Water Treatment Plant Upgrades for the Town of Pasadena

Addition of Nanofiltration Membranes

March 29th, 2023

Building beyond.

Introductions

Cahill Technical Services

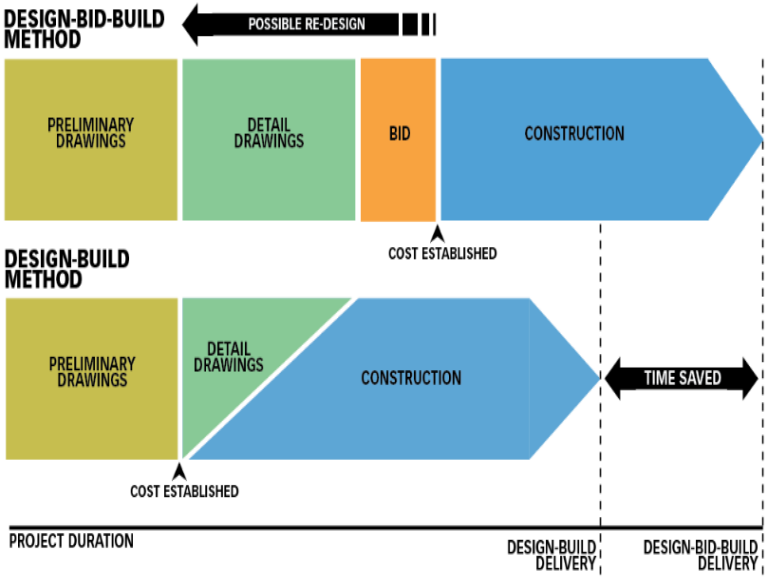
- Established in 1998 as an instrumentation calibration lab dedicated to the Eastern Canadian offshore oil industry.
- CTS is the services entity within the Cahill Group of Companies.
- Cahill Technical Services currently has a technical staff comprising 20 engineers and technologists.

Town of Pasadena

- The Town of Pasadena is located on the West Coast of NL and has a population of 3,600.
- Raw Water Supply from Blue Gulch Pond.
- Existing system includes pre-filtration (80 micron), filtration (3 micron), UV disinfection and gas chlorination.
- Elevated level of THM’s and HAA’s detected within the distribution system.

Design Build Process

- Design Build Team - Cahill Technical Services and Membrane Specialists
- Pre-qualification through RFQ process.
- RFP included Piloting, 30% Design Submission and Commercial proposal.
- Evaluation Committee made of owner's advisor (WSP), owner (Town of Pasadena), DECCM and DTI reviewed responses.
- CTS were selected as Design Builder.



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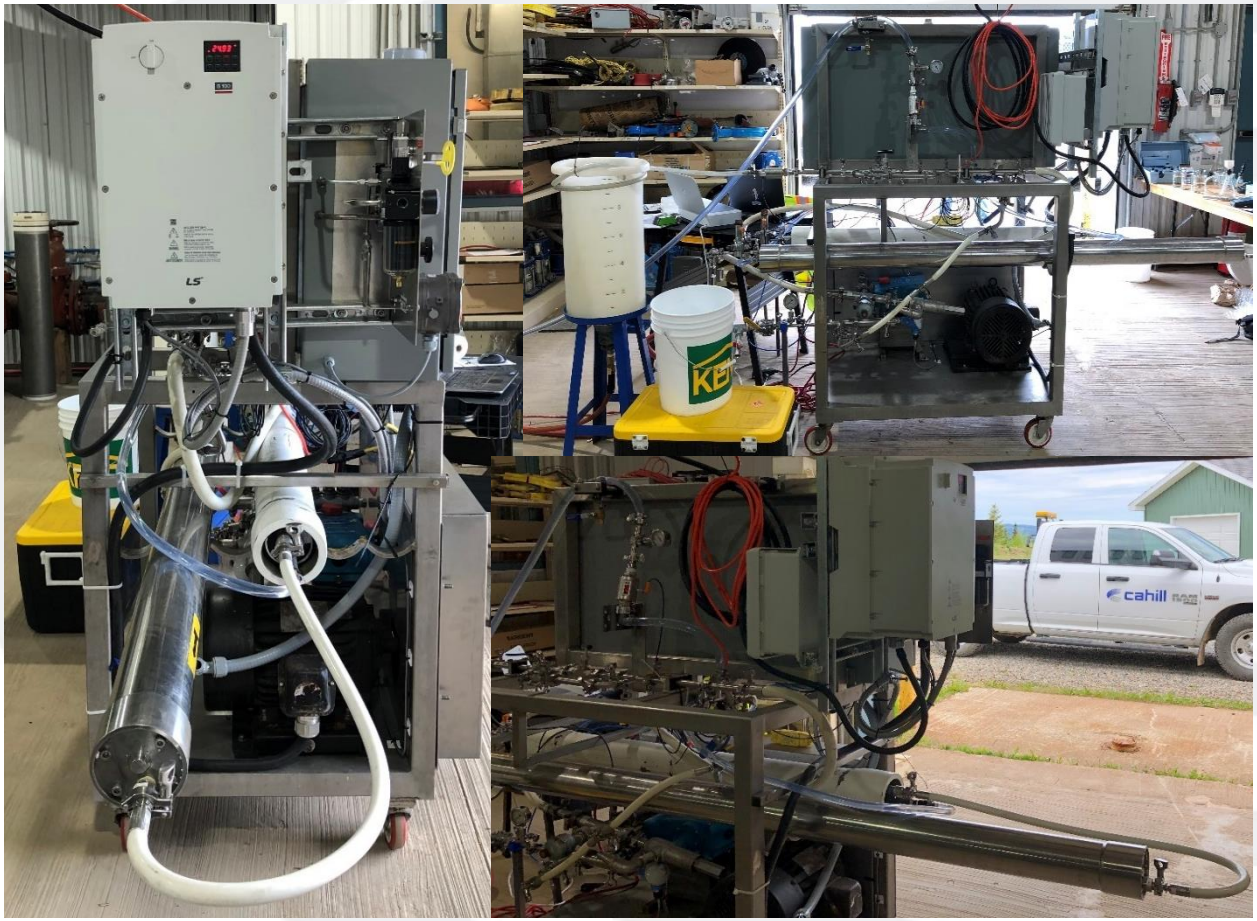
Membrane SPECIALISTS

