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THIS PLAN HAS A TWO-FOLD PURPOSE: 1. TO ASSURE THE PROPER COURSE OF ACTION IS CLEARLY KNOWN IN CASE OF A CONTINGENCY ARISING AT THE NORTH BOUNDARY TREATMENT SYSTEM, AND 2. TO GIVE THE PLANT OPERATOR ON DUTY A GUIDE TO DETECT AND CORRECT QUICKLY AND ACCURATELY ANY PLANT AND/OR PLANT APPURTENCY MALFUNCTION. THE FORMAT IN BOTH CASES STARTS FROM (1) AN OBSERVATION, GIVES (2) A MOST LIKELY CAUSE FOR THE OCCURRENCE, INDICATES (3) ACTION TO BE TAKEN AND THE BEST ORDER, AND TELLS (4) WHERE THE INSTRUMENT, SWITCH, PERSONNEL CAN BE LOCATED.

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AT

ROCKY MOUNTAIN ARSENAL

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original

Supporting Program Under ITARMS 1.05.12

By

Process Development and Evaluation Division of

The Contamination Control Directorate

ROCKY MOUNTAIN ARSENAL
Commerce City, Colorado 80022

AUGUST 1978

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GENERAL INSTRUCTIONS

PURPOSE:

This document is intended to establish procedures to be used in dealing with abnormal events regarding the North Boundary Pilot Treatment System.

RESPONSIBILITIES:

The R.M.A. Fire Prevention Division has been designated the point of contact for reporting all incidents regarding the operations of the North Boundary Pilot Treatment System.

The Security personnel will normally report any alarm lights, smoke, fire or unusual noises which occur during patrol of the North Boundary Area around and including the Carbon Adsorption Treatment Plant which fall outside their scope of operations.

SPECIFIC RESPONSIBILITIES:

The Fire Prevention Division will:

(1) Be aware of plant equipment operations.

(2) Have a copy of the plant S.O.P. (Troubleshooting and Contingency Plan).

(3) Investigate alarms and/or malfunction indications.

(4) Shut down and/or adjust the plant operations as necessary.

(5) Perform any other corrective actions as necessary.

(6) Keep list of Contamination Control personnel to contact.

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INTRODUCTION

This plan has a two-fold purpose: (1) to assure the proper course of action is clearly known in case of a contingency arising at the North Boundary Treatment System, and (2) to give the plant operator on duty a guide to detect and correct quickly and accurately any plant and/or plant appurtenance malfunction.

The format in both cases starts from (1) an observation, gives (2) a most likely cause for the occurrence, indicates (3) the action to be taken and the best order, and tells (4) where the instrument, switch, personnel can be located.

The two-fold purpose is reflected in the plan being broken into two sections: (1) Calgon Plant Operations Troubleshooting Guide, and (2) Calgon Plant Contingency Guide. The first of these two sections starts with malfunction occurring at the dewatering wells and progresses first to the Calgon Plant then to the recharge wells. The second section starts with the more probable contingencies and progresses to the less probable contingencies. The format style used should be the most expedient method in conveying clearly and accurately to the reader trouble shooting and contingency information on the North Boundary Treatment System.

Thus it can be seen the two-fold purpose of this plan (1) assures the proper course of action is known in case of a North Boundary Treatment System contingency, and (2) gives the plant operator a guide for an accurate and quick correction of any Calgon Plant contingency and/or plant equipment malfunction.

USE OF GUIDE

1. Determine whether problem is a plant or plant equipment failure, or if problem concerns a contingency which is not necessarily due to malfunctions of plant equipment and/or appurtenances. These observations of problems and/or serious faults which might be in either section, are listed in both sections to avoid confusion.

2. Go to the "Observation" column in the section chosen which is most closely associated to that which has occurred, and then proceed opposite thereto to the "Probable Cause" column.

3. Either make an action based on the probable cause given in the "Probable Cause" column or continue to the "Action to be Taken" column.

4. Perform the action given in the "Action to be Taken" column using the "Area of Response" information to locate switches, controls and/or personnel to be contacted.

