1831

IEG CONSULTANTS LTD.

February, 18 2011

Véronique D'Amours Gauthier
Science and Regulatory Officer
NWT Water Board
P.O. Box 2531
Inuvik, Nt, X0E 0T0

Additional Information Regarding Water License Application Submitted for Shell Canada's 2011 Unipkat I-22 Sump Remediation Project

This letter is has been sent to provide supplementary information to support our application for a Type B Water Licence and is intended to provide the NWTWB with additional information as requested.

Shell Canada would like to make three amendments to our original application:

1. We would like to amend the volume of water we have applied to withdraw during this program to be not more than 295 m^3/day.

   Although construction of an ice road for this project has begun, the construction program will withdraw less than 100 m^3 of water per day until such time as the NWTWB issues a licence that will allow for larger volumes to be withdrawn.

2. Our original application requested permission to remove bank material from the camp sump and flare pit area of the Unipkat I-22 lease. As described in our Application for Fisheries Act Authorization filed with the Department of Fisheries and Oceans (DFO) on February 9, 2011, we would like to include the excavation of about 3000m^3 from a sandbar in Arvoknar Channel. The NWTWB was provided a copy of the application at that time. The description of the proposed work to take place is described in that application. A letter stating DFO's position on the application will be provided as soon as it is available.

   No disturbance of the river bank will occur prior to receiving permission from the NWTWB.

3. In an effort to minimize disturbance to established vegetation on the Unipkat I-22 site, we would like to move our planned camp location from the site to grounded

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403.274.3424 t • 403.274.5349 f • www.ieg.ca

ice across the river Channel as shown on the attached figure. The possibility of a fuel leak from the camp generator was identified as a risk during discussions with INAC about potential problems with this location. To mitigate this risk, the generator and it's day tank will be contained within a bermed area. The bermed area will be lined with a hydrocarbon resistant 40 mil liner. The berms under the liner will be constructed of snow and frozen solid with the addition of water. The main fuel storage area will remain more than 30 m away from all water bodies on an ice pad on land within the lease area. In addition to the main spill container located on-site (inventory supplied previously), sorbent spill clean-up supplies, shovels and barrels to deposit contaminated snow in will be located at both the fuel storage area on land and the bermed generator area.

The camp will not be mobilized to the site prior to receiving permission and conditions from the NWTWB.

Additional information regarding our program is provided below.

As stated in our earlier submission, all grey and black waste water from the camp will be transported to Inuvik for disposal in the local sewage lagoon. ALL camp refuse will be stored in wildlife resistant covered bins and then transported to Inuvik for disposal in the municipal landfill. We have received verbal confirmation from the Town of Inuvik that they will accept this waste but a letter of acceptance from the Town will be provided as soon as it is available.

Our Project Description outlined our plan to transport waste soil from the Unipkat I-22 site to a containment cell in Inuvik to allow the material to thaw and dewater in the summer. The containment cell is lined with a hydrocarbon resistant arctic liner. Details of the liner are attached with this letter.

The volume and chemical characteristics of all soil and water that is disposed of from the cell will be reported to the NWT Department of Environment and Natural Resources (ENR). A licence application will be filed with the Gwich'in Land and Water Board (GLWB) for the disposal and management of waste soil and water in the Inuvik containment cell.

The water produced from the melting of soils will be contained in the containment berm. Staff from IEG's Inuvik office (located approximately 200 m from the cell) will regularly check water levels in the cell and have any significant accumulations of water pumped into holding tanks adjacent to the cell. Once the soils have been dewatered, the stored water will be tested at a Canadian Association for Laboratory Accreditation certified laboratory. Acceptable water discharge criteria will be developed with ENR officers and the GLWB and permission to discharge will be sought from the GLWB/ENR prior to discharging water to the surrounding land or ditch.

In the event that the collected water does not meet applicable discharge criteria, it will be treated with granular activated carbon to remove hydrocarbons. A process diagram showing the hydrocarbon treatment system is included with this letter. In the event that the water is unacceptable for discharge due to salinity or metal concentrations, the volume of water will be reduced using an evaporator and the remaining residual material will be transported south for disposal at a licenced facility. The NWTWB will be provided with a letter of acceptance from the licenced facility prior to transport of the water from the containment cell.

