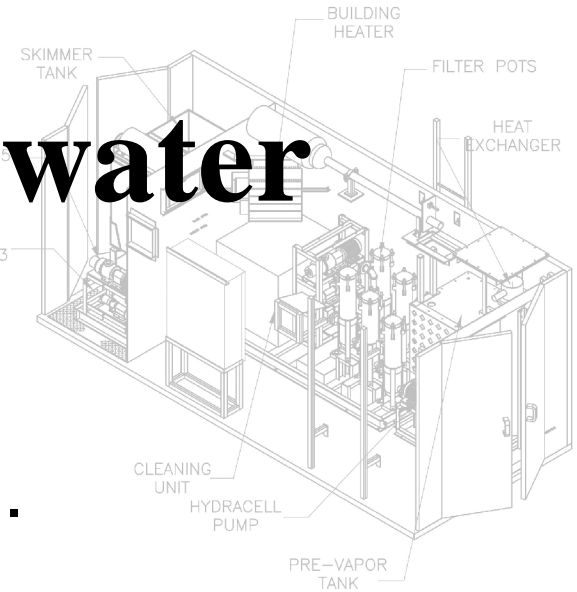


Cascade compact water treatment

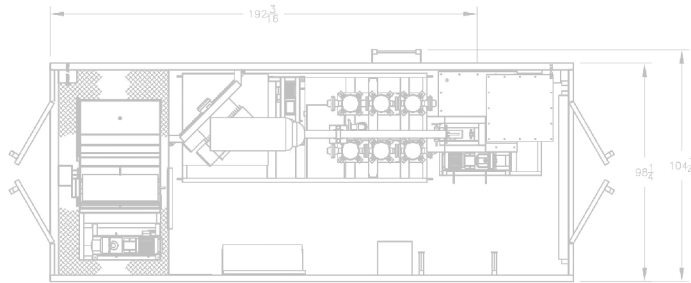
Here's what you get...



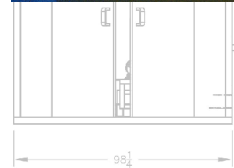
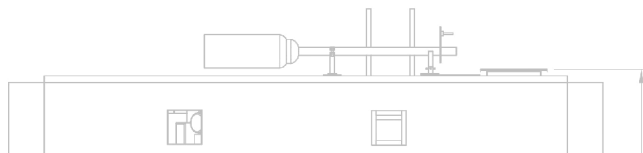
Note you run the show by clicking the mouse

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Overview...



