Environmental Product Declaration | Presto Geosystems | GEOWEB® Geocell Products

PRESTO GEOSYSTEMS®
STRENGTH. FROM THE GROUND UP.
Since 1979

VERIFIED by SCS Global Services
ENVIRONMENTAL PRODUCT DECLARATION
BASED ON LCA

Declaration Owner

Presto Geosystems
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Product:

- GEOWEB® Geocell GW20V
- GEOWEB® Geocell GW30V
- GEOWEB® Geocell GW40V
- GEOWEB® Geocell GW20V Alpha
- GEOWEB® Geocell GW30V Alpha
- GEOWEB® Geocell GW40V Alpha
- GEOWEB® Geocell GW30V Wall
- GEOWEB® Geocell GW40V Wall

Declared Unit

One (1) square meter of technical textile

EPD Number and Period of Validity

SCS-EPD-10339

EPD Valid March 28, 2025 through March 27, 2030

Product Category Rule

PCR 2019:14 Being updated - Construction products (EN 15804+A2) (1.3.4).

EPD International. Valid until June 2025

Program Operator

SCS Global Services

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SCSglobal SERVICES

Declaration owner:	Presto Geosystems
Address:	670 N Perkins St, Appleton, WI 54914
Declaration Number:	SCS-EPD-10339
Date of Issue:	March 28, 2025
Declaration Validity Period:	EPD Valid March 28, 2025 through March 27, 2030
Program Operator:	SCS Global Services, 2000 Powell Street, Ste. 600, Emeryville, CA 94608 USA
Declaration URL Link:	https://www.scsglobalservices.com/certified-green-products-guide
General Program Instructions:	SCS Type III Environmental Declaration Program: Program Operator Manual. V12.0
Product(s):	GEOWEB® Geocell Products
Declared Unit:	One (1) square meter of geosynthetic
Product's Intended Application and Use:	soil stabilization; designed to keep soils from eroding under increased load
Product RSL (if applicable):	149 years
Markets of Applicability:	International
EPD Type:	Product specific
EPD Scope:	Cradle-to-gate with options, modules A4-A5, B1-B7, C1-C4, and D.
Year(s) of Reported Manufacturer Primary Data:	2023
LCA Software & Version Number:	OpenLCA v2.1.0
LCI Database(s) & Version Number:	Ecoinvent v3.10
LCIA Methodology & Version Number:	EF 3.1, TRACI 2.1 & IPCC AR5
Product Category Rule:	PCR 2019:14 Being updated - Construction products (EN 15804+A2) (1.3.4). EPD International. Valid until June 2025
Product Category Rule Review:	PCR review was conducted by: The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
LCA Practitioner:	Lucas Wathen, SCS Global Services
Independent critical review of the LCA and data, according to ISO 14044 and the PCR:	☐ internal ☒ external
LCA Reviewer:	Thomas P. Gloria, Ph.D., Industrial Ecology Consultants
Independent verification of the declaration and data, according to ISO 14025 and the PCR:	☐ internal ☒ external
EPD Verifier:	Thomas P. Gloria, Ph.D., Industrial Ecology Consultants
Declaration Contents:	

Disclaimers: *An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication.*

Conformity: *This EPD conforms to ISO 14025:2006, and EN 15804+A2.*

Ownership: *The EPD owner has the sole ownership, liability, and responsibility of the EPD.*

Accuracy of Results: *Due to PCR constraints, this EPD provides estimations of potential impacts that are inherently limited in terms of accuracy.*

Comparability: *The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.*

In accordance with ISO 21930:2017, EPDs are comparable only if they comply with the core PCR, use the same sub-category PCR where applicable, include all relevant information modules and are based on equivalent scenarios with respect to the context of construction works. The owner of the declaration shall be liable for the underlying information and evidence; SCS shall not be liable with respect to manufacturer information, life cycle assessment data, and evidence supplied or made available to SCS

1. Presto Geosystems

At Presto Geosystems, we pride ourselves on not just manufacturing the highest quality products in the industry, but on the personalized attention our engineers give to your project details, ensuring its success. Our innovative solutions are designed to minimize your project costs and maximize environmental benefits. Furthermore, our complimentary, solutions-focused project evaluations set your company apart by providing unique strategies to tackle even the most challenging problems.

The GEOWEB® System is the industry's most complete geocell system designed with fully engineered components to withstand the most challenging site problems. Made from robust high-density polyethylene (HDPE), GEOWEB® geocells offer the highest, longest-lasting, and most proven performance of any geocell system in civil applications. Made in the USA.

2. PRODUCT

2.1 PRODUCT DESCRIPTION

Presto Geosystems' GEOWEB® Geocell products belong to the CSI code 31 32 00 for Soil Stabilization Systems and the UN CPC code 54320 for Site Formation and Clearance Services, which includes soil stabilization.

Through an interconnected honeycomb-like network, 3D GEOWEB® geocells confine and stabilize soils that would otherwise be unstable under loading. Geocells are efficient and economical for fast-built unpaved or paved roadways, retaining walls that can withstand seismic activity, reasonable differential settlement and hydrostatic pressure, erosion control of slopes, and stormwater control in channels. The GEOWEB® System is designed with fully engineered components to withstand the most challenging site problems. Presto Geosystems performs calculations and modeling to replicate real-world forces, and the recommended solution is designed for the specific project needs, The following GEOWEB® geocell products are included in this EPD.

Table 1. Product Descriptions of GEOWEB® Geocell products

Product name	Description
GEOWEB® Geocell GW20V	Presto Geosystems' genuine GEOWEB® Geocell offerings. 20/30/40V classification refers to the aperture of individual cells within the GEOWEB® grid: 20V represents the smallest cell area (~0.030m^2), 30V represents a larger cell area (~0.046m^2), and 40V represents the largest cell area (~0.12m^2). Available in black.
GEOWEB® Geocell GW30V	
GEOWEB® Geocell GW40V	
GEOWEB® Geocell GW20V Alpha	GEOWEB® Alpha Geocell products are lighter weight counterparts to the genuine GEOWEB® 20V, 30V, and 40V products discussed above. Alpha products have been optimized for faster installation. Available in black.
GEOWEB® Geocell GW30V Alpha	
GEOWEB® Geocell GW40V Alpha	
GEOWEB® Geocell GW30V Wall	GEOWEB® Wall Geocell products are heavier than the genuine GEOWEB® offerings and have been categorized for use in Mechanically Stabilized Earth (MSE) retaining walls and steepened slopes. Unlike the Genuine or Alpha versions, GEOWEB® walls include green or tan fascia.
GEOWEB® Geocell GW40V Wall	

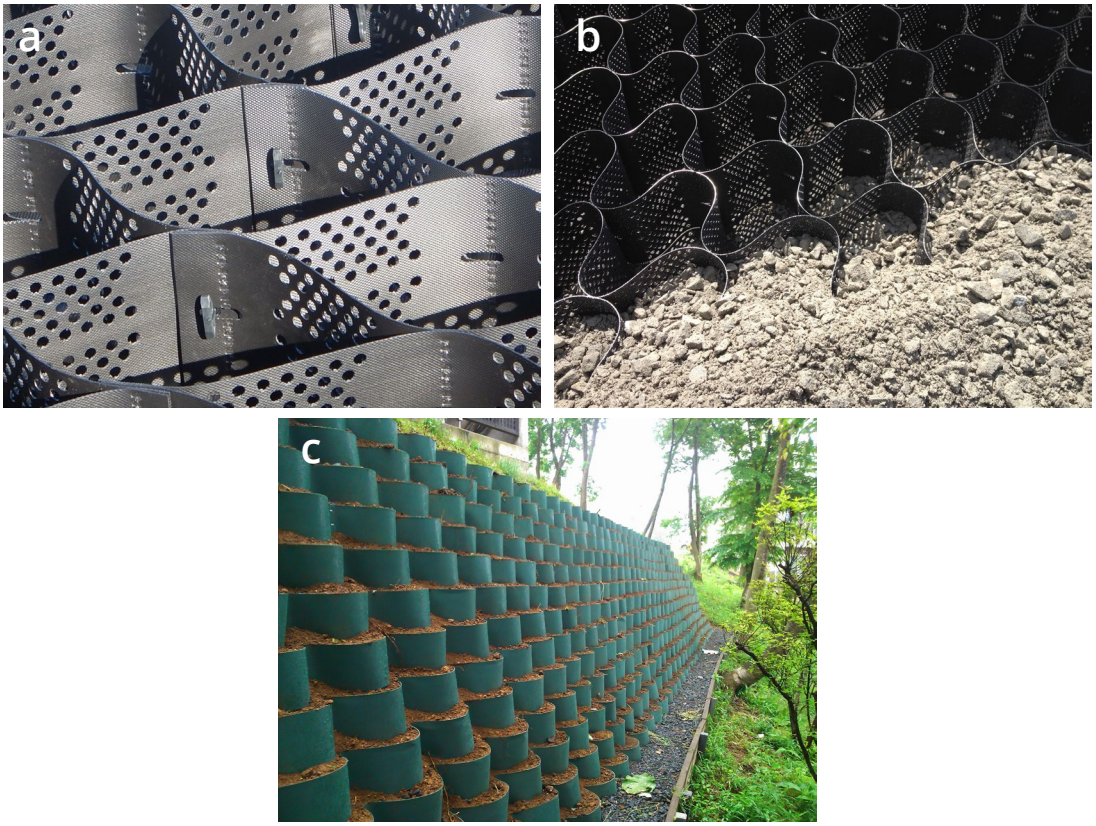

Figure 1. Product Images of GEOWEB® Geocell (a) Genuine, (b) Alpha, and (c) Wall products

2.2 TECHNICAL SPECIFICATIONS

Table 2. Technical specifications of GEOWEB® Geocell products required by the PCR. Test Standards used to calculate fields listed below

Product name	Mass/Unit Area (g/m2)	Cell Depth (mm)	Environmental Stress Crack Resistance (ESCR) (hrs)	ESCR – Accelerated Test (hrs)
GEOWEB® Geocell GW20V	2010	75, 100, 150, 200	>5000	>400
GEOWEB® Geocell GW30V	1430	75, 100, 150, 200, 300	>5000	>400
GEOWEB® Geocell GW40V	1100	75, 100, 150, 200, 300	>5000	>400
GEOWEB® Geocell GW20V Alpha	1260	75, 100, 150, 200	>5000	>400
GEOWEB® Geocell GW30V Alpha	1250	75, 100, 150, 200, 300	>5000	>400
GEOWEB® Geocell GW40V Alpha	781	75, 100, 150, 200, 300	>5000	>400
GEOWEB® Geocell GW30V Wall	1600	150, 200	>5000	>400
GEOWEB® Geocell GW40V Wall	1070	150, 200	>5000	>400

Test standards used to calculate the technical specifications are as follows:

- Mass/Unit Area: ASTM D6566/EN ISO 9864
- Cell Depth: ASTM D6525/EN ISO 9863-1
- Environmental Stress Crack Resistance (ESCR): ASTM D1693
- ESCR - Accelerated Test: ASTM D5397

2.3 FLOW DIAGRAM

A flow diagram illustrating the production processes and life cycle phases included in the scope of the EPD is provided below

