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Generation Cold Weather Preparedness Plan

For Compliance with the following NERC Reliability Standards:

EOP-011-2 Emergency Preparedness and Operations

Version 1.0
Effective Date: April 1, 2023

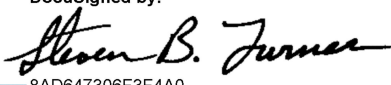
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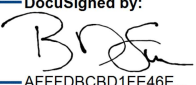


Generation Cold Weather Preparedness Plan
Effective: April 1, 2023

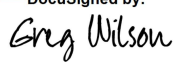
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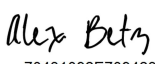
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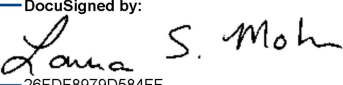
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Version 1.0
Effective Date: April 1, 2023

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Revision History

Revision	Effective	Summary of Changes
1	4/1/2023	Initial Generation Cold Weather Preparedness Plan.

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Contents

1. Purpose and Scope

2. EOP-011-2 Requirements

Appendix A – Cold Weather Data

Appendix B – Development of Cold Weather Preparedness Plans

- B1. Management Roles and Responsibilities
- B2. Communications
- B3. Evaluation of Potential Problem Areas
- B4. Testing
- B5. Training
- B6. Elements of a Cold Weather Preparedness Plan
 - 1. Work Management System (Maximo)
 - 2. Preparation of Critical Instrumentation and Equipment
 - 3. Insulation, Heat Trace and Other Freeze Protection
 - 4. Supplemental Equipment
 - 5. Operational Supplies
 - 6. Staffing
 - 7. Communications
 - 8. Special Operating Instructions (prior to or during severe cold weather events)

Appendix C – Cold Weather Preparedness Plan: E.W. Brown

- C1. Work Management System (MAXIMO)
- C2. Preparation of Critical Instrumentation and Equipment
- C3. Insulation, Heat Trace, and Other Freeze Protection
- C4. Supplemental Equipment
- C5. Operational Supplies
- C6. Staffing
- C7. Communications
- C8. Special Operating Instructions

Appendix D – Cold Weather Preparedness Plan: Cane Run & Paddy's Run

- D1. Work Management System (Maximo)
- D2. Preparation of Critical Instrumentation and Equipment
- D3. Insulation, Heat Trace and Other Freeze Protection
- D4. Supplemental Equipment
- D5. Operational Supplies

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



- D6. Staffing
- D7. Communications
- D8. Special Operating Instructions

Appendix E – Cold Weather Preparedness Plan: Ghent

- E1. Work Management System (MAXIMO)
- E2. Preparation of Critical Instrumentation and Equipment
- E3. Insulation, Heat Trace, and Other Freeze Protection
- E4. Supplemental Equipment
- E5. Operational Supplies
- E6. Staffing
- E7. Communications
- E8. Special Operating Instructions

Appendix F – Cold Weather Preparedness Plan: Mill Creek

- F1. Work Management System (MAXIMO)
- F2. Preparation of Critical Instrumentation and Equipment
- F3. Insulation, Heat Trace, and Other Freeze Protection
- F4. Supplemental Equipment
- F5. Operational Supplies
- F6. Staffing
- F7. Communications
- F8. Special Operating Instructions

Appendix G – Cold Weather Preparedness Plan: Trimble County

- G1. Work Management System (MAXIMO)
- G2. Preparation of Critical Instrumentation and Equipment
- G3. Insulation, Heat Trace, and Other Freeze Protection
- G4. Supplemental Equipment
- G5. Operational Supplies
- G6. Staffing
- G7. Communications
- G8. Special Operating Instructions

Version 1.0
Effective Date: April 1, 2023

v

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



1. Purpose and Scope

The Generation Cold Weather Preparedness Plan establishes the steps for the generating fleet to maintain unit reliability during cold weather events for compliance with NERC Reliability Standard EOP-011-2, which require that Louisville Gas and Electric Company (“LG&E”) and Kentucky Utilities Company (“KU”) (collectively, “LG&E/KU” or the “Company”) maintain one or more cold weather preparedness plan(s) for its generating units.

2. EOP-011-2 Requirements

Requirements R1 through R6 do not apply to the Generator Owner (GO).

- R7** *Each Generator Owner shall implement and maintain one or more cold weather preparedness plan(s) for its generating units. The cold weather preparedness plan(s) shall include the following at a minimum:*
- 7.1 Generating unit(s) freeze protection measures based on geographical location and plant configuration;*
 - 7.2 Annual inspection and maintenance of generating unit(s) freeze protection measures;*
 - 7.3 Generating unit(s) cold weather data, to include:*
 - 7.3.1. Generating unit(s) operating limitations in cold weather including:*
 - 7.3.1.1. capability and availability;*
 - 7.3.1.2. fuel supply and inventory concerns;*
 - 7.3.1.3. fuel switching capabilities; and*
 - 7.3.1.4. environmental constraints.*
 - 7.3.2. Generating unit(s) minimum:*
 - 7.3.2.1. design temperature; or*
 - 7.3.2.2. historical operating temperature; or*
 - 7.3.2.3. current cold weather performance temperature determined by an engineering analysis.*

Version 1.0
Effective Date: April 1, 2023

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



M7 *Each Generator Owner will have evidence documenting that its cold weather preparedness plan(s) was implemented and maintained in accordance with Requirement R7.*

Cold weather preparedness plans were developed for using the methodology outlined in Appendix A. Specific processes for each generating station and unit are included in Appendices C – G. They include the freeze protection measures and annual inspection required by EOP-011-2, R7.1 and R7.2. The plan will be annually reviewed to evaluate improvement opportunities and identify lessons learned.

The cold weather data required per R7.3 is included in Appendix B. The cold weather data for the generating unit(s) operating limitations includes cold weather capacity and availability, fuel supply and inventory concerns, fuel switching capabilities, and environmental constraints. Additionally, the data includes either the generating unit(s) minimum design temperature, or historical operating temperature, or current cold weather performance temperature determined by an engineering analysis.

R8 *Each Generator Owner in conjunction with its Generator Operator shall identify the entity responsible for providing generating unit-specific training, and that identified entity shall provide the training to its maintenance or operations personnel responsible for implementing cold weather preparedness plan(s) developed pursuant to Requirement R7.*

M8 *Each Generator Operator or Generator Owner will have documented evidence that the applicable personnel completed the training of the Generator Owner's cold weather preparedness plan(s). This evidence may include, but is not limited to, documents such as personnel training records, training materials, date of training, agendas or learning objectives, attendance at pre-work briefings, review of work order tasks, tailboards, attendance logs for classroom training, and completion records for computer-based training in fulfillment of Requirement R8.*

Version 1.0
Effective Date: April 1, 2023

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



The Generator Owner (GO) will provide unit specific awareness training for the generating fleet. This training will focus on the personnel responsible for implementing the plan(s) defined in the following Appendices.

Version 1.0
Effective Date: April 1, 2023

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendices

Appendix A – Cold Weather Data

Appendix B – Development of Cold Weather Preparedness Plans

Appendix C – Cold Weather Preparedness Plan: E.W. Brown

Appendix D – Cold Weather Preparedness Plan: Cane Run & Paddy’s Run

Appendix E – Cold Weather Preparedness Plan: Ghent

Appendix F – Cold Weather Preparedness Plan: Mill Creek

Appendix G – Cold Weather Preparedness Plan: Trimble County

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix A
Cold Weather Data

Appendix A – Cold Weather Data

Unit	Historical Minimum Operating Temperature ⁽¹⁾ (°F)	Operating Limitations in Cold Weather			
		Capability and Availability	Fuel Supply and Inventory Concerns	Fuel Switching Capabilities	Environmental Constraints
CR7-CT1 CR7-CT2 CR7-ST	0	None.	None.	N/A	None.
BR3 BR5 BR6 BR7 BR8 BR9 BR10 BR11	-13	None.	None.	None. ⁽²⁾	None.
GH1 GH2 GH3 GH4	-10	None.	None.	N/A	None.
MC1 MC2 MC3 MC4	-5	None.	None.	N/A	None.
PR13	0	None.	None.	N/A	None.
TC1 TC2 TC5 TC6 TC7 TC8 TC9 TC10	-5	None.	None.	N/A	None.
DD1 DD2 DD3	-2	None.	None.	N/A	None.

Notes:

(1) Based on data from 1/1/2000 – 12/1/2022.

(2) BR3, 5, 6, & 7 do not have fuel switching capability. BR8, 9, 10, & 11 have fuel switching capability but there are no operating limitations in cold weather.

Version 1.0
Effective Date: April 1, 2023

A-1



Appendix B – Development of Cold Weather Preparedness Plans

The preparedness plans presented in Appendices C – G were developed using the considerations described below.

B1. Management Roles and Responsibilities

Management core roles and responsibilities related to cold weather preparation will include, but are not limited to the following:

- Set expectations for safety, reliability, and operational performance.
- Develop and maintain cold weather preparedness plans for each generating unit.
- Ensure cold weather preparedness plans include processes and staffing before, during and after extreme cold weather events.
- Ensure proper execution of the cold weather preparedness plans.
- Conduct a plant readiness review prior to any anticipated extreme cold weather event(s).
- Exercise elevated alertness for areas at risk due to cold weather conditions and identify opportunities to improve readiness and response.
- Evaluate the effectiveness of the cold weather plans and incorporate lessons learned.

B2. Communications

Clear and timely communication is essential. Key points include the following:

- Plant Management will communicate with the Vice President of Power Production.
- Plant Management will communicate with station personnel about changing conditions and potential areas of concern to heighten awareness around safe and reliable operations.
- The affected stations will keep the Balancing Authority (Generation Dispatch) up to date on changes to unit availability, capacity, or other operating limitations.
- After a generating unit trip, derate, or failure to start due to severe cold weather, Plant Management will conduct an analysis of the event and incorporate lessons learned into their cold weather preparedness plans.



