



CSR Marine South
Level Three Response – Stormwater Treatment Engineering Report

21 May 2024

Prepared for:
Washington State Department of Ecology

Prepared by:



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On Behalf of:
CSR Marine South
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ACRONYMS AND ABBREVIATIONS

µg/L	Micrograms per Liter
BYGP	Boatyard General Permit
CB	Catch Basin
CSR Marine	CSR Marine South
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
Facility	CSR Marine South
ft	Feet
GPM	Gallons per Minute
Inc	Incorporated
LLC	Limited Liability Company
MH	Manhole
mg/L	Milligrams per Liter
NAICS	North American Industry Classification System
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
OF	Outfall
O&M	Operations and Maintenance
Pacific Stormwater	Pacific Stormwater Solutions, LLC
PE	Professional Engineer
Permit	Boatyard General Permit
ppb	Parts per Billion
Site	22501 Dock Avenue S, Des Moines, Washington
SU	Standard Units
WAC	Washington Administrative Code
WQ	Water Quality



DISCLAIMER

This Level Three Response – Stormwater Treatment Engineering Report has been compiled by Pacific Stormwater Solutions, LLC. (Pacific Stormwater) for the CSR Marine South site located at 22501 Dock Avenue S in Des Moines, Washington. The content herein reflects the professional opinions and judgments of Pacific Stormwater, adhering to the specified scope, schedule, and limitations outlined in this report and the contractual agreement between Pacific Stormwater and the Client. The design parameters outlined in this document are based on conditions and information available at the time of preparation and do not encompass any subsequent changes. Pacific Stormwater's contributions to this report are limited to modeling and design recommendations. CSR Marine assumes full responsibility for the planning, logistics, implementation, installation, construction, operation, and maintenance of the system design proposed in this report.



EXECUTIVE SUMMARY

CSR Marine South operates as a full-service boatyard specializing in marine vessel building, repair, and maintenance in Des Moines, Washington. Stormwater runoff generated at the Facility is currently discharged to the Puget Sound under a Washington State Department of Ecology Boatyard General Permit. Stormwater collected at the Facility is currently treated by a StormwaterRx Aquip treatment system prior to discharge. During 2023, zinc was detected in six monthly stormwater samples collected from CSR Marine South at concentrations exceeding the allowable benchmark limit. As a result, CSR Marine is required to complete a Level Three Response, which includes the installation of supplementary stormwater treatment. CSR Marine contracted Pacific Stormwater to prepare this Engineering Report for the installation of a Purus Polishing System from Newterra to provide additional metals removal in stormwater discharge. This Engineering Report was prepared per Chapter 173-240-060 of the Washington Administrative Code (WAC) and provides a summary of the alternative treatment options considered, describes the proposed treatment system design, and discusses the expected results if the treatment system is to be installed.



1 INTRODUCTION

CSR Marine South is located at 22501 Dock Ave S in Des Moines, Washington (Site or Facility). CSR Marine operates as a full-service boatyard specializing in marine vessel building, repair, and maintenance. Stormwater runoff from the Site currently directly discharges to the Puget Sound under Washington State Department of Ecology's Boatyard General Permit #WAG030009 (Permit). Stormwater discharged from the Facility is currently treated by a StormwaterRx Aquip 50S treatment system manufactured by Newterra (Aquip). During the 2023 calendar year, concentrations of zinc in stormwater samples exceeded the benchmark limits established in the Permit. As a result, CSR Marine is required to complete a Level Three Response, which includes the installation of additional stormwater treatment to reduce zinc concentrations to below the benchmark limit.

Pacific Stormwater has prepared this Engineering Report on behalf of CSR Marine in accordance with the requirements set forth in the Permit. In compliance with WAC 173-240-060, the contents of this Engineering Report provide a summary of considered treatment alternatives, a description of the proposed treatment system design, and a discussion of the expected results if the treatment system is to be installed.

1.1 PROJECT BACKGROUND

CSR Marine South is located within the City of Des Moines Marina along the eastern shore of the Puget Sound, as shown on **Figure 1**. The Site includes King County tax parcel 2006601340, encompasses approximately 0.8 acres, and consists of approximately 100 percent impervious surface. The Site is developed with a main office and shop building, a work shed, two temporary covered work areas, and two small material storage sheds. The Site is bound to the west by an un-named access road followed by an in-water marina on the Puget Sound; to the north by a storage facility; to the east by Dock Avenue S followed by residential properties; and the to the south by a paved parking area. Marine vessel work conducted at the Facility is covered by the North American Industry Classification System (NAICS) 336612 for boat building. The Facility has the capacity for maintenance on up to 22 vessels at any given time. Work at the Facility is conducted year-round, but the majority of the work is conducted in the spring, summer, and fall.

Stormwater at the Facility is collected within two distinct drainage basins, consisting of the northern and southern portions of the Site as shown on **Figure 1**. Stormwater is collected within the northern basin by two catch basins that convey it west to an underground detention vault. A pressure wash pad is present within the northern drainage basin and includes a catch basin and sump. During normal operation the catch basin and sump do not discharge to the storm system. Process wash water is pumped out of the sump and disposed of offsite. However, during large stormwater flows and when the wash pad is not in use, Site personnel open an overflow valve to allow discharge from the sump to the detention vault. The southern drainage basin has one catch



basin that conveys stormwater runoff northwest to the detention vault. The detention vault has two chambers, the eastern chamber for untreated stormwater influent and the western chamber for treated stormwater effluent from the Aquip unit. Stormwater influent in the east chamber of the detention vault is pumped into the Aquip unit located along the west side of the main building, the gravity fed to the western side of the vault. The Aquip is capable of treating up to 75 gallons per minute (GPM). Treated stormwater discharges from the western side of the vault directly to Puget Sound via a single outfall pipe. A map of the current stormwater treatment system at the Facility is presented on **Figure 1**.

As a condition of the Permit, CSR Marine personnel are required to collect stormwater discharge samples from the Site at least once per month during the months of January, March, April, May, October, and November and submit them for analysis of the parameters listed in **Table 1** below. Stormwater discharge samples are collected from a sampling port installed on the effluent pipe of the Aquip treatment unit. The permitted benchmark values and sampling requirements for stormwater discharge from the Site to surface water are as follows:

Table 1. Stormwater Sampling Requirements for Discharge to Surface Water				
Parameter	Units	Benchmark Value	Analytical Method	Laboratory Quantitation Level
Turbidity	NTU	25	EPA 180.1/Meter	0.5
pH	SU	6.0 – 9.0	Meter/Paper	+/- 0.5
Oil Sheen	Yes/No	No visible oil sheen	Visual	N/A
Copper, Total	µg/L	44	EPA 200.8	2.0
Zinc, Total	µg/L	90	EPA 200.8	2.5
Petroleum Hydrocarbons (Diesel Fraction)	mg/L	10	NWTPH-Dx	0.25

During 2023, zinc was detected in six monthly stormwater samples at concentrations exceeding the allowable benchmark limit as presented in **Table 2** below. CSR Marine is required by the Permit to conduct a Level Three Response to reduce the detected concentrations of zinc to less than the permitted benchmark limit.



Sampling Date	Total Zinc Concentration (µg/L)
1/13/23	366
3/13/23	183
4/11/23	165
5/5/23	372
10/25/23	253
11/22/23	275
Total Zinc Benchmark Limit (µg/L)	90

1.2 PROJECT OBJECTIVES AND CONSTRAINTS

The objective of this Level Three Response (Project), described by this Engineering Report, is to reduce the detected concentrations of zinc in stormwater discharge to less than the permitted benchmark limit. This will be done as expeditiously and cost-effectively as possible, while adhering to all local permitting authorities.

CSR Marine South is a small, mostly impervious site located within 50 feet of the Puget Sound on a marina owned by the City of Des Moines. There are not any available areas within the Site to infiltrate, and the proximity of the Site to tidal influence would make infiltration to groundwater impractical. Therefore, stormwater from the Site must discharge to surface water. The proximity of the Site to the Puget Sound also means that any construction or installation at the Site may require special permitting, which would potentially increase the time and cost to achieve compliance. Therefore, stormwater treatment options must have a minimal impact to Site operations and the environment. Additionally, there is already a functional stormwater treatment system installed at the Site. Aquip units are widely used to treat industrial stormwater and have been approved for use by Ecology. The ideal stormwater treatment option for this Level Three Response will serve as supplementary treatment to the existing Aquip unit and will provide additional metals removal capability.

The treatment system described in this Engineering Report has been sized and designed for the current Site stormwater discharge.



2 TREATMENT SYSTEM EVALUATION

Per the requirements set forth in WAC 173-240-060, the following sections of this Engineering Report consist of: 1) a summary of the treatment alternatives evaluated and the reasons they are unacceptable, 2) a description of the proposed treatment process and system operation, 3) basic design data for each unit of the treatment process, and 4) the results to be expected from the treatment process.

2.1 ALTERNATIVES CONSIDERED

The following treatment methods were considered to provide additional metals removal from stormwater at the Site:

- Upsizing the existing Aquip Model 50S to an Aquip Model 80S
- Installing biochar media filters in the Site's catch basins
- Installing a Newterra Purus Polishing System downstream of the existing Aquip

Each treatment alternative was evaluated to determine the efficacy of pollutant removal, system footprint, capital equipment costs, and annual operations and maintenance (O&M) requirements, as discussed below. The treatment options analysis is summarized in **Table 3** below.

The option to increase the volume/flow capacity of the system by installing an Aquip 80S (capable of treating up to 120 GPM) was considered. In January 2023, CSR Marine collected stormwater samples before and after treatment to evaluate the efficacy of the Aquip media. The sampling results indicated the percentage of reduction for both zinc and copper was less than expected for the media. CSR Marine then replaced the sample media in the Aquip unit and in March 2023 collected samples before and after treatment. The reduction of the concentration of copper was significant with the effluent concentration less than the benchmark concentration. However, the reduction of the concentration of zinc was not enough for the concentration of the effluent sample to be less than the benchmark limit. Therefore, the insufficient zinc removal from the system appears to be a result of influent zinc concentrations greater than the treatment capacity of the Aquip rather than volume above capacity.

Filter inserts are currently installed in each of the catch basins installed at the Site as a means of pollution source control. These filters physically reduce oil, sediment, and debris in stormwater runoff, but they do not target metals removal. One cost-effective treatment option is to install catch basin inserts with biochar or other media that is designed to reduce metals in stormwater runoff. In Pacific Stormwater's experience, however, stormwater generally flows quickly through these inserts and does not remain in contact with the filter media long enough for proper adsorption and filtration to occur. Additionally, the media is easily clogged by debris and sediment and requires frequent replacement.



Newterra, the vendor for the existing Aquip media filtration system at the Site, also manufactures Purus Polishing Systems (Purus) that are designed to be installed downstream of Aquip units. Purus systems are sized to the corresponding Aquip treatment rates and provide advanced removal of colloidal solids and dissolved metals using cartridge filtration and ion-exchange technology. According to Newterra, the Purus system is specifically designed to be compatible with the existing Aquip treatment system at the Site and is capable of removing zinc and copper to concentrations of parts per billion (ppb). The Purus polishing systems have a high capital cost, but do not require frequent maintenance.

Table 3. Treatment Options Analysis Summary				
Treatment Option	Anticipated Zinc Removal	Equipment Footprint	Capital Equipment Cost	O&M Frequency
Aquip 80S	88%	112 ft ²	\$110,000	Routine: frequent Full: infrequent
Biochar Catch Basin Insert	19% - 100%	Minimal (size of catch basin)	\$4,200	Frequent
Purus 50	To < 90 µg/L	42 ft ²	\$99,000	Infrequent

CSR Marine determined that the Purus 50 is the ideal stormwater treatment option based on the anticipated metals removal effectiveness and the ease of integration with the existing Aquip system. The Purus is an above-grade system with a manageable footprint that does not require frequent maintenance or oversight. A technical datasheet sheet for Newterra’s Purus Polishing System is provided in **Appendix A**.

