



## **Stormy and Daniels Lake Elodea Eradication Project: Environmental Assessment**

**Alaska Department of Natural Resources**

**Division of Agriculture**

**Plant Materials Center**

**5310 S. Bodenbug Spur Rd.**

**Palmer, AK 99645**

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## LETTER TO THE U.S. FISH AND WILDLIFE SERVICE

Date: August 1, 2013

TO: United States Fish and Wildlife Service (USFWS)

Stormy Lake is a 403 surface-acre natural lake. It is located 8.5 miles northeast of Nikiski and is surrounded by lands managed by the Alaska Department of Natural Resources (ADNR) and the Kenai National Wildlife Refuge (KNWR). Daniels Lake is a 621 surface-area natural lake. It is located 2 miles northeast of Nikiski and is surrounded entirely by private land. The Alaska Department of Natural Resources (ADNR) has developed an Environmental Assessment (EA) that proposes eradicating the invasive aquatic plant elodea (*Elodea canadensis* Michx, *E. nuttallii* (Planch.) H. St. John, and hybrid *E. canadensis x nuttallii*) in Stormy Lake and Daniels Lake using the pesticides fluridone and diquat.

Elodea is a serious threat to the ecological integrity of Kenai Peninsula waterways because of its highly invasive traits, including rapid growth rate, ability to regenerate from small pieces, and difficulty to control once established. Both lakes are part of a wetland system complex with multiple adjacent small lakes and wetlands. The connection of Stormy Lake to the Swanson River threatens the entire drainage's ecological integrity. The objectives of these treatments are to eradicate the elodea populations from Stormy Lake and Daniels Lake. This project would reduce the threat of spreading elodea, maintain ecological and economic lake values, and help protect valuable wild fisheries throughout the Kenai Peninsula waterways. This environmental assessment has been available to the public online at: [http://dnr.alaska.gov/ag/ag\\_dn.htm](http://dnr.alaska.gov/ag/ag_dn.htm). A thirty-day commenting period was announced via a public notice on June 12<sup>th</sup>, 2013.

Please contact Brianne Blackburn at (907) 745-8785 if you have questions.

Attention: Brianne Blackburn  
Stormy and Daniels Lake Elodea Project: Environmental Assessment  
Alaska Department of Natural Resources  
Division of Agriculture  
Plant Materials Center  
5310 S. Bodenbug Spur Rd.  
Palmer, AK 99645 or email at: [Brianne.Blackburn@alaska.gov](mailto:Brianne.Blackburn@alaska.gov)

Sincerely,



Brianne Blackburn  
Invasive Weeds and Agricultural Pest Coordinator

**ALASKA DEPARTMENT OF NATURAL RESOURCES**  
**DIVISION OF AGRICULTURE**

**Environmental Assessment of the proposed fluridone and diquat treatment of Stormy Lake and Daniels Lake for the purpose of eradicating the invasive aquatic elodea population and maintaining ecological integrity of waterways on the Kenai Peninsula.**

**PART I: PROPOSED ACTION DESCRIPTION**

**A. Type of Proposed Action**

The proposed action is to apply the herbicides s fluridone or diquat to eradicate or reduce the biomass of the invasive aquatic plant elodea in both Stormy and Daniels Lakes. Elodea has the potential to spread throughout Kenai Peninsula waterways, affecting ecological and economic values. Eradicating these elodea populations will also reduce the threat that the highly invasive species will disperse elsewhere in the Swanson River and Bishop Creek drainages, or into other lakes, waterbodies, wetlands, streams, and rivers. Eradicating elodea will also reduce the potential damage to wild fisheries. The preferred removal method is killing the plant or reducing the biomass of the plant with the application of aquatic herbicides called fluridone and diquat. After treatment, divers may inspect the lake bottom in treated locations and handpull any remaining stems.

**B. Agency Authority for the Proposed Action**

The Alaska Department of Natural Resources is authorized to perform such acts per Alaska Statue (AS 44.37.030).

**C. Estimated Commencement Date**

The earliest that the fluridone or diquat treatment would occur is July 2013 if funding and all required permits are available. If project funding is problematic the commencement date could be delayed by months or until 2014. Post-treatment monitoring of water quality and biological parameters would continue through 2014.

**Name and Location of the Project**

The project is named the Stormy and Daniels Lake Elodea Eradication Project. Stormy Lake is located in T8N, R10W, within Sections 15,20,21,36 and 37 (Seward Meridian, Kenai Peninsula). Stormy Lake is in the lower Swanson River drainage and is located about one third mile east of Cook Inlet and about 8.5 miles northeast of Nikiski and just east of the Kenai Spur Highway. Stormy Lake is a natural lake. The land surrounding the lake is publicly managed by Alaska Department of Natural Resources (ADNR) and Kenai National Wildlife Refuge (KNWR). Daniels Lake is located at in T8N, R11W, within Sections 33, 34 and 35 and within T7N, R11W, Sections 2 and 3. Daniels Lake is in the Bishop Creek drainage and is 2.2 miles south of the Cook Inlet shore, 2 miles northeast of Nikiski and south of the Kenai Spur Highway. Daniels Lake is also a natural lake, and is entirely within private land ownership (Figure 1).

**D. Project Size (Acres Affected)**

1. Developed/residential - 0 acres
2. Industrial - 0 acres

3. Open space/Woodlands/Recreation - 0 acres
4. Wetlands/Riparian - Stormy Lake covers 403 surface acres, has a maximum depth of ~50 feet, and a volume of ~6,000 acre-feet. Daniels Lake covers 621 surface acres, has a maximum depth of ~50 feet, and a volume of ~12,237 acre-feet (Figures 3 and 4).
5. Floodplain - 0 acres
6. Irrigated Cropland - 0 acres
7. Dry Cropland - 0 acres
8. Forestry - 0 acres
9. Rangeland - 0 acres

**Figure 1. Map of Stormy and Daniels Lake Area**



Figure 2. Stormy Lake Bathymetry Map

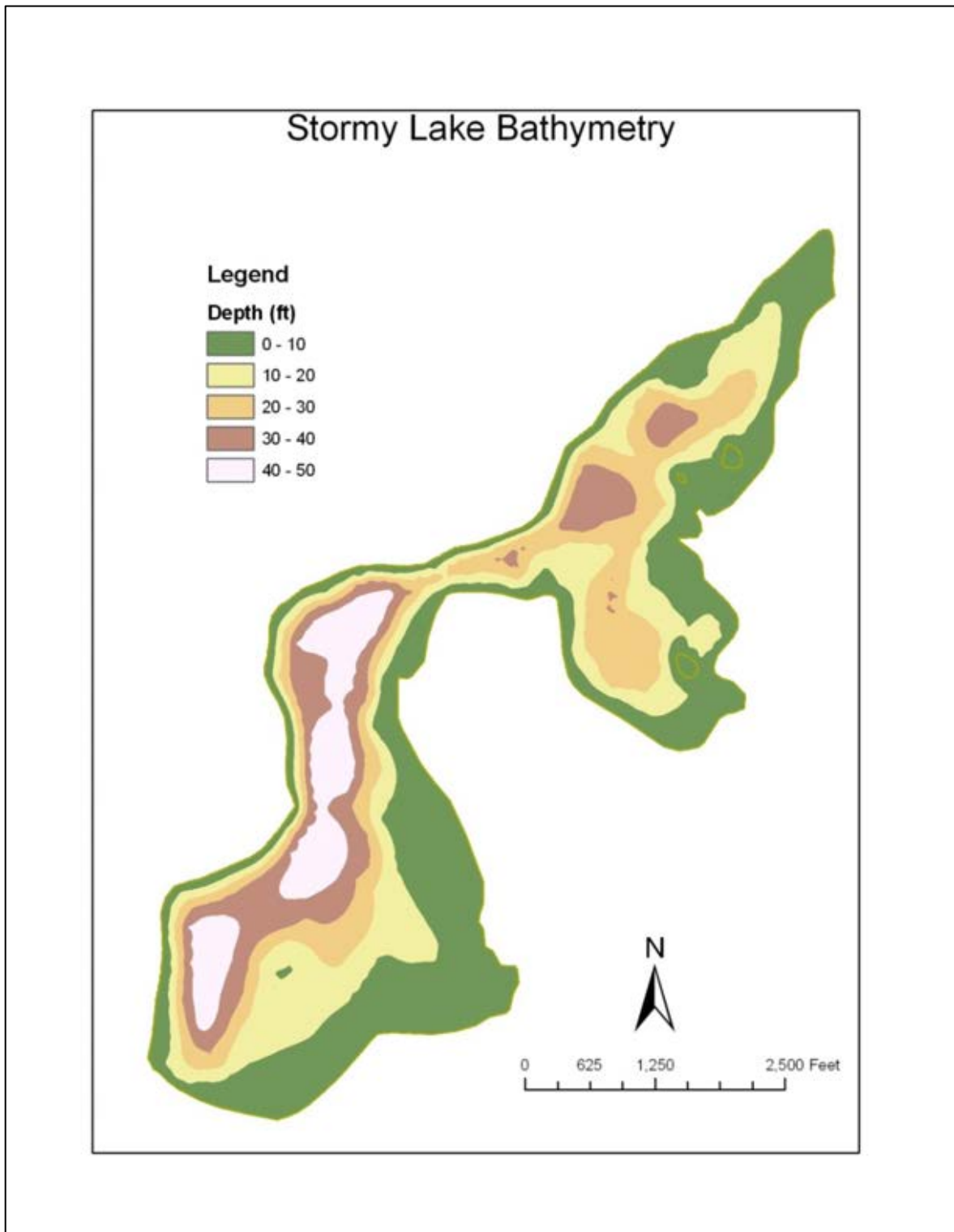
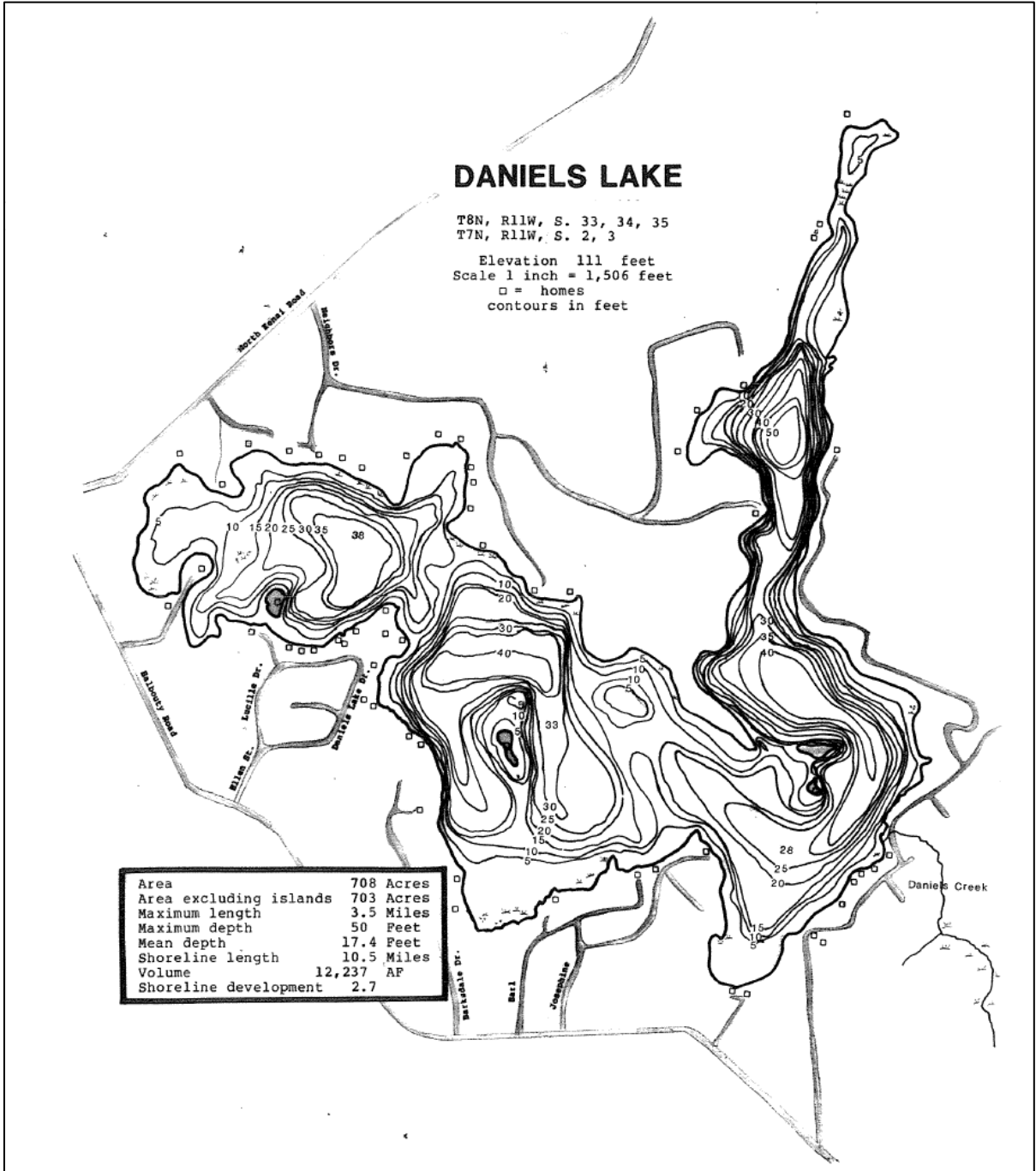