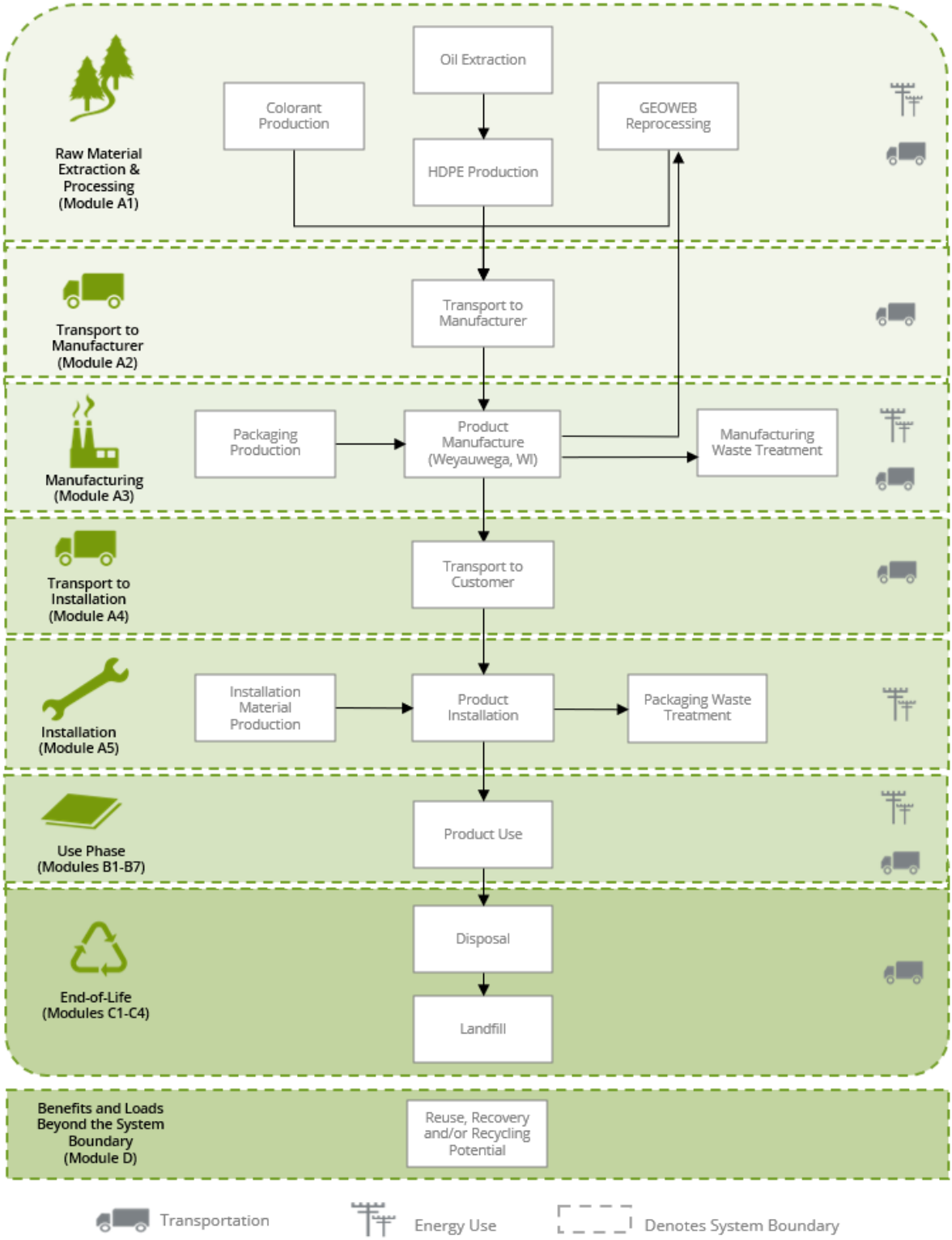

Figure 2. Flow diagram and system boundaries for the life cycle of the GEOWEB® Geocell products.

2.4 APPLICATION

GEOWEB® Geocell products are soil stabilizers designed to keep soils from eroding under increased load and intended to be installed beneath roads, railways, storm water channels and retaining walls.

2.5 DECLARATION OF METHODOLOGICAL FRAMEWORK

The scope of the EPD is cradle-to-gate with modules A4-A5, B1-B7, C1-C4, and D. This includes raw material extraction and processing; raw material transportation; product manufacture, distribution, installation, use, and end-of-life.

Manufacturing resource use was allocated to the products based on mass. Impacts from transportation were allocated based on the mass of material and distance transported.

Processes contributing greater than 1% of the total environmental impact indicator for each impact are included in the inventory. No known flows were deliberately excluded from this EPD.

2.6 MATERIAL COMPOSITION

GEOWEB® Geocell products consist primarily of high-density polyethylene (HDPE). Additional data on the raw material composition of these products is provided in the tables below.

Table 3. Material composition summary by percent of final product for GEOWEB® Geocell products.

Raw Material	GEOWEB® Genuine	GEOWEB® Alpha	GEOWEB® Wall
Virgin HDPE	87%	87%	97%
Reprocessed GEOWEB®	10%	10%	0%
Dye	3%	3%	2%
UV Inhibitor	0%	0%	1%
TOTAL	**100%**	**100%**	**100%**

2.7 TRANSPORTATION

The HDPE used during the production of GEOWEB® Geocell products is purchased from domestic suppliers and delivered to Presto Geosystems' Weyauwega, WI facility via rail. Additional inputs are also sourced domestically, but delivered via truck.

2.8 MANUFACTURE

During the production of GEOWEB® Geocell products, purchased resin is first stored in silos, and eventually be blended with colorants and stabilizers. The blended material then feeds the extrusion line to produce 1.22m x 3.66m strips. The extruded strips are then transferred to an ultrasonic welder, where they are welded together in a specific strip count. The section is then run through a saw to achieve the desired section size. The finished sections are then banded, labeled and palletized for sale to customers. As required by the PCR, the emissions factor for the purchased electricity used during the manufacturing of GEOWEB® Geocell products within the MORE eGRID subregion is reported as 0.746 $kgCO_2e/kWh$, using the GWP-GHG indicator.

2.9 PACKAGING

GEOWEB® Geocell products are packaged for distribution using a combination of wood pallets, plastic wrap, and polyester banding.

2.10 DISTRIBUTION

GEOWEB® Geocell products are distributed internationally. Primary destinations for finished product are (1) the US & Canada, (2), the EU & UK, and (3) Australia & New Zealand.

Table 4. Distribution transportation summary for GEOWEB® Geocell products.

Name	Unit	Freight Truck	Ocean Freighter
Liters of fuel	l/100km	18.7	0.41
Transport distance	km	2163	3249
Capacity utilization (including empty runs)	%	50	n/a
Gross density of product transported	kg/m3		
GEOWEB® Geocell GW20V	kg/m^3	11.5	
GEOWEB® Geocell GW30V	kg/m^3	9.5	
GEOWEB® Geocell GW40V	kg/m^3	5.2	
GEOWEB® Geocell GW20V Alpha	kg/m^3	9.6	
GEOWEB® Geocell GW30V Alpha	kg/m^3	8.0	
GEOWEB® Geocell GW40V Alpha	kg/m^3	4.4	
GEOWEB® Geocell GW30V Wall	kg/m^3	10.3	
GEOWEB® Geocell GW40V Wall	kg/m^3	6.0	
Capacity utilization volume factor		1	1

2.11 INSTALLATION

A variety of materials are required to install GEOWEB® Geocell products, depending on project-specific needs. The list of potential installation materials is provided in Table 5, followed by additional installation information required by the PCR in Table 6

Table 5. Installation materials used with GEOWEB® Geocell products.

Installation Product	Material	Product Description
ATRA Key	HDPE	The ATRA Key is a device to connect adjacent GEOWEB® Geocell sections end-to-end or side-to-side through the GEOWEB® material slots (I-slots). The ATRA Key includes a structurally reinforced handle and frictional barbs for improved interlock with the GEOWEB® surface texture.
ATRA Tendon Clip	HDPE	The ATRA Tendon Clip is a molded, high strength load transfer device with a locking member and post. The ATRA Tendon Clip is used to transfer driving gravitational forces from the GEOWEB® cell walls to the tendon and crest anchorage system. The device includes a structurally reinforced post and locking member with frictional barbs for improved interlock with GEOWEB® surface texture
ATRA Stake Clip	HDPE	The ATRA Stake Clip is a molded, high-strength polymeric device for use with #4 rebar and 10-12 mm diameter rods, for forming ATRA Anchors. ATRA anchors are utilized for crest, toe, and internal anchoring of GEOWEB® sections. Both metal (common rebar) and non-metallic stakes may be used as determined by site soil conditions.
ATRA Speed Stake	HDPE	ATRA Speed Stakes are a one-piece, nonmetallic molded anchor used instead of traditional rebar or steel rods when long-term durability is desired in wet or corrosive environments.
Stake	Rebar	Typically, a #4 rebar and 10-12 mm diameter stakes are used in conjunction with the ATRA Stake Clips described above to anchor the GEOWEB® Geocell product to the soil.
Tendon	Polyester	Woven plastic bands of variable tensile strength, called tendons, are drawn taught using ATRA Tendon Clips and used to secure the GEOWEB® Geocell products during installation. This study assumes use of a woven polyester band based on primary data from Presto Geosystems.

Table 6. Installation summary for the GEOWEB® Geocell products, presented per m^2 of product.

Parameter Name	Value	Unit
Auxiliary Materials	0.396	kg
HDPE	$5.84x10^{-2}$	kg
Steel	0.332	kg
Polyester	$5.60x10^{-3}$	kg
Water consumption	0.00	m^3
Other resources	0.00	kg
Electricity consumption	0.00	kWh
Other energy carriers	0.00	MJ
Material loss	-	-
GW20V	$8.61x10^{-2}$	kg
GW20V Alpha	$5.52x10^{-2}$	kg
GW30V	$6.13x10^{-2}$	kg
GW30V Alpha	$5.37x10^{-2}$	kg
GW30V Walls	$6.86x10^{-2}$	kg
GW40V	$4.71x10^{-2}$	kg
GW40V Alpha	$3.35x10^{-2}$	kg
GW40V Walls	$4.59x10^{-2}$	kg
Output substances following waste treatment on site	n/a	kg
Dust in the air	n/a	kg
VOC in the air	n/a	kg

2.12 PRODUCT USE

The use phase of GEOWEB® Geocell products does require additional consumption of raw materials, energy, or generate waste. Information required by the PCR on the use phase and RSL of the product are provided in the table below.

Table 7. RSL and Use phase information.

Parameter	Value	Unit
Reference Service Life (according to ISO 15686-1, -2, -7, and -8)	149	yrs
Life Span (according to BBSR)	≥50	yrs
Life Span according to the manufacturer	149	yrs
Declared product properties (at the gate) and finishes	Wrapped, banded, and palletized Geocells are delivered to construction sites by truck.	-
Design application parameters (if instructed by the manufacturer), including the references to the appropriate practices and application codes	See manufacturer website	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	See manufacturer website	-
Outdoor environment, (for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	Functions as intended without creating notable pollution under stresses of weather. UV Exposure only for Wall products. Building orientation, shading, and temperature are not relevant	-
Usage conditions, e.g. frequency of use, mechanical exposure	Use conditions vary by project type but is continuous. Outdoor environment may be wet, dry, hot, or cold.	-
Maintenance e.g. required frequency, type and quality and replacement of components	None	-

2.13 END-OF-LIFE

GEOWEB® Geocell products are categorized under the following code according to the European Waste Index: 17 02 03 – *plastic construction and demolition wastes (including excavated solids from contaminated sites).*

Deconstruction and dismantling of installed GEOWEB® Geocell products does not require any additional resource use. As no evidence was presented to the contrary, it is assumed Geocell waste is collected along with mixed construction waste and treated 100% via landfill. Transportation distance to landfill is assumed to be 32km based on the EPA WARM model.

Table 8. End-of-Life summary for GEOWEB® Geocell products.

End-of-life		Unit	GEOWEB® Genuine			GEOWEB® Alpha			GEOWEB® Wall	
			20V	30V	40V	20V	30V	40V	30V	40V
Assumptions for scenario development		Manual deconstruction with other construction wastes, 32km truck transport to final disposal in landfill.								
Collection process	Collected separately	kg	0	0	0	0	0	0	0	0
	Collected with mixed construction waste	kg	1.93	1.23	1.37	1.20	1.53	1.05	0.75	1.03
Recovery	Reuse	kg	0	0	0	0	0	0	0	0
	Recycling	kg	0	0	0	0	0	0	0	0
	Landfill	kg	1.93	1.23	1.37	1.20	1.53	1.05	0.75	1.03
	Incineration	kg	0	0	0	0	0	0	0	0
	Incineration with energy recovery	kg	0	0	0	0	0	0	0	0
	Energy conversion	-	-	-	-	-	-	-	-	-
Disposal	Product of material for final deposition	kg	1.93	1.23	1.37	1.20	1.53	1.05	0.75	1.03
Removals of biogenic carbon (excluding packaging)		kg CO_2	0	0	0	0	0	0	0	0

2.14 RE-USE PHASE

Presto Geosystems' GEOWEB® Geocell products are disposed of via landfill, eliminating potential for re-use, recycling, or energy recovery.

3. Methodological Framework

3.1 DECLARED UNIT

The declared unit of this study is one (1) square meter of geosynthetic product. Per input from product experts at Presto Geosystems, the reference service life (RSL) of GEOWEB® Geocell products is 149 years. The building estimated service life (ESL) is assumed to be 75-years; consistent with ASHRAE 189.1 (2014, Section 9.5.1)

Table 9. declared unit and reference flows for the product system under study.

