

## **Appendix D**

**Silo Water Treatment and Discharge Work Plan,  
October 11, 2017**

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# **Silo Water Treatment and Discharge Work Plan**

**Closure of Underground Nike Missile Silos – Defense Battery BU-34/35  
East Aurora and Orchard Park, New York**

**Contract No. W912WJ-16-C-0023**

***Prepared for:***  
**USACE – New England District**  
**696 Virginia Road**  
**Concord, MA 01742-2751**

***Prepared by:***



**54 Mason Street**  
**Worcester, Massachusetts 01610**  
**508.752.5599 | [www.TantaraCorp.com](http://www.TantaraCorp.com)**

**11 October 2017**

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## **Silo Water Treatment and Discharge Work Plan**

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TANTARA Corporation has been contracted by the US Corps of Engineers to remove standing water from five Nike missile silos associated with the Former Niagara Falls – Buffalo Defense Nike Battery BU-34/35 in East Aurora, New York. As part of this project, the water contained within each silo (estimated to be 300,000 gallons per silo) needs to be removed in order to perform a structural inspection of the silo roof and to perform sampling and cleaning of the interior of the silos. This work plan describes the proposed process to treat this water before discharging on site and draining to Cazenovia Creek. Attachment 1 includes a site location map and a site plan.

The silos consist of an underground vault with approximate dimensions 60 ft by 60 ft by 16 ft deep, and were used to assemble, service, maintain and prepare for firing surface to air missiles. The site was declared excess in 1963. Currently, each of the five silos is filled with water to within 1 to 3 feet of ground surface. The water within the silos has been sampled and characterized on three different occasions. The results of this characterization are provided in Attachment 2. Slight petroleum sheen has been observed on the surface of the water in some of the silos.

The preferred plan to remove the silo water involves pumping the water from the silos, one at a time, and treating the water through an onsite temporary treatment system, and discharging the treated water to Cazenovia Creek. The proposed treatment system will be provided by Baker Corporation and will have the following components:

- 6” Hydraulic Submersible Pump: To be moved from silo to silo.
- Two 21,000-Gallon Frac Tanks: To remove a percentage of suspended solids and petroleum sheen. Sheens that collect on the water surface within the tanks will be removed by absorbent booms and pads.
- Bag Filters (50 micron followed by 10 micron): To remove suspended solids.
- Two-Stage Media Filter: The first stage will be Zeolite organoclay to remove free-phase oil and the second stage will be granulated activated carbon (GAC) to remove dissolved organic compounds. Spent media expected to be non-hazardous, and will be sampled and characterized at the end of the job, and disposed of at an approved offsite facility.
- Flowmeter.

A detailed description of the treatment system along with a process flow diagram is provided in Attachment 3. The attached site plan shows the proposed layout of the system. The system will be sized to handle a flow rate between 300 and 500 gallons per minute (gpm). Discharge will be at the southeast corner of the property, immediately above a well-defined swale that outflows to a tributary to Cazenovia Creek. Erosion from the discharge will be minimized through an energy dissipating structure made with hay bales as shown on the attached detail. A figure showing the proposed location of the discharge is provided in Attachment 4.

Operation of the system will be during daylight hours, Monday through Friday, and will be manned at all times during operation, including a person observing the discharge and another person downstream of the discharge to observe if any modifications are needed to prevent excessive erosion. Should any significant

erosion be observed, the system will be shut down until appropriate measures are taken to prevent erosion.

TANTARA expects that it will take 2 to 3 days to remove, treat and discharge the water from each silo. If substantial quantities of water infiltrate into the silos causing an increase in the total treatment volume (estimated at 1.5M gallons), the NYSDEC will be notified in advance of reaching the 1.5M gallon mark.

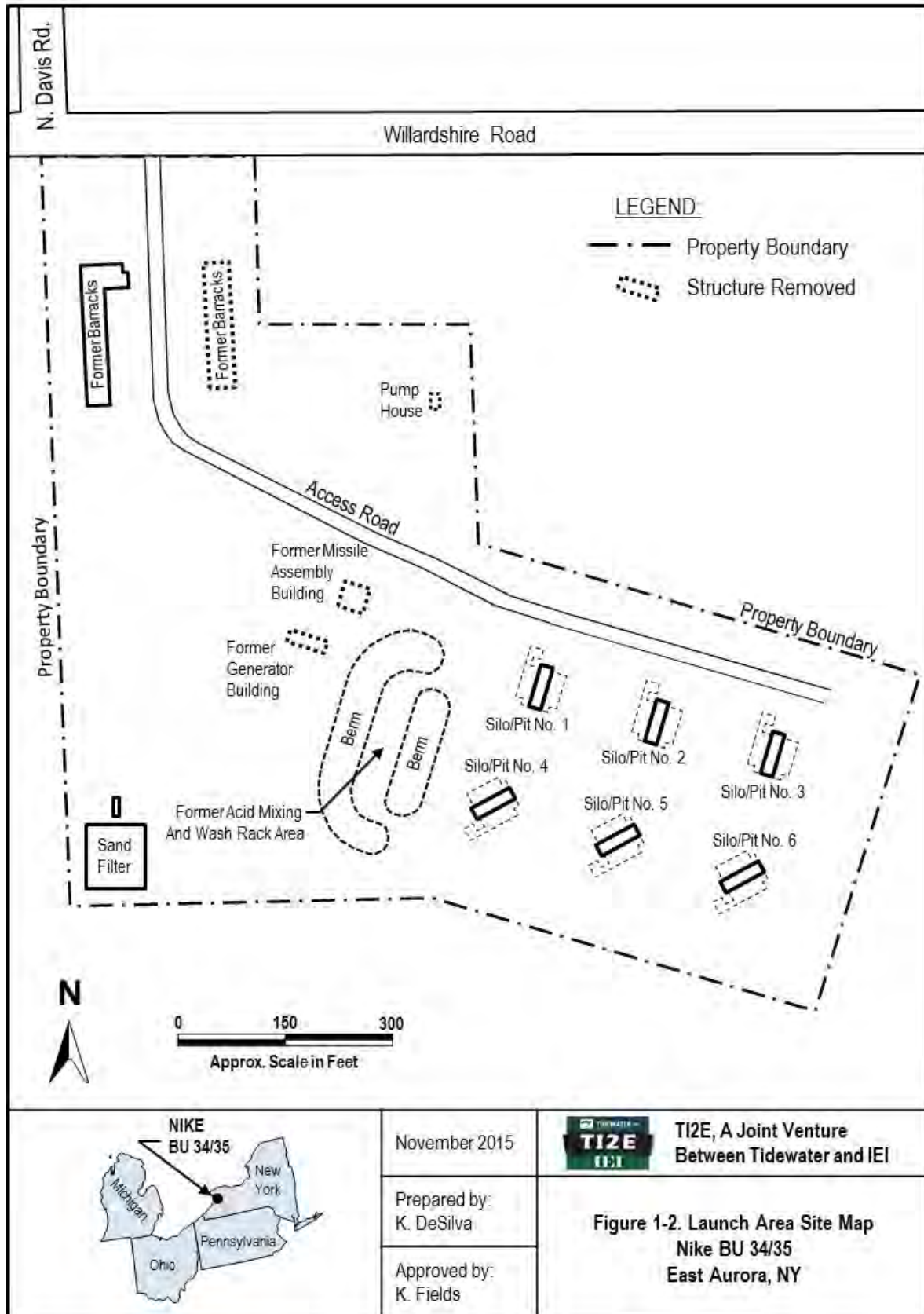
Three grab samples of the discharge will be collected approximately every 100,000 gallons of treated discharge (minimum of one sample per day) and analyzed under 2-day turnaround for oil and grease and total suspended solids (TSS). The results of these analyses will be reviewed and if levels exceed 15 mg/l for oil and grease or 60 mg/l for TSS, the system will be immediately shut down and an evaluation of the system operation will be conducted to determine why the discharge limits were exceeded and make any improvements to the system to avoid future discharge limit exceedances. The results will be transmitted via email to the NYSDEC (Richard.Rink@dec.ny.gov) and the property owner as soon as results are received from the laboratory.

Notification to the NYSDEC Division of Water (716-851-7070) will be made 48 hours in advance of discharging.