Figure 3. Daniels Lake Bathymetric Map





## E. Summary and Purpose of the Proposed Action

### 1. Background

#### a. Elodea Traits

Elodea is a submerged aquatic plant within the Hydrocharitaceae or waterleaf family. *Elodea canadensis* is known by the common name Canadian waterweed in North America, while *E. nuttallii* is known as Nuttall's waterweed (Josefsson 2011, Bowmer et al. 1995). Elodea grows in still or slow-moving neutral or alkaline waters with reduced iron and bicarbonate available as carbon sources. *Elodea nuttallii* is very similar to *E. canadensis*, but has shorter and narrower leaves that are bent and folded along the midrib. *Elodea nuttallii* is generally smaller and paler green with more branches than *E. canadensis* (Figure 4). Characteristics often overlap making the species difficult to distinguish. Hybrids with intermediate characteristics occur naturally between the two species (Catling and Wojtas 1985, Cook and Urmi-König 1985). Elodea historically has had a confused classification; currently five distinct species are recognized globally (Bowmen et al. 1995, Cook and Urmi-König 1985). Growth forms (phenotypes) in native versus introduced ranges can vary considerably in terms of leaf morphology and lateral shoot number in *E. nuttallii* (Thiebaut and Di Nino 2009).



**Figure 4.** Example of two specimens, *Elodea canadensis* (left) and *Elodea nuttallii* (right), displaying clear morphological differences. Photo by Paul Evald Hansen (Josefsson 2011).

The life history traits of these two species are similar (Barrat-Segretain et al. 2002). Both species are resistant to varying water current rates and have high regeneration (regrowth into viable plants) and colonization ability by fragments (establishment in sediment). In experimental tests, both species were shown to withstand strong current and survive long distance dispersal, increasing invasion capabilities (Barrat-Segretain et al. 2002). Few invertebrate species find either species to be palatable.

Reproduction is primarily vegetative. Elodea readily breaks into transportable fragments which root in sediments. Fragments can spread in water and by birds such as geese and swans, although these propagules do not withstand drying (Barnes et al. 2013, Sand-Jensen 2000). Plants are dioecious with separate male and female plants. Elodea is tolerant of cold water and can survive freezing, with documented rapid invasion as far north as northern Finland (Heikkinen et al. 2009, Sand-Jensen 2000) and Norway (Rorslett et al. 1986). Flowering is uncommon, with few records of ripe seed (Bowmen et al. 1995). Elodea has high light requirements and occurs primarily in clear waterbodies with low or slight current. Elodea is not able to use the C4 photosynthetic pathway like many aquatic invaders, but is a facultative  $\text{HCO}_3^-$  species (Raghavendra and Sage 2011). In alkaline conditions, elodea is able to use bicarbonate as a carbon source either directly by converting bicarbonate into carbon dioxide by acidification of the cell walls (Bowmen et al. 1995). Elodea, when biomass levels are high, can cause primary productive to decline (Rorslett et al. 1986).

#### b. Elodea Distribution

*Elodea canadensis* distribution in North America includes northern portions of the US and southern Canada excepting southern Alberta and southwestern Saskatchewan. Distribution is highest in parts of Quebec, the

St. Lawrence Valley, the Great Lakes region, southern British Columbia, and the Pacific West Coast. *Elodea nuttallii* distribution is similar but is more common further south (Bowmen et al. 1995, Catling and Wojtas 1985). *Elodea canadensis* aggressively invaded European waterways in the 19th century after it was first recorded in 1876 in an Irish pond (Josefsson 2011). Although much of Europe has seen a population decline, invasion continues at high rates in Scandinavia, northern Europe, parts of Asia and Africa, Australian, and New Zealand (Josefsson 2011, Bowman et al. 1995). *Elodea nuttallii* was recorded as early as 1914 although specimens were often incorrectly identified as other aquatic species. This species has been observed to displace *E. canadensis*, possibly due to its ability to tolerate more turbid and nutrient-rich or polluted waters (Josefsson 2011, Bowman et al. 1995).

*Elodea* species are absent from northern Canada including the Yukon and northern British Columbia, displaying a sizeable gap in distribution between confirmed locations in Alaska and the northernmost other known locations in North America. The only confirmed locations in Alaska prior to 2010 were Eyak Lake near Cordova in 1982 and Chena Slough near Fairbanks in 2009. Extensive floristic surveys across the state have taken place for over 100 years. The University of Alaska Fairbanks herbarium (ALA) includes over 1500 aquatic plant specimens entered in the Arctos database for Alaska, only two of which are elodea (the specimens from Eyak Lake and Chena Slough) (Wurtz et al. 2013). *Elodea* has since been found in other locations near Cordova, in three lakes in Anchorage, and in Stormy and Daniels Lakes on the Kenai Peninsula.

*Elodea* is currently considered not native to Alaska, due to limited distribution, sparse herbarium records, and published literature on aquatic invasives identifying elodea as non-native within the state (Wurtz et al. 2013). At this time, elodea is commonly used as an aquarium plant and is readily available in pet stores. *Elodea* is also used in college and high school biology labs for classroom experiments in plant cellular structure, living protoplasm, respiration, photosynthesis and other physiological processes (Catling and Wojtas 1985). The introduction to Chena Slough is likely the result of an aquarium dump at a point at Plack and Repp Roads near Fairbanks, as the population is dense below this point, but nonexistent above (Wurtz et al. 2013).

Suitable habitat for elodea may increase in response to global climate change resulting in physical and chemical changes to freshwater systems. Predictive bioclimatic models of elodea suggest that elodea will continue to aggressively colonize even further north in Europe (Heikkinen et al. 2008). *E. canadensis* shows high competitive ability compared to other invasive aquatic species including Brazilian waterweed (*Egeria densa*) and oxygen weed (*Lagarosiphon major*) in a variety of low to high temperature conditions and varied light availability (Riis et al. 2012).

#### c. Kenai Peninsula Population

Invasive freshwater plants were not known to occur on the Kenai Peninsula until September 2012, when elodea (*Elodea* Michx. spp., hereafter “elodea”) was incidentally found while Stormy Lake was being treated with rotenone for northern pike. Shortly thereafter, the Alaska Department of Fish and Game (ADF&G) surveyed the distribution of elodea in Stormy Lake, detecting it at ~ 20% of 150 rake throws, mostly at 7-9 foot depths (Figure 5). In October, ADF&G and the USFWS Kenai Fisheries Office conducted windshield surveys of nine other lakes: Salamatof, Longmere, Island, Sport, Scout, West Mackey, East Mackey, Wik and Daniels. A single strand of *Elodea* was detected in Daniels Lake at that time. In February 2013, agency staff surveyed Daniels Lake by augering through the ice at 25 sites (3 holes per site) distributed systematically around the 10-mile perimeter; elodea was detected at 2 sites adjacent to each other on the southern shore (Figure 6). Photos of the Stormy and Daniels Lakes surveys are found in Appendix 1.

In addition, Vogel, Johnson, and Longmere Lakes were surveyed in 2005 but no exotic aquatic plants were found (Pfauth & Sytsma 2005) At this time, elodea distribution is thought to be constrained to Stormy and Daniels Lakes, although it may occur in other water bodies on the Peninsula. Genetic analysis of samples from Stormy and Daniels Lakes indicate that both populations originated from a hybrid between *E. canadensis* and *E. nuttallii* (Dr. Donald H. Les, University of Connecticut, pers. comm.).

#### d. Ecological and Economic Effects

Elodea is a particularly injurious aquatic perennial. Elsewhere in North America, it has compromised water quality, grown so abundantly that boat traffic is hindered, reduced dissolved oxygen, and severely impacted native fisheries. Elodea is also insidious, in that only a plant fragment is needed to infest a water body because it reproduces vegetatively. The connected waterways of the Kenai Lowlands, where Stormy and Daniels Lakes lie, could potentially support large infestations of elodea if plant fragments are transported to new locations. Inflow and outflow of the known infested lakes are a concern as plant fragments may spread to adjacent water bodies, and from there to the entire wetland complex of the eastern Kenai Peninsula. Likely initial vectors on the Kenai Peninsula are aquaria and discarded commercial lab kits. However, as elodea becomes more established, motor boats, anchors, fishing gear, and float planes will become the greater risk. The sooner elodea is eradicated from Stormy and Daniels Lakes, the more likely it is that other water bodies on the Kenai Peninsula will remain free of elodea.

Elodea can develop into dense, monospecific stands that prevent light from reaching other species. These dense stands limit water movement as well. Many stands experience 5-6 year growth cycles, possibly related to iron availability and depletion cycle, then collapse and cause oxygen depletion with massive amounts of decaying vegetation (Josefsson 2011). Chemical composition, pH, and oxygen level are all affected by elodea infestation, thereby affecting fish, amphibian, and invertebrate populations in the waterbody. Elodea can impede recreational activities such as fishing, boating, and swimming. Fish populations have crashed in areas in Europe with high elodea population. Elodea, along with other non-native aquatic plants, has affected Chinook (king) salmon spawning rates by reducing spawning habitat in California (Merz et al. 2008). Elodea can clog water intake pipes at hydropower and industrial plants, or even cause scrape damage to boats in calcium encrusted stands (Josefsson 2011). In some cases, submerged aquatic vegetation communities with a mixture of non-native and native species may remain stable or even have natives increase over time, and waterfowl communities may show positive response to invaded waters (Rybicki and Landwehr 2007).