B3. Evaluation of Potential Problem Areas

A critical part of cold weather readiness is understanding potential problem areas which may experience freezing problems or other operational issues. Items to consider are:

- Equipment or processes that could create safety related hazards.
- Equipment that could initiate an automatic unit trip.
- Equipment that could impact unit startup.
- Anything that could potentially cause damage to the unit.
- Equipment that could adversely affect environmental controls that could lead to derates or outages.
- Equipment that could affect the delivery of fuel or water to the units.
- Impaired field devices that could cause operational problems.

B4. Testing

In addition to the typical problem areas, emphasis should be placed on additional testing of low frequency tasks such as startup of emergency generators and backup systems where applicable.

B5. Training

Annual winterization awareness training will be conducted for cold weather readiness. This may include response to freeze related alarms, troubleshooting and repair of freeze protection circuitry, review of special inspections or rounds implemented during severe cold weather events, fuel handling procedures, knowledge of the ambient temperature for which the freeze protection is designed, and lessons learned from previous experiences.

B6. Elements of a Cold Weather Preparedness Plan

Listed below are key elements of a cold weather preparedness plan addressed at each station.

1. Work Management System (Maximo)

- Review the work management system to ensure adequate annual preventive work orders (PM's) exist for cold weather preparation.



- Ensure that all cold weather preparation preventive work orders (PM's) are completed prior to the onset of the winter season.
- Perform cold weather readiness system walkdowns to identify any deficiencies and issues that will need repair.
- Review the work management system for open corrective maintenance work orders that could affect plant operation and reliability in cold weather.
- Ensure modifications and construction activities are performed such that the changes maintain cold weather readiness for the station.

2. Preparation of Critical Instrumentation and Equipment

- Operating staff will conduct rounds to ensure critical areas have adequate protection for operability during a severe cold weather event.
- Monitor temperatures in areas containing sensitive equipment.
- Review unit critical equipment freeze protection measures, especially equipment in exposed areas and emphasize the points in the plant where equipment freezing could cause a unit trip, derate or failure to start.

3. Insulation, Heat Trace and Other Freeze Protection

- Heat trace reliability and electrical continuity
 - Perform check out of all heat trace circuits, including power supplies to ensure they maintain their functionality.
 - The evaluation of heat trace and insulation on critical lines should be performed on new installations, during regular maintenance activities or if damaged.
 - Ensure that any heat trace and insulation removed or disturbed during regular maintenance is replaced and integrity restored.
 - Check heat tracing on all critical lines and piping during severe cold weather events to ensure that the circuits remain functional. Temperature guns can be used to check piping temperatures.

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix B
Development of
Cold Weather Preparedness Plans

- Inspect instrument enclosures for any openings, faulty door hardware or insulation, gaps, and that heaters are functional.
- Heaters, Heat Lamps, and Space Heaters
 - Test operation of all permanently mounted wall heaters.
 - All portable space heaters should be tested, repaired and/or replaced as necessary.
- Wind Breaks
 - Install wind barriers as deemed appropriate to protect critical instruments, sensing lines, controllers, and piping.
- Covers, Enclosures, and Buildings
 - Install enclosures with heat lamps for identified transmitters.
 - Missing covers should be installed on valve actuators, damper drives and electrical boxes to prevent accumulating ice.
 - Inspect all buildings to ensure windows, doors, fan louvers and any other penetrations are closed to prevent cold air from entering.
 - Install tarps/plastic enclosures over openings and stairwells as necessary to prevent warm air from leaving the operating areas.
 - Inspect and repair as needed all large overhead doors at the station.

4. Supplemental Equipment

Ensure adequate inventories of equipment and other supplies needed to prepare and respond to a severe cold weather event. Examples of supplemental equipment might include:

- Tarps
- Portable Space Heaters and Heat Lamps and bulbs
- Extension Cords and GFI's
- Kerosene
- Propane and Rosebuds
- Plastic Rolls
- Lumber for building wind breaks and enclosures

Version 1.0
Effective Date: April 1, 2023

B-4

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DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix B
Development of
Cold Weather Preparedness Plans

- Wire Ties
- Portable Lighting
- Portable Generators
- Handheld welding torches
- Instrumentation Tubing
- Ice removal chemicals and equipment
- Blankets
- Cots
- Shovels for Snow Removal
- Cold Weather Personal Protective Equipment (PPE) – Boots, gloves, head socks

5. Operational Supplies

Prior to a severe cold weather event, conduct an inventory of critical supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

Examples of Operational supplies might include:

- Coal
- Oil for Lighters
- Hydrogen
- CO2
- Anhydrous Ammonia
- Lime
- PAC or other Mercury Control Products
- Limestone
- Caustic Soda
- Sulfuric Acid
- Diesel Fuel
- Gasoline

Version 1.0
Effective Date: April 1, 2023

B-5

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DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix B
Development of
Cold Weather Preparedness Plans

- Hydrazine
- Calibration Gases
- Lubricating Oils
- Welding Supplies

6. Staffing

- Consider enhanced staffing (24x7) during severe cold weather events.
- Arrange for on-site lodging and meals as needed.
- Arrange for transportation as needed.
- Arrange for support and appropriate staffing from substation operations to ensure minimal equipment and lines outages as needed.
- Rotate work crews exposed to severe cold weather conditions.
- Consider employing the “buddy system” during severe cold weather events to promote personnel safety.

7. Communications

- Ensure appropriate communication protocols are followed during severe cold weather events.
- Ensure back-up communication option in case the primary system is not working (i.e. satellite phone).
- Ensure communication is discussed as part of the daily job safety briefing during severe cold weather events.

8. Special Operating Instructions (prior to or during severe cold weather events)

- Initiate additional Operator rounds utilizing cold weather checklists to verify critical equipment is protected. Monitor room temperatures.
- Consider pre-warming, early start-up or placing units in service at minimum load prior to forecasted severe cold weather events.

Version 1.0
Effective Date: April 1, 2023

B-6

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DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix B
Development of
Cold Weather Preparedness Plans

- Test run emergency generators prior to severe cold weather events to ensure availability. Review fuel availability.
- Place critical auxiliary equipment in service as necessary on Cooling Towers, Coal and Limestone conveyor systems and Service Water systems where freezing weather could adversely impact their operation.

Version 1.0
Effective Date: April 1, 2023

B-7

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DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix C
Cold Weather Preparedness Plan:
E.W. Brown

Appendix C – Cold Weather Preparedness Plan: E.W. Brown

C1. Work Management System (MAXIMO)

The goals of using the Maximo Work Management System as a part of the Winterization Plan are as follows:

1. Ensure that all cold weather preparation preventive work orders (PM's) are completed prior to the onset of the winter season.
2. Perform cold weather readiness system walkdowns to identify any deficiencies and issues that will need repair.
3. Review the work management system for open corrective maintenance work orders that could affect plant operation and reliability in cold weather. Prioritize work so as to minimize the potential for operability impacts due to cold weather.
4. Ensure that all modifications and construction activities are performed such that the changes maintain cold weather readiness for the station.

These measures are generally PMs in Maximo which are programmed to generate work orders at the beginning of October, to be completed by November 30th. A list and description of these PMs can be found below. Completing these PMs in October and early November will ensure the plant is ready for winter by November 30th.

In addition, SERCO will ensure the plant's fleet of vehicles will have been properly winterized and in good working order.

Version 1.0
Effective Date: April 1, 2023

C-1

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DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix C
Cold Weather Preparedness Plan:
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PM	Description	Responsibility	Date of Generation
BR000200	PM-WINTERIZE COLD WEATHER PROCEDURES / OPERATIONS DEPT ^	BRSTO	10/1/2023
BR000233	PM- YRLY WINTERIZE VENT FANS UNIT 2 ^	BRMMHY	10/1/2023
BR058065	PM-YEARLY - WINTERIZE (580 SUPER N BACKHOE) ^	BRMER	10/3/2023
BR100057	PM-(1 YR) WINTERIZE INSTRUMENTATION (SERC) (1) ^	BREI	10/1/2023
BR100789	PM-YEARLY - WINTERIZE (580 SUPER L BACKHOE) ^	BRMER	10/3/2023
BR020501	PM-(1 YR) PRELIMINARY CHECK OF CAR THAWING SYS ^	BREI	9/1/2023
BR058425	PM-NOVEMBER WINTERIZING SPRINKLER SYSTEM	BRMMHY	10/1/2023
BR058426	PM-APRIL DEWINTERIZING SPRINKLER SYSTEM	BRMMHY	3/25/2024
BC053877	PM-ANNUAL WINTERIZE BRCT, FREEZE PROTECTION PREPERATION ^	BRCTM	10/20/2023
00041903	PM_YRLY AMMONIA PLANT SHUTDOWN AND WINTERIZATION		
00045739	PM-WINTERIZE DIX HYDRO PLANT (SERC) (1) ^	BRMMHY	10/12/2023

C2. Preparation of Critical Instrumentation and Equipment

The following tasks will be completed according to the PMs listed in Section 1 to ensure that critical equipment and instrumentation are adequately prepared for cold weather.

1. All critical site-specific problem areas have adequate protection to ensure operability during a severe cold weather event.
2. All electrical and instrumentation equipment susceptible to cold weather will have been winterized. Critical instrumentation has been identified for additional operator rounds during severe weather events.
3. Temperature Indicators are placed in areas containing equipment sensitive to extreme cold conditions and in freeze protection enclosures to ensure that the temperature is being maintained above freezing.