TROUBLE SHOOTING OPERATIONAL MALFUNCTIONS

	OBSERVATION	PROBABLE CAUSE	ACTION TO BE TAKEN	AREA OF RESPONSE
1.	Red light on power pole by dewatering well.	Pump malfunction.	Turn off pump (if on) notify Geohydrology Personnel.	Power switch on pump pole, Don Cook or Brian Anderson, X366
2.	Arcing of electricity and/or fire in dewatering well pit.	Electrical short.	Turn dewatering pump off, extinguish with electrical type fire extinguisher (if possible), notify Fire Department and personnel at Geohydrology.	Power switch on pump pole, Ray Pimple, FD, X223, Don Cook, Brian Anderson, Geo., X366.
3.	Dewatering well pump makes sound like tearing paper.	Pump cavitation. Water level extremely low.	Shut off pump immediately. Notify Geohydrology.	Power switch on pump pole, Don Cook, Brian Anderson, X366.
4.	Dewatering well pump runs continuously output to feed sump at below normal levels.	Broken or leaky line between Calgon plant sump and dewatering wells.	Notify Geohydrology of observation.	Don Cook or Brian Anderson, X366.
5.	Feed sump pump runs continuously, feed sump above high level point.	High level sensor (in sump) non-functional.	Turn off dewatering wells, notify Calgon personnel.	Gray power box on East wall, Joe Allen, AC 713-682-1301.
6.	Feed sump pump runs continuously, low level in feed sump, no flow thru plant.	Loss of prime to sump pump and/or Low Level Sensor non-functional.	Raise sump level, reprime and start pump (if possible). Contact Calgon personnel if problem persists.	Sump pump switch in front of pumps, Joe Allen, AC 713-682-1301.
7.	Pump making sound like tearing paper (cavitation).	Prime lost and/or air mixed with water at sump pump input.	Shut off pump, contact Calgon's Houston Office.	Joe Allen, AC 713-682-1301.

TROUBLE SHOOTING OPERATIONAL MALFUNCTIONS

	OBSERVATION	PROBABLE CAUSE	ACTION TO BE TAKEN	AREA OF RESPONSE
8.	No feed water from dewatering wells.	1) Main breaker at Calgon plant off.	1) Reset breaker.	1) Large panel box in S.E. corner Calgon Plant.
		2) Dewatering wells shut off at Calgon plant panel box.	2) Restart wells.	2) Smaller panel box S. of truck door.
		3) Breakers are off at individual wells.	3) Reset breakers, stand by to manually shut off pump(s) if cause due to dewatering pump malfunction.	3) Breaker found in dewatering well pit.
		4) Individual start buttons at dewatering wells off.	4) Check with Geohydrology to see if pump was shut off. If pump was not to be shut off, restart pump.	4) Switch on power pole nearest dewatering well.
9.	Low feed rate to feed sump.	1) Metered feed from well too low.	1) Increase flow from dewatering well.	1) Dewatering well meter in well pit.
		2) Motor(s) are off to some wells.	2) Restore power to motor(s).	2) Switch on power pole nearest well.
		3) Motor(s) to some wells are non-operational.	3) Restore motor(s) to operation (replace or repair).	3) Don Cook, Geohydrology, X366.
		4) 3-way valve in bypass position.	4) Return 3-way valve to normal position.	4) Valve located in well pit.
		5) Manual valves closed.	5) Open manual valve only after contact with Geohydrology.	5) Well pit of dewatering wells. Don Cook, Brian Anderson, X366.
		6) Backwash level control and/or relay inoperable.	6) Repair and/or replace level control and/or relay.	6) Control panel in front of filters.

TROUBLE SHOOTING OPERATIONAL MALFUNCTIONS

	OBSERVATION	PROBABLE CAUSE	ACTION TO BE TAKEN	AREA OF RESPONSE
10.	No feed to plant.	1) Low feed sump level.	1) Raise feed sump level with plant pumps off, start plant pumps (see low feed to plant section).	1) Blue control box next to truck door and controls in front of plant pumps.
		2) Plant feed pump lost prime.	2) Try to start after raising feed sump level; if unable to do so, prime by hand.	2) Blue control box, prime port on rear of plant pump, controls to plant pumps.
		3) Pump cavitated.	3) Shut off pump if running, initiate repair procedures.	3) Controls in front of feed pumps and control box in S.E. corner of Calgon plant.
11.	No flow thru plant.	1) No feed to plant. a. No outlet pressure from pump (no flow thru pump).	1)a See previous section.	1)a As indicated in previous section.
		b. Outlet pressure at pump but no inlet pressure to filters.	1)b Valve closed between feed pump and filters and/or piping broken.	1)b Open valve slowly or replace broken pipe.
		2) No flow thru filters (outlet pressure of filters near or at zero).	2) Shut off control panel and wait 30 mins. for valve to return to normal position, may have to run sequencer thru Steps T6 & T7 on Backwash Cycle.	2) Gray control box at N.E. corner Calgon Plant (marked CP-196 & CP-199).
	Cont'd	3) No flow thru Adsorber. a. Outlet pressure near or at zero and totalizer not moving.	3)a Normal if backwash cycle being done, otherwise check to see manual valves are in correct position.	3)a Valve levers in front of Adsorbers.