Once thawed and dewatered, the removed soil from the sump, affected by hydrocarbons, salts and barite, will be transported and disposed of at the CCS Landfill near Ft. Nelson BC. The landfill is licenced by the BC Ministry of the Environment to accept this type of soil. A letter of acceptance from the landfill will be provided to the NWTWB as soon as it is available.

At this time the soil around the sump scheduled to be removed from Unipkat I-22 is affected by hydrocarbons that exceed CCME industrial guidelines and does not appear to be acceptable for disposal in Inuvik. If future testing of the soil demonstrates that the soil does meet CCME criteria, Shell Canada may seek a local disposal option in conjunction with the Town of Inuvik, ENR and the GLWB. However, if an appropriate location can not be found or future analysis demonstrates that the soil remains above CCME criteria, the soil will be transported to the CCS landfill near Ft. Nelson BC.

If you have any questions please feel free to contact me at (403) 990-1382 or at sbird@ieg.ca.

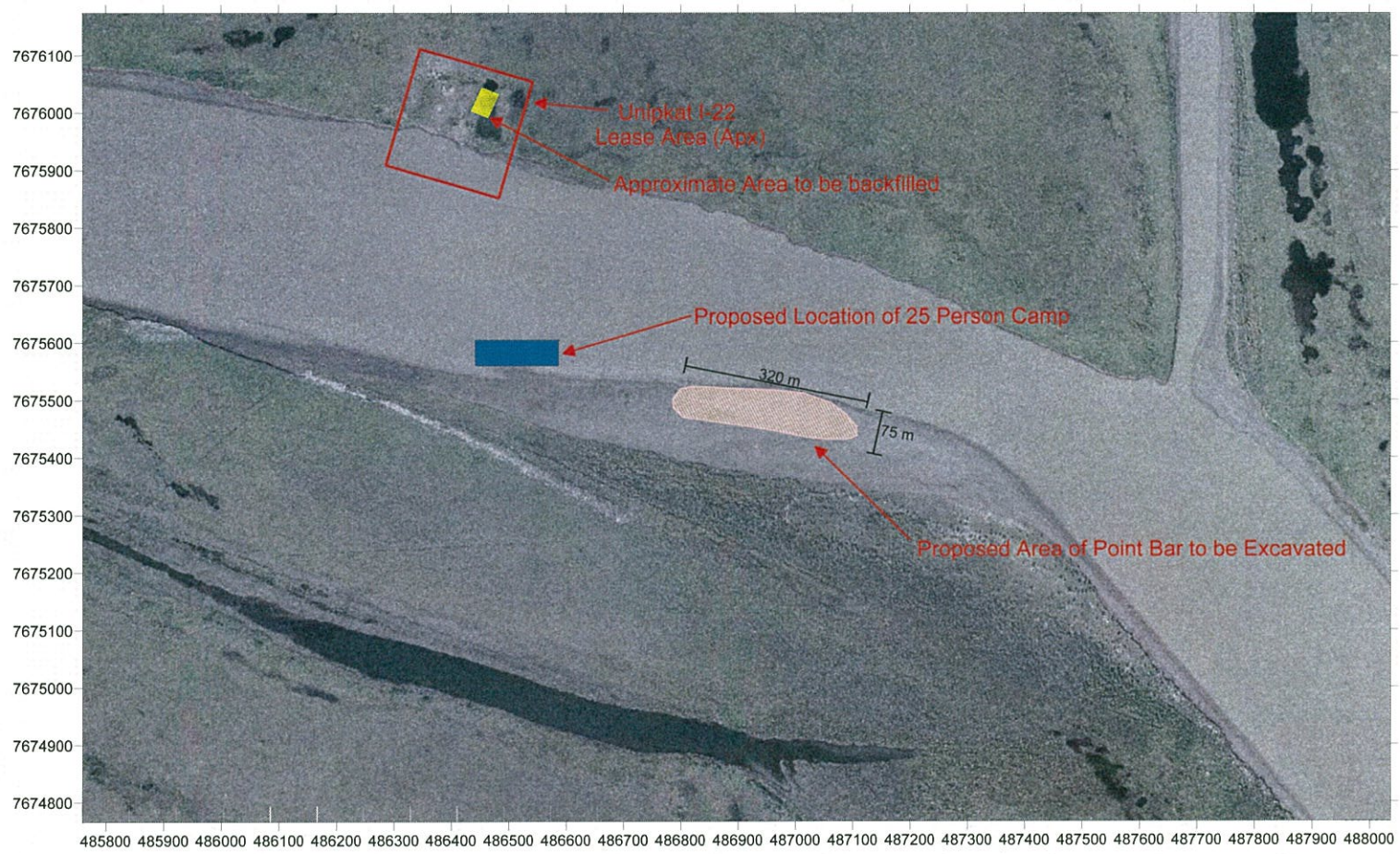
Yours truly,

IEG CONSULTANTS LTD.

Sam Bird

Sam Bird B.Sc.

c.c. Randall Warren – Shell Canada Energy
Randy Ambler – Shell Canada Energy
Kevin Erickson – Hazco Environmental Services
Don Arey – Indian and Northern Affairs Canada
Gerald Enns – GNWT Department of Environment and Natural Resources
Helga Harlander – Gwich'in Land and Water Board



0 100 200 300 400 500 600 700 800 900 1000 meters

N W E S

	CHECKED: JW	CLIENT: SHELL CANADA LTD.	TITLE: UNIPKAT I-22 AREA OF PROPOSED CAMP LOCATION AND POINT BAR BORROW SOURCE	
	DRAWN: SB	IEG CONSULTANTS LTD	DATE: February 7, 2011	AREA:
	APPROVED:		SCALE:	DEPT:
			FIGURE 1	REV: 1

LAYFIELD
Product Cut Sheet

Arctic Liner

1. Product Description

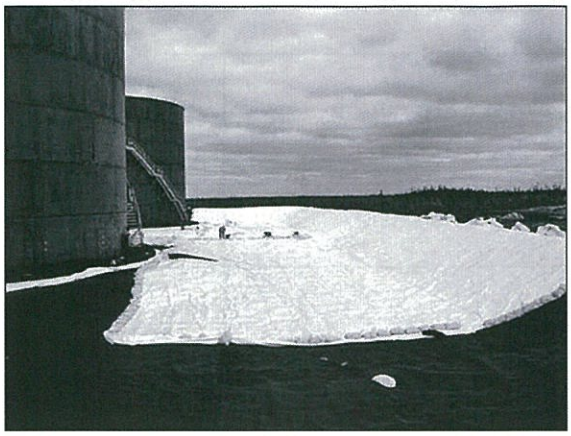