Elodea and other aquatic invasive species can reduce property values for landowners on infested lakes. Policies with successful invasion prevention have significant benefits to lakefront properties and community members. A study in New Hampshire determined 21-43% decline in property values by the presence and increase in variable milfoil, which can clog waterbodies, crowd out native aquatic species, and reduce recreational activities like boating and swimming (Halstead et al. 2003). In a study in Wisconsin on 170 lakes infested with Eurasian watermilfoil, property values were reduced by 8-13%, and spread rate increased due to the number of lakes infested (Horsch and Lewis 2009). A similar study in Vermont also with Eurasian watermilfoil showed a 1%-6% decline in property values (Zhang and Boyle 2010).

#### e. Treatment Methods

Pending the results of surveys by the Kenai Fisheries Office and Kenai National Wildlife Refuge of other water bodies on the Kenai Peninsula in 2013, we continue to assume that the long-term goal is to eradicate elodea from Stormy and Daniels Lakes, beginning in 2013 with diquat and/or fluridone treatments. In the interim, planning for public outreach and agency monitoring is already underway to minimize spread during the summer of 2013. The mandate to eradicate infestations at Stormy and Daniels Lakes is not clear until a more comprehensive survey of other water bodies on the Kenai Peninsula is completed. If elodea is found to occur in many lakes and waterways around the Kenai Peninsula, then eradication of populations in these two lakes will not address the overall invasion risk of elodea. If elodea is only found in these two lakes, complete eradication is the best preventative approach to eliminate future spread.

A key measure in preventing elodea spread is to inform the media, schools, and public about the risk associated with dispersal and spread. Restriction of movement of boats, fishing gear, or other vectors between waters could help in preventing spread, along with disinfection of gear (Josefsson 2011).

Elodea is difficult and expensive to eradicate. The only economical, safe, and effective methods of controlling elodea are draining and drying the channel or waterbody, application of herbicides, or introducing herbaceous fish (grass carp) (Josefsson 2011, Bowman et al. 1995). Mechanical methods, such as cutting and

draglines, are not effective as they break up the plant and cause it to spread to new areas. Covering methods, such as tarping the sediment or covering live plants, may be effective in small areas (CAPM 2004). Herbicides may require a long contact time for effective control and multiple applications. Elodea responds to a limited number of pesticides, including fluridone, diquat, terbutryne, cooper sulphates or chelates of copper (which also inhibits algal growth), and paraquat (Bowmen et al. 1995). The most effective herbicides have been found to be fluridone and diquat. In Stormy and Daniels lakes, herbicide control of elodea is the preferred method to achieve eradication and prevent further spread. Physical or mechanical controls options are limited as small fragments will spread readily throughout the lakes and connected waterways.

Growth suppression of elodea infestations in the nearshore littoral zone (<10' depth) may be accomplished with diquat (Reward™, hereafter "Reward") to minimize plant fragmentation and decrease the likelihood of further spread both within Daniels and Stormy Lakes, and to lakes elsewhere on the peninsula. Diquat is a nonselective, contact herbicide that is best applied in the spring when plant biomass and turbidity are low. Consequently, diquat will be applied in early summer either by underwater boom or spot treatment depending on abundance. The distribution (and depth) of elodea in Daniels Lake will be better surveyed in the nearshore littoral zone by boat as soon as the ice goes out and water clarity is good. At our proposed maximum application rate of 2 gallons per surface acre, the cost for diquat is \$225 per surface acre.

Fluridone (Sonar™, hereafter "Sonar") is a chemical that selectively kills elodea at low application rates and has low toxicity to fish. Fluridone is expensive (\$750 per surface acre) and requires being maintained for an extended period of time. Funds and time for public scoping may not be possible by summer 2013. Titration studies of Sonar on elodea samples from Stormy and Daniels Lake are currently underway by SePRO Corporation (<http://www.sepro.com/default.php>). Results of titration studies will be applied to determine minimum recommended application rates for fluridone in local conditions.

The elodea population in Stormy Lake is extensive with high biomass. Depending on funding for chemical treatment, a dual approach first with diquat to reduce biomass and then with fluridone to kill the plant may be applied. Application of diquat in 2013 will reduce biomass, followed by application of fluridone in 2013 and 2014 to eradicate. This two-chemical approach to first reduce biomass with diquat then to kill the plant with fluridone has been used successfully in the Lower 48 (Dr. Lars Anderson, USDA Agricultural Research Service and University of California-Davis, pers. comm.). Hand pulling by divers after pesticide treatment may be used to remove any remaining rooted stems.

The population in Daniels Lake appears to be less extensive than in Stormy Lake. A comprehensive survey of Daniels Lake will take place in late May 2013 to obtain precise location and biomass information for elodea locations in the lake. Treatment for Daniels Lake, depending on funding, may include application of diquat or fluridone in smaller amounts in locations of elodea occurrence.

In the short-term (2013), elodea suppression in these two target lakes will greatly decrease the likelihood of further spread of elodea both within these lakes and to uncontaminated lakes elsewhere on the peninsula. This containment action buys us time to make an informed decision about further efforts to completely eradicate elodea from the Kenai Peninsula. Over the longer term, eradicating elodea from these known populations will curtail future problems associated with elodea infestations. The cost associated with 1 to 3 years of treatment, with follow up monitoring, is ultimately much lower than the economic and ecological costs of allowing elodea to become permanently established on the Kenai Peninsula.

A decision tree (Appendix 2) illustrates the funding decision process for treatments in both lakes in 2013. If elodea is not widespread on the Kenai Peninsula (determined by surveys in early summer 2013), Stormy and Daniels Lakes will be treated. If sufficient funding is available (in the \$340,000 range), fluridone will be applied to both lakes. If less funding is available (in the \$80k range), Stormy Lake will be treated with fluridone and Daniels Lake will be treated with diquat. If even less funding is available (in the \$40k range), an option is to close Stormy Lake to prevent spread and treat Daniels Lake with fluridone, or to use diquat in both lakes if Stormy Lake remains open for the 2013 season.

Figure 5. Stormy Lake Survey Map

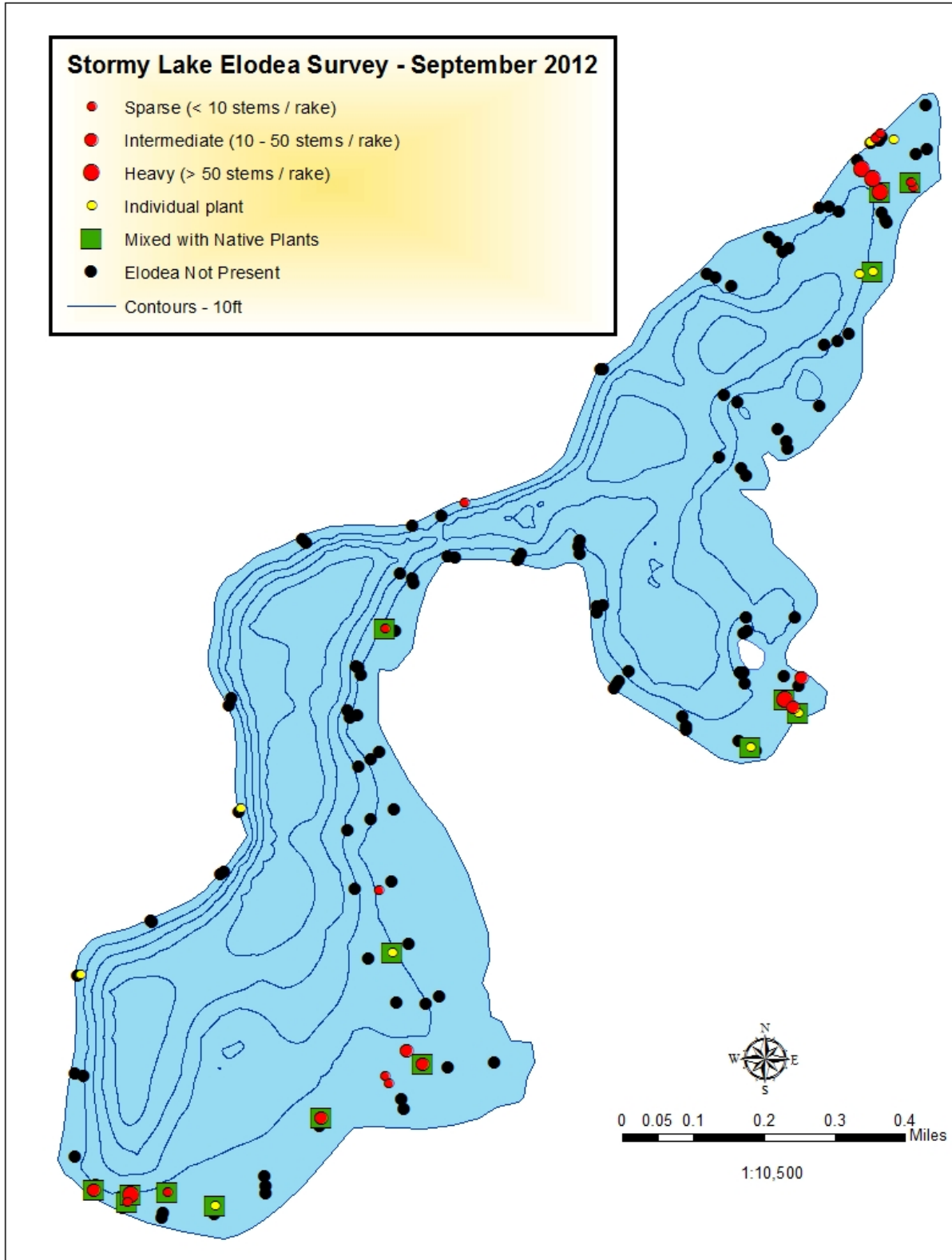
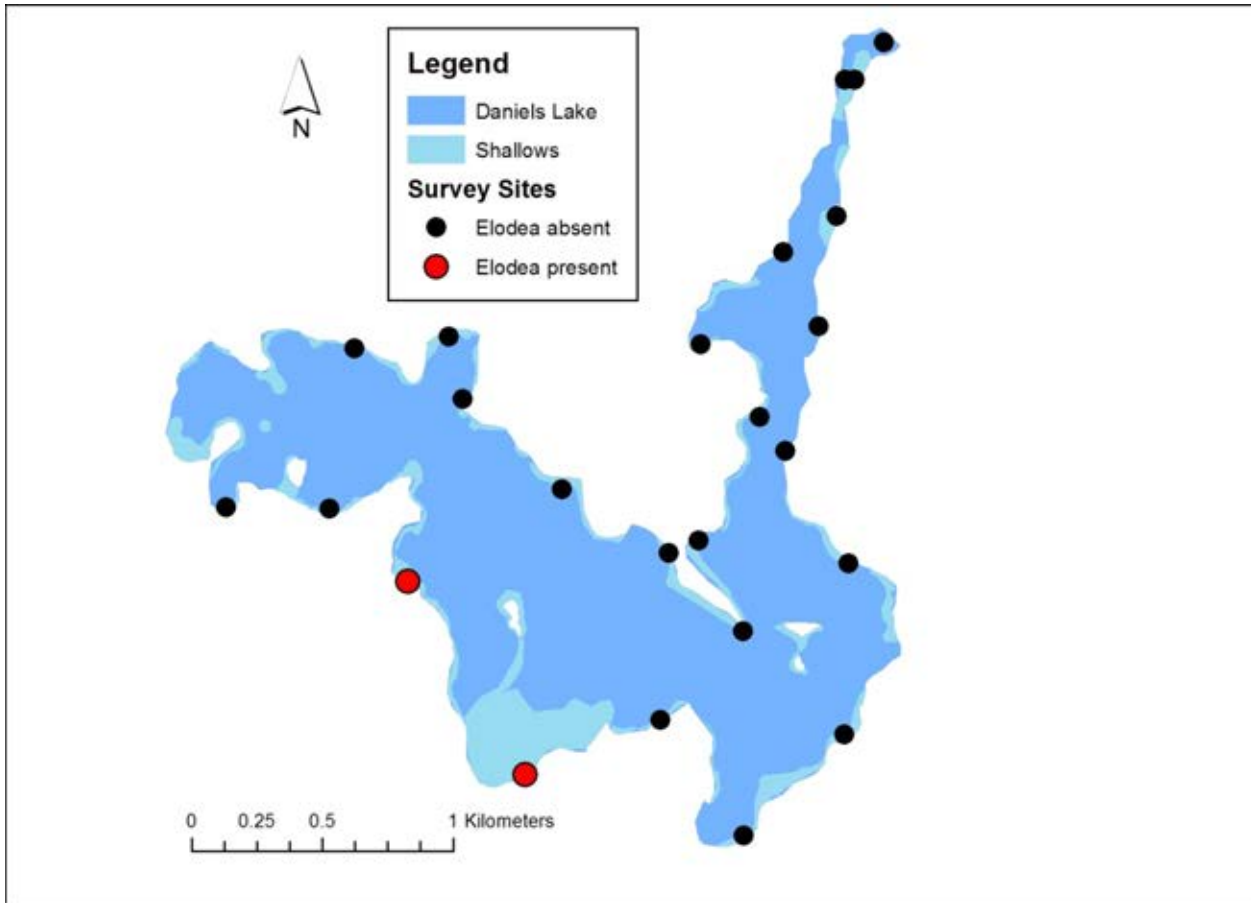


