



49
9851 13th Ave. North
Plymouth, MN 55441
Phone: 763-746-9900
Fax: 763-746-9903
www.H2Ktech.com

OPERATION & MAINTENANCE MANUAL

For

Milco Environmental Services, Inc.

Project Name

**Air Stripper Skid – Wauneta Palisade School
Wauneta, NE**

H2K Technologies Inc., Project Number #2060

Supplied By
H2K Technologies Inc.
9851 13th Avenue North
Plymouth, MN 55441
(763) 746-9900

H2K Technologies, Inc.

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APPENDICES

The appendix contains detail information relating to specific equipment or sections of the system.



Warranty Terms & Conditions

WARRANTIES: We warrant performance against defects in workmanship for a period of twelve (12) months from date of shipment. We also agree to pass on to the Purchaser any extended warranties by the manufacturer for material supplied. Remedies are limited to the repair and/or replacement of the defective part at H2K Technologies Plant in Plymouth, MN, and do not include freight to and from the point of operation or onsite labor to install or remove the product for service. It is agreed that any action for breach of express or implied warranty shall be initiated within fifteen (15) months of the date of shipment and only those defects that are documented to have occurred within twelve (12) months of shipment will be covered by the warranty. In no event shall H2K Technologies be liable for unintended or consequential damages, including, but not limited to, loss of profits or use damages arising out of the manufacture sale or supplying of the product. The provisions of the warranty are in lieu of any other warranty, whether expressed or implied, written or oral, and H2K Technologies liability arising out of the manufacture, sale or supplying of the product and its use, whether based on warranty, contract, negligence, product liability or otherwise shall not exceed the original cost of the defective product.

Section 1. System / Equipment Description

This manual contains important information about the equipment H2K Technologies, Inc has supplied for this project. Specific operation and maintenance information for individual components or systems can be found in the numbered sections. If additional information is required, please call.

The appendices contain the original equipment manufacturers' operation and maintenance manuals, specification sheets, modeling, etc.

Equipment Description:

The below is a list of equipment supplied by H2K Technologies Inc. for this project, more specific information on most of these items can be found in numbered sections of the manual.

Diffused Aeration Tank

(1) H2K Technologies model DTA 4 Diffused Aeration Tank, each including:

304 Stainless steel welded construction

(4) Aeration chambers

(8) Non-fouling 304 Stainless Steel aeration diffusers

Quick connections for easy lateral removal

Counter current water and air flow to provide maximum flow path across each aeration chamber

(1) Hinged 304 Stainless steel covers with prop supports

provides easy access to aeration chambers and diffusers

Off gas nozzle with polypropylene demister element

(1) Pump out clearwell

(1) New York Bower centrifugal blower, model 2303A

320 cfm @ 35" wc

7.5 hp, 230/460VAC 3 ph, EXP motor

Steel blower housing with aluminum wheel

Interconnecting ducting to diffused air inlet

Air flow meter on blower inlet, Dwyer DS-300 with Magnehelic gage, scfm

Site glass with ss high/high-high-low pump out level switches

Low blower pressure switch

Pressure gage on sump vapor space

Note:

1. Diffused stripper will treat 80 gpm water with 200 ppb Benzene to less than 40 ppb and 1000 ppb Xylene to less than 400 ppb.

(1) Control System

For operation on 120/208 volt, 3Ø, 4 wire incoming electrical service. To control (1) 7.5HP DTA Blower, (2) 3HP well pumps and (1) 3HP DTA Transfer Pump. Furnished loose for mounting and wiring by others. To include:

QTY DESCRIPTION

- | QTY | DESCRIPTION |
|-----|---|
| 1 | Enclosure, NEMA 4, 36"h, 30"w, 12"d with inner door mounted switches and indicators |
| 1 | Power distribution terminal block (65-335A) 3 pole; L1, L2, L3 |
| 1 | Power distribution terminal block, 1 pole; Neutral |
| 1 | Motor starter: Contactor 32A FLA/Overload relay 23-32A, 3Ø; DTA blower |
| 2 | Motor starter: Contactor 25A FLA/Overload relay 9-13A, 3Ø; well pumps |
| 1 | Motor starter: Contactor 25A FLA/Overload relay 9-13A, 3Ø; DTA Transfer Pump |
| 1 | Circuit breaker 230V 2P30A; Air Compressor Power Feed |
| 2 | Circuit breaker 120V 1P5A 10K; control power, wall vent fan |
| 1 | Circuit breaker 230V 1P20A 10K; EXP Vent Fan |

- 2 Circuit breaker 230V 2P20A 10K; Heaters
- 1 Circuit breaker 230V 3P50A 10K; DTA Blower
- 2 Circuit breaker 230V 3P20A 10K; well pumps.
- 1 Circuit breaker 230V 3P20A 10K; DTA Transfer Pump
- 2 Circuit breaker 120V 1P10A 10K; Light Fixtures, 1/4HP EXP Vent Fan
- 4 Switch; three position; Hand-Off-Auto, with Integral Run (green/LED) indication
- 2 Light (red/LED); alarms
- 1 Pushbutton (red/NC); alarm Reset
- 2 Intrinsically safe relay, two channel
- 2 Intrinsically safe pump down relays
- Relay and timer logic as required
- Interlocks to skimmer
- Engraved laminated legends for all door mounted devices
- Terminal blocks for external connections and fusing as required
- Color-coded wiring with wire markers at all terminations
- Fully documented, assembled, wired, programmed and pre-shipment test
- 1 UL 698A serialized label
- 2 (Sets 25') Downwell conductivity probes, common, low and high for each well

(1) Discharge pump, Meyers CT-25 end suction centrifugal pump

80 gpm @ 52' TDH

Cast iron bronze fitted

3 HP, 230/460VAC, 3Ø, EXP motor

Check valve, throttle valve and pressure gage on pump discharge

(1) Skid 6'x6'x4" high, with above equipment mounted and wired to the extent possible

4" C-channel base with 3/16" steel deck, enamel paint finish

Includes equipment installation & piping to the extent possible

Equipment will be piped with schedule 80 PVC piping

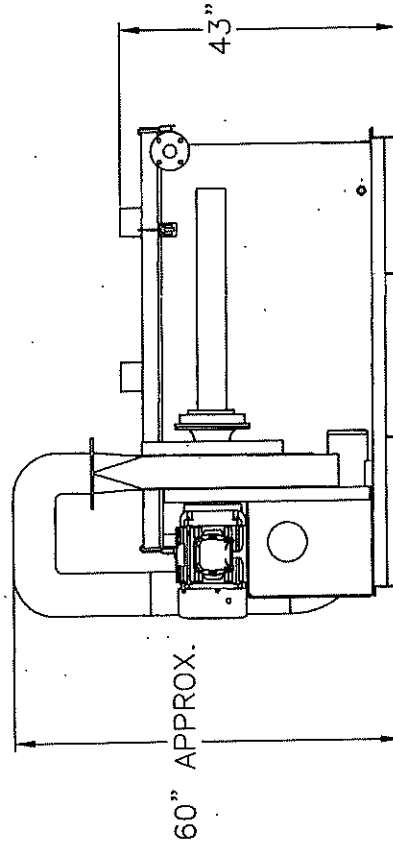
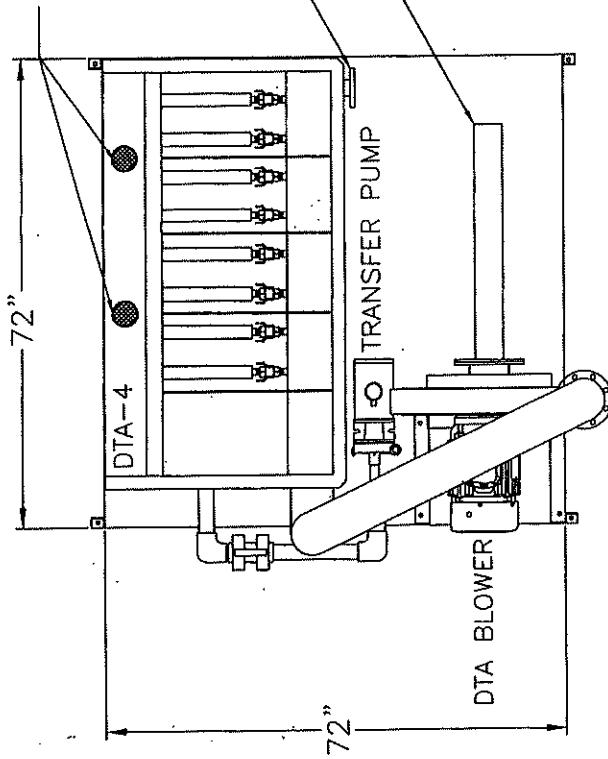
Section 2. Mechanical Drawings:

Contains any H2K Technologies Inc. generated drawings

(2) 4" AIR DISCHARGE PIPE
STUBS, TEE TOGETHER AND
CONNECT WITH MINIMUM 6"
PIPE

2" WATER INLET

4" PVC PIPE WITH
AIR FLOW SENSOR,
CONNECT WITH
MINIMUM 6" PIPE

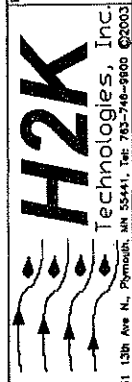


REVISIONS

NO.	DATE	BY	DESCRIPTION

UNLESS SPECIFIED OTHERWISE
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DRAWN BY: MK
DESIGNED BY: GH
PROJECT NO.: 2060
DATE: 7/25/08
PROJECT NO.: 2060

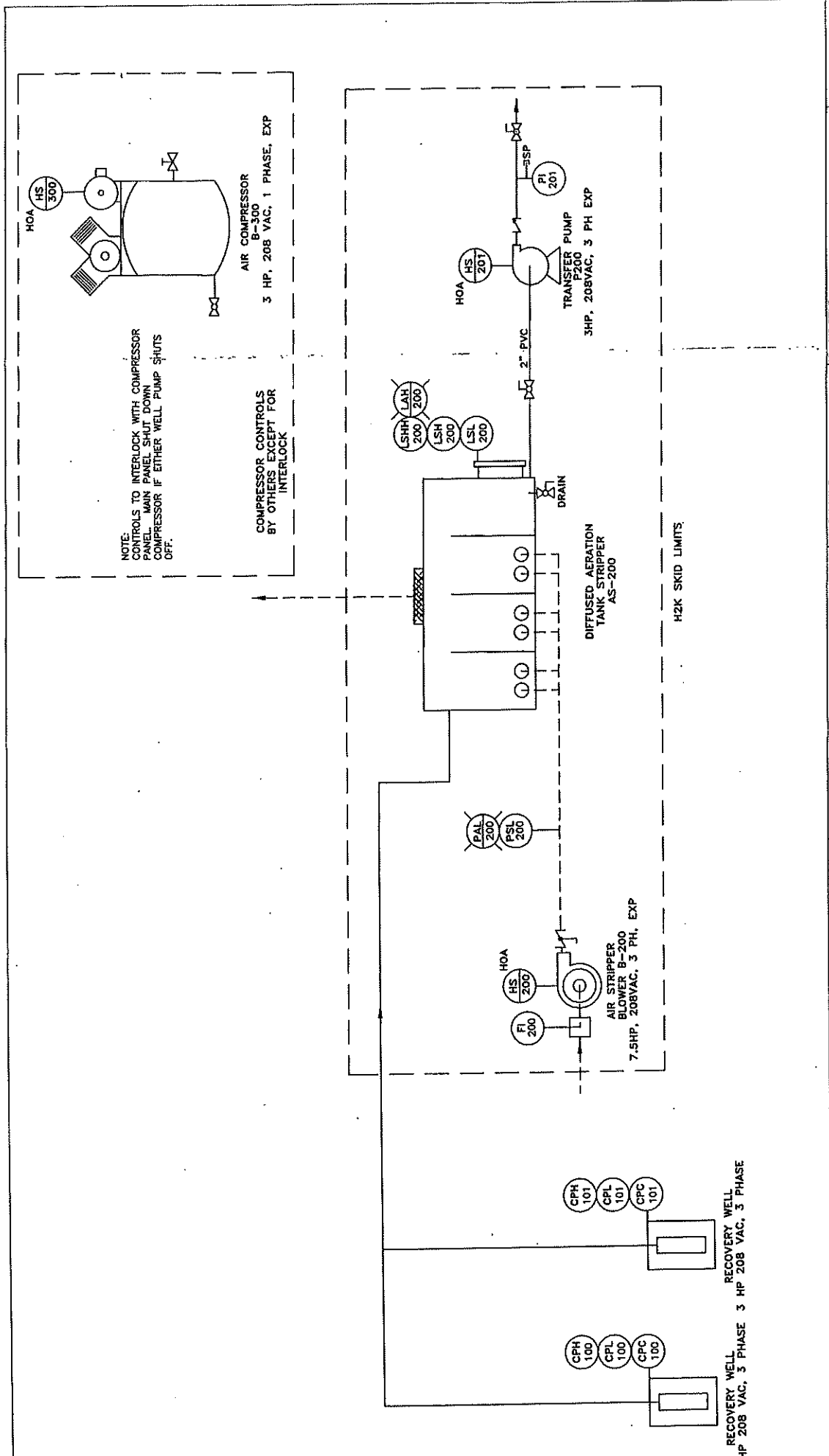
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PROJECT TITLE:
MILCO ENVIRONMENTAL
VAUNETTA PALLISADE
SCHOOL
VAUNETTA, NE

DRAWING TITLE:
LAYOUT DRAWING

SHEET 1 OF 1
DRAWING NO.:
2060-01



REVISIONS		UNLESS SPECIFIED BY REVISE		SHEET 1 OF 1	
DATE	BY	DESCRIPTION	DATE	BY	DRAWING NO.
	HW				2060-02
	GH				
	MH				
	DA				
PROJECT NO. 2060				DRAWING TITLE	
PROJECT TITLE:				MILCO ENVIRONMENTAL	
				WAUNETA PALISADE	
				SCHODD	
				WAUNETA, NE	
				H2K Technologies, Inc.	
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Section 3. Control Panel Schematic & Description:

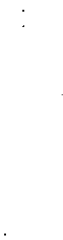
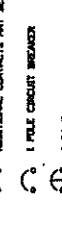
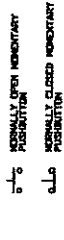
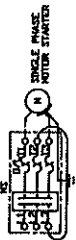
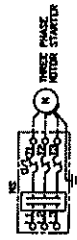
Contains the Control Panel Schematic, Operation Description of the control system and Alarm Schedule.

