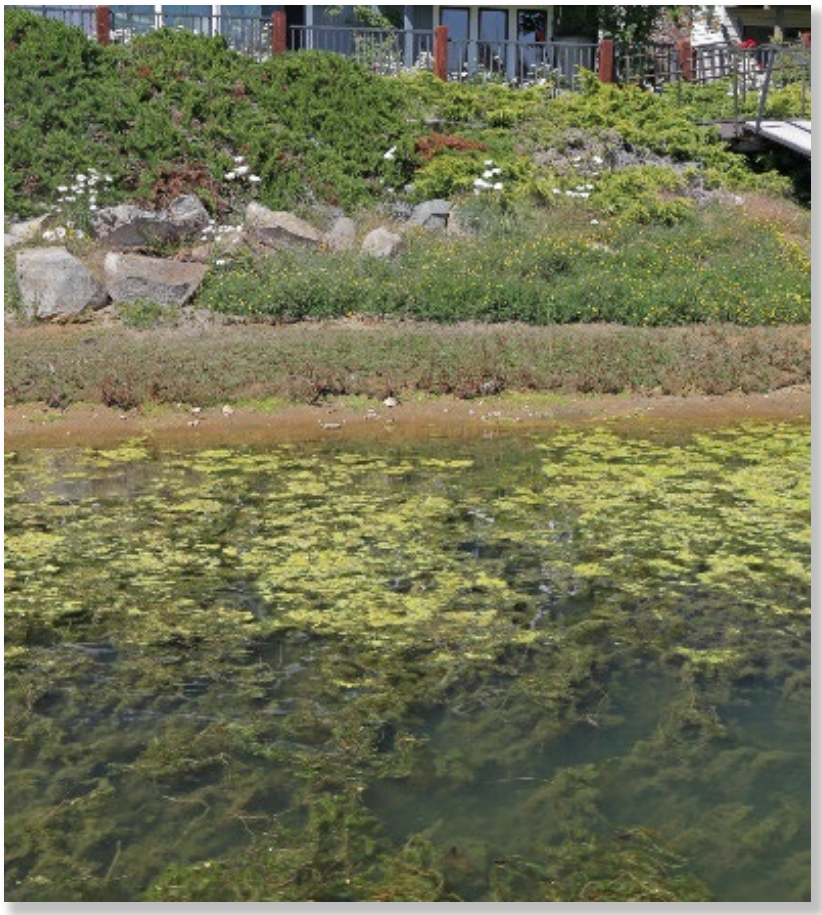
Tahoe Keys Lagoons Aquatic Weed Control Methods Test

Lanthanum-Modified Clay Application Plan



Draft – April 20, 2022

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Lanthanum-Modified Clay Application Plan

Submitted to

State of California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Submitted by

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ATTACHMENTS

1.0 BACKGROUND

The Control Methods Test Project (CMT or Project) will test aquatic weeds management using standalone-treatments of herbicides, ultraviolet (UV-C) light, Laminar Flow Aeration (LFA), and combination treatments of herbicide and UV-C light in the first year of the proposed CMT. These methods will be followed in Years 2 and 3 of the CMT with non-herbicide follow-up methods, including spot treatments using bottom barriers, diver-assisted suction/hand pulling, and UV-C treatments. Follow-up methods would be dependent on the target plants present, size of infestation, and location of infestation. Figures 1 and 2 show the currently identified areas of the Tahoe Keys that will receive treatment and what types of treatment will be deployed in each area. Final CMT site selection will be identified and approved by the Lahontan Regional Water Quality Control Board (Lahontan) in April 2022.

Figure 1. Proposed CMT Treatment Areas

Figure 2. Proposed Control Methods Test Site Locations, New Sites 13, 14, 19, 20, and 21

The objective of this Lanthanum-Modified Clay Application Plan (LMCAP) is to comply with Section VII.B of the National Pollutant Discharge Elimination System (NPDES) Permit No. CA6202201/Order No. R6T-2022-0004.

2.0 CONTINGENCY APPLICATION OF LANTHANUM MODIFIED CLAY

With treatments in the areas identified above in Figures 1 and 2, levels of total phosphorus could become elevated, thus triggering the need for lanthanum-modified clay (LMC) applications to minimize harmful algal blooms (HABs). LMC (Phoslock, or EutroSORB WC), once applied, would reduce the available phosphorus levels in the water column. Per the Project NPDES Permit, LMC is permitted only in sites treated with herbicide, UV-C, or LFA, and is not otherwise permitted.