C3. Insulation, Heat Trace, and Other Freeze Protection

In order to ensure the reliability of building/pipe insulation and heat trace circuitry, and to provide back-up for these systems, the following will occur:

Version 1.0
Effective Date: April 1, 2023

C-2



1. Verification of the integrity of the insulation on all critical equipment identified in the Cold Weather Preparation Procedure.
 - a. Execute observations specific to integrity of insulation and heat trace functionality on exposed piping by operations and/or maintenance personnel. Any heat trace or insulation removed during regular maintenance will have been replaced and integrity restored
 - b. Exercise elevated alertness for continued operations of heat trace equipment during severe cold weather events.
 - c. Back-up methods of heating instrumentation will be on hand- heat blankets, additional lines of heat trace wire w/ 120VAC plugs for quick application, etc.
2. Heaters, Heat Lamps and Space Heaters
 - a. Execute observations specific to building heat equipment by operations and/or maintenance personnel.
 - b. All portable space heaters will be tested, repaired and/or replaced as necessary.
 - c. An adequate fuel supply for the heaters will be onsite.
3. Wind Breaks
 - a. Wind barriers will be installed as deemed appropriate to protect critical instruments, sensing lines, controllers and piping.
4. Covers, Enclosures, and Buildings
 - a. Enclosures with heat lamps will be installed for identified transmitters.
 - b. Portable space heaters will be placed as needed in enclosures with temperature-sensitive equipment and maintained at regular intervals.
 - c. Missing covers will be installed on valve actuators, damper drives and electrical boxes to prevent from accumulating ice.
 - d. Critical instruments have been placed inside plastic enclosures or otherwise protected against ice and wind.
 - e. All of the exterior windows and doors will have been inspected, repaired if necessary, and be in good working order, or temporary provisions made to mitigate the potential for cold weather exposure.

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix C
Cold Weather Preparedness Plan:
E.W. Brown

- f. Tarps/plastic enclosures will be installed over openings and stairwells as necessary to prevent warm air from leaving the operating areas.
- g. All large overhead doors at the station will be inspected and repaired as needed and kept closed when not in use.

C4. Supplemental Equipment

Prior to a severe cold weather event, conduct an inventory of supplemental supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

PERSONAL PROTECTION /EXPOSURE PREVENTION EQUIPMENT

- Jersey Gloves
- Leather Gloves (All Sizes)
- Winter insulated water resistant gloves (All Sizes)
- Head Socks
- Hand and Feet Warmers
- Antifog safety lens wipes
- Tyvek Suits (All Sizes)

FUEL AND ACCESSORIES

- Diesel Fuel (All bulk tanks full)
- Diesel Fuel Tanks (Anti-gel additives)
- Kerosene (All bulk tanks full)
- Starting Fluid (Aerosol Cans)
- Fuel Cans (All sizes)
- Sta-Bil Fuel Storage
- Seafoam
- 20# and 30# propane cylinders

Version 1.0
Effective Date: April 1, 2023

C-4

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix C
Cold Weather Preparedness Plan:
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- Portable double walled fuel cell (CT site)

SNOW REMOVAL/TRACTION MATERIALS

- Bulk Ice-Melt/sand and/or salt

MISCELLANEOUS ITEMS

- De-Icer (for windshields)
- Plastic (Several rolls, used to contain heat)
- Extra Rolls of Heat Trace
- Duct Tape
- Tie-Wire
- Heat Lamps/Bulbs
- Plywood
- 2X4 Lumber
- Galvanized 2 Wood Screws
- Spray Foam Sealant
- Snow Shovel
- Air hoses (chicago fittings)
- Torch Heads (20)
- Nap Gas (30)
- Misc Insulation
- Electric Heaters (20)
- Kerosene Heaters (30)
- Heat Lamps
- Extension Cords 12/3 (Various Lengths)
- Heat Trace in stock
- Conveyor liquid heat
- Pump Sprayer

Version 1.0
Effective Date: April 1, 2023

C-5

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix C
Cold Weather Preparedness Plan:
E.W. Brown

C5. Operational Supplies

Prior to a severe cold weather event, conduct an inventory of critical supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

Product	Tank Location	Main Constituent(s)
Nalco 1393T	Unit 3 Basement – 2,000 gallon tank	30-60% Hydroxyethylidenediphosphonic Acid
Nalco PC-191T	Water Treatment Reverse Osmosis Building – 275 gallon tote	Proprietary
Nalco PC-11	Water Treatment Reverse Osmosis Building – 55 gallon drum	30-60% Polyethylene Glycol, 20% 2,2-Dibromo-3-nitropropionamide
Nalco 7468	FGD Aux Blower – Defoamer – 55 gallon drum	1-5% Sorbitan Monostearate
Nalco 7357	U3 Middle Burner Level – Molybdate – 55 gallon drum	30-60% Sodium Molybdate
Nalco 8035	FGD - North Side - FGD Mercury Re-emission Treatment	Proprietary
Nalco Nalmet 1689	TDCR/PWS - Process Water Treatment – 275 gallon tote	1-5% Sodium Chloride, 1-5% Sodium Sulphide, 0.1-1% Sodium Hydroxide
Nalco Catfloc 71264	Water Treatment Reverse Osmosis Building – Trimites – 275 gallon tote	
Nalco Nalclear 7768	TDCPR/PWS – 275 gallon tote	
Sulfuric Acid	Process Water Treatment pH Control – Reverse Osmosis Building – 275 gallon tote BATW pH Control - Unit 3 Basement – 275 gallon tote	
Nalco 7408 – Bisulfite	RO Trimites – 275 gallon tote	
Ferric Chloride	PWS - Process Water Treatment – 275 gallon tote	
Sodium Hydroxide	TDCPR/PWS – Process Water Treatment – 275 gallon tote RO – 755 gallon tank	
Sodium Hypochlorite	U3 Cooling Tower – 2,000 gallon tank RO – 500 gallon tank	
Sodium Bisulfite	Unit 3 Cooling Tower – 275 gallon tote – Only use during summer months	

Version 1.0
Effective Date: April 1, 2023

C-6

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Appendix C
Cold Weather Preparedness Plan:
E.W. Brown

Product	Tank Location	Main Constituent(s)
Ammonia Hydroxide	U3 Feedwater – U3 Basement – 55 gallon drum	
Powdered Activated Carbon	Environmental Mercury Control – 2 x 340,000 lb. Silo	
Hydrogen	Generator Cooling	
Hydrated Lime	S03 control – 2 x 600,000 lb. Silo	
Limestone	Scrubber Slurry S02 Control – 2 x 1,100,000 gallon tank - FGD	
C02	Generator Purging	
Avista L403 – Low pH	RO Chemical clean – 55 gallon drum	
Avista L212 – High pH	RO Chemical Clean – 55 gallon drum	
Nalco 19H - Hydrazine	U3 Basement – 180 gallon tote	
Nalco DustFoam Plus	Coal Handling – 450 gallon tote	

C6. Staffing

The following are the measures that will be taken to prepare the plant in the days immediately preceding a forecasted extreme cold-weather event.

Having made all the preparations listed above, the majority of this plan revolves around having enough personnel onsite to properly implement the plan and keep the plant running during the weather event and in the days following.

1. All departments will evaluate the need to have increased staffing levels onsite during the cold weather event. This is especially true during periods of normally low staffing (nights and weekends).
2. In the event personnel must stay overnight and cannot leave the property, food rations and cots are available. Cots are stored in the Warehouse. Frozen food or rations are stored in the freezer at the plant.
3. If local roadways are in such bad shape that staff cannot make it to the site in their own vehicles, four-wheel drive vehicles from the plant's fleet will be used to pick them up and bring them to the plant.

Version 1.0
Effective Date: April 1, 2023

C-7

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix C
Cold Weather Preparedness Plan:
E.W. Brown

4. Facilities maintenance personnel will focus on clearing snow and ice from the plant's main thoroughfares. Plant maintenance and extra operations personnel will make rounds to ensure the generating equipment remains in working order. They will deploy the heating and anti-freezing equipment listed above and make corrections to operating conditions as necessary.
5. Work crews will be rotated as staffing allows to limit exposure to severe cold weather
6. The "buddy system" will be employed as needed during severe cold weather events to promote personnel safety.

C7. Communications

To promote effective communication during cold weather events, the following will occur:

1. Appropriate communication protocols will be followed during severe cold weather events.
2. The satellite phone will be tested for operation according to weekly PMs.
3. Communication will be discussed during daily pre-job briefings.

C8. Special Operating Instructions

1. Additional Operator rounds will be initiated to verify critical equipment is protected. Room temperatures will be monitored.
2. Units will be placed online at minimum load prior to severe cold weather as Operations and Generation Dispatch mandate.
3. According to PMs, the Emergency Diesel Generator onsite will be tested for operability.
4. Auxiliary equipment will be placed in service on Cooling Towers and Raw Water systems where freezing weather could adversely impact their operation.

Version 1.0
Effective Date: April 1, 2023

C-8

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DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix D
Cold Weather Preparedness Plan:
Cane Run & Paddy's Run

Appendix D – Cold Weather Preparedness Plan: Cane Run & Paddy's Run

D1. Work Management System (Maximo)

The goals of using the Maximo Work Management System as a part of the Winterization Plan are as follows:

- 1) Ensure that all cold weather preparation preventive work orders (PM's) are completed prior to the onset of the winter season.
- 2) Perform cold weather readiness system walkdowns to identify any deficiencies and issues that will need repair.
- 3) Review the work management system for open corrective maintenance work orders that could affect plant operation and reliability in cold weather. Prioritize work to minimize the potential for operability impacts due to cold weather.
- 4) Ensure that all modifications and construction activities are performed such that the changes maintain cold weather readiness for the station.

These measures are generally PMs in Maximo which are programmed to generate work orders at the beginning of October, to be completed by November 30th. A list and description of these PMs can be found below. Completing these PMs in October and early November will ensure the plant is ready for winter by November 30th.

In addition, SERCO will ensure the plant's fleet of vehicles will have been properly winterized and in good working order.

