1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

1.1 Product Identifier

MATERIAL NAME: VectoBac® 12 AS Biological Larvicide Aqueous Suspension
Synonyms: VectoBac 12AS
EPA Reg No.: 73049-38
Code Number: 15576, 15577, 15578, 21894, 83872
List Number: 05605
Chemical Family: Not applicable; microbial product

1.2 Relevant Identified Uses and Uses Advised Against

Identified Uses: Mosquito larvicide
Uses Advised Against: It is a violation of Federal law to use this product in a manner inconsistent with its FIFRA pesticide labeling.

1.3 Details of the supplier of the Safety Data Sheet

Supplied By: Valent BioSciences Corporation
870 Technology Way
Libertyville, Illinois 60048

1.4 EMERGENCY TELEPHONE NUMBERS

Emergency Health or Spill:
Outside the United States: 651-632-6184
Within the United States: 877-315-9819

2. HAZARDS IDENTIFICATION

2.1 Classification of the Substance or Mixture

Category 1B: Sensitization -Skin

2.2 Labeling Elements

Symbol(s)

Signal Word
WARNING
Hazard Statement(s)
May cause an allergic skin reaction

Precautionary Statement:
Prevention
Avoid breathing mist or spray
Wash thoroughly after handling
Contaminated work clothing must not be allowed out of the workplace
Wear protective impervious gloves

Response
If on skin: Wash with plenty of water.
If skin irritation or rash occurs: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.

Disposal
Dispose of contents/container in accordance with local/regional/national regulations.

2.3 Other Hazards
None identified.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Component Name</th>
<th>Classification</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Bacillus thuringiensis subsp. israelensis</td>
<td>Eye Irritation – Cat 2B</td>
<td>11.61%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin Sensitizer – Cat 1B</td>
<td></td>
</tr>
<tr>
<td>2634-33-5</td>
<td>Proxel GXL</td>
<td>Skin Sensitizer</td>
<td>0.10%</td>
</tr>
<tr>
<td>Trade Secret</td>
<td>Other Ingredients – withheld as Trade Secret</td>
<td>Not classified</td>
<td>88.29%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

4.1 Description of First Aid Measures
GENERAL: In all cases of doubt, seek medical attention.

EYES: Remove from source of exposure. Flush with copious amounts of water. Remove contact lenses, if present and easy to do, after the first 5 minutes, then continue rinsing. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

SKIN: Remove from source of exposure. Take off contaminated clothing. Flush with copious amounts of water. Cover irritated skin with an emollient. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
INGESTION: Remove from source of exposure. Move person to fresh air. Do NOT induce vomiting. Give large quantities of water. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

INHALATION: Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary. If person is not breathing, call 911, then give artificial respiration.

4.2 Most important Symptoms and Effects, both Acute and Delayed

Acute
Mild eye and skin irritation, mild sensitization potential

Delayed
No information on significant adverse effects

4.3 Indication of any Immediate Medical Attention and Special Treatment Needed
Treat symptomatically and supportively

5.  FIRE FIGHTING PROCEDURES

5.1 Extinguisher Media

Suitable Extinguisher Media
Dry chemical, water spray, foam or carbon dioxide. Use appropriate medium for the underlying cause of the fire.

Unsuitable Extinguisher Media
None known

5.2 Specific Hazards Arising from the Chemical
Keep containers cool by spraying with water if exposed to fire.

Thermal decomposition products
Carbon oxides, nitrogen oxides

5.3 Advice to Firefighters

Protective Equipment and precautions for firefighters
Fire fighter should wear full-face, self-contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling combustion products. See Section 8 (Exposure Controls / Personal Protection)

Fire & Explosive hazard
Not expected to be flammable.
6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures
Wear a dust/mist filtering respirator, eye protection and impervious gloves.

6.2 Environmental Precautions
Dispose of excess product and washwaters according to local regulations.

6.3 Methods and Materials for Containment and Cleaning Up
Recover product with inert material (earth, sand, vermiculite), place into appropriate container for disposal. Do not flush to sewer.

6.4 Reference to Other Sections
See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations. See Section 13 for Disposal Considerations.

US Regulations may require reporting spills of hazardous materials: See Section 15: Regulatory Information for details on reportable quantities, if any.

7. HANDLING AND STORAGE

7.1 Precautions for Safe handling
Avoid contact with eyes, skin or clothing. Wash thoroughly after handling. Do not eat, drink or smoke while working with product, obey reasonable safety precautions and practice good housekeeping.

7.2 Conditions for Safe Storage, Including and Incompatibilities
Store in a cool, dry place. For further information refer to local country registration and label.

Incompatibilities
None Known

7.3 Specific End Use(s)
Mosquito Larvicide.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control Parameters
Component Exposure Limits
None Established
Derived No Effect Levels (DNELs)
No DNELs available

Predicted No Effect Concentrations (PNECs)
No PNECs available

8.2 Exposure Controls

Appropriate Engineering Controls
Provide general ventilation.

SKIN PROTECTION:
Wear impervious protective clothing, including boots and gloves. Wear gloves made of impervious materials. Wash thoroughly with soap and water after handling.