2.1 Criteria

Should levels of total phosphorous become elevated above 10% of the composite levels of the control sites in addition to the occurrence of a HAB at a test site in response to phosphorus released during plant decomposition following herbicide or UV-C treatment, Tahoe Keys Property Owners Association (TKPOA) may apply LMC to treatment sites, as applicable. Should both increased levels of total phosphorus and HABs be detected, TKPOA would consult with Lahontan staff to determine if application of LMC shall be applied.

Once applied, LMC would reduce the available phosphorus levels in the water column. Per the CMT Project NPDES Permit, LMC is permitted only in sites treated with herbicide, UV-C, or LFA, and is not otherwise permitted.

The LMC application concentration is not to be greater than the recommended label application rates (see Attachment B, Product Labels). LMC is permitted to reduce the phosphorus concentration between the water quality objective of 0.008 mg/L and 0.005 mg/L. In no case shall the quantity of LMC discharged be greater than the amount necessary to reduce the phosphorus in the waterbody to attain the target range of total phosphorus concentration.

The following criteria must be met prior to application of LMC:

- Visual inspection of a treated area indicates a possible HAB,
- Phosphorus concentrations in the water column for the treated areas are higher than 10% of the levels in that of a comparable control site(s),
- Cyanobacteria indicators are at caution levels or higher[1], and
- Alkalinity of the water in the area to be treated is greater than 20 mg/L.

Requirements of pre- and post-LMC treatment activities are summarized in Table 1 below. Should LMC be applied, monitoring of water and sediment in treated areas will follow that outlined in Table 1.

[1] Caution levels are: Microcystins ≥ 0.8 µg/L; Presence of anatoxin-a; and Cylindrospermopsin ≥ 1.0 µg/L

Table 1. Overview of Required LMC Monitoring

Parameter	Monitoring Variable	Monitoring Method
Visual (Pre-Treatment)	• Visual inspection	• Monitoring area description • At each water and sediment sampling event • Appearance of waterway (color, sheen, clarity) • Weather conditions
Standard (Pre-Treatment)	• Temperature • pH • Turbidity • Dissolved oxygen • Total Phosphorus	• YSI Handheld Meter/Grab Sample
Water Grab Sample (Post-Treatment)	• Free Lanthanum • Alkalinity • Total Suspended Solids • Free Reactive Phosphorus • Total Phosphorus	• Composite sample from surface, mid-depth, and near-bottom • Every 7 days until receiving water limitations are achieved for 2 consecutive events at a minimum of 48 hours apart
Sediment Grab Sample (Post-Treatment)	• Total Phosphorus	• Petite Ponar Grab Sampler or similar device • Composite sample (mixed equal volumes from at least 3 Ponar grabs) • Every 7 days until receiving water limitations are achieved for 2 consecutive events at a minimum of 48 hours apart • 2 samples from each monitoring location

2.2 Notification Requirements

An exceedance in composite (top, middle, bottom water column) samples total phosphorus in UV-C or herbicides site water column total phosphorus greater that 10% above control composite (top, middle, bottom water column) total phosphorus will initiate the following actions:

- Notification within 24 hours of documented exceedance (through monitoring regime within the APAP), to Lahontan staff of the exceedance levels and location(s) (sites).
- Proposed mitigation action to reduce observed total phosphorus exceedance to levels in control sites, as outlined below.
- Activation of the LMCAP components (provided below) that specify modified LMC application procedures (outlined below) using named modified clay product if and only if this action is directed in writing by Lahontan staff after their having reviewed the level and locations of any total phosphorus exceedances.

2.3 Product Information and Protocols

Implementation of LMCAP total phosphorus mitigation measures. The following actions and specifications apply to any and all CMT herbicide or UV-C sites in which total phosphorus exceedance occurs, and in which Lahontan has directed mitigation to be implemented.

Product Used

Phoslock and EutroSORB are sold by SePro Corporation (see product labeling attached in Attachment B).

Method of Application

Either slurry (tank mixture) or granular according to label instructions and requirements. Preference will be to granular formulation and will depend upon location(s) of exceedance but in all cases shall be based upon minimizing risk of spill (see Spill Prevention below). Product will be applied via vessel and with standard distribution equipment (granular dispersal or slurry injection). Product will be applied by a certified applicator (QAL) and trained crew (see personnel and training requirements below).

Rate/Amount of Phoslock or EutroSROB Used

The application vessel will traverse the site using 2 to 3 evenly spaced transit lines to facilitate a uniform dispersion of applied Phoslock in the water column. The application is made to the water surface. The total phosphorus levels and volume of water in the site will be used to determine the amount of Phoslock using the product manufacturer recommendation:

Total phosphorus based on monitored total phosphorus level:

*Volume of water (ac-ft) X phosphorus concentration (ppb) X 0.0027= lbs. of total phosphor*us

For water column reduction in total phosphorus recommended rate of using a 200:1 ratio of Phoslock to total phosphorus.