Version 1.0
Effective Date: April 1, 2023

D-1

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Appendix D
Cold Weather Preparedness Plan:
Cane Run & Paddy's Run

PM	Description	Responsibility	Date of Generation
00056468	PM-ANNUAL Winterization CT1 Evaporative Cooler - Unwinterize and Prepare For Service	CROS	3/7/2024
00056469	PM-ANNUAL Winterization CT1 Evaporative Cooler - Winterize System and Piping	CROD	10/1/2023
00056472	PM-ANNUAL Winterization CT2 Evaporative Cooler - Unwinterize and Prepare For Service	CROS	2/10/2024
00056473	PM-ANNUAL Winterization CT2 Evaporative Cooler - Winterize System and Piping	CROD	10/1/2023
00056900	PM-ANNUAL Winterization - Inspect All Bldg Wall Mounted Heaters For Proper Operation	CROD	10/24/2023
00056901	PM-ANNUAL Winterization - Wholesale Inspection of All Heat Trace Circuits/Enclosed Transmitters	CRI7	10/1/2023
00057618	PM-ANNUAL Winterization - Inspection and Service of Plant Snow Removal Equipment(fm)	CROS	10/1/2023
00057619	PM-ANNUAL Winterization - Inspection and Service of Plant Portable Space Heaters	CRMC	10/1/2023
00057620	PM-ANNUAL Winterization - Inspection and Service of Plant Vehicles For Proper Winterization	CRMC	10/1/2023
00057621	PM-ANNUAL Winterization - Inspection or Repair of All Plant Exterior Doors and Windows(fm)	CROS	10/1/2023
00060305	PM-SEMI-ANNUAL HRSG1 LP ECONOMIZER RELIEF VALVE/PILOT VLV - Removable Insulation Cap - Winter/Summer	CROS	5/1/2023
00060310	PM-SEMI-ANNUAL HRSG2 LP ECONOMIZER RELIEF VALVE/PILOT VLV - Removable Insulation Cap - Winter/Summer	CROS	5/1/2023
00060311	PM-SEMI-ANNUAL HRSG1 IP ECONOMIZER RELIEF VALVE/PILOT VLV - Removable Insulation Cap - Winter/Summer	CROS	5/1/2023
00060312	PM-SEMI-ANNUAL HRSG2 IP ECONOMIZER RELIEF VALVE/PILOT VLV - Removable Insulation Cap - Winter/Summer	CROS	5/1/2023
00063984	PM-ANNUAL Winterization - Demin Water Storage Tank - Winterize N2 Blanketing Vlvs/Regulators	CROS	10/19/2023
00063985	PM-ANNUAL Winterization - Demin Water Storage Tank - Unwinterize N2 Blanketing Vlvs/Regulators	CROS	5/1/2023
00063986	PM-ANNUAL Winterization - CT1 FM-200 Cabinet Heaters - Seasonal Operation	CROD	4/19/2023
00063987	PM-ANNUAL Winterization - CT2 FM-200 Cabinet Heaters - Seasonal Operation	CROD	4/19/2023
00063988	PM-ANNUAL Winterization - HRSG1 SH Sample Lines - Cold Weather Outage PM	CROS	As Needed
00063989	PM-ANNUAL Winterization - HRSG2 SH Sample Lines - Cold Weather Outage PM	CROS	As Needed

Version 1.0
Effective Date: April 1, 2023

D-2

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Appendix D
Cold Weather Preparedness Plan:
Cane Run & Paddy's Run

00044087	PM- Yearly - PR-13 Gas Turbine Winterize PR13.	PR O&M Crew	September 21
03145-01	PM- Annual- PR12 Check all Heaters and Heat Trace	PR O&M Crew	November 1

D2. Preparation of Critical Instrumentation and Equipment

The following tasks will be completed according to the PMs listed in Section 1 to ensure that critical equipment and instrumentation are adequately prepared for cold weather.

1. All critical site-specific problem areas have adequate protection to ensure operability during a severe cold weather event.
2. All electrical and instrumentation equipment susceptible to cold weather will have been winterized. Critical instrumentation has been identified for additional operator rounds during severe weather events.
3. Temperature Indicators are placed in areas containing equipment sensitive to extreme cold conditions and in freeze protection enclosures to ensure that the temperature is being maintained above freezing.

D3. Insulation, Heat Trace and Other Freeze Protection

In order to ensure the reliability of building/pipe insulation and heat trace circuitry, and to provide back-up for these systems, the following will occur:

1. Verification of the integrity of the insulation on all critical equipment identified in the Cold Weather Preparation Procedure.
 - a. Execute observations specific to integrity of insulation and heat trace functionality on exposed piping by operations and/or maintenance personnel. Any heat trace or insulation removed during regular maintenance will have been replaced and integrity restored
 - b. Exercise elevated alertness for continued operations of heat trace equipment during severe cold weather events.
 - c. Back-up methods of heating instrumentation will be on hand- heat blankets, additional lines of heat trace wire w/ 120VAC plugs for quick application, etc.
2. Heaters, Heat Lamps and Space Heaters

Version 1.0
Effective Date: April 1, 2023

D-3

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix D
Cold Weather Preparedness Plan:
Cane Run & Paddy's Run

- a. Execute observations specific to building heat equipment by operations and/or maintenance personnel.
 - b. All portable space heaters will be tested, repaired and/or replaced as necessary.
 - c. An adequate fuel supply for the heaters will be onsite.
3. Wind Breaks
- a. Wind barriers will be installed as deemed appropriate to protect critical instruments, sensing lines, controllers and piping.
4. Covers, Enclosures, and Buildings
- a. Enclosures with heat lamps will be installed for identified transmitters.
 - b. Portable space heaters will be placed as needed in enclosures with temperature-sensitive equipment and maintained at regular intervals.
 - c. Missing covers will be installed on valve actuators, damper drives and electrical boxes to prevent from accumulating ice.
 - d. Critical instruments have been placed inside plastic enclosures or otherwise protected against ice and wind.
 - e. All of the exterior windows and doors will have been inspected, repaired if necessary, and be in good working order, or temporary provisions made to mitigate the potential for cold weather exposure.
 - f. Tarps/plastic enclosures will be installed over openings and stairwells as necessary to prevent warm air from leaving the operating areas.
 - g. All large overhead doors at the station will be inspected and repaired as needed and kept closed when not in use.

D4. Supplemental Equipment

Prior to a severe cold weather event, conduct an inventory of supplemental supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

Version 1.0
Effective Date: April 1, 2023

D-4

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix D
Cold Weather Preparedness Plan:
Cane Run & Paddy's Run

PERSONAL PROTECTION /EXPOSURE PREVENTION EQUIPMENT

- Rubber Boot Slip-Ons (All Sizes) – Min Qty: L – 12pr / XL – 12pr
- Walk by Yaktrax (Attachable grips for work boots) – Min Qty: S – 5pr / M – 8pr / L – 8pr / XL 8pr
- Jersey Gloves – Min Qty: 75pr
- Leather Gloves (All Sizes) – Min Qty: S – 25pr / M – 25pr / L – 75pr / XL 50pr
- Head Socks – Min Qty: 25ea

FUEL AND ACCESSORIES

- Diesel Fuel (All tanks full) – Min Qty: 250 gal
- Diesel Fuel Tanks (Anti-gel additives) – Min Qty: 6 cans
- 400 Gallon Tank of Kerosene - Filled (For portable heaters) – Min Qty: 300 gal
- Starting Fluid (Aerosol Cans) – Min Qty: 12 cans
- Fuel Cans (All sizes/types) – Min Qty: 2 Gal – 2 ea. / 5 Gal – 2 ea.

SNOW REMOVAL/TRACTION MATERIALS

- Sand – Min Qty: 20 bags
- Ice-Melt – Min Qty: Concrete Safe – 40 bags / Regular – 120 bags

MISCELLANEOUS ITEMS

- De-Icer (for windshields) – Min Qty: 10 cans
- Plastic (used to contain heat) – Min Qty: Clear – 5 rolls / Reinforced – 5 rolls
- Extra Rolls of Heat Trace – Min Qty: 2 rolls
- Heat Blankets – Min Qty: 6 ea.
- Heat Tape – Min Qty: 7 ea
- Duct Tape – Min Qty: 24 ea.
- Tie-Wire – Min Qty: 5 rolls
- Heat Lamps/Bulbs – Min Qty: 18 lamps / 35 bulbs

Version 1.0
Effective Date: April 1, 2023

D-5

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix D
 Cold Weather Preparedness Plan:
 Cane Run & Paddy's Run

- Plywood – Min Qty: 12 sheets (4'x8')
- 2X4 Lumber – Min Qty: 12 ea.
- Galvanized 2 ½" Wood Screws – Min Qty: 1 box
- Spray Foam Sealant – Min Qty: 12 cans
- Snow Shovels – Min Qty: 12 ea.

D5. Operational Supplies

Prior to a severe cold weather event, conduct an inventory of critical supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

Product	Tank Location	Main Constituent(s)
0HRE-SKD--001 Sodium Bromide	Circulating Water Chemical Feed Building	Sodium Bromide
0HRE-SKD--001 Sodium Hypochlorite	Circulating Water Chemical Feed Building	Sodium Hypochlorite
0HRE-SKD--002 Sulfuric Acid	Circulating Water Chemical Feed Building	Sulfuric Acid
0HRE-SKD--003 Anti-Scalant	Circulating Water Chemical Feed Building	Nalco TRASAR 3DT134
0HRE-SKD--004 Non-Oxidizing Biocide	Circulating Water Chemical Feed Building	Nalco Nalsprese 73551
0HRE-SKD--005 Sodium Bisulfite	Circulating Water Chemical Feed Building	Sodium Bisulfite
0WTA-SKD--002 Clarifier Coagulant	Water Treatment Building	Ferric Blend Nalco 71264
0WTA-SKD--003 Clarifier/UF Sodium Hypochlorite	Water Treatment Building	Sodium Hypochlorite
0WTA-SKD--004 Clarifier Polymer	Water Treatment Building	Nalco Cat-Floc 7757
0WTA-SKD--005 Clarifier Sodium Permanganate	Water Treatment Building	Sodium Permanganate
0WTA -SKD--007 Dewatering Polymer	Water Treatment Building	Nalco Core Shell
0WTA -SKD--009 UF Acid	Water Treatment Building	Citric Acid

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix D
 Cold Weather Preparedness Plan:
 Cane Run & Paddy's Run

Product	Tank Location	Main Constituent(s)
<i>OWTD-SKD--006</i> RO Anti-Scalant	Water Treatment Building	Permatreat PC191T
<i>OWTD-SKD--007</i> RO Sodium Bisulfite	Water Treatment Building	Sodium Bisulfite
<i>OWTD-SKD--008</i> RO Caustic	Water Treatment Building	Sodium Hydroxide
<i>OHRE-SKD--001</i> Cycle/Aux. Boiler Ammonia	Steam Turbine Building	Aqueous Ammonia
CCCW Scale Inhibitor		Nalco TRAC108

D6. Staffing

The following are the measures that will be taken to prepare the plant in the days immediately preceding a forecasted extreme cold-weather event.