Walk in

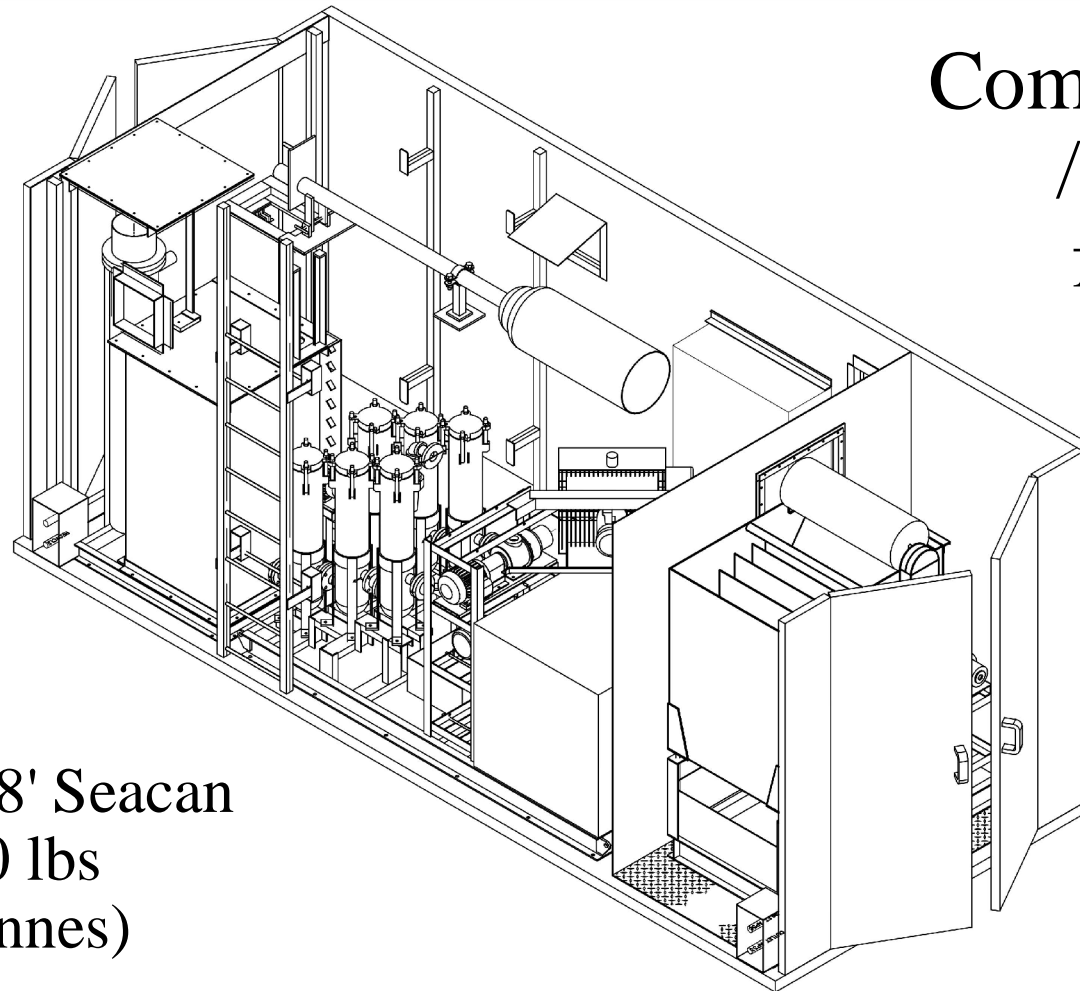


Depending on parameters
clean up can be as fast as 62
me.cu per day.

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Compact layout
/ minimal
footprint



20' X 8' X 8' Seacan
16,500 lbs
(7.5 Tonnes)

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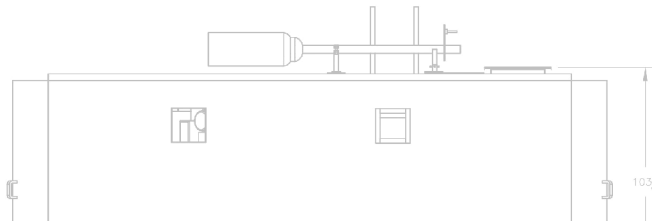
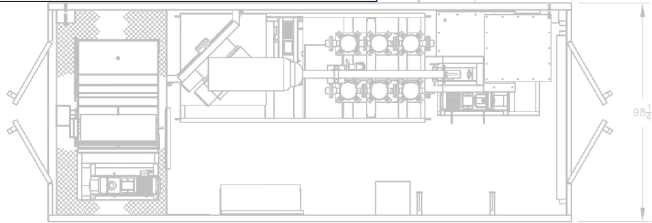
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Process flow overview...



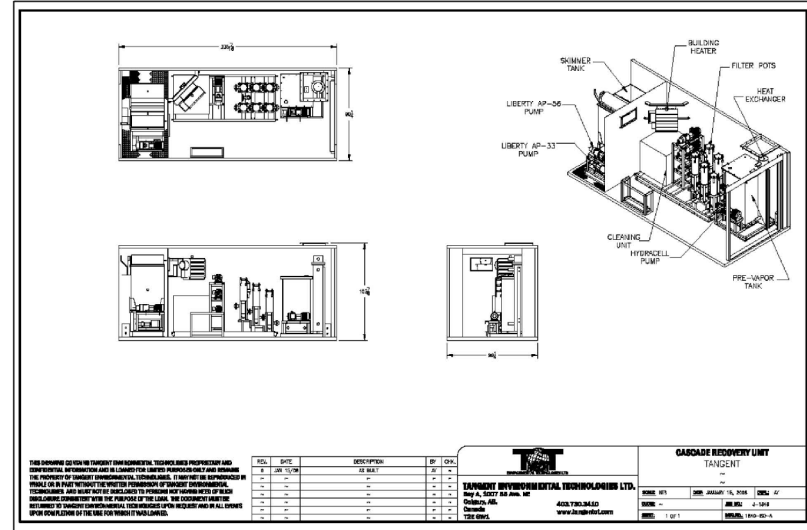
Whole Process Summary...