RFP Pilot Testing

- 14-day pilot required to determine the feasibility of NF filtration.
- Flow rate required to be greater than 8 L/min.
- Bench Testing by CTS.
- Certified Testing by Agat Laboratories.



Existing Water Treatment Plant

Engineering and Design

- 3D Scanning completed to assist with design and estimating.
- Custom design to fit existing footprint and site conditions
- Commissioning of existing PRV system allowed us to reduce the lift pressure required by recycle pumps. This also allowed us to complete a single-phase power upgrade instead of a three-phase power upgrade.

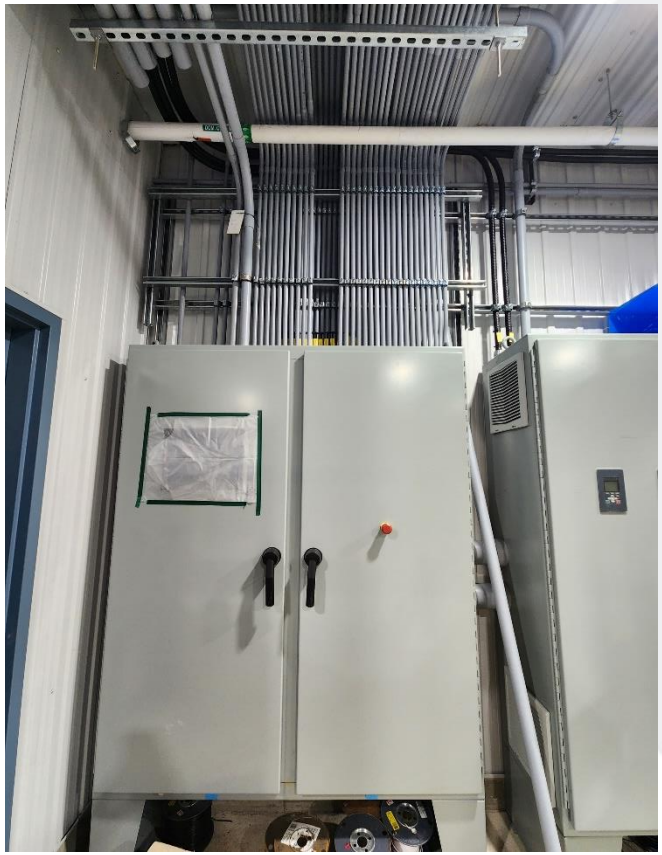
Pasadena Process Description

- The treatment process is arranged in two parallel trains each of which is sized to provide a net capacity of 2100 m3/day (50% of the specified 4200 m3/day).
- Due to the custom design of the membrane system, it has been possible to take full advantage of the existing facilities footprint.
- The main pumps serve two functions in the membrane process. They provide the driving pressure required for filtration when needed, and to recirculate flow through the membranes.

Pasadena Process Description

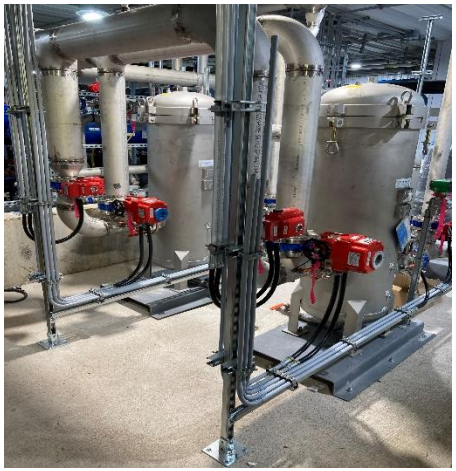
Membrane Type	NF270-400/34i
Capacity (m3/day)	4200
No. of 5 x 8” Element Pressure Vessels	42 (expandable to 48)
Membrane Area (approx.)	7800 m²
Minimum Design Temperature	4°C
Minimum Operating Temperature	0.5°C (Liquid)
Estimated Power Consumption (Typical)- Assume 1 train running at all on average.	19kW + Control/Instrumentation
Maximum Power Consumption (1 skid process, 1 skid CIP)	40kW + Control/Instrumentation
Power Installed	19kW Recirculation + 5.6kW CIP Pump
Pass Average Flux Rate	22.4 (LMH)

Pasadena PLC/HMI/SCADA



- The main plant control system will include a Rockwell Allen Bradley CompactLogix PLC.
- Local Redlion HMI located in the process area at the PLC Panel.
- The existing Trihedral VTScada will be upgraded to accommodate additional I/O.
- All design, programming, commissioning and support by Cahill Technical Services.
- 24/7 Service and support.

Installation



- NSF certified equipment, piping and fittings.
- All piping SCH10 304SS.
- All electrical installed in PVC conduit.
- Foxboro instrumentation selected.
- AT Control Valves selected.
- Grundfos pumps selected.

Conclusion

Thank you.

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