Additionally, CSR Marine has requested that the City of Des Moines (owner of the Des Moines Marina) paint over exposed metal on the main building roof as a structural control to reduce zinc and copper contaminant loading into the treatment system. Rooftop painting is anticipated to take place during Summer 2024.

2.2 BASIC DESIGN DATA

A summary of the design criteria for this treatment system is presented in the following sections.

2.2.1 POLLUTANT REMOVAL

Beginning in May 2021, concentrations of zinc have consistently been greater than the permitted benchmark value in stormwater discharge samples collected from the Site. Concentrations of copper have also periodically been greater than the benchmark value. Newterra’s design criteria were based on the average concentrations of copper and zinc in the Site’s stormwater discharge, provided by the Site, and the benchmark values provided in the Permit.

Table 4 below summarizes the reduction percentages required for compliance and the permitted discharge limits. Per the quote provided to the Site by Newterra (**Appendix B**), the Purus has been



designed to reduce copper and zinc in stormwater to below the corresponding benchmark values.

Table 4. Reduction Percentages Required for Compliance			
Parameter	Average Result (µg/L)	Benchmark Value (µg/L)	Required % Removal
Copper	47	44	7%
Zinc	271	90	67%

2.2.2 DESIGN FLOW RATE AND VOLUME

The Purus 50 was designed by Newterra to match the upstream discharge flow rate of the existing Aquip 50S at the Facility to establish a continuous treatment train.

2.2.3 FOOTPRINT

The proposed location of the Purus polishing system is presented on **Figure 2**. The existing Aquip is located at the western side of the Site, between the northwest corner of the main building and a shed. The Purus 50 has an anticipated footprint of approximately 42 square feet. The Site plans to remove the existing shed west of the Aquip to allow installation immediately downstream of the treatment system.

The topography of the Site is relatively flat and the entire area consists of pavement or cement. The Purus will be mounted on skids to provide additional stabilization. As the system will be installed above ground, no excavation is expected to be required. Installation of the Purus is not expected to significantly impact Facility operations and will not pose a risk to the water, sanitary sewer, or power utilities present at the Facility. CSR Marine may choose to elevate the existing Aquip so that discharge flows via gravity to the Purus rather than via a pump.

2.2.4 OPERATIONS AND MAINTENANCE

Upon installation of the Purus, Newterra will provide an O&M Manual to CSR Marine that details the operations and maintenance requirements for the treatment system. CSR Marine is required to maintain O&M manuals for all treatment system components onsite, per the Permit. The Purus is not anticipated to require frequent maintenance and does not require a treatment system operator.

2.3 TREATMENT PROCESS AND OPERATION

The process flow diagram illustrating the proposed stormwater treatment process is shown in **Figure 3**. Under current conditions, stormwater runoff is conveyed via catch basins and conveyance pipe to an underground detention vault with two chambers. Stormwater in the influent chamber is pumped aboveground into the Aquip media filtration unit to be treated. Treated stormwater then flows via gravity to the effluent chamber of the detention vault, where it



directly discharges to the Puget Sound. The proposed Purus system will be installed, so that stormwater treated by the Aquip will flow into the Purus for additional treatment before discharging to the effluent chamber of the detention vault.

The product anatomy of the Purus 50 system is included in the quote provided to the Site by Newterra, in **Appendix B**.

2.4 AMOUNT AND KIND OF CHEMICALS USED IN TREATMENT PROCESS

The existing Aquip and the proposed Purus do not require the use of any chemicals for operation.

2.5 RESULTS EXPECTED FROM TREATMENT PROCESS

The proposed Purus polishing system, in conjunction with the existing Aquip media filtration system, is expected to reduce both zinc and copper to less than the permitted benchmark values. Additionally, painting of exposed metal surfaces on the main building roof is expected to reduce zinc and copper in stormwater before it enters the treatment system, which will expand the life of the system and reduce maintenance requirements.

2.6 COMPLIANCE STATEMENT

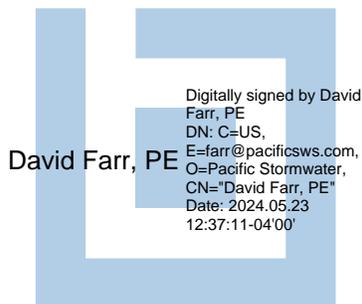
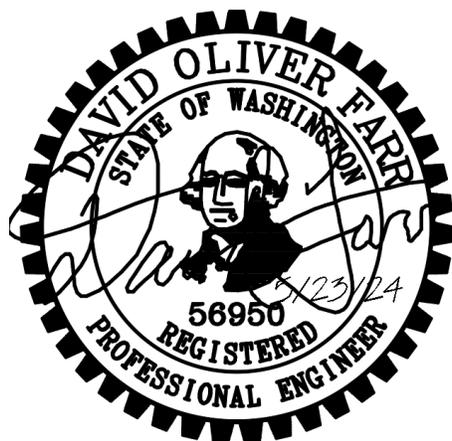
The Purus 50 was designed based on the specific contaminants of concern at the Site. It is designed to work in tandem with the Aquip 50S to provide an additional level of contaminant removal. Newterra is a trusted stormwater treatment vendor, with technologies approved by Ecology in use at a wide range of industrial facilities.

The stormwater treatment system will be owned by CSR Marine South. It will be operated and maintained at CSR Marine's discretion.



3 CERTIFICATION BY A LICENSED PROFESSIONAL ENGINEER

This engineering report was prepared under the direct supervision and direction of the undersigned, whose seal as a professional engineer licensed to practice as such, is affixed below.





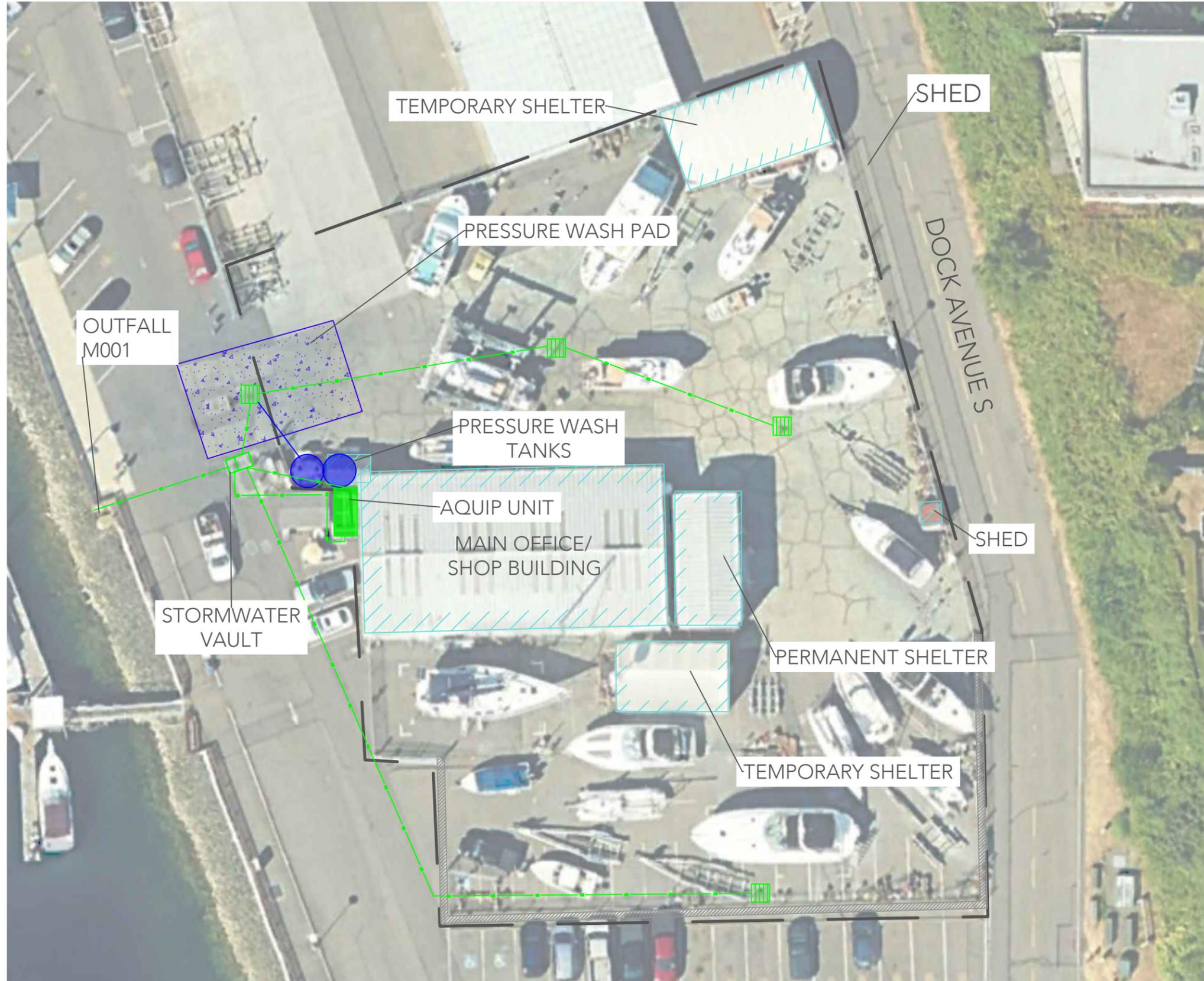
FIGURES

CSR MARINE SOUTH

NW 1/4 SEC 17 T22N R4E

LEGEND

-  FACILITY BOUNDARY
-  BUILDING FOOTPRINT
-  CURBING
-  CONVEYANCE LINE
-  CATCH BASIN



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REVISION	DATE	DESCRIPTION
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DESCRIPTION:	
ISSUE DATE:	
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	

