

Safe Work Instruction – Fluoride Operations at Bamarang WTP

DO NOT enter the Fluoride Plant Room unless you are a qualified Fluoridation Plant Operator or have been inducted in its safe use and operation and either accompanied by a qualified Fluoridation Plant operator or have completed the Risk Assessment Checklist (RAC) for Fluoridation Plant Mechanical / Electrical Servicing Works.

This SWI may not cover all possible hazards and risks and should be referred to as a control measure in the risk assessment process. Additional training may be required for high risk plant. Site and task may change required PPE.

PERSONAL PROTECTIVE EQUIPMENT



Eye protection must be worn when wearing half face mask



Long and loose hair must be contained or covered.



Disposable overalls must be worn



Foot protection must be worn (gumboots or safety boots)



Hand protection must be worn (rubber gauntlets)



Full P3 face mask must be worn when airborne dust or fumes are created



Head protection must be worn when receiving/dispatching fluoride deliveries

POTENTIAL HAZARDS AND RISKS

Chemicals

Exposure to hazardous chemicals, avoid skin contact
Exposure to toxic fumes

Slip, Trips, Falls

Slip, trip, fall due to uneven or slippery work surfaces

Manual Task Injury

Manual task injury from incorrect manual handling techniques

Other

Injury due to plant malfunction or misuse

PRE-OPERATIONAL SAFETY CHECKS

✓ **WARNING: Sodium Silicofluoride is a hazardous substance as it is toxic and a dangerous good. Before carrying out the following procedure the workers are to be familiar with the relevant SDS and follow all safety precautions listed on the SDS prior to handling the chemical**

- ✓ Complete site specific risk assessment
- ✓ Ensure all staff are familiar with plant operations and controls
- ✓ Ensure that guards are fitted, secured and functional in accordance with manufacturers guidelines
- ✓ Induct technical staff and ensure they have completed the Risk Assessment Checklist for Fluoridation Plant Mech/Elec Servicing Works prior to commencing works
- ✓ Allow only WTP trainees, DPI WTP training groups or Student Engineers to enter the fluoride plant room and only after they have completed a thorough site specific induction and all are to be accompanied by a qualified fluoridation plant operator
- ✓ Entry door to be kept locked when workers are not in room
- ✓ Only qualified Fluoridation Plant Operators to carry out the following plant procedures:

1. DAILY OPERATIONS (Start)

- ✓ Complete visual plant check prior to operations
- ✓ Note the current number of kilograms in the fluoride hopper via the loss of weight recorder
- ✓ Note the current raw water flow meter totaliser reading

- ✓ The operator should then determine whether the hopper needs to be topped up, taking into account the predicted daily usage rate and the current hopper capacity

2. LOADING THE FLUORIDE HOPPER PROCEDURE

- ✓ Keep entry door closed during loading process
- ✓ Operate equipment as per manufacturer's recommendations
- ✓ Don all PPE as required above
- ✓ Open the bag loader hopper door
This will automatically initiate the start-up of the dust extractor. Then turn on the bag loader screen vibrator valve, located behind the bag loader
- ✓ Transfer a 25kg bag of Sodium Silicofluoride from the stock platform to the open hopper door
Remove bags from the single pallet at the extreme western end of the platform only (this is designed to reduce the risk of manual handling issues associated with reaching above shoulder height) Once that pallet is empty, lower the next top pallet down by crane into position at the extreme western end of the platform. Continue this process until all top pallets have been emptied
- ✓ Pierce the end of the bag with the bag loader spear and cut open the other end of the bag, being careful not to allow any bag remnants to fall into the hopper
- ✓ Close the bag loader door and allow the contents of the bag to flow into the hopper
Allow enough time for the full contents of the bag loader hopper to be transferred up the screw elevator and into the main storage hopper

- ✓ Slowly open the bag loader hopper door (to minimise dust generation)
- ✓ Remove the empty bag and stow in Hazibag
- ✓ Repeat the above steps until desired capacity reached (hopper is full or adequate for number of days of operation required)
- ✓ With the bag loader door shut, turn off the bag loader screen vibrator and manually initiate the dust extractor sock filter shaker
- ✓ Wait for the screw elevator and dust extractor systems to stop and take final reading of Sodium Silicofluoride hopper contents
- ✓ Proceed to "Daily Operations (finish)"

