

#### LANDFILL ANNUAL REPORT

For Calendar year 2012

FEB 2 6 2013 2013-002070

	Name: Intermountain Re	gional Landfill				
Facility	Mailing Address: PO Box	1889, Salt Lake	City, UT	84110		
		(Number & Stre	eet, Box and/o	or Route)		
	City: Fairfield Town			Zip Code: 840	013	
	County: Utah County			P	ermit Number:	1102
Owner						
	Name: ROC Fund Landfi	ll Holdings, LL	C	Phone No.:	(801)403-7651	
	Owner Mailing Address:	PO Box 1889				
				and/or Route)		
	City: Salt Lake City	State:			Code: 84110	
	Contact Name: Rob Richa			Contact Title:	General Manag	ger
	Contact's Mailing Address					
	Phone No.: (801)403-765					.com
Operato	or (Complete this section only if the	e operator is not an	employee of	the Owner shown ab	ove)	
	Name: <same above="" as=""></same>			Phone No.:		
	Owner Mailing Address:					
	City:	A	(Number & Street, Box State: Utah		and/or Route) Zip Code:	
	Contact Name:					
	Contact's Mailing Address					
	Phone No.:		Contacts	Elliali Addiess.		
<b>Sacility Type</b>	and Status					
	Class I	Class IIIb	×	Class V	- Faci	lity Closed during
	Class II	Class IVa		Class VI	the y	
	Class IIIa	Class IVb		0.000	Date Cle	osed:
	, cass and	Class I v o				
Annual Disp	OSAl (Tons received at the facili	ty for disposal)	*.000			
Waste Type	Wast	e Origin		]	Total	Measurement
	In-State	Out-o	f-State			Tons Cubic Yar
Municipal	18,517.05	0.00		18,517.05		R L
ndustrial	10,017100					
C/D*	***************************************	-				, , ,
*C/D was	ste includes all waste going to a Cla	ass IV or VI landfill	cell			, ,
Conversion F	Factor Used					
	40.01 COVA				100	

Recycling
Material Recycled: 17.50 Reported in Tons ⋉ Cubic Yards ☐
Utah Disposal Fee
Disposal fee required to be paid to State Yes No (If yes please show fees paid below)
Municipal: \$2,407.22 Industrial: C/D: Annual:
Municipal, Industrial and C/D are fees paid by Commercial Facilities. Annual fee is paid by facilities operated by a municipali
Current Landfill Remaining Capacity
Tons: 17,000,000.00 Cubic Yards: 27,000,000.00 Acre: 285.00 Years: 50.00
Acres Currently Open: 7.50 Acres Currently Closed: 0.00
inancial Assurance
Current Closure Cost Estimate: \$817,036.00
Current Post-Closure Cost Estimate: \$690,000.00
Current Amount or Balance in Mechanism: \$1,714,711.00
(If facility permit has been renewed and if balance does not equal or exceed total for closure and post-closure care please contact the Division of the property of the proper
Current Financial Assurance Mechanism: Bond
(ie Bond, Trust Fund, Corporate or government Test etc.)
Current Financial Assurance Mechanism Holder: Travelers Casualty and Surety Company of America
(ie. Name of Bond Company, Bank etc. Account number)
Financial Assurance: Each facility must recalculate the cost of closure and post-closure care to account for inflation and design changes each year. The inflation factor can be found on the Division web page. Facilities that are using a trust account should include a copy of the most recent account statement.  Note Facilities using "Local Government Financial Test" or the "Corporate Financial Test" must provide the information required in R315-309-8(4) or R315-309-9(3) each year.
Other Reports and Information to be Submitted with Annual Report
Ground Water Monitoring: Class I and V landfills only. Check if exempt
Explosive Gas Monitoring: Class I, II and V landfills only. Check if exempt
Does the facility have a landfill gas collection system  Yes No   X
If yes please briefly describe use of gas, e.g., flared or used for electricity generation.
Training Report: A report of all training programs or procedures completed by facility personnel during the year.
Signature: Date: 2-25-2013
ignature should be by an executive officer, general partner, proprietor, elected official, or a duly authorized representative. A duly authorized representative in the requirements of the solid waste rules (UAC R315-310-2(4)(d)).
Type Name: Rob Richards  Title: General Manager

### **Intermountain Regional Landfill**

### **2012 Annual Report**

#### **Attachment List**

Attachment A - Weekly Operator Training Manual

Attachment B - Intermountain Regional Safety Policy Manual

Attachment C - Monthly Training Records for HHW

Attachment D - Landfill Inspection and Load Inspection Forms

Attachment E - December 2012 Groundwater Statistical Analysis Report

Attachment F - Explosive Gas Sampling Report

Attachment G - Closure & Post Closure Care Cost Estimate, Surety Bond

### Attachment A - Weekly Operator Training Manual

Includes program for weekly Safety, Operations, and Material Handling

All trainings materials documented and included in Daily Operating Record which is kept at the site



## Operator Visibility Around Heavy Equipment

Toolbox Talks are intended to facilitate health and safety discussions on the jobsite. For additional Toolbox Talks, please visit SAFETY.CAT.COM™

#### **TOPIC: Operator Visibility Around Heavy Equipment**

In some cases, it is nearly impossible for an operator to see a person standing next to the equipment. An operator must always remain patient and cautious. Never proceed or use reverse to back into an area without knowing what is there

Listed below are some of the more common safety tips to observe to help improve operator visibility.

#### Before operating at the worksite:

- Know the locations where personnel commonly work or visit. Understand where the restricted zones are located.
- Identify traffic hazards, poor road conditions, obstructed intersections and areas where the equipment will be operating in reverse (parking, loading and unloading locations).
- ☑ Use a spotter at all locations where it is impossible for the equipment operator to verify it is safe to proceed. As a reminder, do not operate in a work area if it is not clear.
- Ensure personnel in the work area are wearing clearly marked reflective vests.

#### Tips for improving operator visibility on the mobile equipment:

- ☑ Make sure windows are clean and unobstructed.
- ✓ Verify mirrors are clean and in a position to provide the best visibility to the ground, wheels and adjacent objects.
- While sitting in the cab, identify the areas of limited visibility and what level of risk each presents.
- ☑ Ensure the back-up alarms, horns and other audible controls are working.
- Routinely inspect the condition of windshield wipers and replace when signs of deterioration exist.

#### Questions to Generate Discussion

- What areas or tasks at your job site create the poorest visibility to pedestrians and other obstructions?
- What safety controls can be implemented or improved to increase operator visibility around heavy equipment?

Employee Participants:

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TOPIC: The safe operation of a machine on a slope relies on three factors: the type of terrain, a properly maintained and equipped machine, and a well-trained operator.

#### Type of Terrain

- Uneven terrain can make the machine less stable
- Be cautious of newly filled material
- Be aware of soft / un-compacted areas
- Be alert for buried hard materials that could cause sudden change of center of gravity
- Avoid steep side slope travel. Travel up and down slope or at least 45 degree's to the slope.
- Cover Rocky surfaces can cause a machine to side slip down a slope

#### Properly Maintained and Equipped Machine

- Balance is critical, be sure you have the right equipment and attachments
- Know the weights and balance of any implements being towed
- Be sure you have the correct type of tires
- Make sure the machine's fluids are full
- Always consult the Operator and Maintenance Manual for proper operations and fluid level requirements

#### Well-Trained Operator

- Always read and understand the Operator and Maintenance Manual before operating
- ALWAYS wear your seat belt
- Avoid operating across the slope
- Always operate up and down the slope
- Keep work speed to a safe operating speed for the steepness of the slope (normally 1<sup>st</sup> gear)
- Make sure the heaviest end of the machine is going uphill
- Keep all attachments or pulled loads as low to the ground as possible
- Know when the slope is too steep to be safely worked on
- Identify potential hazards

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# Sate Operation on a Slope — Waste Industry

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TOPIC: No one can anticipate every possible scenario. At some point you will have to rely on your judgment either to avoid a dangerous situation—or to get out of one. Even the best-trained operator has to pay attention on the work site. Situations can change from moment to moment, and your ability to react instantly is vital. Report any problems to your supervisor.

Planning - having a plan, as well as a contingency plan, employee training on those plans, and constantly reviewing those plans with your team will develop a safety awareness that can reduce emergencies before they happen.

#### **Emergency Safety Tips**

- Don't panic. To get control of your situation you must first be in control of yourself.
- Know your tool or machine. Get proper operational training now, before an emergency. And make sure the machine is properly maintained and in good repair.
- Be prepared. You must remain focused, healthy, and alert.
- Communicate. One of the most important things any heavy equipment operator can do is communicate with other operators and the ground crew at the work site.
  - · Use radios.
  - · Avoid making assumptions.
  - · Warn other workers about site conditions.

## Responding To An Emergency = .... Waste Industry

Employee Participants:

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#### **TOPIC: Reducing Noise In The Cab**

#### **Inspect Equipment**

- Always test noise levels in the cab before purchasing a used machine
- Maintain and regularly inspect window and door seals to help manage outside noise
- Find a way to control sources of noise such as the engine, transmission, and hydraulic brakes
- Regularly monitor noise levels

#### Operational

- Keep all doors and windows closed
- Keep all materials in cab contained
- Operate radios at a safe volume to hear all machine sounds safely

#### **Upgrade and Care for Equipment**

- Replace older equipment with new materials and technology
- Install noise-reducing floor mats, insulation, special glass, and any other materials that could help reduce noise
- Replace or relocate mufflers or exhaust pipes whenever necessary
- Take proper care of the air conditioning system to ensure its availability

#### **Make Others Aware**

- Inform other drivers of the potential noise hazards, and keep them aware of prevention methods
- Train drivers to identify and report changes that could have a negative effect on noise levels in the cab

## Reducing Noise In The Cab —Waste Industry

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Protecting the Public — Waste Industry

Toolbox Talks are intended to facilitate health and safety discussions on the job site. For additional Toolbox Talks, please visit SAFETY.CAT.COM™

#### **TOPIC: Protecting The Public**

- Place proper safety signs and instructions for public access to the work area
- Keep public separated from all other commercial traffic
- Alert public when operating a machine for clean up in their area
- Do not allow children or animals out of the vehicles for unloading
- Keep proper safe distance for waste and machine from any public vehicle or person.
- If possible, keep a separate spotter for the public
- Keep the job site fenced off to prevent easy access
- Place barriers before all road entrances to the site and adequately light the entrances
- Ensure there is enough clearance around a job site to protect people from falling material
- When work has stopped for the day, make sure:
  - The boundary is secure
  - All ladders are removed or their rungs boarded
  - All excavations and openings are securely covered or fenced off
  - All mobile equipment is immobilized to prevent unauthorized use
  - Bricks and other materials are safely stacked
  - Flammable or hazardous substances, tools, and other materials are locked away in secure storage locations

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## **TOPIC: Machine Safety – Rollovers in the Waste Industry**

#### What To Do

- If you feel your machine begin to lean in an unstable way, lower all attachments immediately. This will lower the center of gravity and increase stability.
- If you are on an articulated machine, turn the nose of the machine, downhill.
- In waste, work uphill / downhill or at 45 degree angles to the slope
- Inspect the slope for soft, un-compacted areas or hard areas that could cause sudden changes of center of gravity
- If your machine does overturn, stay in the cab until someone can check the outside situation.
  - Your seatbelt is designed to minimize injury, and the cab structure provides more protection than you'll find anywhere else nearby.
  - Heavy equipment and their loads sometimes come to rest in delicately balanced positions—and if you try to get out of the cab, you may upset that balance.
- Call for assistance as quickly as possible.

## Machine Safety-Rollovers - Waste Industry

Employee Partic	ipants:
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## Machine Safety -Fire = Waste Industry

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#### **TOPIC: Machine Safety - Fire in the Waste Industry**

#### Be Prepared

Check fire extinguishers, suppression systems, alarms, and shutdowns regularly to make sure they work properly. If anything is missing or broken, have it replaced or fixed according to the manufacturer's directions.

#### To avoid fires:

- Perform walk around inspections any time off of machine
- Remove waste from heat sources
- Shutoff disconnect when leaving machine for an extended time
- Be alert for fires on machines, vehicles, and in the waste
- Stop the engine before refueling
- Routinely check for fluid leaks
- Do not smoke when using any flammable materials or around batteries

#### What To Do

#### If you have a fire:

- Stop The Vehicle
  - Stop the machine as quickly as possible
  - Stop the machine in the safest location, ie. Away from other machines, working face, people, or structures
  - Know the locations of runaway ramps (if applicable) or straddle berms, and use them if possible
- Shift To Neutral
- Set The Parking Brake
- Shut Down The Engine
- Activate the fire suppression system (if applicable)
- Summon Help
- Get Out Of The Cab
- Assess The Situation

Once on the ground, determine whether you should attempt to put the fire out with a fire extinguisher or just get away from the machine.

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## Machine Safety -Before Operations -Waste Industry

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#### **TOPIC: Machine Safety—Before Operations**

#### **Pre-Start Procedures**

- Clear all personnel and obstacles from the machine path.
- Turn battery disconnect switch to "ON."
- Clean and secure all windows and doors.
- Adjust mirrors for optimum vision.
- If equipped with rearward vision cameras, make sure they are working correctly
- Check back up alarm operation before starting machine
- Adjust seat for pedal operation and operator's height and weight.
- Inspect and fasten seatbelt or harness.
- If equipped with CMS, check for proper function of all indicator lights, warning lights, and horns
- Start engine from operator's compartment only.

#### After Starting Machine

- Allow engine to warm up at low idle.
- If equipped with EMS, conduct monitoring system test (if applicable) by activating the monitoring system switch, observe all lights and warnings and listen for action alarm to sound.
- Check panel indicator lights and gauges frequently.
- Check transmission oil level once it comes to operating temperature.
- If operating a rubber-tired machine, perform the proper brake checks according to the Operations and Maintenance Manual Before moving the machine.

#### **Preparing to Move**

- Sound horn according to site regulations (allowing three to five seconds after to enable anyone to get out of the way). Visually inspect the area during that time.
- Lower the dump body or raise all lowered implements.
- Push on the service brake pedal and disengage parking brake.
- Unlock transmission and move control lever to desired gear.
- Release the service brake pedal; smoothly accelerate and safely govern machine speed.

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#### **TOPIC: Basic Safe Operations**

The waste industry is challenging. Whether working in a landfill, transfer station, or recycling station, this is one of the harshest environments for machine and operators. The following are brief basic guidelines for safe operating practices:

#### Walk around inspections

Walk around inspections are critical to safety and the life of the machine

- Perform proper daily inspections and report if anything needs attention
- Communicate machine concerns with any operator relieving you

#### **Operational Safety**

- Plan and communicate effectively with all your team
- Observe the 3 points of contact rule when mounting and dismounting the machine
- Check all systems, gauges, alarms, brakes, etc. before starting the machine and report any concerns
- Clean / adjust all windows, mirrors, back up cameras
- Clear the area before moving the machine
- Visual basics
  - Use mirrors, back up cameras, and turn to scan the area you are backing in to.
  - o Look in reverse before you move in reverse
- For wheel loaders in transfer / recycling stations, do not climb the stockpile
- Keep required distances from vehicles and tipping floor personnel
- Be alert for possible fires
- Travel at safe speeds
- Anytime you leave the seat you must lower all implements, shift to neutral, and set the parking brake

## Safety - Waste Industry

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## Fire Safety — Waste Industry

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#### **TOPIC: Fire Safety in the Waste Industry**

#### **Jobsite Tips**

- Keep to a minimum the quantity of flammable materials (liquids and gases) on site
- Properly label and store all flammable materials
- Return flammable gas cylinders to a ventilated storage area at the end of each shift
- Strictly ban smoking and other ignition sources from areas where gases or flammable liquids are stored or used. Post signs that are clearly visible.
- Properly maintain gas cylinders, hoses and equipment and keep them in excellent condition at all times
- When gas cylinders are not in use, ensure valves are fully closed and they are stored properly.
- Always remove flammable and combustible waste and store it in suitable bins or containers
- Provide a proper quantity of suitable fire extinguishers. Make sure every worker knows where they are located and how to use them.
- Know all emergency procedures for evacuating the site, raising the alarm and contacting the local fire department
- Develop plans to handle all fires and possible emergencies

#### **Machine Tips**

- Always perform a pre-shift and post-shift walk around
- Visually inspect the machine anytime you are off of the machine
- Always clean all debris from the machine, especially the heat sources
- Always turn off the disconnect switch when leaving the machine for extended periods of time
- Be alert for fires on your machine, other machines / vehicles, and in the waste
- Train all operators on fire suppression, extinguisher checks, and operation
- If a fire occurs, if possible, safely move the machine off of the waste, activate the fire suppression (if equipped), call for help, safely dismount the machine and move away from the machine

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## Rire Prevention & Extinguishing — Waste Industry

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#### **TOPIC: Fire Prevention & Extinguishing**

#### **General Precautions**

- Keep firefighting equipment where it is easy to find and access
- Keep all equipment clean
- Immediately clean up all trash and any oil spills
- Clean materials from heat sources on machines
- Turn off disconnect switch
- Perform proper walk around inspections

#### Flammable Liquids

- Take care to prevent vapors from flammable liquids, such as solvents, from coming into contact with heat or flames
- Store flammable liquids in appropriate, approved containers
- Always observe no smoking signs
- Never use gasoline as a cleaning agent

#### Fire Extinguishers and suppression systèms

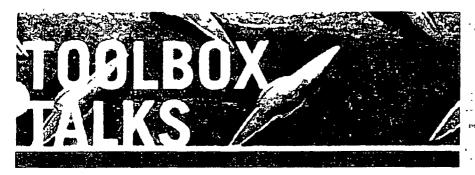
- Never use gasoline as a cleaning agent
- Check that all pins are in place on extinguishers and suppression systems
- Require monthly checks and take time to make sure the extinguisher and suppression system materials are not packed.
- Turn upside down and tap lightly with a rubber hammer to loosen packed material
- Use fire extinguishers on small fires only
- Aim at the base of the fire and use a sweeping motion
- Never block your passage of escape when fighting a fire
- Always use the proper type of extinguisher for the type of fire you are fighting

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## Communication Waste Applic

**Discussion Date:** 

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#### **TOPIC: Communicating Safely**

#### Overview

Communications in waste applications is vital to help overcome the many challenges this industry has to offer. Planning, instituting safe work communications, and training will aid the worksite in safe, efficient operations.

#### **Operational Communication Tips**

- Plan develop plans for all possible contingencies and discuss with team
- Discussions of the daily plan should take place with all involved in the work for that day
- When the plan needs to change, keep all personnel informed

#### **Machine Based Communication Tips**

- Utilize radios and / or two way communication
- Keep eye / visual contact with ground based personnel and other machines
- Utilize hand signals when needed. Train employees proper hand signals
- All communication requires a response!

#### **Ground Based Communication Tips**

- Stay clear of all moving vehicles and machines till you are ready to communicate
- Make eye contact with everyone you are trying to communicate
- Signal your intentions and wait for a response before approaching any vehicle or machine
- When leaving a machine / vehicle after communication, utilize the same type of eye contact and signals as when approaching

 All communication requires a response. experts in this area for more information in no event does the content of this document supersede any applicable local, state, or federal statutes or regulations

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#### **TOPIC: Respiratory Protection**

#### **General Information**

Respirators come in many different forms, shapes and sizes.

☑ Before you wear a respirator, you must make certain it fits your face properly and provides a good seal. This process is called "respirator fit testing."

There are different respirators for different types of hazards.

For example, hazards such as silica dust or asbestos fibers require particulate respirators; whereas hazards such as gasoline vapors and sewer gas (hydrogen sulfide) require respirators that have special cartridges to filter (adsorb) the gas of concern.

Different types of respirators offer different levels of protection.

- ☑ The nature of the hazard determines the respirator that should be used.
- ☑ For example, if the hazard of concern is present in concentrations that are 50 times greater than what is known to be safe, a full-faced respirator would be warranted. If the hazard is present in concentrations that are 2 times greater than what is known to be safe, a half-faced respirator would be warranted.

#### Things to Know Before You Use a Respirator

- ☑ What hazard or hazards are present?
- ☑ How much of the agent of concern is present (this determines the type of respirator that should be worn – e.g. half-faced, full-faced, SCBA)?
- ☑ Is the cartridge in the respirator good? Cartridges are used to filter agents of concern and have can only be used a limited number of times. Change cartridges according to manufacturers' specifications.
- ☑ Does your respirator fit you properly? Check respirator fit every time you put it on and get a professional fit test at least once per year.
- Wearing a respirator may protect you from harmful agents, but respirators also burden one's breathing. A medical professional should determine if you are medically qualified to wear a respirator.

#### **Questions to Generate Discussion**

- What hazard(s) exist in your workplace that might require you to wear a respirator?
- What should you do if you think there is a hazard present that might require respiratory protection?

## Protection

Discussion Date:

### **Employee Participants:**

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#### **TOPIC: Portable Generators**

Whether keeping the lights on at a jobsite or powering tools in remote locations, the portable generator has found its way into most industrial applications. **Like any tool, it is important to know the hazards and limitations to prevent mishaps**. Review some of the suggested safety tips below and see how safe your practices are around generators.

- Only run the engine outdoors with plenty of ventilation. Exhaust gases contain carbon monoxide, an odorless gas which binds to hemoglobin in the blood, preventing oxygen from being transferred to the body. Symptoms of carbon monoxide poisoning include dizziness, nausea and sleepiness
- Always shut down the engine prior to making or removing connections
- Never attempt to move a running generator.
- Always shut down the engine and allow it to cool before refueling.
- ☑ Never overfill the tank. Only fill within ½ inch from the top of the tank to allow for expansion.
- Make sure that hot exhaust gases are never directed toward anything flammable or explosive. Keep the generator at least 3 feet from any buildings or structures.
- Consider using a spark arrestor over the exhaust if operating in an area of dry grasses, brush or forest.
- Be sure you know how to stop the engine quickly in the event of an emergency.
- Familiarize yourself with the sound output ratings of your generator and wear hearing protection, if required.
- ☑ Keep a fire extinguisher near the generator while it is in operation.
- Never attempt to connect power to a building unless a licensed electrician has installed an approved transfer switch.
- ☑ Test and reset the Ground Fault Circuit Interrupter monthly
- Remove all electrical connections and the negative lead to the battery before attempting any type of service to the generator
- Always make sure the system is properly grounded before operating. Never connect the generator output neutral to the ground or frame.
- Know which parts of the generator become hot when running. These areas are not only burn hazards, but the involuntary jerk from touching a hot object could cause your hand to contact a high voltage area resulting in shock.

#### Questions to Generate Discussion

- Does your generator produce enough sound to require hearing protection?
- Why is it hazardous to refuel a generator while it is operating?

### **Portable Generators**

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#### **TOPIC: Near Misses**

## Near Misses are leading indicators in the workplace that must be identified and investigated to reduce overall incidents.

- Near miss incidents are situations that did not result in personal injury or property damage but had the potential to do so.
- ☑ To get to the root cause of a near miss incident, they must be treated with the same attention to detail as if the event actually occurred.
- If near misses are indentified and corrected, future incidents may be prevented.
- Near misses are an inexpensive opportunity to make changes in the workplace before something more severe occurs.
- ☑ For near miss reporting to be effective, there must be a system in place to collect the data, initiate proper root cause analysis, institute corrective action and follow-up to make sure corrective actions were effective.
- Near miss reporting must not be punished in order to gain employee participation.

#### **Questions to Generate Discussion**

- What is your company's reporting procedures for near miss incidents?
- What are some examples of near miss incidents that have occurred at your workplace?

### **Near Misses**

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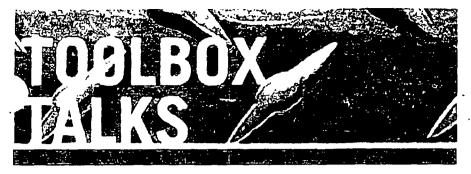
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## Heat Related Illnesses

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#### **TOPIC: Heat Related Illnesses**

#### There are three types of heat related illnesses in the workplace.

- Heat Cramps: Painful cramps in the arms, legs or abdominal muscles caused by the onset of dehydration.
  - If you have heat cramps, stop the activity and move to a cooler area
  - o Drink cool water and gently stretch the affected muscles.
- ☑ Heat Exhaustion: A milder form of heat related illnesses and occurs from working in high temperatures coupled with inadequate fluid intake.
  - Warning signs include heavy sweating, paleness, muscle cramps, tiredness, weakness, dizziness, headache, nausea/vomiting and fainting.
  - The victim's skin may feel pale and moist with rapid heart rate and high blood pressure.
  - o If untreated, heat exhaustion may transition into heat stroke.
  - Drink plenty of liquids such as water and sports drinks to replace electrolytes.
  - In extreme temperatures, more frequent breaks may be necessary to reduce the likelihood of heat related illness.
- ☑ Heat Stroke A serious condition that if untreated by emergency medical care could result in death.
  - Warning signs include pale dry skin with rapid heart rate, difficulty breathing, disorientation, agitation, confusion, fainting, strange behavior, seizures and coma.
  - Contact Emergency Medical Services and start to cool the victim by placing ice under the armpits and groin areas.
  - Keep the victim in a cool place and fan them until emergency medical assistance arrives.

#### **Questions to Generate Discussion**

- How can you prevent Heat Exhaustion?
- What are some indications of Heat Stroke?
- Identify some jobs in your work area that if precautions are not followed could lead to an employee suffering from a heat related illness.

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### **Head Protection**

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**TOPIC: Head Protection** 

**General Information** 

Head protection practices are vital for employee safety in areas that may have overhead work.

ANSI Z89.1 lists two classifications when selecting the proper hard hat:

- ☑ Type I Hard hat designed to reduce forces from an impact from the top of the head. This is generally the most common hard hat type utilized in general industry.
- ☑ Type II: Hard hats designed to reduce forces from an impact from the top of the head and off center. Generally these hard hats are lined with high density foam.

'ard Hat Electrical Classifications:

- ☑ Class G (General): Designed to protect wearers from low voltage contact. (Formerly Class A)
- ☑ Class E (Electrical): Designed to protect wearers from high voltage contact.
- ☑ Class C (Conductive): <u>Not</u> designed to protect wearers from electrical contact.

Inspect your hard hat daily. Look for cracks, gouges, flaking plastic or a chalky appearance on the plastic. Remove the hard hat from service if any defects are found. If you wear your hard hat backwards, make sure the hard hat has the reverse donning arrow marking. This indicates that the hard hat was tested to meet all safety requirements whether it is worn forward or backward. If the reverse donning arrow marking is not on your hard hat, do not wear it backwards.

#### **Questions to Generate Discussion**

- What Type of hard hat are you currently wearing?
- What Class of hard hat are you currently wearing?
- What might trigger the need to remove your hard hat from service after performing an inspection?

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**Safety** 

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**TOPIC: Hand-Held Tool Safety** 

#### **General Information**

Hand-held tool safety practices should be followed to reduce serious and disabling injuries in the workplace.

There are two primary categories of hazards when using hand-held tools:

- ☑ Correct Tool for the Job: Most accidents occur in the workplace due to the use of incorrect hand-held tools to perform work.
- ☑ Defective Tools: Defective hand-held tools can cause serious injuries.

Hand-Held tools can be used safely if you follow these guidelines:

- ALWAYS inspect hand-held tools prior to use. Make sure to remove any defective tool from service.
- Select the correct tool for the job DO NOT use a tool for anything other than its intended purpose.
- If you see a co-worker using a hand-tool incorrectly, STOP them and suggest the correct method.

#### **Questions to Generate Discussion**

- What are some common hand-held tool misuses in the workplace?
- Why is it important to inspect the hand-held tools prior to use?
- What are some common hand-held tool defects that you may find in the workplace?

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**TOPIC: Fire Safety** 

**General Information** 

Fire Safety is an important part of every workplace safety and health program.

- ☑ Elements of the Fire Triangle
  - o Oxygen
  - o Heat Source
  - o Fuel
- Four Classes of fires common in the workplace
  - o Class A Fire: Involves fires of ordinary combustibles such as paper, cardboard, wood and plastics
  - Class B Fire: Involves fires of flammable liquids such as fuels, paints and solvents
  - Class C Fire: Involves fires of electrical equipment such as overloaded circuits, motors, switches and wiring
  - o Class D Fire: Involves fire of combustible metals such as, but not limited to, sodium, lithium, titanium, magnesium and potassium
- ☑ Remember to recharge all discharged fire extinguishers
- Fire Extinguishers must be inspected monthly
- When utilizing a fire extinguisher to extinguish a fire the following must be considered:
  - o Has the fire alarm been activated?
  - o Have all occupants been evacuated from the affected area?
  - o Do I have a clear path to the nearest exit?
  - o Have I been trained in the use of a portable fire extinguisher?
  - If yes, then extinguish fire utilizing the PASS method.
    - P Pull Pin
    - A Aim low at the base of the fire
    - S Squeeze the lever of the extinguisher
    - S Sweep from side to side until fire is extinguished or extinguisher has emptied

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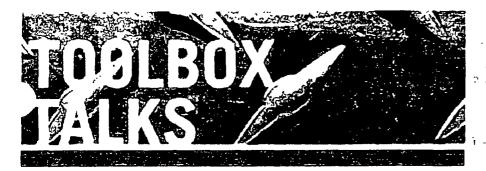
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## Building a Safety Culture

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#### **TOPIC: Building a Safety Culture**

## <u>Safety Culture can be thought of as the values, beliefs, perceptions and</u> normal behaviors that are shared by employees.

Whether it is intentional or not, every organization has a safety culture. The question is whether the safety culture is what we want it to be and what can we do to change it.

#### ☑ POSITIVE SAFETY CULTURE: In a positive safety culture:

- Communication is open at all levels of the organization and feedback is seen as vital to improving safety processes.
- Individuals at all levels focus on what can be done to prevent injuries or illnesses.
- There is a commitment to safety regardless of all other concerns in the business.
- o People and their well being are valued. The focus is on protecting people, not the bottom line.
- All personnel, especially senior managers, demonstrate their commitment to safety by following all safety processes and procedures, just as they instruct their employees to do.

#### ☑ NEGATIVE SAFETY CULTURE: In a negative safety culture:.

- Communication is not open at all levels; employees do not openly communicate with upper management.
- Safety rules are used to discipline employees.
- Management may not follow safety rules (for example, not wearing hearing protection or other PPE as they are supposed to).
- Production demands require less focus on safety.
- o Management's concern is not for the well being of the employees, but rather for a good safety record.

#### **Questions to Generate Discussion**

- What kind of safety culture do we have?
- What can our management team do to improve our safety culture?
- What can you do, individually, to improve our safety culture?
- Why is communication so important in establishing a safety culture?
- Do you feel you could approach a peer to discuss something that they could do more safely? Why or why not?
- If you could change one thing about our safety culture, what would it be?

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### **Diesel Fuel**

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**TOPIC: Diesel Fuel** 

## <u>Diesel fuel is commonly used in construction machinery, Industrial machinery and generators.</u>

There are three primary concerns associated with diesel fuel:

- ☑ Flammability: Diesel fuel is not nearly as flammable as gasoline or other common fuels (such as ethanol or propane) but it can catch fire and can be very difficult to extinguish. Do not smoke around diesel fuel.
- Skin Exposure: Diesel fuel can be absorbed through the skin very easily. It can cause skin irritation, redness and even burns. If the diesel is not cleaned off, it will adsorb into the skin and cause symptoms identical to inhalation.
- ☑ Inhalation: If diesel vapors are inhaled it can cause dizziness, nausea and increased blood pressure, among other symptoms.

What can you do to limit the harmful effects of diesel fuel?

- When fueling diesel powered vehicles or machinery, do so in a well ventilated area.
- ☑ If vehicles must be used indoors or in enclosed spaces, extra ventilation should be provided to remove diesel exhaust.
- ☑ Wear gloves when working with diesel! **Viton gloves** have been shown to be most effective in protecting against diesel exposure.
  - DO NOT USE VINYL OR BUTYL rubber gloves with diesel, as they offer no protection.
- ☑ Maintain diesel vehicles and routinely check emission control devices

#### **Questions to Generate Discussion**

- Diesel fuel is not as flammable as other fuels. Why should it be treated with the same caution as highly flammable materials?
- Why should we make efforts to protect our skin when working with diesel fuel?
- What areas of this workplace represent the greatest concern in terms of potential exposure to diesel exhaust?
- What can you do to help minimize diesel exposure in the workplace?