Having made all the preparations listed above, the majority of this plan revolves around having enough personnel onsite to properly implement the plan and keep the plant running during the weather event and in the days following.

1. All departments will evaluate the need to have increased staffing levels onsite during the cold weather event. This is especially true during periods of normally low staffing (nights and weekends).
2. In the event personnel must stay overnight and cannot leave the property, food rations and cots are available. Cots are stored in the Warehouse. Frozen food or rations are stored in the freezer at the plant.
3. If local roadways are in such bad shape that staff cannot make it to the site in their own vehicles, four-wheel drive vehicles from the plant's fleet will be used to pick them up and bring them to the plant.
4. Facilities maintenance personnel will focus on clearing snow and ice from the plant's main thoroughfares. Plant maintenance and extra operations personnel will make rounds to ensure the generating equipment remains in working order. They will deploy the heating and anti-freezing equipment listed above and make corrections to operating conditions as necessary.
5. Work crews will be rotated as staffing allows to limit exposure to severe cold weather

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix D
Cold Weather Preparedness Plan:
Cane Run & Paddy's Run

6. The "buddy system" will be employed as needed during severe cold weather events to promote personnel safety.

D7. Communications

To promote effective communication during cold weather events, the following will occur:

1. Appropriate communication protocols will be followed during severe cold weather events.
2. The satellite phone will be tested for operation according to weekly PMs.
3. Communication will be discussed during daily pre-job briefings.

D8. Special Operating Instructions

1. Additional Operator rounds will be initiated to verify critical equipment is protected. Room temperatures will be monitored.
2. Units will be placed online at minimum load prior to severe cold weather as Operations and Generation Dispatch mandate.
3. According to PMs, the Emergency Diesel Generator onsite will be tested for operability.
4. Critical auxiliary equipment will be placed in service on Cooling Towers and Raw Water systems in the Screen House where freezing weather could adversely impact their operation.

Version 1.0
Effective Date: April 1, 2023

D-8

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix E
Cold Weather Preparedness Plan:
Ghent

Appendix E – Cold Weather Preparedness Plan: Ghent

E1. Work Management System (MAXIMO)

The goals of using the Maximo Work Management System as a part of the Winterization Plan are as follows:

1. Ensure that all cold weather preparation preventive work orders (PM's) are completed prior to the onset of the winter season.
2. Perform cold weather readiness system walkdowns to identify any deficiencies and issues that will need repair.
3. Review the work management system for open corrective maintenance work orders that could affect plant operation and reliability in cold weather. Prioritize work so as to minimize the potential for operability impacts due to cold weather.
4. Ensure that all modifications and construction activities are performed such that the changes maintain cold weather readiness for the station.

These measures are generally PMs in Maximo which are programmed to generate work orders at the beginning of October, to be completed by November 30th. A list and description of these PMs can be found below. Completing these PMs in October and early November will ensure the plant is ready for winter by November 30th.

In addition, SERCO will ensure the plant's fleet of vehicles will have been properly winterized and in good working order.

PM	Description	Responsibility	Date of Generation
GH066236	PM-(PM) U-1& U-2 OPERATIONS COLD WEATHER PREPERATIONS	GHSOS	10/1/2023
GH066237	PM-(PM) U-3& U-4 OPERATIONS COLD WEATHER PREPERATIONS	GHSOS	10/1/2023

Version 1.0
Effective Date: April 1, 2023

E-1

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix E
Cold Weather Preparedness Plan:
Ghent

PM	Description	Responsibility	Date of Generation
GH066238	PM-(PM) OUTSIDE OPERATIONS COLD WEATHER PREPERATIONS	GHSOS	10/1/2023
GH066239	(PM) PLANNING OUTSIDE BUILD COLD WEATHER HOOCHES	GHPLO	10/1/2023

E2. Preparation of Critical Instrumentation and Equipment

The following tasks will be completed according to the PMs listed in Section 1 to ensure that critical equipment and instrumentation are adequately prepared for cold weather.

1. All critical site-specific problem areas have adequate protection to ensure operability during a severe cold weather event.
2. All electrical and instrumentation equipment susceptible to cold weather will have been winterized. Critical instrumentation has been identified for additional operator rounds during severe weather events.
3. Temperature Indicators are placed in areas containing equipment sensitive to extreme cold conditions and in freeze protection enclosures to ensure that the temperature is being maintained above freezing.

E3. Insulation, Heat Trace, and Other Freeze Protection

In order to ensure the reliability of building/pipe insulation and heat trace circuitry, and to provide back-up for these systems, the following will occur:

1. Verification of the integrity of the insulation on all critical equipment identified in the Cold Weather Preparation Procedure.
 - a. Execute observations specific to integrity of insulation and heat trace functionality on exposed piping by operations and/or maintenance personnel. Any heat trace or insulation removed during regular maintenance will have been replaced and integrity restored
 - b. Exercise elevated alertness for continued operations of heat trace equipment during severe cold weather events.

Version 1.0
Effective Date: April 1, 2023

E-2

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix E
Cold Weather Preparedness Plan:
Ghent

- c. Back-up methods of heating instrumentation will be on hand- heat blankets, additional lines of heat trace wire w/ 120VAC plugs for quick application, etc.
2. Heaters, Heat Lamps and Space Heaters
 - a. Execute observations specific to building heat equipment by operations and/or maintenance personnel.
 - b. All portable space heaters will be tested, repaired and/or replaced as necessary.
 - c. An adequate fuel supply for the heaters will be onsite.
3. Wind Breaks
 - a. Wind barriers will be installed as deemed appropriate to protect critical instruments, sensing lines, controllers and piping.
4. Covers, Enclosures, and Buildings
 - a. Enclosures with heat lamps will be installed for identified transmitters.
 - b. Portable space heaters will be placed as needed in enclosures with temperature-sensitive equipment and maintained at regular intervals.
 - c. Missing covers will be installed on valve actuators, damper drives and electrical boxes to prevent from accumulating ice.
 - d. Critical instruments have been placed inside plastic enclosures or otherwise protected against ice and wind.
 - e. All of the exterior windows and doors will have been inspected, repaired if necessary, and be in good working order, or temporary provisions made to mitigate the potential for cold weather exposure.
 - f. Tarps/plastic enclosures will be installed over openings and stairwells as necessary to prevent warm air from leaving the operating areas.
 - g. All large overhead doors at the station will be inspected and repaired as needed and kept closed when not in use.

Version 1.0
Effective Date: April 1, 2023

E-3

Confidential



E4. Supplemental Equipment

Prior to a severe cold weather event, conduct an inventory of supplemental supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

PERSONAL PROTECTION /EXPOSURE PREVENTION EQUIPMENT

- Rubber Boot Slip-Ons (All Sizes) – Min Qty: L – 12pr / XL – 12pr
- Walk by Yaktrax (Attachable grips for work boots) – Min Qty: S – 5pr / M – 8pr / L – 8pr / XL 8pr
- Jersey Gloves – Min Qty: 75pr
- Leather Gloves (All Sizes) – Min Qty: S – 25pr / M – 25pr / L – 75pr / XL 50pr
- Head Socks – Min Qty: 25ea

FUEL AND ACCESSORIES

- Diesel Fuel (All tanks full) – Min Qty: 250 gal
- Diesel Fuel Tanks (Anti-gel additives) – Min Qty: 6 cans
- 400 Gallon Tank of Kerosene - Filled (For portable heaters) – Min Qty: 300 gal
- Starting Fluid (Aerosol Cans) – Min Qty: 12 cans
- Fuel Cans (All sizes/types) – Min Qty: 2 Gal – 2 ea. / 5 Gal – 2 ea.

SNOW REMOVAL/TRACTION MATERIALS

- Sand – Min Qty: 20 bags
- Ice-Melt – Min Qty: Concrete Safe – 40 bags / Regular – 120 bags

MISCELLANEOUS ITEMS

- De-Icer (for windshields) – Min Qty: 10 cans
- Plastic (used to contain heat) – Min Qty: Clear – 5 rolls / Reinforced – 5 rolls
- Extra Rolls of Heat Trace – Min Qty: 2 rolls

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix E
Cold Weather Preparedness Plan:
Ghent

- Heat Blankets – Min Qty: 6 ea.
- Heat Tape – Min Qty: 7 ea
- Duct Tape – Min Qty: 24 ea.
- Tie-Wire – Min Qty: 5 rolls
- Heat Lamps/Bulbs – Min Qty: 18 lamps / 35 bulbs
- Plywood – Min Qty: 12 sheets (4’x8’)
- 2X4 Lumber – Min Qty: 12 ea.
- Galvanized 2 ½” Wood Screws – Min Qty: 1 box
- Spray Foam Sealant – Min Qty: 12 cans
- Snow Shovels – Min Qty: 12 ea.