3. FLUORIDE SPILL PROCEDURE

- ✓ On discovery of spilt bags or a major fluoride spill, evacuate the affected area
- ✓ Once worker has donned all required PPE as above, attempt to reseal bag with tape for storage, otherwise empty into bag loader as per "Loading the fluoride hopper procedure" above. Split bags should be used first on next hopper fill
- ✓ Use the plant vacuum with HEPA filter installed to suck fluoride dust up. Vacuumed contents can then be emptied into Hazibag and sealed
- ✓ Hose down area to appropriate drain
- ✓ Proceed to "Daily Operations (finish)"

4. CLEANING FLUORIDE DUST EXTRACTOR FILTERS

- ✓ Once worker has donned all required PPE as above, isolate the dust extractor electronically
- ✓ Open filter door and brush excess fluoride of filters so it falls into collector bin
- ✓ Care should be taken to keep head away from the dust zone
- ✓ When brushing is completed, load fluoride from bin into fluoride bag loader
- ✓ Take before and after readings for "Flows and Stocks" workbook
- ✓ Replace bin, close dust extractor door and hose the fluoride room out
- ✓ Proceed to "Daily Operations (finish)"

5. FLUORIDE DELIVERIES

- ✓ Organise pallets before fluoride delivery
- ✓ Ensure to have the same amount of pallets ready for driver to return as was ordered
- ✓ Workers must wear a Hard hat, gloves and safety boots as a minimum.
- ✓ On delivery arrival, visually inspect the pallets for split bags and/or exposed fluoride powder. If fluoride powder is detected follow "Fluoride Spill Procedure"
- ✓ Engage safety gate and open storage room doors
- ✓ Manoeuvre overhead crane to truck, ensure area is clear of personnel
- ✓ With the help of a bystander, position the crane forks through new pallet. Adjust lifting position to create a level lift on fork positioning lugs

- ✓ Stack new pallets behind old stock so old fluoride is used first
- ✓ Repeat until all delivered fluoride is stacked neatly in fluoride storage room
- ✓ Check delivery docket against new chemicals received and sign off for driver. Enter into the
 - "Bamarang Fluoride Log" worksheet
 - "Bamarang Chemicals" worksheet in the
 - "Bamarang Flows & Stocks" workbook
- ✓ Stow crane and lock fluoride storage room doors
- ✓ Use similar practises when dispatching to other WTPs
- ✓ Proceed to "Daily Operations (finish)"

6. DAILY OPERATIONS (Finish)

- ✓ Ensure to hose down, clean and dry all PPE with ROAR or similar, dispose of any wipes and disposable overalls into Hazibag and seal bag
- ✓ Stow apron and gloves in Fluoride plant room
- ✓ Stow P3 respirator and gumboots in personal locker
- ✓ Ensure to change P3 cartridges every 13 weeks (3 months)
- ✓ Organise with Waste Services to arrange for a direct burial of the Hazibags at the West Nowra garbage tip when the bins are full
- ✓ Thoroughly wash hands and face
- ✓ Deduct start weight from finish weight and add the difference to the start of days figure
- ✓ Record the total in the "after addition" column, as well as completing the "Chemical added to hopper since last meeting", Bulk stock after addition to Hopper" and "Spillage or Weight Variations", columns in the "Bamarang Fluoride Log" worksheet in the "Bamarang Flows and Stocks" workbook. At the end of each week the total kg's of Fluoride used is recorded in the Fluoride section of the "Flows-Stocks" workbook
- ✓ Carry out the Fluoride testing as per SOP026 – "Water Treatment Quality Testing Procedure"
- ✓ Test results to be entered into "Bamarang Flows & Stocks" workbook as well as the "Bamarang Worksheet" in the "Plant Log Sheets" workbook
- ✓ Operator is then to determine whether the dose rate needs to be adjusted, depending on the recent daily trending of the fluoride ppm and preferably operating between 0.95 to 1.05ppm

NOTE: Carry out all routine maintenance in accordance with plant's maintenance schedule

DO NOT

- ✗ Do not use if plant is faulty. Attach a DO NOT OPERATE tag and report fault to your supervisor
- ✗ Do not breathe Sodium Silicofluoride dust (use respirator)
- ✗ Do not allow the public to tour the fluoride plant room
- ✗ Do not allow any contaminated clothing to leave the site
- ✗ Do not eat, drink or smoke in or around fluoride
- ✗ Do not use mobile phone while operating plant
- ✗ Do not use contact lenses in fluoride plant room

*Plant in this SWI refers to any machinery, equipment, appliance, container, implement and tool.