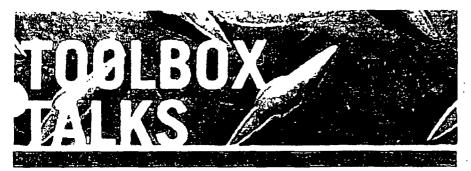
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**TOPIC: Lightning Strikes** 

The average bolt of lightning carries over 100,000,000 volts and can reach out over 100 miles. According to the National Oceanic and Atmospheric Administration (NOAA), lightning is one of the leading weather-related causes of death and injury in the United States. It is estimated that the Earth is struck by this incredible electric force more than 100 times every second. The odds of being struck by lightning in your lifetime are 1 in 3,000.

There is a great deal of misunderstanding and misinformation regarding this powerful natural phenomenon. Let's explore some of the facts.

- ☑ Some forms of lightning originate and release from high up in the thunderstorm cloud. This lightning can strike far away from the actual rain storm up to 5-10 miles in front or behind the storm. Many people are struck by lightning without realizing they are in a lightning risk area.
- If you can hear thunder, you are within 10 miles of a storm and are within reach of lighting. This is the time to seek shelter.
- Rubber-soled shoes provide absolutely no protection from lighting
- Buildings that are not equipped with grounded plumbing or electrical wiring are unable to conduct electrical current and do not offer protection from lightning. This means that you are still vulnerable if you seek shelter in a bus stop, shed, golf hut, park pavilion, etc
- Stay away from tall objects if caught in a storm. Trees are one of the worst forms of shelter from lightning. They offer a false sense of security and, if anything, attract lightning.
- An automobile can offer protection by acting like a Faraday cage, provided that the occupants do not touch the metal of the car while inside.
- When lightning strikes it can easily travel through electrical wire. Avoid using electrical devices (computers, hair dryers, etc.) during a storm to prevent injury.

So, what if you are caught in a vulnerable place during a storm?

If you begin to feel the hair on your body or head begin to rise, this could be a sign that the positive charge of your body is reaching up to the negative charge of the sky. A strike could be imminent. Stay low and seek shelter. If caught in the open, crouch low. Do not lie on the ground. You are more apt to receive a secondary shock from the ground if lightning strikes near you.

If someone is struck, they do not contain an electric charge. Provide first aid immediately and be prepared to provide CPR Call emergency response services

#### **Questions to Generate Discussion**

- When is the best time to seek shelter from a thunderstorm?
- Is it possible to be struck by lightning even when it is sunny?

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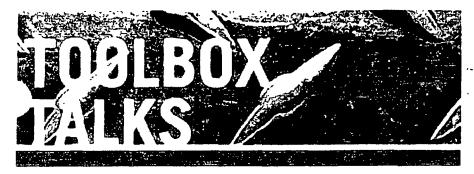
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## Lightning Strikes

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#### **TOPIC: General Decontamination**

Sometimes spills can occur even when precautions are taken. Therefore, it is important to know how to recover from a spill by decontaminating. Doing so can help prevent harm to personnel, equipment and/or the environment.

The definition of decontamination is the process of removing or neutralizing contaminants that have accumulated on personnel and/or equipment. This process is critical for a healthy and safe work environment. This Toolbox Talks document covers decontamination suggestions for contaminants that pose low to moderate risk. Typically employers have trained personnel or response teams to handle decontamination of chemicals with a high toxicity. Those specific procedures will not be discussed.

#### Ways to decontaminate personnel, equipment or the work environment:

- Personnel: Many industrial contaminants can be removed from a person's skin or clothes by scrubbing with soap and water. Even a seemingly benign chemical can cause irritation or other health problems with prolonged contact with the skin. Therefore, it is important to clean skin and/or clothing as soon as possible. If the contaminant has been absorbed into clothing, do not wait for it to dry out, clean it immediately.
- Equipment: Soap and water can also be used when decontaminating equipment. Some heavier industrial contaminants may require a degreasing agent. Make sure to wear appropriate PPE when handling degreasing agents or solvents. It is important to collect the washed liquid and dispose of properly. Do not assume it is safe to pour down a drain.
- ☑ Work Environment: Decontamination of a work environment may include removing contaminants from floors, seats or work tables. Start with an absorbent cloth to remove the bulk of the contaminant. Next, use a mild detergent and water to clean the hard surfaces. Porous or fibrous materials may have to be removed and disposed of properly. If a microbiological contaminant is thought to be present, finish the decontamination by wiping a mild bleach solution (1 teaspoon bleach / 1 quart water) over the surface and allow it to dry

#### Questions to Generate Discussion

- Besides a bleach solution, what are other ways to decontaminate an area with a biological contaminant?
- What kind of situation would it be best to call for help instead of doing your own decontamination procedure?

## General Decontamination

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## Foot and Leg Protection

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#### **TOPIC: Foot and Leg Protection**

#### **General Guidelines**

- Verify loads are secure before using hoists and cranes; inspect the condition of slings, chains and hooks to prevent inadvertent drops
- Inspect the work environment for slip and trip hazards; make sure walking and working surfaces are dry
- ☑ Know the safety concerns associated with chemicals and fluids, and understand what to do in the event of a splash or spill
- ☑ Verify Personal Protective Equipment fits properly and is appropriate for the job; with steel-toed work boots, inspect the quality of the tread
- When lifting, always position the legs and body squarely with the load; do not over exert, as this could cause a muscle strain to legs and knees
- ☑ Be wary of pinch points generated by moving parts and mobile equipment; keep arms and legs inside mobile equipment at all times
- ☑ Always know where you are placing your legs and feet; verify machine guarding is effective and be attentive

#### Personal Protective Equipment for the Feet and Legs

Type of Hazard	Recommended Personal Protective Equip. (PPE)
Rashes, chemical burns, heat burns	Leg coveralls, Hazardous Material boots and suits; rubber over-boots, insulated boots
Cuts, lacerations, punctures	Steel-toed boots, leather leg chaps, long pants, leg and shin guards
Crushes, broken bones, contusions, bruises	Steel-toed boots with metatarsal guards, toe guards, leg and shin guards, thigh and hip pads
Burn from electrical	Non-conductive footwear to stop grounding or inadvertent spark
Slips	Attachable spikes, anti-slip soles
Soreness, muscle fatigue	Knee pads, work boots with re-enforced ankle support, athletic shoes, leg/knee/ankle braces, orthotic inserts

#### **Questions to Generate Discussion**

- Where are the common foot and leg hazards in your work area?
- What is the best method to communicate these hazards and their controls to new employees or visitors?

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## **Machine Footing**

**Discussion Date:** 

**Employee Participants:** 

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**TOPIC: Machine Footing** 

#### **General Information**

Machine footing is critical to operator safety, especially when accessing, exiting or working on inclines. Fatal accidents have occurred due to feet slipping and personnel falling out of machinery. Listed here are safety controls that can be used to help ensure proper footing at all times.

#### Safety Controls to Improve Machine Footing

- ✓ Inspect the condition of the tread on shoes or boots, verify the tread is of equal depth and not flat or smooth
- ☑ Always use steps and handrails when available
- ☑ Verify steps and ladders are clean and tread is visible; no mud or debris
- ☑ Verify the steps and walking surfaces are completely dry
- Always maintain 3 points of contact on rails and steps while accessing and exiting (for example, two feet, one hand or two hands, one foot)
- ☑ Inspect the condition of handrails, steps and ladders; ensure they are properly secured and in good condition
- ☑ If possible, apply anti-slip adhesive tape to handrails to improve grip
- ☑ Do not attempt to carry items up and down ladders if 3 points of contact cannot be maintained Place lunch pales, paperwork, etc. on ledges as you climb up and down, or use a rope to hoist objects up after you have safely climbed to the cab
- ☑ Always pay attention to where you are going to step
- ☑ Do not get in a hurry; take the proper time to access and exit the machine
- ☑ Do not skip steps on the ladder or stairs; use each one

#### **Questions to Generate Discussion**

- What is the most frequent cause of slips on the machine you operate?
- What improvements can be made to reduce this cause?

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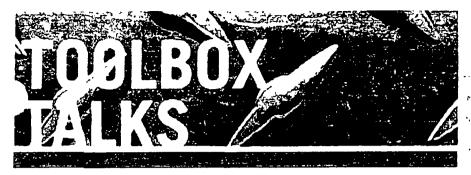
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# Mounting and Dismounting Equipment

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#### **TOPIC: Mounting and Dismounting Equipment**

#### General info

Mounting and dismounting equipment is one of the most dangerous activities associated with equipment. The reason for this is due to a variety of factors:

- o Rushing and not paying attention to foot or hand placement
- Slippery or obstructed surfaces

#### Things You Can Do to Reduce Injuries Due to Mounting and Dismounting

- ☑ ALWAYS read the Operation & Maintenance Manual for proper mount and dismount procedures
- ☑ Inspect the ground before climbing up or down. Note where feet will be placed to avoid a twisted or sprained ankle
- ALWAYS check the condition of the steps, ladders and rails for mud, water, ice, dust or any other material that could cause slips
- Always maintain **three points of contact** when mounting and dismounting equipment This means always have two feet and one hand or two hands and one foot in contact with the machine at all times
  - Doing so means not carrying items when mounting or dismounting equipment
  - o If carrying items up and down from the cab is necessary, place the item(s) on a bench or a ledge of the equipment and stagger step the items up or down with the extra hand while maintaining three points of contact, or you can also use a rope to raise or lower the items
- ☑ ALWAYS mount and dismount while facing the equipment
- ☑ Inspect the condition of rails and guarding for damage and effectiveness
- Always close and latch gates, as required, for fall protection
- ☑ Close doors to the equipment in case the outside grab bars are used as handles while climbing in or out
- ☑ <u>DO NOT RUSH</u> Take the time needed to properly enter and exit the equipment; do not skip steps or rungs in the ladder

#### **Questions to Generate Discussion:**

- What is the top reason for slips and trips while mounting and dismounting your equipment?
- In what condition are the steps, ladders, and handrails on the machines that you use?

Employee Participants:

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## Eye and Face Protection

Toolbox Talks are intended to facilitate health and safety discussions on the job site. For additional Toolbox Talks, please visit SAFETY.CAT.COM™

**TOPIC: Eye and Face Protection** 

#### **General Information**

Protecting the eyes and face from hazards is extremely important considering all of the organs and soft tissue in the area. For example, a projectile to the eye not only damages the eye, but potentially the ligaments and muscles that move it, and in some cases the brain. Furthermore, lacerations to the face can damage muscle tissue and leave life-long scars.

Serious injuries can occur very quickly and it is important to choose the proper Personal Protective Equipment for the task. Always make sure PPE is properly rated for the job, fits properly, and doesn't obstruct view.

#### Causes of Eye and Face injuries

- Splashes from acids, cleaning solutions and other harmful liquid chemicals
- Flying debris, chips and dust from grinding and windy conditions
- o Flying projectiles from objects colliding, falling or being dumped
- Loose straps, cords or banding that breaks or snaps under extreme tension
- o Extreme heat and light from exposed flames, welding or torches

#### Types of Personal Protective Equipment

- Safety goggles: Enclose the whole area around the eyes to help prevent debris when sanding or blowing dirt and debris
- Safety glasses and side shields: Provide some protection against airborne particles and projectiles and are made of impact resistant material
- Weld masks, dark shields and torch glasses can help protect the eyes and face from flash burns and over-exposure to light
- Grinding shields can help protect from grinding debris, flying projectiles and chemical splashes

#### **Questions to Generate Discussion**

- What causes eye and face hazards in your work and work area?
- What behaviors would cause a person not to wear required PPE?

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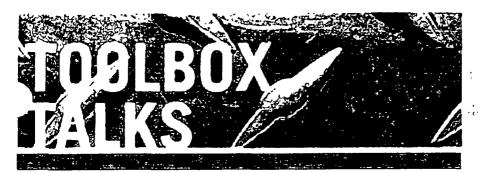
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Employee Participants:

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## How to Improve Safety with Signs

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**TOPIC: How to Improve Safety with Signs** 

#### General info

A sign is a form of visual instruction that can be used to reduce safety hazards and environmental accidents, as well as improve efficiency and quality of business operations

There are many forms of signs. They may be based on standard colors, shapes or sizes, and are limited in text to reduce interpretation errors. The various types of signs include, but are not limited to, adhesive labels, lines or markings on the floor or ground, placards mounted on posts, light stacks displaying pass/fail status, etc.

#### Why signs are an effective form of communication

- o Colors and shapes are more visually stimulating than written words
- o Signs can apply to people of various ages and levels of education
- Signs can provide instruction at the point of use, instead of hidden in a book or procedure
- Many signs are universal (traffic signs, flammability hazards) and can be applied to increase the rate of comprehension

#### Using signs to Improve Safety

- Traffic control signs are used for speed limits, passing zones, lane direction, yielding and stopping, among others
- Slip, trip and fall hazards can be denoted by solid-colored lines on steps, or portable or stationary placards warning of wet or slippery areas and uneven
- Flammability, combustion and explosion signs are denoted on containers and locations to alert personnel of potential hazards
- Confined spaces, heights and tow overhangs are denoted to help prevent head-bumps, and to alert personnel of proper PPE, ventilation and fall hazards
- o Color coding for **mechanical lines** can be used to quickly identify water, air, hydraulic, gas and other forms of energy in the event of emergency
- Material status and housekeeping can be improved by designating a place for everything through the use of colored lines and signage

#### **Questions to Generate Discussion**

- What types of signs are in your work area?
- Are there tasks in your daily work where a sign would improve safety, efficiency, quality or reduce costs?

Employee Participants:

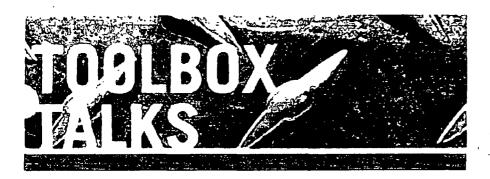
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# Personal Protective Equipment Checklist

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#### **TOPIC: Personal Protective Equipment (PPE) Checklist**

#### Instructions:

The PPE Checklist is designed to assess the level of effectiveness of the PPE Program and opportunities for improvement. It can be used as frequently as needed. Take immediate action on any unsafe working conditions

•		Check (✓) ane			
Work area:	Yes	No	Does not apply		
Eyes and face					
1 Are there flying particles, dust, hazardous chemicals, extreme heat or light?					
2 Is proper PPE used (e.g. safety goggles, face shields, weld masks)?					
3. Does the PPE fit properly and is it in good condition?					
Ears/hearing					
4. Is there continuous exposure to elevated noises or sudden loud noises?					
5. Is proper PPE used (e.g. ear plugs, ear muffs)?		<u> </u>	<u> </u>		
Respiratory system					
6 Are there irritating dust particles or toxic fumes in the work area?					
7. Is there a respirator training program in place that includes fit testing?					
8 Is the proper PPE used (e.g. comfort masks, respirators, ventilated hoods)?					
9 Does the PPE fit properly and is it in good condition?		L			
Head					
10 Is work performed around beams, pipes, falling objects or electrical wires?					
11 Is machining performed, or equipment used with rotating parts?		<u> </u>			
12. Is the proper PPE used (e.g. protective helmets, hairnets, bump-caps)?		<u> </u>			
13 Does it fit properly and is it in good condition?		<u> </u>			
Torso and back					
14 Is work performed at elevated heights where a person could be injured by a fall?					
15 Does the work require continuous lifting, twisting or bending?					
16 Is the proper PPE used (e.g. fall restraint harnesses, lanyards, back braces)?					
17. Does it fit properly and is it in good condition?					
Hands, arms, feet and legs					
18 Does the work include pinch-points, irritating chemicals or extreme hot/cold?					
19 Is there heavy lifting or slippery surfaces?					
20 Is the proper PPE used (e.g. sleeves, chaps, work gloves, steel-toed boots)?	<u></u> .	L			
General					
22 Does all PPE meet industry codes for safety and reliability?					
23 Were employees aware of the need to wear PPE and properly trained?					

Date:							
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Control ID: V0910.1

Comments:

Attachment B - Intermountain Regional Safety Policy Manual

## Intermountain Regional Landfill

**Safety Policy Manual** 

Company Policy, as well as State and Federal law, make the safety and health of the employees of the Intermountain Regional Landfill the first consideration in operating our business. Safety and health in our business must be a part of every operation, and every employee's responsibility at all levels. It is the intent of the Intermountain Regional Landfill to comply with all laws concerning the operation of the business and the health and safety of our employees and the public. To do this, we must constantly be aware of conditions in all work areas that can produce or lead to injuries. No employee is required to work at a job known to be unsafe or dangerous to his/her health. Your cooperation in detecting hazards, reporting dangerous conditions and controlling workplace hazards is a condition of employment. Inform your supervisor immediately of any situation beyond your ability or authority to correct. Employees will not be disciplined or suffer any retaliation for reporting a safety violation in good faith.

It is the policy of the Intermountain Regional Landfill that accident prevention shall be considered of primary importance in all phases of operation and administration. It is the intention of the Intermountain Regional Landfill management to provide safe and healthy working conditions and to establish and insist upon safe practices at all times by all employees.

The prevention of accidents is an objective affecting all levels of our company and its operations. It is, therefore, a basic requirement that each supervisor make the safety of all employees an integral part of his or her regular management function. It is equally the duty of each employee to accept and follow established safety regulations and procedures.

Every effort will be made to provide adequate training to employees. However, if an employee is ever in doubt about how to do a job or task safely, it is his or her duty to ask a qualified person for assistance. Employees are expected to assist management in accident prevention activities. Unsafe conditions must be reported immediately. Fellow employees that need help should be assisted. Everyone is responsible for the housekeeping duties that pertain to their jobs.

Every injury that occurs on the job, even a slight cut or strain, must be reported to management and/or the General Manager as soon as possible. Under no circumstances, except emergency trips to the hospital, should an employee leave the work site without reporting an injury. When you have an accident, everyone is hurt. Please work safely. Safety is everyone's business.

#### EMPLOYEE ACKNOWLEDGEMENT FORM

The employee safety manual describes important information about the IRL. I understand that I should consult a supervisor if I have any questions that are not answered in the manual.

I understand and acknowledge that there may be changes to the information or policies in the safety manual. I understand that the IRL may add new policies to the manual as well as replace, change, or cancel existing policies. I understand that I will be told about any manual changes.

I understand and acknowledge that this manual is not a contract of employment or a legal document. I have received the manual and I understand that it is my responsibility to read and follow the policies contained in this manual and any changes made to it.

EMPLOYEE'S NAME (printed	):
EMPLOYEE'S SIGNATURE:	

#### Safety & Health Training

Training is one of the most important elements of any injury and illness prevention program. This training is designed to enable employees to learn their jobs properly, bring new ideas to the workplace at the IRL, reinforce existing safety policies and put the *injury and illness prevention program* into action.

Training is required for both supervisiors and employees alike. The content of each training class will vary, but each class will attempt to teach the following:

- 1. The success of the IRL's *injury and illness prevention program* depends on the actions of individual employees as well as a commitment by the company.
- 2. Each employee's immediate supervisor will review the safe work procedures unique to that employee's job, and how these safe work procedures protect against risk and danger.
- 3. Each employee will learn when personal protective equipment is required or necessary, and how to use and maintain the personal protective equipment in good condition.
- 4. Each employee will learn what to do in case of emergencies occurring in the workplace.

Supervisors are vested with special duties concerning the safety of employees. Supervisors are key figures in the establishment and success of the IRL's *injury and illness prevention program* They have primary responsibility for actually implementing the injury and illness prevention program, especially as it relates directly to the workplace. Supervisors are responsible for being familiar with safety and health hazards to which employees are exposed, how to recognize them, the potential effects of these hazards, and rules and procedures for maintaining a safe workplace. Supervisors will convey this information to the employees at the workplace, and will investigate accidents according to the accident investigation policies contained in this manual.

#### Safety Rules for All Employees

No one likes to see a fellow employee injured by an accident. Therefore, all operations must be planned to prevent accidents. To carry out this policy, the following rules will apply:

- 1. All employees shall follow the safe practices and rules contained in this manual and such other rules and practices communicated on the job. All employees shall report all unsafe conditions or practices to the proper authority, including the immediate supervision on the job, and, if corrective action is not taken immediately, a senior manager, and if corrective action is not taken immediately, a governmental authority with proper jurisdiction over such practices.
- 2. The General Manager shall be responsible for implementing these policies by insisting that employees observe and obey all rules and regulations necessary to maintain a safe work place and safe work habits and practices.
- 3. Good housekeeping must be practiced at all times in the work area. Clean up all waste and eliminate any dangers in the work area.
- 4. Suitable clothing and footwear must be worn at all times. This includes steel-toed shoes. Personal protection equipment (hard hats, respirators, eye protection, etc.) will be worn whenever needed.
- 5. All employees will participate in a safety meeting conducted by a manager at least once every month.
- 6. Anyone under the influence of intoxicating liquor or drugs, including prescription drugs that might impair motor skills and judgment, shall not be allowed on the job.
- 7 Horseplay, scuffling, and other acts which tend to have an adverse influence on safety or well-being of other

employees are prohibited.

- 8. No one shall be permitted to work while the employee's ability or alertness is so impaired by fatigue, illness, or other causes that it might expose the employee or others to injury.
- 9. Employees should be alert to see that all guards and other protective devices are in proper place and adjusted, and shall report deficiencies promptly to a supervisor.
- 10 Employees shall not handle or tamper with any electrical equipment, machinery, or air or water lines in a manner not within the scope of their duties, unless they have received specific instructions.
- 11. All injuries should be reported to the General Manager so that arrangements can be made for medical or first aid treatment.
- 12. When lifting heavy objects, use the muscles of the leg instead of the muscles of the back.

#### **Periodic Safety Training Meetings**

The Intermountain Regional Landfill has a safety meeting at least once a month. The purpose of the meeting is to convey safety information and answer employee questions. The format of most meetings will be to review special work site hazards, truck safety, serious concealed dangers and material safety data sheets (MSDS). Each meeting the Safety Manager will review a portion of the company's safe work practices contained in this manual or other safety related information. When a new practice or procedure is introduced into the workplace, it will be thoroughly reviewed for safety.

Employee attendance is mandatory and is compensated unless part of an official state approved training program or pre-employment requirement

#### Employee responsibility for training

Teaching safety is a two way street. The IRL can preach safety, but only employees can practice safety. Safety education requires employee participation.

The following general rules apply in all situations:

- 1. An employee should not undertake a job that appears to be unsafe.
- 2. An employee is not expected to undertake a job until he/she has received adequate safety instructions, and is authorized to perform the task.
- 3. An employee should not use chemicals without fully understanding their toxic properties and without the knowledge required to work with these chemicals safely.
- 4. All mechanical safeguards must be kept in place.
- 5. Employees must report any unsafe conditions to his/her supervisor and the General Manager.
- 6. Any work-related injury must be reported to a member of management at once.
- 7. All personal protective equipment must be used when and where required. All personal protective equipment must be properly maintained and replaced when necessary.

#### **Accident Prevention**

Each employee has a personal responsibility to prevent accidents. You have a responsibility to your family, to your fellow employees and to the company. You are expected to observe safe practice rules and instructions relating to the efficient handling of your work

Employee responsibilities include the following:

- 1. Know and obey safe practice rules.
- 2. Report all unsafe conditions or equipment to your supervisor immediately.
- 3. Don't take chances.
- 4. Ask questions when there is any doubt concerning safety.
- 5. Report all injuries immediately, no matter how slight the injury may be.
- 6. Don't tamper with anything you do not understand.
- 7. Incorporate safety into every job procedure.
- 8. Know that disciplinary action may result from a violation of the safety rules.
- 9. Caution fellow employees when they perform unsafe acts.
- 10. Don't remove safety devices or signs.
- 11. Do not back up any vehicle or equipment without checking, using mirrors, visual senses and/or backup cameras, for pedestrians or other equipment.

#### **Accident Investigation**

A primary tool used by the IRL to identify the areas responsible for accidents is a thorough and properly completed accident investigation. The results of each investigation will be reduced into writing and submitted for review by management and the IRL's insurance risk management advisors (Loss Control Engineers). Every incident/accident will be photographed. A written report may be prepared from notes and diagrams made at the scene, or a tape will be made to record direct eyewitness statements as near to the actual time of the observation as possible. All statements should include the time and date given, and all pictures should be similarly identified. If a formal police report of other official investigation is conducted by any governmental agency, get the name and badge number of the official, or a business card, and find out when a copy of the official report will be available to the public. If you are requested to make a statement, you have the right to have the company attorney attend with you at no cost to you.

A complete accident report will answer the following questions:

- 1. WHAT HAPPENED? The investigation report should begin by describing the accident, the injury sustained, the eyewitnesses, the date, time and location of the incident and the date and time of the report. Remember: who, what, when, where and how are the questions that the report must answer.
- 2. WHY DID THE ACCIDENT OCCUR? The ultimate cause of the accident may not be known for several days when all the data is analyzed. However, if an obvious cause suggests itself, include your conclusions as a hypothesis at the time you give your information to the person in charge of the investigation.
- 3. WHAT SHOULD BE DONE? Once a report determines the cause of the accident, it should suggest a method for

avoiding future accidents of a similar nature. This is a decision by the Safety Manager and the supervisor, as well as top management. Once a solution has been adopted, it is everyone's responsibility to implement it.

4. WHAT HAS BEEN DONE? A follow up report will be issued after a reasonable amount of time to determine if the suggested solution was implemented, and if so, whether the likelihood of the same type of accident has been reduced.

#### **Emergencies**

The Intermountain Regional Landfill requires that during every emergency an organized effort be made to protect personnel from further injury and to minimize property damage; in that order.

All of the IRL's resources can be made available to respond to an emergency. Each supervisor must know what to do during an emergency in his or her area and must be certain that his or her employees understand their roles.

#### Supervisor Responsibilities

During an emergency, the supervisor must fulfill the following:

- 1. Ensure that those under his or her supervision are familiar with the plan for the building, particularly the recommended exit routes and how to report an emergency.
- 2. Render assistance to the person in charge during an emergency, as required.
- 3. Maintain familiarity with the shutdown procedures for all equipment used by those under his or her supervision.
- 4. Know the location and use of all safety equipment on his or her floor.
- 5. Keep employees from re-entering an evacuated area until reentry is safe.

#### **Employee Responsibilities**

Employees, other than emergency response groups or teams, involved in any emergency greater than a minor incident are expected to act as follows:

- 1. If there is threat of further injury or further exposure to hazardous material, remove all injured persons, if possible, and leave the immediate vicinity. If there is no threat of further injury or exposure, leave seriously injured personnel where they are.
- 2. Report the emergency immediately by telephone. State what happened, the specific location, whether anyone was injured, and your name and telephone number.
- 3. Proceed with first aid or attempt to control the incident, only if you can do so safely, and have been trained in first aid or the emergency response necessary to control the incident.
- 4. Show the ranking emergency response officer where the incident occurred, inform him or her of the hazards associated with the area, provide any other information that will help avoid injuries and do as he or she requests.

#### **Exit Corridors**

Exit corridors must not be used for storage. The Life Safety Code, NFPA 101, requires that buildings designed for human occupancy must have continuous and unobstructed exits to permit prompt evacuation of the occupants and allow

necessary access for responding emergency personnel. The intent of the Code is to keep exits free from obstructions and clear of combustible materials. Attention to housekeeping, therefore, is very important. Temporary storage of furniture, equipment, supplies, or anything else is not permitted in exit ways. Combustibles, including recyclable waste paper, are not permitted in exit ways.

#### **Fire Safety**

Portable fire extinguishers are provided in adequate numbers and type and are located throughout the facility. Fire extinguishers are mounted in readily accessible locations. Fire extinguishers are recharged regularly and the date of the last inspection noted on their tag.

Fire extinguishers must remain accessible at all times. Means of egress should be kept unblocked, well lighted and unlocked during work hours. Excessive combustibles (paper) may not be stored in work areas.

Aisles and hallways must be kept clear at all times. Designated employees have been trained to respond to a fire or other emergency. Workplaces are to be kept free of debris, floor storage and electrical cords.

Adequate aisle space is to be maintained. File cabinet drawers should be opened one at a time and closed when work is finished.

Employees not involved in the emergency must stay away from the scene and follow the instructions issued over the public address system or directly from the person in charge. The sounding of a fire bell means immediate evacuation by the nearest exit. Employees must not reenter an area that they have evacuated until notified that it is safe to return.

#### FIRE DEPARTMENT

The community fire department is responsible for protecting people and property from fires, explosions, and other hazards through prevention and expeditious control of such events. In addition, the fire department provides first response rescues and transportation services in medical emergencies.

The fire department's inspection staff is responsible for ensuring companywide compliance with fire safety and protection requirements and for reviewing all plans and procedures for compliance with these requirements, for inspecting and testing automatic fire protection and alarm systems and ensuring their maintenance and repair, for conducting fire safety and protection inspections, and for providing fire prevention recommendations. Other responsibilities include training employees in fire safety equipment, practices and procedures.

All these fire protection and response functions are performed in conformance with OSHA regulations, state laws and statutes, nationally recognized standards and guidelines for fire and life safety. The Fire Chief and the Fire Marshall have the authority to enforce applicable requirements of the Uniform Building Code, the Uniform Fire Code, National Fire Protection Association Codes Standards and Recommended Practices, the National Fire Protection Life Safety Code, and the fire protection provisions of OSHA Orders.

All employees must immediately report fires, smoke or potential fire hazards to the fire department.

All employees must conduct their operations in such a way as to minimize the possibility of fire. This means applying rules such as keeping combustibles separated from ignition sources, being careful about smoking, and avoiding needless accumulations of combustible materials.

Supervisors are responsible for keeping their operating areas safe from fire. The Safety Manager and the fire department will provide guidance and construction criteria with respect to fire and life safety as well as inspections. The provision and maintenance of fire detection systems and both automatic and manual fire extinguishing equipment is the responsibility of the Safety Manager. The supervisor, who best knows the day-to-day nature of his or her operations, is

responsible for notifying the Safety Manager of operations that change the degree of fire risk and will therefore require a change in the planned fire protection provisions.

Supervisors must ensure that their personnel are properly instructed regarding potential fire hazards involved in their work and around their workplaces, the proper precautions to minimize fires, and the procedures in case of fire. The local fire department and the Safety Manager also offer formal course and training materials on fire prevention and response:

#### Cedar Fort Fire Agency Phone Number (Non-Emergency): 801-794-3970

- 1. Fire Safety
- 2. Fire Extinguisher Operation
- 3. Self-Contained Breathing Apparatus

Fire hydrants are maintained for emergency use by the fire department. They must be kept accessible and in good working condition.

#### No Smoking

Smoking is forbidden in all inside areas in accordance with Utah Law.

Areas that are designated NO SMOKING areas for fire safety reasons are indicated by large rectangular signs consisting of white backgrounds with red letters stating "NO SMOKING".

#### **Company Vehicles**

The IRL requires that an operator hold a valid driver's license for the class of vehicle that he/she is authorized to operate.

The IRL's company furnished vehicles are restricted to official company business only. These vehicles are limited to the use of properly authorized personnel. Use of an official vehicle for an employee's personal convenience or benefit constitutes misuse and is prohibited. Employees who misuse company vehicles are subjected to disciplinary action and financial responsibility for any accident.

Drive safely. If vehicles are used during the workday, seat belts and shoulder harness are to be worn at all times. Vehicles must be locked when unattended to avoid criminal misconduct. Do not exceed the speed limit. Vehicles must be parked in legal spaces and must not obstruct traffic. All employees must practice defensive driving. Employees should park their vehicles in will lighted areas at/or near entrances to avoid criminal misconduct.

All drivers of company vehicles are responsible for reporting any damage or deficiency to their supervisor. Repairs, adjustments, and maintenance can only be accomplished if the driver adequately documents and reports these items. Failure to report unsafe vehicle conditions can result in an accident.

#### **Accidents**

Any accident involving company vehicles [including private, rented, or leased vehicles used on official company business] must be reported to the driver's supervisor. If the driver is unable to make a report, another employee who knows the details of the accident must make the report.

It is the IRL's policy that employees should not admit to responsibility for vehicle accidents occurring while on official business. It is important that such admissions, when appropriate, be reserved for the company and its insurance carrier. The law requires that each driver involved in a vehicle accident must show his/her license on request by the other party.

