

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 3251-CWS2YW
Issue Date: December 13, 2023

Terra Nova Environmental Services Inc.
3512 Mainway Drive
Burlington, Ontario
L7M 3A8

Site Location: Mobile Facility

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

- one (1) in-situ remediation process to treat soil/groundwater contaminated with petroleum hydrocarbons, chlorinated solvents, herbicides/pesticides, per- and polyfluoroalkyl substances and chlorinated biphenyls by the injection of non-hazardous, non-pathogenic Bioaugmentation Culture(s), Biostimulation Compound(s) and/or Chemical Reagent(s) into the contaminated soil/groundwater via the following delivery methods:
 - temporary injection points;
 - permanent injection points;
 - permeable barrier walls;
 - injection gallery;
 - in-situ mixing;

all in accordance with,

1. The Environmental Compliance Approval Application submitted by Terra Nova Environmental Services Inc., dated March 22, 2023, and signed by Jessie Marini; and the supporting information including the Safety Data Sheets;
2. The Environmental Compliance Approval Application submitted by Terra Nova Environmental Services Inc., dated November 1, 2018, and signed by Jessie Marini; and the supporting information including the Safety Data Sheets;

3. The Environmental Compliance Approval Application submitted by Terra Nova Environmental Services Inc., dated February 14, 2017, and signed by Jessie Marini; and the supporting information including the Safety Data Sheets;
4. The Environmental Compliance Approval Application submitted by Terra Nova Environmental Services Inc., dated November 20, 2015, and signed by Jessie Marini; and the supporting information including the In-situ Operations and Maintenance Manual and Safety Data Sheets; and an email dated August 29, 2016 from Jessie Marini of Terra Nova Environmental Services Inc.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Approval" means this Environmental Compliance Approval, including the application and supporting documentation listed above;
2. "Bioaugmentation Compound (s)" means any non-hazardous, non-pathogenic bacterial culture used in the Process as listed in Schedule "B" of this Approval, and as described in this Approval including the safety data sheets (SDS) submitted with the application, to the extent approved by this Approval;
3. "Biostimulation Compound (s)" means any chemical amendment, nutrient amendment or pH adjustment chemical used in the Process to enhance bioremediation, as listed in Schedule "B" of this Approval, and as described in this Approval including the safety data sheets (SDS) submitted with the application, to the extent approved by this Approval;
4. "Chemical Reagent (s)" means any oxidants, reductants, catalysts, biopolymer slurry, soil modifying compounds, chelating agents, caustics, metal immobilization compounds, sorption compounds, surfactants and tracers used in the Process as listed in Schedule "B" of this Approval, and as described in this Approval including the safety data sheets (SDS) submitted with the application, to the extent approved by this Approval;
5. "Company" means Terra Nova Environmental Services Inc., which is responsible for the operation of the Process and includes any successors and assigns;
6. "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Facility is geographically being operated;
7. "EPA" means the Environmental Protection Act, R.S.O. 1990, c. E.19;
8. "Equipment" means the equipment associated with the Process as described in this Approval;
9. "Facility" means the entire operation located on the property where the Equipment is located;
10. "Monitoring Plan" means a written monitoring plan, developed for the Site, and prepared as a single document by a Qualified Person as described in Condition 4;
11. "Ministry" means the Ministry of the Government of Ontario responsible for the EPA and includes

all officials, employees or other persons acting on its behalf;

12. "Operations and Maintenance Manual" means the written operations and maintenance manual developed for the Company as described in Condition 3;
13. "Process" means the in-situ remediation processes as described in the Company's application, this Approval, and in the supporting documentation submitted with the application, to the extent approved by this Approval;
14. "Publication NPC-300" means the Ministry Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning, Publication NPC-300", August 2013, as amended;
15. "Qualified Person" means a person identified as a Professional Engineer or Professional Geoscientist who meets the qualifications set out in subsection 5 (2) of Ontario Regulation 153/04 (Records of Site Condition – Part XV.1 of the Act), as amended, made under the EPA;
16. "Remedial Amendment(s)" means any Bioaugmentation Culture, Biostimulation Compound, or Chemical Reagent used in the Process with the intent to reduce the soil and/or groundwater concentrations of the Target Compounds at the Site;
17. "Remedial Work Plan" means a plan, developed for the Site, and prepared as a single document by a Qualified Person as described in Condition 2;
18. "Schedule" means the schedules attached to, and forming part of, this Approval, namely:
 - Schedule "A" - Form 1: Soil/Groundwater Remediation Process Notice of Intended Location;
 - Schedule "B" - Remedial Amendments;
19. "Site" means any property or properties described in a completed Schedule "A" at which the Process is operated;
20. "Soil, Groundwater and Sediment Standards" means the Ministry publication "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act" dated April 15, 2011, as may be amended;
21. "SPCP" means the written Spill Prevention and Contingency Plan developed by the Company as described in Condition 5;
22. "Supporting Documents" means the Ministry publications that accompany the Soil, Groundwater and Sediment Standards including "Guide for Completing Phase II Environmental Site Assessment under Ontario Regulation 153/04" dated June 2011, as amended; and
23. "Target Compound(s)" means the petroleum hydrocarbons, chlorinated solvents, polycyclic aromatic