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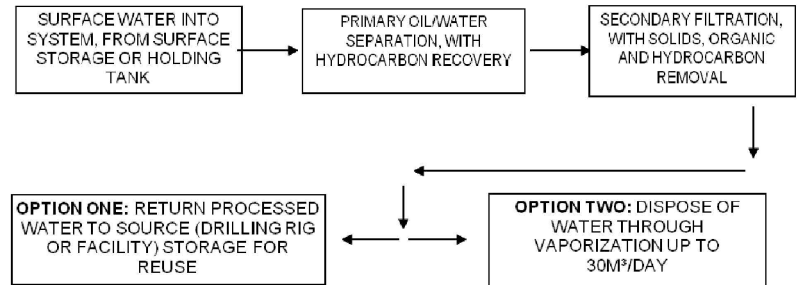
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Basic Layout of cascade system

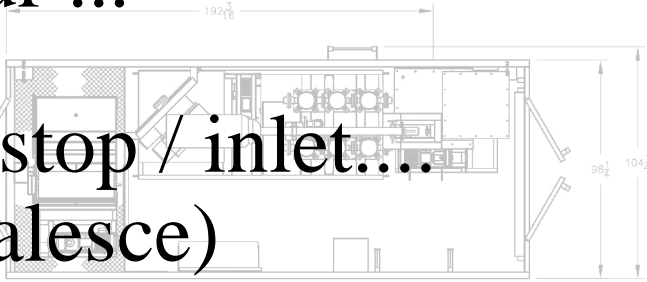


Basic flow through of the CWWS

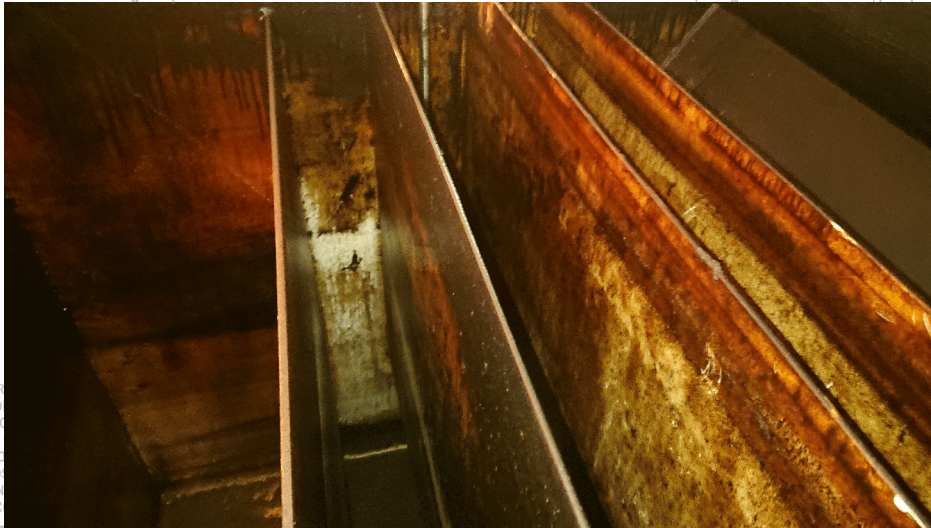
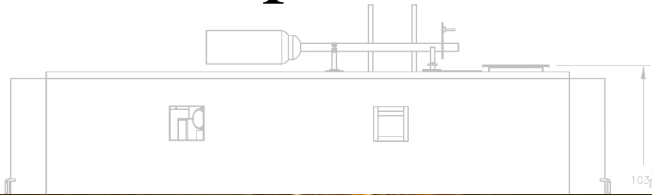


Tour ...

1st stop / inlet... (coalesce)