Be sure to obtain adequate information on the drivers involved as well as on the owner of the vehicles. Names, addresses, driver's license numbers, vehicle descriptions, and registration information are essential. In addition, a description of damages is needed for completion of accident reports. If the accident is investigated by off-site police agencies, request that a copy of the police report be sent to the Intermountain Regional Landfill, or obtain the name and department of the investigating officer. A printed card titled "In Case Of Accident" is to be kept in each official vehicle to assist in collecting required information.

In case of collision with an unattended vehicle or other property, the driver of the moving vehicle is required by law to notify the other party and to exchange information pertaining to the collision. If unable to locate the other party, leave a note in or attached to the vehicle or property. The note will have your name, address, and vehicle license number.

#### Performance Measures.

#### A. Safety

- 1. Accidents
  - a. Personal Injury.
  - b. Property Damage (The IRL Disposal's or others)
  - c. Issues
- 2. Distractions.
  - a. Cell phone or excessive phone usage
  - b. Reading route sheet while driving.

#### B. Other issues.

- 1. Excessive absenteeism or tardiness.
- 2. Yard speed.
- 3. Fuel spillage.
- 4. Excessive oil spillage.
- 5. Littering company property.
- 6. Tardy or unexcused from the safety meeting.
- 7. Work area housekeeping. (Trucks or shop bays)
- 8. Driving complaints.
- 9. Landfill complaints.

#### C. Unsafe Behavior.

- 1. Failure to use safety equipment.
  - a. Personal protective equipment.
  - b. Hard hats.
  - c. Safety footwear.
  - d. Visibility apparel.
  - e. Safety eyewear where required.
  - f. Fall safe equipment.
  - g. Scat belts.
  - h. Proper lifting, jacking and stability equipment.
  - i. Shop safety equipment.
- 2. Horseplay.
- 3. Failure to report an incident/accident.
- 4. Any safety violation as per company safety manual.
- 5. Any issues the management or safety committee members observe.

#### **D.** Customer Service

- 1. Excessive service complaints.
  - a. Missed pickups.
  - b. Poor customer relations.
  - c. Not letting your supervisor know of problems on route.

#### E. Supervisor communication.

- 1. Route maintenance.
  - a. Routes not in order.
  - b. Not following route sheets.
  - c. Not reporting route equipment issues.
  - d. Any issues the management observes.

#### F. Equipment Maintenance.

- 1. Shop housekeeping.
- 2. Vehicle housekeeping.
- 3. Equipment abuse.
  - a. Excessive repairs to vehicle.
  - b. Above average fuel consumption.
  - c. Equipment damage.
  - d. Negligent repair work.
  - e. Any issues the management observes.

#### **Prescription Use**

It is the policy of the IRL that you report any use of prescription pain/narcotics to the Safety or HR department. This is to protect yourself and others from any harm. If you are using any prescription drug that may alter your ability to operate safety sensitive equipment, or be around it safely, you need to report it. It is illegal to operate equipment under the influence of drugs and/or alcohol.

#### D.O.T. Introduction

You must have a Class B CDL with an air brake endorsement to operate any single vehicle or combination of equipment with a GVWR of 26,001 or more pounds. All of The IRL's trucks require a Class B CDL to operate unless on company property with permission from the President. If you hold a Class A CDL, this is greater than a Class B and is considered acceptable. You must be 21 to hold a drivers position for The IRL, although you may hold a CDL at age 18.

It is the duty of the employee to learn and keep up to date of all CDL regulations. In the following pages there is information to help you maintain your driving privileges, although this is not a complete rule book, you may find one at any local Division of Motor Vehicles.

#### **Driving Record "MVR"**

The IRL follows strict standards to maintain a high safety grade. There may be certain times where these standards are over ruled due to extenuating circumstances. It is the employee's obligation as a CDL holder to make the company aware of any new violations/citations that are received.

Once a year the IRL holds a company-wide MVR compliance review; this is to make sure all drivers are within compliance of these standards. Please be up front with all violations that are given.

The following table represents the current standards; keep in mind that these may be altered at any time without notice.

# Driver may not have more than:

Туре	Drivers between age 25 - 65	**Drivers between age 21 - 24
Type A Violations (e.g. DUI, Reckless driving, negligent driving)	None in past 3 years	None in past 3 years
"At-Fault" Accidents	1 Accident in the past 3 years	None in past 3 years
Moving Violations	2 violations in 3 years	1 in past 3 years
Combination of Accidents and/or Violations	2 total violations/accidents in the past 3 years.	1 in past 3 years

#### **Pre/Post Trip Inspections**

In order to obtain a CDL you will be required to pass a pre-trip inspection test. You will be tested to see if you know whether your vehicle is safe to drive. As an IRL employee you will find that our pre/post trip inspections are much more extensive due to the nature of the truck. This company specific pre/post-trip will be taught to you during your initial training. By performing a proper pre/post trip every day you will minimize the chance of getting an "out of service" ticket from a DOT officer If you are to receive an "out of service" ticket, due to negligence, there will be consequences. If you feel you need more instruction with a pre/post trip inspection, please see the General Manager.

#### **Drug & Alcohol Testing**

We are committed to making the IRL a safe, efficient, and productive work environment for all employees. There can be serious safety and health risks if an employee uses or is under the influence of drugs or alcohol on the job. We may ask job applicants and employees to provide body substance samples, such as urine and/or blood. We will use the samples to check for the illegal or illicit use of drugs and alcohol. If you refuse to be tested for drugs, you may be subject to disciplinary action, up to and including termination of employment.

This policy pertains to anyone who conducts safety sensitive functions. If you hold a Commercial Driver's License, this policy pertains to you.

#### As a safety-sensitive employee you must NOT...

- Use or possess alcohol or any illicit drug while you are on company time.
- Report for work, or remain on duty if you:
  - . Are under the influence or impaired by alcohol
  - Have a blood alcohol level of .04 BAC or greater
  - Have used any illicit drug
- Use alcohol within four hours of reporting to work
- Report for work or remain at work when using any controlled substance unless used pursuant to the
  instructions of an authorized medical practitioner and the company has approved the use of it as well.
- Refuse to submit to any test for alcohol or controlled substance.

• Refuse to submit to any test by adulterating or substituting your specimen.

#### Circumstances under which you may be tested for Drugs/Alcohol:

- Pre-employment
- Reasonable Suspicion/Cause
  - Any manager or company official may ask you to take an alcohol or drug test under suspicion that you are violating DOT or company policy. Suspicion may be determined by your behavior, speech, appearance, body odor, and/or performance indicators.
- Random
  - Random testing occurs through our consortium. You are put into a pool of employees, and a percent of the employees are randomly chosen to take a drug and/or alcohol test.
  - -- Return-to-duty
    - If you violate any drug or alcohol policy, and you are allowed to return to work, you have to pass an alcohol and drug test before doing so. You are also subject to unannounced follow-up tests at least 6 times in the first 12 months following your return to safety sensitive work.
- Follow-up
  - Follow-up testing is determined by a SAP (substance abuse professional) and may continue for up to 5 years.
- Post-Accident
  - If you are involved in any kind of accident a post-accident test will be required. You will have to take a drug and alcohol test. You are also required to remain available for at least 24 hours for this testing, and are not permitted to refuse testing. Incidents will be tested at manager's discretion depending on severity or frequency.

When you are tested for drugs you will be required to give a urine sample; this may or may not be observed.

# Types of Drugs you will be tested for: under DOT regulations:

Types of drugs you may also be tested for under company policy:

- Amphetamines (including methamphetamine)

- Barbiturates
- Benzodiazepines

- Cocaine metabolites
- Marijuana metabolites /THC

- Methadone
- Opiates (including codeine, heroin, and morphine)
- Phencyclidine (PCP)

o Propoxyphene/metabolite

If there is a suspicion of drug or alcohol use before, during, or after your shift, you will immediately be removed from your safety sensitive function and be suspended until results have been confirmed. If you hold a CDL, your positive test or refusal of a test, will go on your record. Depending on manager's discretion, you may be terminated. If you are not terminated, as a DOT driver, you will not be able to return to work until you complete the following:

- Undergo an evaluation by a Substance Abuse Counselor (SAP)
- Successfully complete counseling or treatment prescribed by the SAP
- Provide a negative test result for drugs and breath test less than .02

#### Refusal examples are FAILURE TO:

- Appear for your test
- Remain at the testing site until the process is complete
- Provide a urine or breath sample for any required test
- Permit the observation or monitoring of you providing a urine sample
- Provide a sufficient urine or breath sample when directed
- Take a second test when directed to do so
- Cooperate with any part of the testing process

- Undergo a medical evaluation as part of "shy bladder" or shy lung" procedures
- Sign Step #2 of the ATF
- Provide an unaltered specimen

All records are directly sent to Management from the consortium. This is to protect your right to privacy.

Drugs and alcohol affect your health, work, and personal life. If you have a drug or alcohol problem that you need help with resolving, The IRL may be willing to help on a case by case basis. If you are prescribed any drug that may affect the safety of yourself or others, you are **required** to report this to the safety manager or human resource manager.

Remember: Safety sensitive employees are obligated by law to submit to and cooperate in drug and alcohol testing mandated by DOT regulations.

#### Medical Card & Drivers License Renewals

Medical Cards need to be renewed at least every two years depending on the expiration date. To renew your medical card you may go to your own physician or get an authorization form to the designated company clinic. If you choose to see your own physician, the IRL will reimburse your co-pay. Once you receive your new card HR will need to make a copy of the card for your DOT file.

If you have problems with renewing your card, such as: high blood pressure, diabetes, vision problems, etc. you will not be able to perform safety sensitive functions until these problems are resolved. Certain medical issues such as diabetes restrict you from holding a medical card by federal law. Utah has a program called The Commercial Driver Medical Waiver Program. If medically qualified, this program is allowed to issue you a "K" restriction to supplement your medical card until you can qualify for one. For more information on this program you can contact the Driver License Division Customer Service Section at (801) 965-4437.

Drivers license renewals are done at your own expense. These need to be completed by the expiration date and a copy given to I-IR to put into your DOT file. <u>If your medical card and/or drivers license is expired, you cannot operate a commercial motor vehicle.</u>

#### Hours and Reporting

CDL holders are regulated by the federal government to only work so many hours. There are different formula's to determine how many hours you can work. In our environment you may not work more than sixty hours per seven consecutive days. These hours are calculated whether you are driving or not; they count as long as you are on company time. These hours are regulated for safety purposes.

If you hold a second job you are required to report it to The IRL Disposal and report the hours you work each week. Regardless of the type of work you do at your other job, your hours there count toward your maximum worked hours, sixty. You would initially speak with Human Resources regarding your other job, and report your weekly hours to your supervisor.

#### Work Environment

Work sites must be clean and orderly. Work surfaces must be kept dry or appropriate means taken to assure the surfaces are slip-resistant. Spills must be cleaned up immediately. All combustible scrap, debris and waste must be stored safely and removed promptly. Combustible dust must be removed. Metallic or conductive dust must be prevented from entering or accumulating on or around electrical enclosures or equipment.

Waste containers must be covered. Oily and paint soaked rags are combustible and should be discarded in sealable metal containers only.

#### Tire Maintenance

Work safely when repairing vehicles. Where tires are mounted and/or inflated on drop center wheels, a safe practice procedure must be posted and enforced.

Where tires are mounted and/or inflated on wheels with split rims and/or retainer rings, a safe practice procedure must be posted and enforced. Each tire inflation hose must have a clip-on chuck with at least twenty-four (24) inches of hose between the chuck and an in-line hand valve and gauge. The tire inflation control valve should automatically shut off the airflow when the valve is released.

A tire restraining device such as a cage, rack or other effective means must be used while inflating tires mounted on split rims, or rims using retainer rings.

Employees are strictly forbidden from taking a position directly over or in front of a tire while it's being inflated. Employees must use proper lifting techniques to avoid over-exertion when lifting tires or other heavy items. If you do not know these techniques, please see your Supervisor.

#### Safety Equipment

Proper safety equipment is necessary for your protection. The company provides the best protective equipment available. Use all safeguards, safety appliances, or devices furnished for your protection and comply with all regulations that may concern or affect your safety. Wear your gear properly; all snaps and straps are fastened, cuffs not cut or rolled. Your supervisor will advise you as to what protective equipment is required for your job.

Certain jobs require standard safety apparel and appliances for the protection of the employee. Your supervisor is aware of the requirements and will furnish you with the necessary approved protective appliances. These items shall be worn and effectively maintained as a condition of your continued employment and part of our mutual obligation to comply with the Occupational Safety and Health Act (OSHA).

Safety goggles, glasses, respirators and face shields shall correspond to the degree of hazard, such as chemical splashes, welding flashes, impact hazard, dust and so forth. Do not alter or replace an approved appliance without permission from your supervisor.

Rubber gloves and rubber aprons shall be worn when working with acids, caustics or other corrosive materials.

Specified footwear must be worn.

No jewelry shall be worn around power equipment.

Long hair must be tied back and in a net to prevent entanglement in moving machinery.

Hearing protection appliances (muffs or plugs) shall be worn by all employees working within any area identified as having excess noise levels. Your supervisor will instruct you in the proper use of the appliance.

#### **Operating Company Equipment**

Company equipment refers to all shop machines, trucks, fork lifts, etc. To operate such equipment you first must be properly trained and signed off on each piece of equipment. If you are to operate equipment without proper training, there will be consequences up to and including termination. Shop safety is of the utmost importance to everyone and will be looked down upon not being followed. If you have any questions regarding operation of equipment or shop rules, please seek out a Supervisor to lead you in the right direction.

#### Backing

When backing up a garbage truck out of a shop bay it is crucial to always have a spotter to guide you. Backing accidents are not tolerated here at the IRL and serious consequences follow a backing accident. If you cannot find someone to spot you, **DO NOT** back up!

#### **Danger of Noise**

Exposing the ear to high levels of noise may cause hearing loss. This loss can be temporary or permanent. Temporary hearing loss or auditory fatigue occurs after a few minutes exposure to an intense noise but is recoverable following a period of time away from the noise. If the noise exposure is repeated, there may be only a partial hearing recovery and the loss becomes permanent. Typically, significant hearing losses occur first in the frequency range of 3,000 to 6,000 hertz (Hz). Losses in this frequency range are not critical to speech perception, and the individual is usually completely unaware of this initial symptom. With longer exposures, the hearing loss spreads to lower frequencies, which will affect speech perception

The evaluation of hearing loss due to noise is complicated by the fact that hearing acuity normally decreases with increasing age. Further, the losses associated with age are quite similar to those caused by excessive noise since the hearing for high frequency sounds is most affected in both instances. Hearing impairment may also result from infections, tumors and degenerative diseases

#### Reducing noise exposure

Noise exposure can be reduced by using engineering controls, administrative procedures, or personal protective devices.

PERSONNEL PROTECTIVE DEVICES

Ear muffs
Ear plugs

Federal and state occupational safety and health regulations require that whenever employees are exposed to excessive noise levels, feasible engineering or administrative controls must be used to reduce these levels. When these control measures cannot be completely accomplished and/or while such controls are being initiated, personnel must be protected from the effects of excessive noise levels. Such protection can, in most cases, be provided by wearing suitable protective hearing devices.

The supervisor will be able to provide ear plugs for employees upon request or before going into a high noise area. Only approved plugs should be used. Earplugs should be cleaned daily to prevent ear infections or the disposable type can be thrown in the waste at the end of the shift.

Protection greater than provided by a single device can be obtained by wearing earplugs under an earmuff. While the reduction provided by wearing both devices simultaneously is considerably less than the total of the individual protection devices, it is still greater than when either device is worn separately.

#### **OTHER NOISES**

Nuisance noises are noises that are not intense enough to cause hearing loss, but do disturb or interfere with normal

activities of speech communication, telephone communication, listening to TV or radio broadcasts, concentration during mental activities, relaxation, and sleep.

The amount of interference is dependent upon the intensity of the noise and its characteristics, such as steady versus intermittent noise, high or low pitch. The amount of interference may also depend upon the person's personality, attitude toward the source, familiarity with the noise, and the intrusiveness of the noise. What is music to one ear may be noise to another.

#### First Aid Kits

First aid kits are located in various places around the office, it is your responsibility to become familiar with these sites. First aid items must only be used when an injury occurs. When an injury occurs you must assess the severity of the injury to determine if you need medical help. If the injury is something with in your control, take care of the situation and report it to your supervisor immediately afterwards. Items such as scissors, tweezers, tubes of ointments with caps, or rolls of adhesive tape, bandaids, eye wash kits, etc. will be found in with in the first aid kits.

#### **Electrical Safety**

It is the policy of the Intermountain Regional Landfill to follow the fundamental principles of safety, which are described below. A clear understanding of these principles will improve the safety of working with or around electrical equipment and power.

Practice proper housekeeping and cleanliness. Poor housekeeping is a major factor in many accidents A cluttered area is likely to be both unsafe and inefficient. Every employee is responsible for keeping a clean area and every supervisor is responsible for ensuring that his or her areas of responsibility remain clean.

Identify hazards and anticipate problems. Think through what might go wrong and what the consequences would be. On not hesitate to discuss any situation or question with your supervisor and coworkers.

Resist 'hurry-up' pressure. Program pressures should not cause you to bypass thoughtful consideration and planned procedures.

Design for safety. Consider safety to be an integral part of the design process. Protective devices, warning signs, and administrative procedures are supplements to good design but can never fully compensate for its absence. Completed designs should include provisions for safe maintenance.

Maintain for safety. Good maintenance is essential to safe operations. Maintenance procedures and schedules for servicing and maintaining equipment and facilities, including documentation of repairs, removals, replacement, and disposals, should be established.

Document your work. An up to date set of documentation adequate for operation, maintenance, testing, and safety should be available to anyone working on potentially hazardous equipment. Keep drawings and prints up to date. Dispose of obsolete drawings and be certain that active file drawings have the latest corrections.

Test equipment safety. Tests should be made when the electrical equipment is de-energized, or, at most, energized with reduced hazard. Know emergency procedures!

#### Flammable and toxic material control

The use of flammable or toxic material must be kept to a minimum. When components with such fluids are used, a catch basin or other approved method must be provided to prevent the spread of these materials should the normal component case fail.

#### Welding, cutting & brazing

Only authorized and trained personnel are permitted to use welding, cutting or brazing equipment. All operators must have a copy of the appropriate operating instructions and arc directed to follow them.

Compressed gas cylinders should be regularly examined for obvious signs of defects, deep rusting, or leakage. Use care in handling and storing cylinders, safety valves, relief valves, to prevent damage. Precaution must be taken to prevent mixture of air or oxygen with flammable gases, except at a burner or in a standard torch. Only approved apparatus (torches, regulators, pressure-reducing valves, acetylene generators, and manifold) may be used.

Cylinders must be kept away from sources of heat. It is prohibited to use cylinders as rollers or supports. Empty cylinders must be appropriately marked, their valves closed and valve-protection caps on.

Signs reading: "Danger No Smoking, Matches, Open Lights, or equivalent must be posted. Cylinders, cylinder valves, couplings, regulators, hoses and apparatus must be kept free of oily or greasy substances. Care must be taken not to drop or strike cylinders.

Unless secured on special trucks, all regulators must be removed and valve-protection caps put in place before moving cylinders.

All cylinders without fixed hand wheels must have keys, handles, or non-adjustable wrenches on stem valves when in service.

Liquefied gases must be stored and shipped valve-end up with valve covers in place. Before a regulator is removed, the valve must be closed and gas released from the regulator.

All employees are instructed never to crack a fuel-gas cylinder valve near sources of ignition.

RED is used to identify the acetylene (and other fuel-gas) hose.

GREEN is for oxygen hose.

BLACK is for inert gas and air hose.

All pressure-reducing regulators must be used only for the gas and pressures for which they are intended.

The open circuit (No Load) voltage of arc welding and cutting machines must be as low as possible and not in excess of the recommended limits. Under wet conditions, automatic controls for reducing no-load voltage must be used. Grounding of the machine frame and safety ground connections of portable machines must be checked periodically.

Electrodes must be removed from the holders when not in use.

All electric power to the welder must be shut off when no one is in attendance.

Suitable fire extinguishing equipment must be available for immediate use before starting to ignite the welding torch.

The welder is strictly forbidden to coil or loop welding electrode cable around his/her body.

All wet welding machines must be thoroughly dried and tested before being used.

All work and electrode lead cables must be frequently inspected for wear and damage, and replaced when needed. All connecting cable lengths must have adequate insulation. When the object to be welded cannot be moved and fire hazards cannot be removed, shields must be used to confine heat, sparks and slag.

When welding is done on metal walls, precautions must be taken to protect combustibles on the other side. Before hot work is begun, used drums, barrels, tanks and other containers must be so thoroughly cleaned that no substances remain that could explode, ignite or produce toxic vapors. It is required that eye protection helmets, hand shields and goggles meet appropriate standards.

Employees exposed to the hazards created by welding, cutting or brazing operations must be protected with personal protective equipment and clothing.

Check for adequate ventilation where welding or cutting is performed. When working in confined spaces, environmental monitoring tests should be taken and means provided for quick removal of welders in case of emergency.

#### **Machine Guarding**

Before operating any machine, every employee must have completed a training program on safe methods of machine operations. It is the primary purpose of supervision to ensure that employees are following safe machine operating procedures. There will be a regular program of safety inspection of machinery and equipment.

All machinery and equipment must be kept clean and properly maintained. There must be sufficient clearance provided around and between machines to allow for safe operations, set up, servicing, material handling, and waste removal.

All machinery will be securely placed and anchored when necessary, to prevent tipping or other movement that could result in personal injury. Most of the time, machinery should be bolted to the floor to prevent movement. The electrical cord to the machinery will be attached to a breaker or other shut-off device to stop power in case of machine movement.

There must be a power shut-off switch within reach of the operator's position at each machine. Electrical power to each machine shall be capable of being locked out for maintenance, repair or security. The non-current carrying metal parts of electrically operated machines must be bonded and grounded.

The foot-operated switches are guarded and/or arranged to prevent accidental actuation by personnel or falling objects. All manually operated valves and switches controlling the operation of equipment and machines must be clearly identified and readily accessible.

All emergency stop buttons are colored RED.

All the pulleys and belts which are within seven (7) feet of the floor or working level are to be properly guarded.

All moving chains and gears must be properly guarded.

The supervisor will instruct every employee in the work area on the methods provided to protect the operator and other employees in the machine area from hazards created by the operation of a machine, such as nip points, rotating parts, flying chips and sparks.

The machinery guards must be secure and arranged so they do not present a hazard.

If the machinery is cleaned with compressed air, the air must be pressure controlled and personal protective equipment or other safeguards used to protect operators and other workers from eye and bodily injury.

#### Walkways

All aisles and passageways must be kept clear and clearly marked with tape or paint. Wet surfaces must be covered with non-slip material and all holes properly covered or marked with warning guards. All spills must be cleaned up immediately, and a caution sign placed on all wet or drying surfaces.

In cases of passageways used by forklifts, trucks or other machinery, use a separate aisle for walking, if available. If no separately marked aisle is available, use extreme caution. Remember, walking in a passageway used by machinery is like walking in the middle of a street used by cars. Walking employees may have the right of way, but the heavy vehicles can't always see you and can't always stop in time. The key to moving around in such circumstances is to stop, look and listen and them to move when there is no danger. Make eye contact with the drivers of moving vehicles so that you know they know you are there.

If an employee is aware of any breach of these standards, please inform the Responsible Safety Officer.

#### **Material Handling**

In handling materials the employees must know the following:

- 1. There must be safe clearance for equipment through aisles and doorways.
- 2. Aisle ways must be designated, permanently marked, and kept clear to allow unhindered passage.
- 3. Motorized vehicles and mechanized equipment will be inspected daily or prior to use.
- 4. Vehicles must be shut off and brakes must be set prior to loading or unloading.
- 5. Material Safety Data Sheets will be available to employees handling hazardous substances.

#### **Fall Safety**

When your feet are four feet or higher above the floor, you must practice proper fall safety. If you have any questions concerning proper fall safety, please see the General Manager.

# Attachment C - Monthly Training Records for HHW

Monthly Fraining - AHW September 1/2

# **Major Categories of HHW**

- E-waste
- Radioactive Waste
- Mercury Containing Wastes (Fluorescent lamps, Thermostats)
- Batteries
- Refrigerant Containing Devices
- Paints and Solvents
- Cleaning Agents
- Pesticides, Herbicides, & Insecticides
- Aerosols, Propane Cylinders
- Automotive Wastes (Oil, Antifreeze, etc.)
- Ammunition
- Pharmaceuticals

# What to do with it?

- Use it up
- Reuse/Recycling
- Neutralization (for Corrosives)
- Incineration, Destruction and Waste-toenergy
- Hazardous waste landfill (sequestering, isolation, etc.)

# **Safety Hierarchy**

**Elimination** 

**Substitution** 

**Engineering/Maintenance** 

Instruction/ Methods

PPE

# **Everything is Toxic**

# There are 4 Toxicity Classes.

Classes I to III are required to carry a **Signal Word** on the label.

## **Toxicity Class IV**

- Practically nontoxic
- No Signal Word required since 2002

## **Toxicity Class III**

- Slightly toxic
- Signal Word: "<u>Caution</u>", possibly followed by:
- "Harmful if swallowed", "May be harmful if absorbed through the skin",
   "May be harmful if inhaled", or "May irritate eyes, nose, throat, and skin"
- Class III materials are estimated to be fatal to an adult human at some dose in excess of 30 grams.

# **How Toxic is it?**

## **Toxicity Class II**

- Moderately toxic
- Signal Word: "Warning", possibly followed by:
- "Harmful or fatal if swallowed", "Harmful or fatal if absorbed through the skin", "Harmful or fatal if inhaled", or "Causes skin and eye irritation"
- Class II materials are estimated to be fatal to an adult human at a dose of 5 to 30 grams.

## **Toxicity Class I**

- Most toxic:
- Requires Signal Word: "<u>Danger-Poison</u>", with skull and crossbones symbol, possibly followed by:
- "<u>Fatal if swallowed</u>", "<u>Poisonous if inhaled</u>", "<u>Extremely hazardous by skin contact--rapidly absorbed through skin</u>", or "<u>Corrosive--causes eye damage and severe skin burns</u>"
- Class I materials are estimated to be fatal to an adult human at a dose of less than 5 grams (less than a teaspoon).

#### Household Hazardous Waste Chart

Tiouseriola Tiazar	DISPOSAL	METHOD
TYPE OF WASTE	Drain	المام الم
KITCHEN		•
Aerosal cans (empty)		
Aluminum cleaners Ammonia-based cleaners		
Bug sprays		-
Drain cleaners		
Floor care products		
Furniture polish Metal polish with solvent		
Window cleaner		
Oven cleaner (lye base)		E .
Used kitchen oil and grease (contained)  BATHROOM	章	
Alcohol-based lotions		
(aftershaves perfumes, etc.)		
Bathroom cleaners		<u> </u>
Depilatories Disinfectants		-
Permanent lotions	-	
Hair relaxers	•	19
Medicine (expired)		<del></del>
Nail polish (solidified) Toilet bowl cleaner		
Tub and tile cleaners	-	
GARAGE	•	
Antifreeze		💆 💆
Automatic transmission fluid  Auto body repair products		=
Battery (auto)	<del></del>	1 1
Brake fluid		
Car wax with solvent		
Diesel fuel Fuel oil		<u> </u>
Gasoline		2
Kerosene		
Metal polish with solvent		-
Motor oil & oil filters Other oils		
Windshield washer solution		
WORKSHOP		
Paint brush cleaner with solvent Paint brush cleaner with TSP	20	<u></u>
Aerosol cans (empty)		
Cutting oil		
Glue (solvenI-based)		
Glue (water-based) Paint — latex		
Paint — oil-based		
Paint — auto		9
Paint — model		
Paint thinner Paint stripper		<u> </u>
Paint stripper (lye-based)		
Primer		
Rust remover (with phosphoric acid)		
Turpentine Varnish		
Wood preservative		6
GARDEN		
Fertilizer		<u> </u>
Fungicide Herbicide		_ <del></del>
Insecticide		<b>B</b>
Rat poison		
Weed killer		<u>e</u>
MISCELLANEOUS Ammunition		
Artists' paints		<u> </u>
Batteries (household)		#
Dry cleaning solvents	<del></del>	
Fiberglass epoxy Gun cleaning solvents		
Lighter fluid		
Mercury batteries		
Moth balls		R
Old fire alarms Photographic chemicals		<u> </u>
Shoe polish		
Swimming pool acid		
Water softener salt	Switch to putas	
<ul> <li>Products that can be poured down the distin wi</li> </ul>	un previo, of water or teles	n to the household

- Products that can be poured down the drain with plenty of water or taken to the household hezardrus waste contert.

  Makeneds that remost be poured down the drain, but can be safely disposed of in the garbage.

  Hazardbus wastes that should be laters to your unaffall's household nazardous waste collection center Call Monterey Poursalia, 384 C413, Salvinas/Castrovillo/Prundatile 759-7295.

  Peryclable material: Take to a recycling center or call 1-800-CLEANUP for currisde oil pick-up.

Monthly Braining - HHW August 12.

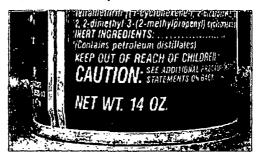
# Civica Software

#### Identifying Household Hazardous Waste

There are many factors that can contribute to a waste being considered household hazardous waste. For example, toxicity, environmental hazards, flammability, reactivity and corrosivity are all characteristics of products that can cause them to be hazardous waste in California Unfortunately, there's no master list of household hazardous products created by state or federal government for residents to check to determine if the products under their shelves are household hazardous waste.

Therefore, we must use common sense and look for warning labels on products to make our best judgment whether or not any product is household hazardous waste. Please err on the side of caution. If you suspect a product of being hazardous, treat it that way.





Warning labels on products can give us important clues that a product may be hazardous Common warnings associated with HHW include. DANGER, CAUTION, WARNING, FLAMMABLE, POISON, REACTIVE, CORROSIVE, HARMFUL WHEN SWALLOWED OR EXPLOSIVE If you need help determining if a product in your house is a hazardous waste and cannot be disposed of in the trash, email or call us

Here are some examples of common household hazardous wastes that must be disposed through our service and NOT in the regular trash.