MILCO-WAUNETA, NE/#2060

STANDARD CONTROL PANEL SYMBOLS AND NOTES

WIRING COLORING & NOTES
 1 RED
 2 BROWN
 3 WHITE
 4 BLACK
 5 BLUE
 6 GREEN
 7 YELLOW
 8 PURPLE
 9 PINK
 10 GREY
 11 SILVER
 12 GOLD
 13 COPPER
 14 BRASS
 15 ALUMINUM
 16 STEEL
 17 ZINC
 18 LEAD
 19 TIN
 20 SOLDER
 21 WAX
 22 GLASS
 23 PAPER
 24 FABRIC
 25 RUBBER
 26 PLASTIC
 27 WOOD
 28 METAL
 29 OTHER

WIRING IDENTIFICATION
 1 120V AC
 2 240V AC
 3 480V AC
 4 120V DC
 5 240V DC
 6 480V DC
 7 120V 50/60 Hz
 8 240V 50/60 Hz
 9 480V 50/60 Hz
 10 120V 50/60 Hz
 11 240V 50/60 Hz
 12 480V 50/60 Hz
 13 120V 50/60 Hz
 14 240V 50/60 Hz
 15 480V 50/60 Hz
 16 120V 50/60 Hz
 17 240V 50/60 Hz
 18 480V 50/60 Hz
 19 120V 50/60 Hz
 20 240V 50/60 Hz
 21 480V 50/60 Hz
 22 120V 50/60 Hz
 23 240V 50/60 Hz
 24 480V 50/60 Hz
 25 120V 50/60 Hz
 26 240V 50/60 Hz
 27 480V 50/60 Hz
 28 120V 50/60 Hz
 29 240V 50/60 Hz
 30 480V 50/60 Hz



TERMINAL IN PANEL
 MOTOR CONTACTOR
 GREEN PILOT LIGHT
 RED PILOT LIGHT
 WHITE PILOT LIGHT
 AMBER PILOT LIGHT
 CONTROL TIMER
 CONTROL RELAY
 ELAPSED RUN TIMER METER
 FLIGHT SWITCH CLOSING ON RISING LEVEL
 FLIGHT SWITCH OPENING ON RISING LEVEL
 PRESSURE SWITCH CLOSING ON RISING PRESSURE
 PRESSURE SWITCH OPENING ON RISING PRESSURE
 TEMPERATURE SWITCH CLOSING ON RISING TEMPERATURE
 TEMPERATURE SWITCH OPENING ON RISING TEMPERATURE
 TIME DELAY CLOSING AFTER TIME SET
 TIME DELAY OPENING AFTER TIME SET
 NORMALLY OPEN CONTACT
 NORMALLY CLOSED CONTACT

FIELD WIRING
 MULTI-POSITION ON/OFF BLOCK

SYSTEM LOAD ANALYSIS		L1	L2	L3	N
120V AC	1.0	100	100	100	100
240V AC	2.0	200	200	200	200
480V AC	4.0	400	400	400	400
120V DC	1.0	100	100	100	100
240V DC	2.0	200	200	200	200
480V DC	4.0	400	400	400	400
CONTROL POWER	0.5	50	50	50	50
120V AC	1.0	100	100	100	100
240V AC	2.0	200	200	200	200
480V AC	4.0	400	400	400	400
120V DC	1.0	100	100	100	100
240V DC	2.0	200	200	200	200
480V DC	4.0	400	400	400	400
CONTROL POWER	0.5	50	50	50	50
120V AC	1.0	100	100	100	100
240V AC	2.0	200	200	200	200
480V AC	4.0	400	400	400	400
120V DC	1.0	100	100	100	100
240V DC	2.0	200	200	200	200
480V DC	4.0	400	400	400	400
CONTROL POWER	0.5	50	50	50	50
120V AC	1.0	100	100	100	100
240V AC	2.0	200	200	200	200
480V AC	4.0	400	400	400	400
120V DC	1.0	100	100	100	100
240V DC	2.0	200	200	200	200
480V DC	4.0	400	400	400	400
CONTROL POWER	0.5	50	50	50	50
120V AC	1.0	100	100	100	100
240V AC	2.0	200	200	200	200
480V AC	4.0	400	400	400	400
120V DC	1.0	100	100	100	100
240V DC	2.0	200	200	200	200
480V DC	4.0	400	400	400	400
CONTROL POWER	0.5	50	50	50	50
120V AC	1.0	100	100	100	100
240V AC	2.0	200	200	200	200
480V AC	4.0	400	400	400	400
120V DC	1.0	100	100	100	100
240V DC	2.0	200	200	200	200
480V DC	4.0	400	400	400	400
CONTROL POWER	0.5	50	50	50	50
120V AC	1.0	100	100	100	100
240V AC	2.0	200	200	200	200
480V AC	4.0	400	400	400	400
120V DC	1.0	100	100	100	100
240V DC	2.0	200	200	200	200
480V DC	4.0	400	400	400	400
CONTROL POWER	0.5	50	50	50	50

H2K

MILCO-WAUNETA, NE
 SCHEMATIC CONTROL PANEL

PROJECT TITLE
 MILCO-WAUNETA, NE

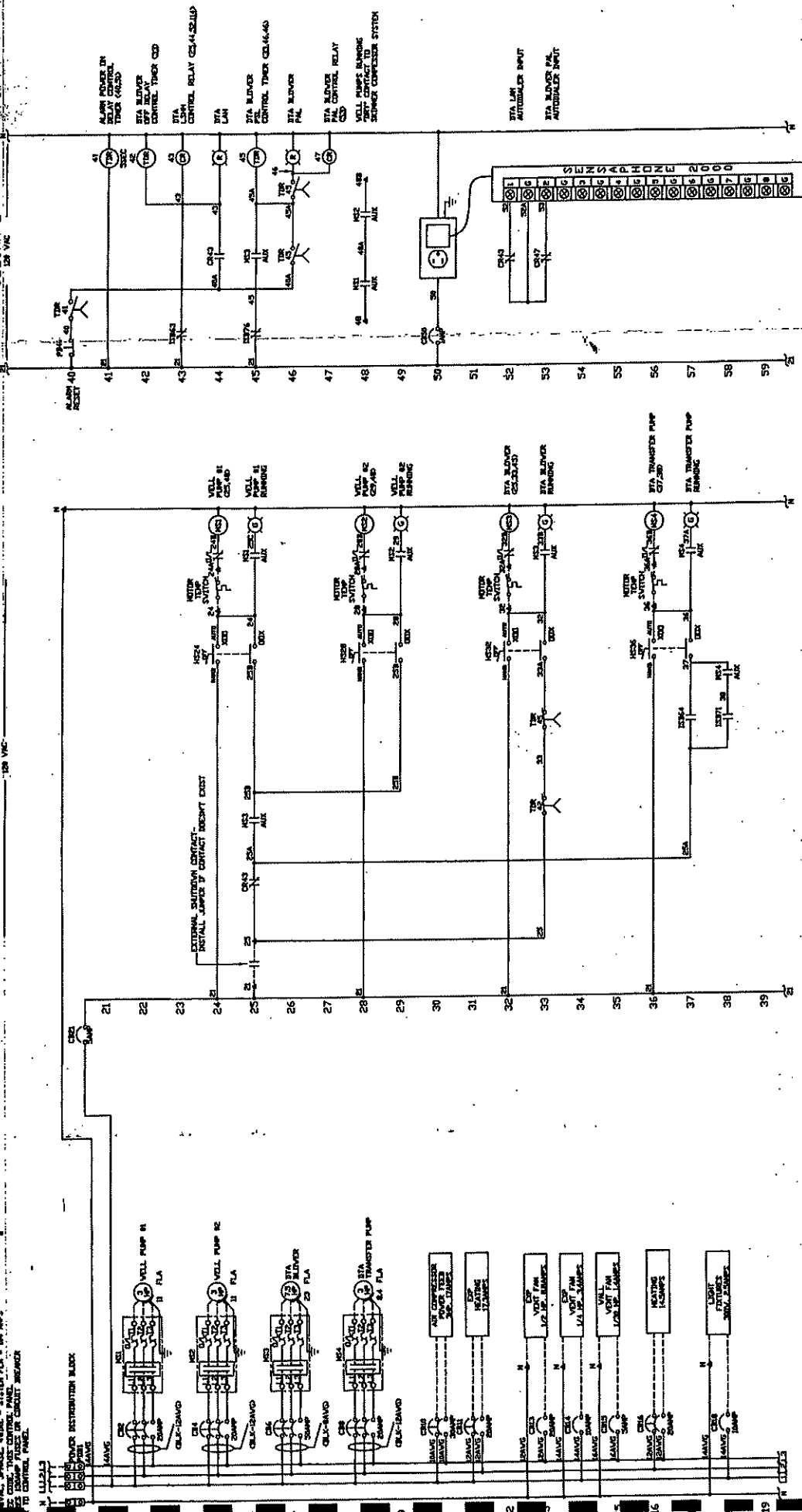
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SYMBOLS AND NOTES
 1 TERMINAL IN PANEL
 2 MOTOR CONTACTOR
 3 GREEN PILOT LIGHT
 4 RED PILOT LIGHT
 5 WHITE PILOT LIGHT
 6 AMBER PILOT LIGHT
 7 CONTROL TIMER
 8 CONTROL RELAY
 9 ELAPSED RUN TIMER METER
 10 FLIGHT SWITCH CLOSING ON RISING LEVEL
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 14 TEMPERATURE SWITCH CLOSING ON RISING TEMPERATURE
 15 TEMPERATURE SWITCH OPENING ON RISING TEMPERATURE
 16 TIME DELAY CLOSING AFTER TIME SET
 17 TIME DELAY OPENING AFTER TIME SET
 18 NORMALLY OPEN CONTACT
 19 NORMALLY CLOSED CONTACT
 20 FIELD WIRING
 21 MULTI-POSITION ON/OFF BLOCK

