

# STANDARD OPERATING PROCEDURE

**Operating Stationary & Mobile Pressure or Steam Washers**

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## OPERATING STATIONARY & MOBILE PRESSURE OR STEAM WASHERS



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*The following is a step-by-step procedure on how to complete a specific task or meet a facility specific requirement. Standard Operating Procedures (SOPs) are written for all identified critical tasks. By virtue of the hazard or complexity associated with critical tasks it is paramount that the SOP be followed as written. SOPs contain a listing of high-level hazards associated with the task, for detailed hazard analysis reference the applicable Task Hazard Assessments. SOPs do not replace the requirements contained in the company Standards, Codes, and Processes nor does it replace the need to comply with required legislation. Section 8.0 references documentation that the worker shall understand before work commences.*

## 1.0 PURPOSE

- To establish a company standard to safely and effectively carry out work as it applies to operating stationary and mobile pressure or steam washer units.

## 2.0 SCOPE AND APPLICATION

- This document applies to all company Heavy Construction Mining operations. Ensure all site-specific requirements are being met or exceeded before performing the task

## 3.0 HAZARDS AND CONTROLS

- Uncontrolled movement of equipment being steamed or washed.
  - Follow 950C-C-028 Hazardous Energy Isolation Code and ensure equipment has been isolated from movement, including lock out/tag out of master switch, secured raised dump bodies, wheels chocked and implements grounded or blocked.
- Equipment damage or fire suppression discharge during pressure washing or steaming.
  - Do not use a cutting tip under equipment where wires or fire suppression lines may be cut.
  - Inspect equipment prior to washing. Ensure doors and windows are closed. If there is a crack in a window or glass, notify supervision as pressure washing will likely damage the glass further.
  - Ensure a competent person has disengaged the fire suppression system prior to all pressure washing or steaming activities.
  - Avoid all direct and indirect spray of water and degreaser on major electrical components (electrical cabinet, grid box) as it will cause equipment damage and delay.
- Excessive pressure leading to damaged equipment, exploding parts and personal injury.
  - Never operate a system at a higher PSI than the maximum rating for the steamer/pressure wash machine. Confirm pressure rating on unit prior to operation then observe pressure gauge on the equipment outlet. If excessive pressure noted, shutdown unit and report to Supervision to have system safely adjusted by qualified personnel.
  - Ensure high pressure pump is equipped with at least one pressure relief device.

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- Use the correct equipment, hoses, fittings, couplers, and accessories that are designed or intended for use with a high-pressure washing system. Do not exceed maximum allowable working pressure, as designated by the manufacturer, for any component.
- Nozzle must be properly sized for the rated flow and pressure. Reset unloader or pressure relief if nozzle size has changed.
- Premature failure of pressure washer hose releasing hot water and injuring workers.
  - Inspect hose prior to use. Fully unwind washer hose from reel for the duration of use in warm weather conditions. (The hose should be coiled in a figure 8 pattern, to keep it from tangling and from creating a tripping hazard). Winter applications do not allow for this due to freezing. (Unwind all hose for overall inspection; reel up hose leaving only enough to safely complete job task). Store in heated areas during breaks.
  - Do not use any hoses that show signs of damage including but not limited to kinks; crushing, stretching, or blistering; rusted or broken reinforcing wires.
  - Do not exceed operating pressure of hoses. Steam hoses are rated at 3000 psi working pressure or higher.
  - Ensure whip checks are used on hoses to prevent the end of the hoses from whipping around if a coupling connecting two hoses breaks.
- Operating pressure washer outside of its manufacturer specifications causing damage or fire to the unit and injuring personnel from increased temperatures and pressure.
  - Do not operate the pressure washer outside of its maximum pressure and temperature settings as defined by the manufacturer. Refer to the manufacturer's specifications outlined in the operating manual to obtain pressure and temperature parameters.
  - Contact supervision if unsure. Observe all signage posted around the units as it will also define operating temperature and pressure settings.
  - Pressure settings and regulators are a safety device and are not to be tampered with. Tampering with a safety device is a cardinal rule violation. Always check with your supervisor if unsure.
- High heat/steam and pressure burning or lacerating the skin. Chemical soaps and degreasers causing skin irritation, burns or other personal injury.
  - When conducting pressure washing or steaming activities additional task specific PPE such as face shield, ear plugs, heavy duty waterproof gloves (insulated, if running hot water), raingear (pants and coat), water resistant safety footwear (CSA approved) with metatarsal guards must be worn. Ensure footwear is consistent with 950C-C-049 PPE General Code and, where applicable, acceptable to client site standards.