Once you have know what you have to get rid of you can make an appointment here Online **Appointment System** 

- Brake Fluid
- Paint Oil-Based, Water-Based & Latex
- \* Flammable Paint thinner, Deck Stains, Varnish, Lacquer, Shellac and Water Repellants
- Flammable Polishes
- ·Motor Oil, Transmission Fluid or Oil filters
- Antifreeze
- Propane (Compressed Gas Cylinders LESS than 5 gallons or 20 lbs i e BBQ or campingsized) Tanks
- Batteries (all types including AA)
- TV or Computer Monitors
- •Gasoline/Kerosene
- Household Aerosols
- \*Lamps (mercury based) Flourescent, Compact Flourescent, Metal Halide, High Pressure

#### Sodium

- \* Fats, Oils, Grease, Fryer Oil (while these are not hazardous, the City prefers to pick these items up and recycle them to prevent future problems with the City's sewer system)
- •Mercury Containing devices Mercury Thermostats, Thermometers and Switches (We can now pick these up with the weekly service too )
- •Electronics (otherwise known as Consumer Electronics including but not limited to VCRs, DVDs, Amps, Printers, Microwaves, Computer CPUs, Scanners)
- •Chlorinated or Solvent Based Cleaners and Degreasers
- Acids
- •Flammable Polishes
- •Pesticides
- •Herbicides
- Fungicides
- Algaecides
- Oxidizers (Tree Stump Removers, compressed Oxygen or Ammonium Nitrate Fertilizer)
- Pharmaceuticals (Take controlled substances to Folsom PD)
- Asbestos
- Lead Scraps
- Drain Cleaner
- Paint Strippers
- Wood Preservatives
- Floor and Furniture Cleaners
- •Gopher Baits and Gassers
- Pool Chemicals (chlonnators and ph adjustors)
- .Poisons and Foggers
- Chlorine Bleach or Chlorine Based Cleaners
- Ammonia Based Cleaners
- •Household Degreasers (containing glycol ethers Simply Green and Formula 409)

#### Special Wastes

Pharmaceuticals (Take controlled substances to Folsom PD)

**Attachment D - Landfill Inspection and Load Inspection Forms** 

# Inspection Report – Intermountain Regional Landfill

	Overall Cond	<u>lition</u>	Monitoring
	Satisfactory	Needs Work*	<b>Results</b>
. Structures & Roads			
Fences & Gates <sup>1</sup>	<del></del>		<del></del>
Access Roads <sup>1</sup>	<del></del>		
Ditches <sup>1</sup>	<del></del>		<del> </del>
Landfill Operations Fences & Gates <sup>1</sup>			
Litter Control <sup>1</sup>			· · · · · · · · · · · · · · · · · · ·
Protective Cover <sup>1</sup>			····
Daily Cover <sup>1</sup>			
Intermediate Cover <sup>2</sup>			
Final Cover <sup>4</sup>			
Equipment <sup>1</sup>	<u></u>		
Stormwater Ditches <sup>2</sup>			
. Leachate Pond Fences & Gates <sup>1</sup>			
Liner System <sup>2</sup>			
Influent Pipe <sup>2</sup>			<del></del>
Gravity Lines <sup>2</sup>			
<b>Monitoring Facilities</b>			
Weed Control <sup>4</sup>			
Groundwater Wells <sup>4</sup>			
	pecify the work nee		
Key: 1 = daily; 2 =	weekly; 3 = month	1y; 4 = quarterry; 5	= semiannuali
Other Comments:			
			······································

18 | Plan of Operations

# **Intermountain Regional Landfill**

### **Load Inspection Form**

<u>Material</u>		Present?		Comment	
Hazardous Waste/Materials					
PCB Materials					
Liquid Wastes					
Batteries					
Flourescent Bulbs					
Tires					
Aerosal Cans					
Oily Rags, Used Sorbent Materials					
Appliances, Computer Components					;
Pesticides				,	
Asbestos Containing Materials					
Shingles/Asphalt					
Other					
Hauler:	TK#				
Origin:					
Inspector:		<del></del>	Date:		
Signature:			·		
Comments:	<del>,</del>		 -		<del></del>

Attachment E – December	2012 Groundwater Sta	atistical Analysis Report
•		
		,
		·
,		

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January 21, 2013

Rob Richards Intermountain Regional Landfill 800 South Allen Ranch Road Fairfield, UT 84013

# Re: December 2012 Groundwater Monitoring Statistical Results for Intermountain Regional Landfill

Dear Mr. Richards:

HDR Engineering, Inc. (HDR) has prepared this letter report regarding the groundwater monitoring program at the Intermountain Regional Landfill (IRL) This report summarizes the statistical analyses performed on analytical results from the groundwater sampling conducted in **December 2012**. Attachment 1 contains the control charts and prediction limit graphs used in the statistical analyses. Attachment 2 contains the results of the latest laboratory analyses and the results of the field-measured parameters, including a recording of the static water level found in each well.

#### Statistical Methods

The initial inter-well analysis of the groundwater chemistry indicated enough variability between wells to justify using an intra-well analysis approach. The results of the inter-well analysis were presented in a report submitted to the Division of Solid and Hazardous Waste on July 6, 2012. A software package called SANITAS, developed by SANITAS technologies (formerly NIC Environmental), was used to perform the statistical analysis of the groundwater data.

The statistical analysis approach uses intra-well methods consisting of control charts and prediction limits. The purpose of this analysis is to determine if there are any statistically significant changes in the compliance data relative to background concentrations. These methods establish limit values based on the background water quality data collected for each well.

In the case of control charts, a statistically significant change is based on the standard deviation established by the background data. When using the control charts method, the constituents will have the following characteristics:

- The data will be tested for normality using the Shipiro-Wilk normality test (for <50 samples) or the Shipiro-Francia test (for >50 samples) included in the SANITAS statistical analysis package. The Shapiro-Wilk normality test is the preferred method based on EPA guidance. When data are considered normal, the values are consistent and follow a normal, bell-shaped curve (Gaussian curve). The majority of the values (95%) are within two standard deviations from the mean of the concentration values.
- The percentage of non-detects will be less than 50%.

<sup>&</sup>lt;sup>1</sup> EPA, June 1992. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance. EPA 530SW89026.

December 2012 Groundwater Monitoring Statistical Results January 21, 2013
Page 2 of 6

- The data will have no statistical trends as shown by the trend analysis plots.
- This method assumes that the landfill has not previously affected the groundwater.

The SANITAS program will not execute a control chart if the data set is transformed normal using Cohen's adjustment. In general, Cohen's adjustment accounts for data that are below the set detection limit or practical quantitation limit (PQL) for the method established by the laboratory. The Cohen adjustment is executed when the data set includes at least 15% non-detects.

The constituents that do not meet all the criteria above are analyzed using a prediction limit (PL). Typically, for inorganic constituents, the preferred method is to use a parametric intra-well analysis approach. Under this approach, the false positive rate or alpha is 0.01 or 1%. The assumption under the parametric approach is that the background data are normal or transformed normal. The PL for a particular constituent is calculated from the mean value (X) of the entire background data set, excluding the most recent data point, using the following equation:

$$PL = Mean(X) + (T-value \times Standard Deviation)$$

Note. T-value from standard statistical tables

Not all constituents in this data set allow the use of a parametric approach A non-parametric approach will be used in lieu of a parametric approach if the data set fails the normality test using the Shipiro-Wilk normality test, cannot be transformed normal, and has between 50% and 90% non-detects. When the data set has greater than 90% non-detects, an intra-well Poisson PL is executed, and the non-detect values are substituted with one-half the detection limit. Data that fall under the Poisson criteria have a low probability of detection but stay constant from sampling period to sampling period. When a non-parametric approach is applied, the highest background concentration from the data set is used for the PL.

#### Summary of Statistical Analysis

The statistical analysis summarized in this report is for data from wells DMW-1 and TMW-4 on December 4, 2012. The background sampling period was performed from August 2011, to March 2012. Well DMW-1 is located upgradient to the entire landfill site. Well TMW-4 currently serves as the downgradient compliance well for the first stages of landfill operation, Cell #1, Phase #1. The laboratory analytical results were reviewed to determine whether a statistical analysis was needed. If the laboratory results reported a non-detect for a particular constituent from a particular monitoring well, no statistical analysis was conducted for that constituent. However, the information was placed in the groundwater quality database to maintain a complete record.

Samples were also collected from Wells DMW-2, DMW-6, and DMW-7, which are located along the site perimeter, down-gradient from future landfill activities. Samples were collected from these wells and analyzed to increase the sample size and improve the background data and future statistical analysis. These wells do not serve as a point of compliance for the IRL landfill units at this time. Therefore, no statistical analysis was conducted.

<sup>&</sup>lt;sup>2</sup> EPA, June 1992. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Addendum to Interim Final Guidance. EPA 530SW89026.

December 2012 Groundwater Monitoring Statistical Results January 21, 2013 Page 3 of 6

#### Statistically Significant Changes

The data were analyzed using control charts (titled Combined Shewhart-Cusum Charts) and PL graphs to determine if there were any statistically significant changes from background levels. Only statistically significant changes in the reported values from the latest sampling event are reported below

#### **Downgradient Monitoring Well**

#### TMW-4

Laboratory reported concentration of carbon disulfide (15.8  $\mu$ g/L) was determined by statistical analysis to be a significant change from the background concentration in temporary monitoring well TMW-4. Carbon disulfide was not previously detected in TMW-4. However, concentrations ranging from 2.38  $\mu$ g/L to 8.03  $\mu$ g/L were reported during background characterization in monitoring wells DMW-1, DMW-5, and DMW-8. Attachment 1 contains a time-series chart showing the reported concentrations of carbon disulfide. Carbon disulfide is known to be a naturally occurring byproduct of the biodegradation of organic material.<sup>3</sup> Because carbon disulfide was detected in groundwater before landfill operations began, it could be naturally occurring at these levels or another groundwater contamination source is discharging carbon disulfide resulting in concentrations near the Practical Quantitation Limits (PQL) of the laboratory method (2  $\mu$ g/L) at the IRL.

#### **Up-gradient Monitoring Well**

#### DMW 1

No statistically significant changes were detected

#### **Conclusions**

Statistical analysis conducted for the December 2012 groundwater sampling event indicate overall chemical concentrations in groundwater at the IRL remain near background concentrations for all constituents except carbon disulfide in TMW-4. As mentioned above, carbon disulfide was detected by the analytical laboratory at similarly low concentrations during background sampling. In addition, the Utah Solid Waste Ground Water Quality standard (Rule R315-308) for carbon disulfide is 4 mg/L (4,000 µg/L) which is well above the reported concentrations (15.8 µg/L) in TMW-4. Further, because no other VOCs were detected, no other reported chemical concentrations in groundwater exhibited statistically significant increases over background concentrations during the last sampling event, and considering the limited amount of waste (1,800 tons) in place and the lack of leachate being generated at the IRL, we do not believe the existence of carbon disulfide is a result of landfill operations. You should request that the next scheduled semi-annual sampling event be used to confirm the presence of carbon disulfide in groundwater at the IRL.

<sup>3</sup> http://www.epa.gov/chemfact/s carbds.txt

December 2012 Groundwater Monitoring Statistical Results January 21, 2013 Page 4 of 6

If you have any questions regarding this letter or the results of the analysis, please contact me at (801) 743-7812.

Sincerely,

Terry Warner, PE

HDR Engineering, Inc.

Attachment 1: Statistical Analysis Results including prediction limit graph of carbon disulfide in TMW-4 and carbon disulfide time-series plot.

Attachment 2: Results of laboratory analysis, field-measured parameters, and chain-of-custody form

December 2012 Groundwater Monitoring Statistical Results January 18, 2013 Page 5 of 6

# **Attachment 1**

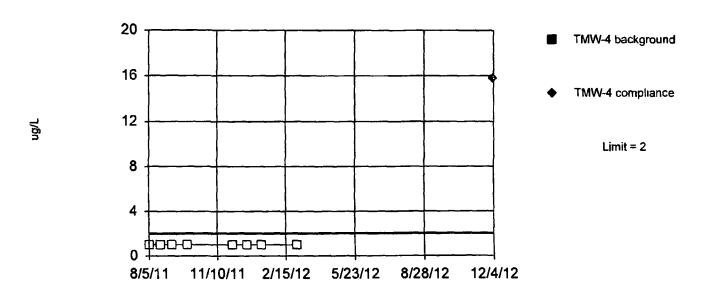
Statistical Analysis Results

v.9.2.17 Sanitas software licensed to HDR, Inc. only EPA Hollow symbols indicate censored values.

**Exceeds Limit** 

#### **Prediction Limit**

#### Intrawell Non-parametric

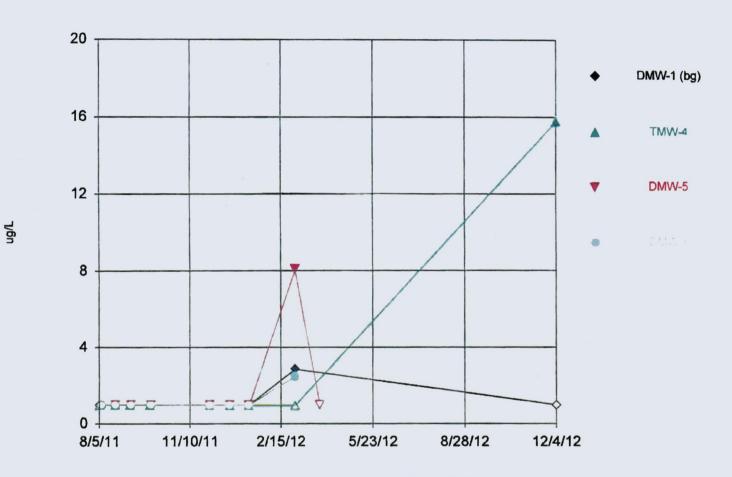


Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. All background values were censored; limit is most recent reporting limit. Report alpha = 0.1111. Most recent point compared to limit.

Constituent: Carbon disulfide Analysis Run 12/18/2012 2:42 PM

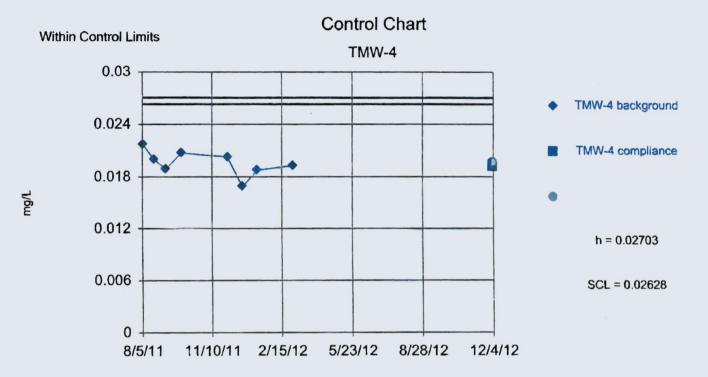
Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1

## **Time Series**



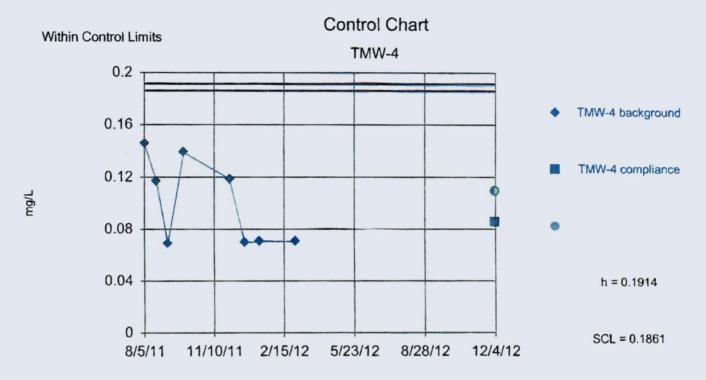
Constituent: Carbon disulfide Analysis Run 1/11/2013 11:16 AM

Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



Background Data Summary: Mean=0.0196, Std. Dev.=0.001485, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9758, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Arsenic Analysis Run 1/16/2013 12:09 PM



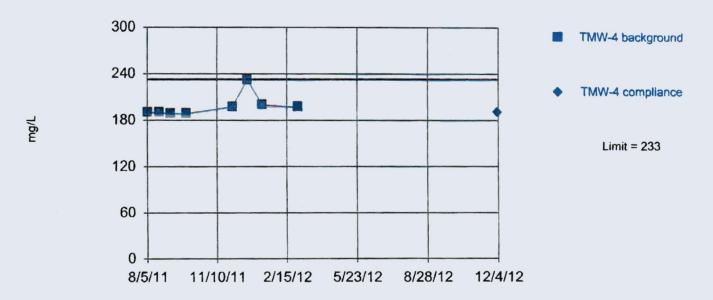
Background Data Summary (based on cube transformation): Mean=0.001307, Std. Dev.=0.001141, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8185, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Barium Analysis Run 1/16/2013 12:10 PM

Within Limit

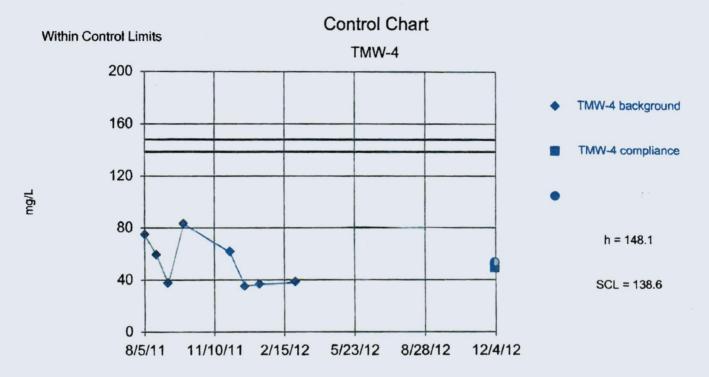
# Prediction Limit

# Intrawell Non-parametric



Non-parametric test used in lieu of control chart because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 8 background values. Report alpha = 0.1111. Most recent point compared to limit.

Constituent: Bicarbonate [as CaCO3] Analysis Run 1/16/2013 12:11 PM Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



Background Data Summary: Mean=53.3, Std. Dev.=18.96, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8473, critical = 0.818. Dates ending 3/2/2012 used for control stats.

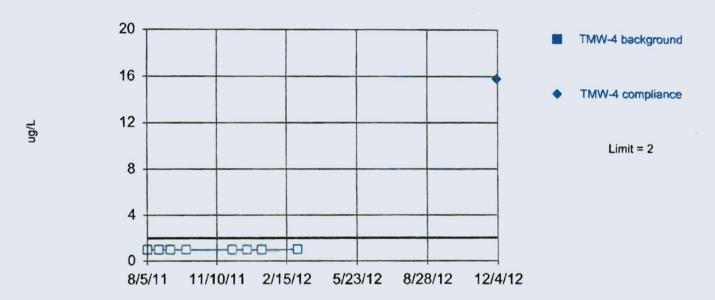
Constituent: Calcium Analysis Run 1/16/2013 12:13 PM

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**Exceeds Limit** 

#### **Prediction Limit**

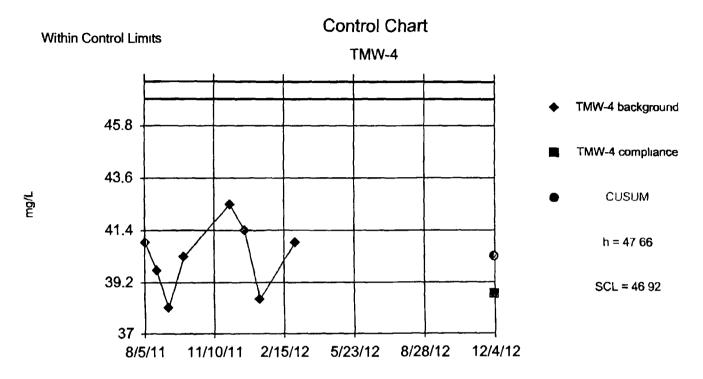
#### Intrawell Non-parametric



Non-parametric test used in lieu of control chart because non-detects exceed user-adjustable maximum of 50%. All background values were censored; limit is most recent reporting limit. Report alpha = 0.1111. Most recent point compared to limit.

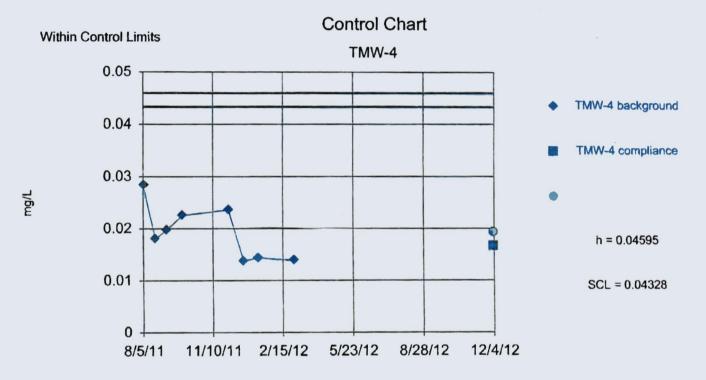
Constituent: Carbon disulfide Analysis Run 1/16/2013 12:14 PM

Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



Background Data Summary Mean=40.29, Std. Dev.=1.474, n=8. Insufficient data to test for seasonality. data were not deseasonalized. Normality test. Shapiro Wilk @alpha = 0.05, calculated = 0.9611, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Chloride Analysis Run 1/16/2013 12:15 PM
Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



Background Data Summary: Mean=0.01933, Std. Dev.=0.005324, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.914, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Chromium Analysis Run 1/16/2013 12:17 PM

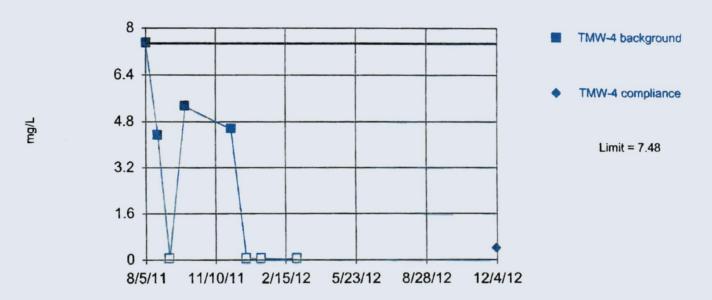
Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1

v.9.2.17 Sanitas software licensed to HDR, Inc. only. EPA Hollow symbols indicate censored values.

Within Limit

#### **Prediction Limit**

#### Intrawell Non-parametric



Non-parametric test used in lieu of control chart because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 8 background values. 50% NDs. Report alpha = 0.1111. Most recent point compared to limit.

Constituent: Iron Analysis Run 1/16/2013 12:21 PM



Background Data Summary: Mean=45.3, Std. Dev.=4.153, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8648, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Magnesium Analysis Run 1/16/2013 12:22 PM

v.9.2.17 panitas software licensed to HDR, Inc. only. EPA Hollow symbols indicate censored values.

Within Limit

#### **Prediction Limit**

#### Intrawell Non-parametric



Non-parametric test used in lieu of control chart because the data required both a power transformation and Cohen's adjustment. Limit is highest of 8 background values. 50% NDs. Report alpha = 0.1111. Most recent point compared to limit.

Constituent: Manganese Analysis Run 1/16/2013 12:23 PM



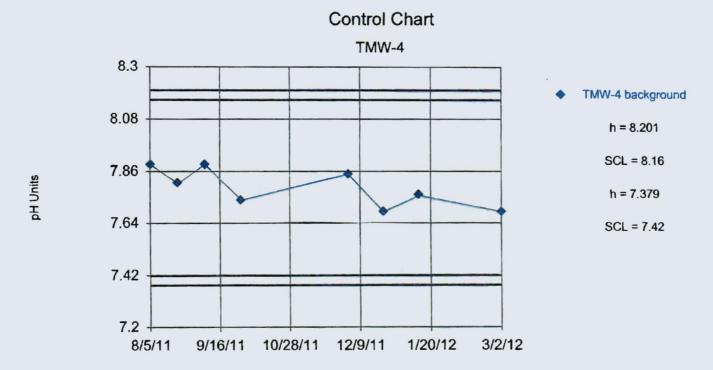
Background Data Summary: Mean=0.006396, Std. Dev.=0.004146, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.922, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Nickel Analysis Run 1/16/2013 12:24 PM



Background Data Summary: Mean=0.4018, Std. Dev.=0.04454, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8304, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Nitrate [as N] Analysis Run 1/16/2013 12:24 PM



Background Data Summary: Mean=7.79, Std. Dev.=0.08229, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8979, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: pH @ 25??? C Analysis Run 1/16/2013 12:25 PM
Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



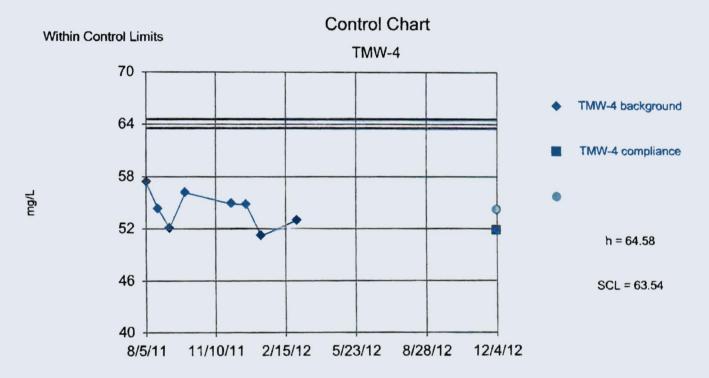
Background Data Summary: Mean=2.514, Std. Dev.=1.41, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8532, critical = 0.818. Dates ending 3/2/2012 used for control stats.



Background Data Summary: Mean=23.21, Std. Dev.=0.9478, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9182, critical = 0.818. Dates ending 3/2/2012 used for control stats.

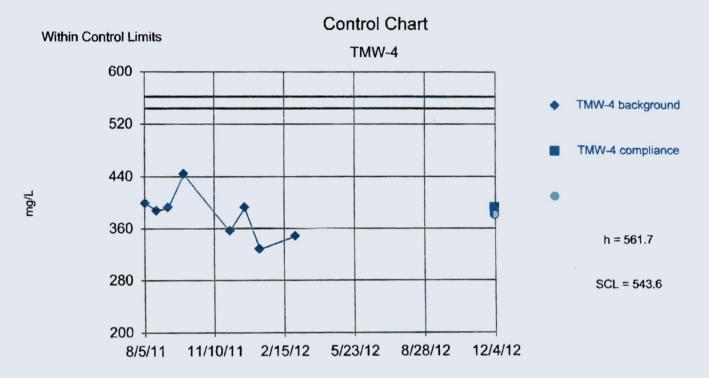
Constituent: Sodium Analysis Run 1/16/2013 12:26 PM

Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



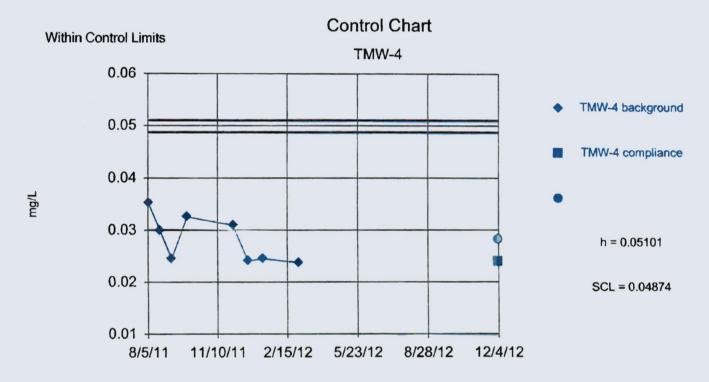
Background Data Summary: Mean=54.24, Std. Dev.=2.068, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9771, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Sulfate Analysis Run 1/16/2013 12:27 PM



Background Data Summary: Mean=381, Std. Dev.=36.14, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.949, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Total Dissolved Solids Analysis Run 1/16/2013 12:29 PM Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



Background Data Summary: Mean=0.02825, Std. Dev.=0.004553, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8562, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Vanadium Analysis Run 1/16/2013 12:32 PM

v.9.2.17 Sanitas software licensed to HDR, Inc. only. EPA Hollow symbols indicate censored values.

Within Limit

#### **Prediction Limit**

#### Intrawell Non-parametric



Non-parametric test used in lieu of control chart because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 8 background values. 50% NDs. Report alpha = 0.1111. Most recent point compared to limit.

Constituent: Zinc Analysis Run 1/16/2013 12:34 PM

Within Limit

#### **Prediction Limit**

### Intrawell Non-parametric



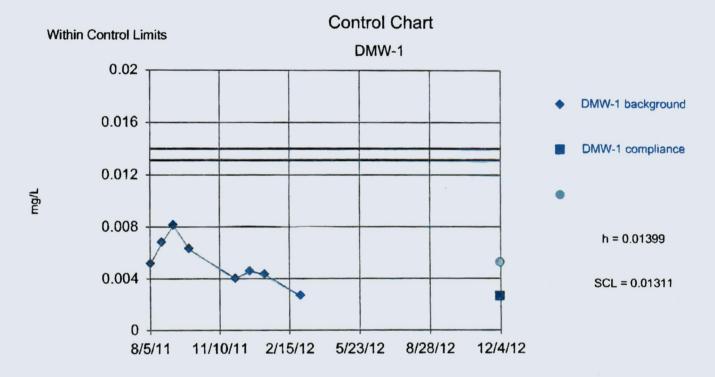
Non-parametric test used in lieu of control chart because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 8 background values. Report alpha = 0.1111. Most recent point compared to limit.

Constituent: Chloride Analysis Run 1/16/2013 12:15 PM



Background Data Summary: Mean=0.04124, Std. Dev.=0.0181, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9298, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Manganese Analysis Run 1/16/2013 12:22 PM
Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



Background Data Summary: Mean=0.005253, Std. Dev.=0.001747, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9774, critical = 0.818. Dates ending 3/2/2012 used for control stats.

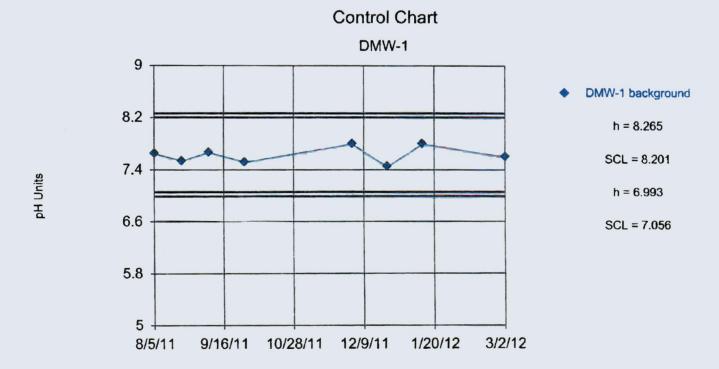
Constituent: Nickel Analysis Run 1/16/2013 12:24 PM

v 9.2.17 sanitas software licensed to HDR, Inc. only. EPA Hollow symbols indicate censored values.



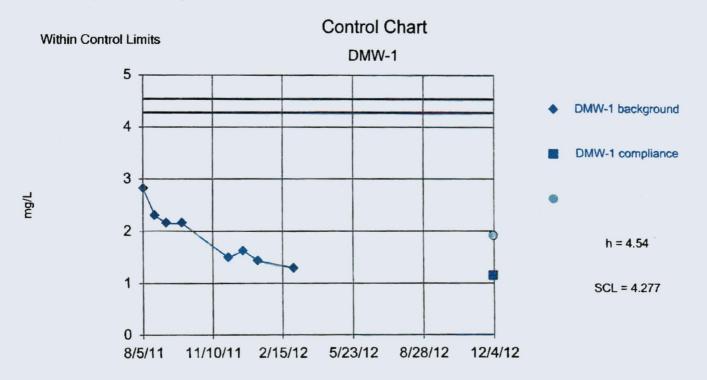
Background Data Summary: Mean=0.0469, Std. Dev.=0.01977, n=8, 12.5% NDs. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8512, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Nitrate [as N] Analysis Run 1/16/2013 12:24 PM



Background Data Summary: Mean=7.629, Std. Dev.=0.1272, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9374, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: pH @ 25??? C Analysis Run 1/16/2013 12:25 PM



Background Data Summary: Mean=1.911, Std. Dev.=0.5257, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9204, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Potassium Analysis Run 1/16/2013 12:25 PM
Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1

Within Limit

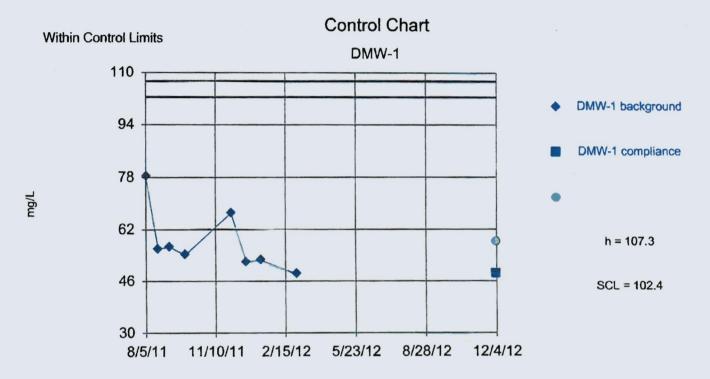
#### **Prediction Limit**

#### Intrawell Non-parametric



Non-parametric test used in lieu of control chart because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 8 background values. Report alpha = 0.1111. Most recent point compared to limit.

Constituent: Sodium Analysis Run 1/16/2013 12:26 PM



Background Data Summary: Mean=58.15, Std. Dev.=9.834, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8362, critical = 0.818. Dates ending 3/2/2012 used for control stats.