E5. Operational Supplies

Prior to a severe cold weather event, conduct an inventory of critical supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

Product	Tank Location	Main Constituents
1393T	Units 1 & 2 Clg Twrs (Cooling Systems)	Anti-Scalant
1393T	Units 3 & 4 Clg Twrs (Cooling Systems)	Anti-Scalant
3DT120	Units 1 & 2 Clg Twrs (Cooling Systems)	Dispersant
3DT120	Units 3 & 4 Clg Twrs (Cooling Systems)	Dispersant
H-901G	Towers (Cooling Systems)	Biocide
ControlBrom CB70	Units 1 & 2 Clg Twrs (Cooling Systems)	Biocide
ControlBrom CB70	Units 3 & 4 Clg Twrs (Cooling Systems)	Biocide
90005	Units 1 & 2 Clg Twrs (Cooling Systems)	Cooling Tower Corrosion Inhibiter
90005	Units 3 & 4 Clg Twrs (Cooling Systems)	Bearing Water Corrosion Inhibiter
3DT397	Cooling Towers (Cooling Systems)	Cooling Tower Corrosion Inhibiter
7357	Units 1 & 2 Bearing (Cooling Systems)	Bearing Water Corrosion Inhibiter

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix E
 Cold Weather Preparedness Plan:
 Ghent

Product	Tank Location	Main Constituents
7357	Units 3 & 4 Bearing (Cooling Systems)	Bearing Water Corrosion Inhibiter
Zebra Mussel Trtmt	Units 1 & 2 Serv Wtr (Zebra Mussel Trmt.)	Zebra Mussel Trtmt
Zebra Mussel Trtmt	Units 3 & 4 Serv Wtr (Zebra Mussel Trmt.)	Zebra Mussel Trtmt
PC-191T	R.O. (Boiler / RO)	Anti-Scalant
PC-11	R.O. (Boiler / RO)	Biocide
CV-941	Boiler (Boiler / RO)	Ammonia
71301	Bottom Ash Flocc (Bottom Ash / Effluent)	Flocculent
8185	Effluent TSS Coagulant (Bottom Ash / Effluent)	Coagulant
1689	Clg Tower Blowdown (Bottom Ash / Effluent)	Copper Removal/Treatment
1689	PWT (PWT)	Organosulfide - Metals Removal/Treatment
7768	PWT (PWT)	Polymer
8034 Plus	Unit 1 Absorber (MerControl)	Mercury Removal/Treatment
8034 Plus	Unit 3 Absorber (MerControl)	Mercury Removal/Treatment
8034 Plus	Unit 4 Absorber (MerControl)	Mercury Removal/Treatment
7895	Unit 2 Boiler (MerControl)	Mercury Oxidation
8035	Unit 1 Absorber (MerControl)	Mercury Removal/Treatment
8035	Unit 3 Absorber (MerControl)	Mercury Removal/Treatment
8035	Unit 4 Absorber (MerControl)	Mercury Removal/Treatment
Sodium Hydroxide	U3 Demin	Sodium Hydroxide
Sulfuric Acid	U3 Demin	Sulfuric Acid
Sulfuric Acid	U1/2 CW	Sulfuric Acid
Sulfuric Acid	U3/4 CW	Sulfuric Acid
Sodium Hypochlorite	U1/2 CW	Sodium Hypochlorite
Sodium Hypochlorite	U3/4 CW	Sodium Hypochlorite
Hydrochloric Acid	PWT	Hydrochloric Acid
Ferric Chloride	PWT	Ferric Chloride
Hydrated Lime	PWT	Hydrated Lime

Version 1.0
Effective Date: April 1, 2023

E-6

Confidential



E6. Staffing

The following are the measures that will be taken to prepare the plant in the days immediately preceding a forecasted extreme cold-weather event.

Having made all the preparations listed above, the majority of this plan revolves around having enough personnel onsite to properly implement the plan and keep the plant running during the weather event and in the days following.

1. All departments will evaluate the need to have increased staffing levels onsite during the cold weather event. This is especially true during periods of normally low staffing (nights and weekends).
2. In the event personnel must stay overnight and cannot leave the property, food rations and cots are available. Cots are stored in the Warehouse. Frozen food or rations are stored in the freezer at the plant.
3. If local roadways are in such bad shape that staff cannot make it to the site in their own vehicles, four-wheel drive vehicles from the plant's fleet will be used to pick them up and bring them to the plant.
4. Facilities maintenance personnel will focus on clearing snow and ice from the plant's main thoroughfares. Plant maintenance and extra operations personnel will make rounds to ensure the generating equipment remains in working order. They will deploy the heating and anti-freezing equipment listed above and make corrections to operating conditions as necessary.
5. Work crews will be rotated as staffing allows to limit exposure to severe cold weather
6. The "buddy system" will be employed as needed during severe cold weather events to promote personnel safety.

E7. Communications

To promote effective communication during cold weather events, the following will occur:

1. Appropriate communication protocols will be followed during severe cold weather events.

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix E
Cold Weather Preparedness Plan:
Ghent

2. The satellite phone will be tested for operation according to weekly PMs.
3. Communication will be discussed during daily pre-job briefings.

E8. Special Operating Instructions

1. Additional Operator rounds will be initiated to verify critical equipment is protected.
Room temperatures will be monitored.
2. Units will be placed online at minimum load prior to severe cold weather as Operations and Generation Dispatch mandate.
3. According to PMs, the Emergency Diesel Generator onsite will be tested for operability.
4. Critical auxiliary equipment will be placed in service on Cooling Towers and Raw Water systems in the Screen House where freezing weather could adversely impact their operation.

Version 1.0
Effective Date: April 1, 2023

E-8

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DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix F
Cold Weather Preparedness Plan:
Mill Creek

Appendix F – Cold Weather Preparedness Plan: Mill Creek

F1. Work Management System (MAXIMO)

The goals of using the Maximo Work Management System as a part of the Winterization Plan are as follows:

1. Ensure that all cold weather preparation preventive work orders (PM's) are completed prior to the onset of the winter season.
2. Perform cold weather readiness system walkdowns to identify any deficiencies and issues that will need repair.
3. Review the work management system for open corrective maintenance work orders that could affect plant operation and reliability in cold weather. Prioritize work to minimize the potential for operability impacts due to cold weather.
4. Ensure that all modifications and construction activities are performed such that the changes maintain cold weather readiness for the station.

These measures are generally PMs in Maximo which are programmed to generate work orders at the beginning of October, to be completed by November 30th. A list and description of these PMs can be found below. Completing these PMs in October and early November will ensure the plant is ready for winter by November 30th.

In addition, SERCO will ensure the plant's fleet of vehicles will have been properly winterized and in good working order.

Version 1.0
Effective Date: April 1, 2023

F-1

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix F
Cold Weather Preparedness Plan:
Mill Creek

PM	Description	Responsibility	Date of Generation
00056022	PM-Annual - Cold Weather Winterization Efforts for Operations (Operations Support Supervisor)	MCPO	9/1/2023
00056159	PM-Annual - Cold Weather Winterization Efforts for Building Maintenance (MCBM): See Long Description	MCBM	9/1/2023
00056162	PM-Annual – (MCM1) Cold Weather Winterization Efforts for 1-4 WFGD: See Long Description	MCM1	9/15/2023
00056180	PM-Annual - Cold Weather Winterization Efforts for Coal Handling (Coal Handling Supervisor)	MCCH	9/1/2023
00056181	PM-CRIT-Annual – (MCM8) Cold Weather Winterization Efforts for I/E 1-4 Plant and 3&4 WFGD.	MCM8	10/1/2023
00056182	PM-Annual - Cold Weather Winterization Efforts for Insulation (INCORP): See Long Description	MCINCORP	9/1/2023
00057247	PM-Annual - PSM / RMP, Anhydrous Ammonia Farm Showers, Heat Tracer Inspections (Winter Time)	MCM12	11/1/2023
00057532	PM- CRIT -Annual – (MCM4) Cold Weather Winterization, Control Instrumentation	MCM4	10/1/2023
00057538	PM-Annual – (MCM12) Cold Weather Winterization Efforts for I/E Limestone, CH, GPP & PWS	MCM12	9/1/2023
00058601	PM-Annual – (MCM14) Cold Weather Winterization Efforts for 1-4 PJFF : See Long Description	MCM14	9/1/2023
00059634	PM-Weekly – (MCBM) - Winter Grounds Keeping: Snow removal, salt spreading, etc	MCBM	11/1/2023
00063678	PM-Annual – (MCM2) Winterization of Submerged Flight Conveyor	MCM2	11/1/2023
00066225	PM-CRIT-Annual – (MCCEM) Cold Weather Winterization Efforts for I/E CEM Equipment All units	MCCEM	9/4/2023

F2. Preparation of Critical Instrumentation and Equipment

The following tasks will be completed according to the PMs listed in Section 1 to ensure that critical equipment and instrumentation are adequately prepared for cold weather.

1. All critical site-specific problem areas have adequate protection to ensure operability during a severe cold weather event.
2. All electrical and instrumentation equipment susceptible to cold weather will have been winterized. Critical instrumentation has been identified for additional operator rounds during severe weather events.

Version 1.0
Effective Date: April 1, 2023

Confidential

F-2

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix F
Cold Weather Preparedness Plan:
Mill Creek

3. Temperature Indicators are placed in areas containing equipment sensitive to extreme cold conditions and in freeze protection enclosures to ensure that the temperature is being maintained above freezing.

F3. Insulation, Heat Trace, and Other Freeze Protection

In order to ensure the reliability of building/pipe insulation and heat trace circuitry, and to provide back-up for these systems, the following will occur:

1. Verification of the integrity of the insulation on all critical equipment identified in the Cold Weather Preparation Procedure.
 - a. Execute observations specific to integrity of insulation and heat trace functionality on exposed piping by operations and/or maintenance personnel. Any heat trace or insulation removed during regular maintenance will have been replaced and integrity restored
 - b. Exercise elevated alertness for continued operations of heat trace equipment during severe cold weather events.
 - c. Back-up methods of heating instrumentation will be on hand- heat blankets, additional lines of heat trace wire w/ 120VAC plugs for quick application, etc.
2. Heaters, Heat Lamps, and Space Heaters
 - a. Execute observations specific to building heat equipment by operations and/or maintenance personnel.
 - b. All portable space heaters will be tested, repaired and/or replaced as necessary.
 - c. An adequate fuel supply for the heaters will be onsite.
3. Wind Breaks
 - a. Wind barriers will be installed as deemed appropriate to protect critical instruments, sensing lines, controllers, and piping.
4. Covers, Enclosures, and Buildings
 - a. Enclosures with heat lamps will be installed for identified transmitters.
 - b. Portable space heaters will be placed as needed in enclosures with temperature-sensitive equipment and maintained at regular intervals.