PACIFIC STORMWATER
 414 RAVENNA BOULEVARD
 SUITE A #1055
 SEATTLE, WA 98115
 WWW.PACIFICSW.COM

PREPARED FOR:
CSR MARINE SOUTH
 22501 DOCK AVENUE S
 DES MOINES, WA 98198

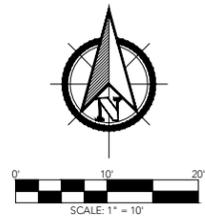
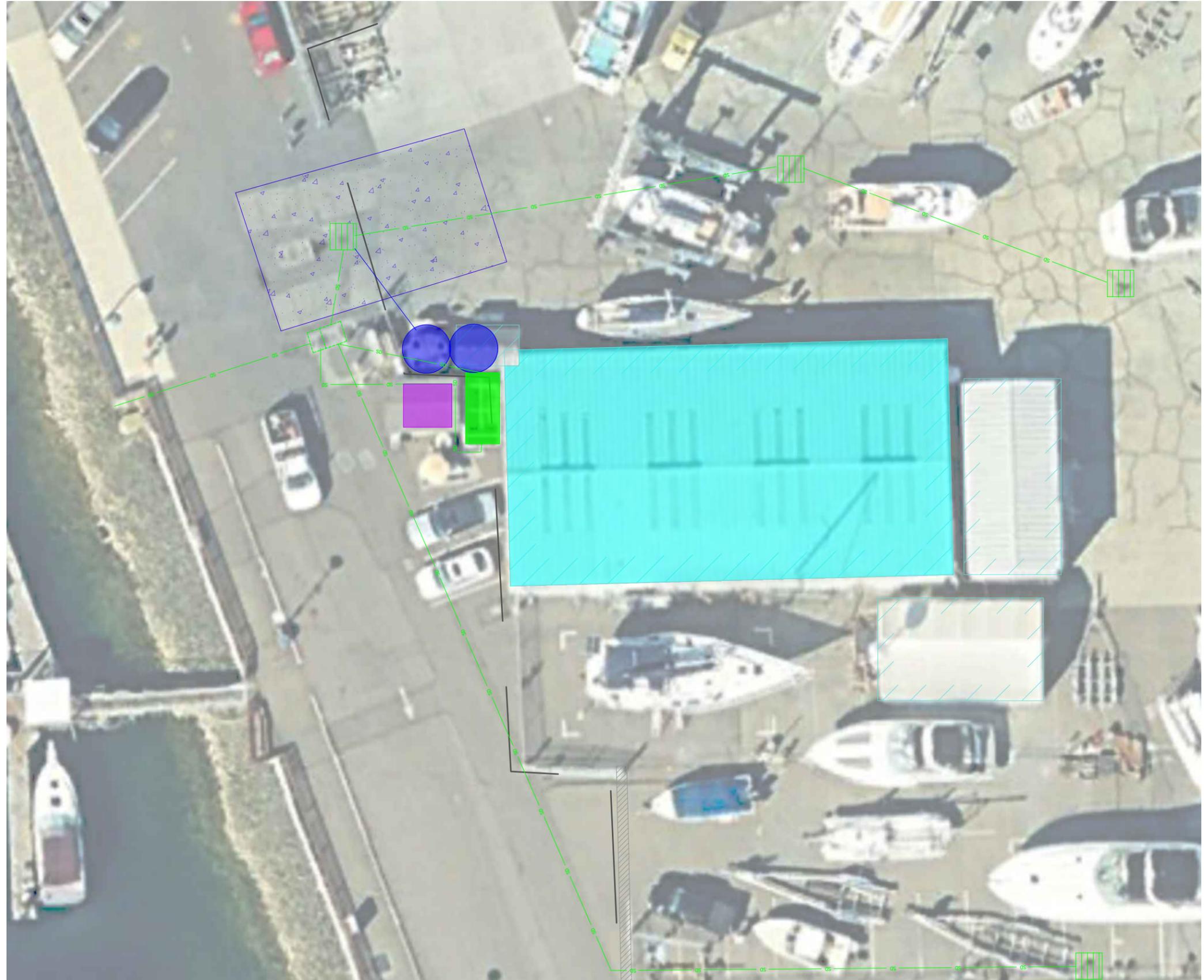
FIGURE 1
 SITE ACTIVITY MAP

CSR MARINE SOUTH

NW 1/4 SEC 17 T22N R4E

LEGEND

-  FACILITY BOUNDARY
-  BUILDING FOOTPRINT
-  CURBING
-  CONVEYANCE LINE
-  CATCH BASIN
-  PROPOSED ROOF PAINTING
-  PROPOSED PURUS 50 LOCATION



THESE PLANS AND SPECIFICATIONS SHALL BE EXAMINED BY THE OWNER/CLIENT FOR WHICH THEY ARE PREPARED AND SHALL NOT BE USED FOR ANY OTHER PROJECT OR PURPOSE WITHOUT THE WRITTEN CONSENT OF THE ENGINEER. THE ENGINEER'S LIABILITY IS LIMITED TO THE PROFESSIONAL SERVICES PROVIDED BY HIM OR HER AND HIS OR HER EMPLOYERS AND SHALL NOT BE EXTENDED TO ANY OTHER PROJECT OR PURPOSE WITHOUT THE WRITTEN CONSENT OF THE ENGINEER.

FIGURE 2
PROPOSED CORRECTIVE ACTIONS

PREPARED FOR:
CSR MARINE SOUTH
 22501 DOCK AVENUE S
 DES MOINES, WA 98198

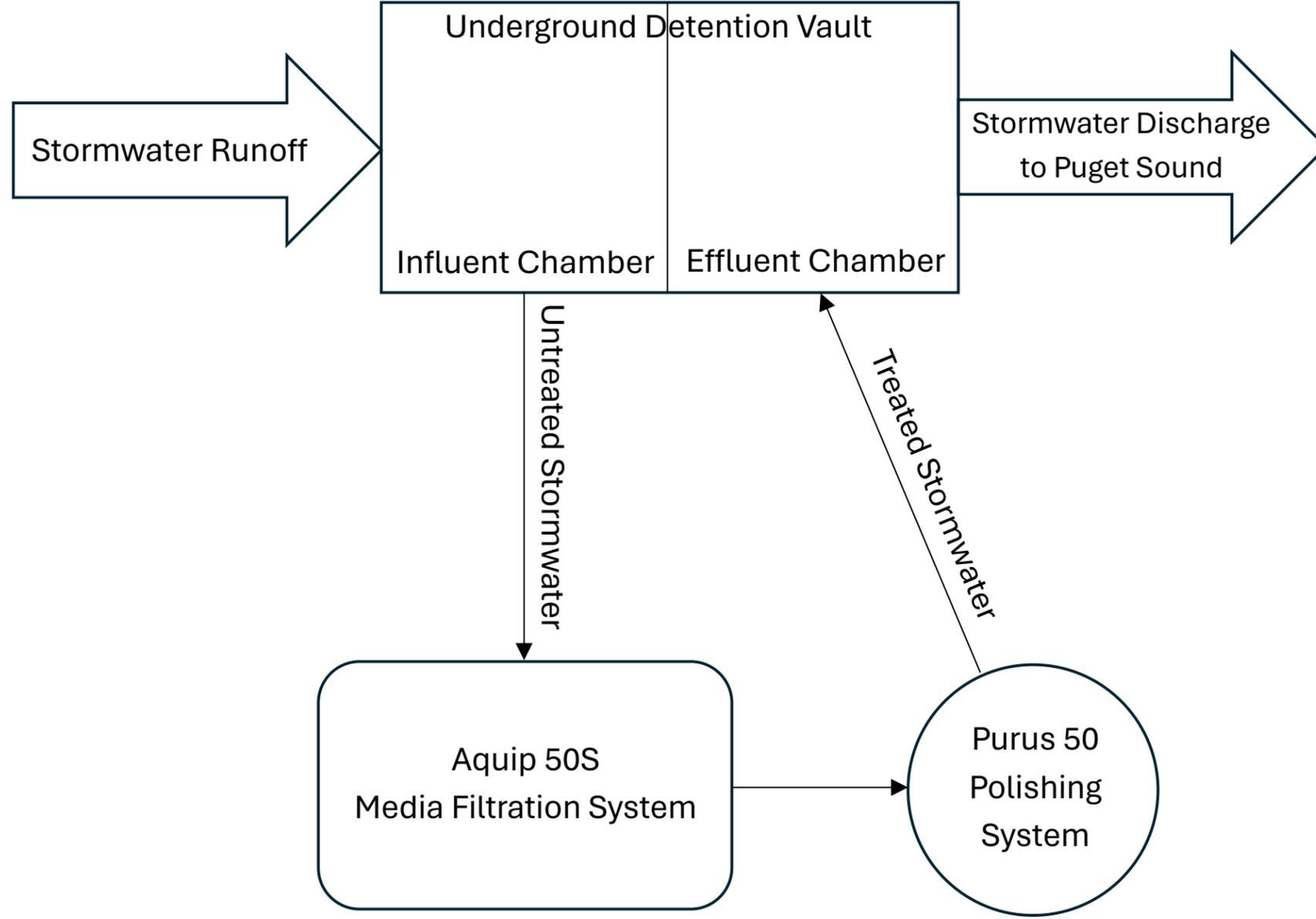
 **PACIFIC STORMWATER**
 414 RAVENNA BOULEVARD
 SUITE A #1055
 SEATTLE, WA 98115
 WWW.PACIFICSW.COM

REVISION	DATE	DESCRIPTION
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DESCRIPTION:
 ISSUE DATE:
 DESIGNED BY:
 CHECKED BY:
 APPROVED BY:

CSR MARINE SOUTH

NW 1/4 SEC 17 T22N R4E



IN USE OF THIS PLAN, THE CONTRACTOR SHALL BE ADVISED THAT THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM ALL APPLICABLE AGENCIES AND AGENCIES.

FIGURE 3
STORMWATER FLOW
DIAGRAM

PREPARED FOR:
CSR MARINE SOUTH
 22501 DOCK AVENUE S
 DES MOINES, WA 98198


PACIFIC STORMWATER
 414 RAVENNA BOULEVARD
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 ISSUE DATE:
 DESIGNED BY:
 CHECKED BY:
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APPENDIX A

Purus Polisher Technical Datasheet



Purus[®] Polisher

advanced stormwater polishing system

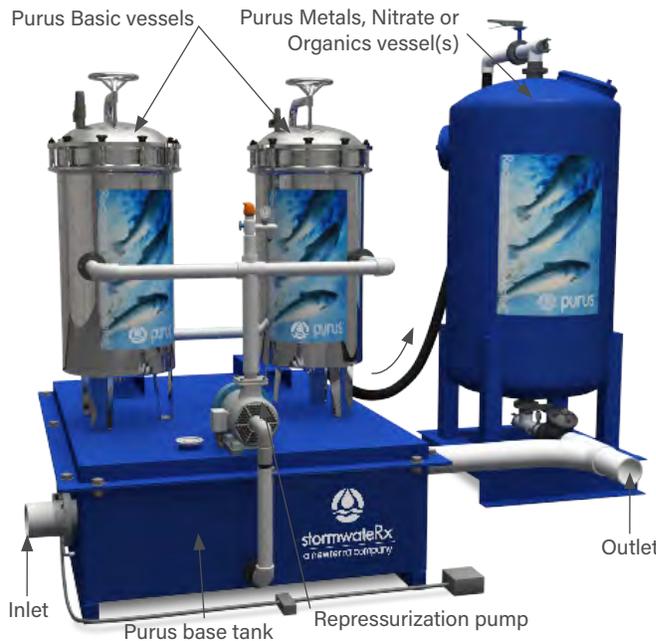
Purus[®] Advantages

- Flow matched to upstream treatment rates
- Targets individual site-specific parameters
- Removes trace pollutants

Purus (PURE-us), a group of stormwater polishing technologies, is designed to provide the most advanced level of stormwater treatment in the most challenging water quality conditions. With this level of stormwater pollutant removal possible, the Purus system is ideal for industries where higher concentrations of specific pollutants are common, or where water quality standards are more stringent or watershed-specific.

The diagram below shows the complete Purus polishing line of products. The large vessel, shown directly below, can house media appropriate for polishing dissolved metals, nitrate and/or organics from stormwater. Purus Bacteria is shown to the far right. Purus is typically installed after the Aquip stormwater filtration technology in a "treatment train" configuration.