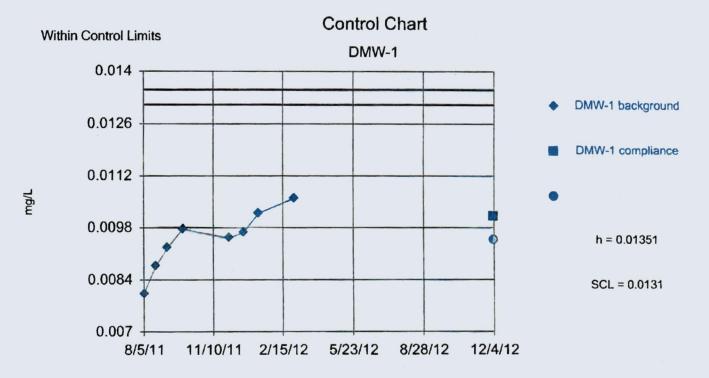
Constituent: Sulfate Analysis Run 1/16/2013 12:27 PM



Background Data Summary: Mean=41.81, Std. Dev.=2.511, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.94, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Magnesium Analysis Run 1/16/2013 12:22 PM

Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



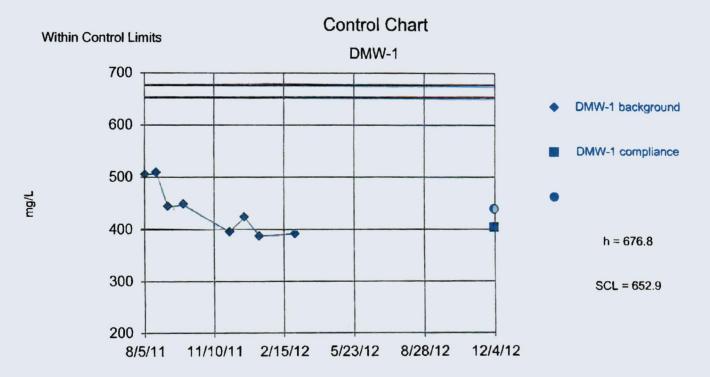
Background Data Summary: Mean=0.00948, Std. Dev.=0.0008053, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9738, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Arsenic Analysis Run 1/16/2013 12:09 PM



Background Data Summary: Mean=0.07546, Std. Dev.=0.01173, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8314, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Barium Analysis Run 1/16/2013 12:09 PM



Background Data Summary: Mean=438, Std. Dev.=47.76, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8756, critical = 0.818. Dates ending 3/2/2012 used for control stats.

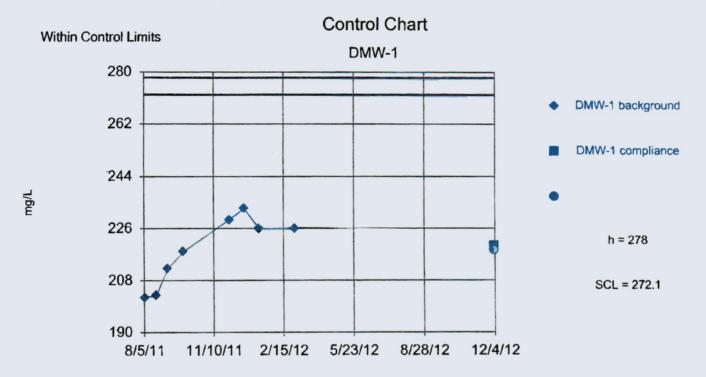
Constituent: Total Dissolved Solids Analysis Run 1/16/2013 12:29 PM

Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



Background Data Summary: Mean=0.01026, Std. Dev.=0.001315, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9107, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Vanadium Analysis Run 1/16/2013 12:32 PM



Background Data Summary: Mean=218.6, Std. Dev.=11.88, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9036, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Bicarbonate [as CaCO3] Analysis Run 1/16/2013 12:11 PM
Facility: Intermountain Regional LF Client: HDR, Inc. Data File: IRLgroundwaterSanitas San8\_1



Background Data Summary: Mean=56.71, Std. Dev.=3.55, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9063, critical = 0.818. Dates ending 3/2/2012 used for control stats.

Constituent: Calcium Analysis Run 1/16/2013 12:13 PM

# Attachment 2

Field Monitored Data

Laboratory Results

Chain of Custody

#### **GROUNDWATER MONITORING PROGRAM**

FIELD DATA REPORTING FORM FAIRFIELD LANDFILL

Date: 12/4/17
Sampled By: North Michels
Recorded By: North Michels
Weather: Westerstalm 350F

Well Number	Depth of Well	Depth of Water	Temp C_V F	pН	Conductivity	Comments
DMW-1	735	48.5'	11.1	7.2	516	
Omw-2	72.8	53.2	10.5	7.3	794	
TMW-4	67.2	592	10.1	フフ	427	
DMW-6	80.3	65.7	123	8.1	392	
DMW-7	81.6	731	122	7.8	462	



Nate Nichols HDR Engineering 3949 South 700 East # 500 Salt Lake City, Utah 84107 TEL: (801) 743-7800

RE: IRL Groundwater

Dear Nate Nichols

463 West 3600 South Salt Lake City, UT 84115

American West Analytical Laboratories received 5 sample(s) on 12/4/2012 for the analyses presented in the following report.

Lab Set ID: 1212052

Phone (801) 263-8686
Toll free (888) 263-8686
Fux (801) 263-8687
e-mail awal@awal-labs.com

web www.awal-labs.com

Kyle F Gross Laboratory Director

> Jose Rocha QA Officer

American West Analytical Laboratories (AWAL) is accredited by The National Environmental Laboratory Association Conference (NELAC) Institute in Utah and Texas; and is state accredited in Colorado, Idaho, New Mexico, and Missouri In addition, AWAL is also accredited by the American Analytical Laboratory Association (A2LA) on ISO IEC 17025:2005, Department of Defense (DOD), UST for the State of Wyoming, and the National Lead Laboratory Accreditation Program (NLLAP). All analyses were performed in accordance to The NELAC Institute and/or A2LA protocols unless noted otherwise Accreditation documents are available upon request. If you have any questions or concerns regarding this report please feel free to call

The abbreviation "Surr" found in organic reports indicates a surrogate compound that is intentionally added by the laboratory to determine sample injection, extraction, and/or purging efficiency. The "Reporting Limit" found on the report is equivalent to the practical quantitation limit (PQL). This is the minimum concentration that can be reported by the method referenced and the sample matrix. The reporting limit must not be confused with any regulatory limit. Analytical results are reported to three significant figures for quality control and calculation purposes.

Thank You,

Approved by:

Kyle F. Digitally signed by Kyle F. Gross, On AVIVAL. Our AVIVAL aboratory Oraction, and AVIVAL aboratory Oracle (12 12 18 12 17 12 -07 00).

Laboratory Director or designee



Contact. Nate Nichols

Client:

HDR Engineering

Project:

IRL Groundwater

Lab Sample 1D

1212052-001

Chent Sample ID: DMW-1

Collection Date. 12/4/2012 1250h

Received Date:

12/4/2012 1603h

**Analytical Results** 

**TOTAL METALS** 

463 West 3600 South	Compound	Units	Date Prepare	Date d Analyze	ed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City UT 84115	Antimony	mg/L	12/5/2012 910	h 12/13/2012	450h	SW6020A	0 00200	< 0 00200	
	Arsenic	mg/L	12/5/2012 910	h 12/13/2012	450h	SW6020A	0.00200	0 0101	
	Bartum	mg/L	12/5/2012 910	h 12/13/2012	450h	SW6020A	0 00200	0.0763	
Phone (801) 263-8686	Beryllium	mg/L	12/5/2012 910	h 12/13/2012 2:	21 ISh	SW6020A	0 00200	< 0 00200	
l oll Free (888) 263-8686	Cadmium	mg/L	12/5/2012 910	h 12/13/2012	450h	SW6020A	0 000500	< 0 000500	
1 ax (801) 263-8687	Calcium	mg/L	12/5/2012 910	h 12/12/2012 10	1059h	SW6010C	100	48.5	•
e-mail awal-@awal-labs.com	Chromium	mg/L	12/5/2012 910	h 12/12/2012 11	156h	SW6010C	0 0100	< 0 0100	t
	Cobalt	mg/L	12/5/2012 910	h 12/13/2012 4	450h	SW6020A	0 00200	< 0 00200	
web www awal-labs com	Copper	mg/L	12/5/2012 910	h 12/13/2012 +	450h	SW6020A	0 00200	< 0 00200	
	Iron	mg/L	12/5/2012 910	h 12/12/2012 (1	156h	\$ <b>W</b> 6010C	0 100	< 0 100	
Kyle F. Gross	Lead	mg/L	12/5/2012 910	h 12/13/2012	450h	SW6020A	0 00200	< 0 00200	
Laboratory Director	Magnesium	mg/L	12/5/2012 910	ti 12/12/2012 10	059b	SW6010C	10 0	36.5	
Caporatory Director	Manganese	mg/L	12/5/2012 910	h 12/13/2012 21	115h	SW6020A	0 00200	0.00233	
Jose Rocha	Mercury	mg/L	12/5/2012 163	Oh 12/6/2012 9	918h	SW7470A	0 000150	< 0 000150	
QA Officei	Nickel	mg/L	12/5/2012 910	h 12/13/2012 4	450b	SW6020A	0 00200	0.00259	
•	Potassium	mg/L	12/5/2012 910	h 12/12/2012 11	156h	SW6010C	1 00	1.15	
	Selenium	mg/L	12/5/2012 910	h 12/13/2012 4	450h	SW6020A	0 00200	< 0 00200	
	Silver	mg/L	12/5/2012 910	h 12/13/2012 4	450h	SW6020A	0 00200	< 0 00200	
	Sodium	mg/L	12/5/2012 910	h 12/12/2012 10	059h	SW6010C	100	24.6	
	Thallium	mg/L	12/5/2012 910	h 12/13/2012 21	115h	SW6020A	0 00200	< 0 00200	
	Vanadium	mg/L	12/5/2012 910	h 12/12/2012 11	156հ	SW6010C	0 00500	0.0100	
	Zinc	mg/L	12/5/2012 910	h 12/14/2012 16	609a	SW6020A	0 00500	< 0 00500	

<sup>&#</sup>x27;- Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS



Contact: Nate Nichols

Client:

HDR Engineering

Project:

IRL Groundwater

Lab Sample 1D:

1212052-001

Chent Sample ID: DMW-1

Collection Date: 12/4/2012 1250h

Received Date:

12/4/2012 1603h

Analytical Results

463 West 3600 South	Compound	Units	Date Prepared	Dat Analy		Method Used	Reporting Linut	Analytical Result	Qual
Salt Lake City, UT 84115	Ammonia (as N)	mg/L	12/6/2012 1000h	12/6/2012	2102h	E350 I	0.0500	< 0.0500	
	Bicarbonate (as CaCO3)	mg/L		12/5/2012	1114h	SM2320B	20 0	220	
Pl (001, 2/2 0/2)	Carbonate (as CaCO3)	mg/L		12/5/2012	1114h	SM2320B	20 0	< 20 0	
Phone (801) 263-8686	Chemical Oxygen	mg/L		12/6/2012	1000h	HACH 8000	100	< 10 0	
Toll Free (888) 263-8686	Demand								
Fax (801) 263-8687	Chloride	mg/L		12/12/2012	1434h	E300 0	1 00	54.4	
e-mail awal@awal-labs.com	Nitrate (as N)	m <b>g/</b> L		12/4/2012	1720h	E353 2	0 0100	0.0882	•
	pH @ 25° C	pH Units		12/4/2012	1700h	SM4500-H+B	1 00	7.31	
web www.awal-labs.com	Sulfate	mg/L		12/11/2012	1906h	E300 0	7 50	48.4	
,	Total Dissolved Solids	mg/L		12/7/2012	1310h	SM2540C	20 0	404	
Kyle F Gross	Total Organic Carbon	mg/L		12/11/2012	1243h	SM5310B	1 00	< 1 00	

Kyle F Gross Laboratory Director

<sup>&#</sup>x27; - Mairix spike recovery indicates matrix interference. The method is in control as indicated by the LCS



Chent.

HDR Fngineering

Project. Lab Sample ID. IRL Groundwater

Chent Sample ID: DMW-1

1212052-001A

Collection Date: 12/4/2012 1250h

Received Date.

12/4/2012 1603h

Analytical Results

VOAs Landfill List by GC/MS Method 8260C/5030C

Contact: Nate Nichols

Analyzed. 12/5/2012 917h

Units ug/L

Chloroform

Dilution Factor: 1

Method.

SW8260C

463 West 3600 South

alt Lake City U1 84115	Compound	CAS Number	Reporting Limit	Analytical Result	Qual
	1,1,1,2-Tetrachloroethane	630-20-6	2 00	< 2 00	
	1,1,1-Trichloroethane	71-55-6	2 00	< 2 00	
Phone (801) 263-8686	1,1,2,2-Tetrachloroethane	79-34-5	2 00	< 2 00	
III (see 1888) 263-8686	1,1,2-Trichloroethane	79-00-5	2 00	< 2 00	
Fax (801) 263-8687	1,1-Dichloroethane	75-34-3	2 00	< 2 00	
nt awal@awal-tabs.com	1,1-Dichloroethene	75-35-4	2 00	< 2 00	
	1,2,3-Trichloropropane	96-18-4	2 00	< 2 00	
uuu awal-lahs.com	1,2-Dibromo-3-chloropropane	96-12-8	5 00	< 5 00	
	1,2-Dibromoethane	106-93-4	2 00	< 2 00	
Kyle F. Gross	1,2-Dichlorobenzene	95-50-1	2 00	< 2 00	
•	1,2-Dichloroethane	107-06-2	2 00	< 2 00	
Laboratory Director	1,2-Dichloropropane	78-87-5	2 00	< 2 00	
Jose Rocha	I,4-Dichlorobenzene	106-46-7	2 00	< 2 00	
QA Officer	2-Butanone	<b>78</b> -93 <b>-</b> 3	10 0	< 10 0	
V I Omer	2-Hexanone	591-78-6	5 00	< 5 00	
	4-Methyl-2-pentanone	108-10-1	5 00	< 5 00	
	Acetone	67-64-1	10 0	< 10 0	
	Acrylonitrile	107-13-1	10 0	< 10.0	
	Benzene	71-43-2	2.00	< 2 00	
	Bromochloromethanc	74-97-5	2.00	< 2 00	
	Bromodichloromethane	. 75-27-4	2 00	< 2 00	
	Bromoform	75-25-2	2 00	< 2 00	
	Bromomethane	74-83-9	5 00	< 5 00	
	Carbon disulfide	75-15-0	2 00	< 2 00	
	Carbon tetrachloride	56-23-5	2 00	< 2 00	
	Chlorobenzene	108-90-7	2.00	< 2 00	
	Chloroethane	75-00-3	2 00	< 2 00	

< 2 00

67-66-3

2 00



Lab Sample ID: 1212052-001A

Client Sample 1D: DMW-1

Analyzed: 12/5/2012 917h

Units: µg/L SW8260C Method: Dilution Factor: 1

American West	compound	CAS Number	Reporting Limit	Analytical Result	Qual
	Chloromethane	74-87-3	3 00	< 3.00	
	cis-1,2-Dichloroethene	156-59-2	2 00	< 2.00	
	cis-1,3-Dichloropropene	10061-01-5	2 00	< 2 00	
	Dibromochloromethane	124-48-1	2 00	< 2 00	
463 West 3600 South	Dibromomethanc	74-95-3	2 00	< 2 00	
Salt Lake City UT 84115	Ethylbenzene	100-41-4	2 00	< 2 00	
	lodomethane	74-88-4	5 00	< 5 00	
	Methylene chloride	75-09-2	2 00	< 2 00	
Phone (801) 263-8686	Styrene	100-42-5	2 00	< 2.00	
Toll Free (888) 263-8686	Tetrachloroethene	127-18-4	2.00	< 2 00	
Fax: (801) 263-8687	Toluene	108-88-3	2 00	< 2 00	
e-mail- awal-Dawal-lahs com	trans-1,2-Dichloroethene	156-60-5	2 00	< 2 00	
· man and games-sons com	trans-1,3-Dichloropropene	10061-02-6	2 00	< 2 00	
web. www awal-labs com	trans-1,4-Dichloro-2-butene	110-57-6	2 00	< 2 00	
	Trichloroethene	79-01 <i>-</i> 6	2 00	< 2 00	
	Trichlorofluoromethane	75-69-4	2 00	< 2 00	
Kyle F Gross	Vinyl acetate	108-05-4	100	< 10 0	
Laboratory Director	Vinyl chloride	75-01-4	1 00	< 1 00	
	Xylenes, Total	1330-20-7	2 00	< 2 00	

Surrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr 1,2-Dichloroethane-d4	17060-07-0	51 1	50 00	102	72-151	·
Surr 4-Bromofluorobenzene	460-00-4	52 1	50 00	104	80-128	
Surr Dibromofluoromethane	1868-53-7	50 7	50 00	101	80-124	
Surr: l'oluene-d8	2037-26-5	498	50 00	996	<b>77</b> -129	



Chent.

HDR Engineering

Contact: Nate Nichols

Project: Lab Sample ID: IRL Groundwater 1212052-001B

Client Sample ID: DMW-1

Collection Date: Received Date:

12/4/2012 1250h 12/4/2012 1603h

Analytical Results

EDB & DBCP by GC/ECD Method 504 1

Analyzed: 12/7/2012 045h

Units: µg/L

Surt 1,2-Dibromopropane

Extracted: 12/5/2012 1432h Dilution Factor

Method:

123

E504 1

65-157

463 West 3600 South Salt Lake City, UT 81115

CAS Reporting Analytical Number Result Qual Compound Limit 96-12-8 0.0104 < 0 0104 1,2-Dibromo-3-chloropropane 106-93-4 0 0 1 0 4 < 0 0104 1,2-Dibromoethane % REC Surrogate CAS Result Amount Spiked Limits Qual

0 122

98-75-1

0 09857

Phone (801) 263-8686 Toll Free (888) 263-8686

Lax (801) 263-8687

e-moil awal@awal-tabs.com

web www.awal-labs.com

Kyle F. Gross Laboratory Director



Contact: Nate Nichols

Client:

HDR Engineering

Project:

IRL Groundwater

Lab Sample ID: 1212052-003

Client Sample ID. TMW-4

Collection Date: 12/4/2012 1215h

Received Date:

12/4/2012 1603h

#### **Analytical Results**

463 West 3600 South	Compound	Units	Date Prepared	Date Analy:		Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84115	Ammonia (as N)	mg/L	12/6/2012 1000h	12/6/2012	2111h	E350 1	0 0500	< 0 0500	
	Bicarbonate (as CaCO3)	mg/L		12/5/2012	1114h	SM2320B	20.0	190	
Db (001) 061 0606	Carbonate (as CaCO3)	mg/L		12/5/2012	1114h	SM2320B	20 0	< 20 0	
Phone (801) 263-8686 Toll Free (888) 263-8686	Chemical Oxygen Demand	mg/l.		12/6/2012	1000h	HACH 8000	10 0	< 10 0	
Fax (801) 263-8687	Chloride	mg/L		12/12/2012	1625h	E300 0	1 00	38.7	1
e-mail awal @awal-labs com	Nitrate (as N)	mg/L		12/4/2012	1735h	E353 2	0.0100	0.427	,-
	рН @ 25° C	pH Units		12/4/2012	[700h	SM4500-H+B	1 00	7.58	_
web www awal-labs com	Sulfate	mg/L		12/11/2012	2058h	E300 0	7 50	51.9	
	Total Dissolved Solids	mg/L		12/7/2012	1310h	SM2540C	20.0	392	•
Kyle F Gross	Total Organic Carbon	mg/L		12/11/2017	14 12h	SM5310B	1.00	< 1 00	

Laboratory Director



Contact: Nate Nichols

Client: Project: HDR Engineering

IRL Groundwater

Lab Sample ID: 1212052-003 Client Sample ID: TMW-4

Collection Date. 12/4/2012 1215h Received Date: 12/4/2012 1603h

Analytical Results

**TOTAL METALS** 

463 West 3600 South	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84115	Antimony	mg/l.	12/5/2012 910h	12/13/2012 613h	SW6020A	0 00200	< 0 00200	
	Arsenic	mg/L	12/5/2017 910h	12/13/2012 613h	SW6020A	0 00200	0.0191	
	Barium	mg/L	12/5/2012 910h	12/13/2012 613h	SW6020A	0 00200	0.0856	
Phone (801) 263-8686	Beryllium	mg/L	12/5/2012 910h	12/13/2012 2225h	SW6020A	0.00200	< 0.00200	
Foll Free (888) 263-8686	Cadmium	mg/L	12/5/2012 91 <b>0</b> h	12/13/2012 613h	SW6020A	0 000500	< 0 000500	
Inv (801) 263-8687	Calcium	mg/L	12/5/2012 910h	12/12/2012 1119h	SW6010C	100	49.4	~
e-mail awal-dawal-labs com	Chromium	mg/L	12/5/2012 910h	12/12/2012 12126	SW6010C	0 0 1 0 0	0.0166	-
	Cobalt	mg/L	12/5/2012 910h	12/13/2012 613h	SW6020A	0 00200	< 0 00200	
web www.awal-labs.com	Copper	mg/L	12/5/2012 910h	12/13/2012 613h	5W6020A	0 00200	< 0 00200	
	Iron	mg/L	12/5/2012 910h	12/12/2012 1212h	SW6010C	0 100	0.380	_
Kyle F. Gross	Lead	mg∕L	12/5/2012 910h	12/13/2012 613h	SW6020A	0 00200	< 0 00200	
Laboratory Duector	Magnesium	mg/L	12/5/2012 910h	12/12/2012 1119h	SW6010C	100	42.0	~
bassiatory Director	Manganese	mg/L	12/5/2012 910h	12/13/2012 2225h	SW6020A	0 00200	0.0451	-
Jose Rocha	Mercury	<b>ო</b> ჸ/Ľ	(2/5/7012 1630h	12/6/2012 929h	SW74704	0 000150	< 0 000150	
QA Officer	Nickel	mg/L	12/5/2012 910h	12/13/2012 613h	SW6020A	0 00200	0.00359	,
	Potassium	mg/L	12/5/2012 910h	12/12/2012 1212h	SW6010C	1 00	1.44	1
	Selenium	mg/L	12/5/2012 910h	12/13/2012 613h	SW6020A	0 00200	< 0 00200	
	Silver	mg/L	12/5/2012 910h	12/13/2012 613h	SW6020A .	0 00200	< 0 00200	
	Sodium	mg/L	12/5/2012 910h	12/12/2012 1119b	SW6010C	10 0	21.9	~
	Thallium	mg/L	12/5/2012 91Nh	12/13/2012 2225h	SW6020A	0 00200	< 0 00200	
	Vanadium	mg/L	12/5/2012 910h	12/12/2012 1212h	SW6010C	0 00500	0.0240	/
	Zinc	mg/L	12/5/2012 910h	12/14/2012 1628h	SW6020A	0 00500	0 00823	L -



Client:

HDR Engineering

Contact: Nate Nichols

Project:

IRL Groundwater 1212052-003A

Lab Sample ID:

Client Sample ID: TMW-4 Collection Date:

12/4/2012 1215h

Received Date:

12/4/2012 1603h

**Analytical Results** 

VOAs Landfill List by GC/MS Method 8260C/5030C

Analyzed: 12/5/2012 955h

Units: µg/L

Dilution Factor: 1

Method:

SW8260C

463 West 3600 South Salt Lake City, LT 84115

Phone (801) 263-8686 Toll Free (888) 263-8686 Fux (801) 263-8687 e-mail awal@awal-labs com web www.awal-labs.com Kyle F Gross

> Jose Rocha QA Officer

Laboratory Director

Compound	CAS Number	Reporting Limit	Analytical Result Qual
1,1,1,2-Tetrachloroethane	630-20-6	2 00	< 2 00
1,1,1-Trichloroethane	71-55 <b>-</b> 6	2 00	< 2 00
1,1,2,2-Tetrachloroethane	79-34-5	2 00	< 2 00
1,1,2-Trichloroethane	79-00-5	2 00	< 2 00
I, I-Dichloroethane	75-34-3	2 00	< 2 00
1,1-Dichlorocthene	75-35-4	2 00	< 2 00
1,2,3-Trichloropropane	96-18-4	2 00	< 2 00
1,2-Dibromo-3-chloropropane	96-12-8	5.00	< 5 00
1,2-Dibromoethane	106-93-4	2.00	< 2 00
1,2-Dichlorobenzene	95-50-1	2 00	< 2 00
1,2-Dichloroethane	107-06-2	2.00	< 2 00
1,2-Dichloropropane	<b>78-87-5</b>	2 00	< 2 00
1,4-Dichlorobenzene	106-46-7	2 00	< 2 00
2-Butanone	<b>78-</b> 93-3	10 0	< 10.0
2-Hexanone	591-78-6	5 00	< 5 00
4-Methyl-2-pentanone	108-10-1	5.00	< 5 00
Acetone	67-64-1	100	< 10 0
Acrylonitrile	107-13-1	100	< 10 0
3enzene	71-43-2	2 00	< 2 00
3romochloromethane	74-97-5	2 00	< 2 00
Bromodichloromethane	75-27-4	2.00	< 2.00
Bromotorm	75-25-2	2 00	< 2 00
3romomethane	74-83-9	5 00	< 5 00
Carbon disulfide	75-15-0	2.00	15.8
Carbon tetrachlonde	56-23-5	2 00	< 2 00
Chlorobenzene	108-90-7	2 00	< 2 00
Chloroethane	75-00-3	2 00	< 2 00
Chloroform	67-66-3	2 00	< 2 00



Lab Sample ID: 1212052-003A Client Sample ID: TMW-4

Analyzed: 12/5/2012 955h

Units: µg/L Dilution Factor: 1 Method: SW8260C

American West	( ompound	CAS Number	Reporting Limit	Analytical Result	Qual
	Chloromethane	74-87-3	3 00	< 3 00	
	cis-1,2-Dichlorocthene	156-59-2	2 00	< 2 00	
	cis-1,3-Dichloropropene	10061-01-5	2 00	< 2 00	
	Dibromochloromethane	124-48-1	2 00	< 2 00	
463 West 3600 South	Dibromomethane	74-95-3	2 00	< 2 00	
Salt Lake City, UT 84115	Ethylbenzene	100-41-4	2.00	< 2.00	
	Iodomethane	74-88-4	5 00	< 5 00	
	Methylene chloride	75-09-2	2.00	< 2.00	
Phone (801) 263-8686	Styrene	100-42-5	2 00	< 2 00	
Toll Free (888) 263-8686	Tetrachloroethene	127-18-4	2 00	< 2 00	
Fax (801) 263-8687	Toluene	108-88-3	2 00	< 2 00	
e-mail awalfu awal-labs com	trans-1,2-Dichloroethene	156-60-5	2 00	< 2 00	
	trans-1,3-Dichloropropene	10061-02-6	2,00	< 2 00	
web www awal-labs com	trans-1,4-Dichloro-2-butene	110-57-6	2.00	< 2.00	
	Trichloroethene	79-01 <b>-</b> 6	2 00	< 2 00	
	Trichlorofluoromethane	75-69-4	2 00	< 2 00	
Kyle F Gross	Vinyl acetate	108-05-4	10.0	< 10 0	
Laboratory Director	Vinyl chloride	75-01-4	1.00	< 1.00	
(see Paula	Xylenes, Total	1330-20-7	2.00	< 2 00	

· ·						
Surrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr 1,2-Dichluroethane-d4	17060-07-0	52 4	50 00	105	72-151	
Surr 4-Bromofluorobenzene	460-00-4	53 <b>3</b>	50 00	107	80-128	
Surr Dibromofluoromethane	1868-53 <b>-7</b>	52 2	50 00	104	80-124	
Surr Toluene-d8	2037-26-5	50 3	50 00	101	77-129	



Client:

HDR Engineering

IRL Groundwater

Contact: Nate Nichols

Project: Lab Sample ID:

1212052-003B

Client Sample ID: TMW-4

Collection Date.

12/4/2012 1215h

Received Date:

12/4/2012 1603h

**Analytical Results** 

EDB & DBCP by GC/ECD Method 504 I

Analyzed: 12/7/2012 145h Units: µg/L

Extracted:

Dilution Factor: 1

12/5/2012 1432h

Method:

E504 I

463 West 3600 South Salt Lake City, UT 84115

CAS Reporting Analytical Compound Number Limit Result Qual 96-12-8 1,2-Dibromo-3-chloropropane 0.0103 < 0 0103 0 0103 1,2-Dibromoethane 106-93-4 < 0 0103 % REC Surrogate CAS Result Amount Spiked Limits Qual Surr 1,2-Dibromopropane 98-75-1 0 131 0 09837 134 65-157

Phone. (801) 263-8686 Toll Irce (888) 263-8686

Fax (801) 263-8687

e-mail awal/@awal-labs.com

web www awal-labs com

Kyle F Gross Laboratory Director



Client:

HDR Engineering IRL Groundwater

Contact: Nate Nichols

Project: Lab Sample ID:

1212052-002A

Client Sample ID: DMW-2

Collection Date: 12/4/2012 1140h

Received Date:

12/4/2012 1603h

**Analytical Results** 

VOAs Landfill List by GC/MS Method 8260C/5030C

Analyzed: 12/5/2012 936h

Units: µg/L 463 West 3600 South

**Ddution Factor: 1** 

Method.