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- Maintain control of wash wand, never point nozzle at yourself or other personnel, wear proper protective equipment, inspect all equipment prior to operation, use adequate ventilation for furnace heat release, take breaks as needed, avoid direct skin contact with soaps and degreasers.
- Never attempt to clean boots or raingear with pressure washer while you are wearing them.
- Review SDS prior to all chemicals used.
- Furnace exploding or causing a fire due to overheating.
  - Allow heat out of the room by opening the doors; cool the furnace down before shutting it down so scale does not build up in the pipes.
  - Ensure roof exhaust vent is open in steam trucks or sea cans.
- Slipping, tripping, or falling because of poor visibility, or slippery/icy conditions.
  - Clean face shield and safety glasses as needed, ensure proper footing, clean and/or re-clean walking, standing/stepping surfaces of equipment during pressure washing.
  - Ensure there is adequate drainage and that ground conditions are maintained.
  - Use footwear with traction aids when working in icy conditions. Review manufacturer's instruction when using footwear traction aids. Use the appropriate traction aid that fits the footwear.
  - Be aware that in colder temperatures water can freeze rapidly on tracks, landings, and platforms. Check your footing and remove ice buildup as needed.
- Being struck by falling lumps/material, moving parts.
  - When working around equipment, do not stand under material (tar sand, muskeg, dirt, etc.). Always remove build up from an angle and be aware that frozen material will thaw rapidly and could fall without warning.
  - Look for cracks in material build up which can indicate frame cracks or broken components. Broken or damaged components can shift or fall when build-up is washed away.
  - Flag off areas that have a potential for falling debris. Follow 960C-SOP-018 Dropped Object Prevention. Using red flagging, establish a 4-5 metre exclusion zone behind a raised truck box. Follow 960C-SOP-822 Securing Raised Truck Boxes. Never stand within the exclusion zone behind a raised truck box.
- Falling from elevated platforms.
  - Work from approved platforms or equipment landings, wear fall protection equipment when working over 6 feet at an unguarded edge (follow 950C-C-016 Fall Protection Code), only trained personnel shall operate elevated work platforms.

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- Where possible use elevated work platforms that allow the hose to be fastened to the boom.
- Review 960C-SOP-001 Safe Use of Aerial Work Platforms.
- The washer hose cannot be fastened to the basket while it is being raised. If the hose were to become tight, it could pull the platform over. Use rope to pull pressure washer hose up to level.
- Ensure weight of hose, water and personnel in basket do not exceeding maximum load capacity of basket.
- Do not travel with hose in basket.
- Cutting through boot and cutting or burning the foot with the high-pressure water/steam.
  - Wear boots with a metatarsal guard or Kevlar type layer; the wand length is to be at least 1.2 meters or 4 feet.
  - In situations where a shorter wand must be used, it is to be noted on the FLRA and approved by the supervisor, JSA completed, appropriate precautions are to be taken, and the wand is to be changed back right after the task is complete.
- Musculoskeletal injuries (sprains/strains) while operating pressure washer or steamer. Vibration hazards when using pressure washer or steamer for extended periods of time.
  - Always use both hands to control the wand and the gun.
  - Always stretch before and during the task. Take micro breaks as required when working in awkward body positions.
- Full pressure water spraying the individual changing hoses from steamer unit to washer unit on combo units.
  - When changing hoses on a pressure and steamer combo unit, ensure the main breaker is switched off and locked out, to isolate power for the washer unit.
- Radiant heat from direct or indirect sunlight resulting in heat related illness (heat cramps, heat exhaustion or heat stroke).
  - Follow the guidelines and recommendations outlined in 950C-C-030 Heat Stress Code.
  - Use the “buddy system” in extreme temperatures and monitor for any signs of heat related illnesses.
  - Implement a schedule of work and rest intervals and provide a cool rest area.
  - If possible, avoid pressure/steaming activities during the hottest period of the day, or choose a different time of day early morning or evening.