Target Pollutants	
Colloidal solids	Toxic organics
Dissolved metals	Bacteria
Nitrate	



Purus Bacteria

Model	Pollutant Type
Basic	Fine particulates, colloidal solids and turbidity
Metals	Dissolved metals to the parts-per-billion range
Organics	Categorical organics such as COD; toxic organics such as PCBs and PAHs; and dissolved organics such as petroleum hydrocarbons (TPH) and VOCs
Bacteria	Bacteria, such as E. coli and fecal coliform
Nitrate	Intermediary degradation product of organic nitrogen, ammonia and urea

Options

- Slip-stream treatment configuration available
- Freeze protection available



Purus[®] Advanced Stormwater Polisher



Purus Basic



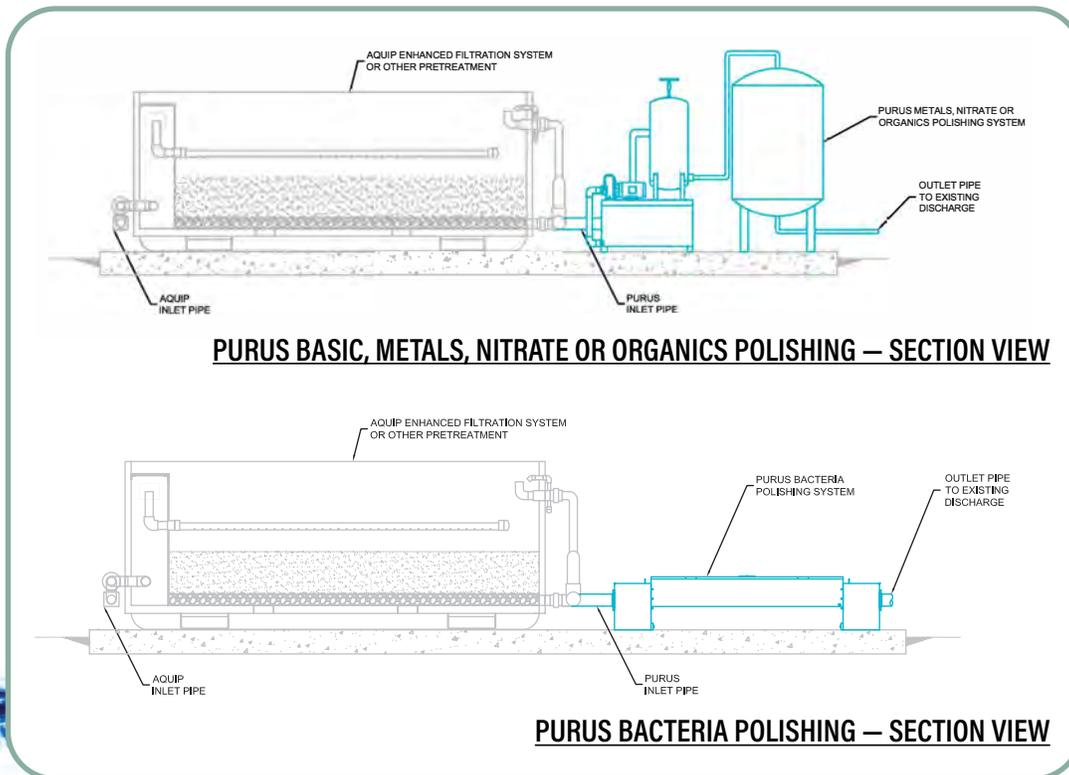
Purus Metals



Purus Bacteria



Purus Nitrate



1.800.680.3543
stormwaterRx.com



APPENDIX B

Proposal for Purus 50 Polishing System

Proposal for

CSR Marine South, Inc.

Purus 50 Polishing Systems

QU-2303593.R0

10/13/23



Prepared for

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Prepared by

Chris Fromme, Newterra Corporation, Inc.

cfromme@newterra.com | 213-248-9940

Executive Summary

Newterra is pleased to provide CSR Marine with the following proposal for 22501 Dock Ave. S. Des Moines, WA 98198.

This firm proposal is designed to meet your needs based on our mutual discussions or based on the information you provided in your request for Aquip polishing systems. Please let us know if these requirements have changed or are inaccurate in any way.

The requirements include:

- Skidded Purus systems with pumps, cartridge filtration, and ion exchange for polishing Aquip 50 system.

As a benefit to you, all Newterra projects include:

- Professional start-up assistance, commissioning, training, and service (if required)
- Extensive experience with engineering, PLC programming and fabrication capabilities in-house.
- Experience manufacturing water treatment systems of this scale and complexity with strict performance and safety requirements
- Optimum equipment arrangement with an objective to minimize footprint and operating costs

The price for this firm proposal is \$87,220.00. Please see Section 5. Commercial offering for additional details.

All prices quoted are valid for 30 days from the date stated in the following proposal. If you have any questions regarding our proposal, please do not hesitate to contact me.

Sincerely,
Chris Fromme
Western United States Regional Manager
Stormwater/Remediation
Newterra Inc.

Email: cfromme@newterra.com
Cell: 213-248-9940

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1. Incoming Water Quality

The source water for the polishing skids in Seattle, WA is representative effluent from existing Aquip systems.

1.1. Inlet Quality

The proposed system is designed based upon the following water quality summary from an email dated 9/13/23:

CSR Marine Seattle:

Benchmarks are 32 ppb for copper and 90 ppb for zinc. We're so close, but even a full media refresh on our Aquip couldn't get us there. We're averaging 42 ppb for copper and 71 ppb for zinc. In practical terms, this means we're exceeding the limits 50% of the time on copper and 25% of the time on zinc. We have enough data to know we're not going to make it long term with this system and we're going to trigger a Level 3 Engineering report soon.

CSR Marine Des Moines:

Benchmarks are 44 ppb for copper and 90 ppb for zinc. We're close on copper but way off on zinc. We've been averaging 47 ppb for copper and 271 ppb on zinc. We only make our copper benchmarks 50% of the time, and we have never made the zinc benchmark. We've already triggered a Level 3 enforcement action, so if anything, this yard is our priority. As a side note, I think we may have a problem with the metal roof on our building and the galvanized fencing causing our zinc numbers to be so high.

Inlet Variability

If in the event that the influent water source changes, the ability of the water treatment system to produce the designed treated water quality and/or quantity may be impaired. Customer may continue to operate the system but assumes the risk of damage to the system and/or additional costs due to increased consumable usage. Additional supplemental equipment can be purchased from Newterra, which in certain cases can restore normal production rates and minimize system damage.

1.2. Outlet Quality Target

The proposed system is designed to treat water with the following water targets:

Seattle Location:

- Copper < 32 ppb
- Zinc < 90 ppb

Des Moines Location:

- Copper < 44 ppb
- Zinc < 90 ppb

2. Newterra Scope of Supply

The proposed treatment system consists of the components described in this section.

2.1. Base System Equipment

2.1.1. Des Moines Aquip 50 Polishing Skid

- Powder-coated carbon steel weldment – (1 each) – total footprint of system estimated at approximately 12 ft length by 3.5 ft width (flexible). The following components will be skid mounted within the boundary:
 - All pipe made of schedule 80 PVC
 - Shutoff valving on skid boundaries and including filter, ion exchange isolation and bypass, check valve for pump discharge.
 - (1 ea) Main skid pump
 - Self-Priming Close Coupled
 - 50 GPM at 40 psi, 5 HP
 - 240V/3Ph/60Hz
 - Cast Iron
 - (1 ea) Variable Frequency Drive
 - NEMA 4X, Panel Mount
 - 240V/1Ph/60Hz Input, 240VAC/3Ph/60Hz Output
 - Estimated 18 FLA @ 240V/1Ph/60Hz
 - Pressure transducer
 - (1 ea) Fused disconnect switch and relay panel with alarm indicating lights
 - (1 ea) High Flow Cartridge filter housing
 - Vertical FRP Housing with pressure indicators, differential pressure switch, and pressure relief
 - 40" x 6" 5-micron polypropylene cartridge filters
 - (1 ea) Ion Exchange Vessel
 - FRP tank, 24" diameter x 65" H
 - Inlet and outlet distributors
 - Silica sand for underdrain and softening resin
 - Isolation and bypass valving
 - Pressure indicators and pressure switch, air vent
 - (1 ea) Horizontal rectangular tank
 - 110 gallon Polyethylene
 - 48" L x 35" W x 18" H
 - Fittings and Level switches

3. Engineering Submittals

3.1. Base Package

The following submittals are provided with equipment purchase.

Deliverable	Description
P&ID – Process & Instrumentation Diagram	Diagram of all process components, sensors, instrumentation, pipe sizes and materials, main equipment specifications and control signals/alarms/interlocks.
GA – Skid General Arrangement	Drawing of 3D skid with plan/elevation/side views to denote skid dimensions, plumbing inlet/outlet connections, electrical connections, lifting/loading points and includes main equipment bill of materials.
Electrical Schematics	Drawing of main skid power connections, disconnect, equipment schedule and component layout of panel. Electrical schematic drawing showing all wire connections within the control panel and component layout of the panel.
User Manual	PDF document describing operation of skid. Includes information about safety, installation, operation, control, maintenance, troubleshooting, alarms, spare parts, drawings & warranty.
Spare Parts List	Recommended critical spare parts list for the system.
Major Equipment Cut Sheets and Vendor Manuals	All cut sheets or user manuals for all major equipment on the skid. Includes items like pumps, controls, sensors, control valves, tanks etc.
1 Hour Webinar Design Review	1 Hour webinar reviewing total project scope and presented submittals.
Shipping Pack List	List of items shipping to customer including loose-packed items like filters or spare parts

3.2. Optional Engineering Documentation

The following is a list of options that can be provided to the client upon request. Newterra to provide estimate based on scope of project.

Deliverable	Description
Seismic Anchorage Structural Engineering Package	Complete structural drawings for skid anchoring signed/stamped by PE Engineer.
Control Narrative	Document describing the overall control scheme for the skid. HMI menu overview and alarm scheme.
I/O Table and SOO	Spreadsheet and documentation of all skid control set points, PLC I/O, alarms, Sequence of Operation and PID control loops.
PLC/HMI Code	PLC and HMI specific code the skid. These are the actual program files uploaded to the device. **Requires executed limited use and license agreement**
In Person Design Review	An in-person design review can be conducted with the customer's design and operations team.

4. Startup Services

The following is a breakdown of start-up services responsibilities.

Item	Description	Scope of Supply	
		Newterra	CSR Marine
Equipment Installation	Unloading the equipment, rigging the equipment into place, connection existing power wiring to control panel, verifying adequate drainage, testing for adequate water pressure, and testing power supply		X
	Remote technical support of Equipment Installation	X	
Plumbing, Electrical and Pre-Startup Inspection	Plumbing and electrical connections to be finalized before Newterra installation visit. All plumbing and electrical connections to the equipment to be perform by the customer.		X
	Includes time to inspect installation work, address questions, develop punch list of completion items necessary prior to startup.	X	
Commissioning Checklist	Newterra pre-commissioning checklist to customer	X	
	Complete pre-commissioning checklist and send completed form to Newterra prior to site mobilization for startup services.		X
Filter Media Loading/ Pre-treatment Loading/ Membrane Loading	Includes loading filter media, loading chemical drums and loading membrane elements (if not loaded in factory). Field service technician with support.	X	X
Equipment Startup and Commissioning	Includes preparing the equipment to operate (flush, backwash, steam, regenerate, etc.), operating the equipment manually, operating the equipment automatically, setting and testing control system, flushing preservative, and putting system into automatic operation. Also includes informal, hands-on training conducted by the service technician in front of the equipment.	X	

4.1. Startup Services Scope of Work

If start-up services are selected:

- This service work assumes no weekends, or a holiday are required and is based on an eight-hour workday.
- Travel time to and from the job site for Newterra Field Service personnel to perform the tasks define in section 5, above, is included in this estimate.
- To ensure personnel availability, Newterra requires a minimum of four weeks' advance notice to schedule equipment start-ups.
- The commissioning plan does not allow for site specific safety training. Any site-specific safety training required will be billed at Newterra's Field Service Labor Rates.

- On-time completion of Newterra's startup and commissioning services requires satisfactory installation of all equipment by Customer (where not included above). If additional service time is required for Newterra's commissioning scope due to Customer's changes in scope or delays in completion of installation, additional charges will apply, billed at Newterra's Field Service Labor Rates.

5. Commercial Offer

5.1. Base System

Description	Price
Base System Equipment, as defined in section 3.1	
Total	\$84,200.00

5.2. Startup Services

Description	Price
Up to 2 hours of remote communication (phone, teleconference, emails, or other as appropriate) is included at no additional charge to provide support for startup and commissioning of a single system.	Included (no additional charge)
Additional time beyond 2 hours of remote communication to be billed at Newterra Field Service Technician rate. (Optional – Actual time used will be invoiced)	Bill Actual: Hours x Field Service Technician Rate
Price indicates cost for (2) Newterra personnel to be on-site for (1) days with assistance to help load media. Additional days to be billed at Newterra field service rate. (Optional – notify account manager to include)	\$3,020.00



5.3. Freight

A shipping estimate will be supplied upon contract award. All pricing is FCA (INCOTERMS 2020) from designated factory.