Product	Declared Unit (m^2)	Reference Flow (kg)
GEOWEB® Geocell GW20V	1	2.01
GEOWEB® Geocell GW30V	1	1.43
GEOWEB® Geocell GW40V	1	1.10
GEOWEB® Geocell GW20V Alpha	1	1.26*
GEOWEB® Geocell GW30V Alpha	1	1.25
GEOWEB® Geocell GW40V Alpha	1	0.781
GEOWEB® Geocell GW30V Wall	1	1.60
GEOWEB® Geocell GW40V Wall	1	1.07*

**Calculated using straight average. All other reference flows calculated using production weighted average*

3.2 SYSTEM BOUNDARY

The scope of this EPD is cradle-to-grave. As such the following life cycle stages are included: raw material extraction and processing, transport to manufacturer, manufacture, distribution, installation, use, and end-of-life. All life cycle modules illustrated below were modeled to represent a geographical scope appropriate for Presto Geosystems' manufacturing facility in Weyauwega, WI. Modules A1-A3 are representative of U.S. manufacturing, and all modules beyond the factory gate are global in scope. Share of specific data is calculated based on the GWP-GHG indicator.

Table 10. System boundary for the product under study.

	Production			Construction		Use							End-of-life				Resource Recovery
	A1	A2	A3	A4	A5	B1	B1	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
	Raw material extraction and processing	Transport to manufacturer	Manufacturing	Transport	Construction - installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, recovery and/or recycling potential
Module Declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	United States			GLO		GLO							GLO				GLO
Share of Specific Data	>90%			>90%		-	-	-	-	-	-	-	-	-	-	-	-

X = Module Included | MND = Module Not Declared | GLO = Global

3.3ALLOCATION

Manufacturing resource use was allocated to the GEOWEB® Geocell products based on mass. Impacts from transportation were allocated based on the mass of the material and distance transported.

3.4 CUT-OFF RULES

According to the PCR, processes contributing greater than 1% of the total environmental impact indicator for each impact are included in the inventory. No data gaps were allowed which were expected to significantly affect the outcome of the indicator results.

Capital equipment, construction, maintenance, and infrastructure were excluded from the system boundary, as the capital equipment is assumed to have a negligible impact to environmental effects due to the general long lifetime of the manufacturing buildings and capital equipment.

3.5 DATA SOURCES

Primary data were provided by Presto Geosystems for their manufacturing facility in Weyauwega, WI. The principal source of secondary LCI data is the Ecoinvent 3.10 database, with additional secondary electricity generation data from the US EPA's eGRID database.

Table 11. LCI datasets and associated databases used to model the Presto Geosystems' GEOWEB® Geocell products.

Component	Dataset	Geography	Data Source	Publication Date
Product				
HDPE	market for polyethylene, high density, granulate | polyethylene, high density, granulate | Cutoff, U	GLO	EI v3.10	2023
Black and Green Dye	market for polyethylene, low density, granulate | polyethylene, low density, granulate | Cutoff, U	GLO	EI v3.10	2023
	market for titanium dioxide | titanium dioxide | Cutoff, U	RoW	EI v3.10	2023
Tan Dye	market for carbon black | carbon black | Cutoff, U	GLO	EI v3.10	2023
	market for polyethylene, low density, granulate | polyethylene, low density, granulate | Cutoff, U	GLO	EI v3.10	2023
UV Inhibitor	market for benzoic-compound | benzoic-compound | Cutoff, U	GLO	EI v3.10	2023
	market for piperidine | piperidine | Cutoff, U	GLO	EI v3.10	2023
	market for polyethylene, low density, granulate | polyethylene, low density, granulate | Cutoff, U - GLO	GLO	EI v3.10	2023
Reprocessed GEOWEB®	market for waste polyethylene, for recycling, sorted | waste polyethylene, for recycling, sorted | Cutoff, U - US	US	EI v3.10	2023
Packaging				
Wood Pallets	market for sawnwood, softwood, raw, dried (u=20%) | sawnwood, softwood, raw, dried (u=20%) | Cutoff, U	RoW	EI v3.10	2023
Stretch Wrap	market for packaging film, low density polyethylene | packaging film, low density polyethylene | Cutoff, U	GLO	EI v3.10	2023
Poly Banding	market for polyester resin, unsaturated | polyester resin, unsaturated | Cutoff, U	RoW	EI v3.10	2023
	market for weaving, synthetic fibre | weaving, synthetic fibre | Cutoff, U	GLO	EI v3.10	2023
Transport				
Train	market for transport, freight train | transport, freight train | Cutoff, U	US	EI v3.10	2023
Truck	market for transport, freight, lorry 16-32 metric ton, EURO4 | transport, freight, lorry 16-32 metric ton, EURO4 | Cutoff, U	RoW	EI v3.10	2023
Ship	market for transport, freight, sea, container ship | transport, freight, sea, container ship | Cutoff, U	GLO	EI v3.10	2023
Manufacture Inputs				
Electricity	market for electricity, medium voltage | electricity, medium voltage | Cutoff, U (modified eGRID dataset - MROE)	MORE	eGRID EI v3.10	2022 2023
Natural Gas	market for heat, district or industrial, natural gas | heat, district or industrial, natural gas | Cutoff, U	RoW	EI v3.10	2023
Installation Materials				
ATRA Products	market for injection moulding | injection moulding | Cutoff, U	GLO	EI v3.10	2023
	market for polyethylene, high density, granulate | polyethylene, high density, granulate | Cutoff, U	GLO	EI v3.10	2023
Rebar Stake	market for metal working, average for steel product manufacturing | metal working, average for steel product manufacturing | Cutoff, U	GLO	EI v3.10	2023
	market for steel, low-alloyed, hot rolled | steel, low-alloyed, hot rolled | Cutoff, U	GLO	EI v3.10	2023
Tendon	market for polyester resin, unsaturated | polyester resin, unsaturated | Cutoff, U	RoW	EI v3.10	2023
	market for weaving, synthetic fibre | weaving, synthetic fibre | Cutoff, U	GLO	EI v3.10	2023
Waste Outputs				
Waste to Landfill	market for inert waste, for final disposal | inert waste, for final disposal | Cutoff, U	RoW	EI v3.10	2023
Waste to Incineration	market for hazardous waste, for incineration | hazardous waste, for incineration | Cutoff, U	RoW	EI v3.10	2023

3.6. DATA QUALITY

The data quality assessment addressed the following parameters: time-related coverage, geographical coverage, technological coverage, precision, completeness, representativeness, consistency, reproducibility, sources of data, and uncertainty.

Table 12. Data quality assessment.

Data Quality Parameter	Data Quality Discussion
Time-Related Coverage: Age of data and the minimum length of time over which data is collected	The manufacturer provided primary data on product manufacturing for the Weyauwega, WI facility on annual production for 2023. Representative datasets (secondary data) for upstream and background processes are generally less than 10 years old.
Geographical Coverage: Geographical area from which data for unit processes is collected to satisfy the goal of the study	The data used in the analysis provide the best possible representation available with current data. Electricity use for product manufacture is modeled using representative data modelled for the specific electricity grids represented in this study. Surrogate data used in the assessment are representative of global operations and are considered sufficiently similar to actual processes.
Technology Coverage: Specific technology or technology mix	For the most part, data are representative of the actual technologies used for processing, transportation, and manufacturing operations. Representative component datasets, specific to the type of material, are used to represent the actual processes, as appropriate.
Precision: Measure of the variability of the data values for each data expressed	Precision of results are not quantified due to a lack of data. Data collected for operations were typically averaged for one or more years and over multiple operations, which is expected to reduce the variability of results.
Completeness: Percentage of flow that is measured or estimated	The LCA model included all known mass and energy flows for production of the products. In some instances, surrogate data used to represent upstream and downstream operations may be missing some data which is propagated in the model. No known processes or activities contributing to more than 1% of the total environmental impact for each indicator are excluded.
Representativeness: Qualitative assessment of the degree to which the data set reflects the true population of interest	Data used in the assessment represents typical or average processes as currently reported from multiple data sources and are therefore generally representative of the range of actual processes and technologies for production of these materials. Considerable deviation may exist among actual processes on a site-specific basis; however, such a determination would require detailed data collection throughout the supply chain back to resource extraction.
Consistency: Qualitative assessment of whether the study methodology is applied uniformly to the various components of the analysis	The consistency of the assessment is considered to be high. Data sources of similar quality and age are used; with a bias towards Ecoinvent v3.10 data where available. Different portions of the product life cycle are equally considered.
Reproducibility: Qualitative assessment of the extent to which information about the methodology and data values would allow an independent practitioner to reproduce the results reported in the study	Based on the description of the data and assumptions used, this assessment would be reproducible by other practitioners. All assumptions, models, and data sources are documented.
Sources of the Data: Description of all primary and secondary data sources	Data representing energy use at the Weyauwega facility represent a 12-month average and are considered of high quality due to the length of time over which these data are collected, as compared to a snapshot that may not accurately reflect fluctuations in production. For secondary LCI data, Ecoinvent v3.10 data are used.
Uncertainty of the Information: Uncertainty related to data, models, and assumptions	Uncertainty related to materials in the products and packaging is low. Actual supplier data for upstream operations was not available for all suppliers and the study relied upon the use of existing representative datasets. These datasets contained relatively recent data (<10 years) but lacked geographical representativeness. Uncertainty related to the impact assessment methods used in the study are high. The impact assessment methodology includes impact potentials, which lack characterization of providing and receiving environments or tipping points.

3.7 PERIOD UNDER REVIEW

A 12-month period from January 2023 through December 2023 serves as the period under review for this study.

3.8 COMPARABILITY AND BENCHMARKING

The PCR this EPD was based on was not written to support comparative assertions. EPDs based on different PCRs, or different calculation models, may not be comparable. When attempting to compare EPDs or life cycle impacts of products from different companies, the user should be aware of the uncertainty in the final results, due to and not limited to, the practitioner's assumptions, the source of the data used in the study, and the specifics of the product modeled.

3.9 ESTIMATES AND ASSUMPTIONS

The assessment relied on a number of assumptions related to material composition, processing, installation, use, and end-of-life. The major assumptions used in the assessment are described below.

- Production weighted averages were used to calculate reference flows for GEOWEB® Geocell products available in a range of depths.
- Primary data from suppliers was not available on colorants (black, green, and tan dye) in the product recipe. Secondary datasets for carbon black, titanium dioxide, and LDPE were used from the Ecoinvent database to represent these colorants in the LCA model.
- Primary data from suppliers was not available on UV inhibitor in the product recipe. Secondary datasets for piperidine, benzoic-compound, and LDPE were used from the Ecoinvent database to represent this material in the LCA model.
- A 10% input of internally reprocessed GEOWEB® material was assumed as an input for all Genuine and Alpha products based on input from experts at Presto Geosystems.
- Direct emissions from Presto Geosystems' manufacturing facility were only available in terms of CO_2e. As such, these emissions were modeled as consisting wholly of carbon dioxide.
- A global average distribution scenario was designed based on the location of Presto Geosystems' customers and the percentage of business that they represent. When ocean transport was required, an average distance of 200 km from the port of destination to customer was assumed.
- The materials required for the installation of GEOWEB® Geocell products is dependent upon the project type. For example, laying Geocell products beneath a flat road will require different materials than if it were installed beneath a slope or wall. To best capture the range of installation possible installation materials, an average installation scenario was designed based on primary data from Presto Geosystems.
- No impacts are associated with the use phase of this product.
- Where primary data was not available, transport of the manufacturing wastes, packaging waste at installation, and product waste at end-of-life was assumed to be 32 km by truck based on the EPA WARM model.
- Based on input from product experts at Presto Geosystems, the Reference Service Life (RSL) of the GEOWEB® Geocell products is 149 years.
- The Estimated Service Life (ESL) of the building/construction works was assumed to be 75 years, as required by the SCS General Program Manual, in order to be consistent with ASHRAE 189.1 (2014, Section 9.5.1).
- Product waste at end-of-life was assumed to be treated 100% via disposal in landfill.

4. LCA: Results

Results of the Life Cycle Assessment are presented below. It is noted that LCA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

The following environmental impact category indicators are reported using characterization factors based on the EF 3.1, TRACI 2.1, and IPCC AR5 methodologies. Results reported in MJ are calculated using lower heating values. All values are rounded to three significant digits.

Table 13. LCIA Indicators included in this EPD.