**ATTACHMENT 1**  
**SITE LOCATION MAP AND SITE PLAN**





**ATTACHMENT 2**  
**ANALYTICAL RESULTS OF SILO WATER SAMPLES**

**October 2, 2017 Silo Sampling Results**

<b>Analysis</b>	<b>Regulatory Level (CFU/100ml)</b>	<b>Test Results (CFU/100 ml)</b>				
		<b>Silo 1</b>	<b>Silo 2</b>	<b>Silo 3</b>	<b>Silo 4</b>	<b>Silo 5</b>
Fecal Coliform	400	<10	<10	10	<10	<10
Total Coliform	2400	415	245	535	610	95

Analyte	CAS Number	Units	Specific Method	Reports To	480-123490-1 SILO #1/2017 8/30/2017 9:30 AM	480-123490-2 SILO #5/2017 8/30/2017 10:23 AM	480-123490-3 SILO #2/2017 8/30/2017 11:30 AM	480-123490-4 SILO #3/2017 8/30/2017 12:30 PM	480-123490-5 SILO #4/2017 8/30/2017 1:50 PM	480-123490-6 SILO #4/2017 DUP 8/30/2017 1:50 PM
Benzene	71-43-2	ug/L	Volatile Organic Compounds by GC/MS	MDL	ND	ND	ND	ND	ND	ND
Biochemical Oxygen Demand	N/A	mg/L	BOD, 5-Day	MDL	ND	ND	ND	ND	ND	ND
Chemical Oxygen Demand	N/A	mg/L	COD	MDL	ND	ND	ND	5.7 J	ND	ND
Ethylbenzene	100-41-4	ug/L	Volatile Organic Compounds by GC/MS	MDL	ND	ND	ND	ND	ND	ND
m-Xylene & p-Xylene	179601-23-1	ug/L	Volatile Organic Compounds by GC/MS	MDL	ND	ND	ND	ND	ND	ND
Oil & Grease	N/A	mg/L	HEM and SGT-HEM	MRL	2.1 J	ND	ND	ND	1.6 J	1.8 J
o-Xylene	95-47-6	ug/L	Volatile Organic Compounds by GC/MS	MDL	ND	ND	ND	ND	ND	ND
Toluene	108-88-3	ug/L	Volatile Organic Compounds by GC/MS	MDL	ND	ND	ND	ND	ND	ND
Total BTEX	N/A	ug/L	Volatile Organic Compounds by GC/MS	MDL	ND	ND	ND	ND	ND	ND
Total Suspended Solids	N/A	mg/L	Solids, Total Suspended (TSS)	MDL	ND	ND	ND	ND	ND	ND
Xylenes, Total	1330-20-7	ug/L	Volatile Organic Compounds by GC/MS	MDL	ND	ND	ND	ND	ND	ND
Total Coliform	N/A	A/P	SM18-20 9223B	MDL	Present	Present	Present	Present	Present	-
E. Coli	N/A	A/P	SM18-20 9223B	MDL	Present	Present	Present	Absent	Absent	-
Asbestos Fibers	N/A	MFL	100.2	MDL	ND	ND	ND	ND	ND	ND



Table 3-1 Summary of Compounds Detected in Silo Water Samples (2016)

Detected Compound	NY Class GA Standard	Silo 1 Shallow	Silo 2 Shallow	Silo 3 Shallow	Silo 4 Shallow*	Silo 5 Shallow	Silo 1 Deep	Silo 2 Deep	Silo 3 Deep	Silo 3 Deep-Dup	Silo 4 Deep	Silo 5 Deep	Silo 2 Composite
Bis(2-ethylhexyl)phthalate (µg/L)	5	-	-	-	23	-	-	-	-	-	-	-	-
Aluminum (µg/L)	2,000	20J	-	12J	150	33J	32J	-	-	17J	44J	16J	39J
Antimony (µg/L)	6	-	-	-	-	-	-	22J	0.14J	0.16J	-	-	-
Arsenic (µg/L)	50	-	0.61J	0.57J	0.32J	-	0.31J	0.18J	0.68J	0.48J	-	-	0.42J
Barium (µg/L)	2,000	53	32	33	39	15	56	37	31	33	40	17	40
Cadmium (µg/L)	10	-	0.09J	0.19J	-	-	-	-	26	15	-	-	-
Calcium (µg/L)	NA	8,400	130,000	130,000	60,000	26,000	88,000	40,000	140,000	140,000	58,000	2,800	38,000
Cobalt (µg/L)	NA	-	-	-	0.13J	-	0.08J	-	-	-	-	-	0.079J
Copper (µg/L)	1,000	-	11J	4.9J	-	3.1J	6.7J	-	5J	40	1.7J	3.8J	6J
Iron (µg/L)	600	790^	55J	54J	510	91J	1,200^	100	110	96J	210	57J	200
Lead (µg/L)	50	0.54J	3.1	3.3	11	2J	10	0.81J	2.4	6.6	0.43J	2.5	2.4
Magnesium (µg/L)	35,000	9,700	14,000	14,000	9,900	8,000	10,000	7,100	14,000	14,000	9,800	8,100	6,500
Manganese (µg/L)	600	180	2.5J	2.5J	31	2.1J	200	1J	3J	2.6J	19	1.7J	13
Potassium (µg/L)	NA	22,000	9,500	9,500	25,000	44,000	2,400	53,000	10,000	9,800	25,000	45,000	51,000
Selenium (µg/L)	20	-	-	-	-	-	-	-	-	0.96J	-	-	-
Sodium (µg/L)	NA	4,900	240	2,300	5,600	8,900	5,100	11,000	2,500	2,400	5,400	9,000	10,000
Zinc (µg/L)	5000	-	190	190	20J	26J	24J	28J	200	240	15J	26J	38J
Total Organic Carbon (µg/L)	NA	2,500	2,500	2,400	1,900	1,700	3,400	2,500	2,800	2,800	2,900	1,700	2,300
pH	6.5-8.5	-	-	-	-	-	-	-	-	-	-	-	7.85

\*0.3 inches or measurable product on water surface

^Dissolved metals result below NY Class GA Standard, total metals result above NY Class GA Standard

Italic results indicate "J" qualifier results below reporting limits

"-" indicates a Non Detect analytical result

VOCs (8260), PCBs (8082), TPH (8015) yielded no detection above the Method Reporting Limits. TPH was only analyzed at the Silo 2 Composition location.

**ATTACHMENT 3**

**TREATMENT SYSTEM DESCRIPTION AND**

**PROCESS FLOW DIAGRAM**





7800 N. Dallas Parkway, Suite 500, Plano, TX 75024

To: Mark Lovejoy  
Company: Tantara Corp  
Phone #: 508.752.5599  
E-mail: mlovejoy@tantara.com

From: Chris Villella  
Date: 29 September 2017  
Page: 1 OF 17  
Quote #: TAN - 09292017CV

Dear Mark,

## **Operational Overview**

Bakercorp is pleased to provide the following proposal for the upcoming Nike Missile Silo Dewatering Project located in East Aurora, NY. The following narrative outlines the proposed process flow and scope of work as understood by Bakercorp. Bakercorp will procure, mobilize, operate and demobilize, a dewatering and water treatment system designed for the removal and treatment of an estimated 1.5 million gallons of impacted water from (5) underground, decommissioned silos (~300,000gal each). Water is confirmed to be impacted by hydrocarbons, which will be the target of treatment efforts. Dewatering system is designed with a target flow rate range of 300-500gpm. It is anticipated that each silo will be dewatered over the course of (2) days; totaling and estimated (10) days of pumping operation. The plan will be to operate in a single, daylight, 10hr shifts, Monday through Friday, with an average pump time of at least (8) hours per day. Dewatering time is based on the assumption of a volume of water Not to Exceed 300,000gal in each silo.

## **Process Flow**

A 6" hydraulic submersible pump will be lowered into silo, via excavator or telehandler (provided by others). The pump will be fitted with a screen to prevent large solids from being removed from the silo. The pump head should be placed as directly on the flat, concrete bottom of the silo as possible. A good faith effort will be made to draw down the silo as low as possible. This may require re-placement of the pump several times to achieve. Determination will be made at the time of entry to the silo, whether we will attempt to re-locate the pump head into the sump, below the elevator. Water from this pump will discharge through a 6" hose to the filtration system. Once the active silo is determined to be emptied, the hydraulic submersible pump, power unit, and discharge hose will be moved and the process re-initiated at the next silo. Lifting equipment will be required for the relocation.

From the silo, the water will be pumped into (2) 21Kgal Frac Tanks. These tanks will act as a stillwell and assist in separation of settleable and floating solids. From the frac tanks, the water will be pumped via sound attenuated diesel

pump, capable of maintaining a rate of 500gpm at the required pressure to overcome estimated dynamic head of the rest of the system. This pump will be Baker Pump model BP88LS – SA or similar.

First step in the filtration/treatment process will be removal of unsettlable, fine particles via bag filtration. (2) 12 bag filter housings will be used to maximize filtration surface area. These housings will be configured in a Lead-Lag fashion with 50 micron bags and 10 micron bags, respectively. Bags will be standard #2 sized polypropylene felt. Pending the amount of free oil and grease, bags in the 'Lead' housing may be substituted with high efficiency oil absorbent bags.