5.4. Invoicing and Payment Terms

- Terms without credit approval are prepaid
- Terms are as follows with credit approval:

5.4.1. Equipment Systems

Payment Terms- Net 30 with approved credit:

- 50% deposit required with confirming order
- 50% and taxes (if any) invoiced when product(s) ready to ship
- 50% restocking fee applies for all cancelled orders

5.5. Project Schedule

The Buyer and Seller will arrange a kick-off meeting after contract acceptance to develop firm deliverable and shipment schedule.

5.6. Equipment Shipment and Delivery

Firm shipment estimates to be determined upon award of contract. The Buyer and Seller will arrange a kick-off meeting after contract acceptance to develop firm shipment schedule.

5.7. Pricing Notes

- All prices quoted are valid for 30 days from the date stated in the proposal (firm proposals only).
- All prices quoted are in USD.
- Any sales or value added tax is not included.
- The customer will pay all applicable local, state, provincial, or federal taxes and duties.
- The equipment delivery date, start date, and date of commencement of operations are to be negotiated.
- Commercial terms and conditions shall be in accordance with Newterra's Standard Terms and Conditions of Sale.
- This proposal and the rates provided herein are subject to final site, environmental, Newterra compliance check and financial due diligence by Newterra.
- This proposal supersedes all previous proposal and correspondence.
- Seller's price and delivery schedule are based on the assumption that Buyer will take delivery as and when foreseen by the schedule. Where this is not the case, the Parties must agree in advance an alternative place of delivery, failing which the Seller will be entitled to ship the equipment to storage. Buyer shall issue a Change Order to consider any additional cost or delay incurred by Newterra in implementing this change.

5.8. Conditional Offering

Customer understands that this proposal has been issued based upon the information provided by customer, and currently available to, Newterra at the time of proposal issuance. Any changes or discrepancies in site conditions (including but not limited to system influent water characteristics, changes in environmental, health and safety (EH&S) conditions, and/or newly discovered EH&S concerns), Customer financial standing, Customer requirements, or any other relevant change, or discrepancy in, the factual basis upon which this proposal was created, may lead to changes in the offering, including but not limited to changes in pricing, warranties, quote specifications, or terms and conditions. Newterra's offering in the proposal is conditions upon a full Newterra EH&S and Customer financial review.

5.9. After Sales Service

Newterra can provide a service agreement adjusted to the needs of each application. We offer monthly, quarterly, and annual services as required. Services include performance monitoring, controls check, consumable parts replacement, water quality testing and operator training.

Should you want to learn more about Newterra's expert service offerings on your equipment, please contact your local Newterra Water Treatment Technologist or visit our website <http://www.h2oengineering.com> to get connected with a Customer Service Representative in your region. In North America, please dial 1-866-987-0303 to contact a customer service representative.

6. Acceptance of Proposal

The commercial offer, specifications, terms, and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified in this proposal. Payment will be made as outlined under the commercial offer.

Name and Title: _____

Signature: _____

Date of acceptance: _____

7. Newterra Project Team Members

Jeffery Martens – General Manager



Jeff has 25 years of water treatment experience as a global business development and marketing executive. He has a history of delivering some of the most innovative and successful water treatment solutions in the industry. As the Vice President of Sales and Market Development, he is responsible for setting strategy, building partnerships, and delivering the right technology solutions for our customers. Jeff graduated from the University of Michigan with a Chemical Engineering degree and went on to get his MBA from Northwestern's Kellogg School of Management.

Ben Corcoran – VP of Operations



As Vice President of Operations, Benjamin Corcoran directs all project processes and logistics, including materials procurement, resource planning, parts fabrication, product assembly, procedural implementation, and delivery logistics. Benjamin is responsible for Newterra's facility requirements, manufacturing safety programs, final product inspection and prove-out and the company's UL 508A certification. Benjamin has been a part of the Newterra team for the last 10 years.

Trevor Weiss – Applications Engineer



Trevor Weiss is a Water Engineering M.S. graduate from California Polytechnic State University, San Luis Obispo. As an Applications Engineer, Trevor is responsible for presales system design including technology selection, water treatment modelling, system specifications, and project costing. Trevor is a bridge between sales and engineering and works with customers to better understand their technical needs to ensure projects are delivered on time and meet customer expectations. Trevor has hands-on experience in the manufacturing industry supporting production and research & development of new technologies related to water treatment.

Stephenie Wright – Water Process Engineer

As a Water Process Engineer, Stephenie interfaces between sales and engineering to identify requirements and meet customer needs. She is responsible for presales system design including technology selection, water treatment modeling, system specifications and project costing. Stephenie has a M.S. in Engineering from the University of Arizona, Fayetteville, and prior experience in municipal wastewater system design.

Erik Barker – Field Operations Supervisor



Erik Barker is the Field Operations Supervisor for Newterra, Inc. Erik has close to 20 years of experience in the ozone and water purification industry. He currently oversees all service operations, in-house and in-field duties for both the Clean World and Pure Water divisions of Newterra. In addition, Erik also oversees and maintains Newterra’s ozone remediation system rental fleet. Erik’s experience provides a wide range of capabilities from system deployment and installation to preventative maintenance and service, to system troubleshooting, prove-out and repairs.

Caitlin McLaughlin – Lifecycle Product Manager



As the Lifecycle Product Manager, Caitlin assists with planning and organizing the Service Department to meet Newterra’s objectives for customer support. Caitlin graduated from San Francisco State University with a B.S. in Environmental Studies: Earth System Science and has experience in biofuel, pollution prevention, and water conservation programs. Her background in product research and development, production management, software troubleshooting and customer support makes her an excellent asset to the team. Caitlin is responsible for resource allocation of the Service Department and serves as the primary point of contact for all service-related activities and projects.

8. Customer Testimonials



“Two years after installation and startup of our large-scale system they remain committed to ensuring our system operates as designed and we continue to use their service team as a result.”

Jorge Montoy, Sovereign Consulting Inc



“In our experiences with H2O Engineering, we have witnessed this company’s determination to deliver a quality product regardless of project obstacles and unforeseen interference that many vendors would charge an additional premium to resolve. H2O Engineering delivered the solution on time, on budget and in a professional manner.”

Anderson Dill Jr., Water Dynamics, Inc.



“It has been a pleasure to work with H₂O Engineering on various projects at the Water Resource Recovery Facility. Their entire staff has shown a high degree of professionalism, dedication and attention to detail throughout the entire time frame of the projects. Their company has provided a value-based relationship with the Water Resource Recovery Facility for the City of San Luis Obispo.”

Howard Brewen, Water Resource Recovery Facility



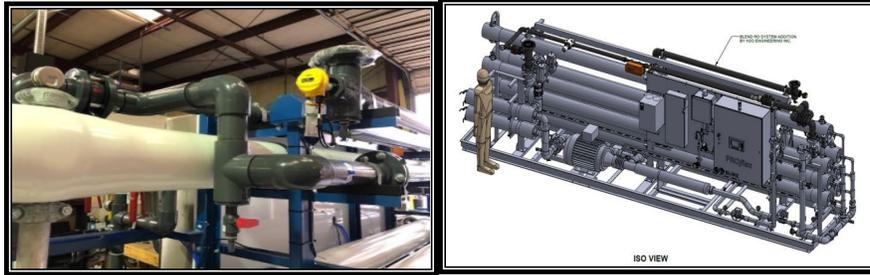
“In the craft brewing industry, quality is top priority and continuous production is paramount. Not only has our water quality improved, but we’ve successfully integrated new equipment centers without interrupting process.”

Mark Fischer, Firestone Walker Brewing Company

9. Newterra Project References

The following **BLUE BOLD** descriptions are hyperlinks. Click on links for more details.

175 GPM RO SYSTEM WITH BLENDED MAKE UP



IRRIGATION WATER FILTRATION AND REUSE SYSTEM FOR VERTICAL FARM



WATER TREATMENT FOR INDOOR AG FACILITY



MOBILE DI WATER FOR PLANNED SYSTEM FLUSH



RO FILTRATION FOR BEVERAGE PROCESSING



CONTINUOUS OZONE FILTRATION AND REUSE SYSTEMS



OZONE SYSTEM FOR IRRIGATION WATER REUSE



RO SYSTEMS FOR INDOOR AGRICULTURE



ULTRAPURE WATER SYSTEM FOR ELECTRONICS MANUFACTURING



10 GPM RO SYSTEM FOR MUNICIPAL WASTE RECYCLE



DI PROCESS AND CONTROL SYSTEM FOR LARGE MANUFACTURING CO.



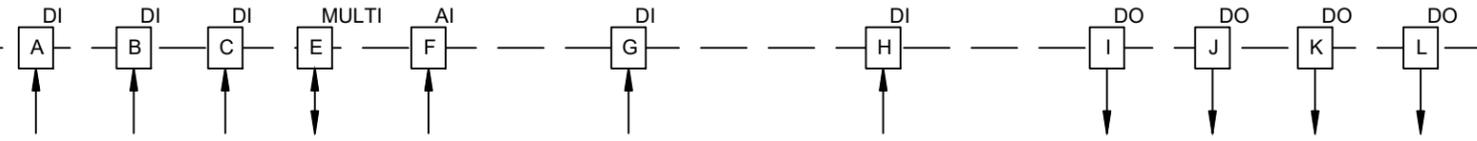
THREE, 208 G/H MOBILE OZONE SPARGE SYSTEMS



10. Appendix – Presales Drawings

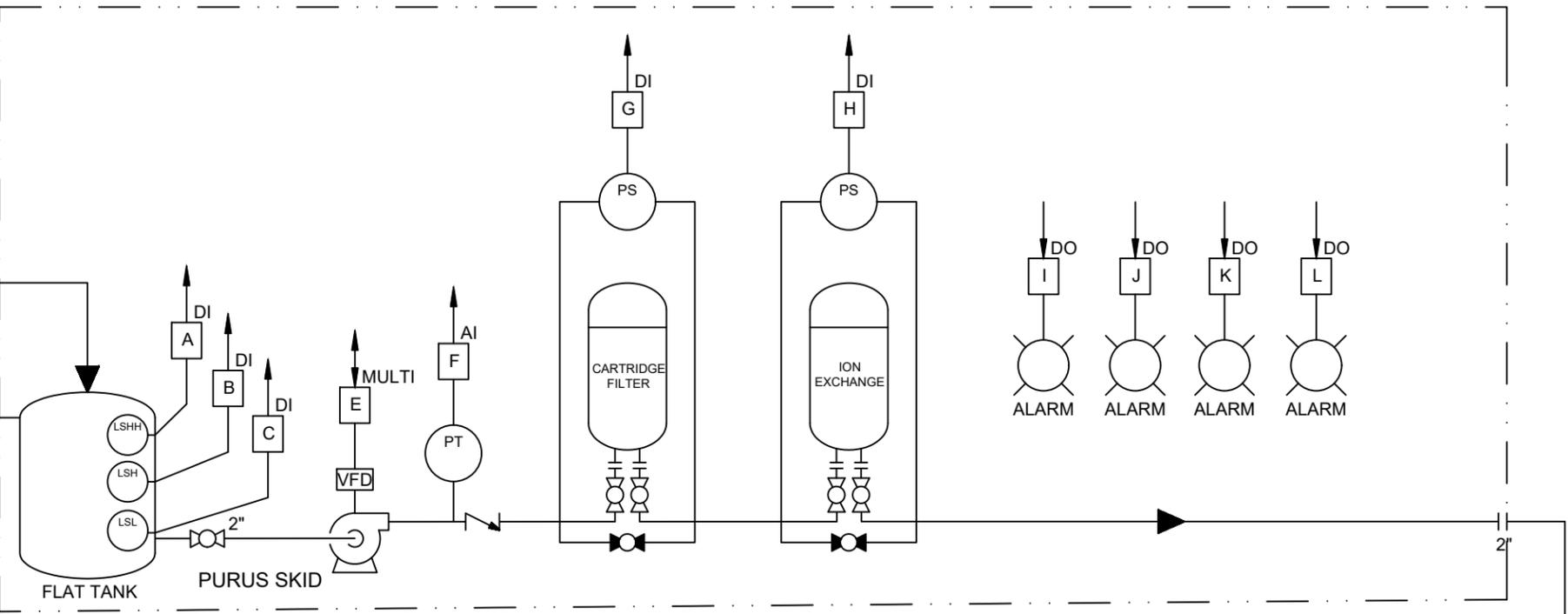
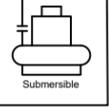
RELAY PANEL