Arctic Liner® is a highly flexible geomembrane with advanced chemical resistance, it is formulated specifically for winter installation in harsh environments like the Arctic. The Arctic Liner® formulation is easily solvent bondable during periods of warm weather, making repairs an easy task even in isolated areas. This proprietary oil resistant alloy is well suited to secondary containment of combustible liquids and some fuels. Arctic Liner® is also excellent for soil remediation work and for separation of soils at contaminated sites. Arctic Liner® is often used for the secondary containment of industrial chemicals as well. Generally a short immersion test with Layfield's Field Chemical Testing Kit will show if Arctic Liner® is compatible with a given chemical. Arctic Liner® is excellent for the containment of combustible liquids and many oilfield chemicals.

2. Technical Data

Materials information is on page 2.

3. Installation

Layfield's Arctic Liner® is flexible enough to be prefabricated at our facility into large panels. The prefabricated panel is accordian folded, rolled on a core, and delivered to the job site secured to a pallet. Prefabricated panels can often cover a small project with a single panel. Local labor forces can be used to unroll and unfold the panel, while on larger projects Layfield installation forces can be used to join panels. Layfield has spent years developing innovative thin film seaming technology. All of our primary field welding of Arctic Liner® is based on hot wedge welding technology. Field wedge welding of the Arctic Liner® provides strong seams, and fast installations on large projects. Arctic Liner® can also be welded in the field with a solvent, allowing contractors to do small seams and attach pipe boots without the need for a Layfield installation crew.