hydrocarbons, metals, pesticides, per- and polyfluoroalkyl substances, or other compounds listed in the Soil, Groundwater and Sediment Standards that the Process is designed to treat as part of the Remedial Work Plan.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. PERFORMANCE REQUIREMENTS

1. The Company shall, at all times, design and operate the Process with the intent to reduce the soil/groundwater concentrations of the Target Compounds to comply with the appropriate criteria provided in the Soil, Groundwater and Sediment Standards, appropriate worker health and safety criteria, or Site specific criteria developed in accordance with the Supporting Documents.
2. The Company shall, ensure that the noise emissions from the Process at the Site comply with the limits set out in Ministry Publication NPC-300.
3. The Company shall, before commencement of operation of the Process at the Site, prepare the following:
 - a. a Remedial Work Plan;
 - b. a Monitoring Plan; and
 - c. an Operations and Maintenance Manual.
4. The Company shall, at all times, unless otherwise agreed in writing by the District Manager, design and operate the Process so that no Remedial Amendments, Target Compounds, or their decomposition compounds, are permitted to migrate off-Site in groundwater or soil vapour, as a result of the Process, at concentrations greater than the applicable criteria provided in the Soil, Groundwater and Sediment Standards, appropriate worker health and safety criteria or Site specific criteria.

2. REMEDIAL WORK PLAN

1. The Company shall, before commencement of operation of the Process at the Site, prepare a Remedial Work Plan designed with specific application for the Site that specifies, as a minimum:
 - a. the remedial objectives established for the Site;
 - b. an overview of the work to be undertaken by the Company;

- c. a description of the Site;
- d. land uses at the Site and in the immediate surrounding vicinity;
- e. locations of on-Site and off-Site receptors and potential migration pathways;
- f. a Site plan overview of the extent of contamination at the Site;
- g. locations of the proposed Equipment and points of application of the Process;
- h. overview of the Site geology and hydrogeology, and expected chemical reactions resulting from the operation of the Process; and
- i. alternative remedial measures to be undertaken in the event that the Process is not successful to meet the Remedial Work Plan objectives.

3. OPERATIONS AND MAINTENANCE MANUAL

- 1. The Company shall, before commencement of operation of the Process at the Site, prepare and implement a Site specific Operations and Maintenance Manual for the Equipment and Process that specifies, as a minimum:
 - a. major components of the Equipment to be used in the Process;
 - b. frequency of inspections and scheduled maintenance for the Equipment;
 - c. the SPCP procedures to prevent spills relating to the Process;
 - d. procedures to prevent and/or minimize odourous and noise emissions;
 - e. procedures to prevent and/or minimize the build-up of hazardous decomposition compounds with respect to appropriate worker health and safety criteria for the Site;
 - f. procedures to prevent any upset conditions and contingency measures to address any off-Site migration;
 - g. procedures to record the amount of Remedial Amendments each time these materials are utilized by the Process;
 - h. procedures to record and respond to environmental complaints; and
 - i. steps to be carried out for the discontinuation of the Process.