TROUBLE SHOOTING OPERATIONAL MALFUNCTIONS

	OBSERVATION	PROBABLE CAUSE	ACTION TO BE TAKEN	AREA OF RESPONSE
11.	No flow thru plant. (Conc'l)	3) No flow thru Adsorber. b. Adsorber outlet pressure normal but totalizer not moving	3)b Valve outside plant closed and/or totalizer has malfunctioned.	3)b Open valve slowly, check at blue control panel at West wall.
		4) Main breaker off.	4) Reset main breaker.	4) Gray power box in S.E. corner of Calgon Plant.
12.	No flow to recharge wells.	1) Valve off between recharge wells & Calgon Plant.	1) Open valve slowly.	1) Large wheel-type handle on exterior of Calgon Plant West wall.
		2) Broken pipe between Calgon Plant & recharge wells.	2) Contact Geohydrology personnel.	2) Don Cook or Brian Anderson, X366.
		3) Flow shut off at recharge wells.	3) Contact Geohydrology personnel.	3) Don Cook or Brian Anderson, X366.
13.	Settling sump too high, overflowing tank walls.	Backwash cycle stuck in drain position, auto decant control malfunction.	Lower feed sump, decant with decant pump, shut off backwash operation.	Pump controls in front of plant pump bank, and control panel off button in front of filters.
14.	Settling sump too low (lower than low level sensor) decant pump running.	Low level sensor and/or relay failed to shut off decant pump.	Shut off decant pump, repair and/or replace sensor and/or relay.	Pump controls in front of plant pump bank.

CONTINGENCIES IN OR AROUND CALGON PLANT

OBSERVATION	PROBABLE CAUSE	ACTION TO BE TAKEN	AREA OF RESPONSE
Electrical NOTE: All electrical lines, irregardless of switch setting (on or off), should be handled as if the lines were hot.			
1. Electrical power line down.		1. Assure area clear of people around downed line, notify Fire Dept.	1. FD X223, pole phone located 1000 yds SO. of Calgon Plant.
2. No electrical power to equipment:			
a. Arcing evident.	a. Short in lines or power box.	a. Stay clear, notify Fire Dept.	a. FD X223, pole phone located 1000 yds SO. of Calgon Plant.
b. No power in any position.	b. Open circuit.	b. Set to OFF position, notify Fire Dept.	b. Same as a. above.
3. Arcing across power line or to equipment.	3. Low resistance path formed.	3. Stay clear, notify Fire Dept.	3. Same as 2a above.
4. Circuit breaker or fuse blown in power box.	4. Amperage flow exceeded circuit capacity.	4. Determine cause for tripping of breaker, reset once problem solved.	4. Notify electricians for check, reset at power box.
5. Electrical malfunction of control panel (control panel reading does not reflect true condition).	5. Integrated circuit malfunction.	5. Notify Calgon's Houston Office.	5. Joe Allen, AC 713-682-1301.
6. Other electrical problems not covered in 1-5.		6. Log improper condition as to nature and location, notify Calgon's Houston Office.	6. Same as 5 abv.