EYE PROTECTION:
Wear goggles, safety glasses with side shields or full-face shield when splashing or spraying of materials is likely.

RESPIRATORY PROTECTION:
Use dust/mist filtering respirator (MSHA/NIOSH approved number prefix TC-21C) or a NIOSH approved respirator with any N, P, R or HE filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Light brown liquid</td>
<td>Odor</td>
<td>Malt-like</td>
</tr>
<tr>
<td>pH</td>
<td>5.0 (1% w/v susp)</td>
<td>Odor Threshold</td>
<td>N/D</td>
</tr>
<tr>
<td>Melting Point</td>
<td>°F (___°C)</td>
<td>Boiling Point</td>
<td>°F (___°C)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>@ °F</td>
<td>Solubility (H₂O)</td>
<td>N/D</td>
</tr>
<tr>
<td>Relative Density</td>
<td>1.06 g/cm³ @ 20 °C</td>
<td>Evaporation Rate</td>
<td>N/D</td>
</tr>
<tr>
<td>Octanol/H₂O Coeff</td>
<td>N/D</td>
<td>Decomposition Temp.</td>
<td>N/D</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>N/D</td>
<td>Vapor Pressure</td>
<td>N/D</td>
</tr>
<tr>
<td>VOC</td>
<td>% by weight</td>
<td>Flammability Class</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Kinematic Viscosity</td>
<td>cSt @ °C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. CHEMICAL STABILITY AND REACTIVITY

10.1 Reactivity
Material does not pose a significant reactivity hazard.

10.2 Chemical Stability
Stable under ordinary conditions of use and storage. Spontaneous reaction not possible.
10.3 Possibility of Hazardous Reactions
    Does not undergo hazardous polymerization

10.4 Conditions to Avoid
    Keep away from incompatible substances.

10.5 Incompatible Materials
    Diluted or undiluted product can cause corrosion if left in prolonged contact with aluminum surfaces (e.g. spray equipment, aircraft components).

10.6 Hazardous Decomposition Products
    Carbon oxides and unidentified organic compounds.

11. TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological Effects

    Likely Routes of Exposure
    Eye Contact: Yes
    Skin Contact: Yes
    Inhalation: No
    Ingestion: No

    Acute Effects – Product Toxicology Studies
    Oral Toxicity: LD$_{50}$ > 5,000 mg/kg (rat)
    Dermal Toxicity: LD$_{50}$ > 5,000 mg/kg (rabbit)
    Inhalation Toxicity: LC$_{50}$ > 5.34 mg/L air
    Corrosiveness: Not corrosive to humans, can be corrosive to aluminum.
    Dermal Irritation: slightly-irritating, (category IV)
    Ocular Irritation: slightly-irritating, (category IV)
    Dermal Sensitization: Mild sensitizer, (guinea pig)

    Mutagenicity Information: Components of this product are not listed as mutagens.
    Carcinogenicity Information: Components of this product are not listed as carcinogenic by NTP, IARC or OSHA.

    Developmental/Reproductive Toxicity: This material is not a teratogenic compound. The NOEL for maternal and embryo toxicity in rabbits was ___ mg/kg/day. The NOEL for reproductive effects in rats was ___ ppm.

    Special Target Organ: Slight eye and skin Irritation.
    Aspiration Hazard: Not Applicable
    Repeat Dose Studies: Not Applicable, Pathogenicity Toxicity testing was all negative
12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity (Data for a Concentrated Technical Powder)

Fish:  LC$_{50}$ >370 mg/L (96-H, Rainbow Trout)
Bird:  LC$_{50}$ >3077 mg/kg (6.2 x 10$^{11}$ cfu/kg) (Acute Oral - Bobwhite Quail)
       LC$_{50}$ >3077 mg/kg (6.2 x 10$^{11}$ cfu/kg) each day for 5 days (Sub-Acute Oral (dietary) - Bobwhite Quail)
Invertebrates:  LC$_{50}$ >50 mg/L (48-H) (Daphnia)
Bees: Essentially non-toxic to honey bees.

12.2 Persistence and Degradability
No data available

12.3 Bioaccumulation potential
Not applicable. Substance is not pathogenic to non-target organisms

12.4 Mobility in Soil
No data available

12.5 Results of PBT and vPvB assessment
Assessments not performed

12.6 Other adverse effects
None known

13. DISPOSAL CONSIDERATIONS

13.1 Waste Disposal Methods
Dispose of product in accordance with federal, state, provincial, and local regulations. Prevent contamination of environment by wastes.

US EPA WASTE NUMBER & DESCRIPTIONS:
There is no applicable EPA waste number. This product, if discarded, is not expected to be a characteristic or listed hazardous waste.

14. TRANSPORTATION INFORMATION

DOT STATUS: Not regulated by US DOT
UN PROPER SHIPPING NAME: N/A
RERMARKS: N/A
15. REGULATORY INFORMATION

15.1 Safety, Health and Environmental Regulations / Specific Legislation

- TSCA STATUS: Not Listed
- CERCLA STATUS: Not regulated as hazardous
- SARA STATUS: Acute: No Chronic: No Fire: No CDT: No
- RCRA STATUS: Not regulated as hazardous

State Right-To-Know: Not listed.
Consult applicable national, state provincial or local laws to determine regulations, laws or ordinances which may be applicable.

