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LOSS CONTROL SERVICES

December 22, 2014

Mike Amodeo
Metro
600 NE Grand Ave
Portland, OR 97232-2736

Policy No: 367747
Policy Dates: 7/1/2014 to 6/30/2015

Dear Mike:

Introduction

A confined space evaluation was conducted at the St. Johns landfill located in Portland. The purpose of the evaluation was to determine if the process of adjusting the weir height in the water control structure that separates Lake Bybee and an adjacent slough meets the criteria for a "permit required" confined space.

Process

The water control structure that separates Lake Bybee and the North slough is a sharp crested rectangular type that has eight gates. The level of the lake is raised or lowered by physically entering the downstream side of the gates and inserting or removing tongue and grove 2" by 6" boards into and out vertical slots. The water below the hydraulic jump is channeled under a gravel road where it proceeds immediately through one of four debris grates and out into the slough. Periodically staff will raise and lower the grates as needed to clean and reinstall them.

Observations

1. The depth of the water at the weir gate was just over five feet deep with an apparent strong current flowing from the weir and into the slough.
2. The catwalk access to the weir ladders does not have 200 lb rated top rails and are missing OR-OSHA required mid-rails that present an employee fall from elevation hazard. See exhibits A & F
3. In some cases the catwalks are located above and downstream of the weirs, are missing both OR-OSHA required top and mid-rails and appear to be unable to support an employee's weight presenting both employee fall from elevation and drowning hazards. See exhibit B.
4. To install the weir planks an employee will descend a fixed ladder to just above water level while another employee hands a plank down to them. The employee then holds on to the ladder with one hand while placing the plank in the slots in with the other one in an unsafe condition that puts their reaching arm in an ergonomically stressful "Red Zone" posture and increases their chance of falling

into the water, getting caught in the hydraulic jump, developing hypothermia in the cold water or getting caught in the downstream debris gate and drowning. See exhibit C.

5. Debris gates have a center mounted hook that decreases unit stability while being lifted and installed or removed from their tracks. See exhibit D.
6. An excavator will park parallel to the debris grates on the road located above the grate channels to both lift and lower the grates for cleaning and installation. The road's side is sloped towards the grates and presents a vehicle rollover hazard. See exhibit E.
7. The unit used to lift and lower the debris grates does not have stabilizers that increases the potential for a rollover hazard while lifting the gate for cleaning or lowering it for installation.

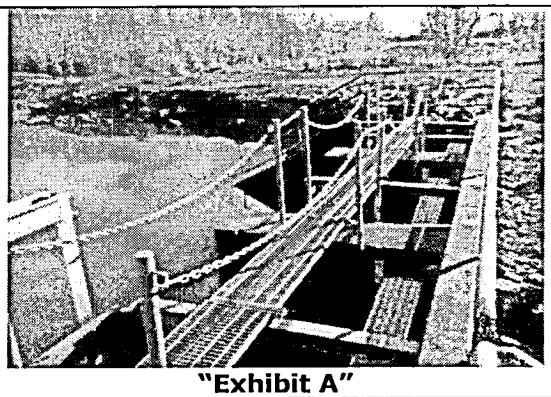
Conclusion

The area below the top of the bays, behind the weirs and upstream of the debris grates presents a potential drowning hazard and should be considered a "Permit Required" confined space.