Figure 6. Daniels Lake Survey Map



## 2. Purpose

The purpose of the proposed action is to reduce the biomass or entirely eradicate the elodea population from both Stormy Lake and Daniels Lakes.

## 3. Proposed Activities

The proposed activity is treating Stormy and Daniels Lakes with the herbicides fluridone (commercially available as Sonar) and diquat (commercially available as Reward) to eradicate or reduce the biomass of the invasive aquatic elodea plant population in both lakes. The ultimate goal is eradication, although biomass reduction may be necessary in the first years of treatment. Treatments will be restricted to Stormy Lake and Daniels Lake perimeters, and may only be applied to specifically designated locations within the lakes.

Treatment strategies will differ between the lakes. Stormy Lake has an extensive population with higher biomass. The elodea populations are distributed around the lake perimeter. Daniels Lake has a more restricted population. Treatments will be specifically formulated to maximally affect either population, will be applied at minimal doses required and in minimal locations necessary.

Both fluridone and diquat are rated E for Excellent, with success rates exceeding 95%, in terms of control potential for elodea species (DiTomaso et al. 2013). Treating Stormy Lake and Daniels Lake during the growing season (June through September) is preferred because plants are more biologically active, aiding

uptake of the pesticide; the pesticides are more effective at warm temperatures; and upcoming fall turnover of the lake would help disperse the pesticides to deep areas.

Our preference is to apply the initial treatment of either herbicide shortly after ice-out when water clarity is good, turbidity is low, water volume is low, and plants are actively photosynthesizing. However, Fluridone can be applied at any time that Elodea is photosynthesizing, which appears to be year-round. Unlike most other native submerged aquatic plants, Elodea does not completely senesce. In February 2013, when we sampled Elodea through two feet of ice and snow cover in Stormy and Daniels Lakes, it was obvious that Elodea was green, vibrant and photosynthesizing under the ice. Similarly, Pedlow et al. (2006) effectively treated watermilfoil in a Michigan lake with a whole-lake treatment of low-dosage fluridone, first applied in October and subsequently boosted in November, with herbicide residuals maintained through the winter. We believe this is a viable alternative if permits are not available until late in summer 2013.

During treatment, signage will be placed at all access locations to Stormy Lake in compliance with all applicable legal requirements related to the fluridone or diquat treatment. All residents of Daniels Lake will be notified directly in compliance with all applicable legal requirements related to treatments.

a. Fluridone (Sonar)

Fluridone works absorption through leaves, shoots, and roots of susceptible plants. Fluridone interferes with the synthesis of RNA, proteins, and carotenoid pigments in plants, and disrupts photosynthesis of targeted plants. Production of carotene is inhibited, preventing carbohydrate formulation necessary to sustain the plant. Fluridone controls a broad spectrum of annual grass and broadleaf weeds, but not algae (Bartels et al. 1978, Berard et al. 1978, McCowen et al. 1979, Marquis et al. 1981). Fluridone is a tan to off-white odorless crystalline solid and is chemically formulated as 1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridinone (Bartels et al. 1978, McCowen et al. 1979).

Fluridone has been field tested on a variety of invasive or non-native aquatic plants including salvinia (*Salvinia* spp.), bladderwort (*Utriculata* spp.), Eurasian watermilfoil (*Myriophyllum spicatum*), coontail (*Ceratophyllum demersum*), pondweeds (*Potamogeton* spp.), cattail (*Typha* spp.), horsetail (*Equisetum* spp.), duckweed (*Lemna* spp.), fanwort (*Cabomba caroliniana*), vallisneria (*Vallisneria* spp.), water hyacinth (*Eichornia crassipes*), hydrilla (*Hydrilla* spp.), and elodea (*Elodea* spp. (McCowen et al. 1979). Fluridone did not affect water quality parameters such as pH, dissolved oxygen, color, dissolved solids, hardness, nitrate nitrogen, total phosphates, and turbidity (McCowen et al. 1979). Because fluridone does not work on algae, ponds or waterbodies with high algal concentrations should not be treated with this herbicide as the algal coating on elodea can prevent herbicide absorption. Field tests in mixed invasive and native submerged aquatic vegetation showed reduction in invasive populations with native plant cover retention of approximately 70% (Madsen et al. 2002). Treatments of Michigan lakes resulted in drastic reductions in invasive Eurasian watermilfoil, increases in native submerged aquatic vegetation, and increases in size and abundance of native fish populations (Schneider 2000).

Sonar by SePRO Corporation is a commercially available aquatic herbicide used to selectively manage undesirable aquatic vegetation in freshwater ponds, lakes, reservoirs, rivers, and canals. Sonar is currently approved for use in Alaska by the AK Department of Environmental Conservation in five different formulations: two aqueous suspensions known as Sonar AS (U. S. Environmental Protection Agency [USEPA] USEPA Registration Number 67690-4) and Sonar Genesis (USEPA Registration Number 67690-54), and three time-released pellet forms known as Sonar Q (USEPA Registration Number 67690-3), Sonar PR Precision Release (USEPA Registration Number 67690-12), and SonarONE (USEPA Registration Number 67690-45). Based on our current knowledge of water quality parameters and Elodea distributions, SonarONE (pellet) and Sonar Genesis (liquid) are the preferred products for treating Stormy and Daniels Lake.

Sonar products may be applied to an entire water body (whole-lake) or on smaller infestations within a water body (partial-lake). In the former case, fluridone is generally applied as a liquid by boat through surface or underwater drip equipment depending on the size and distribution of necessary treatment areas. In the latter case, fluridone is often applied as time-release pellets. A targeted, partial-lake treatment will result in less herbicide to the lake, reduced treatment costs, and fewer non-target impacts. In both cases, application will take place under appropriate conditions for boating, avoiding conditions of high wind, water flow, or wave action. The herbicide will be applied following all directions on the EPA approved label and will not exceed the maximum cumulative concentration of 150 ppb.

Fluridone will be applied to Elodea infestations in Stormy and Daniels Lake through either partial-lake or whole-lake treatment depending on infestation size and frequency of occurrence of Elodea. Based on our knowledge at the time this document was prepared, we believe that Stormy Lake will require whole-lake treatment and Daniels Lake will only require a partial-lake treatment. However, this assessment is subject to change pending surveys that are planned for Daniels Lake after the ice goes out. Currently, we expect to maintain concentrations in the range of 5-15 ppb for 6—10 weeks during the first season's application. We also expect to treat a second season for complete eradication. In addition, we are working with SePRO to determine the optimal treatment concentration based on laboratory studies being conducted in Colorado and North Carolina on Elodea samples taken from Stormy Lake. One possible outcome already discussed with SePRO is combining an initial treatment with a liquid formulation of fluridone (for rapid uptake) with a subsequent treatment of pelleted fluridone (to ensure that concentrations remain at lethal dosages). Lastly, if Elodea is detected in out-flowing streams below either of the two lakes, a one-time application of fluridone in pelleted form at a rate of 5—8 ppb is likely.

Any USEPA approved pesticides has undergone extensive testing to determine toxicity level through acute (high doses for short periods of time) and chronic (long term exposure) studies on animals (USEPA 1986). Sonar has been tested in both acute and chronic studies, as well as studies to examine genetic, cancer, and reproductive effects. Sonar was not shown to result in the development of tumors, adverse reproductive effects or offspring development, or genetic damage. Sonar has been tested extensively on target aquatic invasive plants, as well as in long-term residue monitoring studies in treated waters. Sonar is labeled with the signal word "caution" by the USEPA on the label, indicating a level of toxicity lesser than those labeled with either "danger" (more toxic) or "poison" (most toxic).

The USEPA has approved Sonar's application in water used for drinking as long as residue levels do not exceed 0.15 parts per million (ppm) or 150 parts per billion (ppb). One ppm can be considered equivalent to approximately one second in twelve days or one food in two hundred miles. Sonar applications can be made within one-fourth mile (1,320 feet) of a potable water intake. This treatment concentration is well below the 0.15 ppm (150ppb) allowable limit in water used for drinking (USEPA 1986). Human contact to fluridone may be through swimming in treated waters, drinking water from treated waters, by consuming fish from treated waters, or by consuming meat, poultry, eggs, or milk from livestock that were provided water from treated waters. Stormy and Daniels Lake have no commercial agricultural use, so exposure through livestock is unlikely. There are no USEPA restrictions on the use of fluridone-treated water for swimming or fishing when used according to label directions (USEPA 1986).

The maximum non-toxic dose is characterized by the "no-observed-effect-level" or NOEL for pesticides. The dietary NOEL for fluridone (the highest dose at which no adverse effects were observed in laboratory test animals fed Sonar) is approximately 8 milligrams of Sonar per kilogram of body weight per day (8mg/kg/day). A 70-kg (150 lb.) adult would have to drink over 1,000 gallons of water containing the maximum legal allowable concentration of Sonar in potable water (15 ppm) for a significant portion of their lifetime to receive an equivalent dose. A 20-kg (40 lb.) child would have to drink approximately 285 gallons of Sonar-



treated water every day to receive a NOEL- equivalent dose. The risk therefore is negligible even if a human were to accidentally ingest water directly after Sonar treatment. As Sonar is only applied intermittently and in limited areas, and because it disappears from the environment, continuous exposure over a lifetime for humans, mammals, and other animals is improbable.