COMING POWER SUPPLY

COLUMN 1

COLUMN 2



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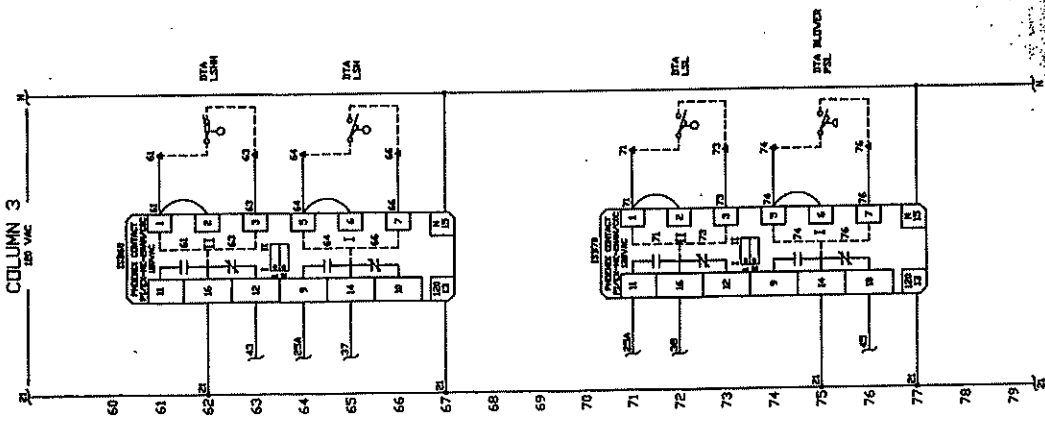
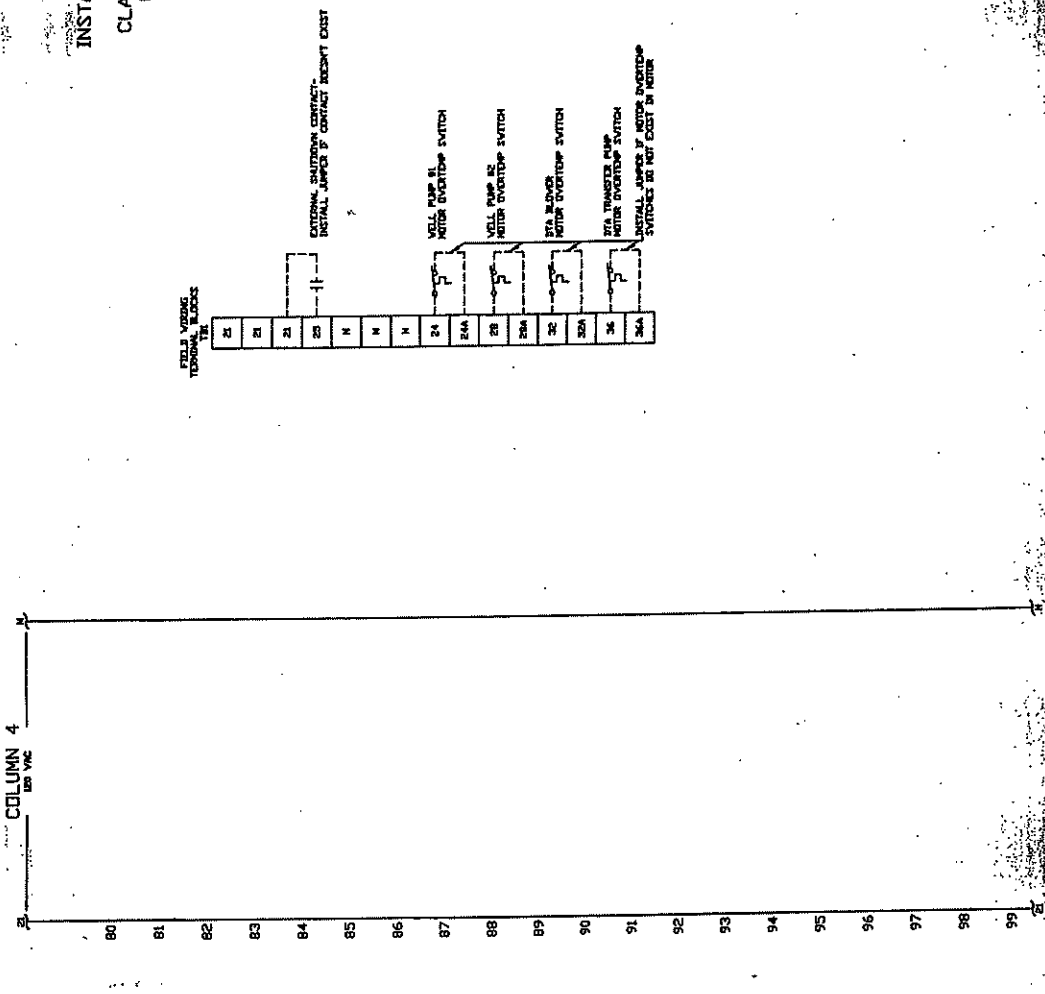


PROJECT TITLE: **MILCO WAUNATIA, NE**

DATE: **2060 22**

PROJECT NO. **2060 22**

INSTALL IN ACCORDANCE WITH ARTICLE 504 OF THE NEC CODES
 CLASSIFIED AREA IS CLASS I DIV 2
 GROUP D HAZARDOUS LOCATION



H2K
 TECHNOLOGIES, INC.
 10000 W. 16th Ave., Suite 100, Denver, CO 80202
 (303) 751-1000
 www.h2ktechnologies.com

PROJECT FILE:
MILCO WAUNETTA INE

SHEET NO. OF 23
2060-23

SCHEMATIC CONTROL PANEL

Section 4. Installation, Start-up & Shut-down Procedures

Contains general installation instructions, start up and shut down procedures.