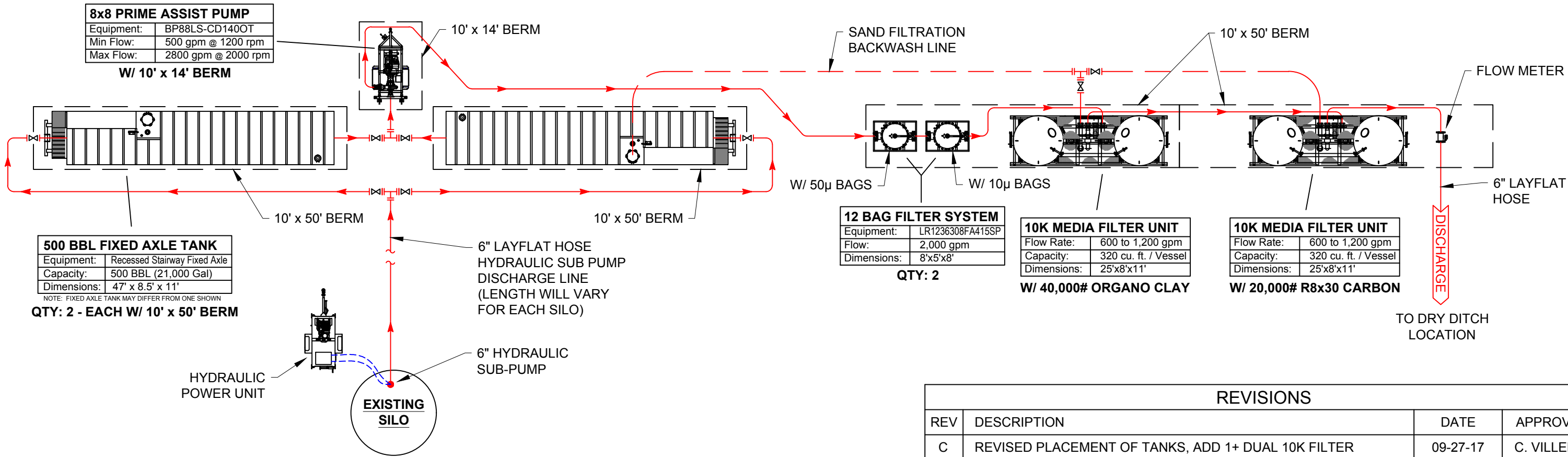
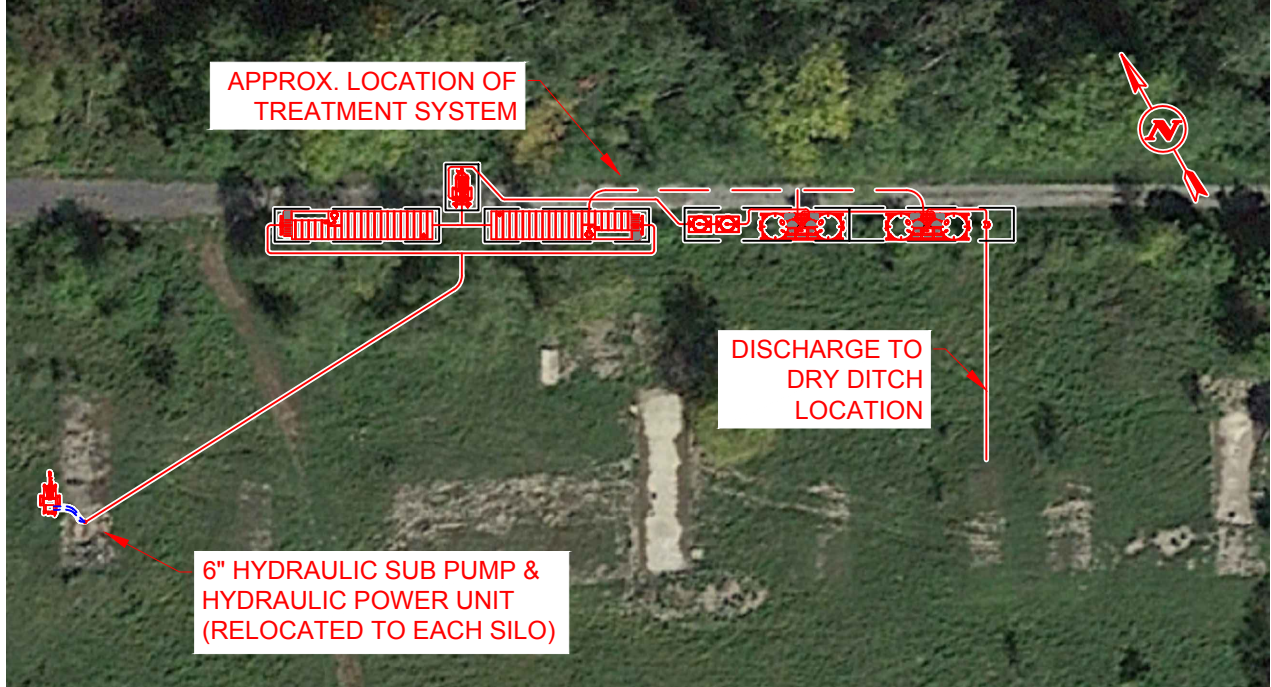
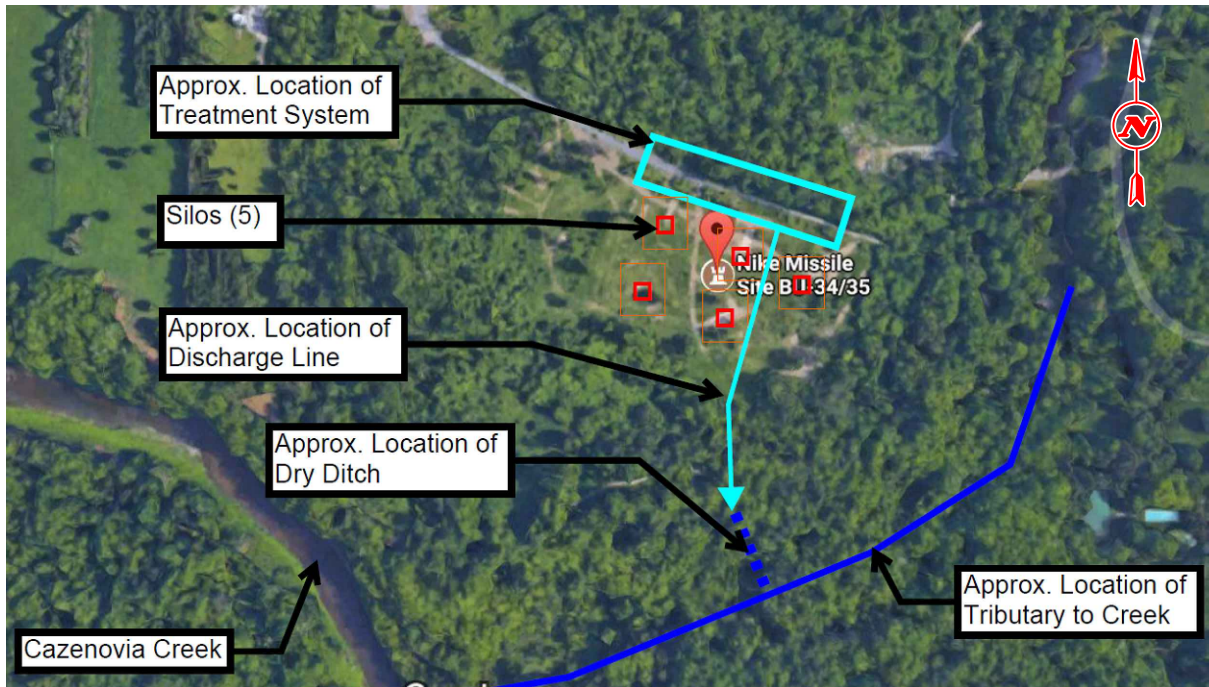
Once particles are removed, water will be pumped through a two-stage multimedia train to remove hydrocarbons. Stage 1 will utilize a Modified Zeolite Organoclay (Z200). This media has the ability to absorb up to 70% of its total weight in free oil, as well as, an affinity for other hydrocarbons as well as some metals. Stage 2 will utilize 8x30 Mesh Reactivated GAC in order to complete the removal of VOCs. (2) Bakercorp Kleen.Water Dual – 10,000 High Pressure Vessels will be utilized in a lead-lag configuration to accommodate this process. Media volumes prescribed are calculated for a total contact time of ~15 minutes.