Impact Category	Abbreviation	Unit	LCIA Methodology
Global warming potential	GWP-total GWP-fossil GWP-biogenic GWP-GHG	kg CO_2 eq	EF 3.1
Ozone depletion potential	ODP	kg CFC-11 eq	EF 3.1
Eutrophication potential	EP-freshwater EP-aquatic marine EP-terrestrial	kg PO_4 eq kg N eq mol N eq	EF 3.1
Acidification potential	AP	mol H^+ eq	EF 3.1
Photochemical ozone formation	POCP	kg NMVOC eq	EF 3.1
Abiotic Depletion Potential, non-fossil resources*	ADP_E	kg Sb eq	EF 3.1
Abiotic Depletion Potential, fossil fuels*	ADP_F	MJ eq	EF 3.1
Water Use Deprivation Potential*	WDP	m^3 world eq deprived	EF 3.1
Global warming potential – IPCC 2013	GWP 100a	kg CO_2 eq	IPCC AR5
Ozone depletion potential	ODP	kg CFC-11 eq	TRACI 2.1
Eutrophication potential	EP	kg N eq	TRACI 2.1
Acidification potential	AP	kg SO_2 eq	TRACI 2.1
Smog Formation Potential	SFP	kg O_3 eq	TRACI 2.1
Fossil Fuel Depletion	FFD	MJ Surplus	TRACI 2.1

**The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.*

These impact categories are globally deemed mature enough to be included in Type III environmental declarations. Other categories are being developed and defined and LCA should continue making advances in their development. However, the EPD users shall not use additional measures for comparative purposes.

Per the PCR, aggregating of results of multiple life cycle stages is not presented, save for the production stage (modules A1-A3). However, as the scope of this EPD is cradle-to-grave, use of the aggregated production stage results presented is discouraged without giving additional consideration to the results of the end-of-life stage (modules C1-C4).

The following inventory parameters, specified by the PCR, are also reported.

Table 14. Resource use and waste/output indicators included in this EPD.

Resource Use Indicators	Abbreviation	Unit
Renewable primary resources used as an energy carrier	PERE	MJ, LHV
Renewable primary resources with energy content used as materials	PERM	MJ, LHV
Total use of renewable primary energy resources	PERT	MJ, LHV
Non-renewable primary resources used as an energy carrier	PENRE	MJ, LHV
Non-renewable primary resources with energy content used as material	PENRM	MJ, LHV
Total use of non-renewable primary energy resources	PENRT	MJ, LHV
Secondary materials	SM	kg
Renewable secondary fuels	RSF	MJ, LHV
Non-renewable secondary fuels	NRSF	MJ, LHV
Consumption of freshwater	FW	m^3
Waste/Output Indicators	**Abbreviation**	**Unit**
Hazardous waste disposed	HWD	kg
Non-hazardous waste disposed	NHWD	kg
Radioactive waste	RWD	kg
Components for re-use	CRU	kg
Materials for recycling	MFR	kg
Materials for energy recovery	MER	kg
Exported electrical energy	EEE	MJ, LHV
Exported thermal energy	EET	MJ, LHV

All LCA results are stated to three significant figures in agreement with the PCR for this product and therefore the sum of the total values may not exactly equal 100%.

Table 15. EF 3.1, TRACI 2.1, and IPCC AR5 LCIA results for the **Genuine GEOWEB® Geocell GW20V**.

LCIA Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
EF 3.1									
GWP-total	kg CO_2 eq	6.40	0.100	1.02	**7.52**	0.975	2.12	$1.15x10^{-2}$	$3.46x10^{-2}$
GWP-fossil	kg CO_2 eq	6.38	0.100	1.01	**7.49**	0.974	2.09	$1.15x10^{-2}$	$3.45x10^{-2}$
GWP-biogenic	kg CO_2 eq	$1.89x10^{-2}$	$1.97x10^{-5}$	$1.01x10^{-3}$	**$2.00x10^{-2}$**	$1.50x10^{-4}$	$3.05x10^{-2}$	$1.80x10^{-6}$	$6.93x10^{-6}$
GWP-GHG	kg CO_2 eq	6.40	0.100	1.10	**7.60**	0.975	2.04	$1.15x10^{-2}$	$3.46x10^{-2}$
ODP	kg CFC-11 eq	$1.85x10^{-7}$	$1.26x10^{-9}$	$7.73x10^{-9}$	**$1.94x10^{-7}$**	$1.45x10^{-8}$	$2.79x10^{-8}$	$1.71x10^{-10}$	$7.18x10^{-10}$
EP-freshwater	kg PO_4 eq	$1.32x10^{-3}$	$9.97x10^{-6}$	$4.50x10^{-4}$	**$1.78x10^{-3}$**	$7.32x10^{-5}$	$7.10x10^{-4}$	$9.01x10^{-7}$	$2.86x10^{-6}$
EP-marine	kg N eq	$4.82x10^{-3}$	$3.30x10^{-4}$	$7.10x10^{-4}$	**$5.86x10^{-3}$**	$1.91x10^{-3}$	$1.91x10^{-3}$	$1.76x10^{-5}$	$7.19x10^{-5}$
EP-terrestrial	mol N eq	$4.91x10^{-2}$	$3.60x10^{-3}$	$6.51x10^{-3}$	**$5.92x10^{-2}$**	$2.08x10^{-2}$	$1.92x10^{-2}$	$1.90x10^{-4}$	$7.70x10^{-4}$
AP	mol H^+ eq	$2.39x10^{-2}$	$7.70x10^{-4}$	$4.01x10^{-3}$	**$2.87x10^{-2}$**	$5.87x10^{-3}$	$8.54x10^{-3}$	$4.79x10^{-5}$	$1.90x10^{-4}$
POCP	kg NMVOC eq	$2.98x10^{-2}$	$1.06x10^{-3}$	$2.51x10^{-3}$	**$3.33x10^{-2}$**	$6.79x10^{-3}$	$7.75x10^{-3}$	$6.63x10^{-5}$	$2.70x10^{-4}$
ADP_E	kg Sb eq	$4.66x10^{-5}$	$2.50x10^{-7}$	$1.69x10^{-6}$	**$4.85x10^{-5}$**	$2.99x10^{-6}$	$1.19x10^{-5}$	$3.71x10^{-8}$	$8.94x10^{-8}$
ADP_F	MJ eq	161	1.31	12.7	**175**	13.6	30.8	0.162	0.615
WDP	m^3 world eq	1.86	$9.50x10^{-3}$	0.210	**2.08**	$7.73x10^{-2}$	0.699	$9.50x10^{-4}$	$1.53x10^{-2}$
TRACI 2.1									
ODP	kg CFC-11 eq	$2.04x10^{-7}$	$1.39x10^{-9}$	$1.84x10^{-8}$	**$2.24x10^{-7}$**	$1.57x10^{-8}$	$3.36x10^{-8}$	$1.85x10^{-10}$	$7.74x10^{-10}$
EP	kg N eq	$4.34x10^{-2}$	$1.40x10^{-4}$	$4.37x10^{-3}$	**$4.79x10^{-2}$**	$1.08x10^{-3}$	$1.02x10^{-2}$	$1.26x10^{-5}$	$4.58x10^{-5}$
AP	kg SO_2 eq	$2.27x10^{-2}$	$7.10x10^{-4}$	$3.43x10^{-3}$	**$2.69x10^{-2}$**	$5.18x10^{-3}$	$7.48x10^{-3}$	$4.31x10^{-5}$	$1.70x10^{-4}$
SFP	kg O_3 eq	0.287	$2.08x10^{-2}$	$3.57x10^{-2}$	**0.343**	0.120	0.106	$1.10x10^{-3}$	$4.47x10^{-3}$
FFD	MJ Surplus	21.4	0.174	1.09	**22.6**	1.90	2.95	$2.25x10^{-2}$	$8.67x10^{-2}$
IPCC AR5									
GWP 100a	kg CO_2 eq	6.42	0.101	1.02	**7.55**	0.977	2.13	$1.15x10^{-2}$	$3.46x10^{-2}$

Table 16. EF 3.1, TRACI 2.1, and IPCC AR5 LCIA results for the **Genuine GEOWEB® Geocell GW30V**.

LCIA Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
EF 3.1									
GWP-total	kg CO_2 eq	4.56	$7.16x10^{-2}$	0.724	**5.35**	0.694	2.03	$8.17x10^{-3}$	$2.46x10^{-2}$
GWP-fossil	kg CO_2 eq	4.54	$7.15x10^{-2}$	0.723	**5.34**	0.694	1.99	$8.17x10^{-3}$	$2.46x10^{-2}$
GWP-biogenic	kg CO_2 eq	$1.35x10^{-2}$	$1.40x10^{-5}$	$7.20x10^{-4}$	**$1.42x10^{-2}$**	$1.10x10^{-4}$	$3.03x10^{-2}$	$1.28x10^{-6}$	$4.94x10^{-6}$
GWP-GHG	kg CO_2 eq	$1.35x10^{-2}$	$1.40x10^{-5}$	$7.20x10^{-4}$	**$1.42x10^{-2}$**	$1.10x10^{-4}$	$3.03x10^{-2}$	$1.28x10^{-6}$	$4.94x10^{-6}$
ODP	kg CFC-11 eq	$1.31x10^{-7}$	$9.00x10^{-10}$	$5.51x10^{-9}$	**$1.38x10^{-7}$**	$1.03x10^{-8}$	$2.55x10^{-8}$	$1.22x10^{-10}$	$5.12x10^{-10}$
EP-freshwater	kg PO_4 eq	$9.40x10^{-4}$	$7.11x10^{-6}$	$3.20x10^{-4}$	**$1.27x10^{-3}$**	$5.21x10^{-5}$	$6.80x10^{-4}$	$6.42x10^{-7}$	$2.04x10^{-6}$
EP-marine	kg N eq	$3.43x10^{-3}$	$2.40x10^{-4}$	$5.00x10^{-4}$	**$4.17x10^{-3}$**	$1.36x10^{-3}$	$1.82x10^{-3}$	$1.25x10^{-5}$	$5.12x10^{-5}$
EP-terrestrial	mol N eq	$3.50x10^{-2}$	$2.56x10^{-3}$	$4.64x10^{-3}$	**$4.22x10^{-2}$**	$1.48x10^{-2}$	$1.83x10^{-2}$	$1.40x10^{-4}$	$5.50x10^{-4}$
AP	mol H^+ eq	$1.70x10^{-2}$	$5.50x10^{-4}$	$2.85x10^{-3}$	**$2.04x10^{-2}$**	$4.19x10^{-3}$	$8.15x10^{-3}$	$3.41x10^{-5}$	$1.30x10^{-4}$
POCP	kg NMVOC eq	$2.12x10^{-2}$	$7.60x10^{-4}$	$1.79x10^{-3}$	**$2.38x10^{-2}$**	$4.84x10^{-3}$	$7.29x10^{-3}$	$4.72x10^{-5}$	$1.90x10^{-4}$
ADP_E	kg Sb eq	$3.32x10^{-5}$	$1.78x10^{-7}$	$1.21x10^{-6}$	**$3.46x10^{-5}$**	$2.13x10^{-6}$	$1.13x10^{-5}$	$2.64x10^{-8}$	$6.37x10^{-8}$
ADP_F	MJ eq	115	0.932	9.05	**125**	9.70	28.6	0.115	0.439
WDP	m^3 world eq	1.33	$6.77x10^{-3}$	0.149	**1.48**	$5.51x10^{-2}$	0.674	$6.80x10^{-4}$	$1.09x10^{-2}$
TRACI 2.1									
ODP	kg CFC-11 eq	$1.46x10^{-7}$	$9.92x10^{-10}$	$1.31x10^{-8}$	**$1.60x10^{-7}$**	$1.12x10^{-8}$	$3.09x10^{-8}$	$1.32x10^{-10}$	$5.51x10^{-10}$
EP	kg N eq	$3.09x10^{-2}$	$1.00x10^{-4}$	$3.11x10^{-3}$	**$3.41x10^{-2}$**	$7.70x10^{-4}$	$9.65x10^{-3}$	$8.97x10^{-6}$	$3.26x10^{-5}$
AP	kg SO_2 eq	$1.62x10^{-2}$	$5.00x10^{-4}$	$2.45x10^{-3}$	**$1.91x10^{-2}$**	$3.69x10^{-3}$	$7.11x10^{-3}$	$3.07x10^{-5}$	$1.20x10^{-4}$
SFP	kg O_3 eq	0.204	$1.48x10^{-2}$	$2.54x10^{-2}$	**0.244**	$8.52x10^{-2}$	0.100	$7.80x10^{-4}$	$3.19x10^{-3}$
FFD	MJ Surplus	15.2	0.124	0.778	**16.1**	1.35	2.67	$1.60x10^{-2}$	$6.18x10^{-2}$
IPCC AR5									
GWP 100a	kg CO_2 eq	4.58	$7.17x10^{-2}$	0.728	**5.38**	0.696	2.03	$8.19x10^{-3}$	$2.47x10^{-2}$

Table 17. EF 3.1, TRACI 2.1, and IPCC AR5 LCIA results for the **Genuine GEOWEB® Geocell GW40V**.