CONTINGENCIES IN OR AROUND CALGON PLANT

OBSERVATION	PROBABLE CAUSE	ACTION TO BE TAKEN	AREA OF RESPONSE
Leaks and/or rupture of water lines	Pressure exceeded pipe or seal strength, defective materials.	See 1. below.	See 1. below.
1. Fluid spraying or falling on electrical connections and/or power lines.		1. Shut off power to area, close valves going to and from pipe or vessel, contact Calgon's Houston Office.	1. Power boxes on Calgon Plant East wall and individual equipment switches, Joe Allen, AC 713-682-1301.
2. Fluid spraying or leading on non-hazardous area.		2. Close valves going to and from pipe or vessel, contach Calgon's Houston Office.	2. Joe Allen, AC 713-682-1301.
3. Flooding w/electrical hazard.		3. Shut off power to area concerned, contact Calgon's Houston Office, stop source of flooding.	3. Same as 2 abv.
4. Flooding, no electrical hazard.		4. Contact Calgon's Houston Office, stop source of flooding.	4. Same as 2 abv.
Leaks and/or Ruptures of Airlines			
1. Hissing heard only at high pressures.	1. Minor leak in air lines or fittings.	1. Note location of leak, fix if possible otherwise contact Calgon's Houston Office.	1. Joe Allen, AC 713-682-1301.
2. Continuous hissing, compressor pump runs continuously, tank will not build up pressure.	2. Major leak and/or rupture of air lines and/or tank.	2. Shut off compressor, log extent of damage, contact Calgon's Houston Office.	2. Power box in S.E. corner Calgon plant, Joe Allen AC 713-682-1301.

CONTINGENCIES IN OR AROUND CALGON PLANT

OBSERVATION	PROBABLE CAUSE	ACTION TO BE TAKEN	AREA OF RESPONSE
Leaks and/or Ruptures of Air Lines			
3. Serious rupture of air lines and/or compressor tank.	3. HIgh level shut off activator and safety bypass failures.		
a. With injuries to personnel.	a. Flying metal fragments.	a. Perform immediate First Aid, contact Fire Dept, shut off compressor, contact Calgon's Houston Office.	a. Ray Pimple, FD, X223, Joe Allen, AC 713-682-1301, Power box in S.E. corner Calgon Plant.
b. No injuries to personnel.		b. Shut off compressor, contact Calgon's Houston Office.	b. Power box in S.E. corner Calgon Plant; Joe Allen, AC 713-682-1301.
Fire			
1. In Calgon Plant.	1. Electrical malfunction, breakers fail to operate.	1. Extinguish if possible with proper type of fire extinguisher, otherwise close doors & windows, shut off plant power, contact Fire Dept.	1. Extinguisher on SO wall of Calgon Plant near pumps, Ray Pimple, FD, X223, pole phone 1000 yds SO of plant.
2. Outside or on exterior of Calgon Plant.	2. Lightning, brush fire.	2. Extinguish if possible, otherwise contact Fire Dept.	2. Same as 1.
Other Contingencies			
1. Alarm bell sounds in Plant and/or red light is on in S.E. corner of Calgon Plant, exterior.	1. Filter plugged.	1. Contact plant operator during duty hours or Fire Dept. during non-duty hours. Manual backwash should be performed.	1. Dennis Prusinski, Mike French, X310; Ray Pimple, FD, X223.
Cont'd.			

CONTINGENCIES IN OR AROUND CALGON PLANT

OBSERVATION	PROBABLE CAUSE	ACTION TO BE TAKEN	AREA OF RESPONSE
Other Contingencies			
2. Off-scale reading of Adsorber Differential Pressure (GT 15psi or 100%).	2. Adsorber plugged and/or saturated.	2. Shut off feed sump to plant, shut off dewatering wells, notify plant operator (duty hours) or Fire Dept (non-duty hours).	2. Dennis Prusinski, Mike French, X 310; Ray Pimple, FD, X223.
3. Mechanical damage to plant and/or equipment.			
a. Personal risk likely to occur.	a. Unsafe plant supports, electrical lines shorting, etc.	a. Survey damage at an assured safe distance, notify Fire Dept.	a. Ray Pimple, FD, X223.
b. No personal risk or hazard to be encountered.	b. Windows broke, support of plant equipment loose, small hole in wall, etc.	b. Survey and log damage, notify plant operator or Fire Dept.	b. Note in Calgon Log Book in green cabinet on West wall of Plant, Ray Pimple, FD, X223.
4. Severe weather (tornado, flood, thunderstorm, etc.)	4. Not known.	4. Take Weather Bureau precaution, return upon cessation for damage survey, notify plant operator or Fire Dept.	4. Dennis Prusinski, Mike French, X310; Ray Pimple, FD X223.