After treatment, water will be metered via mechanical style flowmeter as it is pumped to the discharge point. 6" layflat hose will be utilized for the discharge. The exact point is yet to be demined, but general area puts location at an estimated 500' from the treatment system in the South west corner of the site. All reasonable efforts will be made to control discharge to prevent erosion at the discharge point. It is expected that a vinyl splash liner and a hay bale diffusion structure will be utilized to disperse energy. An example of such structure has been provided in the appendix.

#### **Serialized Equipment List**

- 1 - 6" Hydraulic Submersible Pump with Poser Unit
- 2 - 21Kgal Fixed Axle Frac Tank
- 1 – BP88LS Sound Attenuated Diesel Pump
- 2 – 8" 12 Round Bag Filter Housing
- 2 – KW D-10000HPV Specialty Media Vessel
- 6" Layflat hose will be utilized from Hydraulic Pump to Frac tanks and from end of treatment system to discharge point.
- 6" Rigid hose will be utilized for remainder of treatment system
- All fittings will be steel flange or aluminum QD
- Flow meter will be mechanical propeller style with totalizer

Process Flow Diagram and Spec Sheets can be found in the appendix



**NOTE:**  
SYSTEM TO BE PLUMBED W/ 6" QD HOSES EXCEPT WHERE NOTED.

The information presented on this drawing is for informational purposes only. Use of this drawing is not a replacement for a professional engineering evaluation of the application. This drawing is intended to show preliminary equipment requirements and arrangement and is in no way a replacement for a thorough engineering review of the application at hand. A representative of the customer or end user should always conduct the final evaluation of the application. That representative, and not BakerCorp Inc., or its employees and representatives, is responsible for the final engineering design and performance of the application.

No warranty is provided or implied, including any warranty of fitness for a particular purpose. As such, the customer agrees that by using the suggestions shown on this drawing, you assume the risk of all loss or injury resulting from any information found within. In no event shall BakerCorp, or any representative or agent thereof, be liable under any theory based in contract, negligence or strict liability or any other legal or equitable theory to any party for any amounts including, without limitation, lost revenues, lost profits, lost business or indirect, consequential, incidental, special or punitive damages. This disclaimer shall survive any and all notices advising of the possibility that any user may suffer harm from any inaccuracies contained herein.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
C	REVISED PLACEMENT OF TANKS, ADD 1+ DUAL 10K FILTER	09-27-17	C. VILLELLA
B	REVISED FOR NEW PROJECT NAME & LAYOUT, ADD AERIAL VIEWS	09-22-17	C. VILLELLA
A	REVISED FOR NEW PROJECT LAYOUT	07-24-17	C. VILLELLA

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TITLE: <b>NIKE MISSILE SILO - 300-500 GPM DEWATERING FILTRATION WITH OIL REMOVAL - PROCESS FLOW DIAGRAM</b>		CUSTOMER: <b>TANTARA CORPORATION</b>	
SHEET SIZE: <b>B</b> 11" x 17"		DWG BY: <b>M. BROOKS</b>	DATE: <b>08-18-16</b>
FINISH:		CKD BY: <b>C. VILLELLA</b>	DATE: <b>08-18-16</b>
		SCALE: <b>-</b>	SHEET: <b>1</b> OF: <b>1</b>
		DWG No: <b>SKF2657</b>	REV: <b>C</b>



### PRODUCT DATA SHEET

January, 2007

### MODERN FIXED AXLE TANK

("V" BOTTOM VERSION)

#### GENERAL INFORMATION

This tank has a smooth interior wall and "V" shaped bottom for easy cleaning.

#### WEIGHTS AND MEASURES

» Capacity:	500 BBL (21,000 gallons)
» Height:	10'-9" (grade to top of tank)
» Width :	8'-5"
» Length:	44'-10" (overall)
» Weight:	25,500 lbs.

#### STRUCTURAL DESIGN

» Floor:	¼" thick ASTM A36 carbon steel "V" bottom sloping from each side into the center
» Sides/Ends:	¼" thick ASTM A36 carbon steel
» Roof Deck:	¼" thick ASTM A36 carbon steel
» Wall Frame:	¼" thick ASTM A36 carbon steel channels (on exterior side of walls)
» Roof Frame:	¼" thick ASTM A36 carbon steel channels (on exterior side of walls)

#### FEATURES

» Valves:	2-Front & 1-Rear: 4"- wafer butterfly valve. Cast iron body, Buna-N seat & seals, 316 SS stem, Nylon 11 coated ductile iron disk w/ plug and chain. Remote operation handle for rear valve.
» Relief Valve:	16 oz./in <sup>2</sup> pressure setting, 0.4 oz./in <sup>2</sup> vacuum setting; Buna-N seal
» Rear Drain:	4"-150# tank-side weld neck flange mated to valve and 150# FPT flange
» Front Drain:	4"-150# tank-side weld neck flange mated to valve and 150# FPT flange
» Top Fill Line:	3" pipe, top of tank, with cap and chain

#### FEATURES – cont.

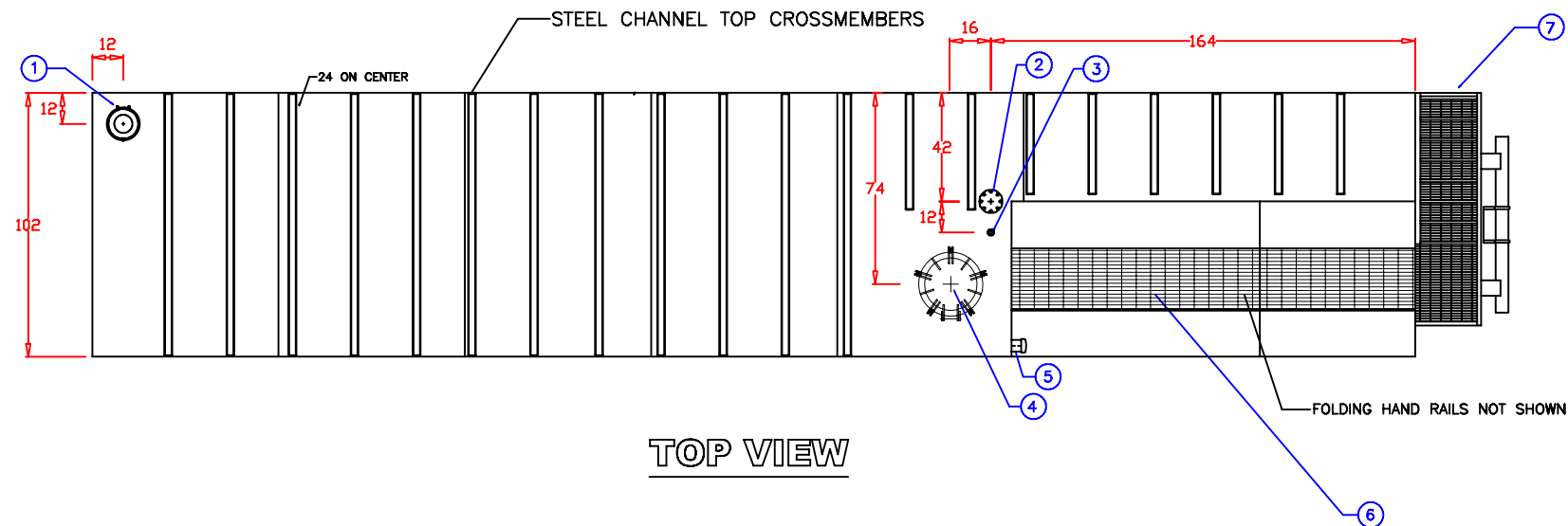
» Top Vapor Connection:	4"-150# weld neck flange with blind flange (chained) and Buna N gasket
» Top Manway:	22" I.D., slotted hinges and 5 - ¾" T or eye bolt with wing nut fasteners, hinged to side of tank, ½" flat plate or 3/8" if domed ASTM A36 steel. Buna N formed gasket, thermally fused.
» Front Manway:	22" I.D., slotted hinges and 5 - ¾" T or eye bolt with wing nut fasteners, hinged away from stairs, ½" flat plate or 3/8" if domed ASTM A36 steel. Buna N formed gasket, thermally fused.
» Side Manway:	22" I.D., slotted hinges and 5 - ¾" T or eye bolt with wing nut fasteners, mounted on passenger side and hinged to front of tank, ½" flat plate or 3/8" if domed ASTM A36 steel. Buna N formed gasket, thermally fused.
» Stairway:	Non-slip with handrails and guardrails; OSHA compliant
» Level Gauge:	Ball style with 2-8" 304 SS floats. Floor supports hold floats ½" off floor.
» Tires:	11.00 x 22.5 (nylon tubeless)
» Axles:	Standard 22,500#, Rockwell automatic slack adjusters, cast drum and hub, 30 service chambers, outboard drums

#### SURFACE DETAILS

» Exterior Coating:	High gloss polyurethane paint
» Interior Coating:	Chemical resistant lining
» Safety Paint:	Safety yellow – handrails, hatch covers and trip hazard surfaces
» Decal Mounts:	Removable 10-gauge steel, 48"x48", both sides of tank at top rear. Secured with nylock nuts or bolts with lock washers.