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## 4.0 CHECKLIST

- Attend all preparatory meetings (IE: daily PSI; job scope; review of JSA's and SOP's for the job).
- Complete FLRA cards before starting the work.
- Ensure all personnel involved in the task are aware of the hazards and the controls to be used, as identified in the SOP's; JSA's; and FLRA's
- Conduct a pre-job inspection of all equipment to be worked on and tools to be used.
- Standard of Training required for working on this job: On-the job training.**

## 5.0 DEFINITIONS

### 5.1 Company

Means North American Construction Group Ltd. (NACG) and all directly or indirectly owned subsidiary companies, including joint ventures.

### 5.2 Company Personnel

Includes the Company's employees, officers, directors, agents, associates, consultants/contractors, temporary employees, and third-party processors.

### 5.3 HSE

Refers to the Health, Safety & Environment department.

### 5.4 PSI

Pounds per square inch.

## 6.0 PROCEDURE

- 1) Complete FLRA for task and ensure appropriate PPE is available and worn. This includes: face shield, ear plugs, heavy duty waterproof gloves (insulated, if running hot water), raingear (pants and coat), water resistant safety footwear (CSA approved) with metatarsal guards must be worn.
- 2) If using mobile pressure washer (i.e. steam truck), stage on level ground near equipment to be cleaned. Use a spotter in congested areas. Set park brake and chock truck wheels.
- 3) Ensure area where pressure washing will take place is adequately flagged or marked with signage to prevent unauthorized entry to the area.
- 4) Lock and tag-out equipment to be washed.
- 5) Ensure equipment to be washed or steamed is chocked and any raised components are blocked or adequately secured against movement.
- 6) Ensure fire suppression system has been deactivated.
- 7) Complete a pre use inspection of pressure washer or steamer before use, including all associated parts.

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- a. Confirm pressure and temperature settings are appropriate for the unit being used (most units will have signage indicating maximum pressure and temperature settings).
  - b. Depress the gun several times to ensure the trigger reverts to its original safety position. Notify supervision immediately if it does not.
  - c. Check the wand and ensure that the connections on both ends are tightened properly and there are no leaks.
  - d. Check the nozzles to make sure they are clog free.
- 8) Ensure hose does not create tripping hazards and that area is free from slipping hazards (i.e. during winter months ensure adequate sand has been placed on icy areas).
  - 9) Complete an inspection of equipment to be steamed or washed. Look for material build up and cracks in material. Identify these areas and avoid standing under them.
  - 10) Use the pressure controller to regulate wand pressure. Only use the amount of pressure necessary to effectively clean the equipment. During normal pressure washing the operator is not to adjust preset pressures. Notify supervision if unit is operating out of preset limit.
  - 11) When initially engaging spray, ensure the nozzle is in an open area, pointed at the ground away from yourself and personnel to test and initiate the sprayer (holding the nozzle in close proximity to equipment when engaging spray can cause the wand to recoil and possibly cause you to lose your balance).
  - 12) When pressure washing or steaming is complete, turn off heat and allow pressure washer to continue to run for 10 minutes. This allows time for the boiler to adequately cool before shutdown which reduces scale build-up in pipes.