4. Availability and Cost

Available from Layfield or distributors. Call
425-254-1075 Pacific time
780-453-6731 Mountain time, or
905-761-9123 Eastern time

5. Fabricated By

Layfield Environmental Systems Corp.
Layfield Geosynthetics & Ind. Fabrics Ltd.

6. Warranty

Products sold will meet Layfield's published specifications. Any extended warranty required by the buyer must be negotiated at the time of order. Extended warranties may be available on this product and may be at extra cost. Full warranty details are available from Layfield.

7. Maintenance

Geomembranes should be inspected at least once per year for damage, stress, or any other detrimental condition. The entire containment area should be visually inspected annually. Layfield provides geomembrane maintenance services on request.

8. Filing Systems

www.LayfieldGroup.com
www.geomembranes.com

9. Material Properties

18 Oct 2010	Arctic Liner® Material Properties		
Style	**ASTM**	**Arctic Liner 30 (U)** (White)	**HAZGARD 100** (Green)
Thickness (Nominal)	D1593	30 mil 0.75 mm	30 mil 0.75 mm
Thickness Minimum	D1593	28.5 mil 0.72 mm	28.5 mil 0.72 mm
Tensile Strength (MD)	D882	57 ppi 10 N/mm	57 ppi 10 N/mm
Elongation	D882	500 %	500 %
Modulus at 100%	D882	18 ppi 3.2 N/mm	18 ppi 3.2 N/mm
Tear Strength (MD)	D1004	6 lbs 26.7 N	6 lbs 26.7 N
Low Temperature	D1790	**-65°F** **-54°C**	**-22°F** **-30°C**
Dimensional Stability	D1204 Max Change	4 %	4%
Water Extraction	D3083	0.25 %	0.25%
Volatile Loss	D1203 (A)	1.0 %	1.0%