RELAY PANEL



AQUIP 50

STORMWATER



BYPASS
OVERFLOW

LSHH, LSH, LSL, 2"

VFD, MULTI, AI F, PT

OUTFALL

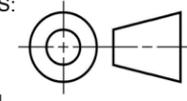
PURUS 50 - DES MOINES

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DIMENSIONS ARE IN INCHES:
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ANGULAR: MACH ± 1°
TWO PLACE DECIMAL: ±0.01
THREE PLACE DECIMAL: ±0.005
INTERPRET GEOMETRIC TOLERANCES PER ASME Y14.5-2009
MATERIAL: --- FINISH: ---



PFD & LAYOUT PURUS SYSTEMS CSR MARINE		
SIZE B	DRAWING NO. PRESALES	REV. A
SCALE NTS	WEIGHT ---	SHEET NO. 2 OF 6

4

3

2

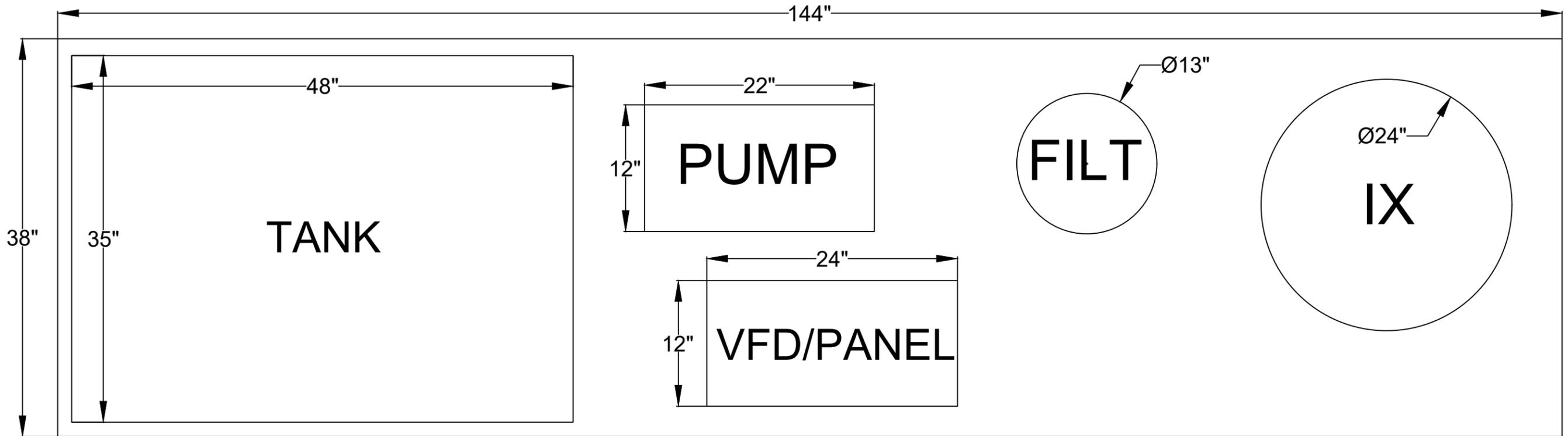
1

B

B

A

A



PURUS 50 CONCEPTUAL LAYOUT - DES MOINES

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PFD & LAYOUT PURUS SYSTEMS CSR MARINE		
SIZE B	DRAWING NO. PRESALES	REV. A
SCALE NTS	WEIGHT ----	SHEET NO. 4 OF 6

4

3

2

1

ACTUATORS		NO	VALVES	NC	PUMPS	EQUIPMENT	MEASUREMENT	INDICATION	FUNCTION SYMBOLS	LINES
	SPRING DIAPHRAGM (OR GENERIC)		GATE (OR GENERIC)							
	SPRING DIAPHRAGM WITH POSITIONER		BALL							
	PRESSURE BALANCED DIAPHRAGM		BUTTERFLY							
	PNEUMATIC LINEAR PISTON		NEEDLE							
	PNEUMATIC LINEAR PISTON WITH POSITIONER		GLOBE							
	ROTARY MOTOR		ANGLE							
	HANDWHEEL		PLUG							
	SOLENOID		PINCH							
	ELECTRIC		KNIFE GATE							
	CONTACTOR		GATE							
			BACKFLOW PREVENTER							
			CHECK							
			THREE WAY							
			FOUR WAY							
			BACKPRESSURE REGULATOR-INTERNAL							
			BACKPRESSURE REGULATOR-EXTERNAL							
			PRESSURE REDUCING REGULATOR-INTERNAL							
			PRESSURE REDUCING REGULATOR-EXTERNAL							
			PRESSURE REDUCING REGULATOR W/ GAUGE							
			PRESSURE RELIEF VALVE							
			RUPTURE DISC							

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PFD & LAYOUT
PURUS SYSTEMS
CSR MARINE

SIZE B	DRAWING NO. PRESALES	REV. A
SCALE NTS	WEIGHT ----	SHEET NO. 5 OF 6

FIRST LETTER	SUCCEEDING LETTER	A										C	E	G	I	K	L	Q	R	S					T		Y	V,Z			SPECIAL IDENTIFICATION	
		ALARM	HIGH-HIGH ALARM	HIGH ALARM	LOW ALARM	LOW-LOW ALARM	SENSOR FAULT ALARM	BLIND CONTROLLER	INDICATING CONTROLLER	SENSOR (PRIMARY ELEMENT)	GLASS	INDICATOR	CONTROL STATION	PILOT LIGHT	TOTALIZER	RECORD	SWITCH	HIGH-HIGH SWITCH	HIGH SWITCH	LOW SWITCH	LOW-LOW SWITCH	BLIND TRANSMITTER	INDICATING TRANSMITTER	SOLENOID VALVE (PILOT), RELAY, COMPUTATION, CONVERTER	CONTROL VALVE	VALVE	FINAL CONTROL ELEMENT	SYMBOL	DESCRIPTION			
A	ANALYSIS	AA	AAHH	AAH	AAL	AALL	AAT	AC	AIC	AE		AI		AL		AR	AS	ASHH	ASH	ASL	ASLL	AT	AIT	AY	ACV	AV	AZ					
B	USER'S CHOICE																															
C	USER'S CHOICE																															
D	USER'S CHOICE																															
E	VOLTAGE	EA	EAHH	EAH	EAL	EALL	EAT	EC	EIC	EE		EI	EK	EL		ER	ES	ESHH	ESH	ESL	ESLL	ET	EIT	EY			EZ					
F	FLOW	FA	FAHH	FAH	FAL	FALL	FAT	FC	FIC	FE	FG	FI		FL	FQI	FR	FS	FSHH	FSH	FSL		FT	FIT	FY	FCV	FV		FO	ORIFICE PLATE			
G	USER'S CHOICE																															
H	HAND	HA						HC	HIC					HL		HS								HCV	HV		HMS	PUSHBUTTON SWITCH				
I	CURRENT (ELECTRICAL)	IA	IAHH	IAH	IAL	IALL	IAT	IC	IIC	IE		II	IK	IL		IR	IS	ISHH	ISH	ISL		IT	IIT	IY			IZ					
J	POWER	JA	JSHH	JAH	JAL	JALL	JAT	JC	JIC	JE		JI	JK	JL	JQI	JR	JS	JSHH	JSH	JSL		JT	LIT	JY			JZ					
K	TIME SCHEDULE	KA											KI	KL		KS																
KQ	TIME TOTAL	KQA	KQAHH	KQAH	KQAL	KQALL							KQI	KQL		KQR	KQS	KQSHH	KQSH	KQSL												
L	LEVEL	LA	LAHH	LAH	LAL	LALL	LAT	LC	LIC	LE	LG	LI		LL		LR	LS	LSHH	LSH	LSL		LT	LIT	LY	LCV	LV		LKx	LEVEL RATE-OF-CHANGE			
M	MOTOR CONTROL													MK		MS																
N	USER'S CHOICE																															
O	USER'S CHOICE																															
P	PRESSURE OR VACUUM	PA	PAHH	PAH	PAL	PALL	PAT	PC	PIC			PI	PL		PR	PS	PSHH	PSH	PSL		PT	PIT	PIT	PY	PV		PSV	PRESSURE SAFETY VALVE				
PD	PRESSURE DIFFERENTIAL	PDA	PDAHH	PDAH	PDAL	PDALL	PDAT	PDC	PDIC			PDI	PDL		PDR	PDS	PDSHH	PDSH	PDSL		PDT	PDIT	PDY	PDCV								
Q	QUANTITY													QQI																		
R	USER'S CHOICE																															
S	SPEED OR FREQUENCY	SA	SAHH	SAH	SAL	SALL	SAT	SC	SIC	SE		SI	SK	SL		SR	SS	SSHH	SSH	SSL		ST	SIT	SY	SCV		SZ					
T	TEMPERATURE	TA	TAHH	TAH	TAL	TALL	TAT	TC	TIC	TE		TI	TL		TR	TS	TSHH	TSH	TSL		TT	TIT	TY	TCV	TV	TZ	TW	THERMOWELL				
U	MULTI-VARIABLE																					UT	UIT									
V	USER'S CHOICE																															
W	WEIGHT OR FORCE	WA	WAHH	WAH	WAL	WALL	WAT	WC	WIC	WE		WI		WL	WQI	WR	WS	WSHH	WSH	WSL		WT	WIT	WY	WCV	WV	WZ					
X	UNCLASSIFIED																															
Y	EVENT, STATE OR PRESENCE	YA											YI	YK	YL		YR	YS						YY								
Z	POSITION OR DIMENSION	ZA	ZAO=OPEN	ZAC=CLOSE	ZAT	ZC	ZIC	ZE	ZG	ZI	ZK	ZL		ZR	ZS	ZSO=OPEN	ZSC=CLOSE	ZT	ZIT	ZY	ZCV	ZV	ZZ	ZKx			ZKx	POSITION RATE-OF-CHANGE				

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MATERIAL: ---- FINISH: ----

PFD & LAYOUT
PURUS SYSTEMS
CSR MARINE

SIZE B	DRAWING NO. PRESALES	REV. A
SCALE NTS	WEIGHT ----	SHEET NO. 6 OF 6



TERMS AND CONDITIONS:

1. PURCHASE ORDER:

Newterra ("Newterra" or "Seller") will not initiate work prior to purchasing party ("Buyer") providing a signed purchase order or letter which includes the overall price of system and options chosen, purchase order number, payment terms, billing address, Tax Identification Number, and Newterra Proposal Number including revision and date.

2. APPLICABILITY / SCOPE:

All goods and services provided shall be governed by the terms and conditions set forth herein. Any modifications to these terms or to the scope of any purchase order or project hereunder, shall be mutually agreed upon and set forth in writing executed by both parties. Such writing shall clearly set forth the nature and extent of the change, and, if applicable, any adjustment in price associated with such change.

3. SCHEDULE

Newterra's estimated delivery schedule is included in the proposal and may be affected by manufacturing loading at time of order. Authorizing Newterra to order long lead components at time of order may help to expedite the project schedule. In order to notify Newterra of the intent to allow the long lead components to be ordered immediately please check the box on the signature page of this document.

4. CREDIT APPROVAL:

All new purchase orders are subject to mandatory credit approval for first time Newterra Buyers and discretionary credit approval for repeat Newterra Buyers (credit approval form available from Newterra upon request). Should Seller learn of any information that causes Seller concern about Buyer's ability to perform any of its obligations owing to Seller under a purchase order, Seller has the right to request Buyer to provide Seller adequate assurance of due performance on such terms as are deemed reasonable by Seller when acting in good faith, including the right to demand full or partial payment from Buyer as demanded by Seller. A complete credit check is required prior to shipping on a Net-30 or "C.O.D. – customer check acceptable" basis.