Before starting any system, thoroughly inspect the system for signs of damage. Use the provided P&ID to verify that the system has been connected correctly. Then, read the start up procedure before proceeding.

Start-Up Procedure:

- Verify the system is properly secure.
- Verify that all influent and effluent connection have been made, and open all valves to ensure that there are no restrictions on the blower.
- Turn on power to the control panel. If any lights come on press the reset button and the alarms should clear. If not, check the switches and controls to determine the problem.
- Verify the power leads are properly wired to the motor. **Incorrect voltage or improper wiring will ruin the motor**

Control Panel 3 ϕ , 208V

WARNING! – Do not power the panel until this procedure is complete. Damage to the panel may result.

- Switch the disconnect to the “OFF” position and open the inner door. Verify that the inner door disconnect is in the off position.
- Switch on the main incoming power to the panel. **CAUTION!** - The disconnect now has power!
- Confirm that incoming power is 208 V on all three phases. If the incoming power has a “high leg” (a four wire delta system), measure the voltage from each leg to ground. It is critical that L1 and L3 to ground be 120 volts. Power for the control panel is taken from either L1 or L3. If the high leg (usually L2, 208V) is wired in the L1 or L3 position, the panel may be damaged upon powering the system.
- It is best to record the initial readings of the system for trouble shooting purposes later. Record the following operating conditions:

L1 to ground	_____	V
L2 to ground	_____	V
L3 to ground	_____	V
L1 to L2	_____	V
L1 to L3	_____	V
L2 to L3	_____	V

- Be sure that all circuit protectors are reset.
- Close the inner door. Make sure that all of the green HOA's (Hand-Off-Auto) are in the “OFF” position. Turn the inner disconnect to the “ON” position. The panel should have power. All of the alarm lights may be lit depending on the panel. If so, press the “RESET” button. If the alarms will not reset, an alarm may be tripped. (See section “B” for details.)

- Rotation needs to be verified on all motors. To do so, bump any motor holding the HOA in the "HAND" position for no more than a second. Rotation arrows are located most pieces of equipment.
- If rotation is backwards, have an electrician exchange the incoming power leads L1 and L3. Be sure to lock out and tag the main incoming power. Verify that there is no power with a multimeter.

Centrifugal Pump

- Ensure that all valves up stream on the pump are open. Valves up stream should never be used to throttle the pump. All valves located up stream of a pump are strictly isolation valves for servicing the pump. Close all sample taps.
- Verify the power leads are properly wired to the blower motor. **Incorrect voltage or improper wiring will ruin the motor.**
- Bump the pump to verify rotation by holding the PUMP HOA in the "HAND" position for no more than a few seconds. Rotation arrows are located on the pump to signify proper rotation.
- If rotation is backwards, have an electrician exchange two of the power leads. **Be sure to lock out and tag the main incoming power. Verify that there is not power at the motor with a multimeter.**
- Prime the pump.
- If there is a suction head requirement on the pump inlet due to elevation, the pump may be primed by open the top plug and adding water until full.
- If there is a suction head requirement due to a mechanical vacuum, the pump may be primed by turning off the source of the vacuum. Water should gravity feed into the pump.
- If there is a positive suction head, the pump should self-prime.
- Test the prime. Run the pump for a few seconds to verify that water is flowing through the pump at a constant rate and pressure. If not, repeat the above steps.
- Put the Pump HOA in the "AUTO" position. Throttle the pump to the desired flow.
- It is best to record the initial readings of the system for trouble shooting purposes later. Record the following operating conditions:

PUMP motor amp draw _____

PUMP pressure _____

PUMP flow rate _____

Deadhead pressure (pressure w/pump effluent valve closed) _____

Notes: Depending on the interlock schedule, the pump may not run until all of the appropriate alarms have been cleared and the correct pieces of equipment enabled.

DTA – Diffused Aeration Tank Stripper

Please review the below for recommend operating flow rates. The correct flow rate for your system will be determined by the contaminate levels you are treating.

DTA-2	DTA-3	DTA-4	DTA-6	DTA-8	DTA-10
1-80 GPM 100-160	1-80 GPM 150-240	1-80 GPM 200-320	1-80 GPM 300-480	1-80 GPM 400-640	1-80 GPM 500-800

CFM	CFM	CFM	CFM	CFM	CFM
-----	-----	-----	-----	-----	-----

- Verify that all influent and effluent connection have been made, and open all inlet, outlet, and bleed valves to ensure that there are no restrictions on the blower. Close all sample taps.
- Verify the power leads are properly wired to the blower motor. **Incorrect voltage or improper wiring will ruin the motor.**
- Bump the blower to verify rotation by holding the DTA blower HOA in the "HAND" position. Rotation arrows are located on the blower to signify proper rotation.
- If rotation is backwards, have an electrician exchange two of the power leads. **Be sure to lock out and tag the main incoming power. Verify that there is not power at the motor with a multimeter.**
- Once rotation has been confirmed to be correct, put the DTA blower HOA in the "AUTO" position to start the blower. Let the blower run with no load for a few minutes. If the system has a bleed valve, close the bleed valve.
- Introduce water into the system.
- It is best to record the initial readings of the system for trouble shooting purposes later. Record the following operating conditions:

DTA tank blower pressure _____

DTA Blower motor amp draw _____

DTA back pressure, if there is off gas treatment _____

Air flow rate, if a meter is available _____

Water flow rate, if a meter is available _____

Notes: Depending on the interlock schedule, the blower may not run in "Auto" until all of the appropriate alarms have been cleared and the correct pieces of equipment enabled.

SHUT DOWN PROCEDURES:

CAUTION! – When disabling any motor or piece of equipment be certain that all source of power and fluid have been locked out and tagged.

DTA Tank

Be sure all sources of water are disabled.
Let system blower continue to run for 10 minutes.
Disable blower.
Remove all remaining water in the tank

Transfer Pump

Disable pump.
Drain pump head and all inlet and effluent lines.

Section 5. Maintenance Schedule

These forms should be used as a guide for general maintenance items. The recommended maintenance intervals are based upon past experience with the equipment and equipment manufactures' literature. It is important to use discretion when implementing the maintenance schedule. Unforeseen operating condition may require additional maintenance.

Maintenance Schedule

Recommend frequency	Task	Comment
---------------------	------	---------

Air Stripper

As Needed	Clean trays, and demister	Depending on the amount of hardness in the water. An initial inspection of the trays is suggested after the two to three weeks. If the differential pressure across the unit exceeds 7" of water pressure per tray, the system should be cleaned.
	Clean site glass and level assembly	Depending on the amount of hardness in the water. If the site glass every becomes rust colored, the site glass should be cleaned.
	Blower filter cleaning or replacement	Depending on air quality conditions
Yearly	Grease blower motor bearings with NLGI #2. Grease, if applicable.	

Centrifugal Pump

6 months/Yearly	Disassemble, inspect, and clean impeller housing, and rotor	May require service more often based on the site operating conditions
Yearly	Grease motor with NLGI #2, if applicable.	