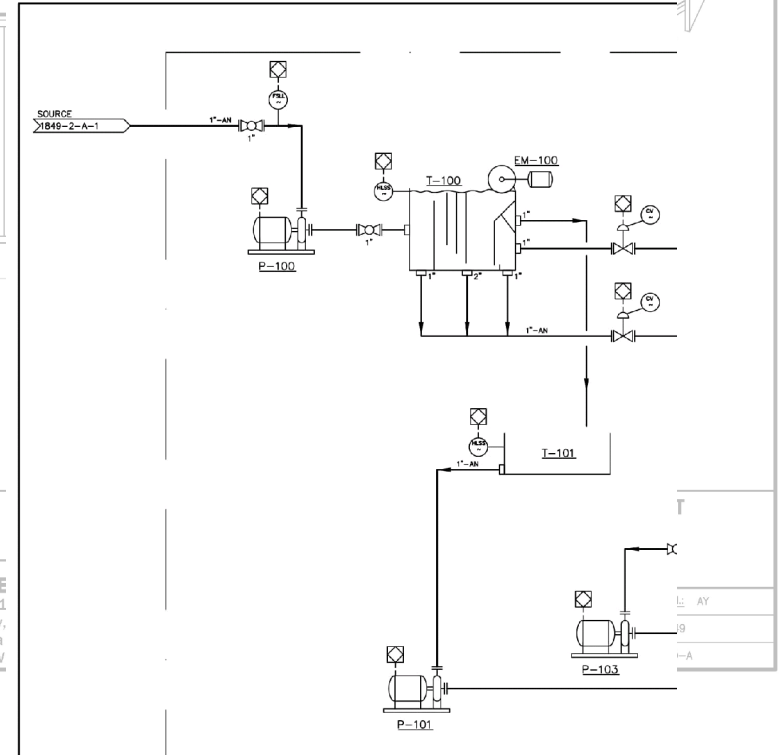


Then to separation



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Separated solution is also skimmed
 Oil, recovered at this stage is pumped out to a discharge line



All lighting, pumps, control lines and sensors are explosion proof. Certified Class 1 Div 1

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CASCADE RECOVERY UNIT
 TANGENT

SCALE: NTS DATE: JANUARY 15, 2008 DWN: AY

QUOTE: ~ JOB NO.: J-1849

SHEET: 1 OF 1 DWG.NO.: 1849-ISO-A

Here a second pump moves the flow to the system inlet

Liberty AP-56, 3 ϕ ,
1 HP, 20 gpm @ 40 psi



And a Liberty AP-33, 3 ϕ ,
1/2 HP, 4.2 gpm @ 50 psi
moves the oil out when
signalled by the High level
sensor-switch on oil sump /
recovery tank T-101



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All sensors / sending units are certified min. Class 1 Div 1 and relay status to the central PLC in real time



A third pump {designated as P-102} moves the flow from the separation tank to filtration array using a Liberty AP-56, 3 ϕ , 1 HP, 20 gpm @ 40 psi



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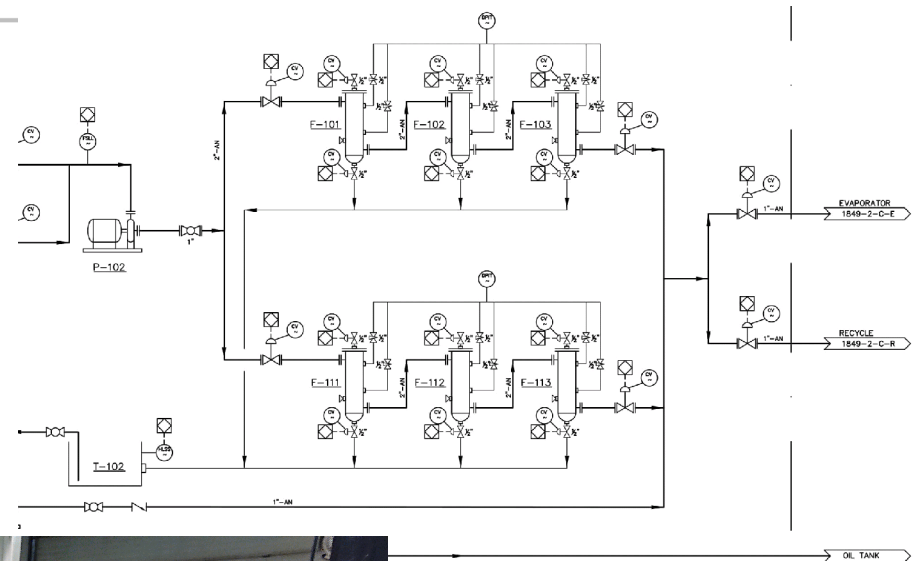
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CLEANING UNIT

CASCADE RECOVERY UNIT
TANGENT

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The filtration array has two three stage filter pots of 5 stainless steel elements / each except the last pot which has five Polyethylene (lipophilic) disposable elements to strip residual hydrocarbon from the product flow.



The recycle can consist of frac tanks or other reservoir that can support production. The unit can easily keep huge volumes of water warm/ hot under a wide range of conditions.

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Arranged in parallel and rigged with pressure sensors, the PLC can easily switch the flow to the clean set of filters. All the valving is servo controlled from the PLC. Only operator intervention required is the maintenance, switching out and cleaning of the other filter set outside of the critical path of operation.

T-102 is a catch pan for filtrate drained from the filter pots to allow maintenance/ filter replacement.