4. MONITORING PLAN

1. The Company shall, before commencement of operation of the Process at the Site, design and implement a Monitoring Plan, in accordance with the Supporting Documents, for the soil/groundwater at the Site to document that the Performance Requirements outlined in Condition 1 are not exceeded and that the Remedial Work Plan objectives are achieved. The Monitoring Plan shall specify, as a minimum:
 - a. the Monitoring Plan objectives;
 - b. a list of analytical and/or indicator parameters;
 - c. a Site-specific evaluation of the potential impact of the Process to assess whether groundwater and/or surface water monitoring is required;
 - d. a soil vapour monitoring program, when applicable, to assess the levels of hazardous decomposition compounds at the Site with respect to appropriate worker health and safety criteria for the Site;
 - e. identification of potential migration pathways on-Site and off-Site;
 - f. procedures for monitoring any potential off-Site migration;
 - g. approximate monitoring locations and frequency of the monitoring, prior to, during and after the Process; and
 - h. sampling methodology and QA/QC procedures, when applicable.

5. SPILL PREVENTION AND CONTINGENCY PLAN

1. The Company shall prepare, and implement a written spill prevention and contingency plan that is applicable to the Process at the Site. The SPCP shall include appropriate measures to mitigate spills that may result from the Process, including different spill sizes, types of contaminants, and receiving environments (including land, natural waterways, and municipal sewers). The SPCP shall include as a minimum the following information commensurate with the risk of spills at the Site:
 - a. containment procedures;
 - b. treatment, neutralization and/or clean up procedures;
 - c. disposal procedures that are in accordance with the EPA, and/or municipal by-laws and other legislation as applicable;
 - d. securement of necessary equipment;

- e. notification procedures; and
 - f. details of the training procedures.
2. The Company shall ensure that employees and agents of the Company have been trained on the SPCP prior to commencement of the Process at the Site.
 3. The Company shall review and update the SPCP from time to time as needed.

6. NOTIFICATION REQUIREMENTS

1. The Company shall notify the District Manager at least ten (10) calendar days, or at such other time as may be agreed to in writing by the District Manager, before commencement of operation of the Process at any Site by submitting a completed Form 1, set out in Schedule "A" of this Approval, with attachments, to the District Manager.
2. The Company shall notify the District Manager, in writing, forthwith if the Process is not carried out in accordance with the Performance Requirements outlined in Condition 1.
3. The Company shall notify the District Manager, in writing, forthwith within two (2) business days of each complaint that the Company receives resulting from the operation of the Process at the Site. The notification shall include the information described in paragraph (f) of Condition 7.

7. RECORD KEEPING REQUIREMENTS

1. The Company shall, for each Site, retain for a minimum of five (5) years from the date of their creation, all reports, records, and information as described in this Approval, related to or resulting from the operation of the Process at the Site including:
 - a. the Remedial Work Plan;
 - b. the Monitoring Plan;
 - c. records about the type and quantity of Remedial Amendments used in the Process;
 - d. records about the inspection, maintenance, and repair of the major components of the Equipment related to the Process;
 - e. all monitoring results including any verification sampling; and
 - f. records about complaints, including:
 - i. a description of the time and date of the complaint and of the incident to which the complaint relates;

- ii. the nature of the complaint and the address of the complainant, if known;
- iii. weather conditions at the time of the incident to which the complaint relates;
- iv. a description of the measures taken to determine the possible causes of the complaint and the steps taken to investigate and deal with the cause of the incident to which the complaint relates and the steps taken and/or to be taken to prevent a similar occurrence in the future; and
- v. a written response to the complainant, if known.

SCHEDULE "A"

Form 1

SOIL/GROUNDWATER REMEDIATION PROCESS NOTICE OF INTENDED LOCATION

1. Owner and/or Operator
 - a. Company name :
 - b. Environmental Compliance Approval (Air) number:
 - c. Contact person :
 - d. Telephone number :
2. Proposed Location
 - a. Municipality:
 - b. Street address or Lot and Concession number:
3. Land use in the immediate vicinity:
4. Operating schedule:
 - a. Date of commencement:
 - b. Estimated duration:
 - c. Hours of operation:

Please attach the following:

- a. A plan showing the area(s) within the Site where the Process is going to be operated;
- b. A copy of the most recent safety data sheet (SDS) for each Remedial Amendment to be used at the Site;
- c. An overview of the Process to be used at the Site, including a description of the technology (or technologies) and delivery method(s) to be used; and
- d. An overview of the Site specific Remedial Work Plan, the Monitoring Plan, and the Operations and Maintenance Manual that have been drafted and will be finalized before commencement of operation of the Process at the Site and will be implemented at the Site as required by this Approval.