Version 1.0
Effective Date: April 1, 2023

F-3

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DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix F
Cold Weather Preparedness Plan:
Mill Creek

- c. Missing covers will be installed on valve actuators, damper drives and electrical boxes to prevent from accumulating ice.
- d. Critical instruments have been placed inside plastic enclosures or otherwise protected against ice and wind.
- e. All the exterior windows and doors will have been inspected, repaired if necessary, and be in good working order, or temporary provisions made to mitigate the potential for cold weather exposure.
- f. Tarps/plastic enclosures will be installed over openings and stairwells as necessary to prevent warm air from leaving the operating areas.
- g. All large overhead doors at the station will be inspected and repaired as needed and kept closed when not in use.

F4. Supplemental Equipment

Prior to a severe cold weather event, conduct an inventory of supplemental supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

- 1. Portable Space Heaters and Heat Lamps and bulbs
- 2. Extension Cords and GFI's
- 3. Kerosene
- 4. Propane and Rosebuds
- 5. Plastic Rolls
- 6. Lumber for building wind breaks and enclosures
- 7. Wire Ties
- 8. Portable Lighting
- 9. Portable Generators
- 10. Instrumentation Tubing
- 11. Ice removal chemicals and equipment
- 12. Blankets
- 13. Cots

Version 1.0
Effective Date: April 1, 2023

F-4

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix F
Cold Weather Preparedness Plan:
Mill Creek

- 14. Shovels for Snow Removal
- 15. Cold Weather Personal Protective Equipment (PPE) – Boots, gloves, head socks
- 16. MRE's
- 17. Additional Heat Trace

F5. Operational Supplies

Prior to a severe cold weather event, conduct an inventory of critical supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

Product	Tank Location	Main Constituent(s)
HEDP 1393T	Unit 2 CT & Unit 3&4 CT service bldg	30-60% Hydroxyethylidenediphosphonic acid
Control Brom CB70	Unit 2 CT & Unit 3&4 CT service bldg	10-30% Sodium Bromide
Sodium Hypochlorite	Unit 2 CT & Unit 3&4 CT service bldg	12.5% sodium hypochlorite
H901G	Unit 1 screenhouse bromination room	96% 1-Bromo-3-Chloro-5,5-Dimethyl-Hydantoin
PC-191T	RO bldg (antiscalant)	Proprietary
Sodium Hydroxide tote	RO bldg	50% sodium hydroxide
Sodium Hypochlorite tote	RO bldg	12.5% sodium hypochlorite
Sodium Bisulfite tote	RO bldg	40% sodium bisulfite
Aqueous Ammonia tote	Unit 1 main floor	
Anhydrous Ammonia	Ammonia farm at the end of unit 4	
Trac 114plus61 tote	Outside basement lab	Proprietary
Propylene Glycol 50%	RO bldg	
Nalco Nalmet 1689 (Dissolved Metals)	PWS	Organosulfide
Brenntag (Coagulant)	PWS	Ferric Chloride

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix F
 Cold Weather Preparedness Plan:
 Mill Creek

Product	Tank Location	Main Constituent(s)
Nalco Coreshell 71301 (Flocculant)	PWS	Polymer
Hydrochloric Acid	PWS	Hydrochloric Acid
Hydrated Lime HRH KY-BULK	WFGD	Hydrated Lime (High reactive)
PowerPAC Premium	WFGD	Powder Activated Carbon (Brominated)
PowerPAC	WFGD	Powder Activated Carbon (Non-brominated)
Nalco 8035	WFGD	Nalco Scrubber Additive

F6. Staffing

The following are the measures that will be taken to prepare the plant in the days immediately preceding a forecasted extreme cold-weather event.

Having made all the preparations listed above, the majority of this plan revolves around having enough personnel onsite to properly implement the plan and keep the plant running during the weather event and in the days following.

1. All departments will evaluate the need to have increased staffing levels onsite during the cold weather event. This is especially true during periods of normally low staffing (nights and weekends).
2. In the event personnel must stay overnight and cannot leave the property, food rations and cots are available. Cots are stored in the Warehouse. Frozen food or rations are stored in the freezer at the plant.
3. If local roadways are in such bad shape that staff cannot make it to the site in their own vehicles, four-wheel drive vehicles from the plant's fleet will be used to pick them up and bring them to the plant.
4. Facilities maintenance personnel will focus on clearing snow and ice from the plant's main thoroughfares. Plant maintenance and extra operations personnel will make rounds to ensure the generating equipment remains in working order. They will deploy the heating and anti-freezing equipment listed above and make corrections to operating conditions as necessary.

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix F
Cold Weather Preparedness Plan:
Mill Creek

5. Work crews will be rotated as staffing allows to limit exposure to severe cold weather.
6. The "buddy system" will be employed as needed during severe cold weather events to promote personnel safety.

F7. Communications

To promote effective communication during cold weather events, the following will occur:

1. Appropriate communication protocols will be followed during severe cold weather events.
2. The satellite phone will be tested for operation according to weekly PMs.
3. Communication will be discussed during daily pre-job briefings.

F8. Special Operating Instructions

1. Additional Operator rounds will be initiated to verify critical equipment is protected. Room temperatures will be monitored.
2. Units will be placed online at minimum load prior to severe cold weather as Operations and Generation Dispatch mandate.
3. According to PMs, the Emergency Diesel Generator onsite will be tested for operability.
4. Critical auxiliary equipment will be placed in service on Cooling Towers and Raw Water systems in the Screen House where freezing weather could adversely impact their operation.

Version 1.0
Effective Date: April 1, 2023

F-7

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix G
Cold Weather Preparedness Plan
Trimble County

Appendix G – Cold Weather Preparedness Plan: Trimble County

G1. Work Management System (MAXIMO)

The goals of using the Maximo Work Management System as a part of the Winterization Plan are as follows:

1. Ensure that all cold weather preparation preventive work orders (PM's) are completed prior to the onset of the winter season.
2. Perform cold weather readiness system walkdowns to identify any deficiencies and issues that will need repair.
3. Review the work management system for open corrective maintenance work orders that could affect plant operation and reliability in cold weather. Prioritize work to minimize the potential for operability impacts due to cold weather.
4. Ensure that all modifications and construction activities are performed such that the changes maintain cold weather readiness for the station.

These measures are generally PMs in Maximo which are programmed to generate work orders at the beginning of October, to be completed by November 30th. A list and description of these PMs can be found below. Completing these PMs in October and early November will ensure the plant is ready for winter by November 30th.

In addition, SERCO will ensure the plant's fleet of vehicles will have been properly winterized and in good working order.

Version 1.0
Effective Date: April 1, 2023

G-1

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix G
Cold Weather Preparedness Plan
Trimble County

PM	Description	Responsibility	Date of Generation
00066216	PM-Inventory all #2 fuel oil supplies and ensure adequate su	TCOPPLT	9/30/2023
00066217	PM-Test run all portable heaters and ensure they are in good	TCOPPLT	9/30/2023
00066218	PM-Inspect unit 1 cooling tower for fill damage and valve op	TCOPPLT	9/30/2023
00066219	PM-Inspect unit 2 cooling tower for fill damage and valve	TCOPPLT	9/30/2023
00066220	PM-Inspect entry doors on all structures and ensure they wil	TCOPPLT	9/30/2023
00066221	PM-Check thermometer locations and ensure all thermometers a	TCOPPLT	9/30/2023
00066223	Check Glycol in Cooling systems and LCI cooling systems on all units at Combustion Turbine site.	TCOPPLT	9/30/2023
00066226	PM-Ensure all evaporative cooling systems including sumps ar	TCOPPLT	9/30/2023
00066227	PM-Place mobile fuel oil tank in bed of field truck and fill	TCOPPLT	9/30/2023
00066228	PM-Stage mobile fuel drums in unit 2 Ground floor area at th	TCOPPLT	9/30/2023
00066229	PM-Verify all louvers are positioned correctly for TC1	TCOPPLT	9/30/2023
00066230	PM-Verify all louvers are positioned correctly for TC2	TCOPPLT	9/30/2023
00066231	PM-Verify all heat trace panels for TC1 are operational.	TCOPPLT	9/30/2023
00066233	PM-Verify all heat trace panels for TC2 are operational.	TCOPPLT	9/30/2023
00066234	PM-Verify all heat trace panels for out outlining building are operational.	TCOPPLT	9/30/2023

G2. Preparation of Critical Instrumentation and Equipment

The following tasks will be completed according to the PMs listed in Section 1 to ensure that critical equipment and instrumentation are adequately prepared for cold weather.

1. All critical site-specific problem areas have adequate protection to ensure operability during a severe cold weather event.
2. All electrical and instrumentation equipment susceptible to cold weather will have been winterized. Critical instrumentation has been identified for additional operator rounds during severe weather events.
3. Temperature Indicators are placed in areas containing equipment sensitive to extreme cold conditions and in freeze protection enclosures to ensure that the temperature is being maintained above freezing.