Fluridone has been tested for acute and chronic toxicity, as well as reproductive effects, on mammals (rats, mice, guinea pigs, rabbits, dogs), birds (bobwhite quail, mallard duck), insects (honey bee, amphipods, daphnids, midge, chironomid), earthworms, fish (fathead minnows, catfish, mosquitofish, rainbow trout), and other aquatic animals (Hamelink et al. 2009, Kamarianos et al. 1989, Muir et al. 1982, McCowen et al. 1979). Exposure of test animals dermally (skin contact) has shown minimal toxicity to mammals by acute, concentrated contact. Chronic dermal exposure in mammals showed no signs of toxicity and slight skin irritation. Mammals were shown to excrete fluridone metabolites within 72 hours of varying doses of up to 1400 ppm/day (McCowen et al. 1979). A dietary NOEL was established for birds that may feed on aquatic plants or insects in treated waters. The risk to birds via diet was considered negligible. The acute median lethal concentrations of fluridone were 4.3 +/- 3.7 mg/L for invertebrates and 10.4 +/- 3.9 mg/L for fish. Fish in treated ponds have shown no fluridone metabolites after treatment (Kamarianos et al. 1989). Chronic studies showed no effects on daphnids, midge larvae, fathead minnows, or channel catfish and rapid rates of metabolic excretion (Hamelink et al. 2009, Muir et al. 1982). Insects that fed on bottom sediment had higher rates of fluridone intake and persistence than others (Muir et al. 1982). Honeybees and earthworms were not considered particularly sensitive to fluridone, even when directly dusted or placed in treated soil.

Fluridone has low bioaccumulation potential in fish, bird, or mammal tissues. In the case of Stormy Lake, most fish have been removed through the application of rotenone in September 2012. Irrigation of crops using water treated with fluridone lead to only trace amounts detected in forage crops. Livestock consumption of Sonar-treated water resulted in negligible levels of Sonar in lean meat and milk. Sonar manufacturer recommendations indicate the livestock can be watered immediately from Sonar-treated water. The tolerance for milk is the same as for water (0.15 ppm).

Fluridone is removed from treated water by degradation by sunlight, adsorption to sediments, and absorption by plants. In partially treated water bodies, dilution reduces the level of the pesticide more rapidly following application. In field studies, fluridone (various formulations) decreased logarithmically with time after treatment and approached zero detectable presence between 64 and 69 days after treatment (Langeland and Warner 1986). In other studies, fluridone levels decreased rapidly to a value below detection limits after 60 days in various parts of the water column, with a half-life 7-21 days or less (Kamarianos et al. 1989, Osborne et al. 1989, Muir et al. 1980, McCowen et al. 1979). Fluridone can persist in hydrosols (sediments) with a half-life exceeding one year (Muir et al. 1980).

Materials and equipment would be transported to the site by truck. Pesticide dispersal will be directly into the lake by DEC-certified applicators from outboard motorboats. Boats would be equipped with gas-powered pumping systems that would mix lake water with Sonar (if applied in liquid form) and sprayed on the lake surface. Alternatively, pelleted formulations will be distributed on the lake surface by an electric disk-driven spreader or a high-velocity blower applicator; in either case, the application rate will be calibrated. The target concentration for fluridone will be formulated by calculating area of infestation, volume of water in infested areas, and desired persistence time but is generally expected to be in the range of 5-15 ppb, with no single application exceeding 90 ppb and the sum of all applications in a given season not to exceed 150 ppb. For complete eradication, both lakes will have to be treated for at least two seasons.

SePRO Corporation, producers of Sonar products, is conducting titration tests with elodea samples from Stormy Lake in order to calculate optimal lethal concentrations. The goal is to maintain a lethal dosage in the eradication zone for 45-90 days. To ensure that concentrations are maintained, water samples will be collected from 2-4 sites in the target area, two subsamples per site at the mid and bottom depths. For whole-lake treatment (i.e., Stormy Lake), water samples will be collected every two weeks. For partial lake

treatment (i.e., Daniels Lake), water samples will be collected each week because of the increased dilution factor. All water samples will be collected using protocols established by, and sent by overnight delivery to, SePRO Corporation's analytical laboratory in Whitakers, NC for assays following techniques described by Netherland et al. (2002).

Applicators of Sonar will experience risks from exposure. Applicators must avoid breathing spray mist, or any contact with skin, eyes, or clothing. They must wash thoroughly with soap and water after handling and should wash exposed clothing before reuse. Sonar used according to label instructions minimizes risk to applicators. A fluridone Material Data Safety Sheet (MSDS) is available in Appendix 3, and a Sonar AS label is available in Appendix 4.

b. Diquat (Reward)

Diquat dibromide (diquat) is a general use, non-selective contact algicide, defoliant, desiccant, and herbicide. Herbicide uses include control of broadleaf and grassy weeds in non-crop and aquatic areas (USEPA 2002). Diquat is an organic solid of colorless or yellow crystals, or dark red-brown in water solution. Diquat is highly soluble in water. In the presence of strong oxidizers, diquat may pose a fire and explosion hazard. Diquat is absorbed by plant leaves where it interferes with cell respiration and prevents uptake of oxygen. Diquat is a quick-acting herbicide, causing injury only to the parts of the plant to which it is applied (Hayes and Laws 1990). Diquat is formulated as 6,7-dihydrodipyrido (1,2-a: 2',1'-c) pyrazinediium dibromide (Cochrane et al. 1994). Reward Landscape and Aquatic Herbicide (USEPA Registration No. 100-1091) contains the active ingredient diquat dibromide and is currently approved for use in Alaska by the AK Department of Environmental Conservation.

Diquat is considered a moderately toxic material, labeled with the USEPA signal word "warning" (USEPA 2002). Diquat exhibits low acute toxicity via oral and inhalation exposure, but has moderate to severe acute toxicity by dermal exposure. Humans drinking water containing diquat in excess of the maximum contaminant level (MCL) over many years could get cataracts. Diquat can cause eye irritation, and can cause serious burns and scarring of the cornea (Sax 1984). Diquat may be harmful to the gastrointestinal tract, kidneys, and liver of mammals, causing severe congestion and ulceration of stomach and gastrointestinal tract (Gosselin et al. 1984).

Diquat is not known to cause genetic changes and is therefore not considered a mutagen in acute tests with mice. Diquat does not cause tumors in rat studies both acute and chronic. Tests have been conducted on mice, rats, guinea pigs, rabbits, dogs, and cows (Cochrane et al. 1994, Hayes and Law 1990). Diquat causes cataracts in dogs and rats, and developmental effects in rats and rabbits (Cochrane et al. 1994). Oral diquat doses are metabolized mainly in the intestines with excretion in feces, in tests with rats, hens, and cattle. Minute traces (0.004 to 0.015% of oral doses) of diquat were found in cow milk, and cows are considered sensitive to diquat exposure. Diquat is considered moderately toxic to practically nontoxic to birds, depending on the species. In mallards acute toxicity (LD50 or lethal dose fifty in which half of the subjects are killed with that dose) was 564 mg/kg. For hens, oral LD50 was 200-400 mg/kg; for rats 120/mg/L, for mice 233 mg/kg, and 188 mg/L in rabbits. Chronic exposure at the 4-week no-observed-effect-level (NOEL) for increased relative liver weight in rats from dietary exposure to diquat was 7.2 mg/kg-day (Cochrane et al. 1994).

Diquat is slightly toxic to fish. The LC50 (lethal concentration fifty, in which half of the experimental subjects are killed when exposed to that concentration) was 12.3 ppm for rainbow trout and 28.5 in Chinook (king) salmon at eight hours, and 16 ppm at 96 hours for northern pike and 20.4 ppm for fingerling trout. Some species of fish may be harmed but not killed by sublethal levels of diquat, including suffering respiratory stress (yellow perch) (Bimber et al. 1976). There is no bioconcentration of diquat in fish. Diquat is toxic to

aquatic invertebrates, which display varying levels of sensitivity. Diquat has shown to be 300 more times toxic to amphipods than mayfly, with caddisfly, damselfly, and dragonfly less sensitive in that order (Nicholson and Clerman 1974, Wilson and Bond 1969).

The Maximum Contaminant Level (MCL) is 0.02 milligrams per liter (mg/L) or 20 ppb for diquat (USEPA 2002). Diquat residue studies suggest that diquat is not persistent in water, as it binds to suspended particles in the water, which are then taken up by plants. The half-life is less than 48 hours in water. Affected plants decompose and release diquat, which is then degraded by microbes, photodegraded by sunlight (within 1 to 3 weeks), or adsorbed to sediment particles. Adsorbed sediment diquat is also degraded by microbial activity, although diquat has been found in the bottom soil of pools and ponds four years after application. Adsorption rates are highest in loam, sandy clay loam, and sandy loam (Cochrane et al. 1994). Granular activated carbon can be used to remove diquat to below MCL.

A 14-day interval between treatment of water and use of treated water for domestic, livestock, or irrigation purposes is required (USEPA 2002). Swimming, fishing, and domestic animal watering should not be allowed for 14 days after application.

The pesticide will be applied by boat using the “bottom acre-foot method,” which uses weighted trailing hoses to inject the liquid herbicide into the lower portions of the water column to treat the submersed elodea (see attachment). This targeted delivery of the herbicide directly into the plant bed at the bottom of the lake (as opposed to the entire water column) results in less herbicide applied to the lake and reduced treatment costs. The target concentration for diquat will be formulated by calculating area of infestation, volume of water in infested areas, water temperature, and desired persistence time.

Applicators of Reward will experience risks from exposure. Applicators must avoid breathing spray mist, or any contact with skin, eyes, or clothing. They must wash thoroughly with soap and water after handling and should wash exposed clothing before reuse. Sonar used according to label instructions minimizes risk to applicators. Applicators must wear protective clothing when handling the concentrated produce to reduce skin exposure. Splashes should be immediately washed from eyes and skin. Applicators should avoid drift contact to skin or eyes. Breathing diquat spray or mist should also be avoided, and respiratory equipment is recommended. A diquat Material Data Safety Sheet (MSDS) is available in Appendix 5, and a Reward label is available in Appendix 6.

#### **4. Funding**

The proposed action will be supported primarily by funding through, and/or services of, the U.S. Fish and Wildlife Service; the Alaska Department of Natural Resources; the Alaska Department of Fish and Game, and the Kenai Peninsula Borough Assembly.

## PART II. ENVIRONMENTAL REVIEW AND COMMENTS

### A. Natural Environment

#### 1. Land Resources

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Soil instability or changes in geologic substructure?		<b>X</b>			
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce productivity or fertility?		<b>X</b>			
c. Destruction, covering or modification of any and unique geologic or physical features?		<b>X</b>			
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		<b>X</b>			
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?		<b>X</b>			

#### 2. Water Resources

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Discharge into surface or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			<b>X</b>		<b>2a</b>
b. Changes in drainage patterns or rate and amount of surface runoff?		<b>X</b>			
c. Alteration of the course or magnitude of flood water or other flows?		<b>X</b>			
d. Changes in the amount of surface water in any water body or creation of a new water body?		<b>X</b>			
e. Exposure of people or property to water related hazards such as flooding?		<b>X</b>			
f. Changes in the quality of groundwater?		<b>X</b>			<b>2f</b>
g. Changes in the quantity of groundwater?		<b>X</b>			

h. Increase in risk of contamination of surface or groundwater?			X		see 2a, 2f
i. Effects on any existing water right or reservation?		X			
j. Effects on other water users as a result of any alteration in surface or groundwater quality?			X		see 2f,2j
k. Will the project affect a designated floodplain?		X			
l. Will the project result in any discharge that will affect federal or state water quality regulations? (Also see 2a)			X		2l

**Comment 2a.** This project would intentionally introduce a pesticide to surface waters to kill an invasive plant. It is anticipated the impacts would be short-term. Fluridone (brand name Sonar, USEPA Registration Number 67690-4 for SonarAS) and diquat (brand name Reward, USEPA Registration Number 100-1091) are registered by both the USEPA and the Alaska Department of Environmental Conservation (ADEC) and are deemed safe to use to eradicate invasive aquatic plant species when applied according to label instructions.