SCHEDULE "B"

REMEDIAL AMENDMENTS

The following sets out the Remedial Amendments that have been submitted and approved at the time of the issuance of this Approval. Additional Remedial Amendments may be added, on a permanent basis, upon an amendment to this Approval.

Remedial Amendment	Manufacturer
3-D Microemulsion	Regenesis
3-D Microemulsion Factory Emulsified	Regenesis
Advanced Formula Oxygen Release Compound (ORC Advanced)	Regenesis
Ammonium Persulfate	FMC Corporation
AquaZVI	Regenesis
BCP 35S	Bionetix International
Bio-Dechlor Inoculum Plus	Regenesis
Biostryke TPHenhanced	Plant Products Co. Ltd.
Buffered Provect-OX2 Self Activating ISCO Enhanced Bioremediation Reagent	Provectus Environmental Products, Inc.
Calcium Nitrate	Chemco Inc.
Calcium Peroxide	Chemco Inc.
Calcium Sulfate Dihydrate	Excalibur Minerals LLC
Carbo-Iron	Chemco Inc.
Cast Iron Aggregate	Peerless Metal Powders & Abrasives
Chemical Reducing Solution (CRS)	Regenesis
Chemical Reducing Solution -CRS	Regenesis
Chemsol DL3	Chemco Inc.
Chemsol DL4	Chemco Inc.
Citric Acid	Chemco Inc.
Daramend	FMC Corporation
Daramend Metals Amendment	FMC Corporation
Dibasic Ammonium Phosphate	The Mosaic Company
Dipotassium Phosphate Food Grade	Innophos
Dissolvine D-40 and Dissolvine D-40-L	Akzo Nobel Functional Chemicals LLC
Dissolvine D-FE-11	Akzo Nobel Functional Chemicals LLC
Dissolvine E-FE-13	Akzo Nobel Functional Chemicals

	LLC
EHC – A	Adventus Americas Inc.
EHC – F	Adventus Americas Inc.
EHC ISCR Amendment	FMC Corporation
EHC Liquid	FMC Corporation
EHC Liquid - solid component	FMC Corporation
EHC Metals Amendment	FMC Corporation
EHC Plus	PeroxyChem LLC
ELS Bioremediation Amendment	FMC Corporation
Emulsified Oil Substrate	EOS Remediation LLC
Emulsified Zero Valent Iron	Provectus Environmental Products, Inc.
Emulsified Zero Valent Iron (antimethanogenic) - EZVI/EZVI-CH4	Provectus Environmental Products, Inc.
EOS 100	EOS Remediation LLC
EOS Pro	EOS Remediation LLC
ERD-CH4	Provectus Environmental Products, Inc.
Ferric Sulfate	Chemco Inc.
H2Omet 58 Zero Valent Iron	Rio Tinto
Hydrogen Peroxide 50%	Canada Colors and Chemicals Limited
Hydrogen Release Compound (HRC)	Regenesis
Intraplex	Chemco Inc.
Intrasorp	Chemco Inc.
Ivey-Sol Surfactant Technology	Canada Colours & Chemical
KB-1 Dechlorinator	SiREM
Klozur CR	FMC Corporation
Klozur KP	PeroxyChem LLC
Lactic Acid	Sigma-Aldrich Canada Co.
Liquid Invert	Lantic Inc.
Lithium Bromide	Sigma-Aldrich Canada Co.
Lithium Chloride	Sigma-Aldrich Canada Co.
MetaFix Reagent	PeroxyChem LLC
Metals Remediation Compound (MRC)	Regenesis
MicroZVI	Regenesis
MKP 7.5 + AMP	Chemco Inc.
Monoammonium Phosphate, MAP	Agrium
Monosodium Phosphate, Anhydrous	Innophos