10. Shop Seam Strengths

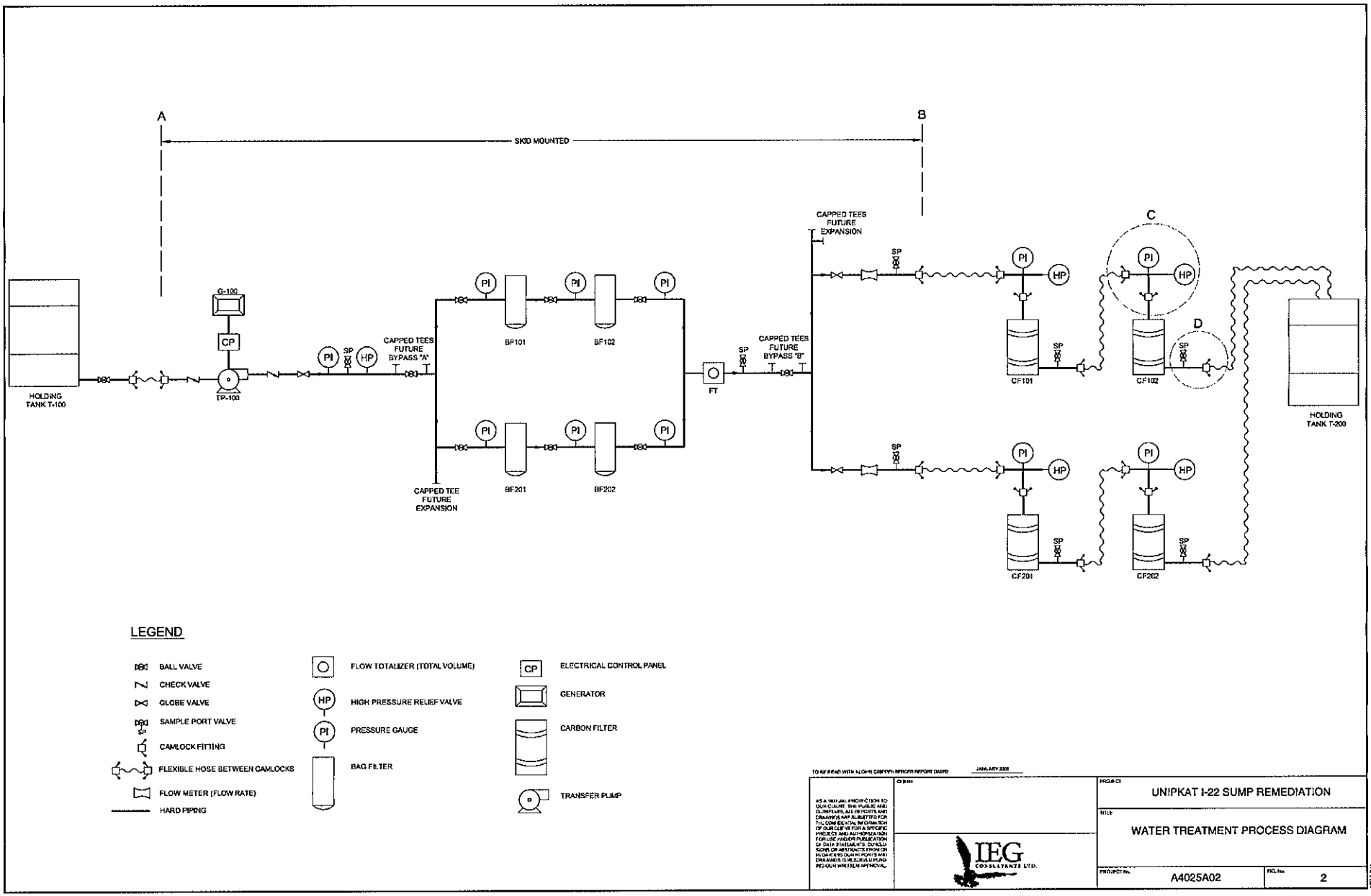
18 Oct 2010	Arctic Liner® Shop Seam Strengths		
Style	**ASTM**	**Arctic Liner® 30 (U)**	**HAZGARD 100**
Heat Bonded Seam Strength	D6392 25.4 mm (1") Strip	37 ppi 6.5 N/mm	37 ppi 6.5 N/mm
Heat Bonded Peel Adhesion Strength	D6392 25.4 mm (1") Strip	FTB 19 ppi 3.3 N/mm	FTB 19 ppi 3.3 N/mm

11. Field Seam Strengths

18 Oct 2010	Arctic Liner® Field Seam Strengths		
Style	**ASTM**	**Arctic Liner® 30 (U)**	**HAZGARD 100**
Heat Bonded Seam Strength	D6392 25.4 mm (1") Strip	Solvent 28 ppi 5.0 N/m	Solvent 28 ppi 5.0 N/m

Heat Bonded Peel Adhesion Strength	D6392 25.4 mm (1") Strip	AD-BRK 10 ppi 1.7 N/mm	AD-BRK 10 ppi 1.7 N/mm

Layfield
Environmental Systems
www.geomembranes.com
service@geomembranes.com
Tel (US): 1-800-796-6868
Tel (Canada): 1-800-840-2884



TO BE READ WITH KLOHN CRIPPEN BERGER REPORT DATED JANUARY 2008

AS A WELL AS PROTECTION TO OUR CLIENT, THE PUBLIC AND OURSELVES, ALL REPORTS AND DRAWINGS ARE SUBMITTED FOR THE CONFIDENTIAL INFORMATION OF OUR CLIENT FOR A SPECIFIC PROJECT AND AUTHORIZATION FOR USE AND/OR PUBLICATION OF DATA, STATEMENTS, OPINIONS OR ABSTRACTS FROM OR REFERENCES TO REPORTS AND DRAWINGS IS NOT AUTHORIZED WITHOUT OUR WRITTEN APPROVAL.

IEG CONSULTANTS LTD.