Section 6 Trouble Shooting Guide:

Any time the system will not run and there is not an alarm condition present, verify the following:

1. All alarm lights are functioning. To test the lights, press the alarm light to verify if the bulb is functional.
2. All circuit protectors are reset. Open the inner door and reset any circuit protectors that may have been tripped. A tripped circuit protect may indicate a problem with the system. Inspect the system for abnormal conditions.
3. All of the inter locks have been properly installed.
 - On the control panel terminal strip, verify that the 201-202 interlock is a closed circuit.
 - Verify that all motor temperature switches are wired. Some motors have internal temperature switches that do not require external connection. If a motor has internal temperature switches, the provided space in the panel for external temperature switches must be wired to close the circuit.
 - If the provided panel requires an upstream or a downstream enable, verify that the enable is present and wired correctly.

For all other troubleshooting refer to the following table:

System Problem	Possible cause	Solution
----------------	----------------	----------

Low Profile Air Stripper

Water in air discharge line	Water flow rate too high	Verify water flow rate conditions and adjust flow rate accordingly
	Air flow rate too high	Verify airflow rate conditions and adjust flow rate accordingly.
	Foaming	Contact H2K for a foaming test kit.
High Pressure Drop Pressure in the unit exceeds the recommended maximum (9" H ₂ O per tray).	Water flow rate too high	Verify water flow rate conditions and adjust flow rate accordingly
	Air flow rate too high	Verify airflow rate conditions and adjust flow rate accordingly.
	Excessive effluent pressure	Verify operating condition. Ensure that there is not excessive backpressure on the unit, (i.e. reduced pipe sizes, fouled Carbon bed, or fouled CATOX.)
	Trays fouled	Inspect and clean trays
Leaky Gaskets	Pressure drop too high	See High Pressure Drop section
	Damaged gaskets	Replace leaky gasket

Transfer Pump

Pump will run with the selector switch in "hand", but not "auto"	Alarm condition is active	Clear any alarm condition and reset the control panel.
	Pump down latch not active	Allow sump to fill until the high level switch activates the pump.

System Problem	Possible cause	Solution
Pump will not run when the operator turns the switch on "hand" or "auto"	Circuit protection is tripped	Reset overload protection. Try restarting the blower. Since the overload tripped, there might still be a problem in the system. Try to determine what caused the overload to trip.
	Motor temperature switch is Open	The motor might have an internal motor temperature switch. Check to see that it was wired. If not, it needs to be wired into the logic of the controls. If it was wired, the motor might have gotten too hot. Try restarting the blower and monitor it to see if it opens again. If it does, there is either a problem with the motor or the system causing the motor to overheat.
	Alarm condition occurs, or a system enable is not active.	Verify what alarm is active or what system enable is not active. Even if the panel doesn't show there is an alarm, there might be a light bulb burnt out which would normally display the alarm condition. There needs to be a jumper from terminal 21 to terminal 25 if an upstream enable is not present.
Pump operating at reduced performance	Incorrect pump rotation	Verify and change rotation
	Pump restricted	Inspect and clean all influent lines, pump head and effluent lines.
	Rotor is worn	Replace the rotor
Pump leaking	Shaft seal worn, cracked housing	Replace shaft seal, inspect housing and fittings

DTA Blower (Diffused Aeration Tank Blower)

Blower will run in "HAND" but not in "AUTO"	Alarm condition	Clear any alarm condition and reset the control panel. See "Section 3" for alarm interlocks.
Blower will not run in the "HAND" position	Tripped circuit protector	Open the inner door and reset the circuit protector. A tripped circuit protect can be an indication of a problem. Inspect the system thoroughly and check the operating conditions.
	Motor temperature switch is inoperative	Check to see that the motor temperature switch has been wired, or that there is a jumper, if a switch is not present.
	Faulty Blower	Refer to Appendix or contact H2K Tech for help in diagnosing faulty blower.
Blower runs at a reduced performance	Incorrect blower rotation	Verify and change rotation
	Inlet filter fouled	Clean or replace inlet filter
	Excessive effluent pressure	Check for fouled air distributors



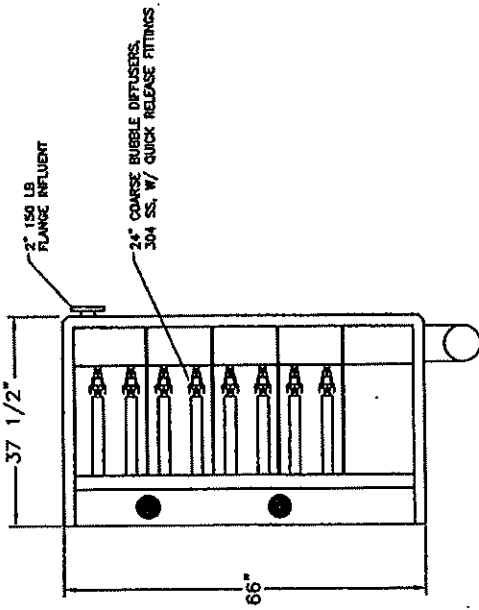
9851 13th Ave. North
 Plymouth, MN 55441
 Phone: 763-746-9900
 Fax: 763-746-9903
www.H2Ktech.com

Diffused Tank Aerator Model Calculations
 12/13/2006 17:17

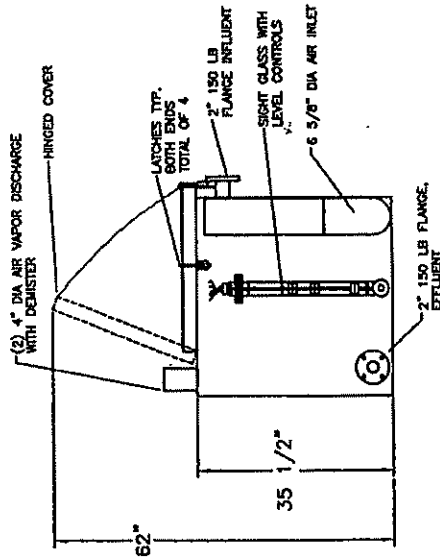
Water flow Rate (GPM) 80 Air Temperature (F) 55
 Water Temperature (F) 55 Safety Factor (%) 0

Compound DTA Model	Influent Conc (ug/l)	Effluent Conc (ug/l)	Removal Efficiency (%)	Off-Gas Conc (ug/l)	Off-Gas Emmissions (lb/day)	Airflow (cfm)
Benzene						
DTA-2	200	78	60.97	8.15	0.117	160
DTA-4	200	30	84.77	5.66	0.163	320
DTA-6	200	12	94.05	4.19	0.181	480
DTA-8	200	5	97.68	3.26	0.188	640
DTA-10	200	2	99.09	2.65	0.191	800
DTA-12	200	1	99.65	2.22	0.192	960
DTA-16	200	1	99.95	2.23	0.192	1280