The active ingredient in Sonar products is fluridone. The highest concentrations in the liquid formulations are in Sonar A.S at 41.7%; however, we expect to use Sonar GENESIS with a concentration of 6.3%. The pelleted formulations have a fluridone concentration of 5%. Regardless of formulation or application rate, we will not exceed 150 ppb cumulatively in one season.

The active ingredient in Reward Landscape and Aquatic Herbicide is diquat dibromide at 37.3%. The formulation for application would be liquid. The rate of dilution will be 50 gallons of diluent to 2 gallons of product. The rate of application will be 52 gallons per acre. Total acreage is anticipated to be 200 acres maximum, for a maximum total volume of 10, 400 gallons. No excess mixed product will be produced as product will not be mixed in advance or stored. Rather, product will only be mixed with lake water as part of the actual application process. There may be excess unmixed product (concentrate) which will remain properly stored.

Water quality is not expected to decrease by the application of either fluridone or diquat to Stormy or Daniels Lake. Application of fluridone may result in death of elodea, increasing decaying and dead biomass within the lake as the elodea plants break down. This may result in a temporary increase in organic material suspended in the lake, and a decrease in dissolved oxygen levels (McCowen et al. 1979). The level of algae within either lake may increase as a result of the decrease in elodea, although algal levels in both lakes are thought to be low. An increase in algae may reduce visibility within the lakes and decrease dissolved oxygen.

Water quality may increase with the reduction of the large biomass of elodea in Stormy Lake, and the expected increase in native submerged aquatic vegetation.

Past water quality information is available for Stormy Lake (Appendix 7). More recent water quality information will be available after monitoring post-rotenone application, from 2012 and 2013.

**Comment 2f:** No contamination of groundwater is anticipated to result from this project. The primary soil types in the Stormy and Daniels Lake area consists decaying organics (0-4 inches from the surface) overlaying

a silt and loam mixture (2-16 inches from the surface) and gravelly loamy sand/sandy loam (8-60 inches from the surface) with most soils classified as moderately to highly permeable (Van Patten 2005).

There are no concerns for fluridone contaminating potable groundwater supplies because of the inability of the pesticides to travel more than few inches through soil, binding ability to particles, few users down gradient, low quality aquifers near the surface, and no bedrock in the area.

Three subsurface water rights are found in the immediate area of Stormy Lake all belonging to ADNR (Appendix 8). No private wells are known to exist in the immediate area of Stormy Lake although two public use hand-pump wells are located about 200 feet from the lake. One is near the swimming beach parking lot by the southern lake basin and another is near the middle of the lake at a picnic/day use area. Neither well is operational as both are missing the pump handle. Because Stormy Lake water must travel through lake sediments, soil, and gravel to reach ground aquifers, and fluridone and diquat is known to bind readily with these materials, no contamination of ground water is anticipated.

Fifteen subsurface water rights are found near Daniels Lake with six adjacent to or within the 100 foot buffer zone around the lake perimeter (Appendix 9). As with Stormy Lake, water must travel through lake sediments, soil, and gravel to reach ground aquifers, and fluridone and diquat is known to bind readily with these materials, no contamination of ground water is anticipated.

**Comment 2j:** The existing sport fishery in Stormy Lake before northern pike infestation was for rainbow trout and arctic char. Following the rotenone treatment in September 2012, the lake will be restocked with native fish species. Sport fishing will be temporarily impacted by this project by restricting access to Stormy Lake potential for the entire season, and by restricting use of both lakes during and after pesticide treatment. After native fish are reintroduced to and have had time to fully recolonize Stormy Lake, the native fisheries should provide an increase in sportfishing opportunities over what currently exists.

Recreational contact (swimming, wading, etc.) or drinking of treated lake water would be discouraged with signage until the fluridone or diquat. This is expected to be restricted for fourteen days post-treatment. The Department would prefer that all such contact be avoided until the pesticide is no longer present based on lab results of water samples. This would eliminate any reasonable route for pesticide exposure and subsequent human health concerns.

**Comment 2i:** The treatment will be confined to Stormy Lake and Daniels Lake. The minimal treatment determined to be necessary for biomass reduction or eradication will be applied in accordance with accepted standards and the result of titration tests by SePRO Corporation for fluridone. Any waters discharging from the outlet creek and mixing with the Swanson River or Bishop Creek will result in a fluridone concentration below the 0.15 ppm threshold of acceptable levels, and below a 0.20 ppm threshold of acceptable levels for diquat. As required by state regulation, ADNR will submit a pesticide permit application to the Alaska Department of Environmental Conservation (ADEC) which must be approved prior to treating Stormy Lake and Daniels Lake with fluridone or diquat. In addition, the USFWS will acquire a permit for application of pesticide to Stormy Lake.

**3. Air**

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Emission of air pollutants or deterioration of ambient air quality? (Also see 13 c)			X		3a
b. Creation of objectionable odors?			X		3b

c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		X			
d. Adverse effects on vegetation, including crops, due to increase emissions of pollutants?		X			
e. Will the project result in any discharge which will conflict with federal or state air quality regulations.		X			

**Comment 3a:** Emissions from two and four-stroke outboard motors would be produced, but are expected to dissipate rapidly.

Dry powdered pesticide products pose the greatest airborne risk, mostly to the applicators, because they are in direct contact with undiluted product and product particulates can become airborne. To reduce exposure risk, powdered fluridone or diquat (if used) will be applied via a semi-closed pumping system that premixes the powder with lake water to form a slurry just prior to discharge from the boat, and applicators will adhere to the safety protocol suggested by Finlayson et al. (2010). This safety protocol, in addition to the use of PPE, utilizes a foam gasket to seal out pesticide dust that otherwise might escape from the pesticide container opening that allows a vacuum line to draw the pesticide powder into the pumping/mixing apparatus. Pesticide containers will only be opened in the boat and away from individuals not wearing PPE.

Fluridone and diquat are not volatilized and present no airborne or drift risk.

**Comment 3b:** Applicators will have the greatest potential contact with odors created by application of pesticides to water. However, as the product label recommends, they will wear respirators for protection. Any impacts caused by objectionable odors would be short-term and minor.

#### 4. Vegetation

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops and aquatic plants)?				X	4a
b. Alteration of a plant community?				X	4b
c. Adverse effects on any unique, rare, threatened, or endangered species?		X			
d. Reduction in acreage or productivity of any agricultural land?		X			
e. Establishment of spread of noxious weeds?		X			

f. Will the project affect wetlands, or prime and unique farmland?		X			
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**Comment 4a and 4b:** The desired outcome is eradication of elodea, which forms a significant portion of the submerged aquatic vegetation in parts of Stormy Lake. Elodea has been found growing either alone or with other aquatic species in Stormy Lake (see Figure 5). Fluridone is selective to certain species and would target elodea specifically. The aquatic plant community may shift back to one comprised entirely of native species. There will be parts of the lake that are not treated or that receive less pesticide. In these areas, native aquatic vegetation is expected to survive and produce propagules that will recolonize areas in which the elodea was been killed. There may be a time period while the elodea is decaying that light and dissolved oxygen may be reduced. As the plant continues to decay, water clarity and dissolved oxygen as well as nutrient levels is expected to return to normal water quality levels.

Elodea comprises a smaller proportion of the aquatic vegetation in Daniels Lake. Treatment by fluridone in areas with elodea will specifically target this species. Decayed biomass is expected to be lower in Daniels Lake. Treatment by diquat may affect non-target native species. Since only parts of the lake will be treated, propagules of native aquatic plants are expected to recolonize any areas where elodea has been eliminated. Reduction of biomass using diquat may create a more favorable environment in which native plants can compete with elodea, or may have no effect on native plant populations in the short term (Rybicki and Landwehr 2007).

Stormy Lake has one concrete ramp boat launch with an adjacent gravel parking lot that will serve as the project storage and operating base. Basing operations from the boat launch area should prevent trampling of vegetation around the lake. Daniels Lake access will be by private boat ramp provided by a lake owner which will prevent vegetation trampling on this lake.

In terms of physical damage to emergent vegetation, a large bed of emergent aquatic vegetation (bulrushes) occurs in the south basin of Stormy Lake that may require the use of an airboat or mud-buddy (specialized outboard) to apply the pesticide because the vegetation is too dense for a typical outboard boat to operate in. It is anticipated that the bulrushes will sustain some damage near the waterline which may result in visible boat swaths through the vegetation.

## 5. Fish and Wildlife

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Deterioration of critical fish or wildlife habitat?		X			
b. Changes in the diversity or abundance of game animals or bird species?			X		5b
c. Changes in diversity or abundance of nongame species?			X		5c
d. Introduction of new species into an area?		X			



e. Creation of a barrier to the migration or movement of animals?		X		
f. Adverse effects on any unique, rare, threatened, or endangered species?		X		
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?		X		
h. Will the project be performed in any area in which T & E species are present, and will the project affect any T & E species on their habitat? (Also 5f)			X	5h
i. Will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)		X		

**Comment 5b: Game Mammals:** Grizzly bears, black bears and wolves are found in the area but are not dependent on the lake for food although some salmon predation by bears likely occurs in the outlet creek. The project itself would have no significant impact on bears or wolves.

Ingestion of treated waters by terrestrial wildlife should also have no adverse effects because of the low pesticide concentration found in the lake water and the enzymatic action in the animal's digestive tracts.

There is a year-round distribution of moose at Stormy Lake. It is possible that moose may ingest water from the lake during the treatment period or feed on aquatic vegetation in the lake.

Adverse effects of drinking water are expected to be none for fluridone and insignificant for diquat on mammal species.

**Migratory waterfowl:** Waterfowl likely will be present during the proposed treatment and may be temporarily displaced from the Stormy Lake and Daniels Lake area, but the availability of other waters in close proximity to the project area should minimize any impacts.

Toxicity of fluridone or diquat to waterfowl and other birds is low. It is possible that birds may ingest treated water, consume fish or aquatic invertebrates that have been exposed to or affected by treated water, or land and dive in treated water. Ingesting or exposure treated water is unlikely to have effects as dispersal rates are rapid for either fluridone or diquat. Ingesting fish affected by pesticides will have low impact on birds, as fish do not bioaccumulate either pesticide. Ingesting affected invertebrates may introduce trace amounts of pesticides to bird digestive systems. Studies indicate that low amounts of pesticides, either fluridone or diquat, are metabolized and excreted by birds. It is important to note that nearly all of the cited examples in the Proposed Activities Section discussing fluridone and diquat effects on animals involved subjecting laboratory specimens to unusually high concentrations of pesticides that are far above concentrations used in aquatic plant control management uses. Based on this information we expect the impacts to birds to range from non-existent to short-term.

**Comment 5c:** Non-game species that might be present during this project include zooplankton, aquatic insects, wood frogs, some birds, and some small mammals such as coyotes, snowshoe hare, lynx, muskrats,

beaver, mink, otter, weasel, red squirrels, porcupine, flying squirrels, shrews, voles and domesticated dogs and cats.

Cook Inlet beluga whale is the only endangered species found in the area of Cook Inlet. No direct impacts to beluga whales are expected because Stormy and Daniels Lakes and their outlet creeks are not utilized by beluga whales.