Example 1:
For 10-acre X 5 feet (50 ac-ft), and a level of 20 ppb total phosphorus X 0.0027 = 2.7 lbs. of total phosphorus

Amount of Phoslock: *200 lbs X 2.7 = 540 lbs. of Phoslock*[2]

Example 2: Typical CMT Site
1.5 acres X 8 ft (12 ac-ft) X 10 ppb total phosphorus X 0.0027= 0.32 lbs total phosphorus

Amount of Phoslock: *200 lbs X 0.32= 64 lbs. of Phoslock*

[2] This equates to a concentration of about 4 ppm of Phoslock and about 200 ppb of lanthanum.

Post LMC Application

In order to confirm lanthanum concentrations in the water column, mid-depth water samples will be taken and shipped for Lanthanum analysis to an approved (by Lh laboratory and a 48-hour turnaround time will be required. To determine effects of Phoslock or EutroSORB, the previously scheduled water quality sampling (grab sample composited from top, middle, and bottom of the water column) will be continued. Reports of the total phosphorus levels will be provided within 48 hours of sampling time. Adjustments to the Phoslock or EutroSORB applications (e.g., additional treatments) will be made in consultation with Lahontan staff.

All applications will adhere to label instructions/use rates and safety precautions and related measures (e.g., PPE). All required PPE, limitations, and precautions on the product label (Attachment B) will be followed and the QAL will document same with date, product name, Lot Number (if available) and list of staff who have read the product label. When the application is completed, the QAL will document the actions noted below in "Records and Logs."

2.4 Daily Briefings

At the commencement of CMT treatments, and each morning thereafter, the QAL will hold a 30-minute briefing with supporting staff before handling, loading, or use of Phoslock or EutroSORB. The briefing shall review the day's proposed CMT treatments, monitoring activities and coordination with others conducting CMT activities. The briefing shall review cautionary actions to prevent spills and how to respond if a spill occurs. The briefing will review the communications equipment conditions, use, and sequence of communications.

2.5 Records and Logs

Contents of records and logs will include the following:

- Applicator name(s) and QAL certification number(s) and names of QAL field supporting staff.
- Documentation of types of PPE used and signed by each person who wears PPE.
- Date, time, location (i.e., CMT site) and methods used to apply product, product name and Lot Number, if available. (Product name is "Phoslock", or "EutroSORB")
- Name, make, model of application equipment
- Date and method used to calibrate Phoslock or EutroSORB application equipment and results of calibrations.
- Amount of Phoslock or EutroSORB product applied, and formulation of product and projected concentration of lanthanum.
- Visual observation of pre/post application (e.g., general water clarity or turbidity, evenness of application)
- Any incidences of spills and how these were responded to (see Spill prevention/containment)
- Documentation that the LMCAP was adhered to via check list of key requirements (see Attachment A).

3.0 APPLICATOR QUALIFICATIONS / REQUIREMENTS

The following qualifications and experience are required:

- Experience and qualifications with similar LMC applications
- Knowledge and familiarity with the Project NPDES, APAP and MMRP
- QAL will provide record(s) of training (including support staff), QAL certification number and currency (i.e., still within certificate period of use)
- Training shall consist of correct product label understanding, correct use of PPE, protocols for loading, applying Phoslock, and protocols for responding to spillage and notifications

4.0 BEST MANAGEMENT PRACTICES (BMPS)

Application BMPs:

- QAL and supervised staff shall comply with all applicable directions, limitations, conditions, application methods and equipment, PPE and all other safety and environmental protection, disposal and containment requirements stated in the respective label for all LMC products specified. QAL shall review the label, application schedule and application logistics to ensure all labelling is complied with.
- Prior to application, turbidity curtains (if not already in place) are to be installed in the locations identified on Figure 1 or Figure 2, dependent on Lahontan approval of final CMT test sites.
- Loading of LMC on to watercraft utilized for chemical applications (i.e., discharges) must be done with the vessel behind the double turbidity curtains (within the site treatment zones).
- Only enough LMC product to apply to a single CMT site to achieve targeted final concentration shall be loaded onto the application vessel at any time.
- Rate of application must be consistent with product label requirements for the targeted phosphorus reduction.

5.0 SPILL PREVENTION/CONTAINMENT

Once the level of total phosphorus is known, the amount of Phoslock or EutroSORB needed will be calculated (see above examples). Only the amount of Phoslock or EutroSORB necessary to reduce total phosphorus levels to "control" site or below levels will be used. Only the amount of Phoslock or EutroSORB needed for a single site treatment will be loaded on the application vessel. To avoid spillage on land Phoslock or EutroSORB containers will be kept closed until loaded on the vessels, behind turbidity curtains, and will only be opened at application site in preparation for use. All opened containers will be re-sealed with closures (caps/lids/ or suitable closure methods) with which they were received once the contents have been transferred to the application device/systems.