PROJECT: UNIPKAT I-22 SUMP REMEDIATION

TITLE: WATER TREATMENT PROCESS DIAGRAM

PROJECT No.: A4025A02

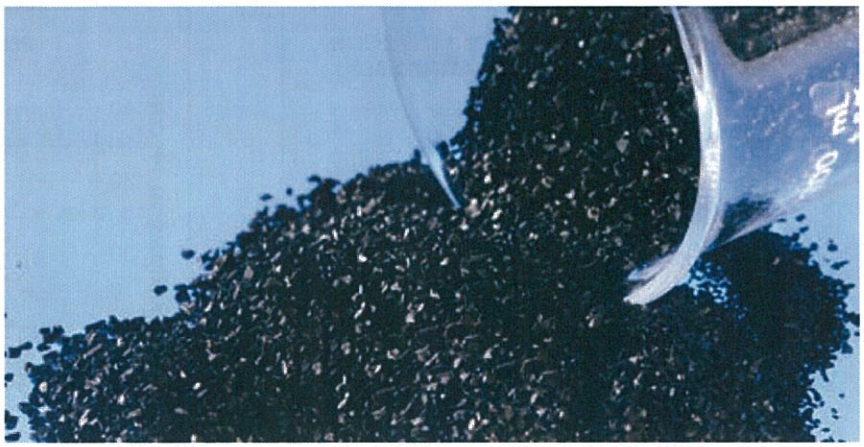
FIG. No.: 2

DATA SHEET

USFILTER WESTATES CARBON AQUACARB® 1230C AND 1230AWC

Coconut shell based granular activated carbon

(Formerly CC-602 and CC-602AW)



FOR USE IN POTABLE, WASTE AND PROCESS WATER APPLICATIONS

Description and Applications

AquaCarb® 1230C and AquaCarb® 1230AWC are high activity coconut shell based granular activated carbons. These hard, attrition resistant high surface area carbons are designed to remove difficult to adsorb organics from potable, waste and process water. They are especially effective for adsorbing chlorine, disinfection by-products, TCE, PCE, MTBE and other trace level organics. AquaCarb® 1230AWC is acid washed yielding a very low ash content, pH neutral carbon that is ideally suited for use in potable water and high purity water systems for the microelectronics and other industries.

- ANSI/NSF Standard 61 classified for use in potable water applications
- Fully conforms to physical, performance and leachability requirements established by the current ANSI/AWWA B604 (which includes the Food Chemical Codex requirements)
- A detailed quality assurance program guarantees consistent quality from lot to lot and shipment to shipment

Quality Control

All AquaCarb® activated carbons are extensively quality checked at our State of California certified environmental and carbon testing laboratory located in Los Angeles, CA. USFilter's laboratory is fully equipped to provide complete quality control analyses using ASTM standard test methods in order to assure the consistent quality of all AquaCarb® carbons.

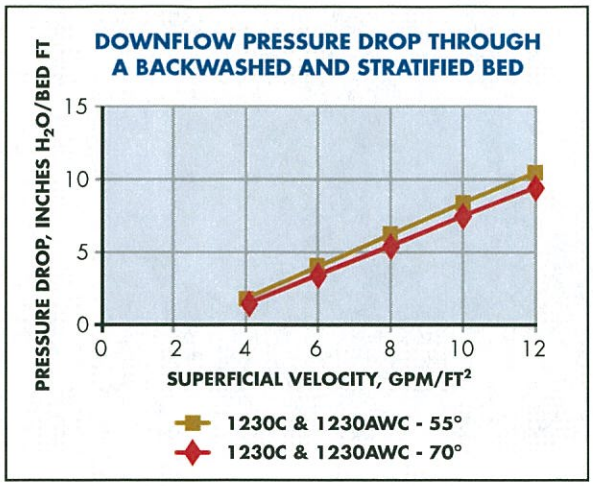
Our technical staff offers hands-on guidance in selecting the most appropriate system, operating conditions and carbon to meet your needs. For more information, contact your nearest USFilter representative.