LCIA Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
EF 3.1									
GWP-total	kg CO_2 eq	3.50	$5.49x10^{-2}$	0.556	**4.11**	0.533	1.78	$6.28x10^{-3}$	$1.89x10^{-2}$
GWP-fossil	kg CO_2 eq	3.49	$5.49x10^{-2}$	0.555	**4.10**	0.533	1.75	$6.27x10^{-3}$	$1.89x10^{-2}$
GWP-biogenic	kg CO_2 eq	$1.04x10^{-2}$	$1.08x10^{-5}$	$5.50x10^{-4}$	**$1.09x10^{-2}$**	$8.28x10^{-5}$	$2.97x10^{-2}$	$9.86x10^{-7}$	$3.79x10^{-6}$
GWP-GHG	kg CO_2 eq	3.50	$5.49x10^{-2}$	0.672	**4.23**	0.533	1.67	$6.28x10^{-3}$	$1.89x10^{-2}$
ODP	kg CFC-11 eq	$1.01x10^{-7}$	$6.91x10^{-10}$	$4.23x10^{-9}$	**$1.06x10^{-7}$**	$7.91x10^{-9}$	$1.96x10^{-8}$	$9.33x10^{-11}$	$3.93x10^{-10}$
EP-freshwater	kg PO_4 eq	$7.20x10^{-4}$	$5.45x10^{-6}$	$2.50x10^{-4}$	**$9.75x10^{-4}$**	$4.00x10^{-5}$	$6.30x10^{-4}$	$4.93x10^{-7}$	$1.56x10^{-6}$
EP-marine	kg N eq	$2.63x10^{-3}$	$1.80x10^{-4}$	$3.90x10^{-4}$	**$3.20x10^{-3}$**	$1.04x10^{-3}$	$1.60x10^{-3}$	$9.60x10^{-6}$	$3.93x10^{-5}$
EP-terrestrial	mol N eq	$2.69x10^{-2}$	$1.97x10^{-3}$	$3.56x10^{-3}$	**$3.24x10^{-2}$**	$1.14x10^{-2}$	$1.60x10^{-2}$	$1.00x10^{-4}$	$4.20x10^{-4}$
AP	mol H^+ eq	$1.31x10^{-2}$	$4.20x10^{-4}$	$2.19x10^{-3}$	**$1.57x10^{-2}$**	$3.21x10^{-3}$	$7.16x10^{-3}$	$2.62x10^{-5}$	$1.00x10^{-4}$
POCP	kg NMVOC eq	$1.63x10^{-2}$	$5.80x10^{-4}$	$1.37x10^{-3}$	**$1.82x10^{-2}$**	$3.71x10^{-3}$	$6.15x10^{-3}$	$3.62x10^{-5}$	$1.50x10^{-4}$
ADP_E	kg Sb eq	$2.55x10^{-5}$	$1.37x10^{-7}$	$9.26x10^{-7}$	**$2.65x10^{-5}$**	$1.63x10^{-6}$	$9.81x10^{-6}$	$2.03x10^{-8}$	$4.89x10^{-8}$
ADP_F	MJ eq	88.3	0.715	6.95	**96.0**	7.45	23.2	$8.86x10^{-2}$	0.337
WDP	m^3 world eq	1.02	$5.20x10^{-3}$	0.115	**1.14**	$4.23x10^{-2}$	0.613	$5.20x10^{-4}$	$8.37x10^{-3}$
TRACI 2.1									
ODP	kg CFC-11 eq	$1.12x10^{-7}$	$7.62x10^{-10}$	$1.01x10^{-8}$	**$1.23x10^{-7}$**	$8.57x10^{-9}$	$2.40x10^{-8}$	$1.01x10^{-10}$	$4.23x10^{-10}$
EP	kg N eq	$2.37x10^{-2}$	$7.91x10^{-5}$	$2.39x10^{-3}$	**$2.62x10^{-2}$**	$5.90x10^{-4}$	$8.25x10^{-3}$	$6.89x10^{-6}$	$2.50x10^{-5}$
AP	kg SO_2 eq	$1.24x10^{-2}$	$3.90x10^{-4}$	$1.88x10^{-3}$	**$1.47x10^{-2}$**	$2.83x10^{-3}$	$6.20x10^{-3}$	$2.36x10^{-5}$	$9.27x10^{-5}$
SFP	kg O_3 eq	0.157	$1.14x10^{-2}$	$1.95x10^{-2}$	**0.188**	$6.54x10^{-2}$	$8.72x10^{-2}$	$6.00x10^{-4}$	$2.45x10^{-3}$
FFD	MJ Surplus	11.7	$9.51x10^{-2}$	0.597	**12.4**	1.04	1.97	$1.23x10^{-2}$	$4.74x10^{-2}$
IPCC AR5									
GWP 100a	kg CO_2 eq	3.51	$5.50x10^{-2}$	0.559	**4.13**	0.534	1.79	$6.29x10^{-3}$	$1.90x10^{-2}$

Table 18. EF 3.1, TRACI 2.1, and IPCC AR5 LCIA results for the **GEOWEB® Alpha Geocell GW20V**.

LCIA Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
EF 3.1									
GWP-total	kg CO_2 eq	4.10	$6.44x10^{-2}$	0.651	**4.82**	0.625	1.78	$7.35x10^{-3}$	$2.22x10^{-2}$
GWP-fossil	kg CO_2 eq	4.09	$6.43x10^{-2}$	0.650	**4.80**	0.624	1.75	$7.35x10^{-3}$	$2.21x10^{-2}$
GWP-biogenic	kg CO_2 eq	$1.21x10^{-2}$	$1.26x10^{-5}$	$6.40x10^{-4}$	**$1.28x10^{-2}$**	$9.71x10^{-5}$	$2.97x10^{-2}$	$1.16x10^{-6}$	$4.44x10^{-6}$
GWP-GHG	kg CO_2 eq	4.10	$6.44x10^{-2}$	0.787	**4.95**	0.625	1.65	$7.35x10^{-3}$	$2.22x10^{-2}$
ODP	kg CFC-11 eq	$1.18x10^{-7}$	$8.10x10^{-10}$	$4.96x10^{-9}$	**$1.24x10^{-7}$**	$9.27x10^{-9}$	$1.96x10^{-8}$	$1.09x10^{-10}$	$4.60x10^{-10}$
EP-freshwater	kg PO_4 eq	$8.50x10^{-4}$	$6.39x10^{-6}$	$2.90x10^{-4}$	**$1.15x10^{-3}$**	$4.69x10^{-5}$	$6.30x10^{-4}$	$5.78x10^{-7}$	$1.83x10^{-6}$
EP-marine	kg N eq	$3.09x10^{-3}$	$2.10x10^{-4}$	$4.50x10^{-4}$	**$3.75x10^{-3}$**	$1.22x10^{-3}$	$1.60x10^{-3}$	$1.13x10^{-5}$	$4.61x10^{-5}$
EP-terrestrial	mol N eq	$3.15x10^{-2}$	$2.30x10^{-3}$	$4.17x10^{-3}$	**$3.80x10^{-2}$**	$1.33x10^{-2}$	$1.60x10^{-2}$	$1.20x10^{-4}$	$5.00x10^{-4}$
AP	mol H^+ eq	$1.53x10^{-2}$	$4.90x10^{-4}$	$2.57x10^{-3}$	**$1.84x10^{-2}$**	$3.77x10^{-3}$	$7.16x10^{-3}$	$3.07x10^{-5}$	$1.20x10^{-4}$
POCP	kg NMVOC eq	$1.91x10^{-2}$	$6.80x10^{-4}$	$1.61x10^{-3}$	**$2.14x10^{-2}$**	$4.35x10^{-3}$	$6.15x10^{-3}$	$4.25x10^{-5}$	$1.70x10^{-4}$
ADP_E	kg Sb eq	$2.99x10^{-5}$	$1.60x10^{-7}$	$1.08x10^{-6}$	**$3.11x10^{-5}$**	$1.91x10^{-6}$	$9.81x10^{-6}$	$2.38x10^{-8}$	$5.73x10^{-8}$
ADP_F	MJ eq	103	0.839	8.14	**112**	8.73	23.2	0.104	0.394
WDP	m^3 world eq	1.19	$6.09x10^{-3}$	0.134	**1.33**	$4.96x10^{-2}$	0.613	$6.10x10^{-4}$	$9.81x10^{-3}$
TRACI 2.1									
ODP	kg CFC-11 eq	$1.31x10^{-7}$	$8.93x10^{-10}$	$1.18x10^{-8}$	**$1.44x10^{-7}$**	$1.00x10^{-8}$	$2.40x10^{-8}$	$1.19x10^{-10}$	$4.96x10^{-10}$
EP	kg N eq	$2.78x10^{-2}$	$9.27x10^{-5}$	$2.80x10^{-3}$	**$3.07x10^{-2}$**	$6.90x10^{-4}$	$8.25x10^{-3}$	$8.07x10^{-6}$	$2.93x10^{-5}$
AP	kg SO_2 eq	$1.46x10^{-2}$	$4.50x10^{-4}$	$2.20x10^{-3}$	**$1.72x10^{-2}$**	$3.32x10^{-3}$	$6.20x10^{-3}$	$2.76x10^{-5}$	$1.10x10^{-4}$
SFP	kg O_3 eq	0.184	$1.33x10^{-2}$	$2.29x10^{-2}$	**0.220**	$7.67x10^{-2}$	$8.72x10^{-2}$	$7.00x10^{-4}$	$2.87x10^{-3}$
FFD	MJ Surplus	13.7	0.111	0.700	**14.5**	1.22	1.97	$1.44x10^{-2}$	$5.56x10^{-2}$
IPCC AR5									
GWP 100a	kg CO_2 eq	4.12	$6.45x10^{-2}$	0.655	**4.84**	0.626	1.79	$7.37x10^{-3}$	$2.22x10^{-2}$

Table 19. EF 3.1, TRACI 2.1, and IPCC AR5 LCIA results for the **GEOWEB® Alpha Geocell GW30V**.

LCIA Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
EF 3.1									
GWP-total	kg CO_2 eq	3.99	$6.27x10^{-2}$	0.634	**4.69**	0.608	2.00	$7.16x10^{-3}$	$2.16x10^{-2}$
GWP-fossil	kg CO_2 eq	3.98	$6.26x10^{-2}$	0.633	**4.68**	0.608	1.97	$7.16x10^{-3}$	$2.15x10^{-2}$
GWP-biogenic	kg CO_2 eq	$1.18x10^{-2}$	$1.23x10^{-5}$	$6.30x10^{-4}$	**$1.25x10^{-2}$**	$9.45x10^{-5}$	$3.02x10^{-2}$	$1.12x10^{-6}$	$4.32x10^{-6}$
GWP-GHG	kg CO_2 eq	3.99	$6.27x10^{-2}$	0.766	**4.82**	0.608	1.87	$7.16x10^{-3}$	$2.16x10^{-2}$
ODP	kg CFC-11 eq	$1.15x10^{-7}$	$7.89x10^{-10}$	$4.82x10^{-9}$	**$1.21x10^{-7}$**	$9.02x10^{-9}$	$2.49x10^{-8}$	$1.06x10^{-10}$	$4.48x10^{-10}$
EP-freshwater	kg PO_4 eq	$8.30x10^{-4}$	$6.22x10^{-6}$	$2.80x10^{-4}$	**$1.12x10^{-3}$**	$4.57x10^{-5}$	$6.80x10^{-4}$	$5.62x10^{-7}$	$1.78x10^{-6}$
EP-marine	kg N eq	$3.01x10^{-3}$	$2.10x10^{-4}$	$4.40x10^{-4}$	**$3.66x10^{-3}$**	$1.19x10^{-3}$	$1.81x10^{-3}$	$1.10x10^{-5}$	$4.48x10^{-5}$
EP-terrestrial	mol N eq	$3.07x10^{-2}$	$2.24x10^{-3}$	$4.06x10^{-3}$	**$3.70x10^{-2}$**	$1.30x10^{-2}$	$1.81x10^{-2}$	$1.20x10^{-4}$	$4.80x10^{-4}$
AP	mol H^+ eq	$1.49x10^{-2}$	$4.80x10^{-4}$	$2.50x10^{-3}$	**$1.79x10^{-2}$**	$3.67x10^{-3}$	$8.07x10^{-3}$	$2.99x10^{-5}$	$1.20x10^{-4}$
POCP	kg NMVOC eq	$1.86x10^{-2}$	$6.60x10^{-4}$	$1.56x10^{-3}$	**$2.08x10^{-2}$**	$4.24x10^{-3}$	$7.20x10^{-3}$	$4.14x10^{-5}$	$1.70x10^{-4}$
ADP_E	kg Sb eq	$2.91x10^{-5}$	$1.56x10^{-7}$	$1.06x10^{-6}$	**$3.03x10^{-5}$**	$1.86x10^{-6}$	$1.11x10^{-5}$	$2.31x10^{-8}$	$5.58x10^{-8}$
ADP_F	MJ eq	101	0.816	7.93	**110**	8.50	28.1	0.101	0.384
WDP	m^3 world eq	1.16	$5.93x10^{-3}$	0.131	**1.30**	$4.83x10^{-2}$	0.667	$5.90x10^{-4}$	$9.55x10^{-3}$
TRACI 2.1									
ODP	kg CFC-11 eq	$1.28x10^{-7}$	$8.69x10^{-10}$	$1.15x10^{-8}$	**$1.40x10^{-7}$**	$9.78x10^{-9}$	$3.01x10^{-8}$	$1.16x10^{-10}$	$4.83x10^{-10}$
EP	kg N eq	$2.71x10^{-2}$	$9.03x10^{-5}$	$2.73x10^{-3}$	**$2.99x10^{-2}$**	$6.70x10^{-4}$	$9.48x10^{-3}$	$7.86x10^{-6}$	$2.86x10^{-5}$
AP	kg SO_2 eq	$1.42x10^{-2}$	$4.40x10^{-4}$	$2.14x10^{-3}$	**$1.68x10^{-2}$**	$3.23x10^{-3}$	$7.03x10^{-3}$	$2.69x10^{-5}$	$1.10x10^{-4}$
SFP	kg O_3 eq	0.179	$1.30x10^{-2}$	$2.23x10^{-2}$	**0.214**	$7.47x10^{-2}$	$9.96x10^{-2}$	$6.80x10^{-4}$	$2.79x10^{-3}$
FFD	MJ Surplus	13.3	0.109	0.681	**14.1**	1.18	2.59	$1.40x10^{-2}$	$5.41x10^{-2}$
IPCC AR5									
GWP 100a	kg CO_2 eq	4.01	$6.28x10^{-2}$	0.638	**4.71**	0.609	2.01	$7.17x10^{-3}$	$2.16x10^{-2}$