G3. Insulation, Heat Trace, and Other Freeze Protection

In order to ensure the reliability of building/pipe insulation and heat trace circuitry, and to provide back-up for these systems, the following will occur:

Version 1.0
Effective Date: April 1, 2023

G-2



5. Verification of the integrity of the insulation on all critical equipment identified in the Cold Weather Preparation Procedure.
 - a. Execute observations specific to integrity of insulation and heat trace functionality on exposed piping by operations and/or maintenance personnel. Any heat trace or insulation removed during regular maintenance will have been replaced and integrity restored
 - b. Exercise elevated alertness for continued operations of heat trace equipment during severe cold weather events.
 - c. Back-up methods of heating instrumentation will be on hand- heat blankets, additional lines of heat trace wire w/ 120VAC plugs for quick application, etc.
6. Heaters, Heat Lamps and Space Heaters
 - d. Execute observations specific to building heat equipment by operations and/or maintenance personnel.
 - e. All portable space heaters will be tested, repaired and/or replaced as necessary.
 - f. An adequate fuel supply for the heaters will be onsite.
7. Wind Breaks
 - a. Wind barriers will be installed as deemed appropriate to protect critical instruments, sensing lines, controllers, and piping.
8. Covers, Enclosures, and Buildings
 - a. Enclosures with heat lamps will be installed for identified transmitters.
 - b. Portable space heaters will be placed as needed in enclosures with temperature-sensitive equipment and maintained at regular intervals.
 - c. Missing covers will be installed on valve actuators, damper drives, and electrical boxes to prevent from accumulating ice.
 - d. Critical instruments have been placed inside plastic enclosures or otherwise protected against ice and wind.
 - e. All the exterior windows and doors will have been inspected, repaired if necessary, and be in good working order, or temporary provisions made to mitigate the potential for cold weather exposure.

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix G
Cold Weather Preparedness Plan
Trimble County

- f. Tarps/plastic enclosures will be installed over openings and stairwells as necessary to prevent warm air from leaving the operating areas.
- g. All large overhead doors at the station will be inspected and repaired as needed and kept closed when not in use.

G4. Supplemental Equipment

Prior to a severe cold weather event, conduct an inventory of supplemental supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

PERSONAL PROTECTION /EXPOSURE PREVENTION EQUIPMENT

- Rubber Boot Slip-Ons (All Sizes) – Min Qty: L – 12pr / XL – 12pr
- Walk by Yaktrax (Attachable grips for work boots) – Min Qty: S – 5pr / M – 8pr / L – 8pr / XL 8pr
- Jersey Gloves – Min Qty: 75pr
- Leather Gloves (All Sizes) – Min Qty: S – 25pr / M – 25pr / L – 75pr / XL 50pr
- Head Socks – Min Qty: 25ea

FUEL AND ACCESSORIES

- Diesel Fuel (All tanks full) – Min Qty: 250 gal
- Diesel Fuel Tanks (Anti-gel additives) – Min Qty: 6 cans
- 400 Gallon Tank of Kerosene - Filled (For portable heaters) – Min Qty: 300 gal
- Starting Fluid (Aerosol Cans) – Min Qty: 12 cans
- Fuel Cans (All sizes/types) – Min Qty: 2 Gal – 2 ea. / 5 Gal – 2 ea.

SNOW REMOVAL/TRACTION MATERIALS

- Sand – Min Qty: 20 bags
- Ice-Melt – Min Qty: Concrete Safe – 40 bags / Regular – 120 bags

Version 1.0
Effective Date: April 1, 2023

G-4

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix G
Cold Weather Preparedness Plan
Trimble County

MISCELLANEOUS ITEMS

- De-Icer (for windshields) – Min Qty: 10 cans
- Plastic (used to contain heat) – Min Qty: Clear – 5 rolls / Reinforced – 5 rolls
- Extra Rolls of Heat Trace – Min Qty: 2 rolls
- Heat Blankets – Min Qty: 6 ea.
- Heat Tape – Min Qty: 7 ea
- Duct Tape – Min Qty: 24 ea.
- Tie-Wire – Min Qty: 5 rolls
- Heat Lamps/Bulbs – Min Qty: 18 lamps / 35 bulbs
- Plywood – Min Qty: 12 sheets (4’x8’)
- 2X4 Lumber – Min Qty: 12 ea.
- Galvanized 2 ½” Wood Screws – Min Qty: 1 box
- Spray Foam Sealant – Min Qty: 12 cans
- Snow Shovels – Min Qty: 12 ea.

G5. Operational Supplies

Prior to a severe cold weather event, conduct an inventory of critical supplies needed to keep the plant operational. Coordinate with the Commercial Group at the station to schedule deliveries based on the severity of the event and lead times of the individual items.

Product	Tank Location	Main Constituent(s)
1393T	TC1 and TC2 Cooling Tower Antiscalant	30-60% Hydroxyethylidenediphosphonic Acid
3DT120	TC1 and TC2 Cooling Tower Dispersant	Proprietary
ControlBrom CB70	TC1 and TC2 Cooling Tower Bio Control	10-30% Sodium Bromide
H901G	TC1 and TC2 Cooling Tower Bio Control	96% 1-Bromo-3-Chloro-5,5-Dimethyl-Hydantoin
PC-191T	Water Treatment Reverse Osmosis Antiscalant	Proprietary
PC-11.36	Water Treatment Reverse Osmosis Bio Control	30-60% Polyethylene Glycol, 20% 2,2-Dibromo-3-nitrilopropionamide

Version 1.0
Effective Date: April 1, 2023

G-5

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix G
Cold Weather Preparedness Plan
Trimble County

Product	Tank Location	Main Constituent(s)
PC-87	Water Treatment Reverse Osmosis Membrane Cleaner	5-10% Phosphoric Acid
PC-97	Water Treatment Reverse Osmosis Membrane Cleaner	5-10% Tetrasodium EDTA, 5-10% Sodium Hydroxide
Y303759.91	Water Treatment Clarifier Coagulant	70-99.5 % Aluminum chlorohydrate solution, 0.5-10% Polyquaternary amine
7468	Defoamer	1-5% Sorbitan Monostearate
7468	Defoamer	See Above
7357	Closed Cooling Corrosion Control	30-60% Sodium Molybdate
7346	Sewage Treatment	54.2 % 1-Bromo-3-Chloro-5,5-Dimethyl-Hydantoin, 28.9% 1,3-Dichloro-5,5-Dimethylhydantoin, 15.9% 1,3-Dichloro-5-Ethyl-5-Methylhydantoin
7160	Sewage Treatment	Proprietary
8801	Coal Dust Suppression	10-30% Ethoxylated 4-Nonylphenol
22350	Aux. Boiler	1-5 % Diethylethanolamine
7221	Boiler Treatment	Proprietary
8035	FGD Mercury Re-emission Treatment	Proprietary
1689	Process Water Treatment Mercury Treatment	1-5% Sodium Chloride, 1-5% Sodium Sulphide, 0.1-1% Sodium Hydroxide
71301	Process Water Treatment Clarifier Flocculant	10-30 % Hydrotreated Light Distillate (petroleum), 1-5% Ethoxylated Sorbitan Monostearate, 1-5% Ethoxylated C10-16 Alcohols, 1-5% Sodium Chloride, 1-5% Urea
Hydrochloric Acid	Process Water Treatment pH Control	Hydrochloric Acid
Ferric Chloride	Process Water Treatment Clarifier Coagulant	Ferric Chloride
Sulfuric Acid	Water Treatment Demineralizer and TC2 Condensate Polisher Resin Regeneration; TC1 and TC2 Cooling Tower pH Control	Sulfuric Acid
Sodium Hydroxide	Water Treatment Demineralizer and TC2 Condensate Polisher Resin Regeneration	Sodium Hydroxide
Sodium Hypochlorite	TC1 and TC2 Cooling Tower Bio Control	Sodium Hypochlorite
Sodium Bisulfite	TC1 and TC2 Cooling Tower Dechlorination	Sodium Bisulfite
Aqueous Ammonia	Environmental NOX Control	Aqueous Ammonia
Powdered Activated Carbon	Environmental Mercury Control	Powdered Activated Carbon
Hydrogen	Generator Cooling	Hydrogen

Version 1.0
Effective Date: April 1, 2023

G-6

Confidential

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix G
 Cold Weather Preparedness Plan
 Trimble County

Product	Tank Location	Main Constituent(s)
Hydrated Lime	S03 control	Hydrated Lime
Limestone	Scrubber Slurry S02 Control	Limestone
C02	Generator Purging	C02

G6. Staffing

The following are the measures that will be taken to prepare the plant in the days immediately preceding a forecasted extreme cold-weather event.

Having made all the preparations listed above, the majority of this plan revolves around having enough personnel onsite to properly implement the plan and keep the plant running during the weather event and in the days following.

1. All departments will evaluate the need to have increased staffing levels onsite during the cold weather event. This is especially true during periods of normally low staffing (nights and weekends).
2. In the event personnel must stay overnight and cannot leave the property, food rations and cots are available. Cots are stored in the Warehouse. Frozen food or rations are stored in the freezer at the plant.
3. If local roadways are in such bad shape that staff cannot make it to the site in their own vehicles, four-wheel drive vehicles from the plant's fleet will be used to pick them up and bring them to the plant.
4. Facilities maintenance personnel will focus on clearing snow and ice from the plant's main thoroughfares. Plant maintenance and extra operations personnel will make rounds to ensure the generating equipment remains in working order. They will deploy the heating and anti-freezing equipment listed above and make corrections to operating conditions as necessary.
5. Work crews will be rotated as staffing allows to limit exposure to severe cold weather
6. The "buddy system" will be employed as needed during severe cold weather events to promote personnel safety.

Version 1.0
Effective Date: April 1, 2023

DocuSign Envelope ID: BAE6E51F-3A6C-4200-8E9D-3C8875BCFFBA



Appendix G
Cold Weather Preparedness Plan
Trimble County

G7. Communications

To promote effective communication during cold weather events, the following will occur:

1. Appropriate communication protocols will be followed during severe cold weather events.
2. The satellite phone will be tested for operation according to weekly PMs.
3. Communication will be discussed during daily pre-job briefings.

G8. Special Operating Instructions

1. Additional Operator rounds will be initiated to verify critical equipment is protected. Room temperatures will be monitored.
2. Units will be placed online at minimum load prior to severe cold weather as Operations and Generation Dispatch mandate.
3. According to PMs, the Emergency Diesel Generator onsite will be tested for operability.
4. Critical auxiliary equipment will be placed in service on Cooling Towers and Raw Water systems in the Screen House where freezing weather could adversely impact their operation.

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G-8

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