SW8260C

Salt Lake City, UT 84115	Compound	CAS Number	Reporting Limit	Analytical Result Qual
	1,1,1,2-Tetrachloroethane	630-20-6	2 00	< 2 00
	1,1,1-Trichloroethane	71-55-6	2 00	< 2 00
Phone (801) 263-8686	1,1,2,2-Tetrachloroethane	79-34-5	2 00	< 2 00
Toll Free: (888) 263-8686	1,1,2-Trichloroethane	79-00-5	2 00	< 2 00
Fax (801) 263-8687	1,1-Dichloroethane	75-34-3	2 00	< 2 00
e-mail awal@awal-labs com	1,1-Dichloroethene	75-35-4	2 00	< 2 00
web www.awal-labs.com	1,2,3-Trichloropropane	96-18-4	2 00	< 2 00
web www.awai-iaos.com	1,2-Dibromo-3-chloropropane	96-12-8	5 00	< 5 00
	1,2-Dibromoethane	106-93-4	2 00	< 2 00
Kyle F Gross	1,2-Dichlorobenzene	95-50-1	2 00	< 2 00
Laboratory Director	1,2-Dichloroethane	107-06-2	2 00	< 2 00
Date of the color	1,2-Dichloropropane	78-87-5	2 00	< 2 00
Jose Rocha	1,4-Dichlorobenzene	106-46-7	2 00	< 2 00
QA Officer	2-Butanone	78-93-3	100	< 10.0
•	2-Hexanone	591-78-6	5 00	< 5 00
	4-Methyl-2-pentanone	108-10-1	5 00	< 5 00
	Acetone	67-64-1	10.0	< 10 0
	Acrylonitrile	107-13-1	10.0	< 10 0
	Benzene	71-43-2	2 00	< 2 00
	Bromochloromethane	74-97-5	2 00	< 2 00
	Bromodichloromethanc	75-27-4	2.00	< 2 00
	Bromoform	75-25-2	2.00	< 2 00
	Bromomethane	74-83-9	5.00	< 5 00
	Carbon disulfide	75-15-0	2.00	< 2 00
	Carbon tetrachloride	56-23-5	2 00	< 2 00
	Chlorobenzene	108-90-7	2.00	< 2 00
	Chloroethane	75-00-3	2 00	< 2 00
	Chloroform	67-66-3	2.00	< 2 00



Lab Sample ID: 1212052-002A Client Sample ID: DMW-2

Analyzed: 12/5/2012 936h

	Units: µg/L	Dilution Factor	: 1		Method.	SW8260C	
erican West	Compound			CAS I umber	Reporting Limit	Analytical Result	Qual
	Chloromethane		7	4-87-3	3.00	< 3 00	
	cis-1,2-Dichloroethene		15	66-59-2	2 00	< 2 00	
	cis-1,3-Dichloropropene		100	061-01-5	2 00	< 2.00	
	Dibromochloromethane		12	24-48-1	2.00	< 2 00	
0 South	Dibromomethane		7	4-95-3	2 00	< 2 00	
ce City, UT 84115	Ethylbenzene		10	00-41-4	2 00	< 2 00	
	Iodomethane		7	4-88-4	5 00	< 5 00	
	Methylene chloride		7	5-09-2	2 00	< 2 00	
63-8686	Styrene		10	0-42-5	2 00	< 2 00	
63-8686	Tetrachloroethene		12	27-18-4	2 00	< 2 00	
3-8687	Toluene		10	8-88-3	2 00	< 2.00	
bs com	trans-1,2-Dichloroethene		15	6-60-5	2 00	< 2.00	
	trans-1,3-Dichloropropene		100	61-02-6	2 00	< 2 00	
hs com	trans-1,4-Dichloro-2-butene		11	0-57-6	2 00	< 2.00	
	Trichloroethene		7	9-01-6	2 00	< 2 00	
	Trichlorofluoromethane		7	5 <b>-</b> 69-4	2 00	< 2 00	
Gross	Vinyl acetate		10	8-05-4	10.0	< 10 0	
nector	Vinyl chloride		7.	5-01-4	1.00	< 1 00	
	Xylenes, Total		13	30-20-7	2 00	< 2.00	
e Rocha	Surrogate	CAS	Result	Amount Spike	1 % REC	Limits	Qual
Officer	Surr 1,2-Dichloroethane-d4	17060-07-0	52 2	50 00	104	72-151	
	Surr 4-Bromofluorobenzene	450-00-4	52 8	50 00	106	80-128	

urrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr 1,2-Dichloroethane-d4	17060-07-0	52 2	50 00	104	72-151	
Surr 4-Bromofluorobenzene	460-00-4	52 8	50 00	106	80-128	
Surr Dibromofluoromethane	1868-53 <b>-7</b>	519	50 00	104	80-124	
Surr Toluene-d8	2037-26-5	50 1	50 00	100	77-129	



Client:

HDR Engineering

Project. Lab Sample ID: IRL Groundwater 1212052-002B

Client Sample ID: DMW-2

12/4/2012 1140h

Collection Date:

Received Date:

12/4/2012 1603h

**Analytical Results** 

EDB & DBCP by GC/ECD Method 504 1

Analyzed: 12/7/2012 130h

Units: µg/L

Surr 1,2-Dibromopropane

Dilution Factor: 1

Extracted:

98-75-1

Method:

115

Contact: Nate Nichols

E504 1

65-157

463 West 3600 South Salt Lake City, UT 84115

CAS Reporting Analytical Compound Number Limit Result Qual 1,2-Dibromo-3-chloropropane 96-12-8 0.0103 < 0 0103 1,2-Dibromoethane 106-93-4 0.0103 < 0 0103 Surrogate CAS Result Amount Spiked % REC Limits Qual

0 113

0 09848

12/5/2012 1432h

Phone (801) 263-8686 Toll Free (888) 263-8686

Fax (801) 263-8687

e-mail awal@awal-labs com

web www.awal-labs.com

Kyle F Gross Laboratory Director



Contact: Nate Nichols

Chent:

HDR Engineering

Project:

IRL Groundwater

Client Sample ID: DMW-2

Lab Sample ID: 1212052-002

Collection Date: 12/4/2012 1140h

Received Date:

12/4/2012 1603h

**Analytical Results** 

463 West 3600 South	Compound	Units	Date Prepared	Data Analy		Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84115	Ammonia (as N)	mg/L	12/6/2012 1000h	12/6/20(2	2105h	E350 I	0.0500	< 0 0500	
	Bicarbonate (as CaCO3)	mg/L		12/5/2012	1) l4h	SM2320B	20.0	238	
Dhama (801) 242 9484	Carbonate (as CaCO3)	mg/L		12/5/2012	(1 14h	SM2320B	20 0	< 20 0	
Phone (801) 263-8686 Toll Free (888) 263-8686	Chemical Oxygen Demand	mg/l.		12/6/2012	1000h	HACH 8000	10 0	< 10 0	
Гах (801) 263-8687	Chloride	mg/L		12/12/2012	1603h	E300 0	10.0	187	
e-mail awal@awal-labs.com	Nitrate (as N)	mg/L		12/4/2012	1734h	E353 2	0 0100	1.38	
	pH @ 25° C	pH Units		12/4/2012	1700h	SM4500-H+B	1 00	7.28	
web www awai-labs com	Sulfate	mg/L		12/11/2012	2035h	E300 0	7 50	49.0	
	Total Dissolved Solids	mg/L		12/7/2012	13 (Oh	SM2540C	20 0	676	
Kyle f Gross	Total Organic Carbon	mg/L		12/11/2012	1352h	SM5310B	1.00	1.31	

Laboratory Director



Contact: Nate Nichols

Client: Project: HDR Engineering

Lab Sample ID:

IRL Groundwater 1212052-002

Client Sample ID. DMW-2

Received Date:

Collection Date: 12/4/2012 1140h 12/4/2012 1603h

Analytical Results

**TOTAL METALS** 

463 West 3600 South	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84115	Antimony	mg/L	12/5/2012 910h	12/13/2012 603h	SW6020A	0 00200	< 0 00200	
	Arsenic	mg/L	12/5/2012 910h	12/13/2012 603h	SW6020A	0.00200	0.00989	
	Barium	mg/L	12/5/2012 910h	12/13/2012 603h	SW6020A	0 00200	0.105	
Phone (801) 263-8686	Beryllium	mg/L	12/5/2012 910h	12/13/2012 2143h	SW6020A	0 00200	< 0 00200	
Toll Free (888) 263-8686	Cadmium	mg/L	12/5/2012 910h	12/13/2012 603h	SW6020A	0.000500	< 0 000500	
Fax (801) 263-8687	Calcium	mg/L	12/5/2012 910h	12/12/2012 1115h	SW6010C	10 0	66 9	
e-mail awal@awal-labs com	Chromium	mg/L	12/5/2012 910h	12/12/2012 1208h	SW6010C	0.0100	< 0.0100	
	Cobalt	mg/L	12/5/2012 910h	12/13/2012 603h	SW6020A	0 00200	< 0.00200	
web www awal-labs com	Copper	mg/L	12/5/2012 910h	12/13/2012 603h	SW6020A	0.00200	< 0.00200	
	Iron	mg/L	12/5/2012 910h	12/12/2012 1208h	SW6010C	0.100	< 0.100	
Kvie F Gross	Lead	mg/L	12/5/2012 910h	12/13/2012 603h	\$W6020A	0 00200	< 0.00200	
-	Magnesium	mg/I	12/5/2012 910h	12/12/2012 1115b	SW6010C	100	74.6	
Laboratory Director	Manganese	mg/L	12/5/2012 910h	12/13/2012 2143h	SW6020A	0 00200	0.0219	
Jose Rocha	Mercury	mg/L	12/5/2012 1630h	12/6/2012 924h	SW7470A	0.000150	< 0.000150	
QA Office	Ņickel	mg/L	12/5/2012 910h	12/13/2012 603h	SW6020A	0 00200	0.00417	
•	Potassium	mg/L	12/5/2012 910h	12/12/2012 1208h	SW6010C	1 00	4.53	
	Selenium	mg/L	12/5/2012 910h	12/13/2012 603h	SW6020A	0.00200	0.0115	
	Silver	mg/l.	12/5/2012 910h	12/13/2012 603h	SW6020A	0 00200	< 0 00200	
	Sodium	mg/L	12/5/2012 910h	12/12/2012 1115h	<b>SW</b> 6010C	10.0	32.7	
	Thallium	mg/L	12/5/2012 910h	12/13/2012 2143h	SW6020A	0 00200	< 0 00200	
	Vanadium	mg/L	12/5/2012 910h	12/12/2012 1208h	SW6010C	0 00500	0.0134	
	Zinc	mg/L	12/5/2012 910h	12/14/2012 1G23h	SW6020A	0 00500	0.00580	



Client:

HDR Engineering

Project: Lab Sample ID:

IRL Groundwater 1212052-004A

Client Sample ID: DMW-6

Collection Date: 12/4/2012 1330h Received Date: 12/4/2012 1603h

**Analytical Results** 

VOAs Landfill List by GC/MS Method 8260C/5030C

Contact: Nate Nichols

Analyzed: 12/5/2012 1014h

Units: µg/L

Dilution Factor: 1

SW8260C Method:

	465	west.	3600	South
Salt	Lake	City,	ŲΓ	84115

463 West 3600 South	Compound	CAS Number	Reporting Limit	Analytical Result Qual
	1,1,1,2-Tetrachloroethanc	630-20-6	2 00	< 2.00
Db (DOI) 0/2 0/3/	1,1,1-Trichloroethane	71-55-6	2 00	< 2.00
Phone (801) 263-8686	1,1,2,2-Tetrachloroethane	<b>79-</b> 34-5	2 00	< 2.00
oll Free (888) 263-8686	1,1,2-Trichloroethane	79-00-5	2.00	< 2 00
Γυλ (801) 263-8687	1,1-Dichloroethane	75-34-3	2 00	< 2 00
iail awal@awal-labs com	1,1-Dichloroethene	75-35-4	2 00	< 2 00
b www.awal-labs.com	1,2,3-Trichloropropane	96-18-4	2.00	< 2 00
o www.awat-taos.com	1,2-Dibromo-3-chloropropane	96-12-8	5 00	< 5.00
	1,2-Dibromoethane	106-93-4	2 00	< 2.00
Kyle F Gross	1,2-Dichlorobenzene	95-50-1	2.00	< 2 00
Laboratory Director	1,2-Dichloroethane	107-06-2	2.00	< 2 00
Euroratory Director	1,2-Dichloropropane	<b>7</b> 8-87 <b>-</b> 5	2 00	< 2 00
Jose Rocha	I,4-Dichlorobenzene	106-46-7	2 00	< 2.00
QA Officer	2-Butanone	7 <b>8-</b> 93 <i>-</i> 3	10 0	< 10 0 '
	2-llexanone	591-78-6	5.00	< 5 00
	4-Methyl-2-pentanone	108-10-1	5 00	< 5 00
	Acetone	67-64-1	10 0	< 10 0
	Acrylonitrile	107-13-1	10 0	< 10 0
	Benzene	71-43-2	2 00	< 2 00
	Bromochloromethane	74-97-5	2 00	< 2.00
	Bromodichloromethane	75-27-4	2 00	< 2.00
	Bromoform	75-25-2	2 00	< 2.00
	Bromomethane	74-83-9	5 00	< 5.00
	Carbon disulfide	75-15-0	2 00	< 2.00
	Carbon tetrachloride	56-23-5	2 00	< 2.00
	Chlorobenzene	108-90-7	2.00	< 2.00
	Chloroethane	75-00-3	2.00	< 2.00
	Chloroform	67-66-3	2 00	< 2 00



Lab Sample ID: 1212052-004A Client Sample ID: DMW-6

Analyzed: 12/5/2012 1014h

Units: µg/L Dulution Factor: 1 Method: SW8260C

	Units: µg/L	Dilution Fact	tor: 1	Method:	SW8260C	
m West	Compound		CAS Number	Reporting Limit	Analytical Result	Qual
	Chloromethane		74-87-3	3.00	< 3 00	
	cis-1,2-Dıchloroethene		156-59-2	2 00	< 2.00	
	cis-1,3-Dichloropropene		10061-01-5	2 00	< 2.00	
	Dibromochloromethane		124-48-1	2 00	< 2.00	
South	Dibromomethane		74-95-3	2 00	< 2 00	
84115	Ethylbenzene		100-41-4	2 00	< 2 00	
	Iodomethane		74-88-4	5 00	< 5 00	
	Methylene chloride		75-09-2	2 00	< 2 00	
3-8686	Styrene		100-42-5	2 00	< 2 00	
3-8686	Tetrachloroethene		127-18-4	2 00	< 2.00	
-8687	Toluene		108-88-3	2 00	< 2.00	
.com	trans-1,2-Dichloroethene		156-60-5	2 00	< 2 00	
	trans-1,3-Dichloropropene		10061-02 <b>-</b> 6	2.00	< 2 00	
.com	trans-1,4-Dichloro-2-butene		110-57-6	2 00	< 2 00	
	Trichloroethene		79-01-6	2.00	< 2 00	
	Trichlorofluoromethane		75-69-4	2 00	< 2 00	
Gross	Vinyl acetate		108-05-4	10 0	< 10 0	
rector	Vinyl chloride		75-01-4	1 00	< 1 00	
	Xylenes, Total		1330-20-7	2 00	< 2.00	
Rocha	Surrogate	CAS	Result Amount S	piked % REC	Limits	Qual
A Officer	Surr 1.2-Duchloroethene-d4	17060-07-0	52.1 50.00	104	72-151	

Surrogate	CAS	Result	Amount Spiked	% REC	Limits	Qual
Surr 1,2-Dichloroethane-d4	17060-07-0	52 1	50 00	104	72-151	
Surr 4-Bromofluorobenzene	460-00-4	53 1	50.00	106	80-128	
Surr Dibromofluoromethane	1868-53-7	52 0	50.00	104	80-124	
Surr Toluene-d8	2037-26-5	50 0	50.00	100	77-129	



Client:

**HDR** Engineering

Project:

IRL Groundwater

Lab Sample ID: Client Sample ID: DMW-6

1212052-004B

Collection Date:

12/4/2012 1330b

Received Date:

12/4/2012 1603h

Analytical Results

EDB & DBCP by GC/ECD Method 504.1

Units: µg/L

Surrogate

Analyzed: 12/7/2012 200h

Surr 1,2-Dibromopropane

12/5/2012 1432h Extracted:

Dilution Factor: 1

CAS

98-75-1

Method:

916

Contact: Nate Nichols

E504.1

Lumits

65-157

Qual

463 West 3600 South Salt Lake City, UT 84115

CAS Reporting Analytical Compound Number Limit Qual Result 1,2-Dibromo-3-chloropropane 96-12-8 0 0105 < 0.0105 1,2-Dibromoethane 106-93-4 0 0105 < 0 0 10 5 % REC

Result

0 0913

**Amount Spiked** 

0 09969

Phone (801) 263-8686 Toll Free (888) 263-8686

Fax. (801) 263-8687

e-mail awal@awal-labs.com

web www awal-labs com

Kyle Γ. Gross Laboratory Director



Client: Project: HDR Engineering

Contact: Nate Nichols

Lab Sample ID:

IRL Groundwater 1212052-004

Client Sample ID: DMW-6

Collection Date: 12/4/2012 1330h

Received Date:

12/4/2012 1603h

**Analytical Results** 

463 West 3600 South	Compound	Units	Date Prepared	Date Analy	_	Method Used	Reporting Lunit	Analytical Result	Qual
Salt Lake City, UT 84115	Ammonia (as N)	mg/L	12/6/2012 1000h	12/6/2012	2112h	E350 I	0 0500	`< 0.0500	
	Bicarbonate (as CaCO3)	mg/L		12/5/2012	[114h	SM2320B	20 0	208	
Phone (801) 263-8686	Carbonate (as CaCO3)	mg/l,		12/5/2012	1114h	SM2320B	20 0	< 20 0	
Toll Free (888) 263-8686	Chemical Oxygen Demand	mg/L		12/6/2012	1000h	HACH 8000	10 0	< 10 0	
Fax (801) 263-8687	Chloride	mg/L		12/12/2012	1648h	E300 0	1 00	43.6	
e-mail awal@awal-labs.com	Nitrate (as N)	mg/L		12/4/2012	1737h	£353.2	0 0100	0.340	
	рН @ 25° С	pH Units		12/4/2012	1700h	SM4500-H+B	1.00	7.74	
web www awal-labs com	Sulfate	mg/L		12/11/2012	2120h	E300 0	7 50	55.0	
	Total Dissolved Solids	mg/L		12/7/2012	1310h	SM2540C	20.0	416	
Kyle F. Gross	Total Organic Carbon	mg/L		12/11/2012	1433h	SM5310B	1.00	< 1.00	

Laboratory Director



Contact: Nate Nichols

Client: HDR Engineering Project: IRL Groundwater

Lab Sample ID: 1212052-004 Client Sample ID: DMW-6

Collection Date: 12/4/2012 1330h Received Date: , 12/4/2012 1603h

**Analytical Results** 

TOTAL METALS

463 West 3600 South	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84115	Antimony	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0 00200	< 0 00200	
	Arsenic	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0 00200	0.0279	
	Barium	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0.00200	0.0638	
Phone (801) 263-8686	Beryllium	mg/L	12/5/2012 910h	12/13/2012 2234h	SW6020A	0 00200	< 0 00200	
Toll Free (888) 263-8686	Cadmium	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0 000500	< 0 000500	
Fax (801) 263-8687	Calcium	mg/L	12/5/2012 910h	12/12/2012 11 <b>22</b> h	SW6010C	10 0	33.1	
e-mail awal@awal-labs com	Chromium	mg/L	12/5/2012 910h	12/12/2012 1216h	SW6010C	0 0100	< 0 0100	
	Cobalt	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0 00200	< 0.00200	
web www awat-labs com	Copper	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0 00200	< 0 00200	
•	Iron	mg/L	12/5/2012 910h	12/12/2012 1216h	SW6010C	0 100	< 0 100	
V. I. F. C	Lead	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0 00200	< 0 00200	
Kyle F. Gross	Magnesium	mg/L	12/5/2012 910h	12/12/2012 1122h	SW6010C	10.0	50.0	
Laboratory Director	Manganese	mg/L	12/5/2012 910h	12/13/2012 2234h	SW6020A	0.00200	0.00724	
Jose Rocha	Mercury	mg/L	12/5/2012 1630h	17/6/2012 931h	SW7470A	0.000150	< 0 000150	
OA Officer	Nickel	mg/L	12/5/2012 91 <b>0</b> h	l2/13/2012 622h	SW6020A	0.00200	0.00239	
<b>(</b>	Potassium	mg/L	12/5/2012 910h	12/12/2012 1216h	SW6010C	1 00	10.7	•
	Selenium	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0.00200	< 0.00200	
	Silver	mg/L	12/5/2012 910h	12/13/2012 622h	SW6020A	0 00200	< 0.00200	
	Sodium	mg/L	12/5/2012 910h	12/12/2012 1122h	SW6010C	100	23.7	
	Thallium	mg/I.	12/5/2012 910h	12/13/2012 2234h	SW6020A	0 00200	< 0 00200	
	Vanadium	mg/L	12/5/2012 910h	12/12/2012 1216h	SW6010C	0.00500	0.0220	
	Zinc	mg/L	12/5/2012 910h	12/14/2012 1633h	SW6020A	0 00500	< 0 00500	



Client: HDR Engineering

Project: IRL Groundwater Lab Sample ID: 1212052-005A Client Sample ID: DMW-7

Collection Date: 12/4/2012 1400h Received Date: 12/4/2012 1603h

**Analytical Results** 

VOAs Landfill List by GC/MS Method 8260C/5030C

Contact: Nate Nichols

Analyzed: 12/5/2012 1033h

Chloroform

	Units: µg/L	Dilution Factor:	1	Method:	SW8260C	
463 West 3600 South Lake City, UT 84115	Compound		CAS Number	Reporting Limit	Analytical Result	Qual
	1,1,1,2-Tetrachloroethane		630-20-6	2 00	< 2 00	
	1,1,1-Trichloroethane		71-55-6	2 00	< 2 00	
Phone (801) 263-8686	1,1,2,2-Tetrachloroethane		79-34-5	2 00	< 2.00	
Free (888) 263-8686	1,1,2-Trichloroethane		79-00-5	2 00	< 2 00	
Tax. (801) 263-8687	1,1-Dichloroethane		75-34-3	2 00	< 2 00	
l awal@awal-labs com	1,1-Dichloroethene		75-35-4	2.00	< 2 00	
eb www.awal-labs.com	1,2,3-Trichloropropane		96-18-4	2 00	< 2 00	
	1,2-Dibromo-3-chloropropane		96-12-8	5 00	< 5 00	
	1,2-Dibromoethane		106-93-4	2 00	< 2 00	
Kyle F Gross	1,2-Dichlorobenzene		95-50-1	2 00	< 2.00	
Laboratory Director	1,2-Dichloroethane		107-06-2	2 00	< 2.00	
East atory Director	1,2-Dichloropropane		78-87-5	2.00	< 2 00	
lose Rocha	1,4-Dichlorobenzene		106-46-7	2 00	< 2 00	
QA Officer	2-Butanone		78-93-3	10.0	< 10.0	
<b>(</b>	2-Hexanone		591-78-6	5 00	< 5 00	
	4-Methyl-2-pentanone		108-10-1	5 00	< 5 00	
	Acetone		67-64-1	10.0	< 10 0	
	Acrylonitrile		107-13-1	100	< 10.0	
	Benzene		71-43-2	2.00	< 2 00	
	Bromochloromethane		74-97-5	2.00	< 2 00	
	Bromodichloromethane		75-27-4	2 00	< 2 00	
	Bromoform		75-25-2	2 00	< 2.00	
	Bromomethane		74-83-9	5 00	< 5.00	
	Carbon disulfide		75-15-0	2 00	< 2 00	
	Carbon tetrachloride		56-23-5	2 00	< 2.00	
	Chlorobenzene		108-90-7	2 00	< 2 00	
	Chloroethane		75-00 <b>-</b> 3	2 00	< 2.00	

< 2 00

67-66-3

2 00



Lab Sample ID: 1212052-005A Client Sample ID: DMW-7

Analyzed: 12/5/2012 1033h

Surr 4-Bromofluorobenzene

Surr Dibromofluoromethane

Sur Toluene-d8

	Units: μg/L	Dilution Fact	or: 1	Method:	SW8260C	
merican West	Compound		CAS Number	Reporting Limit	Analytical Result	Qual
	Chloromethane		74-87-3	3 00	< 3 00	
	cis-1,2-Dichloroethene		156-59-2	2 00	< 2 00	
	cis-1,3-Dichloropropene		10061-01-5	2 00	< 2.00	
	Dibromochloromethane		124-48-1	2 00	< 2.00	
Vest 3600 South	Dibromomethane		74-95-3	2 00	< 2.00	
lity, UT 84115	Ethylbenzene		100-41-4	2 00	< 2 00	
	Iodomethane		74-88-4	5 00	< 5 00	
	Methylene chloride		75-09-2	2 00	< 2 00	
1) 263-8686	Styrene		100-42-5	2 00	< 2 00	
8) 263-8686	Tetrachloroethene		127-18-4	2 00	< 2 00	
1) 263-8687	Toluene		108-88-3	2 00	< 2 00	
val-labs.com	trans-1,2-Dichloroethene		156-60-5	2 00	< 2.00	
	trans-1,3-Dichloropropene		10061-02-6	2.00	< 2 00	
l-labs com	trans-1,4-Dichloro-2-butene		110-57-6	2 00	< 2.00	
	Trichloroethene		79-01-6	2 00	< 2 00	
	Trichlorofluoromethane		75-69-4	2.00	< 2.00	
le F Gross	Vinyl acetate		108-05-4	10 0	< 10 0	
y Dnector	Vinyl chloride		75-01-4	1.00	< 1 00	
	Xylenes, Total		1330-20-7	2 00	< 2 00	
Jose Rocha	Surrogate	CAS	Result Amount Sp	uked % REC	Limits	Qual
QA Officer	Surr 1,2-Dichloroethane-d4	17060-07-0	51 9 50 00	104	72-151	

460-00-4

1868-53-7

2037-26-5

53 0

516

498

50 00

50 00

50 00

106

103

996

80-128 80-124

77-129



Client:

**HDR Engineering** 

Contact: Nate Nichols

Project: Lab Sample ID: IRL Groundwater 1212052-005B

Client Sample ID: DMW-7

Collection Date: 12/4/2012 1400h 12/4/2012 1603h

Received Date:

EDB & DBCP by GC/ECD Method 504.1

**Analytical Results** Analyzed: 12/7/2012 215h

Units: ug/

Extracted: 12/5/2012 I432h Dilution Factor: 1

Method:

E504 1

463 West 3600 South Salt Lake City, UT 84115

Phone (801) 263-8686

Toll Free (888) 263-8686

Fax (801) 263-8687 e-mail awal@awal-labs.com

web www awal-labs com

Kyle F Gross Laboratory Director

Dilution Facto	)r; 1		Miethon:	E304 I	
	N		Reporting Limit	Analytical Result	Qual
	9	6-12-8	0 0107	< 0 0107	-
	10	06-93-4	0.0107	< 0.0107	
CAS	Result	Amount Spik	ed % REC	· Limits	Qual
98-75-1	0 0904	0 1019	88 7	65-157	
	CAS	9 10 CAS Result	CAS Number  96-12-8 106-93-4  CAS Result Amount Spik	CAS Reporting Number Limit  96-12-8 0 0107 106-93-4 0.0107  CAS Result Amount Spiked % REC	CAS Number         Reporting Limit         Analytical Result           96-12-8         0 0107         < 0 0107



Contact: Nate Nichols

Chent:

HDR Engineering

Project:

IRL Groundwater

Lab Sample ID:

1212052-005

Client Sample ID: DMW-7

Collection Date: 12/4/2012 1400h

Received Date:

12/4/2012 1603h

**Analytical Results** 

463 West 3600 South	Compound	Units	Date Prepared	Date Analy		Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City. UT 84115	Ammonia (as N)	mg/L	12/6/2012 1000h	12/6/2012	2113h	E350 1	0 0500	< 0 0500	
	Bicarbonate (as CaCO3)	mg/L		12/5/2012	1114b	SM2320B	20 0	217	
Dhana (001) 262 9696	Carbonate (as CaCO3)	mg/L		12/5/2012	11 J4h	SM2320B	20.0	< 20 0	
Phone (801) 263-8686	Chemical Oxygen	mg/L		12/6/2012	1000h	HACH 8000	10 0	< 10.0	
Toll Free (888) 263-8686	Demand								
Fax (801) 263-8687	Chloride	mg/L		12/12/2012	1839h	E300 0	1 00	37.9	
e-mail awal@awal-labs com	Nitrate (as N)	mg/L		12/4/2012	1738h	E353 2	0 0100	0.138	
	рН @ 25° C	pH Units		12/4/2012	1700h	SM4500-H+B	1 00	7.67	
web: www awal-labs com	Sulfate	mg/L		12/11/2012	2142h	E300 0	<b>7.</b> 50	47.9	
	Total Dissolved Solids	mg/L		12/7/2012	1310h	SM2540C	20 0	436	
Kyle F. Gross	Total Organic Carbon	mg/L		12/11/2012	(454 <u>b</u>	SM5310B	1 00	< 1.00	

Laboratory Director



Contact: Nate Nichols

HDR Engineering Chent:

Project: IRL Groundwater Lab Sample ID: 1212052-005 Client Sample ID: DMW-7

Collection Date: 12/4/2012 1400h 12/4/2012 1603h Received Date:

**Analytical Results** 

**TOTAL METALS** 

463 West 3600 South	Compound	Units	Date Prepared	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Salt Lake City, UT 84115	Antimony	mg/L	12/5/2012 910h	12/13/2012 631h	SW6020A	0.00200	< 0 00200	
•	Arsenic	mg/L	12/5/2012 910h	12/13/2012 631b	SW6020A	0.00200	0.0487	
	Barium	mg/L	12/5/2012 910h	12/13/2012 631h	SW6020A	0.00200	0.0709	
Phone (801) 263-8686	Beryllium	mg/L	12/5/2012 910h	12/13/2012 2243h	SW6020A	0.00200	< 0 00200	
Toll Free (888) 263-8686	Cadmium	mg/L	12/5/2012 910h	12/13/2012 63 Jh	SW6020A	0 000500	< 0 000500	
Fax (801) 263-8687	Calcium	mg/L	12/5/2012 910h	(2/12/2012 1139h	SW6010C	10.0	50.5	
e-mail awal@awal-labs.com	Chromium	mg/L	12/5/2012 910h	(2/12/2012 (220h	SW6010C	0 0100	< 0 0100	
Ŭ	Cobalt	mg/L	12/5/2012 910h	12/13/2012 631h	SW6020A	0.00200	< 0.00200	
web: www awal-labs com	Copper	mg/L	12/5/2012 910h	12/13/2012 631h	SW6020A	0.00200	< 0 00200	
	Iron	mg/L	12/5/2012 910h	12/12/2012 1220h	SW6010C	0 100	0 441	
	Lead	mg/L	12/5/2012 910h	12/13/2012 631h	SW6020A	0 00200	< 0.00200	
Kyle F Gross	Magnesium	mg/L	12/5/2012 910h	12/12/2012 1139h	SW6010C	10 0	52.3	
Laboratory Director	Manganese	mg/L	12/5/2012 910h	12/13/2012 2243h	SW6020A	0 00200	0.0696	
Jose Rocha	Mercury	mg/L	12/5/2012 1630h	12/6/2012 932h	SW7470A	0 000150	< 0 000150	
QA Officer	Nickel	mg/L	12/5/2012 910h	12/13/2012 631h	SW6020A	0 00200	0.00318	
Q11 O III O	Potassium	mg/L	12/5/2012 910h	12/12/2012 1220h	SW6010C	1 00	5.59	
	Selenium	mg/L	12/5/2012 910h	12/13/2012 631h	SW6020A	0 00200	0.0126	
	Silver	mg/L	12/5/2012 910h	12/13/2012 631h	SW6020A	0 00200	< 0.00200	
	Sodium	mg/L	12/5/2012 910h	12/12/2012 1139h	SW6010C	10 0	22.9	
	Thallium	mg∕I	12/5/2012 910h	12/13/2012 2243h	SW6020A	0 00200	< 0 00200	
	Vanadium	mg/l_	12/5/2012 910h	12/12/2012 1220Ь	SW6010C	0 00500	0.0414	
	Zinc	mg/L	12/5/2012 910h	12/14/2012 1702h	SW6020A	0 00500	0.00981	

#### UTAH LANDFILL GROUNDWATER PARAMETERS FOR DETECTION AND ASSESSMENT MONITORING

Analysis	Method	Unit Price	Discounted Price
Metals Prep.	SW846 3005A	20.00	\$18.00
Antimony	SW846 6010C/6020A	10.00	9.00
Arsenic	SW846 6010C/6020A	10.00	9 00
Barium	SW846 6010C/6020A	10.00	9 00
Beryllium	SW846 6010C/6020A	10.00	9.00
Cadmium	SW846 6010C/6020A	10 00	9.00
Chromium	SW846 6010C/6020A	10.00	· 9.00
Cobalt	SW846 6010C/6020A	10.00	9.00
Copper	SW846 6010C/6020A	10 00	9.00
Lead	SW846 7421/6020	10.00	9.00
Mercury	SW846 7470A	28.00	25,20
Nickel	SW846 6010C/6020A	10.00	9.00
Selemum	SW846 6010C/6020A	10.00	9.00
Silver	SW846 6010C/6020A	10.00	9.00
Thallium	SW846 6010C/6020A	10 00	9.00
Vanadium	SW846 6010C/6020A	10.00	9.00
Zinc	SW846 6010C/6020A	10 00	9.00
<del></del>		·	<del></del>
Ammonia	EPA 350.1	38.00	34 20
Bicarb/Carbonate	EPA 310.1	20.00	18.00
Calcium	SW846 6010C/6020A	10.00	9.00
COD	HACH 8000	28.00	25.20
Chloride	SM4500C1 E/EPA 300 0	13.00	11.70
lron	SW846 6010C/6020A	10.00	9.00
Magnesium	SW846 6010C/6020A	10.00	9.00
Manganese	SW846 6010C/6020A	10.00	
Nitrate			9.00
Music oH	EPA 353.2/300.0	13.00 13 00	11 70
pri Potassium	SM 4500 (H+) B		11.70
roussium Sodium	SW846 6010C/6020A	10.00	9 00
Sulfate	SW846 6010C/6020A	10.00	9.00
	EPA 375.4/300.0	13 00	11 70
rds	SM 2540C	15.00	13 50
Total Organic Carbon	2W 2310R	\$25.00	22.50
Valadia dou av	077/846 80600	6170.00	0150 50
Volatiles (Det Mon)	SW846 8260C	\$170 00	\$153.00
DB & DBCP	EPA 504	110.00	99.00
UTAL COST FOR	DETECTION MONITORI	ING PER WELL	\$644.40
.b	-	m : ///	A
	ANICS FOR ASSESSMEN		
vanide /	EPA 335.2, 335.4	38.00	34.20
Sulfide /	SM 4500 (S-) F	13.00	\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
i'ln	SW846 6010C/6020A/	10.00	9 00
1		1 7	
ADDITIONAL ORGA	NICS FOR ASSESSENT M		DIX II)
emivolatiles (Appl. II)		365.00	324.00
esticides (App. II)	SW8468081B	180.00	<b>y</b> 62.00
CB (App II)	SW846 8082A	120.00	<b>  08.00</b>
ferbicides (App/II)	SW\$46 8151A /	320.00	288.00
olatiles (App, II)	SW846 8260C/	170,00	\ /153.00/
OTAL COST FOR	DETECTION& ASSESSM	IENT MONITORING	\$1581,3d/well