To prevent migration of Phoslock or EutroSORB to receiving waters, applications will only be made within designated CMT sites that received treatments with UV-C or herbicides. Only the amount needed to reduce total phosphorus to control site levels will be used. All of herbicide and UV-C / Herbicide Combination sites are strategically separated from receiving waters that are adjacent to the West Channel by double barriers (i.e., two turbidity curtains at each point).

Therefore, the same preventative actions (curtain installations) that prevent herbicide residues from entering West Lagoon receiving water connected directly to the West Channel:

1. During the post-CMT treatment period, water will be entering the Keys lagoons and thus potential movement of Lanthanum will be further reduced.
2. Due to incoming water from Lake Tahoe proper to the Keys West lagoon, when curtains are removed, there will be additional dilution of Lanthanum concentrations beginning approximately 21 to 30 days after treatment.

Taken together, it is extremely unlikely that Lanthanum from Phoslock or EutroSORB applications will reach the receiving water which connects to Lake Tahoe proper via the West Channel.

In the event of a spill in the water, outside the application vessel, and within the turbidity curtain delineated area, the location will be GPS-referenced and the approximate amount of Phoslock or EutroSORB spilled will be documented immediately. If the spillage does not exceed the planned application amount for the site, no further action will be taken. If the spillage is likely to result in exceeding the planned total application amount for that site by more than 10%, any further applications planned will be stopped and Lahontan will be notified immediately. The cause(s) of spill will be ascertained within one hour after the event and that information will be provided to Lahontan along with remedial measure to prevent a recurrence. Regardless of the amount of spillage, water samples (in duplicate) from mid-depth will be taken within 6 hours of the event, and 24 hours after the event, and the sample will be sent to a laboratory for analysis to determine lanthanum concentration (at 20 µg/liter detection). Results of analysis will be reported to Lahontan within 48 hours after receipt of the sample by the laboratory.

6.0 RESPONSE TO EXCEEDANCE(S) IN RECEIVING WATER

If either inadvertent spillage (see above), miscalculation, or other unanticipated conditions appears that it may result in levels above that required for reduction of total phosphorus, application(s) will immediately cease. Lahontan will be notified within 24 hours of receipt of analysis documenting exceedance. The date, time, site, and level of exceedance will be reported to Lahontan. The QAL and TKPOA will consult with Lahontan to resolve the most effective response such as installation of additional turbidity (barriers) curtains directly at the CMT site in exceedance or continuing to monitor for lanthanum daily.

Attachment A

LMC Key Requirements Checklist

DRAFT Template:

Documentation of Adherence to Lanthanum-Modified Clay Application Plan (LMCAP)

A. Objective:

Confirmation that the QAL and supporting staff have complied with requirements in the LMCAP.

B. Documentation:

Implementation of LMCAP TP mitigation measures.

Table 1. LMC Application Checklist

Actions:	**QAL (Initial)**	**TKPOA Review (Initial)**	**Notes/other verifications (and Initial)**
Date of Document Completion:			
Staff (Full Name):			
Product used			
Training (QAL; support staff)			
Daily Morning Briefing			
Application Method(s)			
Spill Prevention/Containment			
Correct amount applied			
Label compliance			
Integrity of Containments			
Exceedance Response			
Records and Logs: • Date/time of application(s)			
• Location(s) (CMT site)			
• Amount Phoslock applied			
• Spillage or miscalculation?			
• Reporting/Communications (TKPOA, Lahontan)			
• Site observations (anomalies?)			
Overall Adherence to LMCAP Gaps? Omissions?			