**Invertebrates:** Micro- and macro-invertebrates may be affected by pesticides. Fluridone effects on aquatic macroinvertebrate populations vary but are expected to be low as most insects and earthworms are not sensitive to this pesticide. Macroinvertebrates show varying levels of sensitivity to diquat (Cochrane et al. 1994, Wilson and Bond 1969). Recent treatment of Stormy Lake with rotenone may have reduced zooplankton and macroinvertebrate populations already. As treatment will only be applied to sections of either lake, some zooplankton is expected to remain unaffected and repopulate the rest of the lake. The proximity of other local waterbodies makes recolonization of both lakes extremely likely in the event that micro- and macroinvertebrate populations are reduced.

Because of their short life cycles, good dispersal ability, and generally high reproductive potential, aquatic invertebrates are capable of rapid recovery from disturbance (Matthaei et al. 1996, Boulton et al. 1992, Pennack 1989, Anderson and Wallace 1984). Recolonization will include aerial dispersal of adult invertebrates from adjacent areas of the project area (e.g., mayflies and caddis flies).

**Amphibians:** Wood frogs are the only amphibians on the Kenai Peninsula and presumed to be common to the area and probably inhabit the area of Stormy and Daniels Lake. Wood frogs mate in the spring and their offspring quickly develop from egg to tadpole to frog. Adult frogs may be more resistant to any pesticide affects, although little published literature is available to examine amphibian effects of fluridone or diquat.

**Nongame mammals:** Mammals varying in size from coyotes to shrews could be present and drink treated lake water. Levels of toxicity to most animals subject to pesticide tests for either fluridone or diquat show that levels that greatly exceed the expected treatment dilutions would be necessary for any affects to nongame mammals. It is important to note that nearly all of the cited examples in the Proposed Activities Section discussing fluridone and diquat effects on animals involved subjecting laboratory specimens to unusually high concentrations of pesticides that are far above concentrations used in aquatic plant control management uses. Based on this information we expect the impacts to non-target organisms to range from non-existent to short-term.

**Comment 5h:** Cook Inlet beluga whale is the only endangered species found in the area of Cook Inlet. No direct impacts to beluga whales are expected because Stormy Lake, Daniels Lake, and their outlet creek are not utilized by beluga whales. Any pesticide that enters Cook Inlet via discharge from the Swanson River or Bishop Creek drainage will be below detectable limits and will pose no threat to fish, birds or mammals.

## B. Human Environment

### 6. Noise/Electrical Effects

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Increase in existing noise levels?			X		6a
b. Exposure of people to severe or nuisance noise levels?			X		6b

c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X			
d. Interference with radio or television reception and operation?		X			

**Comment 6a:** The noise generated from this project would result from the use of outboard motors during application of the pesticide. The noise generated from these activities would be short-term and minor.

**Comment 6b:** The greatest exposure to severe noise will be to the applicators who are operating the application boats and pumping equipment. These individuals will have access to ear protection during the application.

## 7. Land Use

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Alteration or interference with the productivity or profitability of the existing land use area?			X		7a
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		X			
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?		X			
d. Adverse effects on the relocation of residences?		X			

**Comment 7a:** Because the boat launch facility at Stormy Lake will be restricted to treatment team members only for the treatment period, and contact with treated water will be strongly discouraged (another ~2-4) weeks, ADNR revenue (user fees) could be lost that would have normally be generated by those utilizing the boat launch facility. The Stormy Lake boat launch and lake use may be restricted for the entire 2013 season, to prevent elodea spread, result in further losses to ADNR revenue through user fees.

## 8. Risk/Health Hazards

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event			X		8a

of an accident or other forms of disruption?					
b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?		X			
c. Creation of any human health hazard or potential hazard?			X		see 8a
d. Will any chemical toxicants be used?			X		see 8a

**Comment 8a:** The principal risk of human exposure to hazardous materials (fluridone and diquat) from this project would be to the pesticide applicators. To reduce exposure risk, all applicators would wear personal protective equipment (PPE) as stipulated by the diquat and fluridone product labels. The fluridone or diquat application will be supervised by someone who is currently certified by the Alaska Department of Environmental Conservation (ADEC) as a pesticide applicator with aquatic pesticide application certification.

Diquat and fluridone would be transported, handled, applied and stored according to the label specifications to reduce the possibility of human exposure or spill. Accidental spillage is a concern and a spill response plan has been developed, along with a general safety plan for all safety aspects of the project (Appendix 10).

**Comment 8c:** Although pesticides are widely used to control unwanted species, legitimate public concerns have been raised regarding health and human safety. As with any pesticide, direct exposure or consumption of pesticides can have harmful or sometimes fatal effects on humans. Diquat and fluridone are EPA-registered pesticides that have been approved for use by ADEC.

Any threats to human health during application (particularly to applicators) will be greatly reduced with proper use of safety equipment. People recreating in the area would not be exposed to the treatments because a temporary lake access closure would preclude them from the area. Public notification through news releases, signs, and ADNR personnel in the project area should be adequate to keep unintended recreationists from being exposed to waters during and after the treatment.

## 9. Community Impact

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Alteration of the location, distribution, density, or growth rate of the human population of the area?		X			
b. Alteration of the social structure of a community?		X			
c. Alteration of the level of distribution of employment or community or personal income?		X			
d. Changes in the industrial or commercial activity?		X			

e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?		X			
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**10. Public Services/Taxes/Utilities**

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Will the proposed action have an effect upon or result in the need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid water disposal, health, or other governmental services? If any, specify:			X		10a
b. Will the proposed action have an effect upon the local or state tax base and revenues?		X			
c. Will the proposed action result in need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or communications?		X			
d. Will the proposed action result in increased use of any energy source?		X			
e. Define projected revenue sources		X			
f. Define projected maintenance costs		X			

**Comment 10a:** The Alaska Department of Natural Resources, Division of Parks and Recreation administers the land containing the public accesses to Stormy Lake and the Division will be asked to collaborate with ADNR Division of Agriculture and US Fish and Wildlife Service to temporarily close the Stormy Lake access to public use during the treatment preparation, application, and follow-up (up to 14 days total), and possibly for the entire season to prevent spread of elodea to new areas. ADNR will work with property owners in Daniels Lake to prevent contact during and after the treatment period. As a precaution, signage discouraging human contact with treated waters would be posted until all waters are determined to be safe for human contact.

**11. Aesthetics/Recreation**

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open			X		11a

to public view?					
b. Alteration of the aesthetic character of a community or neighborhood?			X		11b
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings?			X		11c
d. Will any designated or proposed wild and scenic rivers, trails or wilderness areas be impacted?		X			

**Comment 11a:** Public access to Stormy Lake is on land owned by the Alaska Department of Natural Resources, Division of Parks and Recreation and the Kenai National Wildlife Refuge. Public access will be prohibited at Stormy Lake immediately before and during the treatment and contact with treated waters discouraged after treatment using appropriate signage and public notices.

**Comment 11b:** Daniels Lake property owners will be informed of treatment activities and an increase in treatment personnel in their community during the time of treatment. Daniels Lake property owners will be actively encouraged to participate in the entire process of the elodea project to remain informed about actions and timing.

**Comment 11c:** Removal of elodea may improve boating and angling quality at Stormy Lake, which could result in increased use. The benefits of eradicating this invasive plant population would outweigh any short-term social impacts associated with the actual pesticide treatment. Any aesthetic impacts would be short-term and minor and would be directly associated with the actual pesticide treatment and immediate aftermath.

**12. Cultural/Historical Resources**

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Destruction or alteration of any site, structure or object of prehistoric, or paleontological importance?		X			
b. Physical change that would affect unique cultural views?		X			
c. Effects on existing religious or sacred uses of a site or area?		X			
d. Will the project affect historic or cultural resources?		X			

### 13. Summary Evaluation of Significance

Will the proposed action, considered as a whole:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Have impacts that are individually limited, but cumulatively considerable? (A project or program may result in impacts on two or more separate resources which creates a significant effect when considered together or in total).		X			
b. Involved potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?				X	13b
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X			
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X			
e. Generate substantial debate or controversy about the nature of the impacts that would be created?	X			yes	13e
f. Is the project expected to have organized opposition or generate substantial public controversy?	X			yes	See 13e,f
g. List any federal or state permits required.					13g

**Comment 13b:** There is always some potential that a crisis/emergency could result from this project due to an unforeseen accident or act of vandalism. Site, safety and storage plans will serve to reduce the risk that a crisis/emergency occurs. The plans also provide a structured and planned response should a crisis/emergency occur.

**Comment 13e and 13f:** In general, the use of pesticides can generate controversy. Scoping/outreach efforts by the Department will help to educate the public on the safe and effective use of both fluridone and diquat and the potential benefits of restoring Stormy Lake and Daniels Lake. It is not known if this project will have organized opposition.

**Comment 13g:** The following permits and approvals will need to be obtained prior to the proposed treatment:

ADEC (Alaska Department of Environmental Conservation): Alaska Pollution Discharge Elimination System (APDES) Permit (Appendix 11).

US Fish and Wildlife Service: USFWS Pesticide Application Permit (Appendix 13).

## **PART III. ALTERNATIVES**

### **Alternative 1 - No Action**

The no action alternative would maintain the status quo. Elodea populations would remain in both lakes. As long as elodea remains in Stormy and Daniels Lake, there is a high risk of spread to adjacent lakes and waterbodies. Elodea is likely to spread to remote locations from float plane use of both lakes, or to other lakes from transportation by boats. Elodea can also be spread by humans and gear, waterfowl, and possibly mammalian herbivores like moose. Unchecked movement of elodea could be extremely detrimental to the Kenai Peninsula waterways with high ecological and economic impacts.

### **Alternative 2 – Fluridone and Diquat treatment (Proposed Action)**

The Proposed Action involves reducing the biomass and eradicating the invasive aquatic plant elodea from Stormy and Daniels Lakes using Fluridone (Sonar) and diquat (Reward). Multiple treatments spanning several years may be necessary to completely remove the populations from the lakes. After pesticide treatment, hand removal of any remaining strands of elodea may be accomplished by divers.

This alternative offers the highest probability of achieving the goal of completely eradicating elodea from both of these lakes to prevent spread to other waterbodies, maintain the ecological integrity of Kenai Peninsula waterways.

### **Alternative 3 – Lake Draining**

Draining Stormy or Daniels Lake would not be a practical alternative because of the sheer size, complexity, and associated wetlands of either lake. The cost of draining either lake may exceed \$660k. Draining the lakes would still leave pockets of water that would require chemical treatment to ensure elodea fragments did not survive within them. It is estimated that either lake could take up to or over five years to refill to capacity prolonging the impact of the restoration effort on the community.

### **Alternative 4 – Mechanical Removal and Tarping**

Mechanical removal by suction dredge, dragline, cutting, or similar mechanical treatments have a high risk of spreading elodea further in the lake systems. Since elodea fragments easily into small pieces when disturbed, mechanical treatments are likely to make the elodea problem worse. Mechanical treatments have not demonstrated success with elodea removal except in cases where removal is done merely to reduce biomass on an annual basis. Mechanical removal would not eradicate elodea in the lakes, and would only serve to reduce biomass rather than eradicate the population while increasing risk of spread.

Tarping in Stormy and Daniels Lake is impractical and expensive. The mixed sediment would be difficult to anchor tarps in, and installment would require trained divers. Tarping may be effective in suppressing growth in areas where the population in the nearshore littoral zone is sparse, as in Daniels Lake. In areas of thick biomass, tarping would not work. Tarping may reduce biomass or prevent growth after several years of tarping application, but would not eradicate elodea from the lakes.



