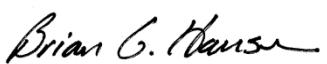



**ILLINOIS GULCH SITE**  
**Time-Critical Removal Action (TCRA)**

**ENGINEERING CHANGE ORDER (ECO)**

ECO # 1	DATE: 06/17/21
TITLE: ALTERNATIVE LINER MATERIAL FOR SETTLING POND	
<p><b>DESCRIPTION OF MODIFICATION:</b> The approved 2021 Removal Design Work Plan specified a settling pond liner consisting of Solmax 60 mil high-density polyethylene (HDPE) black, single sided textured (or pre-approved equal) as the primary liner, with a 40 mil LLDPE or other pre-approved product for a sacrificial skirt. This modification allows substitution of these materials with a Dura-Skrim N45B Reinforced Polyethylene (LLDPE) product for both the primary liner and the sacrificial skirt. See attached sample product specification. The minimum 20-year warranty requirements shall apply.</p> <p>This modification will not materially affect the function of the TCRA.</p>	
<p><b>JUSTIFICATION/BENEFIT:</b></p> <p>The 60 mil HDPE originally specified would be difficult to work with in the field due to its stiffness. In addition, recent oil shortages created supply issues for this material. The substituted material will be easier to work with in the field and is readily available. Per review of product specifications and discussions with industry experts, the proposed Dura-Skrim N45B product will meet or exceed the design requirements and performance expectations while allowing for improved installation quality control.</p>	
<p><b>PREPARED BY:</b> Formation Environmental, LLC <u>or</u> The Sanitas Group on behalf of TABR Realty Services Inc.</p> <p> Brian G. Hansen, PE – Formation Environmental, LLC</p> <p>Curtis C. Stevens, PE – The Sanitas Group</p>	<p><b>APPROVED BY:</b></p> <p> 6/17/2021 U.S. EPA ON-SCENE COORDINATOR</p>

## PRODUCT DESCRIPTION

DURA♦SKRIM® N45B is a flexible geomembrane, reinforced with a closely knit 9x9 weft inserted polyester scrim fully encapsulated between two layers of highly UV stabilized linear low density polyethylene. Exceptional toughness, high tensile and puncture strength is achieved with the combination of premium high strength LLDPE and dense scrim reinforcement. A highly stabilized formulation consisting of antioxidants, UV stabilizers and carbon black provide excellent protection for long-term exposed or barrier applications. DURA♦SKRIM® N-Series geomembranes are produced in the color black as standard, and are available in other custom manufactured colors with minimum order quantity requirements.

## PRODUCT USE

DURA♦SKRIM® N45B is used in applications that require exceptional outdoor life requiring up to 20 years of exposure depending upon the geographical location. Applications requiring high tear properties, exceptional tensile strength and puncture resistance utilize N45B to meet these demands. DURA♦SKRIM® N-Series is manufactured from a chemical-resistant, linear-low-density polyethylene with excellent cold crack performance and resistance to thermal expansion.

DURA♦SKRIM® N45B meets the physical property values as stated in GRI test method GM25, and is certified under the NSF/ANSI Standard 61, Drinking Water System Components – Health Effects.

## SIZE & PACKAGING

DURA♦SKRIM® N45B is available in a variety of widths and lengths to meet the project requirements. Large diameter mill rolls are available to assure an efficient seaming process. Factory welded panels are produced in a controlled environment and are accordion folded and tightly rolled on a heavy-duty core for ease of handling and time saving installation.

# DURA♦SKRIM®



Bio Cell Liner

## PRODUCT

## PART #

DURA♦SKRIM ..... N45B

## APPLICATIONS

Waste Lagoon Liners	Landfill Caps
Floating Covers	Erosion Control Covers
Daily Landfill Covers	Canal Liners
Modular Tank Liners	Disposal Pit Liner
Tunnel Liners	Water Containment Ponds
Remediation Liners	Heap Leach Liner
Earthen Liners	Secondary Containment
Interim Landfill Covers	Remediation Covers

# DURA♦SKRIM® N45B

SCRIM REINFORCED POLYETHYLENE — NSF/ANSI STANDARD 61 CERTIFIED

## PRO-FORMA DATA SHEET

		DURA♦SKRIM® N45B			
		IMPERIAL		METRIC	
PROPERTIES	TEST METHOD	MINIMUM	TYPICAL	MINIMUM	TYPICAL
APPEARANCE		Black		Black	
CORE THICKNESS	ASTM D5199	40 mil	45 mil	1.02 mm	1.14 mm
WEIGHT	ASTM D751	189 lbf/msf	213 lbf/msf	923 g/m <sup>2</sup>	1040 g/m <sup>2</sup>
CONSTRUCTION		9x9-1000 Denier PET scrim reinforced polyethylene			
TONGUE TEAR STRENGTH	ASTM D5884	100 lbf	135 lbf	445 N	601 N
GRAB TENSILE AT BREAK	ASTM D7004	275 lbf	350 lbf	1223 N	1557 N
TENSILE ELONGATION AT BREAK	ASTM D7004	22 %	30 %	22 %	30 %
PUNCTURE RESISTANCE	ASTM D4833	108 lbf	125 lbf	480 N	556 N
STANDARD OIT OR HIGH PRESSURE HPOIT	ASTM D3895 ASTM D5885	100 min 400 min	150 min 2400 min	100 min 400 min	150 min 2400 min
HYDRAULIC CONDUCTIVITY		1.47 x 10 <sup>-10</sup> cm/sec			
MAXIMUM STATIC USE TEMPERATURE		180° F		82° C	
MINIMUM STATIC USE TEMPERATURE		-70° F		-57° C	

**PRO-FORMA SHEET CONTENTS:** The data listed in the Pro-Forma data sheet is representative of initial production runs. These values may be revised at anytime without notice as additional test data becomes available.

## DURA♦SKRIM®

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Scan QR Code to  
download technical  
data sheets.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. Chemical resistance, odor transmission, longevity as well as other performance criteria is not implied or given and actual testing must be performed for applicability in specific applications and/or conditions. RAVEN INDUSTRIES MAKES NO WARRANTIES AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage. Limited Warranty available at [www.ravenefd.com](http://www.ravenefd.com)

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