HOK

HOK\_

HOK

COC Emailed\_

FOR LABORATORY USE ONLY [fill out on page 1]

WORK O	RDER Summary HDR Engineering					Work Order: Page 2 of 4	1212052 12/4/2012
Sample ID	Client Sample ID	Collected Date	Received Date	Date Due	Matrix	Test Code	Sel Storage
1212052-002E	DMW-2	12/4/2012 1140h	12/4/2012 1603h	12/18/2012	Aqueous	TDS-W-2540C	ww-tds I
1212052-002F						COD-HACH8000	ww-cod
1212052-002G	<del></del>					NH3-W-350 1	df - nh3
						NH3-W-PR	df-nh3
1212052-002H						3005A-ICPMS-PR	✓ MET/HG
	OTT A A A A CO CO CO CO A A A A A A A A A A					6010C-W	₩ET/HG
	SEL Analytes: CA CR FE MG K NA			<del></del>	<del></del>	6020-W	MET/HG
	SEL Analytes: SB AS BA BE CD CO	CUPB MIN NI SE AG IL ZN	<del></del>			HG-W-7470A	MET/HG
						HG-W-PR	MET/HG
1212052-003A	TMW-4	12/4/2012 1215h	<del></del>		<del></del>		VOCFridge :
1212052-003B							✓ hall-edb
			<del></del>		<del></del>		hail - edb
1212052-003C			·			TOC-W-5310B	df - toc
1212052-003D			·	<del></del>		300 <b>0-W</b>	df-wc
	SEL Analytes: CL 804				<del></del> -	ALK-W-2320B	df-wc
	SEL Analytes: ALKB ALKC						
						NO3-W-353 2	df-wc
						PH-4500H+B	df-wc
1212052-003E						TDS-W-2540C	ww • tds
1212052-003F						COD-HACH8000	ww-cod
1212052-003G						NH3-W-350 1	☐ df-nh3
						NH3-W-PR	☐ df-nh3
1212052-003H						3005A-ICPMS-PR	✓ MET/HG
						6010C-W	✓ MET/HG
	SEL Analytes: CA CR FE MG K NA	<u> </u>				6020-W	☑ MET/HG
	SEL Analytes: SB AS BA BE CD C	O CU PB MIN NI SE AG TL ZN					
						HO-W-7470A	☐ MET/HG
						HG-W-PR	☐ MET/HG
1212052-004A	DMW-6	12/4/2012 1330h				8260-W	✓ VOCFndge
1212052-004B						504-W	₩ hall - edb
						504-W-PR	hall-edb
1212052-004C	······································		·	<del></del>		TOC-W-5310B	df-toc
FOR LABORATO	ORY USE ONLY [fill out on page 1]. %M	RT CN TAT	qc 🗆	нок н	ок но	рк сос	Emailed

	RDER Summary					Work Order	:	1212052
Chent:	HDR Engineering		<u></u>			Page 3 of 4		12/4/2012
Sample ID	Client Sample ID	Collected Date	Received Date	Date Due	Matrix	Test Code	Sel	Storage
1212052-004D	DMW-6 SEL Analytes: CL SO4	12/4/2012 1330h	12/4/2012 1603h	12/18/2012	Aqueous	300 O-W	Ø	df - wc
	SEL Analytes: ALKB ALKC			-		ALK-W-2320B	V	df - wc
						NO3-W-353 2		df - wc
						PH-4500H+B		df - wc
1212052-004E						TDS-W-2540C		ww - tds
1212052-004F						COD-HACH8000		ww - cod
1212052-004G						NH3-W-350 I		df - nh3
						NH3-W-PR		df - nh3
1212052-004H						3005A-ICPMS-PR	$\overline{\mathbf{Z}}$	MET/HG
			<del></del>			6010C-W	Ø	MET/HG
	SEL Analytes: CA CR FE MG K NA	<u>v</u>	<del></del>			6020-W	$\mathbf{Z}$	MET/HG
	SEL Analytes: SB AS BA BE CD CO	CU PB MN NI SE AG TL ZN				00-0	ت	(1121/113
	Chia Than I was a second		<del></del>		- <del></del>	HG-W-7470A		MET/HG
						HG-W-PR		MET/HG
1212052-005A	DMW-7	12/4/2012 1400h	·	· · · · · · · · · · · · · · · · · · ·		8260-W	Ø	VOCFndge
1212052-005B	· · · · · · · · · · · · · · · · · · ·					504-W	Ø	hall - cdb
	<del></del>		<del></del>		<del></del>	504-W-PR		hali - cdb
1212052-005C		<del></del>	<del></del>		<del></del>	TOC-W-5310B		df - toc
1212052-005D				<del></del>		300 0-W	<u>-</u>	df - wc
	SEL Analytes: CL 904					<del></del> -		
	SEL Analytes: ALKB ALKC					ALK-W-2320B	V	df - wc
	DED AURIT KO. ALAED ALAEC				· <del>·······</del>	NO3-W-353 2		df - wc
		·····				PH-4500H+B		df - wc
1212052-005E						TDS-W-2540C	一	ww - tds
1212052-005F						COD-HACH8000	$\bar{\Box}$	ww - cod
1212052-005G		<del></del>			· <del></del>	NH3-W-350 1		df - nh3
		<del></del>	<del></del>			NH3-W-PR		df - nh3
1212052-005H		<del></del>	<del></del>			3005A-ICPMS-PR	<b>V</b>	MET/HG
<del></del>	CEPT A I-A CA CEP TEP MC V NIA	v				6010C-W	Z	MET/HG
	SEL Analytes: CA CR FE MG K NA		<del> </del>			6020-W	$\overline{\mathbf{Z}}$	MET/HG
	SEL Analytes: SB AS BA BE CD CO	CU PB MIN NI SE AG TL ZN		<del></del>		HO-W-7470A		MET/HG
FOR LABORATO	DRY USE ONLY [fill out on page 1] %M []	RT CN TAT	QC 🗆	нок н	OK HC	ж со	C Em	elled .

WORK O	RDER Summary					Work Ord	ier: 1212052
Client:	HDR Engineering					Page 4 of	12/4/2012
Sample ID	Client Sample ID	Collected Date	Received Date	Date Due	Matrix	Test Code	Sel Storage
1212052-005H	DMW-7	12/4/2012 1400h	12/4/2012 1603h	12/18/2012	Aqueous	HG-W-PR	☐ MET/HG 1

#### Preservation Check Sheet

Sample	Set	Extension	Ha bas	
Samuri	JUL	TYTCHOIGH	anu on	

Ammonia       pH ≥ H₂SO₄       VES VES VES VES VES       VES VES VES VES VES VES VES VES VES VES	DB 12	Exec	Except	Evcept	Except	Except	Ехсерт	Except	Ехсері	Except	Except	- 005			-00Z.	Except	All OK	Preservative	Bottle Type
COD       pH <2 H <sub>2</sub> SO <sub>4</sub> √CS       ✓CS       ✓CS <td></td> <td><del></del></td> <td> </td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td>pH &lt;2 H<sub>2</sub>SO<sub>4</sub></td> <td>Ammonia</td>		<del></del>								-							1	pH <2 H <sub>2</sub> SO <sub>4</sub>	Ammonia
Cyanide       PH > 12 NaOH       /	<del></del> i																	pH <2 H₂SO₄	COD
Metals       pH <2 HNO <sub>3</sub> VES VES VES VES VES         NO <sub>2</sub> & NO <sub>3</sub> pH <2 H <sub>2</sub> SO <sub>4</sub> Nutrients         Phenols       pH <2 H <sub>2</sub> SO <sub>4</sub> Image: Control of the contr												7	7		7	1		PH >12 NaOH	Cyanide
NO2 & NO3       pH <2 H₂SO4	$\neg$	Г										Ves	Ves	VRS	NES	ves		pH <2 HNO <sub>3</sub>	Metals
O & G       pH < 2 HCL												1	7	7	7			pH <2 H <sub>2</sub> SO <sub>4</sub>	NO <sub>2</sub> & NO <sub>3</sub>
Phenols       pH <2 H <sub>2</sub> SO <sub>4</sub> Image: Control of the con		$\Box$														$I = \_!$		pH <2 H₂SO₄	Nutrients
Sulfide     pH > 9NaOH,       Zn Acetate     2n Acetate       TKN     pH <2 H <sub>2</sub> SO <sub>4</sub> TOC     pH <2 H <sub>3</sub> PO <sub>4</sub> TOX     pH <2 H <sub>2</sub> SO <sub>4</sub> T PO <sub>4</sub> pH <2 H <sub>2</sub> SO <sub>4</sub>			$\Box$															pH <2 HCL	O&G
Zn Acetate       Image: Control of the c									_								T	pH <2 H <sub>2</sub> SO₄	Phenols
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						[										77	T	pH > 9NaOH,	Sulfide
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		<u>L</u>				Ĺ											<u> </u>	Zn Acetate	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		$\Box$										<u> </u>							TKN
T PO₄ pH <2 H <sub>2</sub> SO <sub>4</sub>		$\Box$										<u></u>						pH <2 H₃PO₄	TOC
	]									Ĺ		[				!		pH <2 H <sub>2</sub> SO₄	TOX
TPH pH <2 HCL		<u> </u>																pH <2 H₂SO₄	T PO <sub>4</sub>
																		pH <2 HCL	TPH
		<u> </u>										]							
			<u> </u>																
		$\Box$											1			1			

Procedure:

- 1)

- Pour a small amount of sample in the sample lid
  Pour sample from Lid gently over wide range pH paper
  Do Not dip the pH paper in the sample bottle or lid
  If sample is not preserved properly list its extension and receiving pH in the appropriate column above
  Flag COC, notify client if requested
  Place client conversation on COC
  Samples may be adjusted
- 2) 3) 4) 5)
- 6)

Frequency

All samples requiing preservation

Chent HL 1C.  Address  City State  Phone 801-713-786U Fax	Zto			4	•	46	Lae 83 W	OR. est 3	W LYTI ATOI 1600 S City,	RIES South Utah	Fax	CHA CUS (801) 26 (888) 26 (801) 26 ail:awak	TO1 3-8686 3-8686 3-8687	D <b>Y</b>	Page Tun	Sample Set #n Around Time y 2 day 3 day	of	
Contact Nate Nichols E-mail nathyn wichols @ holyin		—- [	•						1	EST	S RE	QUIRE	D			OC FEAET	LAB	ORATORY USE ONLY
Project Name IRL Grandusta	<u>1c.                                     </u>					(da)									] ,	2 (2+)	Ìll₁ sı	PLES WERE
Project Number/P 0.#				ate/Time Collected	Matrix	er or Containers (		5	P	ا بدا	+nd	12			3	3+ 4	2 Ar	ories  mitienter Chilles  ories.
Sample ID					Mai	Numb		ľ		<b>,</b>						COMMENTS	- II	
DMW-1			12/	4/12 1250	Α						$\square$							mproperly Sealed
DMM-3			_	1/12/11:46	Δ			L		$ldsymbol{f eta}$							- [[	
1MW-4				4/12 12.15	A		_	_	↓	$oldsymbol{ol}}}}}}}}}}}}}}}}}}$	$\sqcup$			<u> </u>	┵—		_  '&	roperty Preserved N Tecked at Bench
0mW-6				4/12 1:30		<u> </u>	<u> </u>	<u> </u>	_	<u> </u>			ļ	<b>↓</b> ↓	<del> </del>		]  Y	N
DMW-7			12/	4/12 2:00	4	L	_	1	1_	↓			╄-		<del> </del>		_	
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				*	T	t	T	十	+	$\top$	†		1		†		٦ <u> </u>  , ,	Present on Outer
PRINT NAME ATE Nichols	12/4/12 16:07	Paul T NA	By: Sig. A.1.A ME VVL	SO Br	ن س	₹ 2		27	103	Sp	ecial	Instruc	hons					Package N NA  Unbroken on Outer NA  Package N NA
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Lab Set ID: 1212052

HDR Engineering

IRL Groundwater

Client:

Project:

463 West

Salt Lake City, . . 84115

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Kyle F Gross Laboratory Director

Jose Rocha QA Officer

## **OC SUMMARY REPORT**

Contact: Nate Nichols

ME Dept: QC Type: LCS

	<del> </del>	<del></del>	·· <u>····</u>						·	DDD		
Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
LCS-22523	Calcium	mg/L	SW6010C	9 24	10 00	0	92 4	80-120	•			12/12/2012 1051h
LCS-22523	Chromium	mg/L	SW6010C	0 194	0 2000	0	97 1	80-120				12/12/2012 t051h
LCS-22523	Iron	mg/L	SW6010C	0.970	1 000	0	97 0	80-120				12/12/2012 1051h
LCS-22523	Magnesium	mg/L	SW6010C	9 94	10 00	0	9 <b>9</b> 4	80-120				12/12/2012 1051h
LCS-22523	Polassium	mg/L	SW6010C	9 79	10 00	0	97 9	80-120				12/12/2012 1051h
LCS-22523	Sodium	mg/L	SW6010C	9 70	10 00	0	97 0	80-120				12/12/2012 1051h
LCS-22523	Vanadium	mg/L	SW6010C	0 196	0 2000	0	97 8	80-120				12/12/2012 I051h
LCS-22523	Antimony	mg/L	SW6020A	0 202	0 2000	0	101	85-115				12/13/2012 440h
LCS-22523	Arsenic	mg/L	SW6020A	0 197	0 2000	0	98 5	85-115				12/13/2012 440h
LCS-22523	Barium	mg/L	SW6020A	0 186	0 2000	0	92.8	85-115				12/13/2012 440h
LCS-22523	Cadmium	mg/L	SW6020A	0 198	0 2000	0	98.8	85-115				12/13/2012 440h
LCS-22523	Cobalt	mg/L	SW6020A	0 190	0 2000	0	95 1	85-115				12/13/2012 440h
LCS-22523	Copper	mg/L	SW6020A	0 201	0 2000	0	100	85-115				12/13/2012 440h
LCS-22523	Lead	mg/L	SW6020A	0 202	0 2000	0	101	85-115				12/13/2012 440h
LCS-22523	Nickel	mg/L	SW6020A	0 193	0 2000	0	96 5	85-115				12/13/2012 440h
LCS-22523	Selensum	mg/L	SW6020A	0 193	0 2000	0	96 3	85-115				12/13/2012 440h
LCS-22523	Silver	mg/L	SW6020A	0 198	0 2000	0	99 2	85-115				12/13/2012 440h
LCS-22523	Beryllium	mg/L	SW6020A	0 203	0 <b>2000</b>	0	101	85-115				12/13/2012 2106h
LCS-22523	Manganese	mg/L	SW6020A	0 207	0 2000	0	103	85-115				12/13/2012 2106h
LCS-22523	Thallium	mg/L	SW6020A	0 200	0 2000	0	100	85-115				12/13/2012 2106h
LCS-22523	Zinc	mg/L	SW6020A	0.979	1 000	0	97.9	85-115				12/14/2012 1604h
LCS-22538	Mercury	mg/L	SW7470A	0 00329	0 003330	0	98 8	80-120				12/6/2012 914h

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Kyle F Gross

Laboratory Director

Jose Rocha QA Officer

# **OC SUMMARY REPORT**

Client: HDR Engineering

Lab Set ID: 1212052

Project: IRL Groundwater

Contact: Nate Nichols

Dept: ME

QC Type: MBLK

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
MB-22523	Calcium	mg/L	SW6010C	< 1 00								12/12/2012 1046h
MB-22523	Chromium	mg/L	SW6010C	< 0 0100				-				12/12/2012 1046h
MB-22523	Iron	mg/L	SW6010C	< 0 100				-				12/12/2012 1046h
MB-22523	Magnesium	mg/L	SW6010C	< 1 00				•				12/12/2012 1046h
MB-22523	Potassium	mg/L	SW6010C	< 1 00				•				12/12/2012 1046h
MB-22523	Sodium	mg/L	SW6010C	< 1 00				-				12/12/2012 1046h
MB-22523	Vanadium	mg/L	SW6010C	< 0 00500				•				12/12/2012 1046h
MB-22523	Antimony	mg/L	SW6020A	< 0 00200				-				12/13/2012 431h
MB-22523	Arsenic	mg/L	SW6020A	< 0 00200				-				12/13/2012 431h
MB-22523	Barrum	mg/L	SW6020A	< 0 00200				•				12/13/2012 431h
MB-22523	Cadmium	mg/L	SW6020A	< 0 000500				•				12/13/2012 431h
MB-22523	Cobalt	mg/L	SW6020A	< 0 00200				•				12/13/2012 431h
MB-22523	Copper	mg/L	SW6020A	< 0 00200				•				12/13/2012 431h
MB-22523	Lead	mg/L	SW6020A	< 0 00200				•				12/13/2012 431h
MB-22523	Nickel	mg/L	SW6020A	< 0 00200				-				12/13/2012 431h
MB-22523	Selenium	mg/L	SW6020A	< 0 00200				•				12/13/2012 431h
MB-22523	Silver	mg/L	SW6020A	< 0 00200				•				12/13/2012 431h
MB-22523	Beryllium	mg/L	SW6020A	< 0 00200				-				12/13/2012 2057h
MB-22523	Manganese	mg/L	SW6020A	< 0 00200				-				12/13/2012 2057h
MB-22523	Thallium	mg/L	SW6020A	< 0.00200				•				12/13/2012 2057h
MB-22523	Zinc	mg/L	SW6020A	< 0 00500				•				12/14/2012 1559h
MB-22538	Mercury	mg/L	SW7470A	< 0 000150				-				12/6/2012 913h

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Kyle F Gross Laboratory Director

lose Rocha QA Officei

## **OC SUMMARY REPORT**

Client: HDR Engineering

Lab Set ID: 1212052

Project:

IRL Groundwater

Contact: Nate Nichols

Dept: ME QC Type: MS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
1212052-001HMS	Calcium	mg/L	SW6010C	55.7	10 <b>0</b> 0	48 54	71 3	75-125			,	12/12/2012 1107h
1212052-001HMS	Magnesium	mg/L	SW6010C	45.3	10 00	36.47	88 4	75-125				12/12/2012 1107h
1212052-001HMS	Sodium	mg/L	SW6010C	33 3	10 00	24 59	86 8	75-125				12/12/2012 1107h
1212052-001HMS	Chromium	mg/L	SW6010C	0 196	0 2000	0 003340	96.2	75-125				12/12/2012 1200h
1212052-001HMS	Iron	mg/L	SW6010C	0 946	1 000	0	94 6	75-125				12/12/2012 1200h
1212052-001HMS	Potassium	mg/L	SW6010C	10 9	10 00	1 150	97 2	75-125				12/12/2012 1200h
1212052-001HMS	Vanadium	mg/L	20109W2	0 204	0 2000	0 01004	97 1	75-125				12/12/2012 1200h
1212052-001HMS	Antimony	mg/L	SW6020A	0 205	0 2000	0 0005030	102	75-125				12/13/2012 517h
1212052-001HMS	Arsenic	mg/L	SW6020A	0.200	0.2000	0 01013	<b>95</b> 0	75-125				12/13/2012 517h
1212052-001HMS	Banum	mg/L	SW6020A	0 257	0 2000	0 07631	90 2	75-125				12/13/2012 517h
1212052-001HMS	Cadmium	mg/L	SW6020A	0 195	0 2000	0 0001200	97 2	75-125				12/13/2012 517h
1212052-001HMS	Cobalt	mg/L	SW6020A	0 179	0 2000	0 0001870	89.6	<b>75-125</b>				12/13/2012 517h
1212052-001HMS	Copper	mg/L	SW6020A	0 185	0 2000	0 0007780	<b>92</b> 0	75-125				12/13/2012 517h
1212052-001HMS	Lead	mg/L	SW6020A	0 201	0 2000	0 0006650	100	75-125				12/13/2012 517h
1212052-001HMS	Nickel	mg/L	SW6020A	0 183	0 2000	0 002587	90 2	75-125				12/13/2012 517h
1212052-001HMS	Selenium	mg/L	SW6020A	0 186	0 2000	0 001750	92 2	75-125				12/13/2012 517h
1212052-001HMS	Silver	mg/L	SW6020A	0 196	0 2000	0	98.1	75-125				12/13/2012 517h
1212052-001HMS	Beryllium	mg/L	SW6020A	0.192	0 2000	0 00008300	96 2	75-125				12/13/2012 2124h
1212052-001HMS	Manganese	mg/L	SW6020A	0.198	0.2000	0 002332	978	75-125				12/13/2012 2124h
1212052-001HMS	Thallium	mg/L	SW6020A	0 195	0 2000	0 0006640	97 1	75-125				12/13/2012 2124h
1212052-001HMS	Zinc	mg/L	SW6020A	0 966	000 1	0 003385	96 3	75-125				12/14/2012 1614h
1212052-001HMS	Mercury	mg/L	SW7470A	0 00333	0 003330	0	100	80-120				12/6/2012 921h

<sup>1 -</sup> Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS



Lab Set ID: 1212052

HDR Engineering

IRL Groundwater

Client:

Project:

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Kyle F Gross Laboratory Director

Jose Rocha QA Officer

## **QC SUMMARY REPORT**

Contact. Nate Nichols

Dept: ME QC Type: MSD

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Oyal	Date Analyzed
1212052-001HMSD	Calcium	mg/L	SW6010C	59 6	10 00	48 54	111	75-125	6 83	20		12/12/2012 1111h
1212052-001HMSD	Magnesium	mg/L	SW6010C	47 8	10.00	36.47	113	75-125	5 35	20		12/12/2012 1111h
1212052-001HMSD	Sodium	mg/L	SW6010C	35 4	10 00	24.59	108	75-125	63	20		12/12/2012 1111h
1212052-001HMSD	Chromium	mg/L	SW6010C	0 198	0 2000	0 003340	97.1	75-125	0 928	20		12/12/2012 1204h
1212052-001HMSD	Iron	mg/L	SW6010C	0.977	1 000	0	97 7	75-125	3 24	20		12/12/2012 1204h
1212052-001HMSD	Potassium	mg/L	SW6010C	110	10 00	1 150	98 2	75-125	0 904	20		12/12/2012 1204h
1212052-001HMSD	Vanadium	mg/L	SW6010C	0.206	0.2000	0 01004	<b>97</b> 9	75-125	0 727	20		12/12/2012 1204h
1212052-001HMSD	Antimony	mg/L	SW6020A	0 204	0 2000	0 0005030	102	75-125	0 223	20		12/13/2012 554h
1212052-001HMSD	Arsenic	mg/L	SW6020A	0 202	0 2000	0 01013	<b>96</b> 0	75-125	0 982	20		12/13/2012 554h
1212052-001HMSD	Barium	mg/L	SW6020A	0 261	0 2000	0 07631	92.5	75-125	18	20		12/13/2012 554h
1212052-001HMSD	Cadmium	mg/L	SW6020A	0 196	0 2000	0 0001200	97 8	75-125	0 575	20		12/13/2012 554h
1212052-001HMSD	Cobalt	mg/L	SW6020A	0 176	0 2000	0 0001870	88.1	75-125	16	20		12/13/2012 554h
1212052-001HMSD	Соррег	mg/L	SW6020A	0 185	0 2000	0 0007780	92 1	75-125	0 162	20		12/13/2012 554h
1212052-001HMSD	Lead	mg/L	SW6020A	0 202	0 2000	0 0006650	101	75-125	0 667	20		12/13/2012 554h
1212052-001HMSD	Nickel	mg/L	SW6020A	0 182	0 2000	0 002587	89 5	75-125	0 737	20		12/13/2012 554h
1212052-001HMSD	Selenium	mg/L	SW60204	0 189	0 2000	0 001750	93 6	75-125	1 56	20		12/13/2012 554h
1212052-001HMSD	Silver	mg/L	SW6020A	0 197	0 2000	0	98 4	75-125	0 309	20		12/13/2012 554h
1212052-001HMSD	Beryllium	mg/L	SW6020A	0 194	0 2000	0 00008300	96 8	75-125	0 656	20		12/13/2012 2133h
1212052-001HMSD	Manganese	mg/L	SW6020A	0 200	0 2000	0 002332	98 8	75-125	1 02	20		12/13/2012 2133h
1212052-001HMSD	Thallium	mg/L	SW6020A	0 196	0 2000	0 0006640	97 5	75-125	0 467	20		12/13/2012 2133h
1212052-001HMSD	Zinc	mg/L	SW6020A	0 974	1 000	0 003385	<b>9</b> 7 1	75-125	0 811	20		12/14/2012 1618h
1212052-001HMSD	Mercury	mg/L	SW7470A	0 00327	0 003330	0	98 2	80-120	1 82	20		12/6/2012 923h



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Kyle F Gross

Laboratory Director

Jose Rocha QA Officer

## **OC SUMMARY REPORT**

Client: HDR Engineering

Lab Set ID: 1212052

Project: IRL Groundwater

Contact: Nate Nichols

Dept: WC

QC Type: DUP

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
1212052-001DDUP	pH @ 25° C	pH Units	SM4500-H+B	7 30		7 310		•	0 137	5		12/4/2012 1700h
1212052-001EDUP	Total Dissolved Solids	mg/L	SM2540C	420		404 0		•	3 88	_ 5		12/7/2012 1310h

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Kyle F Gross

Laboratory Director

Jose Rocha QA Officer

## **OC SUMMARY REPORT**

HDR Engineering

Lab Set ID: 1212052

Client:

Project: IRL Groundwater Contact: Nate Nichols

WC Dept: QC Type: LCS

Sample LD	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
LCS-R48302	Sulfate	mg/L	E300 0	4.99	5 000	0	99 8	90-110				12/11/2012 1608h
LCS-R48360	Chloride	mg/L	E300 0	4 91	5 000	0	98 3	90-110				12/12/2012 1412h
LCS-R48050	Alkalınıty (as CaCO3)	mg/L	SM2320B	51,000	50,000	0	102	90-110				12/5/2012 1114h
LCS1-R48114	Chemical Oxygen Demand	mg/L	HACH 8000	316	300 0	0	105	85-115				12/6/2012 1000h
LCS2-R48114	Chemical Oxygen Demand	mg/L	HACH 8000	101	100 0	0	101	85-115				12/6/2012 1000h
LCS3-R48114	Chemical Oxygen Demand	mg/L	HACH 8000	9 00	10 00	0	90 O	85-115				12/6/2012 1000h
LCS-R48114	Chemical Oxygen Demand	mg/L	HACH 8000	1,020	1,000	0	102	85-115				12/6/2012 1000h
LCS-22549	Ammonia (as N)	mg/L	E350 1	1 08	1 000	0	108	90-110				12/6/2012 2055h
LCS-R48015	Nitrate (as N)	mg/L	E353 2	1 08	1 000	0	108	90-110				12/4/2012 1715h
LCS-R48010	рН @ 25° C	pH Units	SM4500-H+B	9 01	9 000	0	100	98-102				12/4/2012 1700h
LCS-R48178	Total Dissolved Solids	mg/L	SM2540C	198	205 0	0	96 6	80-120				12/7/2012 1310h
LCS-R48290	Total Organic Carbon	mg/L	SM5310B	10 4	10 00	0	104	<del>9</del> 0-110				12/11/2012 1223h

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Kyle F Gross

Laboratory Director

Jose Rocha QA Officer

## **OC SUMMARY REPORT**

Client: HDR Engineering

Lab Set ID: 1212052

IRL Groundwater Project:

Contact: Nate Nichols

WC Dept:

QC Type: MBLK

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
MB-R48302	Sulfate	mg/L	E300 0	< 0 750				•			<del></del>	12/11/2012 1546h
MB-R48360	Chloride	mg/L	£300 O	< 0.100				•				12/12/2012 1349h
MB-R48050	Bicarbonate (as CaCO3)	mg/L	SM2320B	< 10 0				•				12/5/2012 1114h
MB-R48050	Carbonate (as CaCO3)	mg/L	SM2320B	< 10 0				•				12/5/2012 1114h
MB-R48114	Chemical Oxygen Demand	mg/L	HACH 8000	< 10.0				-				12/6/2012 1000h
MB-22549	Ammonia (as N)	mg/L	E350 1	< 0.0500				-				12/6/2012 2054h
MB-R48015	Nitrate (as N)	mg/L	E353 2	< 0 0100				-				12/4/2012 1708h
MB-R48178	Total Dissolved Solids	mg/L	SM2540C	< 10 0				•				12/7/2012 1310h
MB-R48290	Total Organic Carbon	mg/L	SM5310B	< 1 00				•				12/11/2012 1200h



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Jose Rocha QA Officer

## **OC SUMMARY REPORT**

HDR Engineering Client:

Lab Set ID: 1212052

Project: IRL Groundwater Contact: Nate Nichols

WC Dept:

QC Type MS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
1212052-001DMS	Sulfate	mg/L	E300 0	557	500 0	48 39	102	90-110				12/11/2012 1928h
1212052-001DMS	Chlonde	mg/L	E300 0	541	500 0	54 42	97 3	90-110				12/12/2012 1456h
1212052-001DMS	Alkalinity (as CaCO3)	mg/L	SM2320B	322	100 0	220 2	102	80-120				12/5/2012 1114h
1212052-005FMS	Chemical Oxygen Demand	mg/L	HACH 8000	52.0	50.00	0	104	85-115				12/6/2012 1000h
1212052-001GMS	Ammonia (as N)	mg/L	E350 1	1 02	1 000	0	102	90-110				12/6/2012 2103h
1212052-001DMS NO3	Nitrate (as N)	mg/L	E353.2	1 18	1 000	0 08820	110	90-110				12/4/2012 1731h
1212052-001CMS	Total Organic Carbon	mg/L	SM5310B	6 14	5 000	0 7752	107	80-120				12/11/2012 1309h



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## **OC SUMMARY REPORT**

HDR Engineering Client:

Lab Set 1D: 1212052

Project: IRL Groundwater Contact: Nate Nichols

WC Dept:

QC Type: MSD

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
1212052-001DMSD	Sulfate	mg/L	- E300 0	588	500 0	48 39	108	90-110	5 47	20		12/11/2012 1951h
1212052-001DMSD	Chloride	mg/L	E300 0	542	5000	54 42	97.6	90-110	0 264	20		12/12/2012 1518h
1212052-001DMSD	Alkalinity (as CaCO3)	mg/L	SM2320B	319	100 0	220 2	98 4	80-120	1 12	10		12/5/2012 1114h
1212052-005FMSD	Chemical Oxygen Demand	mg/L	HACH 8000	53 0	50 00	0	106	85-115	19	10		12/6/2012 1000h
1212052-001GMSD	Ammonia (as N)	mg/L	E350 I	1 04	1 000	0	104	90-110	2 74	10		12/6/2012 2104h
1212052-001DMSD NO	03 Nitrate (as N)	mg/L	E353 2	1 20	1 000	0 08820	111	90-110	1 11	10	ı	12/4/2012 1733h
1212052-001CMSD	Total Organic Carbon	mg/L	SM5310B	5 62	5 000	0 7752	96 9	80-120	8 78	20		12/11/2012 1331h

<sup>&#</sup>x27;- Matrix spike recovery indicates matrix interference. The method is in control as indicated by the LCS



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## **OC SUMMARY REPORT**

Client:

HDR Engineering

Lab Set ID: 1212052

IRL Groundwater Project:

Contact: Nate Nichols

GC Dept:

QC Type: LCS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
LCS-22530	1,2-Dibromo-3-chloropropane	μ <b>g/L</b>	E504 I	0 103	0 1000	0	103	60-130				12/7/2012 030h
LCS-22530	1,2-Dibromoethane	μg/L	E504 1	0 0865	0 1000	0	86 5	48 8-146				12/7/2012 030h
LCS-22530	Surr 1,2-Dibromopropane	%REC	E504 t	0 126	0 1000		126	65-157				12/7/2012 030h

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**OC SUMMARY REPORT** 

Client: HDR Engineering

Lab Set ID: 1212052

Project: IRL Groundwater

Contact: Nate Nichols

Dept: GC

QC Type: MBLK

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
MB-22530	1,2-Dibromo-3-chloropropane	μg/L	E504 1	< 0 0105				•				12/7/2012 016h
MB-22530	1,2-Dibromoethane	μg/L	E504 1	< 0 0105				•				12/7/2012 016h
MB-22530	Surr 1,2-Dibromopropane	%REC	E504 1	0 0762	0 1000		76 2	65-158				12/7/2012 016h