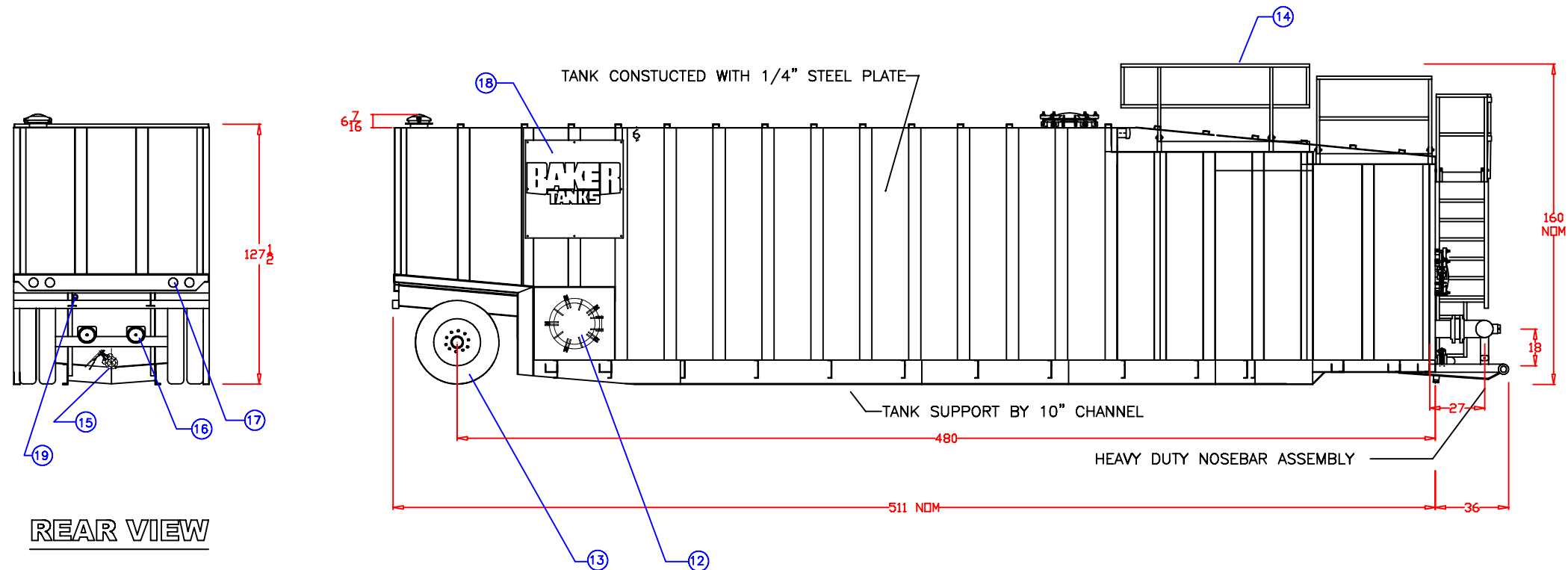
#### TESTS/CERTIFICATIONS

» Test Performed:	100% water tested to full capacity, 3 psi – 20 min test; Level I, II and III inspections on a scheduled basis
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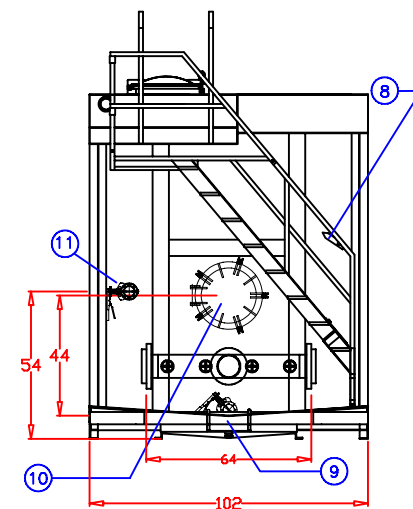


TOP VIEW

- 1) FLANGE MOUNT BLAYLOCK LL10 P/V VENT  
160Z SETTING, BAKER SPEC
- 2) 4" FLANGE WITH BLIND CAP AND CHAIN
- 3) 1 1/2" COUPLING WITH PLUG
- 4) MANWAY WITH INTERNAL BARS, 21 1/2"ID, DOMED LID
- 5) 3" NIPPLE WITH CAP AND CHAIN
- 6) SAFETY WALK WAY
- 7) ACCESS STAIRS
- 8) LEVEL GAUGE W/2-8" STAINLESS STEEL BALL  
"Y" SUPPORT HOLDS BALLS 1/2" OFF FLOOR
- 9) FRONT DRAIN W/VALVE, BULL PLUG, CHAIN
- 10) MANWAY, 21 1/2"ID, DOMED LID
- 11) 4" FLANGE, VALVE, THREADED FLANGE, BULL PLUG, CHAIN
- 12) MANWAY, 21 1/2" ID, DOMED LID
- 13) 11.00 X 22.5 TUBLESS TIRE ON 10 HOLE STEEL WHEEL
- 14) FOLDING HAND RAILS
- 15) 4" FLANGE, VALVE, THREADED FLANGE, BULL PLUG, CHAIN  
REMOTE OPERATION HANDLE
- 16) 25K AXLE, AUTOMATIC SLACK ADJUSTERS, TOP MOUNTED  
30 SERVICE CHAMBERS, OUTBOARD DRUMS, HUTCH  
9700 SUSPENSION, 3 LEAF HIGH ARCH SPRINGS
- 17) DOT TAIL LIGHTS AND LOWER MARKER LIGHTS, NO  
TOP LIGHTS
- 18) 48X48 BOLTED PLATE
- 19) 1" X 6" PIPE W/WELDED CAP & THREADED CAP



SIDE VIEW



NOTE:  
ALL VALVES BRAY SERIES 30, CAST IRON BODY,  
416SS STEM, BUNA-N SEAT, NYLON 11 COATED  
DUCTILE IRON DISC, HANDLES AS SHOWN.  
ALL WALL AND ROOF RIBS TO BE CONTINUOUSLY  
WELDED, ALL TANK SHELL SEAMS TO BE WELDED  
ON BOTH SIDES.  
RAILINGS, STAIRS & WALKWAY TO MEET OSHA STDS  
INTERIOR COATED PER BAKER SPEC 8.2  
EXTERIOR COATED PER BAKER SPEC 7.6  
100% CAPACITY WATER TEST  
7 PIN ROUND LIGHT PLUG  
ALL SHELL 1/4" A-36 STEEL, V-BOTTOM  
SOME ITEMS MAY NOT BE SHOWN IN ALL VIEWS

NOTES:  
8" INSIDE CONNECTION WITH FLANGED 90 DEG  
TURN DOWN, 2" OFF FLOOR, MITERED  
UPPER 4" FITTED INSIDE WITH FLANGED STEEL GEL LINE  
GEL LINE U-BOLTED TO PIPE SUPPORTS  
STAIRS FITTED WITH LOWER 1/2 WIDTH SECTION  
REMOVABLE TO REPLACE WITH FULL WIDTH STEP OPTION

FRONT VIEW

**SPECIFICATIONS:**

- 1) Tank Capacity: 21,000 gallons (500 BBL)
- 2) Tank Weight: 25,500 lbs. (empty)

**NOTES:**

1. This drawing is a baseline representation for this model of tank. Variations between this drawing and the actual equipment in the field can and do exist, primarily with appurtenance locations, sizes and quantities. Consult your local BakerCorp representative if specific needs exist.
2. THIS TANK IS *NOT DESIGNED FOR TRANSPORTING LIQUIDS*. It should be moved only when empty.
3. Tanks of this type have an internal lining (coating) on the wetted surfaces.
4. This tank is equipped with a pressure/vacuum relief valve set at 1.0 lbs/sq. in. pressure and 0.4 oz/sq.in. vacuum.

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3020 OLD RANCH PARKWAY  
SEAL BEACH, CA 90740-2751

G				SCALE:	SIZE	ORIGINAL DWG. DATE
F				Do Not Scale	B	10SEP02
E				DRAWN BY:	APPROVED BY:	CAT/CLASS
D				P.J.B.	-	--
C				TITLE		SHEET
B				MODERN MFG. "V" BOTTOM FIXED AXLE TANK		1 OF 1
A	Fixed lineweight and text	7/12/05	ZER	DRAWING NO.		REV.
REV.	DESCRIPTION	DATE	BY	S-2-M0007-1-		A

## PRODUCT DATA SHEET

1/4/2012

## BP88LS-GD115AT

BakerPrime 8x8 Low Pressure Solids Handling Unit (Attenuated, Trailer)

### GENERAL INFORMATION

The compressor/venturi priming system uses a compressor to blow compressed air through a jet into a tapered tube to create a vacuum on the suction.