Attachment B

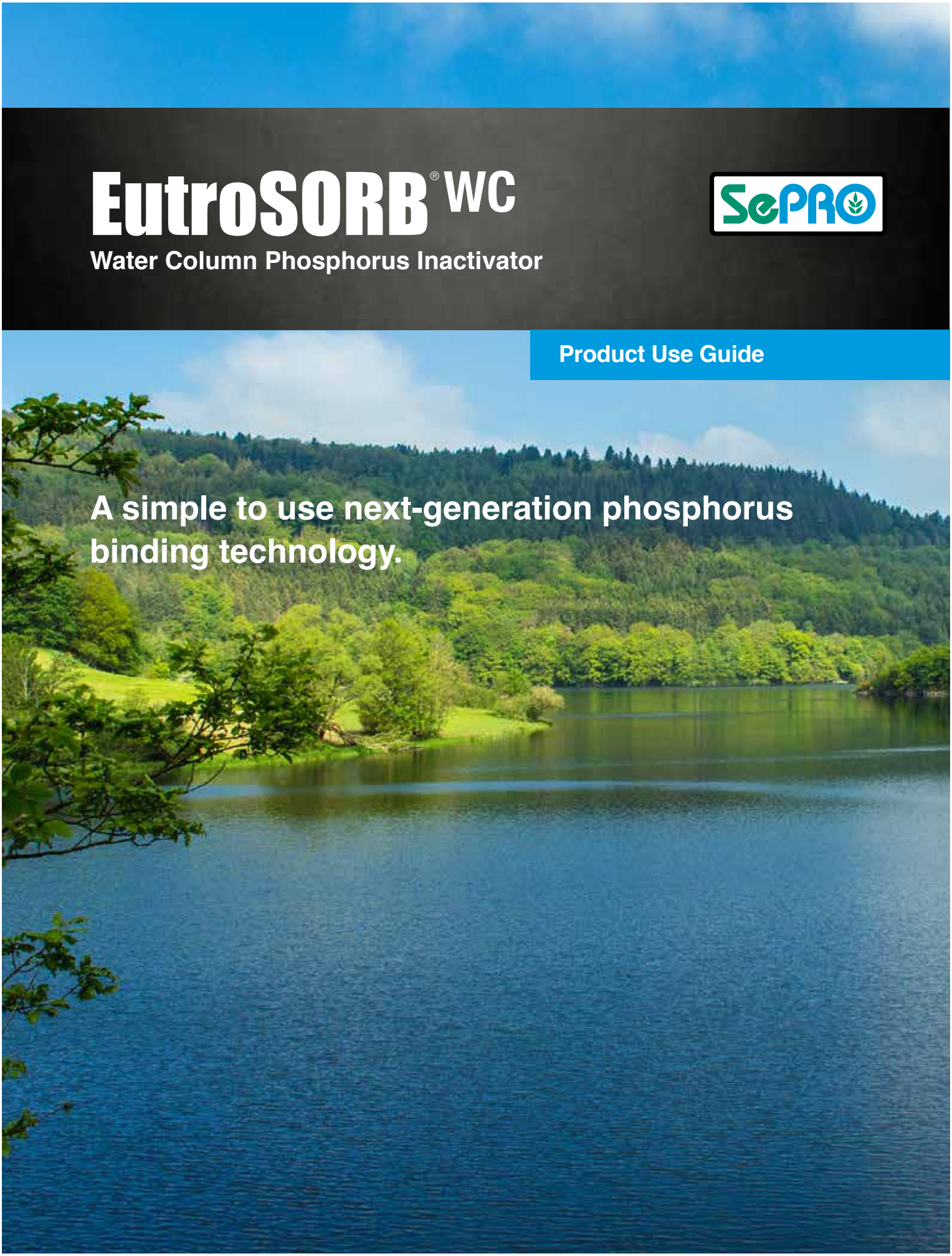
Product Labels

EutroSORB® WC

Water Column Phosphorus Inactivator

SePRO

Product Use Guide



EutroSORB WC. Water quality protection and restoration just got easier!

Eutrophication - an increase in surface water concentration levels of phosphorus and nitrogen that degrade water quality and negatively impact the health of an aquatic ecosystem when excess levels are reached. Phosphorus is a key limiting nutrient in water resources—one pound of phosphorus can support five hundred pounds of algae growth.

20 PDU container

EutroSORB WC is a proprietary aqueous blend of phosphate binding minerals for rapid and permanent inactivation of phosphorus from the water column.

EutroSORB WC is simple to use and reduces phosphorus concentrations in natural waters when applied to surface water resources containing phosphorus.

EutroSORB WC can be easily applied via surface spray application, sub-surface injections, or poured into areas where good mixing occurs. The material is an aqueous solution that **does not** require a slurry mix prior to application, as with other clay-based technologies.

Assessment Recommendations for EutroSORB WC
As with all in-water treatments, it is important to have an accurate assessment of the surface acres and average water depth for the water body being treated with EutroSORB WC. It is also important to understand how many pounds of phosphorus are in the water column being treated. To determine the pounds of phosphorus, the following formula can be used:

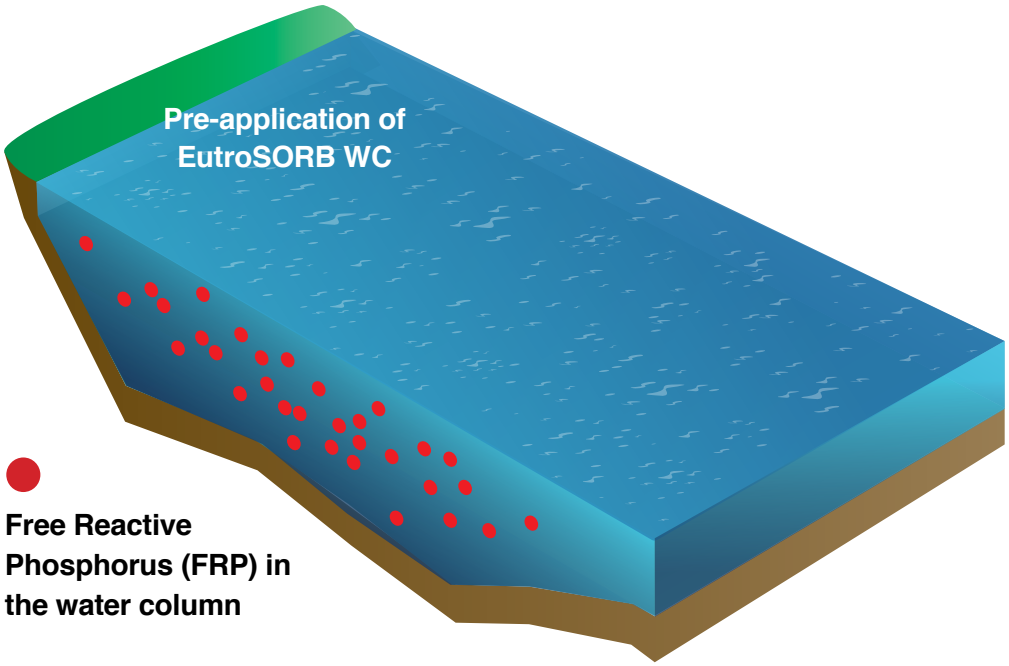
Surface Acres x Average Depth of Water x Total P (ppb)* x 0.0027 = Lbs. of Phosphorus

*A SeSCRIPT analysis from SePRO's lab services can be used to determine Total P (TP). Go to **sepro.com/aquatics/lab** for more information.

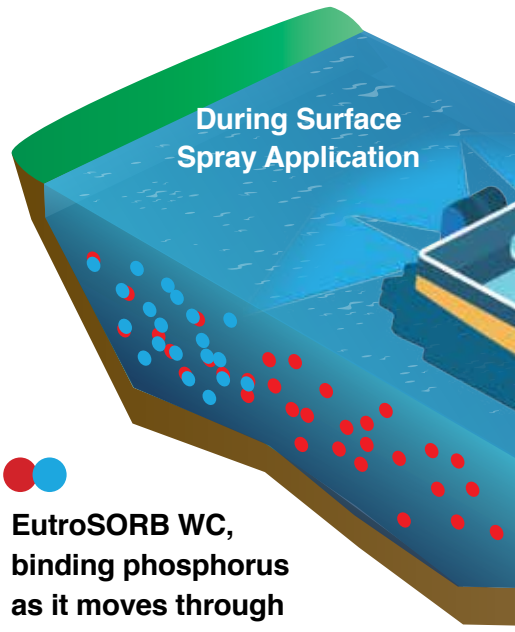
Prescription Guidelines for EutroSORB WC
Once the pounds of phosphorus have be determined in the water column, the following formula can be used to determine how many PDUs are required to inactivate the calculated volume of phosphorus:

Lbs. of Phosphorus x 10 = PDUs of EutroSORB WC

What is a PDU? EutroSORB WC utilizes the new, precise system of rate recommendations and product measurements called Prescription Dose Units (PDU).

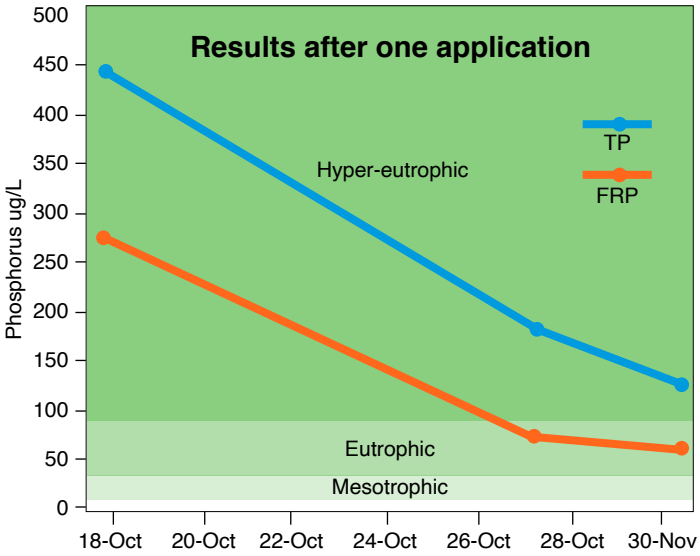


Free Reactive Phosphorus (FRP) in the water column



EutroSORB WC, binding phosphorus as it moves through the water column

Image courtesy of AQUA DOC Lake & Pond Management



Phosphorus Removal Efficiency

EutroSORB WC is very effective at binding phosphorus. Each PDU of EutroSORB WC will inactivate 0.1 lbs. of phosphorus from the water column. It only takes 10 PDUs of EutroSORB WC to inactivate 1 lb. of phosphorus rapidly and permanently.