Net ZerO2 35% Hydrogen Peroxide	FMC Corporation
Oxygen Release Compound (ORC)	Regenesis
PAC-800-NSF	Chemco Inc.
PermeOx Plus	FMC Corporation
PermeOx Ultra	PeroxyChem LLC
Persulfate de Sodium – Klozur	Chemco Inc.
PersulfOx	Regenesis
PersulfOx SP	Regenesis
PetroFix	REGENESIS
Phosphoric Acid 75%	Chemco Inc.
PlumeSTOP	Regenesis
PlumeSTOP Nutrients	Regenesis
Potassium Bromide	Sigma-Aldrich Canada Co.
Potassium Persulfate	FMC Corporation
Provect-ABR (Aerobic Bioremediation Reagent)	Provectus Environmental Products, Inc.
Provect-CH4 Methanogenic Inhibitor/ERD Supplement	Provectus Environmental Products, Inc.
Provect-CH4 Methanogenic Inhibitor/ERD Supplement	Provectus Environmental Products, Inc.
Provect-IR Antimethanogenic for ISCR and Heavy Metal Immobilization	Provectus Environmental Products, Inc.
Provect-IR Antimethanogenic ISCR Reagent	Provectus Environmental Products, Inc.
Provect-ORS	Provectus Environmental Products, Inc.
Provect-Ox Self Activating ISCO-Enhanced Bioremediation Reagent	Provectus Environmental Products, Inc.
Quick Release Substrate (QRS)	Terra Systems Inc.
RegenOx - Part A	Regenesis
RegenOx PetroCleanze	Regenesis
RemOx L ISCO Reagent	Carus Corporation
RemOx S ISCO Reagent	Carus Corporation
Slow Release Substrate+ (SRS+)	Terra Systems Inc.
Sodium Bromide	Sigma-Aldrich Canada Co.
Sodium Citrate Tribasic	Chemco Inc.
Sodium Hydroxide (Beads)	Chemco Inc.
Sodium Lactate	Chemco Inc.
Sodium Persulfate	FMC Corporation
Terramend Carbon	FMC Corporation

Terramend Inorganic	FMC Corporation
Trap & Treat Bacteria Concentrate	Remediation Products Inc.
Trap & Treat BOS 100	Remediation Products Inc.
Trap & Treat BOS-200	Remediation Products Inc.
Urea Ammonium Nitrate Liquid – UAN (28-32%)	Agrium
Urea, Granular 46-0-0	Agrium
Vitamin B12	EOS Remediation LLC
VTX Catalyst 22	Chemco Inc.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1 is included to outline the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Process.
2. Condition No. 2 is included to require the Company to gather accurate information and prepare a work plan prior to carrying out the Process at the Site and so that compliance with the EPA and this Approval can be verified.
3. Condition No. 3 is included to emphasize that the Equipment and Process must be operated according to a procedure that will result in compliance with the EPA, the regulations, and this Approval.
4. Condition No. 4 is included to require the Company to gather accurate information so that the environmental impact and subsequent compliance with the EPA, the regulations, and this Approval can be verified.
5. Condition No. 5 is included to require the Company to prevent and mitigate spills thereby minimizing adverse environmental impacts.
6. Condition No. 6 is included to require the Company to notify the Ministry so that the environmental impact and subsequent compliance with the EPA, the regulations, and this Approval can be verified.
7. Condition No. 7 is included to require the Company to retain records and provide information to the Ministry so that the environmental impact and subsequent compliance with the EPA, the regulations, and this Approval can be verified.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 7829-B8RQ45 issued on March 1, 2019

In accordance with Section 139 of the *Environmental Protection Act*, you may by written notice served upon me, the Ontario Land Tribunal and in accordance with Section 47 of the *Environmental Bill of Rights*, 1993, the Minister of the Environment, Conservation and Parks, within 15 days after receipt of this notice, require a

hearing by the Tribunal. The Minister of the Environment, Conservation and Parks will place notice of your appeal on the Environmental Registry. Section 142 of the *Environmental Protection Act* provides that the notice requiring the hearing ("the Notice") shall state:

- a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
- b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the *Environmental Protection Act*, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

- 1. The name of the appellant;
- 2. The address of the appellant;
- 3. The environmental compliance approval number;
- 4. The date of the environmental compliance approval;
- 5. The name of the Director, and;
- 6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5
OLT.Registrar@ontario.ca

and

The Minister of the Environment,
Conservation and Parks
777 Bay Street, 5th Floor
Toronto, Ontario
M7A 2J3

and

The Director appointed for the purposes of
Part II.1 of the *Environmental Protection Act*
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

This instrument is subject to Section 38 of the *Environmental Bill of Rights*, 1993, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at <https://ero.ontario.ca/>, you can determine when the leave to appeal period ends.

The above noted activity is approved under s.20.3 of Part II.1 of the *Environmental Protection Act*.

DATED AT TORONTO this 13th day of December, 2023



Nancy E Orpana, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

BR/

c: District Manager, MECP Halton-Peel
J.P. Marini, Terra Nova Environmental Services Inc.