### PERFORMANCE DATA

» Flow (min/max):	- 500 gpm / 2600 gpm
» Minimum Shutoff Head:	- 125 feet (54 psi) @ 1500 rpm (1)
» Maximum Shutoff Head:	- 195 feet (84 psi) @ 2000 rpm (1)
» Minimum Speed:	- 1500 rpm
» Maximum Speed:	- 2000 rpm
» Maximum Suction Lift:	- 25 feet (2)
» Maximum Casing Press:	- 127 psi
» Maximum Temperature:	- 160°F
» Maximum Solids Size:	- 3" spherical diameter

### PUMP SPECIFICATIONS

» Impeller:	- 11.77"
» Bearing Lubrication:	- SAE No. 30 Oil
» Vacuum System:	- 34 cfm Compressor/Venturi
» Mechanical Seal Lube:	- SAE No. 30 Oil (3)

### PHYSICAL SPECIFICATIONS

» Suction Size:	- 8" flange
» Discharge Size:	- 8" flange
» Approximate Weight:	- 5081 lbs dry / 5720 lbs wet
» Overall Height:	- 95" (to top of lifting eye)
» Overall Width:	- 66" (outer most edges)
» Overall Length:	- 137" (nose to tail)

### Enclosure

> Enclosure is made from Galvaneal. Hinged doors on each side provide easy interior access for servicing. Soundproof insulation provides the quietest operation in the industry, and the entire unit, including controls, can be locked for added security.

» Sound Rating:	- 67 dBA at 23 feet
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### MATERIAL SPECIFICATIONS

» Pump Casing:	- Ductile Iron No. 65-45-12
» Shaft Sleeve:	- 17-4 PH S.S.
» Wear Rings:	- Ductile Iron No. 80-60-03
» Mechanical Seal Faces:	- Silicon-Carbide/Silicon-Carbide
» Pump Shaft:	- 17-4 PH Stainless Steel
» O-rings:	- Viton
» Impeller:	- Ductile Iron No. 65-45-12
» Check Valve Body:	- Gray Iron No. 30
» Check Valve Flapper:	- Buna-N

### ENGINE SPECIFICATIONS

» Engine Make/Model:	- Deere 4045H
» Total Displacement:	- 4.5 Liter
» Aspiration:	- Turbocharged
» Max. Continuous BHP:	- 115 @ 2400 rpm (4)
» Crankcase Oil:	- SAE 10W40 (5)
» Coolant:	- 50/50 Water/Antifreeze
» Safety Shutdowns:	- High Water Temp & Low Oil Pressure
» Fuel Consumption:	- 4.79 gal/hr @ 1800 rpm (6)
» Run Time:	- 22 hours at 1400 rpm at 80% Engine Load
» Fuel Capacity/Type:	- 90 gal of No. 2 diesel
» Number of Cylinders:	- Four

### Notes:

- (1) Based on 1.0 specific gravity
  - (2) Depends on flow rate, pump speed, and elevation. See performance curve.
  - (3) Should always be visible and clear in appearance thru sight glass.
  - (4) WARNING – this is the rated speed for the ENGINE ONLY. The rated speed of the pump is less. See curve for max pump RPM.
  - (5) Must be changed every 250 hours of runtime.
  - (6) Run time fluctuates with speed and engine loads.
- BakerCorp Reference # 408-0104

To the best of our knowledge the technical data contained herein are true and accurate at the date of issuance and are subject to change without prior notice. No guarantee of accuracy is given or implied because variations can and do exist.

NO WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY BAKERCORP, EITHER EXPRESSED OR IMPLIED.