## 6.1 Mobile (Steam Truck) and Portable (Sea-Can) Pressure Washer Procedure

- 1) If using steam truck - after truck has been parked, area set up adequately and tools/equipment inspected, engage PTO, and turn on power inverter inside van/truck body.
- 2) If using sea-can steamer – after area has been set up adequately and tools/equipment inspected, ensure that switch gear panel is on.
- 3) Light the burner, ensure roof vent is open. Stop and notify supervision immediately if the roof vent does not work.
- 4) Confirm/adjust water flow/pressure is set.
- 5) Activate the burner by holding the wand in the open position until there is a steady stream of water coming from the wand. Switch the burner to the on position.
- 6) Activate the flow test switch with the nozzle closed.
- 7) Confirm/adjust temperature.
- 8) Adjust soap/degreaser.

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- 9) Engage wand, initially pointing it away from equipment. Wash equipment.
- 10) Shut down pressure washer unit:
  - a. Turn the soap or degreaser off.
  - b. With the wand trigger pulled open turn the burner off and flow water until the temperature is down to 50 degrees Celsius.
  - c. Release the wand trigger.
  - d. Turn off the pumps one at a time.
  - e. Turn off the power inverter (on truck) and close the roof vent.
  - f. Turn off the PTO pump (on truck).
  - g. Depress the wand trigger to bleed off any remaining line pressure, reel in hose and clean up area.

## 6.2 Wash Bay Pressure Washer Procedure

- 1) Ensure area has been set up adequately and tools/equipment inspected.
- 2) Turn pump on to run pump.
- 3) Turn burner control switch to hot.
- 4) Engage wand, initially pointing it away from equipment. Wash equipment.
- 5) Turn burner control switch to cold and run wand water until burner cools down.
- 6) Turn off pump.
- 7) Clean up work area.

## 6.3 Wash Bay Steamer Procedure

- 1) Ensure area has been set up adequately and tools/equipment inspected. Ensure panels and guards are in place.
- 2) Ensure that the exhaust blower fan is running (Should never be turned off).
- 3) Verify oil level in sight glass located on side of pumping unit.
- 4) Ensure hazardous energy on steamer has been locked out before attempting to change hoses from pressure wash hose to wet steam hose application.
- 5) Remove pressure wash hose at the rear of the unit and replace with the red steam hose.
- 6) Ensure steam wand is connected to the red steam hose.



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- 7) Set thermostat to 300°F and turn the large ball valve located in the front of the unit to reduce working pressure to 200 PSI (Always confirm based on manufacturer specifications).
- 8) Turn on the pump and burner using the two switches located at the top of the unit.
- 9) Engage wand and hold firmly and steam unit.
- 10) Turn off burner; let the pump cool to allow heating coil to cool off (at least four minutes).
- 11) Then shut off pump.
- 12) Clean up work area.

## 7.0 NOTES

If this task is to be done by a method different than described in this SOP, the work must **STOP**, and the alternate method must be **DOCUMENTED** with an adequate hazard assessment tool such as a JSA. The document must be **APPROVED** by a supervisor before such procedures are implemented.

## 8.0 REFERENCES

- Alberta Occupational Health and Safety Act, Regulation and Code – Part 9 Sections 138 to 161 – Fall Protection
- Alberta Occupational Health and Safety Act, Regulation and Code – {Part15, Section 212 (2) Managing the Control of Hazardous Energy - Isolation}
- 950C-C-016 - Fall Protection Code
- 950C-C-022 - General Housekeeping Code
- 950C-C-038 - Mobile Elevated Work Platforms Code
- 950C-C-028 - Hazardous Energy Isolation Code
- 950C-C-030 - Heat Stress Code
- 950C-C-049 - PPE - General Code
- 960C-SOP-001 - Elevated Work Platform, Safe Use of
- 960C-SOP-004 - Flagging Tagging and Barricading Hazardous Areas
- 960C-SOP-018 - Working at Heights
- 960C-SOP-019 - Slip Trip and Fall Hazard Prevention
- 960C-SOP-601 - Wash Ramp Use

## 9.0 APPENDICES

No appendices.