10 PDUs = Inactivates 1 pound of P

*1 PDU is eqivalent to 16 oz.

Pro Tip: If algae are present, treat with a SePRO algaecide (e.g., Captain XTR, Cutrine Plus, SeClear Algaecide and Water Quality Enhancer, Oximycin P5, etc.) 3 - 5 days prior to the initial application of EutroSORB WC.

Fun Fact: 1 pound of phosphorus in water can support 500 pounds of algae growth.

General Maintenance

One pound of P Inactivation Program	
Spring	4 PDUs per acre
Summer	4 PDUs per acre
Fall	2 PDUs per acre

Applicatiion Directions

EutroSORB WC can be used in surface waters such as lakes, ponds, reservoirs, rivers, streams, canals, ditches, etc.

EutroSORB WC can be applied via surface spray application, sub-surface injections, or poured into areas where good mixing occurs such as intakes or fill pipes.

For best results, distribute EutroSORB WC uniformly over the surface of the water body or the area targeted for

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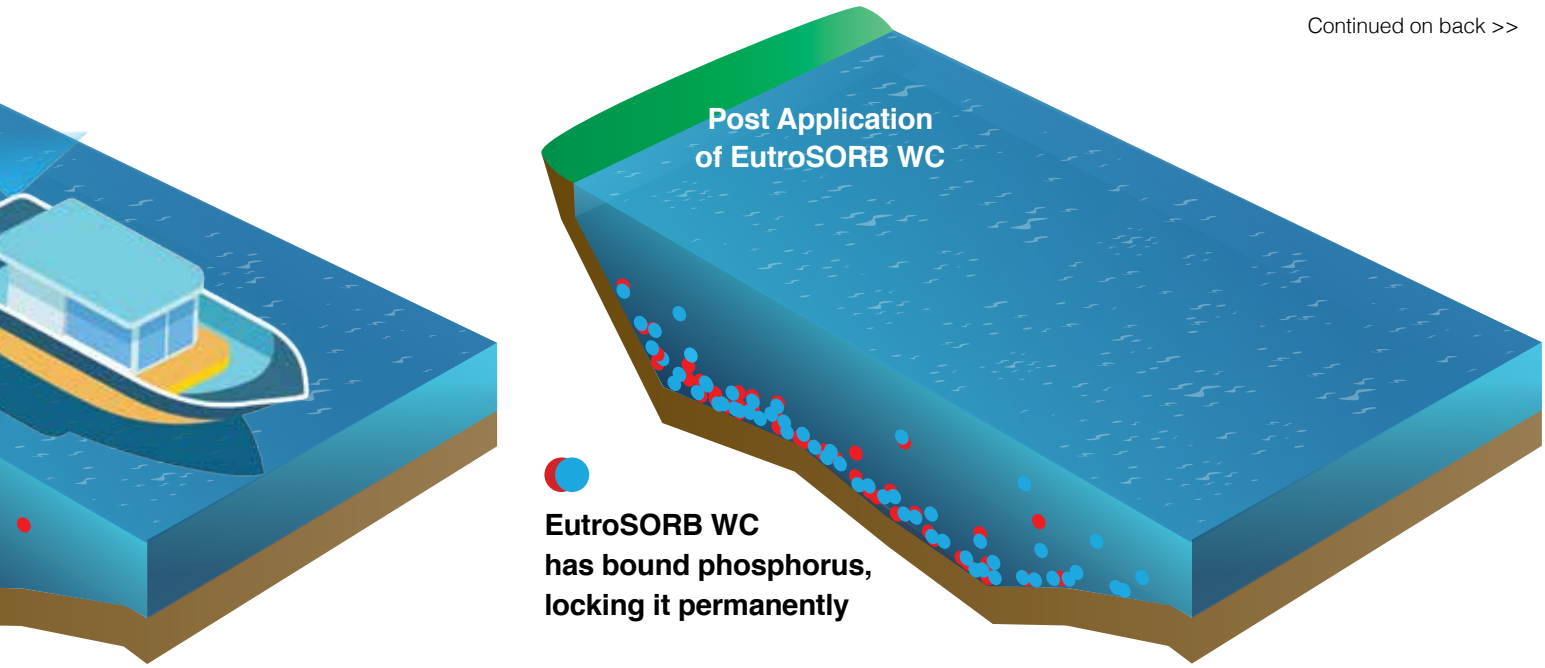

phosphorus inactivation. When making applications to flowing water (e.g., rivers, streams, canals, ditches, etc.), inject, drip, or pour EutroSORB WC at a location where adequate mixing occurs to optimize phosphorus binding.

