, check mirrors, and assess traffic lights (fresh vs. stale)<br>• Maintain safety cushion around vehicle (front, sides, and rear) and 4-second following distance<br>• Utilize all driving defensive techniques | |
| 10 | Arrive at site | • Pedestrian injury<br>• Collision | • Maintain awareness of pedestrian/vehicular traffic when entering site and traveling to work zone | |
| 11 | Park vehicle | • Pedestrian injury<br>• Collision<br>• Property damage | • Maintain awareness of pedestrian/vehicular traffic<br>• Park vehicle in pull-through parking space or facing the exit<br>• Use caution and mirrors/spotter when backing vehicle | |
| 12 | Demobilization | • Collision<br>• Injury or death to occupants or other parties | • Perform perimeter vehicle check<br>• Maintain awareness of pedestrian/vehicular traffic when exiting site<br>• Utilize defensive driving techniques<br>• Complete post-departure checklist and report vehicle problems to company vehicle maintenance manager or rental car agency | |

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(2) A hazard is a potential danger. What can go wrong? How can someone get hurt? Consider, but do not limit, the analysis to: **Contact** - victim is struck by or strikes an object; **Caught** - victim is caught on, caught in or caught between objects; **Fall** - victim falls to ground or lower level (includes slips and trips); **Exertion** - excessive strain or stress/ergonomics/lifting techniques; **Exposure** - inhalation/skin hazards. Specify the hazards and do not limit the description to a single word such as "Caught".

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ATTACHMENT B-5

PRE-DEPARTURE ATV AND UTILITY VEHICLE CHECKLIST

# PRE-DEPARTURE ATV AND UTILITY VEHICLE CHECKLIST

Name of Employee Performing Inspection: _____

Trailer Destination: _____ Date: _____

| Inspection | | | Comments |
|---|---|---|---|
| When the engine is off, check the oil level. Check fuel levels. Make sure there are no leaks. | ☐ Yes | ☐ No | |
| While engine is off, check for loose nuts and bolts. | ☐ Yes | ☐ No | |
| Check tire pressure. | ☐ Yes | ☐ No | |
| Check wheels – Axle nuts are tight and secured with cotter pins. Lug nuts are tight and none missing. | ☐ Yes | ☐ No | |
| All brakes are working properly. Check cables and linkages to insure proper movement. | ☐ Yes | ☐ No | |
| Throttle operates smoothly and snaps back to the idle position when released. | ☐ Yes | ☐ No | |
| Foot shifter firmly attached and positioned in a way that shifting is comfortable. | ☐ Yes | ☐ No | |
| Lights and Switches – Ignition switch functioning properly. Kill switch working properly. All lights working. | ☐ Yes | ☐ No | |
| Check the chain for proper adjustment and lubrication. Check for improper wear. If ATV has drive shaft, check oil level and leaks. | ☐ Yes | ☐ No | |
| Make sure tool kit and emergency equipment available. | ☐ Yes | ☐ No | |

# APPENDIX C

# FIELD SAMPLING PLAN

# TABLE OF CONTENTS


| | | Page |
|---|---|---|
| 1.0 | INTRODUCTION | C-1 |
| 2.0 | GENERAL SAMPLING PROTOCOLS | C-2 |
| 3.0 | SURFACE SOIL SAMPLE COLLECTION | C-3 |
| 4.0 | SAMPLING EQUIPMENT CLEANING | C-4 |
| 5.0 | CHAIN OF CUSTODY | C-5 |

## 1.0 INTRODUCTION

This appendix presents the Field Sampling Plan (FSP) for data collection and remedial field activities associated with the Interim Corrective Measure (ICM) at the South Landfill and Curtain Area Site at Atkemix Ten Inc. in Louisville, Kentucky (Site). This report outlines the protocols that will be implemented during confirmatory soil sampling.

## 2.0 GENERAL SAMPLING PROTOCOLS

The following general procedures will be conducted for all sampling activities presented in this FSP.

1) Prior to sampling at each location, all sampling instruments and equipment will be cleaned in accordance with the protocols presented in Section 4.0.
2) Disposable gloves will be worn by samplers and changed between sampling points. Additional glove changes will be undertaken as necessary.
3) All sampling generated wastes such as gloves, Tyveks, etc., will be collected and consolidated with the waste material for proper disposal.
4) Samples will be labeled noting the location and/or interval, analysis required, preservative added, date, time, and sampler's initials. A hardcover bound field book will be maintained to record all samples and sampling events. Details regarding recordkeeping and labeling are presented in the Quality Assurance Project Plan (QAPP).
5) Sample containers will be packed loosely in laboratory-supplied coolers to allow for placement of cushioning materials (i.e., vermiculite) between bottles to prevent breakage.
6) Following packing of the sample cooler, the completed chain-of-custody (see Section 5.0) will be placed in a watertight plastic bag and attached to the inside of the cooler lid.
7) A signed custody seal will be placed across the cooler closure and the cooler will then be sealed with packing tape. The packing tape will not completely cover the seal.
8) Samples will be handled and shipped in accordance with the protocols described in the QAPP.
9) All samples will be delivered to the laboratory via an overnight courier.
10) At the laboratory, all samples will be stored at 4 degrees Celsius (C) ±2 degrees C.

## 3.0 SURFACE SOIL SAMPLE COLLECTION

Following excavation in Areas 1, 2, 4, and 6, confirmatory soil samples will be collected. The soil samples will be collected at the base of excavation at a frequency of one sample per 2,500 square feet of excavated area. Soil samples will be collected from the top 3 inches using a pre-cleaned trowel, and analyzed for TCL SVOCs to ensure that all material with HCB concentrations above the KYDEP PRG criterion of 1,100 μg/kg has been removed. If analytical results indicate that the HCB concentrations are below 1,100 μg/kg, the excavation will be deemed complete. If the analytical results for HCB are above 1,100 μg/kg, further excavation will be conducted in the area of the exceedance, followed by the collection of additional confirmatory soil samples. The process of excavation and confirmatory sampling will continue until all areas meet the cleanup criterion of 1,100 μg/kg or to a maximum depth of 3 ft bgs.

A sampling grid will be laid out in each of the excavation areas to ensure correct sample spacing. The grid will consist of 50 x 50-foot cells. One confirmatory soil sample will be taken from each cell.

## 4.0 SAMPLING EQUIPMENT CLEANING

Reusable sampling equipment will be cleaned between sampling locations using the following rinse sequence;

1) Wash and scrub with tap water and low phosphate detergent
2) Rinse with tap water
3) Rinse with methanol
4) Thoroughly rinse with deionized demonstrated analyte-free water. The volume of water used must be at least five times the volume of solvent used in step 3)
5) Air dry for 15 minutes
6) Following the final rinse, sampling equipment will be visually inspected to verify that it is free of particulates and other solid material that may contribute to possible sample cross-contamination. Fluids used for cleaning will not be recycled. Washwater, rinse water, and decontamination fluids will be collected and transferred to the on-Site wastewater treatment facility

## 5.0 CHAIN OF CUSTODY

Samples will remain in coolers under the control of the sampling personnel in the field until relinquished to the delivery firm or directly to the laboratory. Chain-of-custody documents will be completed for each sample cooler. The original and two copies will be placed within the cooler. The fourth copy will be retained by the sampler. In addition, Field Sampling Data Sheets and a sample log of samples collected and shipped off Site will be maintained on Site.