Table 20. EF 3.1, TRACI 2.1, and IPCC AR5 LCIA results for the **GEOWEB® Alpha Geocell GW40V**.

LCIA Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
EF 3.1									
GWP-total	kg CO_2 eq	2.49	$3.91x10^{-2}$	0.396	**2.93**	0.379	1.92	$4.47x10^{-3}$	$1.35x10^{-2}$
GWP-fossil	kg CO_2 eq	2.48	$3.91x10^{-2}$	0.395	**2.92**	0.379	1.88	$4.46x10^{-3}$	$1.34x10^{-2}$
GWP-biogenic	kg CO_2 eq	$7.38x10^{-3}$	$7.68x10^{-6}$	$3.90x10^{-4}$	**$7.78x10^{-3}$**	$5.90x10^{-5}$	$3.00x10^{-2}$	$7.02x10^{-7}$	$2.70x10^{-6}$
GWP-GHG	kg CO_2 eq	2.49	$3.91x10^{-2}$	0.478	**3.01**	0.379	1.83	$4.47x10^{-3}$	$1.35x10^{-2}$
ODP	kg CFC-11 eq	$7.18x10^{-8}$	$4.92x10^{-10}$	$3.01x10^{-9}$	**$7.53x10^{-8}$**	$5.63x10^{-9}$	$2.28x10^{-8}$	$6.64x10^{-11}$	$2.79x10^{-10}$
EP-freshwater	kg PO_4 eq	$5.20x10^{-4}$	$3.88x10^{-6}$	$1.70x10^{-4}$	**$6.94x10^{-4}$**	$2.85x10^{-5}$	$6.60x10^{-4}$	$3.51x10^{-7}$	$1.11x10^{-6}$
EP-marine	kg N eq	$1.87x10^{-3}$	$1.30x10^{-4}$	$2.70x10^{-4}$	**$2.27x10^{-3}$**	$7.40x10^{-4}$	$1.72x10^{-3}$	$6.83x10^{-6}$	$2.80x10^{-5}$
EP-terrestrial	mol N eq	$1.91x10^{-2}$	$1.40x10^{-3}$	$2.53x10^{-3}$	**$2.31x10^{-2}$**	$8.10x10^{-3}$	$1.72x10^{-2}$	$7.41x10^{-5}$	$3.00x10^{-4}$
AP	mol H^+ eq	$9.30x10^{-3}$	$3.00x10^{-4}$	$1.56x10^{-3}$	**$1.12x10^{-2}$**	$2.29x10^{-3}$	$7.70x10^{-3}$	$1.86x10^{-5}$	$7.31x10^{-5}$
POCP	kg NMVOC eq	$1.16x10^{-2}$	$4.10x10^{-4}$	$9.80x10^{-4}$	**$1.30x10^{-2}$**	$2.64x10^{-3}$	$6.77x10^{-3}$	$2.58x10^{-5}$	$1.10x10^{-4}$
ADP_E	kg Sb eq	$1.81x10^{-5}$	$9.74x10^{-8}$	$6.59x10^{-7}$	**$1.89x10^{-5}$**	$1.16x10^{-6}$	$1.06x10^{-5}$	$1.44x10^{-8}$	$3.48x10^{-8}$
ADP_F	MJ eq	62.8	0.509	4.94	**68.3**	5.30	26.2	$6.30x10^{-2}$	0.239
WDP	m^3 world eq	0.725	$3.70x10^{-3}$	$8.16x10^{-2}$	**0.810**	$3.01x10^{-2}$	0.647	$3.70x10^{-4}$	$5.96x10^{-3}$
TRACI 2.1									
ODP	kg CFC-11 eq	$7.95x10^{-8}$	$5.42x10^{-10}$	$7.16x10^{-9}$	**$8.72x10^{-8}$**	$6.10x10^{-9}$	$2.78x10^{-8}$	$7.21x10^{-11}$	$3.01x10^{-10}$
EP	kg N eq	$1.69x10^{-2}$	$5.63x10^{-5}$	$1.70x10^{-3}$	**$1.86x10^{-2}$**	$4.20x10^{-4}$	$9.01x10^{-3}$	$4.90x10^{-6}$	$1.78x10^{-5}$
AP	kg SO_2 eq	$8.84x10^{-3}$	$2.80x10^{-4}$	$1.34x10^{-3}$	**$1.05x10^{-2}$**	$2.02x10^{-3}$	$6.70x10^{-3}$	$1.68x10^{-5}$	$6.60x10^{-5}$
SFP	kg O_3 eq	0.112	$8.10x10^{-3}$	$1.39x10^{-2}$	**0.134**	$4.66x10^{-2}$	$9.44x10^{-2}$	$4.30x10^{-4}$	$1.74x10^{-3}$
FFD	MJ Surplus	8.32	$6.77x10^{-2}$	0.425	**8.81**	0.738	2.35	$8.75x10^{-3}$	$3.37x10^{-2}$
IPCC AR5									
GWP 100a	kg CO_2 eq	2.50	$3.92x10^{-2}$	0.398	**2.94**	0.380	1.92	$4.47x10^{-3}$	$1.35x10^{-2}$

Table 21. EF 3.1, TRACI 2.1, and IPCC AR5 LCIA results for the **GEOWEB® Wall Geocell GW30V***.

LCIA Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
EF 3.1									
GWP-total	kg CO_2 eq	5.59	$7.04x10^{-2}$	0.809	**6.47**	0.776	2.04	$9.14x10^{-3}$	$2.75x10^{-2}$
GWP-fossil	kg CO_2 eq	5.59	$7.03x10^{-2}$	0.808	**6.47**	0.776	2.01	$9.13x10^{-3}$	$2.75x10^{-2}$
GWP-biogenic	kg CO_2 eq	$2.84x10^{-3}$	$1.46x10^{-5}$	$8.00x10^{-4}$	**$3.65x10^{-3}$**	$1.20x10^{-4}$	$2.98x10^{-2}$	$1.44x10^{-6}$	$5.52x10^{-6}$
GWP-GHG	kg CO_2 eq	5.59	$7.04x10^{-2}$	0.978	**6.64**	0.776	1.87	$9.14x10^{-3}$	$2.75x10^{-2}$
ODP	kg CFC-11 eq	$2.44x10^{-7}$	$8.42x10^{-10}$	$6.16x10^{-9}$	**$2.51x10^{-7}$**	$1.15x10^{-8}$	$2.97x10^{-8}$	$1.36x10^{-10}$	$5.72x10^{-10}$
EP-freshwater	kg PO_4 eq	$1.15x10^{-3}$	$7.39x10^{-6}$	$3.60x10^{-4}$	**$1.52x10^{-3}$**	$5.83x10^{-5}$	$6.90x10^{-4}$	$7.18x10^{-7}$	$2.28x10^{-6}$
EP-marine	kg N eq	$4.43x10^{-3}$	$2.70x10^{-4}$	$5.60x10^{-4}$	**$5.26x10^{-3}$**	$1.52x10^{-3}$	$1.81x10^{-3}$	$1.40x10^{-5}$	$5.72x10^{-5}$
EP-terrestrial	mol N eq	$4.26x10^{-2}$	$2.89x10^{-3}$	$5.18x10^{-3}$	**$5.06x10^{-2}$**	$1.66x10^{-2}$	$1.80x10^{-2}$	$1.50x10^{-4}$	$6.20x10^{-4}$
AP	mol H^+ eq	$2.07x10^{-2}$	$6.10x10^{-4}$	$3.19x10^{-3}$	**$2.45x10^{-2}$**	$4.68x10^{-3}$	$8.14x10^{-3}$	$3.82x10^{-5}$	$1.50x10^{-4}$
POCP	kg NMVOC eq	$2.61x10^{-2}$	$8.40x10^{-4}$	$2.00x10^{-3}$	**$2.90x10^{-2}$**	$5.41x10^{-3}$	$7.31x10^{-3}$	$5.28x10^{-5}$	$2.20x10^{-4}$
ADP_E	kg Sb eq	$4.05x10^{-5}$	$1.61x10^{-7}$	$1.35x10^{-6}$	**$4.20x10^{-5}$**	$2.38x10^{-6}$	$1.15x10^{-5}$	$2.95x10^{-8}$	$7.12x10^{-8}$
ADP_F	MJ eq	143	0.896	10.1	**154**	10.8	29.4	0.129	0.490
WDP	m^3 world eq	1.60	$6.89x10^{-3}$	0.167	**1.78**	$6.16x10^{-2}$	0.684	$7.50x10^{-4}$	$1.22x10^{-2}$
TRACI 2.1									
ODP	kg CFC-11 eq	$2.63x10^{-7}$	$9.33x10^{-10}$	$1.47x10^{-8}$	**$2.79x10^{-7}$**	$1.25x10^{-8}$	$3.52x10^{-8}$	$1.47x10^{-10}$	$6.16x10^{-10}$
EP	kg N eq	$3.86x10^{-2}$	$1.10x10^{-4}$	$3.48x10^{-3}$	**$4.22x10^{-2}$**	$8.60x10^{-4}$	$9.94x10^{-3}$	$1.00x10^{-5}$	$3.65x10^{-5}$
AP	kg SO_2 eq	$1.97x10^{-2}$	$5.60x10^{-4}$	$2.73x10^{-3}$	**$2.30x10^{-2}$**	$4.12x10^{-3}$	$7.12x10^{-3}$	$3.43x10^{-5}$	$1.40x10^{-4}$
SFP	kg O_3 eq	0.249	$1.67x10^{-2}$	$2.84x10^{-2}$	**0.294**	$9.53x10^{-2}$	$9.89x10^{-2}$	$8.70x10^{-4}$	$3.56x10^{-3}$
FFD	MJ Surplus	19.0	0.118	0.869	**20.0**	1.51	2.77	$1.79x10^{-2}$	$6.90x10^{-2}$
IPCC AR5									
GWP 100a	kg CO_2 eq	5.62	$7.05x10^{-2}$	0.814	**6.50**	0.778	2.05	$9.16x10^{-3}$	$2.76x10^{-2}$

**GEOWEB® Geocell Wall results presented for the green color. Results for the tan color are within +/-1% for all indicators.*

Table 22. EF 3.1, TRACI 2.1, and IPCC AR5 LCIA results for the **GEOWEB® Wall Geocell GW40V***.