Contact a SePRO Technical Specialist for tank-mix compatibility and assistance with more dynamic systems and projects, or visit **eutrosorb.com** for more information.

Ecological Assessment

EutroSORB WC does not impact water quality or chemistry. It has an excellent safety profile with no environmental, health, or safety concerns associated with this technology.

Summary

EutroSORB WC is a simple to use next-generation phosphorus binding technology that can be used to remove excess phosphorus rapidly and permanently from surface water resources—because water quality protection and restoration does not have to be difficult.

Also available in 2,200 PDU totes

EutroSORB WC Benefits

- Easy to use formulation
  - No slurry required
  - Low volume use rates
- Rapid and permanent inactivation of phosphorus
- Safe for fish, invertebrates, and personnel
- No irrigation restrictions
- Patent pending

To purchase or for more information, contact your SePRO Technical Specialist at **1-800-419-7779,** visit **sepro.com,** or contact a SePRO Distributor Partner

Visit **eutrosorb.com**

Specimen Label

PHOSLOCK®

Phosphate Sequestering Agent

Phosphorus Locking Technology

For use in aquatic systems to reduce phosphorus and improve water quality.

Keep Out of Reach of Children

In the case of emergency endangering health or the environment involving this product, have the package label with you and call **INFOTRAC** at **1-800-535-5053**.

DIRECTIONS FOR USE

For best results, distribute uniformly over the surface of the waterbody, or the area targeted for application, as an aqueous slurry. Under certain conditions Phoslock granules may also be applied directly to the water based on management objectives and site conditions. For applications to waters with alkalinity less than 20 ppm, lower application rates may be needed. For site specific rate and treatment recommendations, contact SePRO Corporation at **1-800-419-7779**.

NSF/ANSI 60

Tested and certified against NSF/ANSI 60 by Water Quality Association (WQA). The maximum application rate is 80 ppm when applied to drinking water. This seal does not imply enhanced safety or efficacy.

NSF/ANSI 60

Precaution: Avoid ingestion, inhalation, contact with eyes and skin. Breathing dust may be irritating. For large volume applications, the use of a dust protection mask is recommended.

FIRST AID	
If on skin or clothing	• Remove contaminated clothing • Immediately rinse skin with water for 15 to 20 minutes. • Seek medical attention if skin irritation persists.
If in eyes	• Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. • Seek medical attention if eye irritation persists.
If inhaled	• Immediately move to fresh air; if person is not breathing, call 911 or an ambulance, then give artificial respiration.
If swallowed	• Do not induce vomiting unless instructed to do so by a doctor.
HOTLINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor or going for treatment. You may also contact **INFOTRAC** for emergency medical information: **1-800-535-5053**.	

Specimen Label

PHOSLOCK®

Phosphorus Locking Technology

Phosphate Sequestering Agent

STORAGE AND DISPOSAL

Do not contaminate food, feed or water by storage or disposal.

Storage: Store in original container and keep closed. Store in a dry place.

Container Handling: Non-refillable Container (non-rigid, ANY size): Do not reuse or refill this container. Completely empty bag into application equipment. Offer for recycling if available. If recycling not available, then dispose of empty bag in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

WARRANTY DISCLAIMER

SePRO Corporation warrants that this product conforms to the chemical description on the product label. Testing and research have also determined that this product is reasonably fit for the uses described on the product label. To the extent consistent with applicable law, SePRO Corporation makes no other express or implied warranty of fitness or merchantability nor any other express or implied warranty and any such warranties are expressly disclaimed.

MISUSE

Federal law prohibits the use of this product in a manner inconsistent with its label directions. To the extent consistent with applicable law, the buyer assumes responsibility for any adverse consequences if this product is not used according to its label directions. In no case shall SePRO Corporation be liable for any losses or damages resulting from the use, handling or application of this product in a manner inconsistent with its label.

For additional important labeling information regarding SePRO Corporation's *Terms and Conditions of Use, Inherent Risks of Use* and *Limitation of Remedies*, please visit **http://seprolabels.com/terms** or scan the image below.

FPL20170412

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