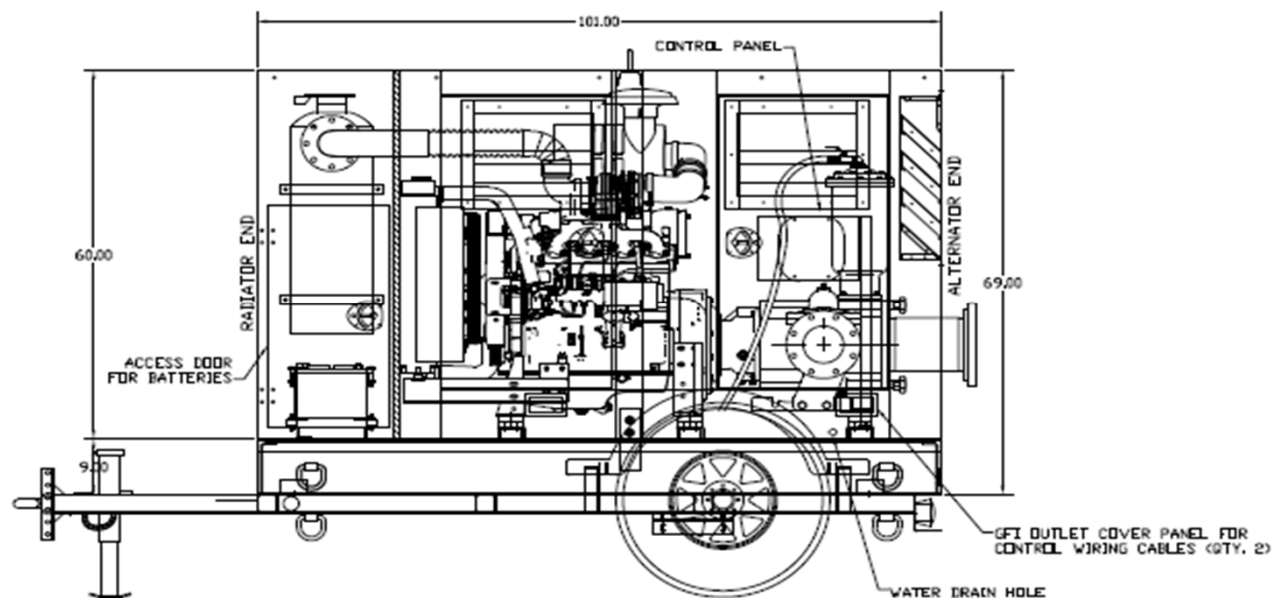
## PRODUCT DATA SHEET

**1/4/2012**

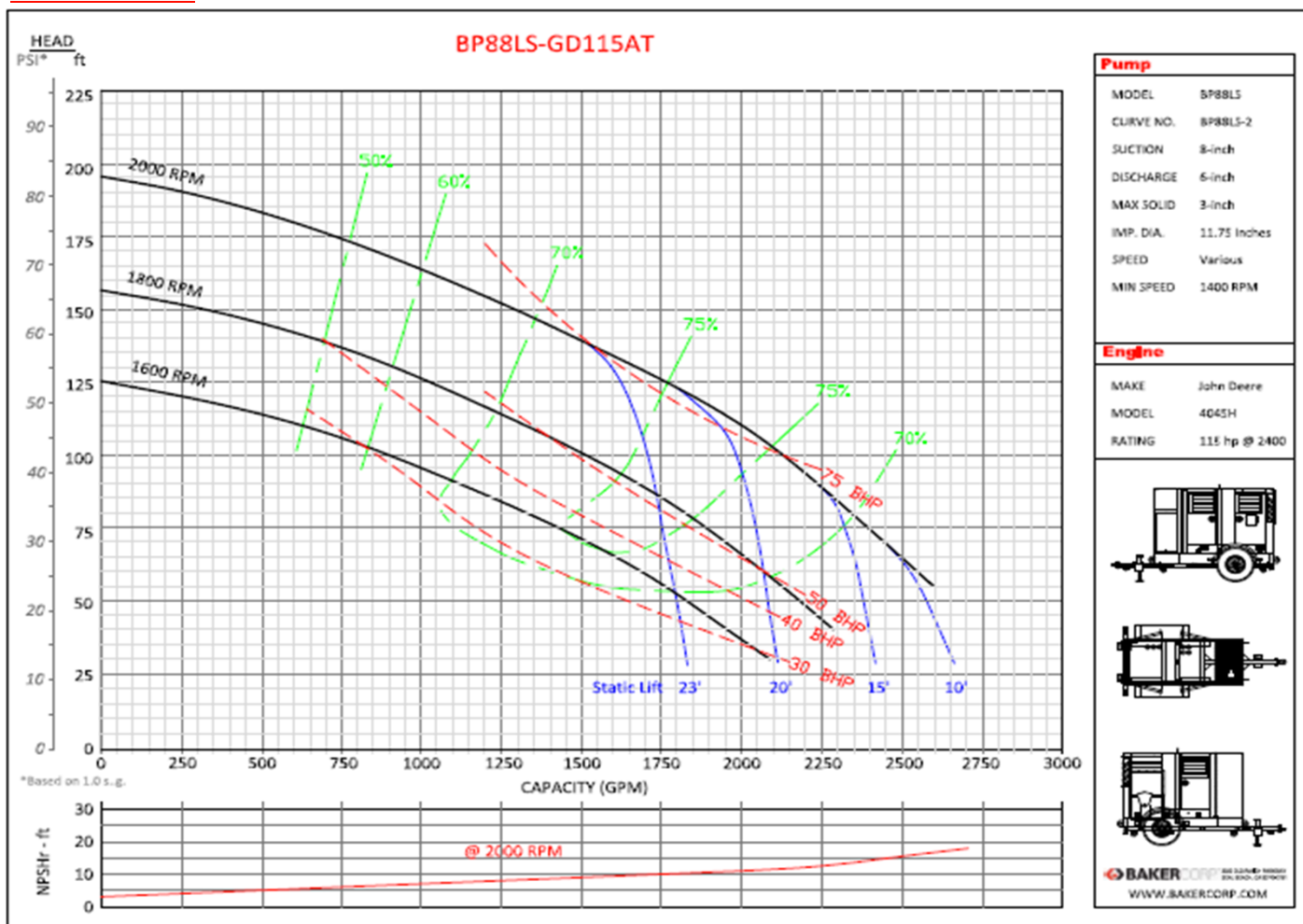
**BP88LS-GD115AT**

BakerPrime 8x8 Low Pressure Solids Handling Unit (Attenuated, Trailer)

## PHYSICAL SPECIFICATIONS



## PERFORMANCE CURVE



## PRODUCT DATA SHEET

March, 2008

8" 304 STAINLESS STEEL  
12-BAG FILTER SYSTEM

## GENERAL INFORMATION

Single vessel mounted on a forkliftable skid. Housing is not ASME code stamped. Different filter elements are available depending on job requirements and should be specified by the customer prior to use.

## WEIGHTS AND MEASURES

» Capacity*:	1200 – 2000 gpm (@ 1 micron and up)
» Design Press:	150 psig
» Design Temp:	225°F max. (gasket dependent)
» Height:	7'-5" (overall)
» Width:	4'-11"
» Depth:	7'-5"
» Weight (dry):	1075 lbs. (approx.)

\*Capacity (flowrate) depends on factors such as liquid viscosity, micron value of the filter media, solids loading etc. Assuming water as a filtrate and factoring in pressure drop only, 2000 gpm is a practical upper limit for a size #2 bag with a 100 micron rating; 1200 gpm with 1-micron rated bags. Clean pressure drop would be 2-3 psi. Lowering the micron rating increases the pressure drop. The minimum pressure drop for this unit at higher micron ratings is 1-2 psi. Filter bags should be changed out at 15-18 psid, or earlier if the process requires it.

## SKID DESIGN

» Skid:	2"x2"x0.25" A36 c.s. structural tubing
» Vessel Leg Supports:	3x3x.375 angle, SA-36
» Forklift Pockets:	Through front and rear framing channels

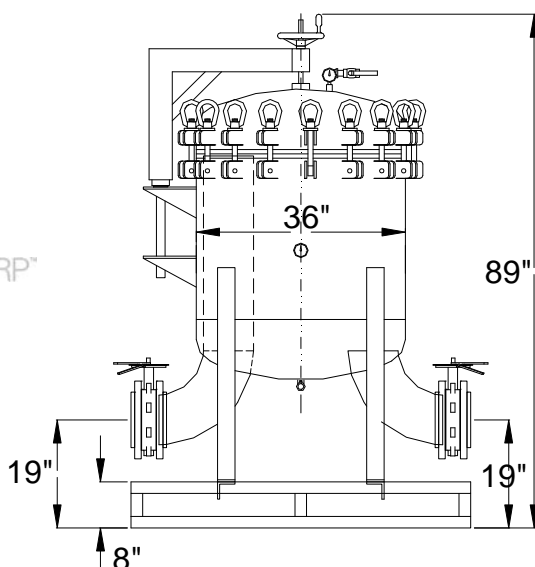
## FILTER DESIGN

» Assembly Number:	Krystil Klear LR12-36-30-8F-A-4-15-SP
» Top Head:	(17) closure bolts and nuts with davit lift assembly. 36" O.D., 0.25" thk, SA-240 Gr. 304 stainless steel
» Shell:	36" O.D., 0.25" thick x 28" L. R & T, SA-240 Gr. 304 stainless steel
» Inlet & Outlet:	8" 150# RFSO flanges, SA-182 Gr. 304 S.S.
» Bag Elements:	12 required: size #2, 7-1/16" snap ring & 30" length required; Available fibers range from 1 to 1500 microns.
» Lid Seal:	Buna N O-ring
» In/Out Valves:	8" 150" butterfly with Buna seat
» Internal Hardware:	SA-240 Gr. 304 S.S. tube sheet

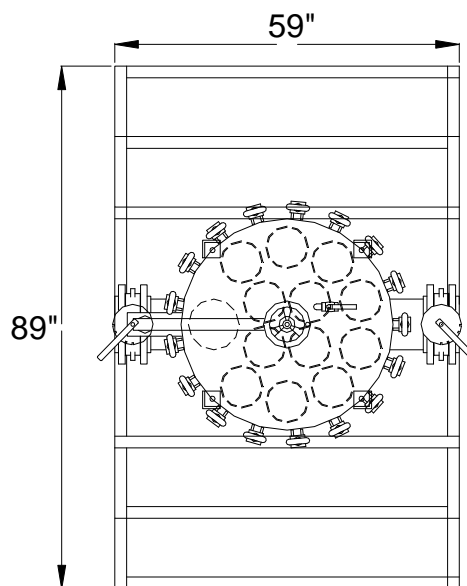
## TESTS / CERTIFICATIONS

» Test Performed:	OEM Hydrotested @ 195 psi. Scheduled QMS inspections after purchase by BakerCorp.
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## PRODUCT DATA SHEET

*March, 2007*

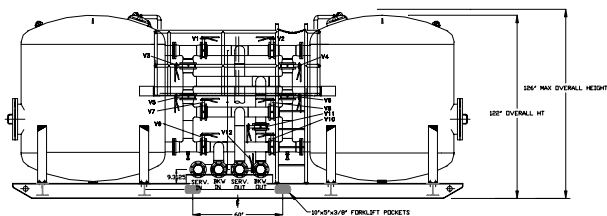
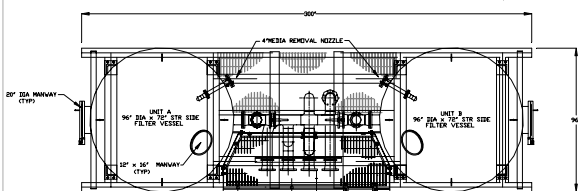
## D-KLEEN.WATER 10K

### GENERAL INFORMATION

This system is designed for continuous aqueous phase treatment of groundwater or wastewater, and has the ability to remove contaminants to non-detectable levels. The influent stream may be drawn in through the system in either series or parallel flow, and can operate on one vessel only while the other is in backwash mode. BakerCorp can provide a number of service and disposal options for the spent media.

## WEIGHTS AND MEASURES

» <b>Max. Flowrate:</b>	Up to 600 gpm in series or 1200 gpm in parallel (application dependent)
» <b>Max. Pressure:</b>	100 psi
» <b>Max. Temp:</b>	150°F
» <b>Height:</b>	10'-6" (overall)
» <b>Width:</b>	8'-0" (skid)
» <b>Length:</b>	25'-0" (skid)
» <b>Diameter:</b>	96" (each vessel)
» <b>Shipping Wt.: (empty)</b>	40,000 lbs. (equipment – 20,000 lbs; activated carbon – 20,000 lbs)
» <b>Operating Wt.:</b>	80,000 lbs. (including 40,000 lbs. water)



## FILTER MEDIA

» <b>Types:</b>	.....	<ul style="list-style-type: none"> <li>▪Activated Carbon</li> <li>▪Organoclay</li> <li>▪Ion Exchange Resin</li> <li>▪Specialty Media</li> </ul>
» <b>Volume:</b>	.....	320 cu. ft per vessel ( 640 cu. ft. total)
» <b>Weight:</b>	.....	~ 10,000 lbs. each vessel (20,000 lbs. total)

### MISCELLANEOUS DATA

» <b>Vessel Code:</b>	ASME Code stamped for 100 psi @ 150°F.
» <b>Service In/Out:</b>	6" Flanged connection w/ sch. 40 piping
» <b>Backwash In/Out:</b>	6" Flanged connection w/ sch. 40 piping
» <b>Manifold Valves:</b>	6" Lever-operated cast iron butterfly
» <b>Media Removal:</b>	4" top-mounted nozzle with draw connection at grade
» <b>Internals:</b>	<u>Lower Underdrain:</u> 6" header/2"x1" drop strainer type constructed of 316 SS <u>Upper Distributor:</u> 6" header/3" open end riser type constructed of 316 SS
» <b>Platform:</b>	Galvanized grating with perimeter guardrails
» <b>Vessel Interior Access:</b>	Top manway – 12"x16" elliptical Side manway – 20" round
» <b>Manway Gaskets:</b>	Neoprene
» <b>Interior Coating:</b>	Polyamine epoxy coating

**PRESSURE DROP DATA & OPTIONS AVAILABLE**

Contact BakerCorp



**NOTE:**

1. Wet activated carbon preferentially removes oxygen from air. In closed or partially closed containers and vessels, oxygen depletion may reach hazardous levels. If workers are to enter a vessel containing carbon, appropriate procedures for potentially low oxygen spaces must be followed, including all federal and state requirements.