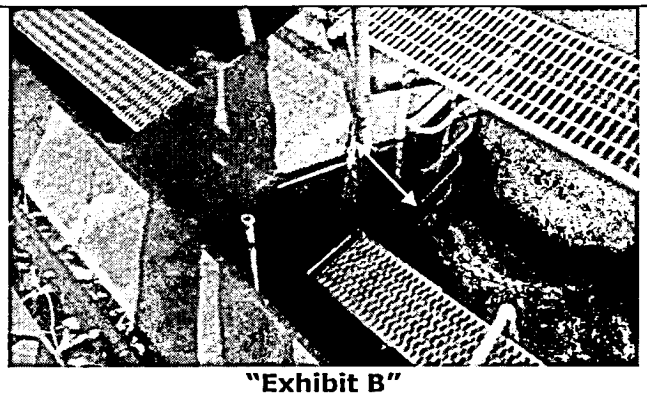
Recommendations

1. Redesign the task of installing and removing the weir planks by moving the catwalk immediately adjacent to the weir board slots, installing 200 lb rated top-rails and 150 lb rated mid-rails on all catwalks, have an engineer determine if the catwalks are strong enough to support anticipated weight, develop a long handled hook or its equivalent to tamp down and remove weir planks and require employees to wear personal floatation devices as a strategy to eliminate entering the permit required confined space for this particular task.
2. Develop a "Permit required" confined space procedure for employees who must enter the space for other tasks.
3. Use a crane or bucket lift equipped with out-riggers when installing or removing the debris gates to prevent a rollover hazard.
4. Install dual attachments on the debris grates and install or remove grates with an engineered spreader bar and sling system as a strategy to increase stability and prevent an employee fall-on or crush hazards when lifting or lower the gates into their slots.

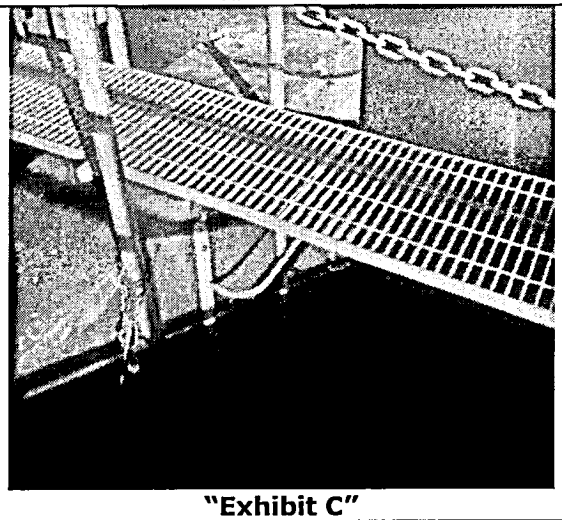
Exhibits



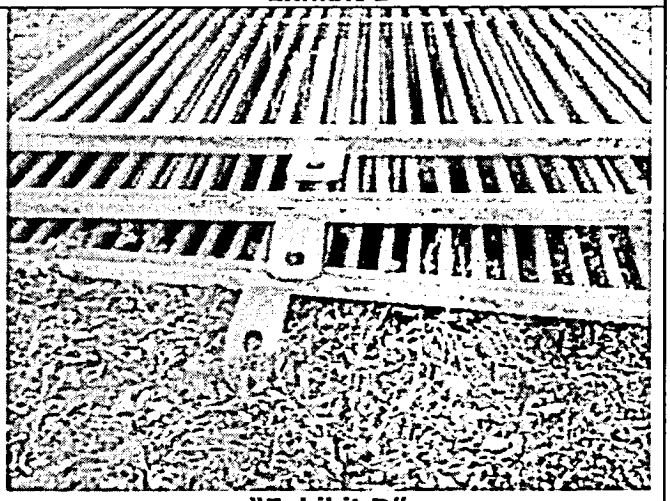
"Exhibit A"



"Exhibit B"

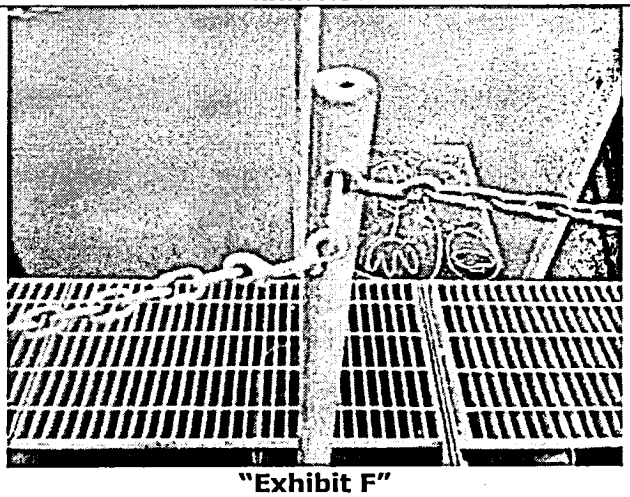


"Exhibit C"



"Exhibit D"

"Exhibit E"



"Exhibit F"

Closing

Thank you for utilizing SAIF's loss control services. Please give me a call if you have any questions or need further assistance.

Sincerely,

Charles H Beck

Charles H. Beck, CSP, ALCM, ARM
Senior Safety Management Consultant

C: William Jemison/Risk Manager, Chuck Paxton/Underwriter, Willis of Oregon/Agent, Firm File