5. TELEMETRY SERVICES AGREEMENT:

A Telemetry Services Agreement must be completed for all system orders that include a Newterra SiteLink Remote Telemetry and Communication Package. The Telemetry Services Agreement is required to activate the services listed in the proposal (Telemetry Service Agreement available from Newterra upon request).

6. CURRENCY: As per pricing page of the proposal.

7. PAYMENT TERMS:

The price to be paid by Buyer shall be mutually agreed upon by the parties and set forth in writing. Unless otherwise agreed to, prices quoted do not include any state or local sales or use tax, special fees, duties or custom fees, freight and handling charges, or export crating costs that may be added to the price at invoicing. The Buyer agrees to make payments as described herein.

Additionally, the Buyer agrees to grant to Newterra security as described below to secure the payment in full for the equipment supplied relating to this purchase order. The Buyer hereby assigns and pledges to Newterra a security interest in all of the Buyer's rights, title, and interest in the following (the "Collateral"):

- i. Equipment, supplies, fittings, machinery, and other tangible personal property, wherever located, sold to Buyer by Newterra under the purchase order;
- ii. The trade account receivable generated by the design, construction and installation of the equipment referenced above up to the cost of such equipment.

The Buyer represents and warrants that this agreement and the UCC Financing Statement(s) executed herewith create a valid and perfected priority security interest in the Collateral, securing the payment of amounts owing by the Buyer to Newterra. The Security interest assigned to Newterra by the Buyer is released upon payment in full for the equipment.

8. METHOD OF PAYMENT:

All orders shall be shipped C.O.D. or require payment in advance until credit has been established. Payment shall be made in the currency quoted without discount. Minimum billing amount is \$100. Shipments outside of the U.S.A. and Canada shall be prepaid (by credit card, wire transfer, or cashier's check), or by an irrevocable Letter of Credit.

Processing fees may be assessed for additional costs incurred for credit card charges, returned checks, Letters of Credit, or other bank charges. Wire transfers should be initiated with all bank charges paid from the account of the Buyer. Newterra reserves the right to specify the method and/or timing of payment (including prior to shipment).

Newterra shall be entitled to a liquidated late charge calculated at a rate of 1.5% per month (18% per annum) or if lower, at the maximum rate permitted by law, for any payment not made within 10 days following the date due.

If the Buyer disputes any portion of an invoice, they shall notify Newterra in writing with specific details and pay the undisputed portion as per the executed purchase order. Buyer shall reimburse all costs incurred in collection of past due amounts including but not limited to attorney's fees, court costs and collection fees incurred by Newterra.

At Newterra's option, Letters of Credit will be accepted by Newterra when compliant with the following: The Letter of Credit must (a) Be IRREVOCABLE and CONFIRMED by a U.S.A. or Canadian bank; (b) Be in favor of Newterra; (c) State payment is by site draft payable; (d) State that ALL bank charges, including those outside the country of origin, are to be applied to BUYER'S account; (e) Must state Ex-Works, point as factory unless terms of Pro Forma Invoice specify otherwise, (f) Be advised through a class A bank and show Buyer as applicant for the Letter of Credit.

9. SHIPPING & DELIVERY TERMS:

Unless otherwise specified in the proposal, shipping incoterms are:



FCA delivery location* as per incoterms® 2010, cost of transportation and in-transit insurance will be prepaid and added to the final invoice.

*delivery location as specified in the proposal.

If a customer wishes to arrange for their own transportation, then incoterms will be FCA Newterra final manufacturing facility as per incoterms® 2010.

Equipment provided by Newterra cannot be held after completion without additional charges being paid to Newterra.

10. ACCEPTANCE:

- (a) Buyer shall inspect all shipments of equipment or other goods within 10 days of receipt and shall promptly notify Newterra of any specific defects or non-conforming goods. The parties acknowledge that acceptance of any goods supplied hereunder shall be deemed to have occurred if Buyer fails to notify Newterra of any such defects or non-conforming goods within 10 days of the date of receipt. The parties acknowledge that acceptance of any services provided hereunder shall be deemed to have occurred if Buyer fails to notify Newterra of any defects or non-conformance in such services within 10 days of the date the services were completed;
- (b) For any order hereunder which requires Newterra's involvement in the installation, start-up, check-out and/or commissioning of any Newterra equipment or system, the parties acknowledge that system acceptance shall be deemed to have occurred upon completion of the startup and checkout of the system, or upon beneficial use of the system by Buyer, whichever occurs first.

11. OPERATIONAL AND MAINTENANCE PROCEDURES:

Buyer acknowledges that any improper use, maintenance, or modification of the equipment provided hereunder, or use of unqualified maintenance or service technicians will severely impair the operational effectiveness of the entire system. Buyer hereby agrees to indemnify, defend and hold harmless Newterra from and against any and all third-party claims arising, in any manner, out of: (a) Buyer's neglect of the equipment; (b) Buyer's use of technicians not authorized by Newterra to service the equipment; or (c) Buyer's improper use or modification of the equipment or failure to follow the operational and maintenance procedures provided with the equipment.

12. CUSTOM EQUIPMENT OR SYSTEMS:

Buyer acknowledges that any approvals and/or listings specified in Newterra's proposal are limited to the specific scope and application set forth in the proposal and may not cover or apply to any custom or special equipment or services which are outside the scope of Newterra's proposal.

Newterra shall retain all proprietary rights to any and all technical data, designs, or other information developed by Newterra (and not provided by Buyer) in the course of designing, developing and/or manufacturing custom equipment or systems.

Programming for Newterra's custom equipment and systems is proprietary and will remain the property of Newterra and is not available for distribution to Buyer or others at any time.

13. TAXES:

All applicable Federal, State/Provincial/Local sales or use taxes and/or custom/duty taxes are not included in the prices quoted by the Seller unless otherwise specified in writing. If Seller is subjected to any such tax in connection with this sale or the delivery; the same shall be added to the purchase price and Buyer shall be responsible for paying that tax or reimbursing Seller therefore within 30 days.

14. PROPOSAL EXPIRATION:

Proposal and pricing valid for 90 days unless extended, in its sole discretion, by Newterra unless stated otherwise in the proposal.

15. DELAYS:

If the approval to proceed with ordering material is not given within 21 days of execution of this order, Newterra reserves the right to adjust the sell price of this Purchase Order based on actual increases incurred from its Suppliers due to the delay in the project schedule.

16. SYSTEM STORAGE AFTER COMPLETION:

At the Buyer's request, storage of completed systems may be provided. Upon receipt of a system storage request, Newterra will provide a quote to store the system at a nearby storage facility. The costs will include a monthly storage fee as well as the costs associated to load and unload the system at the storage yard (e.g. crane or fork truck), and financing charges for any unpaid balance that goes beyond due date of the requested storage time. The warranty period will start upon the date of notice of readiness to ship. Any invoices due for payment that are subject to the shipment of the system will be initiated and subject to payment based on the date of notice of readiness to ship.

17. OVERDUE ACCOUNTS:

Overdue accounts of the above terms are subject to a finance charge of 1.5% per month. If legal proceedings are instituted for collection of overdue accounts unpaid after 30 days, the Buyer will be liable for all costs adjudged by the court, including court costs and reasonable attorney fees.

18. CHANGE ORDERS:

Any Buyer driven change orders accepted by Newterra will be billed as follows: (1) Engineering hours billed at a rate of \$150 per hour, (2) \$500 administration fee plus materials and labor, and (3) all other costs associated with execution of change order, including but not limited to restocking fees, return fees, etc.

19. TECHNICAL ASSUMPTIONS:

This proposal and pricing is based on Newterra's interpretation of the sections of the RFP or specification that have been made available to Newterra. Exceptions have been noted wherever possible. In the event of a conflict between the language in the specification or the proposal, Buyer agrees that the language in the proposal takes precedence and is the basis of the proposed pricing and scope.



20. HEALTH & SAFETY:

Any health and safety requirements for entering a project site must be communicated at the time of Order. It is the Buyer/Owner's responsibility to ensure that field technicians operating on live panels are informed and equipped with the appropriate PPE.

21. INSTALLATION:

Electrical service and installation are not included unless specifically indicated in the proposal and approved in writing.

22. APPROVALS:

Local approvals and certificates are not included unless otherwise specified in the proposal.

23. SITE PERMITS & INSPECTIONS:

Obtaining any required site permits (i.e. building) is the responsibility of the Buyer/Owner; Newterra is not responsible for any such items unless otherwise specified in the proposal.

All required site inspections including, but not limited to electrical, building and fire are the responsibility of the Buyer/Owner; Newterra is not responsible for any such items.

24. WARRANTY:

Refer to separate warranty document(s) attached hereto and incorporated herein as if set forth in full

25. ENGINEERING SUBMITTAL PACKAGE:

Upon receipt of purchase order, Newterra and Buyer shall agree to a timeline for provision of engineering documentation, unless otherwise agreed to in writing.

26. BREACH:

In addition to any failure to comply with any other terms as set forth herein, the occurrence of any of the following events shall constitute a breach on the part of Buyer: (a) If Buyer shall become insolvent or make a general assignment for the benefit of creditors; (b) If a petition for Bankruptcy is filed by or against Buyer; (c) If, at any time Buyer fails to fulfill its obligations under the terms and conditions hereof, or acts in such a manner as to endanger performance of such obligations; (d) If Newterra shall reasonably believe that Buyer will not timely fulfill its obligations or otherwise perform hereunder, and Buyer is unable to provide reasonable assurances that such timely performance will occur.

Upon breach by Buyer, Newterra may terminate the contract or agreement by giving notice to the Buyer. Such termination may be effective immediately at the sole choice and discretion of Newterra. In the event of a breach and contract termination, Buyer is still responsible for all costs incurred by Newterra.

27. INDEMNIFICATION:

Each party shall defend, indemnify and hold each other's officers, directors and employees, harmless from and against any third party claims, damages or losses, including reasonable attorney's fees and costs (whether based on negligence, contract or any other legal theory), to the extent such claims, damages or losses are attributable to the negligence of each party or each party's failure to perform in accordance with the terms and conditions set forth herein and the recovering party is the prevailing party in any claim or litigation.

28. CONFIDENTIAL & PROPRIETARY INFORMATION:

Buyer acknowledges that the information and processes utilized by Newterra in the design, manufacture, and supply of its products and systems are confidential and proprietary to Newterra. Buyer agrees to treat as confidential and proprietary any such information or processes, including, but not limited to, design information or data, proposals, software, schematics, drawings, operational and maintenance manuals, testing procedures or other similar technical information ("Confidential Information") provided by Newterra in connection with the supply or installation of products or systems hereunder, and will, at a minimum, protect any such confidential Information in a manner commensurate with the measures taken to protect Buyer's own confidential or proprietary information. Newterra retains all rights, titles and interests in all such Confidential Information and Buyer shall not use or otherwise disclose to any third party any such Confidential Information except to the extent authorized by Newterra in writing.

29. INTELLECTUAL PROPERTY RIGHTS:

Excepting for the benefit of air and/or water treatment as contemplated by the design of the equipment, all rights, benefits from any value received as a result of the use of intellectual property, equipment, information or advice provided by Newterra remain the sole property of Newterra, specifically, including, but not limited to, as it may relate to carbon or water credits, etc.

Newterra retains any and all intellectual property rights in and to the equipment, services, and/or information supplied hereunder (including, but not limited to, patents, copyrights, trademarks and trade secrets) ("Intellectual Property").

Buyer is not granted any interest, right, or license with respect to any such Intellectual Property, except to use the equipment, services and/or information for the purposes for which it is specifically provided to Buyer in accordance with the terms and conditions hereof.