LCIA Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
EF 3.1									
GWP-total	kg CO_2 eq	3.74	$4.71x10^{-2}$	0.542	**4.33**	0.520	1.96	$6.12x10^{-3}$	$1.84x10^{-2}$
GWP-fossil	kg CO_2 eq	3.74	$4.71x10^{-2}$	0.541	**4.33**	0.519	1.93	$6.11x10^{-3}$	$1.84x10^{-2}$
GWP-biogenic	kg CO_2 eq	$1.90x10^{-3}$	$9.75x10^{-6}$	$5.40x10^{-4}$	**$2.45x10^{-3}$**	$8.08x10^{-5}$	$2.98x10^{-2}$	$9.61x10^{-7}$	$3.69x10^{-6}$
GWP-GHG	kg CO_2 eq	3.74	$4.71x10^{-2}$	0.655	**4.45**	0.520	1.84	$6.12x10^{-3}$	$1.84x10^{-2}$
ODP	kg CFC-11 eq	$1.63x10^{-7}$	$5.63x10^{-10}$	$4.12x10^{-9}$	**$1.68x10^{-7}$**	$7.71x10^{-9}$	$2.63x10^{-8}$	$9.10x10^{-11}$	$3.83x10^{-10}$
EP-freshwater	kg PO_4 eq	$7.70x10^{-4}$	$4.95x10^{-6}$	$2.40x10^{-4}$	**$1.01x10^{-3}$**	$3.90x10^{-5}$	$6.70x10^{-4}$	$4.80x10^{-7}$	$1.52x10^{-6}$
EP-marine	kg N eq	$2.96x10^{-3}$	$1.80x10^{-4}$	$3.80x10^{-4}$	**$3.52x10^{-3}$**	$1.02x10^{-3}$	$1.74x10^{-3}$	$9.36x10^{-6}$	$3.83x10^{-5}$
EP-terrestrial	mol N eq	$2.85x10^{-2}$	$1.93x10^{-3}$	$3.47x10^{-3}$	**$3.39x10^{-2}$**	$1.11x10^{-2}$	$1.73x10^{-2}$	$1.00x10^{-4}$	$4.10x10^{-4}$
AP	mol H^+ eq	$1.38x10^{-2}$	$4.10x10^{-4}$	$2.14x10^{-3}$	**$1.64x10^{-2}$**	$3.13x10^{-3}$	$7.82x10^{-3}$	$2.55x10^{-5}$	$1.00x10^{-4}$
POCP	kg NMVOC eq	$1.75x10^{-2}$	$5.60x10^{-4}$	$1.34x10^{-3}$	**$1.94x10^{-2}$**	$3.62x10^{-3}$	$6.92x10^{-3}$	$3.53x10^{-5}$	$1.40x10^{-4}$
ADP_E	kg Sb eq	$2.71x10^{-5}$	$1.08x10^{-7}$	$9.02x10^{-7}$	**$2.81x10^{-5}$**	$1.59x10^{-6}$	$1.09x10^{-5}$	$1.98x10^{-8}$	$4.76x10^{-8}$
ADP_F	MJ eq	95.6	0.600	6.77	**103**	7.26	27.4	$8.63x10^{-2}$	0.328
WDP	m^3 world eq	1.07	$4.61x10^{-3}$	0.112	**1.19**	$4.12x10^{-2}$	0.660	$5.10x10^{-4}$	$8.16x10^{-3}$
TRACI 2.1									
ODP	kg CFC-11 eq	$1.76x10^{-7}$	$6.24x10^{-10}$	$9.81x10^{-9}$	**$1.86x10^{-7}$**	$8.35x10^{-9}$	$3.15x10^{-8}$	$9.87x10^{-11}$	$4.12x10^{-10}$
EP	kg N eq	$2.58x10^{-2}$	$7.22x10^{-5}$	$2.33x10^{-3}$	**$2.82x10^{-2}$**	$5.80x10^{-4}$	$9.38x10^{-3}$	$6.71x10^{-6}$	$2.44x10^{-5}$
AP	kg SO_2 eq	$1.32x10^{-2}$	$3.70x10^{-4}$	$1.83x10^{-3}$	**$1.54x10^{-2}$**	$2.76x10^{-3}$	$6.81x10^{-3}$	$2.30x10^{-5}$	$9.04x10^{-5}$
SFP	kg O_3 eq	0.167	$1.12x10^{-2}$	$1.90x10^{-2}$	**0.197**	$6.38x10^{-2}$	$9.51x10^{-2}$	$5.80x10^{-4}$	$2.38x10^{-3}$
FFD	MJ Surplus	12.7	$7.87x10^{-2}$	0.582	**13.4**	1.01	2.50	$1.20x10^{-2}$	$4.62x10^{-2}$
IPCC AR5									
GWP 100a	kg CO_2 eq	3.76	$4.72x10^{-2}$	0.545	**4.35**	0.521	1.96	$6.13x10^{-3}$	$1.85x10^{-2}$

**GEOWEB® Geocell Wall results presented for the green color. Results for the tan color are within +/-1% for all indicators.*

Table 23. Resource use indicator results for the **Genuine GEOWEB® Geocell GW20V.**

Resource Use Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
PERE	MJ, LHV	3.84	$2.87x10^{-2}$	4.74	**8.61**	$1.80x10^{-3}$	$1.63x10^{-2}$	$2.21x10^{-5}$	$3.60x10^{-4}$
PERM	MJ, LHV	0.00	0.00	2.14	**2.14**	0.00	0.00	0.00	0.00
PERT	MJ, LHV	3.84	$2.87x10^{-2}$	6.87	**10.7**	$1.80x10^{-3}$	$1.63x10^{-2}$	$2.21x10^{-5}$	$3.60x10^{-4}$
PENRE	MJ, LHV	159	1.30	12.5	**173**	13.5	30.5	0.161	0.611
PENRM	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
PENRT	MJ, LHV	159	1.30	12.5	**173**	13.5	30.5	0.161	0.611
SM	kg	0.201	0.00	0.00	**0.201**	0.00	0.00	0.00	0.00
RSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
NRSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
FW	m^3	$4.33x10^{-2}$	$2.20x10^{-4}$	$4.88x10^{-3}$	**$4.84x10^{-2}$**	$1.80x10^{-3}$	$1.63x10^{-2}$	$2.21x10^{-5}$	$3.60x10^{-4}$

Table 24. Resource use indicator results for the **Genuine GEOWEB® Geocell GW30V.**

Resource Use Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
PERE	MJ, LHV	2.74	$2.04x10^{-2}$	3.37	**6.13**	$1.28x10^{-3}$	$1.57x10^{-2}$	$1.57x10^{-5}$	$2.50x10^{-4}$
PERM	MJ, LHV	0.00	0.00	1.52	**1.52**	0.00	0.00	0.00	0.00
PERT	MJ, LHV	2.74	$2.04x10^{-2}$	4.89	**7.65**	$1.28x10^{-3}$	$1.57x10^{-2}$	$1.57x10^{-5}$	$2.50x10^{-4}$
PENRE	MJ, LHV	113	0.926	8.91	**123**	9.64	28.3	0.115	0.436
PENRM	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
PENRT	MJ, LHV	113	0.926	8.91	**123**	9.64	28.3	0.115	0.436
SM	kg	0.143	0.00	0.00	**0.143**	0.00	0.00	0.00	0.00
RSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
NRSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
FW	m^3	$3.09x10^{-2}$	$1.60x10^{-4}$	$3.48x10^{-3}$	**$3.45x10^{-2}$**	$1.28x10^{-3}$	$1.57x10^{-2}$	$1.57x10^{-5}$	$2.50x10^{-4}$

Table 25. Resource use indicator results for the **Genuine GEOWEB® Geocell GW40V.**

Resource Use Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
PERE	MJ, LHV	2.10	$1.57x10^{-2}$	2.59	**4.71**	$9.80x10^{-4}$	$1.43x10^{-2}$	$1.21x10^{-5}$	$1.90x10^{-4}$
PERM	MJ, LHV	0.00	0.00	1.17	**1.17**	0.00	0.00	0.00	0.00
PERT	MJ, LHV	2.10	$1.57x10^{-2}$	3.76	**5.88**	$9.80x10^{-4}$	$1.43x10^{-2}$	$1.21x10^{-5}$	$1.90x10^{-4}$
PENRE	MJ, LHV	86.9	0.711	6.84	**94.5**	7.40	23.0	$8.80x10^{-2}$	0.334
PENRM	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
PENRT	MJ, LHV	86.9	0.711	6.84	**94.5**	7.40	23.0	$8.80x10^{-2}$	0.334
SM	kg	0.110	0.00	0.00	**0.110**	0.00	0.00	0.00	0.00
RSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
NRSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
FW	m^3	$2.37x10^{-2}$	$1.20x10^{-4}$	$2.67x10^{-3}$	**$2.65x10^{-2}$**	$9.80x10^{-4}$	$1.43x10^{-2}$	$1.21x10^{-5}$	$1.90x10^{-4}$

Table 26. Resource use indicator results for the **GEOWEB® Alpha Geocell GW20V.**

Resource Use Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
PERE	MJ, LHV	2.46	$1.84x10^{-2}$	3.03	**5.51**	$1.15x10^{-3}$	$1.43x10^{-2}$	$1.41x10^{-5}$	$2.30x10^{-4}$
PERM	MJ, LHV	0.00	0.00	1.37	**1.37**	0.00	0.00	0.00	0.00
PERT	MJ, LHV	2.46	$1.84x10^{-2}$	4.40	**6.88**	$1.15x10^{-3}$	$1.43x10^{-2}$	$1.41x10^{-5}$	$2.30x10^{-4}$
PENRE	MJ, LHV	102	0.833	8.02	**111**	8.67	23.0	0.103	0.392
PENRM	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
PENRT	MJ, LHV	102	0.833	8.02	**111**	8.67	23.0	0.103	0.392
SM	kg	0.129	0.00	0.00	**0.129**	0.00	0.00	0.00	0.00
RSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
NRSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
FW	m^3	$2.78x10^{-2}$	$1.40x10^{-4}$	$3.13x10^{-3}$	**$3.11x10^{-2}$**	$1.15x10^{-3}$	$1.43x10^{-2}$	$1.41x10^{-5}$	$2.30x10^{-4}$

Table 27. Resource use indicator results for the **GEOWEB® Alpha Geocell GW30V.**

Resource Use Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
PERE	MJ, LHV	2.40	$1.79x10^{-2}$	2.95	**5.37**	$1.12x10^{-3}$	$1.55x10^{-2}$	$1.38x10^{-5}$	$2.20x10^{-4}$
PERM	MJ, LHV	0.00	0.00	1.33	**1.33**	0.00	0.00	0.00	0.00
PERT	MJ, LHV	2.40	$1.79x10^{-2}$	4.29	**6.70**	$1.12x10^{-3}$	$1.55x10^{-2}$	$1.38x10^{-5}$	$2.20x10^{-4}$
PENRE	MJ, LHV	99.2	0.811	7.81	**108**	8.44	27.8	0.100	0.382
PENRM	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
PENRT	MJ, LHV	99.2	0.811	7.81	**108**	8.44	27.8	0.100	0.382
SM	kg	0.125	0.00	0.00	**0.125**	0.00	0.00	0.00	0.00
RSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
NRSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
FW	m^3	$2.71x10^{-2}$	$1.40x10^{-4}$	$3.05x10^{-3}$	**$3.02x10^{-2}$**	$1.12x10^{-3}$	$1.55x10^{-2}$	$1.38x10^{-5}$	$2.20x10^{-4}$

Table 28. Resource use indicator results for the **GEOWEB® Alpha Geocell GW40V.**

Resource Use Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
PERE	MJ, LHV	1.49	$1.12x10^{-2}$	1.84	**3.34**	$7.00x10^{-4}$	$1.51x10^{-2}$	$8.59x10^{-6}$	$1.40x10^{-4}$
PERM	MJ, LHV	0.00	0.00	0.832	**0.832**	0.00	0.00	0.00	0.00
PERT	MJ, LHV	1.49	$1.12x10^{-2}$	2.67	**4.18**	$7.00x10^{-4}$	$1.51x10^{-2}$	$8.59x10^{-6}$	$1.40x10^{-4}$
PENRE	MJ, LHV	61.9	0.506	4.87	**67.2**	5.27	25.9	$6.26x10^{-2}$	0.238
PENRM	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
PENRT	MJ, LHV	61.9	0.506	4.87	**67.2**	5.27	25.9	$6.26x10^{-2}$	0.238
SM	kg	$7.81x10^{-2}$	0.00	0.00	**$7.81x10^{-2}$**	0.00	0.00	0.00	0.00
RSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
NRSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
FW	m^3	$1.69x10^{-2}$	$8.61x10^{-5}$	$1.90x10^{-3}$	**$1.89x10^{-2}$**	$7.00x10^{-4}$	$1.51x10^{-2}$	$8.59x10^{-6}$	$1.40x10^{-4}$