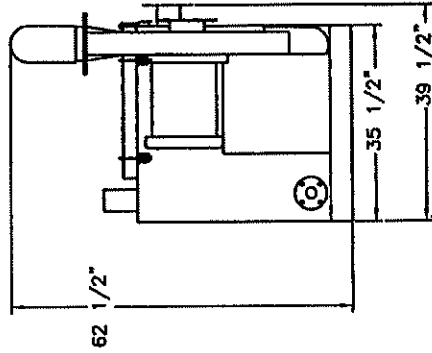
Compound DTA Model	Influent Conc (ug/l)	Effluent Conc (ug/l)	Removal Efficiency (%)	Off-Gas Conc (ug/l)	Off-Gas Emmissions (lb/day)	Airflow (cfm)
Xylene						
DTA-2	1,000	406	59.40	39.69	0.571	160
DTA-4	1,000	165	83.52	27.91	0.803	320
DTA-6	1,000	67	93.31	20.78	0.897	480
DTA-8	1,000	27	97.28	16.25	0.935	640
DTA-10	1,000	11	98.90	13.22	0.951	800
DTA-12	1,000	4	99.55	11.09	0.957	960
DTA-16	1,000	1	99.93	11.13	0.961	1280



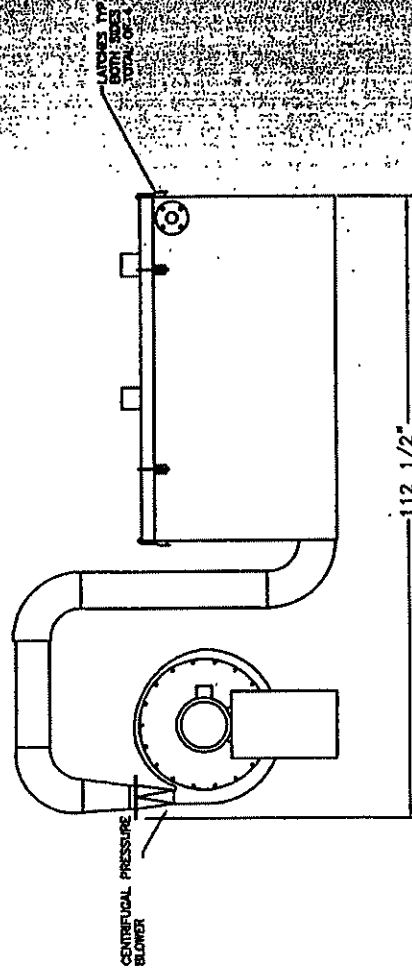
AERATOR TANK PLAN VIEW



AERATOR TANK END VIEW



SYSTEM END VIEW



SYSTEM RIGHT SIDE VIEW

REV	DATE	BY	DESCRIPTION

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SALES

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**DTA-4 Diffused Tank
 Aerator
 Plot & Elevation Drawing**

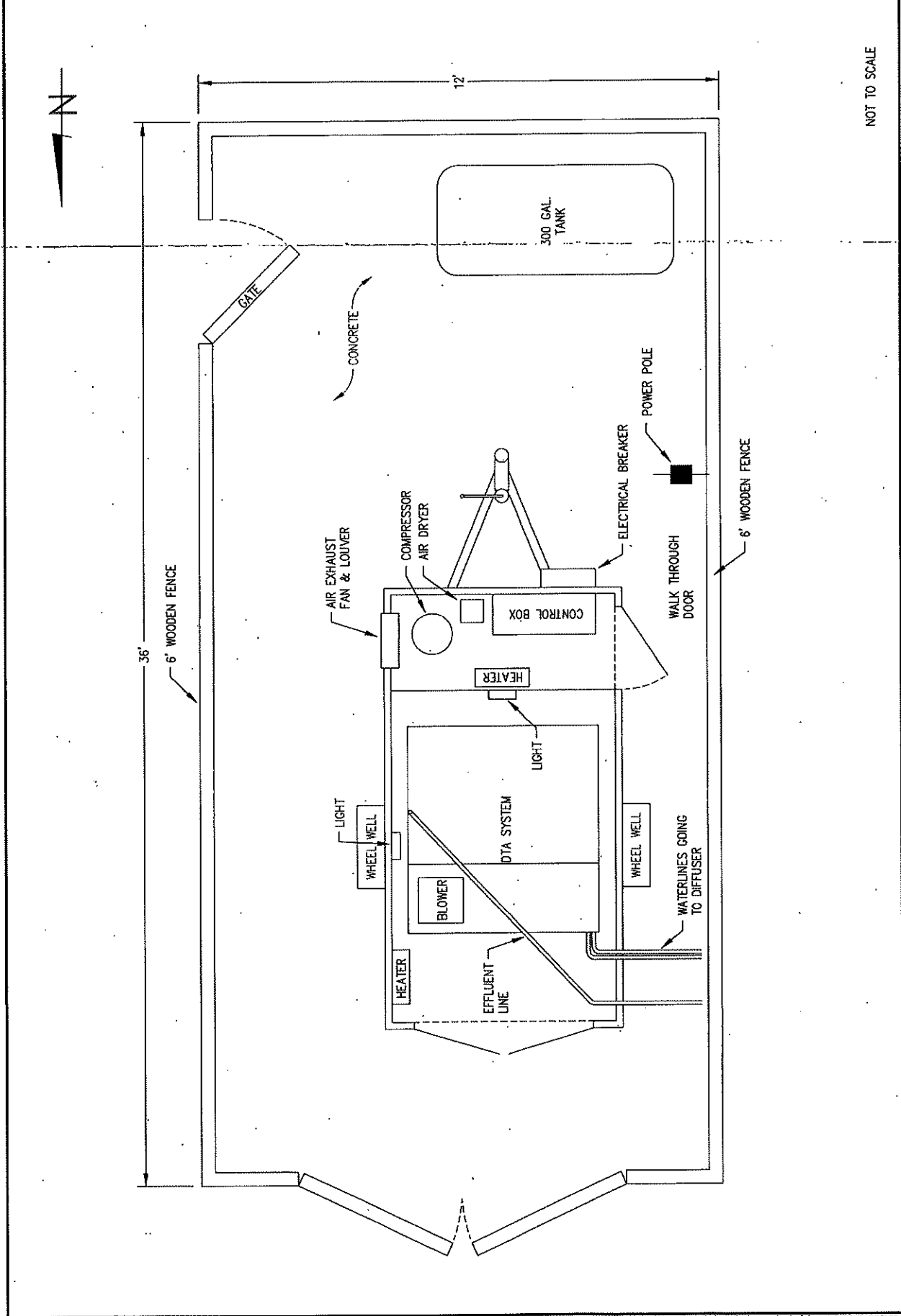
SHEET NO. 1 OF 1
DTA-4-SLS

MILCO
 Environmental
 Engineering, Inc.
 10000 N. 100th St.
 Omaha, NE 68137
 PHONE: 402-426-4242
 FAX: 402-426-4243