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## **OC SUMMARY REPORT**

Client: HDR Engineering

Lab Set ID: 1212052

Project: IRL Groundwater

Contact: Nate Nichols

Dept: GC

QC Type: MS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
1212052-001BMS	1,2-Dibromo-3-chloropropane	μg/L	ES04 1	0 109	0 09876	0	110	58-148				12/7/2012 100h
1212052-001BMS	1,2-Dibromoethane	μg/L	E504 1	0 0883	0 09876	0	89 4	34-161				12/7/2012 100h
1212052-001BMS	Surr: 1,2-Dibromopropane	%REC	E504 1	0 126	0 09876		128	65-157				12/7/2012 100h



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Jose Rocha QA Officer

## **OC SUMMARY REPORT**

HDR Engineering Client:

Lab Set ID: 1212052

IRL Groundwater Project:

Contact: Nate Nichols

GC Dept:

QC Type: MSD

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
1212052-001BMSD	1,2-Dibromo-3-chloropropane	μg/L	E504 1	0 114	0 09974	0	114	58-148	4 39	25		12/7/2012 115h
1212052-001BMSD	1,2-Dibromoethane	μg/L	E504 [	0 0908	0 09974	0	910	34-161	2 73	25		12/7/2012 115h
1212052-001BMSD	Surr 1,2-Dibromopropane	%REC	E504 I	0 127	0 09974		128	65-157				12/7/2012 115h

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## **OC SUMMARY REPORT**

Client: HDR Engineering

Lab Set ID: 1212052

Project: IRL Groundwater Contact: Nate Nichols

MSVOA Dept:

QC Type: LCS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
LCS VOC 120512A	1,1,1-Trichloroethane	μg/L	SW8260C	24 4	20 00	0	122	59-156	<del></del>	*		12/5/2012 820h
LCS VOC 120512A	1,1-Dichloroethene	μg/L	SW8260C	28 9	20 00	0	145	46-171				12/5/2012 820h
LCS VOC 120512A	1,2-Dichlorobenzene	μg/L	SW8260C	22 5	20 00	0	112	67-135				12/5/2012 820h
LCS VOC 120512A	1,2-Dichloroethane	μg/L	SW8260C	22 8	20 00	0	114	60-137				12/5/2012 820h
LCS VOC 120512A	1,2-Dichloropropane	μg/L	\$W8260C	209	20 00	0	104	59-135				12/5/2012 820h
LCS VOC 120512A	Benzene	μg/L	SW8260C	23 2	20 00	0	116	62-127				12/5/2012 820h
LCS VOC 120512A	Chlorobenzene	μg/L	SW8260C	23 6	20 00	0	118	63-140				12/5/2012 820h
LCS VOC 120512A	Chloroform	μ <b>g/L</b>	SW8260C	23.2	20 00	0	116	67-132				12/5/2012 820h
LCS VOC 120512A	Ethylbenzene	μg/L	SW8260C	24 3	20 00	0	121	55-133				12/5/2012 820h
LCS VOC 120512A	Methylene chloride	μg/L	SW8260C	24.9	20 00	0	125	32-185				12/5/2012 820h
LCS VOC 120512A	Toluene	μg/L	SW8260C ·	23 8	20 00	0	119	64-128				12/5/2012 820h
LCS VOC 120512A	Trichloroethene	μg/L	SW8260C	24 2	20.00	0	121	54-152				12/5/2012 820h
LCS VOC 120512A	Xylenes, Total	μg/L	SW8260C	72 2	60 00	0	120	52-134				12/5/2012 820h
LCS VOC 120512A	Surr 1,2-Dichloroethane-d4	%REC	SW8260C	498	50.00		99 7	76-138				12/5/2012 820h
LCS VOC 120512A	Surr 4-Bromofluorobenzene	%REC	SW8260C	512	50 00		103	77-121				12/5/2012 820h
LCS VOC 120512A	Surr Dibromofluoromethane	%REC	SW8260C	517	50 00		103	67-128				12/5/2012 820h
LCS VOC 120512A	Surr Toluene-d8	%REC	SW8260C	50 I	50 00		100	81-135				12/5/2012 820h

Lab Set ID: 1212052

HDR Engineering

IRL Groundwater

Client:

Project:

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## **QC SUMMARY REPORT**

Contact: Nate Nichols

Dept: MSVOA

QC Type: MBLK

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
MB VOC 120512A	1,1,1,2-Tetrachloroethane	μg/L	SW8260C	< 2.00		··	<del></del>					12/5/2012 858h
MB VOC 120512A	1,1,1-Trichloroethane	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	1,1,2,2-Tetrachloroethane	μg/L	SW8260C	< 2.00				-				12/5/2012 858h
MB VOC 120512A	1,1,2-Trichloroethane	μg/L	SW8260C	< 2.00				-				12/5/2012 858h
MB VOC 120512A	1,1-Dichloroethane	μg/L	SW8260C	< 2.00				-				12/5/2012 858h
MB VOC 120512A	1,1-Dichloroethene	μg/L	SW8260C	< 2 00				•	_'			12/5/2012 858h
MB VOC 120512A	1,2,3-Trichloropropane	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	1,2-Dibromo-3-chloropropane	μg/L	SW8260C	< 5.00				•				12/5/2012 858h
MB VOC 120512A	1.2-Dibromoethane	μg/L	SW8260C	< 200				•				12/5/2012 858h
MB VOC 120512A	1,2-Dichlorobenzene	μ <b>g</b> /L	\$W8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	1.2-Dichloroethane	μg/L	SW8260C	< 2 00								12/5/2012 858h
MB VOC 120512A	1,2-Dichloropropane	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	1,4-Dichlorobenzene	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	2-Butanone	μg/L	SW8260C	< 10 0				•				12/5/2012 858h
MB VOC 120512A	2-Hexanone	μg/L	SW8260C	< 5 00				•				12/5/2012 858h
MB VOC 120512A	4-Methyl-2-pentanone	μ <b>g/</b> L	SW8260C	< 5 00				•				12/5/2012 858b
MB VOC 120512A	Acetone	μg/L	SW8260C	< 10 0				-				12/5/2012 858h
MB VOC 120512A	Acrylonitrile	μg/L	SW8260C	< 10.0				-				12/5/2012 858h
MB VOC 120512A	Benzene	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	Bromochloromethane	μg/L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	Bromodichloromethane	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	Bromoform	μg/L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	Bromomethane	μg/L	SW8260C	< 5 00				•				12/5/2012 858h
MB VOC 120512A	Carbon disulfide	μg/L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	Carbon tetrachlonde	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	Chlorobenzene	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	Chloroethane	μg/L	SW8260C	< 2 00				-				12/5/2012 858h

Report Date 12/17/2012 Page 41 of 44

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Jose Rocha QA Officer

## **OC SUMMARY REPORT**

Chent: HDR Engineering

Lab Set ID: 1212052

Project: IRL Groundwater

Contact: Nate Nichols

Dept: MSVOA

QC Type: MBLK

					Amount	Original				RPD		
Sample ID	Analyte	Units	Method	Resuit	Spiked	Amount	%REC	Limits	%RPD	Limit	Qual	Date Analyzed
MB VOC 120512A	Chloroform	μg/L	SW8260C	< 2 00	_			•				12/5/2012 858h
MB VOC 120512A	Chloromethane	μg/L	SW8260C	< 3 00				•				12/5/2012 858h
MB VOC 120512A	cis-1,2-Dichloroethene	μg/L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	cis-1,3-Dichloropropene	μg/L	SW8260C	< 2.00				-				12/5/2012 858h
MB VOC 120512A	Dibromochloromethane	μg/L	SW8260C	< 2.00				•				12/5/2012 858h
MB VOC 120512A	Dibromomethane	μg/L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	Ethylbenzene	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	Iodomethane	μg/L	SW8260C	< 5 00				•				12/5/2012 858h
MB VOC 120512A	Methylene chloride	ug/L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	Styrene	μ <b>g/</b> L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	Tetrachloroethene	μ <b>g/</b> L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	Toluene	μg/L	SW8260C	< 2 00				-				12/5/2012 858h
MB VOC 120512A	trans-1,2-Dichloroethene	μg/L	SW8260C	< 2.00				•				12/5/2012 858h
MB VOC 120512A	trans-1,3-Dichloropropene	μg/L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	trans-I,4-Dichloro-2-butene	μg/L	SW8260C	< 2.00				•				12/5/2012 858h
MB VOC 120512A	Trichloroethene	μ <b>g</b> /L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	Trichlorofluoromethane	μg/L	SW8260C	< 2 00				ı <del>-</del>				12/5/2012 858h
MB VOC 120512A	Vinyl acetate	μg/L	SW8260C	< 10 0				-				12/5/2012 858h
MB VOC 120512A	Vinyl chloride	μg/L	SW8760C	< 1 00				•				12/5/2012 858h
MB VOC 120512A	Xylenes, Total	μ <b>g</b> /L	SW8260C	< 2 00				•				12/5/2012 858h
MB VOC 120512A	Surr 1,2-Dichloroethane-d4	%REC	SW8260C	50 4	50 00		101	76-138				12/5/2012 858h
MB VOC 120512A	Surr. 4-Bromofluorobenzene	%REC	SW8260C	512	50 00		102	77-121				12/5/2012 858h
MB VOC 120512A	Surr Dibromofluoromethane	%REC	SW8260C	50 5	<b>50 0</b> 0		101	67-128				12/5/2012 858h
MB VOC 120512A	Surr Toluene-d8	%REC	SW8260C	49 3	50 00		98.6	81-135	<u></u>			12/5/2012 858h

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Kyle F Gros.

Laboratory Director

Jose Rocha QA Officer

## **OC SUMMARY REPORT**

Client: HDR Engineering

Lab Set ID: 1212052

Project: IRL Groundwater

Contact: Nate Nichols

Dept: MSVOA

QC Type: MS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
1212052-001AMS	1,1,1-Trichloroethane	μg/L	SW8260C	23.5	20 00	0	118	67-147				12/5/2012 1227h
1212052-001AMS	1,1-Dichloroethene	μg/L	SW8260C	27 5	20.00	0	138	51-152				12/5/2012 1227h
1212052-001AMS	1,2-Dichlorobenzene	μ <b>g</b> /L	SW8260C	20 4	20 00	0	102	70-130				12/5/2012 1227h
1212052-001AMS	1,2-Dichloroethane	μg/L	SW8260C	21.6	20 00	0	108	39-162				12/5/2012 1227h
1212052-001AMS	1,2-Dichloropropane	μg/L	SW8260C	193	20 00	0	967	59-135				12/5/2012 1227h
1212052-001AMS	Benzene	μg/L	SW8260C	22 1	20 00	0	111	66-145				12/5/2012 1227h
1212052-001AMS	Chlorobenzene	μg/L	SW8260C	22 2	20 00	0	111	63-140				12/5/2012 1227h
1212052-001AMS	Chloroform	μg/L	SW8260C	21 9	20 00	0	109	50-146				12/5/2012 1227h
1212052-001AMS	Ethylbenzene	μg/L	SW8260C	22 8	20 00	0	114	69-133				12/5/2012 1227h
1212052-001AMS	Methylene chloride	μg/L	SW8260C	23 7	20 00	0	118	30-192				12/5/2012 1227h
1212052-001AMS	Toluene	μg/L	SW8260C	22 3	20 00	0	111	18-192				12/5/2012 1227h
1212052-001AMS	Trichloroethene	μg/L	SW8260C	23 0	20 00	0	115	61-153				12/5/2012 1227h
1212052-001AMS	Xylenes, Total	μg/L	SW8260C	67.5	60 00	0	113	42-167				12/5/2012 1227h
1212052-001AMS	Surr 1,2-Dichloroethane-d4	%REC	SW8260C	50 4	50 00		101	72-151				12/5/2012 1227h
1212052-001AMS	Surr 4-Bromofluorobenzene	%REC	SW8260C	50 1	50 00		100	80-128				12/5/2012 1227h
1212052-001AMS	Surr: Dibromofluoromethane	%REC	SW8260C	51 6	50 00		103	80-124				12/5/2012 1227h
1212052-001AMS	Surr Toluene-d8	%REC	SW8260C	48 8	50 00		97 5	77-129				12/5/2012 1227h

463 West

'outh

Salt Lake City, .

84115 Phone (801) 263-8686 Toll Free (888) 263-8686. Fax (801) 263-8687\_\_\_\_\_ Kyle F Gross

Laboratory Director

e-mail awal@awal-labs.com web www awal-labs coin

Jose Rocha QA Officer

## **OC SUMMARY REPORT**

HDR Engineering Client:

Lab Set ID: 1212052

Project: IRL Groundwater

Nate Nichols Contact:

**MSVOA** Dept:

QC Type: MSD

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qual	Date Analyzed
1212052-001AMSD	l,l,l-Trichloroethane	μg/L	SW8260C	22 7	20 00	0	113	67-147	3 77	25		12/5/2012 1246h
1212052-001AMSD	1,1-Dichloroethene	μg/IL	SW8260C	27 2	20 00	0	136	51-152	1.1	25		12/5/2012 1246h
1212052-001AMSD	1,2-Dichlorobenzene	μg/L	SW8260C	198	20 00	0	99 2	70-130	2 88	25		12/5/2012 1246h
1212052-001AMSD	1,2-Dichloroethane	μg/L	SW8260C	20.6	20 00	0	103	39-162	4 84	25		12/5/2012 1246h
1212052-001AMSD	1,2-Dichloropropane	μg/L	SW8260C	189	20 00	0	94 6	59-135	2 2	25		12/5/2012 1246h
1212052-001AMSD	Benzene	μg/L	SW8260C	21 6	20 00	0	108	66-145	2 43	25		12/5/2012 1246h
1212052-001AMSD	Chlorobenzene	μg/L	SW8260C	21 4	20 00	0	107	63-140	3 39	25		12/5/2012 1246h
1212052-001AMSD	Chloroform	μg/L	SW8260C	21 3	20 00	0	106	50-146	2 59	25		12/5/2012 1246h
1212052-001AMSD	Ethylbenzene	μg/L	SW8260C	218	20 00	0	109	69-133	4 75	25		12/5/2012 1246h
1212052-001AMSD	Methylene chloride	μg/L	SW8260C	23 1	20 00	0	115	30-192	2 69	25		12/5/2012 1246h
1212052-001AMSD	Toluene	μg/L	SW8260C	21 6	20 00	0	108	18-192	3 15	25		12/5/2012 1246h
1212052-001AMSD	Trichloroethene	μg/L	SW8260C	22 1	20 00	0	111	61-153	3.9	25		12/5/2012 1246h
1212052-001AMSD	Xylenes, Total	μg/L	SW8260C	65 2	60 00	0	1 <b>09</b>	42-167	3.54	25		12/5/2012 1246h
1212052-001AMSD	Surr 1,2-Dichloroethane-d4	%REC	SW8260C	50 4	50 00		101	72-151				12/5/2012 1246h
1212052-001AMSD	Surr 4-Bromofluorobenzene	%REC	SW8260C	50 0	50 00		100	80-128				12/5/2012 1246h
1212052-001AMSD	Surr Dibromofluoromethane	%REC	SWB260C	515	50 00		103	80-124				12/5/2012 1246h
1212052-001AMSD	Surr Toluene-d8	%REC	SW8260C	48 8	50 00		<b>97</b> 7	77-129				12/5/2012 1246h

Attachment F - Explosive Gas Sampling Report



## Memo

To Rob Richards, Intermountain Regional Landfill	
From Terry Warner	Project December 2012 Explosive Gas Monitoring
CC Nate Nichols	
Date December 5, 2012	Job No

#### RE:Intermountain Regional Lanfill Explosive Gas Quarterly Monitoring

Dear Rob,

This letter transmitts HDR's findings related to on site explosive gas monitoring at the Intermountain Regional Landfill. In accordance with Utah State Regulation R315-303-02(2), Intermountain Regional Landfill is required to monitor for explosive gases within all structures and at the landfill property limits once quarterly, or 4 times a year. This memo discusses results of monitoring effort during the fourth quarter of 2012, which took place on December 4th, 2012.

HDR staff analyzed 5 locations within Intermountain Regional Landfill, including the scale house/office and the North, South, East and West limits of the current and only active landfill cell. Results of all 5 samples indicated that the current landfill operations are not producing methane in detectible amounts. These results are below reportable limits as defined by Utah State Regulation R315-303-2(2)(a). All results showed 00 0% - 00.1% methane, and 20 7- 20 8% oxygen. See attached for all field documentation and calibration certificates

These results should be included in your 2012 annual report to the Utah Division of Solid and Hazardous Waste

If you have any questions regarding this letter or the results of the analysis, please contact me at (801) 743-7812

Sincerely,

Terry Warner, PE HDR Engineering, Inc

#### Attachments.

- 1 Methane gas field monitoring results
- 2 GEM 200+ Calibration Certificate

### Methane Gas Monitoring Prgram Field Data reporting form Intermountain Regional Landfill

Date: 12/4/12
Field Equipment Gem 2000/Cal 11/29/12
Sampler. N Nichols
Weather: University Calm

Location Description	Oxygen Percent	Methane Percent	Other	Comments
Scale House	20.7	00.1		
Cell East boundary	20.7	OU. I		
North boundary	20, 8	0.0.0		
West boundary	20.7	00.1		
South boundary	20.7	00.1		
•				



# **Gem 2000+ Calibration Certificate**

Unit Number

3639

Factory Calibration Date: 4/20/2012

Field Calibration Date 11/29/2012 09:27 AM

Serial Number GM13973

Technician:

Larry Lundberg

☑ Cleaned Unit and Case	Battery charge	100 %	Pass
✓ Visually inspect for damage and missing parts	Pump flow	600 ml/min	Pass

Manual is in case

Gas Zered	<u>Zero</u>	Reading	<u>Variance</u>		Zero Gas	<u>Lot #</u>	Exp Date	
CH₄	0 %	0 %	0 00%	Pass	Amblent Air	Not Applicable		
CO <sub>2</sub>	0 %	01%	0 10%	Pass	Ambient Air	Not Applicable		
CO	0 ppm	0 ppm	0 00%	Pass	Ambient Air	Not Applicable		
H₂S	0 ppm	0 ppm	0 00%	Pass	Amblent Air	Not Applicable		
O <sub>2</sub>	0 %	0 %	0.00%	Pass	Gem Gas	IAM-399-S-2	6/14	Pass

Span								
Gas Spaned	<u>Span</u>	Reading	Variance		Calibration Gas	<u>Ļot #</u>	Exp Date	
CH₄	15 %	15 %	0 00%	Pass	Gem Gas	IAM-399-S-2	6/14	Pass
CO₂	15 %	15 %	0 00%	Pass	Gem Gas	IAM-399-S-2	6/14	Pass
CO	50 ppm	49 ppm	-2 00%	Pass	4 Gas	1372740	9/14	Pass
HzS	10 ppm	10 ppm	0 00%	Pass	4 Gas	1372740	9/14	Pass
$O_2$	20 9 %	20 8 %	-0 48%	Pass	Ambient Air	Not Applicable		

Geotech Environmental Equipment, Inc. takes pride in ensuring this instrument is tested to function as specified by the manufacturer and was calibrated in accordance to manufacturer specifications. All calibration standards used are NIST traceable. With the provided lot numbers we can provide NIST documents on request. Call us at (800) 833-7958 and we will be glad to help.

Attachment G - Closure & Post Closure Care Cost Estimate, Surety Bond

February 25, 2013

Rob Richards General Manager Intermountain Regional Landfill PO Box 1889 Salt Lake City, UT 84110

Re: 2013 Closure and Post Closure Care Cost Estimates, Intermountain Regional Landfill (Permit #1102)

Dear Rob:

This letter transmits Closure and Post Closure Care cost estimates for the 2013 financial assurance program at the Intermountain Regional Landfill (IRL).

Closure and post closure care cost estimates were originally prepared in 2010 for the Class V permit application. The financial assurance mechanism is a surety bond, in the amount of \$1,714,711, which was originally submitted to the Utah Division of Solid and Hazardous Waste on July 2, 2012. This bond is attached. The current Closure (\$817, 036) and Post Closure Care (\$690,000) cost estimate totals \$1,507,036. These estimates are also attached. The factors that led to a decrease in the cost estimates are as follows:

- A reduced landfill area The 2010 cost estimates in the permit application were based on conceptual design for an 8-acre landfill operating area The final designed and asconstructed active liner area is 7.5 acres. This change reduces the estimated material quantities in the landfill cover system.
- Adjusted unit costs. Contractor bids from the 2012 Cell 1 Phase 1 liner construction project were reviewed, and several unit costs in the closure estimate could be adjusted.
- Lowered contingencies. With better estimates of unit costs and more accurate closure material quantities, we lowered the contingency line items.

I appreciate the opportunity to provide engineering services to the IRL. If you have any questions or comments, please contact me at (801) 743-7812.

Sincerely,

Terry Warner, PE

Enclosures Closure and Post Closure Care Cost Estimates and Surety Bond

## Intermountain Regional Landfill Closure Cost Estimate Cell 1 (2013 Dollars)

Cell 1 Phase 1	7.50	Acres
Total	7 50	Acres

1	Engineering/Management	Unit	Unit Cost	Quantity	Cost
1.01	Topo Survey Initial	HR	\$150	25	\$3,750
1.02	Topo Survey Final	HR	\$150	16	\$2,400
1.03	Site Reconnaissance	HR	\$150	8	\$1,200
1.04	Boundary Survey	HR	\$150	16	\$2,400
1 05	Construction Plans/Specs	LUMP	\$40,000	1	\$40,000
1.06	Bidding and Award	LUMP	\$5,000	1	\$5,000
1.07	Quality Control Testing	LUMP	\$10,000	1	\$10,000
1.08	Construction Management/QC	LUMP	\$50,000	_ 1]	\$50,000
1.09	Closure Report/As-Builts	LUMP	\$25,000	1	\$25,000
1 10	Obtain UPDES and other permits	LUMP	\$10,000	1	\$10,000
			Subtotal		\$149,750
			Contingency	10%	\$14,975
		(	<b>Engineering Subt</b>	otal	\$164,725

2	Construction	Unit	Unit Cost	Quantity	Cost
2 01	Grading Top of Intermediate Cover	SY	\$1 25	36,300	\$45,375
2 02	Top Liner (60 mil FML)	SF	\$0 60	326,700	\$196,020
2.03	Clay Final Cover (1.5')[3]	CY	\$12 00	18,150	\$217,800
2 04	Topsoil (0 5') [4]	CY	\$4 00	6,050	\$24,200
2 05	Seed and Seeding	ACRE	\$1,000 00	7 5	\$7,500
2 06	Silt Fence/Erosion Control	LF	\$2 50	5,000	\$12,500
2 07	Dust Control and Watering	LS	\$10,000.00		\$10,000
2.08	Drainage Ditches	LF	\$2 00	5,000	\$10,000
2 09	Temporary Drainage Control	LS	\$10,000.00	1	\$10,000
2 10	Gas Collection System [5]	ACRE	\$15,000.00	0	\$0
			Subtotal		\$533,395
			Contingency	15%	\$80,009
			Construction Sub	total	\$613,404

**Closure Cost Summary** 

0.00			
	Engineering Subtotal		\$164,725
	Construction Subtotal		\$613,404
	Subtotal		\$778,129
	Legal/Regulatory Oversight Contingency	5%	\$38,906
		Total	\$817,036

#### Assumptions/Notes

- 1 Estimate assumes closure of Cell 1 Phase 1 only
- 2 No permanent culverts or drainage piping is required
- 3 Assumes clay cover can be constructed from material at the landfill
- 4 Assumes topsoil is available onsite
- 5 Active gas collection system not required at this time

### Intermountain Regional Landfill Closure Cost Estimate Cell 1 (2013 Dollars)

#### COST ESTIMATE FOR LANDFILL POST-CLOSURE CARE

Item	Unit	Unit Cost	Quantity	Cost
1 0 ENGINEERING				
1.1 Post Closure Plan	LUMP	\$9,000	1	\$9,000
1.2 Site Inspection & Recordkeeping (quarterly)	PER YEAR	\$2,500	30	\$75,000
1 3 Correctional Plans & Specs (annual)	PER YEAR	\$1,200	30	\$36,000
1 4 Site Monitoring (semi-annually) (1)	PER YEAR	\$10,000	30	\$300,000
2 0 MAINTENANCE COSTS (2)	PER YEAR	\$6,000	30	\$180,000
				\$600,000
				\$90,000
		To	tal	\$690,000

Closure Estimate (previous page)

\$817,036

**Total Closure/Post Closure** 

\$1,507,036

#### Assumptions/Notes.

- 1 Includes groundwater monitoring and statistical analysis but no gas sampling
- 2. Includes repairing eroded final cover material with on site material and seed

(Divisined funitions are not RILLD with TEXT and in 1991) with the control of the

# Solid Waste Permitting and Management Closure and Post-Closure Care Bond

Utah Administrative Code R315-309-5

Ctarry tarifficative dead No Fe Cod C
Bond Amount \$ \$1,714.711 00 One Million Seven Hundred Fourteen Thousand Seven Hundred Eleven and 00/100 Bond No. [105 771 368]
KNOWN BY THESE PRESENTS:
That we, [ ROC Fund Landfill Holdings, LLC ] (PRINCIPAL)
of the County of Salt Lake State of Utah as PRINCIPAL and Travelers Casualty and Surety Company of America (SURETY)
as a corporation, duly organized and doing business under and by virtue of the laws of the State of <a href="Connecticut">Connecticut</a> and authorized to do business in the State of Utah, and duly licensed for the purpose of making, guaranteeing, and becoming sole surety upon bonds required or authorized by the laws of the State of Utah, as surety, and held and firmly bound unto the Director, Utah Division of Solid and Hazardous Waste, P. O Box 144880, Salt Lake City, Utah 84114-4880, in the sum of <a href="Cone Million Seven Hundred Fourteen Thousand Seven Hundred Eleven and 00/100">Million Seven Hundred Fourteen Thousand Seven Hundred Eleven and 00/100</a> \$1,714,711 00 <a href="Replication">Replication</a> , lawful money of the United States of America, for the payment whereof well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents
The Condition of the foregoing obligation is such that,
WHEREAS, the above named PRINCIPAL has made application to the Director for the issuance of a permit to operate a Class $[v]$ Landfill under the authority of the State of Utah Solid and Hazardous Waste Act, and
WHEREAS, the SOLID AND HAZARDOUS WASTE CONTROL BOARD, with authority, has promulgated rules, Utah Administrative Code (UAC) R315-301 through 320 (the "RULES"), regulating the operation of landfills,
WHEREAS, under the terms of said RULES a cash or corporate surety bond in the penal sum of [\$1,714,711 00] is required of said PRINCIPAL and a responsible surety as financial assurance for closure and post-closure care costs of said landfill payable to a Standby Trust as specified hereafter. Said bond is conditioned upon the faithful and proper compliance with all of the terms, conditions, provisions, requirements, and specifications of landfill closure and post-closure care contained in said landfill permit, UAC R315-302-2, and UAC R315-[_v], not to exceed the bond penalty amount hereof,

Now, therefore, if the above bound PRINCIPA provisions for closure and post-closure care of obligation shall be null and void, otherwise to	of said Class [_v] Landfill, then this
This bond may be increased by rider or other as established by the annual up-date of the care as required by UAC R315-309-2(3) and	cost estimate for closure and post-closure
The duration of this bond shall be from the tir time as the Director may cancel the same or	
The SURETY may cancel this bond by giving addressed to the Director, Utah Division of Scancellation of this bond, the Director shall re-	olid and Hazardous Waste. Upon
In the event of default by the PRINCIPAL of a conditions of closure and post-closure care o shall conduct or cause to be conducted the c required in permit # [ 1102 ] Upon the to exceed the penal sum of this bond, this ob-	f said Class [V] Landfill, the SURETY losure and post-closure activities as completion of the required activities, not
Signed and Sealed this [ 28th ] day of [	June ]. [ 2012 ]
Witness:  / Lan D Lac Carole    Faul B Richards (Print Name)	ROC Fund Landfill Holdings, LLC  Valuat P. Ranads (Print Name)
Witness:	Travelers Casualty and Surety Company of America
Linds Rowlette	Sitter (when)
Linda Rowlette (Print Name)	Bette J. Croshaw Attorney-in-Fact (Print Name)
X	(

# AFFIDAVIT OF QUALIFICATION FOR SURETY COMPANIES

STATE OF UTAH ) SS COUNTY OF SALT LAKE )

BETTE J. CROSHAW, BEING FIRST AND DULY SWORN, ON OATH DEPOSES AND SAYS THAT SHE IS THE ATTORNEY-IN-FACT (OFFICER OR AGENT) OF SAID COMPANY, AND THAT SHE IS DULY AUTHORIZED TO EXECUTE THE SAME AND HAS COMPLIED IN ALL RESPECTS WITH THE LAWS OF THE STATE OF UTAH, IN REFERENCE TO BECOMING SOLE SURETY UPON BONDS, UNDERTAKINGS AND OBLIGATIONS.

SUBSRIBED AND SWORN TO BEFORE ME THIS 28th DAY OF June 2012 A D.

(BIGNATURE OF OFFICER OR AGENT)

P.O. Box 58139
709 East South Temple
Salt Lake City, UT 84158-0139
(RESIDENCE)
(SURETY SEAL)

(SIGNATURE OF NOTARY PUBLIC)

RUIH R. NIEMEYER Notary Public State of Utah My Commission Expires on: March 8, 2013 Comm. Number: 578065

(SEAL)
MY COMMISSION EXPIRES:

3-8-2013

(THIS FORM REQUIRED TO BE FILLED OUT BY SECTION 31-24-3, UCA 1953)

709 East South Temple Salt Lake City, Utah 84102 WARNING THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

# TRAVELERS

#### POWER OF ATTORNEY

Farmington Casualty Company
Fidelity and Guaranty Insurance Company
Fidelity and Guaranty Insurance Underwriters, Inc.
St Paul Fire and Marine Insurance Company
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company Travelers Casualty and Surety Company Travelers Casualty and Surety Company of America United States Fidehty and Guaranty Company

Attorney-In Fact No.

224879

Certificate No. 004784150

KNOW ALL MEN BY THESE PRESENTS: That St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company and St. Paul Mercury Insurance Company are corporations duly organized under the laws of the State of Minnesora, that Furnington Casualty Company, Travelers Casualty and Surety Company, and Travelers Casualty and Surety Company of America are corporations duly organized under the laws of the State of Connecticut, that United States Fidelity and Guaranty Company is a corporation duly organized under the laws of the State of Maryland that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of lowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint
William R. Moreton, Philip S. Walter, Bette J. Croshaw, and Judy Parry
of the City of Salt Lake City.  State of Utah  their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign execute, scal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law
IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this
Farmington Casualty Company  Fidelity and Guaranty Insurance Company  Fidelity and Guaranty Insurance Underwriters, Inc.  St. Paul Mercury Insurance Company  Travelers Casualty and Surety Company  Travelers Casualty and Surety Company of America  United States Fidelity and Guaranty Company  St. Paul Mercury Insurance Company
1977 P SEAL S SEAL S SEAL S SEAL S SEAL S
State of Connecticut City of Hartford ss  State of Connecticut City of Hartford ss  State of Connecticut City of Hartford ss
On this the 22nd day of March , 2012 , before me personally appeared George W Thompson, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer
In Witness Whereof, I hereunto set my hand and official seal  My Commission expires the 30th day of June, 2016  Mane C Tetreault, Notary Public  WEOTO

58440-6-11Printed in U.S.A.

#### WARNING THIS POWER OF ATTORNEY IS INVALID WITHOUT THE RED BORDER

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Company, St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, which resolutions are now in full force and effect, reading as follows

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary, or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority, and it is

FURTIFER RESOLVED, that the signature of each of the following officers President, any Executive Vice President, any Senior Vice President, any Vice President, any Senior Vice President, any Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached

I. Kevin E. Hughes, the undersigned, Assistant Secretary, of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which is in full force and effect and has not been revoked

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 28th day of June ... 2012

Kevin E Hughes, Assistant Secretary



















To verify the authenticity of this Power of Attorney, call 1-800-421-3880 or contact us at www.travelersbond.com. Please refer to the Attorney-In-Fact number, the above-named individuals and the details of the bond to which the power is attached.