The sump T-102 is monitored for level by sensor to the PLC and volume handled by another Liberty AP-33, pump 3 ϕ , 1/2 HP, 4.2 gpm @ 50 psi moving the filtrate out onto the next step: Produced water to feed either the recycle or evaporator.

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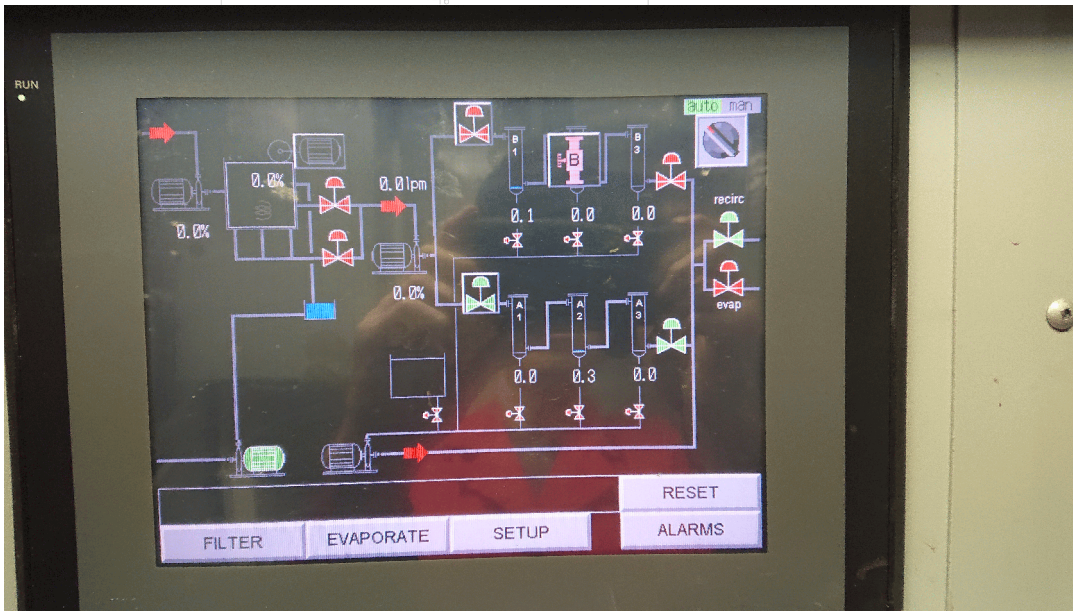
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TANK

Controls..



Fully customized, realtime programmed logic controller handles all aspects of operation.

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Pre-flight check ...



The unit we proposed to send was pulled into a shop we found by mid December and we have gone through all the systems as much as utilities allow. Many parts have been obtained and all components we couldn't run we tested. All in the last 3 1/2 months.

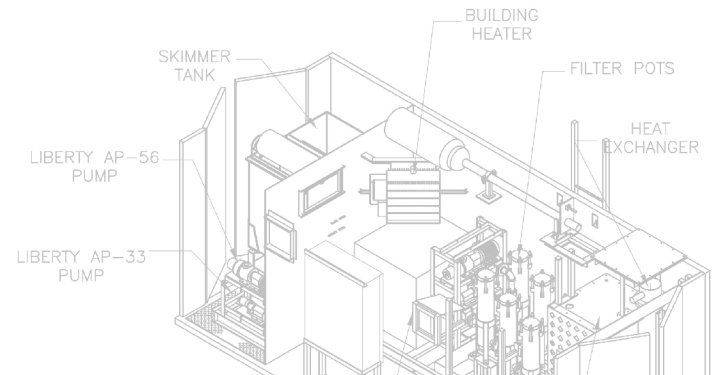
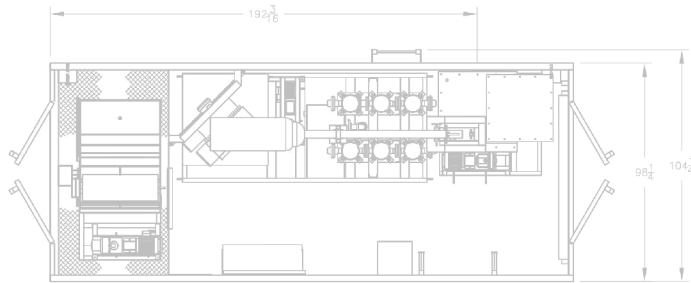
Paul Gagnon



Western Ultrasonics Inc.
"The Sound Solution"

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