**WAUNETA/PALISADE SCHOOLS
 REMEDIAL TRAILER
 WAUNETA, NEBRASKA**

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FIGURE 7



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REVISIONS

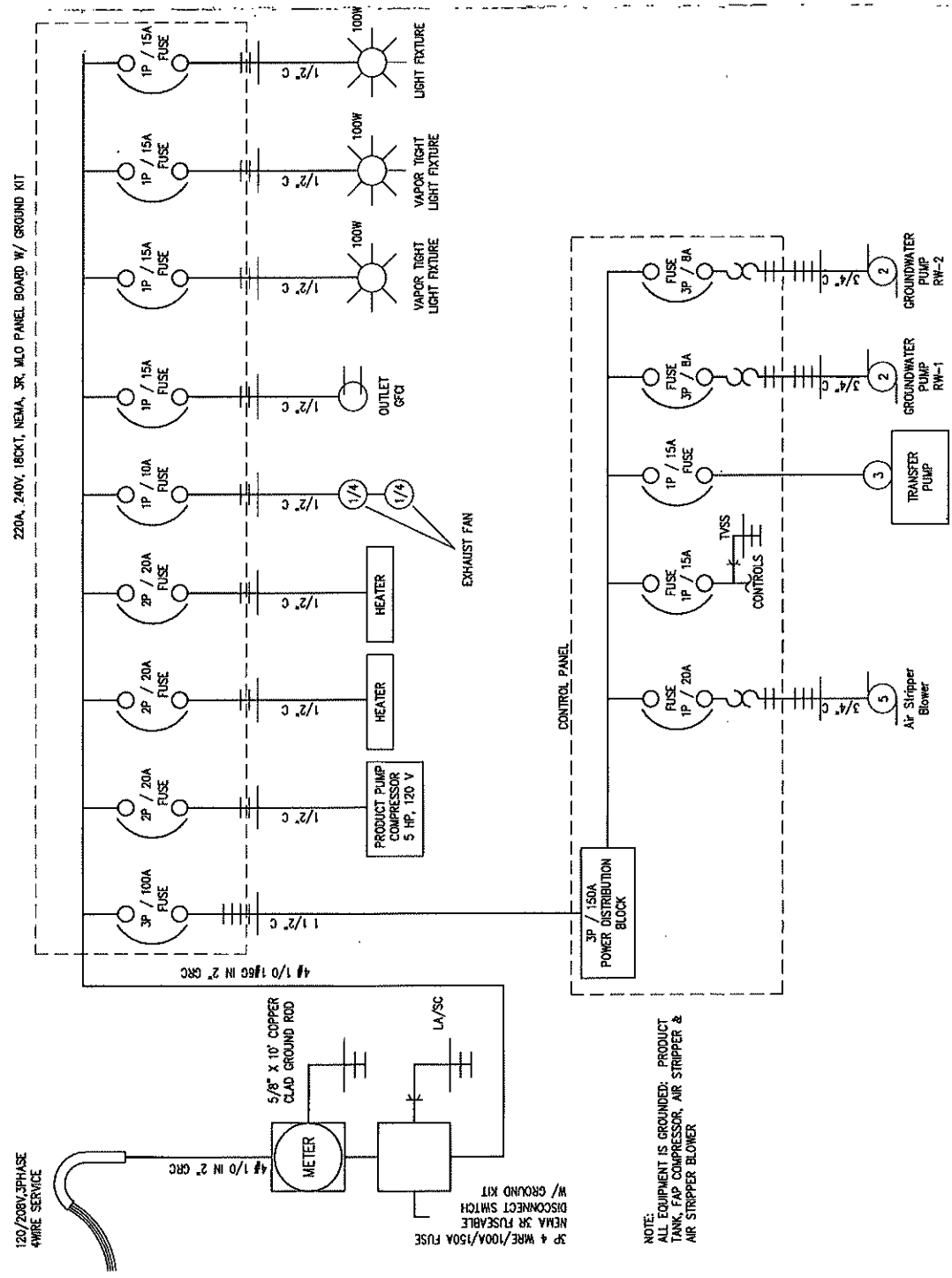
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FIGURE 5

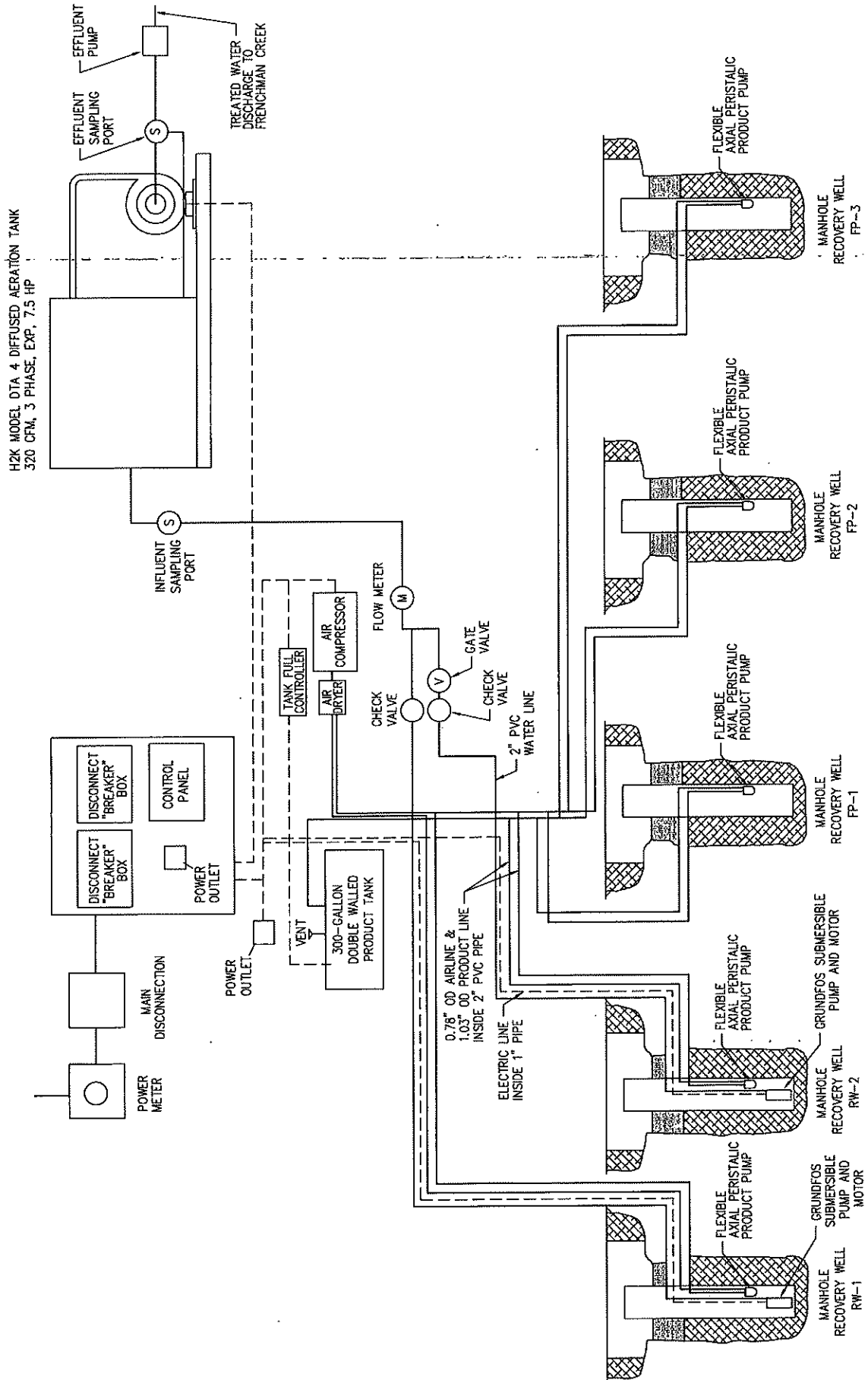


NOTE:
ALL EQUIPMENT IS GROUNDED: PRODUCT
TANK, FAP COMPRESSOR, AIR STRIPPER &
AIR STRIPPER BLOWER

MILCO
Manufacturing
Services, Inc.
Normal, NE 68601-2800
Normal, NE 68601-2800
Normal, NE 68601-2800

**WAUNETA/PALISADE SCHOOLS
PRODUCT RECOVERY P. & I.D.**
WAUNETA, NEBRASKA

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CHECKED BY:	J. L. WILSON
DATE:	3/11/08
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FIGURE NO.:	5



PROCESS AND INSTRUMENTATION DIAGRAM