Newterra shall indemnify and hold Buyer harmless from and against all third-party claims of infringement or alleged infringement arising out of Buyer's use of any equipment, services, or information supplied by Newterra hereunder. Provided, however, that Newterra's indemnity obligation hereunder shall not apply to, and Newterra shall not be responsible for, any claims to the extent arising out of Buyer's modification of Newterra's equipment, services or information, or use of such equipment, services or information: (a) in combination with equipment, services or information not supplied by Newterra, or (b) in the operation of any process or in any other manner inconsistent with the purpose for which Newterra's equipment, services or information were intended.

30. INSURANCE:

Each party shall provide and maintain at its own expense, such policies of insurance in such amounts as are appropriate and commercially reasonable for parties engaging in the type of activities contemplated by the projects entered into hereunder. Upon request, each party shall furnish the other with certificates evidencing the required insurance coverage.



31. LIENS:

Newterra shall promptly pay for all materials, supplies and labor employed by it in providing the goods and/or services hereunder, such that any equipment or system supplied to Buyer remains free of materialmen's, warehousemen's, mechanics', and any other similar liens. Newterra shall promptly discharge any such liens arising out of its performance hereunder.

32. PRESERVATION OF LIEN RIGHTS:

Newterra reserves all rights hereunder to file notice and execute liens in the event Buyer breaches its obligations in the proposal, purchase order, or as set forth herein. Any executed lien waiver, release claim, or payment application executed and submitted by Newterra shall not serve to waive Newterra's right to pursue a lien claim for previously noticed, reserved, or filed claims.

33. ASSIGNMENT:

The rights and responsibilities of Buyer as set forth herein are personal to Buyer and may not be assigned or delegated without the prior written consent of Newterra.

34. NON-WAIVER:

The parties' failure to demand strict performance or to otherwise enforce any rights hereunder shall not constitute a waiver of any rights hereunder. No claim arising out of a breach hereof may be discharged in whole or in part by a waiver of the claim unless supported by consideration and set forth in a writing signed by the waiving party. Any such waiver shall apply to the specifically identified claim only and shall in no way constitute a waiver or discharge of any other prior or subsequent claim.

35. SUSPENSION BY BUYER:

If any project or order, for which Newterra is to supply goods and/or services hereunder, is suspended by Buyer for any reason other than a breach by Newterra, Newterra shall take all reasonable measures to cooperate with Buyer in rescheduling any planned or ongoing work, and in otherwise complying with the suspension instructions. Provided, however, that in the event of any such suspension which continues for a period of 90 days, Newterra shall be entitled to terminate that order, without any further liability or obligation thereunder. Provided, further, that Newterra shall be entitled to prompt reimbursement from Buyer per Cancellation/Termination clause below.

36. CANCELLATION/TERMINATION:

Purchaser reserves the right at any time without cause to terminate or cancel all or part of any undelivered or unperformed portion of this Purchase Order by notice to Seller. Upon receipt of such notice, Seller shall immediately stop delivery or work on the portion of the order terminated or canceled. In the event of such termination or cancellation, Purchaser shall be liable for the value of the work performed, materials received, and any materials not received that cannot be cancelled, prior to the time that notice of termination is given. If any project or order, for which Newterra is to supply goods and/or services hereunder, is terminated in agreement with the provisions of these terms and conditions, Newterra shall be entitled to charge 25% of selling price if canceled prior to incurring related engineering, drafting, and production time. Additional costs incurred as a direct result

of termination may include, but are not limited to, freight and storage charges, costs of labor, and transportation.

37. APPLICABLE LAW / DISPUTES:

Buyer acknowledges that the "Terms" from the Contract are deemed to be made in Pennsylvania for transactions in the U.S.A. and in Ontario for transactions in Canada, and that Buyer, in relation to this project, is deemed to be transacting business in Pennsylvania (U.S.A. transactions) and Ontario (Canadian transactions). It is the expectation of the parties that any disputes arising hereunder, whether in contract, tort or otherwise, will be amicably resolved by mutual agreement of the parties.

Any dispute, involving the supply of goods or services within the U.S.A. or Canada, which cannot be amicably resolved by the parties, shall be submitted to binding arbitration in accordance with the applicable rules and regulations of the American Arbitration Association for U.S.A. contracts or the Canadian Arbitration Association for Canadian contracts. The substantive law of Pennsylvania for U.S.A. contracts or Ontario for Canadian contracts shall apply to any such arbitration, which shall be conducted in Philadelphia, Pennsylvania (U.S.A. contracts) or Ottawa, Ontario (Canadian contracts).

Nothing herein shall be construed as preventing Seller from enforcing any claim or right to a mechanic's lien or any claim or right against a bond regardless of where such a claim must be filed or enforced.

38. FORCE MAJEURE:

Neither party shall be liable for any cost increase, failure or delay in its performance resulting from any cause beyond its reasonable control including, but not limited to, acts of God; acts or omissions of civil or military authority; fires; floods; unusually severe weather; strikes or other labor disputes; embargoes; wars; political strife; riots; epidemic; pandemic; changes in laws, delays in transportation; sabotage; or fuel, power, material or labor shortages.

39. INTEGRATION / MODIFICATION:

Except as otherwise specifically set forth herein, these terms and conditions are intended by both Buyer and Newterra as the final and exclusive integrated expression of their agreement with respect to any projects or orders subject hereto. No additions to or modifications of any of the terms or conditions herein shall be effective unless set forth in a writing duly executed by both parties.

40. CONSTRUCTION:

If these terms and conditions have been provided in response to an invitation to bid or other solicitation from Buyer, and the provisions set forth herein differ in any way from the provisions (if any) of Buyer's invitation or solicitation, these terms and conditions shall constitute Newterra's binding counteroffer upon the Buyer's decision to order from Newterra. If these terms and conditions constitute a counteroffer, acceptance hereof must be on the exact terms contained herein. Any additional, conflicting or different terms proposed by Buyer shall constitute a counteroffer by Buyer and shall not be effective unless set forth in a mutually agreed upon writing executed by both parties.



41. RETURNED GOODS:

No equipment shall be returned to Seller without its prior written authorization. All returns due to unwanted products or Buyer error will be assessed a minimum 25% restocking charge, based on the original invoice amount (shipping charges will be borne by the Buyer).

The Buyer will be credited the full invoice amount, including return shipping charges, if the original shipment was Newterra's error. To obtain specific performance under this warranty, the defective product must be returned to Newterra together with proof of purchase, installation date, failure date, supporting technical data, and documentation supporting the warranty claim.

Any defective product to be returned to a Newterra factory or service center must be sent Freight Prepaid. Buyers desiring to return product should contact our Customer Service Department at 1-800-420-4056 to obtain a Return Authorization (RA) number and a Return Material Tag (RMT). Each carton must be visibly marked with the RA number and have the RMT tag (RMT) in the packing list pouch and shipped via ground transport to: The Newterra facility indicated on the Return Authorization form.

The following applies to returns: (a) Cartons that are not marked with the RA number or do not have the RMT tag in the packing list pouch will be returned to the sender, unopened; (b) The appropriate credit will be issued upon verification of the age and condition of the product returned; (c) Customized products cannot be returned for credit unless it is identified that Newterra shipped the order in error; (d) Return of products not manufactured by Newterra will be subject to the original manufacturer's return to stock policy; (e) Newterra will not accept C.O.D. return shipments; (f) A return authorization will become null and void if equipment is not received by Newterra within 30 days of the date of issue. Claims for error in quantity or condition must be made within 10 days of receipt of the material. Newterra will not be responsible for any claimed shortages not reported within 10 days.

42. LIMIT TO LIABILITY:

Under no circumstances whatsoever will Newterra be responsible for liquidated, indirect, special, incidental or consequential damages including, but not limited to, lost business, overhead, loss of use of property, delay, damages, lost profits or third party claims, whether foreseeable or not, even if Newterra has been advised of the possibility of such damages in connection with the delivery, installation, use or performance of the equipment or the provision of maintenance services by Newterra regardless of whether such claims are alleged to have arisen out of breach of warranty, breach of contract, stricter absolute liability in tort, or other act, error or omission or any other cause whatsoever, or any combination of the foregoing.

Under no circumstances whatsoever will Newterra be responsible for direct damages in excess of 15% of the contract value.

43. RETENTION:

Newterra reserves the exclusive right to provide an irrevocable letter of credit in lieu of any retention amount.

IN WITNESS WHEREOF, the Buyer hereby agrees and accepts these Terms and Conditions.

The customer authorizes Newterra to proceed with ordering the long lead parts per section 3 of these terms and conditions.

Yes No

Company: _____

Signature: _____

Name (print): _____

Title: _____

Date: _____



WARRANTY

This Warranty Agreement is between Newterra Corporation, Inc. or Newterra Ltd. (known as Newterra) and the customer (known as the Buyer).

General Warranty Statement

1. Newterra warranties those products of its manufacture against defective workmanship or material for a period of 12 months from startup or 18 months from the date of notice of readiness to ship, whichever comes first.
2. This warranty is expressly and strictly limited to replacing, without charge (see Warranty Exclusions), any part or parts which proven to Newterra's satisfaction upon examination, to have been defective in design, material or workmanship, and which have not been neglected, abused or misapplied, provided the Buyer gives Newterra immediate written notice upon discovery of any claimed defect.
3. During the warranty period, parts will be shipped as necessary with instructions to replace, which can be further elaborated over phone or email; visit(s) of our technician to site can be covered if there is a service agreement in place; otherwise, actual charges will be quoted to the owner at that time, if required.
4. Newterra will also warranty those component parts manufactured by others to the extent of the original manufacturer's warranty. In any case, specific components warranties will be extended a minimum of one year from date of notice of readiness to ship.
5. Membranes, if used, will be covered under separate warranty statement.
6. This warranty shall not be construed as a fitness of purpose warranty nor a performance warranty.

Warranty Exclusions

1. Warranty coverage does not include:
 - Freight, labor, travel, and living expenses associated with parts replacement
 - Normal maintenance items such as lubrication, fan belts, and cleaning of the equipment
 - Consumable items such as filters and reagents.
 - Replacement of items due to normal wear and tear
 - System parts damaged because of Buyer changes to the system and/or PLC program without the written consent of Newterra.
 - System electrical components or motors damaged by inconsistent power, voltage fluctuations and/or frequent power failures.
2. If the Buyer, or any contractor employed by the Buyer, contracts an outside company, other than Newterra for modification of system equipment,

- without knowledge of Newterra, the warranty coverage will be denied.
3. If the Buyer, or any installation contractor employed by the Buyer, contracts outside Newterra for installation work or erection of quoted equipment, the Buyer shall assume full responsibility for said contract.
4. The warranty shall not cover normally scheduled preventative maintenance or maintenance services listed in O&M Manual unless specifically contracted with Newterra.
5. If Newterra's Supplier assesses a part evaluation fee as part of their warranty claim assessment process, then the Buyer will be required to pay this fee. All parts must be returned to Newterra, transportation prepaid, unless other arrangements have been pre-approved by Newterra.

Warranty Validation

1. Newterra requires that the system be commissioned by a Newterra factory trained technician unless specifically authorized by Newterra. Newterra authorization will be dependent on the qualifications of the Buyer's / contractor technicians.
2. Warranty validation is conditional upon timely receipt of:
 - a. Signed Installation Checklist – by authorized Buyer representative, if not Newterra.
 - b. As built Site drawings – by authorized Buyer representative, if not Newterra.
 - c. Signed Pre-Commissioning Checklist – by authorized Buyer's representative, if not Newterra.
 - d. Signed Commissioning Checklist – by authorized Buyer's representative, if not Newterra.
3. If the warranty validation requirements are not followed, Newterra reserves the right to deny warranty coverage.

Warranty Conditions

1. The system must be maintained and serviced in accordance with the schedule and procedures listed in the system O&M Manual. Failure to follow Newterra's recommendations may result in a denial of warranty coverage. Newterra reserves the right to review maintenance records as part of the warranty claim assessment process.

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