## **Z-200**

BakerCorp's Z-200 media is a naturally occurring rock type media modified (impregnated) with hexadecyl trimethylammonium chloride and has various commercial applications. Z-200 is a specific grade of zeolite with unique properties which include: high cation exchange capacity, high surface area, the ability to adsorb/desorb water without any chemical or physical change in structure, and the ability to selectively adsorb gas molecules without affecting the inherent zeolite structure. Applications for Z-200 include: ammonium and heavy metals removal, oily water filtration and as an absorbent for waste spills.

### **PHYSICAL PROPERTIES:**

Base Chemical Composition:	Natural Zeolite
Impregnate:	Hexadecyl trimethylammonium chloride
Apparent Density (lbs./cu.ft.):	57 - 59
Hardness (Mohs Scale):	3.5 - 5.1
Pore Size / Volume:	4.0A
Crushing Strength:	2500 lbs./sq. in.
Specific Surface Area:	40 sq. m/g
Thermal Stability:	1202F (650C)

Information herein is accurate to the best of our knowledge. Suggestions are made without warranty or guarantee of results. These specifications represent general parameters and are subject to change. Please consult with BakerCorp before proceeding with your applications.

## **R 8x30 Activated Carbon**

R 8x30 mesh activated carbon is a reactivated bituminous coal and coconut shell blended carbon ideal for liquid filtration applications including groundwater and process water.

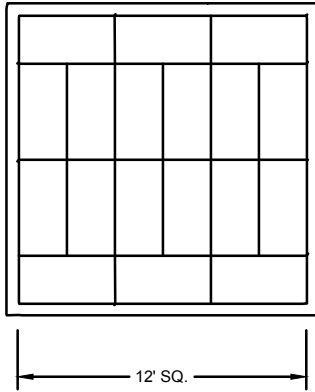
### **PHYSICAL PROPERTIES:**

Carbon Tetrachloride Activity (CTC):	60%
Apparent Density (lbs./cu.ft.):	30 average
Total Ash Content:	8% maximum
Hardness (ball abrasion):	90 average
Iodine Number:	800 minimum
Mesh Sizes*:	8x30

\*Custom sizing available

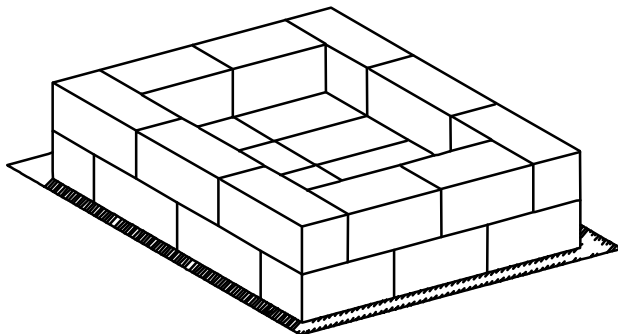
Standard Packaging: 1000 lb. super sacks. Other packaging available upon request.

These specifications represent general parameters and are subject to change. Please consult with BakerCorp before processing with your applications.



#### STEP 1

ARRANGE HAY BALES OVER GEOTEXTILE FABRIC ON LEVEL LAND TIGHTLY PACKED AS SHOWN TO COVER AN AREA APPROXIMATELY 12' x 12'.

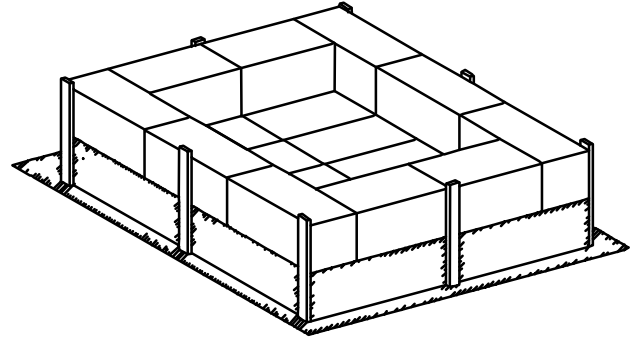


#### STEP 2

INSTALL ANOTHER LAYER OF HAY BALES ON THE OUTER EDGE AS SHOWN.

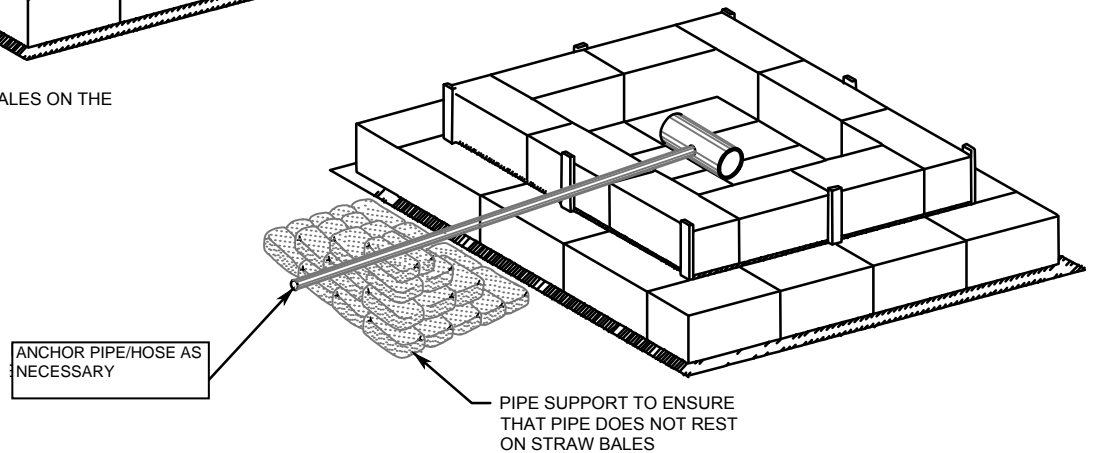
#### STEP 3

INSTALL SEDIMENT BARRIER, IF REQUIRED BY COMPANY REPRESENTATIVE, AROUND ENTIRE HAY BALE STRUCTURE AS SHOWN.



#### STEP 4

INSTALL ANOTHER LAYER OF HAY BALES ON THE OUTSIDE OF THE SEDIMENT BARRIER AND SECURE IN PLACE BY DRIVING REBAR OR WOODEN STAKE THROUGH EACH OF THE OUTER HAY BALES. (STAKES NOT SHOWN FOR CLARITY PURPOSES)



#### NOTES:

WHERE POSSIBLE STRUCTURE SHALL BE PLACED ON A LEVEL, WELL VEGETATED UPLAND SITE SUCH THAT WATER WILL FLOW AWAY FROM STRUCTURE AND ANY WORK AREAS.

CONTRACTOR SHALL PROPERLY REMOVE AND PROPERLY DISPOSE OF DEWATERING STRUCTURE IMMEDIATELY UPON COMPLETION OF DEWATERING OPERATIONS. UNDER NO CIRCUMSTANCES SHALL USED DEWATERING STRUCTURES BE LEFT IN PLACE FOR A PERIOD OF TIME GREATER THAN 48 HOURS AFTER DEWATERING OPERATIONS ARE COMPLETE.

STRUCTURE SHOULD BE POSITIONED SUCH THAT WATER WILL NOT FLOW INTO ANY WETLANDS OR WATERBODIES.



							PENNEAST PIPELINE PROJECT	
							TYPICAL DEWATERING STRUCTURE	
						PREPARED BY:		
A	01/2016	ISSUED FOR PERMIT		HMM	HMM	HMM		FIGURE 22
REV	REV	REVISION DESCRIPTION		BY	CKD	APP		

**ATTACHMENT 4**  
**TREATMENT SYSTEM LAYOUT**



**FIGURE 1**

TREATMENT SYSTEM LAYOUT