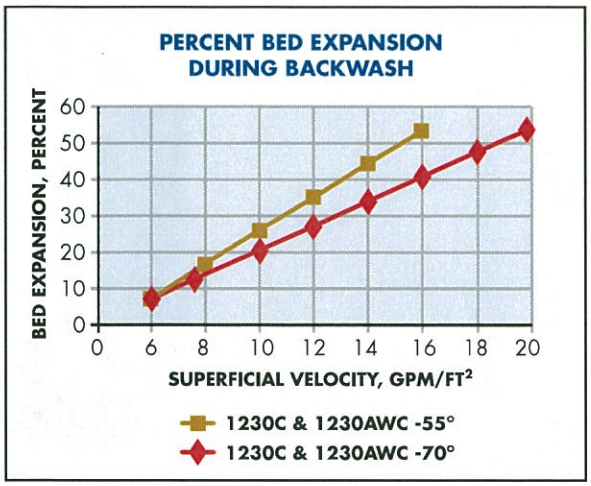
USFilter

AQUACARB® 1230C
AQUACARB® 1230AWC

Coconut shell based granular activated carbon

(Formerly CC-602 and CC-602AW)





Safety Note: Wet activated carbon depletes oxygen from the air and therefore dangerously low levels of oxygen may be encountered. Whenever workers enter a vessel containing activated carbon, the vessel's oxygen content should be determined and work procedures for potentially low oxygen areas should be followed. Read Material Safety Data Sheet (MSDS) before using this product.

All information presented herein is believed reliable and in accordance with accepted engineering practices. USFilter makes no warranties as to the completeness of this information. Users are responsible for evaluating individual product suitability for specific applications. USFilter assumes no liability whatsoever for any special, indirect or consequential damages arising from the sale, resale or misuse of its products.

SPECIFICATIONS/TYPICAL PROPERTIES		
Specification	**AquaCarb® 1230C**	**AquaCarb® 1230AWC**
Carbon Type	Coconut Shell	Coconut Shell
Mesh Size, U.S. Sieve	12 x 30	12 x 30
Effective Size, mm	0.6 - 0.85	0.6 - 0.85
Uniformity Coefficient (max.)	2.0 (max)	2.0 (max)
Iodine No., mgI_2/g (min.)	1100 (min)	1100 (min)
Hardness No., Wt. % (min.)	98 (min)	98 (min)
Abrasion No., Wt. % (min.)	85 (min)	85 (min)
Apparent Density, g/cc	0.45 - 0.52	0.45 - 0.52
Water Soluble Ash, Wt. % (max)	2.0	0.2
Contact pH	9.0 - 10.0	6.5 - 8.0

USFilter

Westates
Customer and
Technical Service Network:

Gulf Coast Region	800.659.1723
(Louisiana)	225.744.3153
Western Region	800.659.1771
Mid-Atlantic Region	800.659.1717
Midwest Region	708.345.7290
Northwest Region	800.659.1718
Southeast Region	225.744.3153
New England Region	800.659.1717

www.usfilter.com

USFilter reserves the right to change the specifications referred to in this literature at any time, without prior notice. AquaCarb is a trademark of United States Filter Corporation or its affiliates.

WS-AQ12-DS-0704

USFilter
Westates
11711 Reading Road
Red Bluff, CA 96080
Telephone (530) 527-2664
Facsimile (530) 527-8724

ASC200-SS
Specification Summary

ASC200 Liquid Phase Adsorption Filter is designed to treat a wide range of contaminated process streams, ease of handling and economical usage. This adsorber is capable of maximum flow rate of 10 GPM.

Data Summary:

Dimensions	22" dia x 34" high
Maximum Working Pressure	3 psi.
Vessel Volume	7.4 cu-ft
Carbon Capacity	200 lbs.
Carbon Bed Volume-Typical	6.8 Ft^3
Maximum Flow	10 GPM
Empty Bed Contact Time	5 MIN @10 GPM
Material	Stainless Steel
Standard Color	Stainless Steel

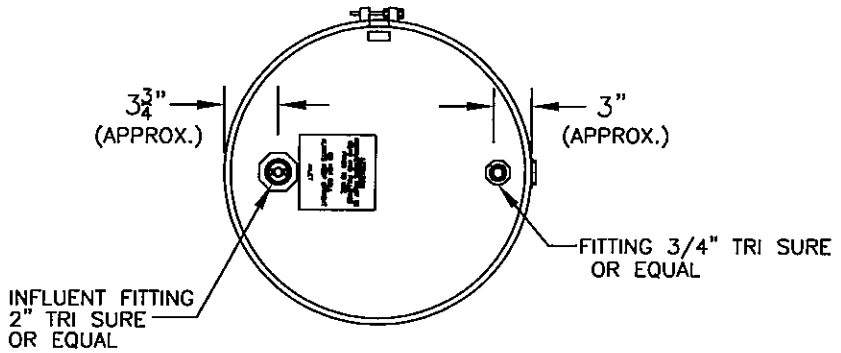
UNDERDRAIN:

Slotted pipe	2" x 18" PVC

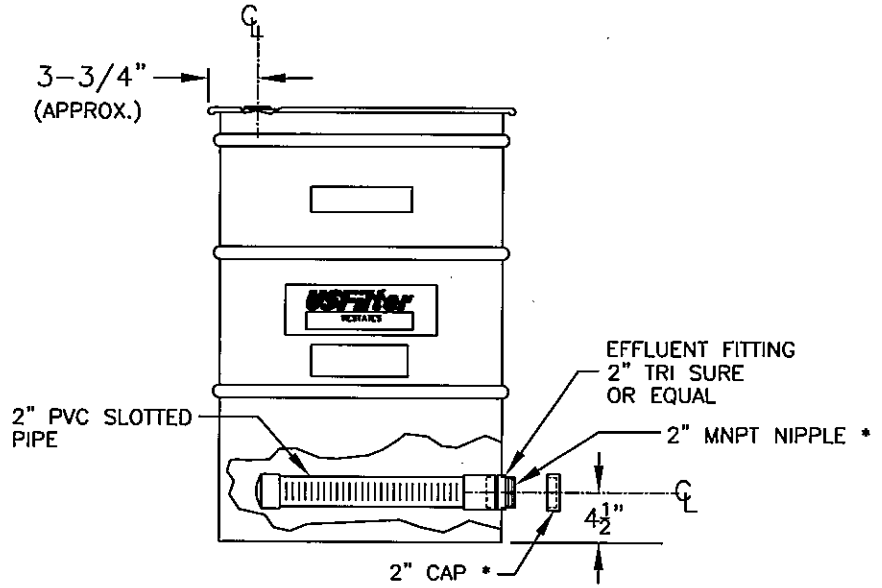
WEIGHT:

Shipping	250 lb
Operating	500 lb

STD: 2-0600-8X11A | INTL REF:



PLAN VIEW



SIDE VIEW

DESCRIPTION:	55 GALLON OPEN HEAD DRUM
MATERIAL:	CARBON STEEL
EXTERIOR FINISH:	HIGH GLOSS ENAMEL
LINNING:	VALSPAR 285D118 RED BROWN EPOXY PHENOLIC
FITTINGS:	
HEAD:	TYPE 1 (2" & 3/4")
BODY:	2" SIDE FITTING 4-1/2" TO CL FROM BOTTOM OF DRUM
FITTINGS GASKETS:	BUNA ON TRI SURE PLUGS
CLOSURE:	12 GA SQUARE BACK W/ 5/8" BOLT & JAM NUT
HEAD GASKET:	7/16" EPDM ROUND CORD GASKET
OUTSIDE DIAMETER:	23.5"
OVERALL HEIGHT:	34.625" +/- .5
INTERNALS:	2" PVC SLOTTED PIPE
FLOW RATE:	10 GPM MAX.
TEMPERATURE:	140° F MAX. OPERATING
PRESSURE:	6 PSI MAX. WORKING
CARBON CAPACITY:	200 LBS.
WEIGHTS:	
SHIPPING:	250 LBS.
OPERATING:	500 LBS.

* THIS IS FOR NON-HAZARDUS MATERIAL ONLY. SPECIAL FITTING REQUIRED FOR HAZARDUS MATERIAL TRANSPORTATION.

DESIGNER	TAC	DATE 2/1/05
CHECKER		DATE
ENGINEER	LLR	DATE 1/26/05
MANAGER		DATE
FILE:		
SCALE: NONE		

TITLE: ASC200 SALES DRAWING

CLIENT:

USFILTER/WESTATES
RED BLUFF, CA
1-800-795-2664

PROJECT	DRAWING	SHEET	REV
	ASC200-Sales	1 OF 1	