Table 29. Resource use indicator results for the **GEOWEB® Wall Geocell GW30V*.**

Resource Use Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
PERE	MJ, LHV	3.34	$2.20x10^{-2}$	3.77	**7.13**	$1.43x10^{-3}$	$1.59x10^{-2}$	$1.76x10^{-5}$	$2.80x10^{-4}$
PERM	MJ, LHV	0.00	0.00	1.70	**1.70**	0.00	0.00	0.00	0.00
PERT	MJ, LHV	3.34	$2.20x10^{-2}$	5.47	**8.84**	$1.43x10^{-3}$	$1.59x10^{-2}$	$1.76x10^{-5}$	$2.80x10^{-4}$
PENRE	MJ, LHV	141	0.890	9.96	**152**	10.8	29.1	0.128	0.487
PENRM	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
PENRT	MJ, LHV	141	0.890	9.96	**152**	10.8	29.1	0.128	0.487
SM	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
RSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
NRSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
FW	m^3	$3.73x10^{-2}$	$1.60x10^{-4}$	$3.89x10^{-3}$	**$4.13x10^{-2}$**	$1.43x10^{-3}$	$1.59x10^{-2}$	$1.76x10^{-5}$	$2.80x10^{-4}$

**GEOWEB® Geocell Wall results presented for the green color. Results for the tan color are within +/-1% for all indicators.*

Table 30. Resource use indicator results for the **GEOWEB® Wall Geocell GW40V*.**

Resource Use Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
PERE	MJ, LHV	2.24	$1.47x10^{-2}$	2.52	**4.77**	$9.60x10^{-4}$	$1.54x10^{-2}$	$1.18x10^{-5}$	$1.90x10^{-4}$
PERM	MJ, LHV	0.00	0.00	1.14	**1.14**	0.00	0.00	0.00	0.00
PERT	MJ, LHV	2.24	$1.47x10^{-2}$	3.66	**5.91**	$9.60x10^{-4}$	$1.54x10^{-2}$	$1.18x10^{-5}$	$1.90x10^{-4}$
PENRE	MJ, LHV	94.2	0.596	6.67	**101**	7.21	27.1	$8.57x10^{-2}$	0.326
PENRM	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
PENRT	MJ, LHV	94.2	0.596	6.67	**101**	7.21	27.1	$8.57x10^{-2}$	0.326
SM	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
RSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
NRSF	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
FW	m^3	$2.50x10^{-2}$	$1.10x10^{-4}$	$2.60x10^{-3}$	**$2.77x10^{-2}$**	$9.60x10^{-4}$	$1.54x10^{-2}$	$1.18x10^{-5}$	$1.90x10^{-4}$

**GEOWEB® Geocell Wall results presented for the green color. Results for the tan color are within +/-1% for all indicators.*

Table 31. Waste and Output indicator results for the **Genuine GEOWEB® Geocell GW20V.**

Waste/Output Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
HWD	kg	0.00	0.00	$1.74x10^{-5}$	**$1.74x10^{-5}$**	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.147	**0.147**	0.00	$8.02x10^{-2}$	0.00	1.93
RWD	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EEE	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EET	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00

Table 32. Waste and Output indicator results for the **Genuine GEOWEB® Geocell GW30V.**

Waste/Output Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
HWD	kg	0.00	0.00	$1.24x10^{-5}$	**$1.24x10^{-5}$**	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.105	**0.105**	0.00	$5.71x10^{-2}$	0.00	1.37
RWD	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EEE	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EET	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00

Table 33. Waste and Output indicator results for the **Genuine GEOWEB® Geocell GW40V.**

Waste/Output Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
HWD	kg	0.00	0.00	$9.52x10^{-6}$	**$9.52x10^{-6}$**	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	$8.04x10^{-2}$	**$8.04x10^{-2}$**	0.00	$4.39x10^{-2}$	0.00	1.05
RWD	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EEE	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EET	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00

Table 34. Waste and Output indicator results for the **GEOWEB® Alpha Geocell GW20V.**

Waste/Output Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
HWD	kg	0.00	0.00	$1.12x10^{-5}$	**$1.12x10^{-5}$**	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	$9.43x10^{-2}$	**$9.43x10^{-2}$**	0.00	$5.14x10^{-2}$	0.00	1.23
RWD	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EEE	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EET	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00

Table 35. Waste and Output indicator results for the **GEOWEB® Alpha Geocell GW30V.**

Waste/Output Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
HWD	kg	0.00	0.00	$1.09x10^{-5}$	**$1.09x10^{-5}$**	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	$9.18x10^{-2}$	**$9.18x10^{-2}$**	0.00	$5.01x10^{-2}$	0.00	1.20
RWD	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EEE	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EET	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00

Table 36. Waste and Output indicator results for the **GEOWEB® Alpha Geocell GW40V.**

Waste/Output Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
HWD	kg	0.00	0.00	$6.77x10^{-6}$	**$6.77x10^{-6}$**	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	$5.72x10^{-2}$	**$5.72x10^{-2}$**	0.00	$3.12x10^{-2}$	0.00	0.749
RWD	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EEE	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EET	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00

Table 37. Waste and Output indicator results for the **GEOWEB® Wall Geocell GW30V*.**

Waste/Output Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
HWD	kg	0.00	0.00	$1.39x10^{-5}$	**$1.39x10^{-5}$**	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	0.117	**0.117**	0.00	$6.39x10^{-2}$	0.00	1.53
RWD	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EEE	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EET	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00

**Waste/Output results for the green and tan GEOWEB® Geocell Wall are the same.*

Table 38. Waste and Output indicator results for the **GEOWEB® Wall Geocell GW40V*.**

Waste/Output Indicator	Unit	Life Cycle Module							
		A1	A2	A3	A1-A3 Total	A4	A5	C2	C4
HWD	kg	0.00	0.00	$9.27x10^{-6}$	**$9.27x10^{-6}$**	0.00	0.00	0.00	0.00
NHWD	kg	0.00	0.00	$7.84x10^{-2}$	**$7.84x10^{-2}$**	0.00	$4.28x10^{-2}$	0.00	1.53
RWD	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
CRU	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EEE	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00
EET	MJ, LHV	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00

*Waste/Output results for the green and tan GEOWEB® Geocell Wall are the same

6. LCA: Interpretation

Contribution analysis of the LCIA results indicates that, with few exceptions, the raw material extraction and processing phase (A1), followed by the installation phase (A5) are responsible for the largest share of impact compared to all other life cycle stages The manufacturing (A3) and distribution (A4) stages represent a smaller but non-negligible share of impact, typically ranging from ~2% to ~20% of total impact depending on the product and indicator in question. Across all GEOWEB® Geocell products, the raw material transport (A2), end-of-life waste transport (C2), and end-of-life disposal (C4) phases are responsible for comparative small shares of total impact. A contribution analysis of the Genuine GW30V GEOWEB® Geocell product is illustrated below in Figure 3. This product was chosen to present in further detail as (1) its reference flow is central among those examined, making it broadly representative of the other Geocell products included in this study, and (2) it was the primary version produced during the study period.

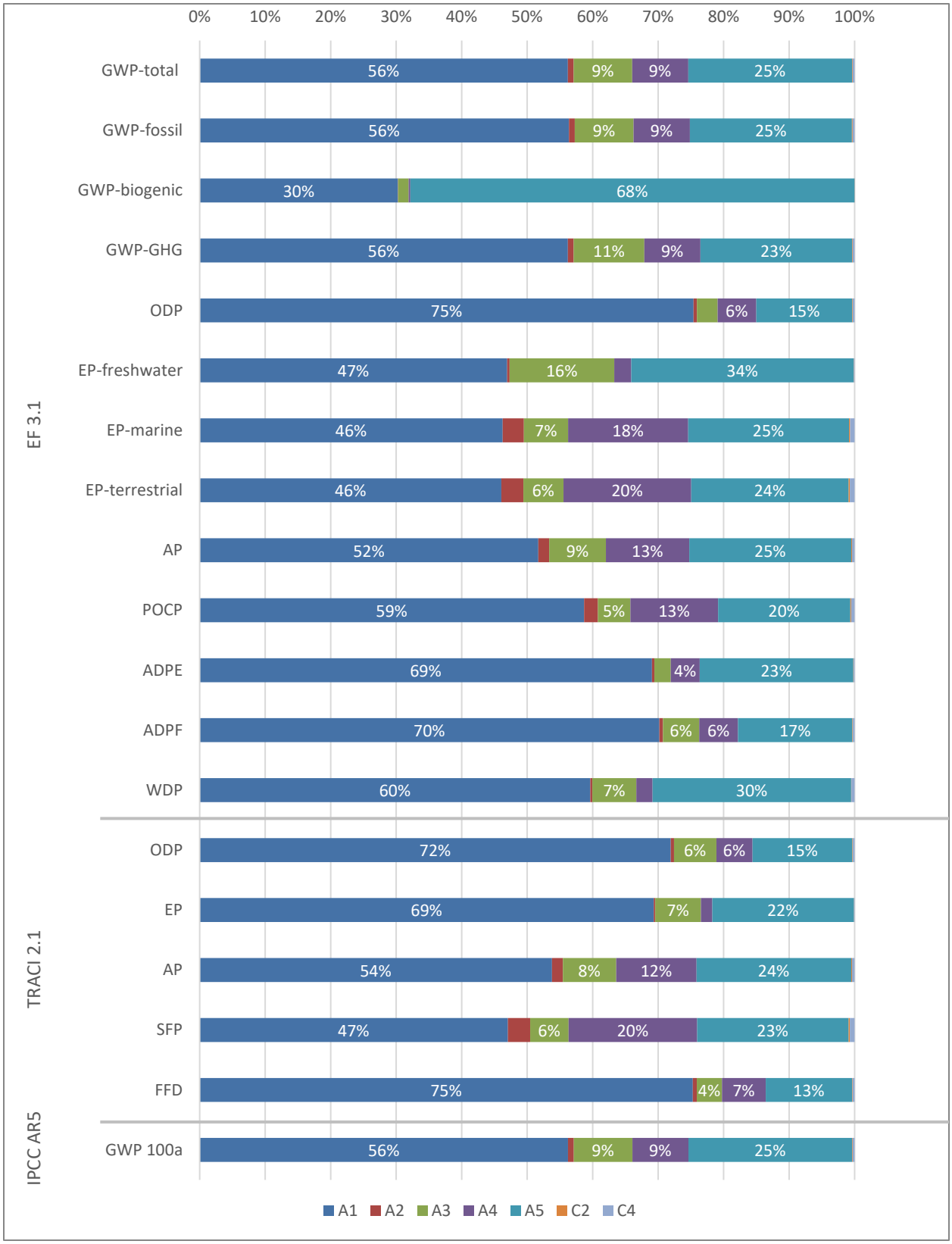

Figure 3. Contribution analysis for the **Genuine GEOWEB® Geocell GW30V**.

7. Additional Environmental Information

7.1 ENVIRONMENTAL ACTIVITIES AND CERTIFICATIONS

LEED (Leadership in Energy and Environmental Design) is the world's most widely used green building rating system. LEED certification provides a framework for healthy, highly efficient, and cost-saving green buildings, which offer environmental, social and governance benefits. Project developers earn points toward their LEED certification at during the design and construction of their buildings. Depending on project type, GEOWEB® Geocell contribute points toward LEED certification in the following areas (1 credit each):

- Stabilization of steepened slopes and stormwater containment facilities.
- Reduce stormwater runoff using vegetated retaining walls instead of concrete/module block walls.
- Open-grid pervious surfaces for parking or access roads with turf or aggregate infill.
- Retaining walls to minimize the construction footprint and site disruption.
- Vegetated retaining walls.
- Vegetated roof gardens and vegetated swales to minimize impervious surfaces.
- Vegetated roof gardens to minimize heat absorption and increase energy efficiency.
- Use of materials manufactured within a 500-mile radius.

7.2 FURTHER INFORMATION

Further information can be found on the manufacturer's website at www.prestogeo.com

8. References

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- "WARM Model Transportation Research – Draft." Memorandum from ICF Consulting to United States Environmental Protection Agency. September 7, 2004. http://epa.gov/epawaste/conserve/tools/warm/SWMGHGreport.html#background.

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