OSHA HAZARD COMMUNICATION STANDARD: Not defined by the OSHA Hazard Communication Standard, 29 CFR.

15.2 FIFRA – Pesticide Labeling

- EPA registration Number 73049-38
- EPA Pesticide Label signal word: CAUTION

Product must have EPA Approved Pesticide Label attached or accompanying all containers.

This chemical is a pesticide product registered by the United States Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets (SDS), and for workplace labels of non-pesticide chemicals. The hazard information required on the pesticide label is reproduced below. The pesticide label also includes other important information, including directions and limitations for its use.

KEEP OUT OF REACH OF CHILDREN
PRECAUTIONARY STATEMENT
HAZARD TO HUMANS AND DOMESTIC ANIMALS
CAUTION

Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash contaminated clothing before reuse.
Mixers/loaders and applicators not in enclosed cabs or aircraft must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95 or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

PHYSICAL AND CHEMICAL HAZARDS
Diluted or undiluted VectoBac® 12 AS can cause corrosion if left in prolonged contact with aluminum spray system components. Rinse spray system with plenty of clean water after use. Care should be taken to prevent contact with aluminum aircraft surfaces, structural components and control systems. In case of contact, rinse thoroughly with plenty of water. Inspect aluminum aircraft components regularly for signs of corrosion.

DIRECTIONS FOR USE
It is in violation of Federal law to use this product in a manner inconsistent with its labeling. Do not apply directly to treated finished drinking water reservoirs or drinking water receptacles when water is intended for human consumption.

Do not apply when weather conditions favor drift from treated areas. Do not apply to metallic painted objects, such as automobiles, as spotting may occur. If spray is deposited on metallic painted surfaces, wash immediately with soap and water to avoid spotting.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather related factors determine the potential for spray drift. The applicator and the treatment coordinator are responsible for considering all these factors when making decisions.

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

Storage: Store in a cool, [less than 86°F (30° C)] dry place.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Once cleaned, some agricultural plastic pesticide containers can be taken to a container collection site or picked up for recycling or puncture and dispose of in a sanitary landfill or by incineration, or if allowed by state and local authorities, by burning. If burned, stay out of smoke. Do not reuse container.
16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA Hazard Ratings</th>
<th>HMIS Hazard Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health: N/D</td>
<td>Health: N/D</td>
</tr>
<tr>
<td>Flammability: N/D</td>
<td>Flammability: N/D</td>
</tr>
<tr>
<td>Instability: N/D</td>
<td>Instability: N/D</td>
</tr>
<tr>
<td>0 = minimal</td>
<td>1 = slight</td>
</tr>
<tr>
<td>1 = slight</td>
<td>2 = moderate</td>
</tr>
<tr>
<td>2 = moderate</td>
<td>3 = serious</td>
</tr>
<tr>
<td>3 = serious</td>
<td>4 = Extreme</td>
</tr>
</tbody>
</table>

REASON FOR ISSUE: Updated List #’s
APPROVAL DATE: 03/08/16
SUPERSEDES DATE: 04/14/15

LEGEND: N/A = Not Applicable
N/D = Not Determined
N/L = Not Listed
L = Listed
C = Ceiling
S = Short-term

(R) = Registered Trademark of Valent BioSciences
(TM) = Registered Trademark of Valent BioSciences

The information provided in this Safety Data Sheet (SDS) is provided in good faith and believed to be accurate at the time of preparation of the SDS. However, to the extent consistent with applicable law, Valent BioSciences Corporation and its subsidiaries or affiliates extend no warranties, make no representations, and assume no responsibility as to the accuracy, suitability, or completeness of such information. Additionally, to the extent consistent with applicable law, neither Valent BioSciences Corporation nor any of its subsidiaries or affiliates represents or guarantees that this information or product may be used without infringing the intellectual property rights of others. Except to the extent a particular use and particular information are expressly stated on the product label, it is the users’ own responsibility to determine the suitability of this information for their own particular use of this product. If necessary, contact Valent BioSciences Corporation to confirm that you have the most current product label and SDS.

This Safety Data Sheet (SDS) serves different purposes than and DOES NOT REPLACE OR MODIFY THE EPA-APPROVED PRODUCT LABEL (attached to and accompanying the product container). This SDS provides important health, safety, and environmental information for employers, employees, emergency responders and others handling large quantities of the product in activities generally other than product use as required by the Occupational Health and Safety Act (29 CFR 1910.1200, “Hazcom”). The product label provides information specifically for product use in the ordinary course. Use, storage and disposal of pesticide products is regulated by the EPA under the authority of FIFRA through the product label. All necessary hazard classification and appropriate precautionary use, storage, and disposal information is set forth on that label or labeling accompanying the pesticide or to which reference is made on the label. It is a violation of federal law to use an EPA-registered pesticide product in any manner inconsistent with its labeling.