## **PART IV. ENVIRONMENTAL ASSESSMENT CONCLUSION SECTION**

### **A. Is an EIS required?**

After reviewing the information provided by the applicant, the assessment of environmental impact contained in Part II of this document, and the responses received during the public review process, the USFWS has accepted the Environmental Assessment (EA) and has prepared and signed a Finding of No Significant Impact (FONSI) for the project as described above.

### **B. Public Involvement**

This EA is posted on the ADNR internet site found at: [http://dnr.alaska.gov/ag/ag\\_dn.htm](http://dnr.alaska.gov/ag/ag_dn.htm) and can be mailed directly to persons who request it. Any interested citizens are encouraged to contact the preparers of this EA to discuss the proposal.

Public scoping/notifications:

1. The local ADNR advisory committees (Kenai/Soldotna, Cooper Landing, and Central Peninsula) and other identified stakeholders were notified of the elodea proposal on April 19<sup>th</sup>, 2013.
2. A public scoping meeting to discuss options for Daniels Lake was held on February 19, 2013, at the Nikiski Recreational Center from 6PM to 8PM.
3. Public notices for the pesticide use permit application for the Stormy and Daniels Lake restoration project were printed in the Peninsula Clarion on two consecutive days (April 12<sup>th</sup> and 14<sup>th</sup>) as required by ADEC for the pesticide use permitting process (Appendix 12).
4. ADNR public notice was issued on June 12<sup>th</sup>, 2013 announcing that the Stormy Lake and Daniels Lake Elodea Project public commenting periods will be open for the pesticide use applications and environmental assessments (Appendix 14).

### **C. Duration of Public Comment Period**

The public comment period began on June 12<sup>th</sup>, 2013 and concluded July 12<sup>th</sup>, 2013.

### **D. Summary Report of Public Scoping Process**

A summary of the public scoping process is given in Appendix 15 including the comments and response by ADNR.

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**APPENDIX 1. ELODEA PHOTOS FROM STORMY AND DANIELS LAKES**

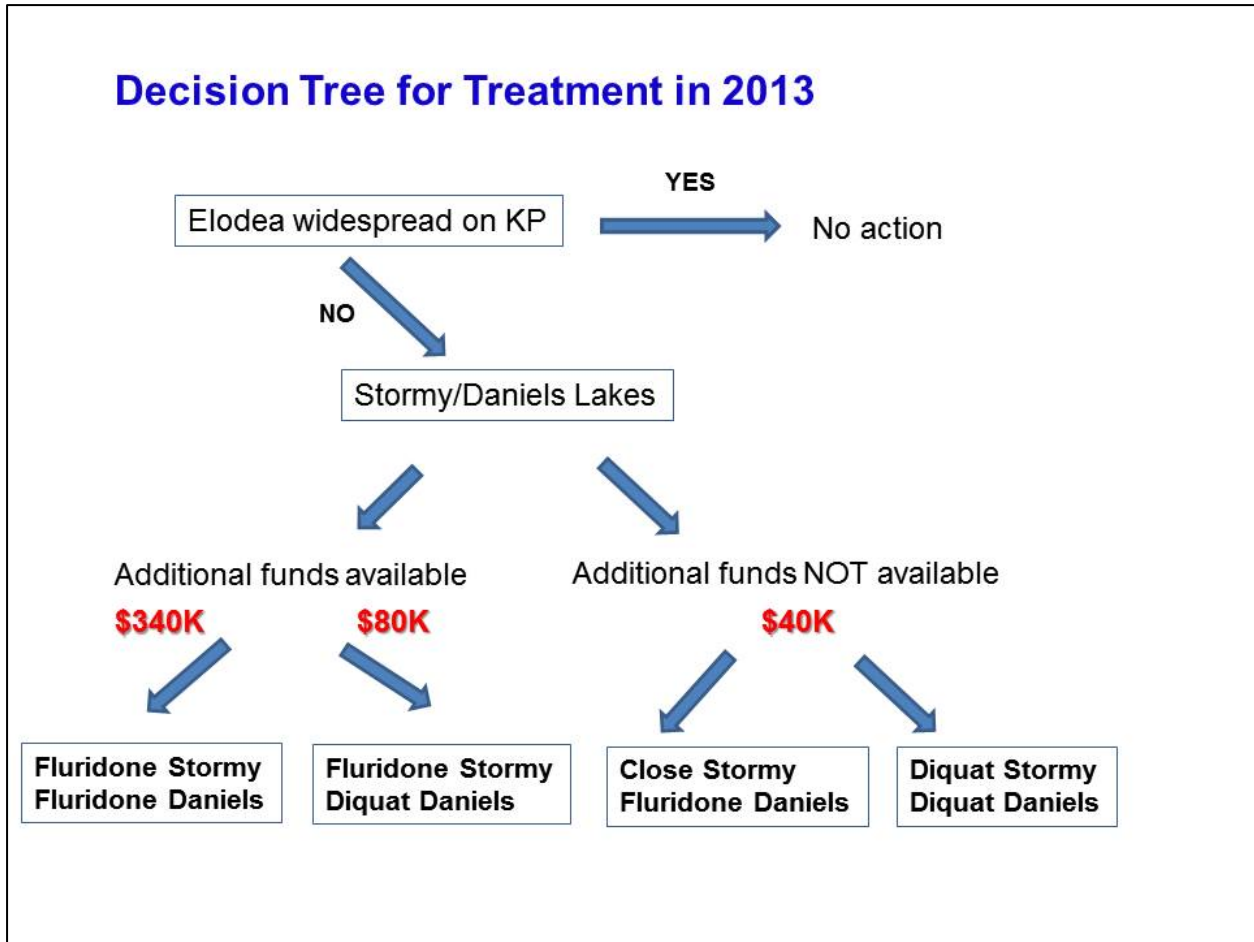
Stormy Lake Survey, January 29<sup>th</sup>, 2013



Daniels Lake Survey, February 7<sup>th</sup>, 2013



APPENDIX 2: DECISION TREE FOR FUNDING TREATMENT OPTIONS



## APPENDIX 3. SONAR AS™ (FLURIDONE) MATERIAL DATA SAFETY SHEET



# Material Safety Data Sheet



## Sonar A.S.

### 1. Product and company identification

**Product name** : Sonar A.S.  
**EPA Registration Number** : 67690-4  
**Material uses** : Herbicide.  
**Supplier/Manufacturer** : **SePRO Corporation**  
 11550 North Meridian Street  
 Suite 600  
 Carmel, IN 46032 U.S.A.  
 Tel: 317-580-8282  
 Toll free: 1-800-419-7779  
 Fax: 317-428-4577  
 Monday - Friday, 8am to 5pm E.S.T.  
**www.sepro.com**

**Responsible name** : Atrion Regulatory Services, Inc.  
**In case of emergency** : **INFOTRAC - 24-hour service 1-800-535-5053**

### 2. Hazards identification

**Physical state** : Liquid. [Opaque.]  
**Odor** : Faint sweetness.  
**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
**Emergency overview** : **WARNING!**  
**MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE EYE AND SKIN IRRITATION.**  
 May be harmful if swallowed. Slightly irritating to the eyes and skin. May cause sensitization by skin contact. Do not breathe vapor or mist. Do not ingest. Do not get on skin or clothing. Avoid contact with eyes. Wash thoroughly after handling.

**Routes of entry** : Dermal contact. Eye contact. Inhalation. Ingestion.

**Potential acute health effects**

**Inhalation** : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.

**Ingestion** : May be harmful if swallowed.

**Skin** : Slightly irritating to the skin. May cause sensitization by skin contact.

**Eyes** : Slightly irritating to the eyes.

**Potential chronic health effects**

**Chronic effects** : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

**Teratogenicity** : No known significant effects or critical hazards.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : No known significant effects or critical hazards.

**Over-exposure signs/symptoms**

**Inhalation** : No specific data.

**Ingestion** : No specific data.

**Skin** : Adverse symptoms may include the following:  
 irritation  
 redness

**Eyes** : Adverse symptoms may include the following:  
 irritation  
 watering  
 redness

**Medical conditions aggravated by over-exposure** : Pre-existing skin disorders may be aggravated by over-exposure to this product.

See toxicological information (section 11)

### 3 . Composition/information on ingredients

United States			
Name	CAS number	%	
<b>Active ingredient:</b>			
4(1h)-pyridinone, 1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-	59756-60-4	41.7	
<b>Inert Ingredient:</b>			
Proprietary Alcohol	Proprietary	5 - 10	
Proprietary Alcohol 2	Proprietary	1 - 5	

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

### 4 . First aid measures

- Eye contact** : Check for and remove any contact lenses. In case of contact with eyes, rinse immediately with plenty of water. Get medical attention if symptoms occur.
- Skin contact** : Wash with soap and water. Get medical attention if symptoms occur.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms appear.
- Ingestion** : Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

### 5 . Fire-fighting measures

- Flammability of the product** : May be combustible at high temperature.
- Extinguishing media**
- Suitable** : In case of fire, use water spray (fog), foam, dry chemical or CO<sub>2</sub>.
- Not suitable** : None known.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide  
nitrogen oxides  
halogenated compounds
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

### 6 . Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Methods for cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble or absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

- Large spill** : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

## 7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Avoid freezing. Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

## 8. Exposure controls/personal protection

<b>United States</b>	
<b>Product name</b>	<b>Exposure limits</b>
Proprietary Alcohol	<b>AIHA WEEL (United States, 1/2008).</b> TWA: 10 mg/m <sup>3</sup> 8 hour(s).

Consult local authorities for acceptable exposure limits.

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. **Applicators should refer to the product label for personal protective clothing and equipment.**
- Engineering measures** : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

### Personal protection

- Eyes** : Safety glasses.
- Skin** : Lab coat.
- Respiratory** : A respirator is not needed under normal and intended conditions of product use.
- Hands** : Nitrile gloves.

### Personal protective equipment (Pictograms)



- HMIS Code/Personal protective equipment** : B

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

## 9 . Physical and chemical properties

**Physical state** : Liquid. [Opaque.]  
**Color** : Off-white to tannish-gray.  
**Odor** : Faint sweetness.  
**Flash point** : Closed cup: >93.333°C (>200°F)  
**pH** : 5.6 to 7.6  
**Boiling/condensation point** : 100°C (212°F)  
**Relative density** : 1.15  
**Vapor pressure** : 0.31 kPa (2.3 mm Hg)  
**Solubility** : Partially soluble in the following materials: cold water and hot water.

## 10 . Stability and reactivity

**Stability** : The product is stable.  
**Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.  
**Conditions to avoid** : Avoid freezing.  
**Materials to avoid** : Reactive or incompatible with the following materials: oxidizing materials and acids.  
**Hazardous decomposition products** : If water evaporates, residues may product harmful vapors under fire conditions.

Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge.  
 Non-flammable in the presence of the following materials or conditions: heat.

## 11 . Toxicological information

### Acute toxicity

Product/ingredient name	Species	Dose	Result	Exposure
4(1h)-pyridinone, 1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-	Rat	>10 g/kg	LD50 Oral	-
Proprietary Alcohol	Rabbit	20800 mg/kg	LD50 Dermal	-
	Rat	20 g/kg	LD50 Oral	-
Sonar A.S.	Rabbit	>2000 mg/kg	LD50 Dermal	-
	Rat	>500 mg/kg	LD50 Oral	-

**Inhalation** : Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.  
**Ingestion** : May be harmful if swallowed.  
**Skin** : Slightly irritating to the skin. May cause sensitization by skin contact.  
**Eyes** : Slightly irritating to the eyes.

## 12 . Ecological information

**Environmental effects** : No known significant effects or critical hazards.

### Aquatic ecotoxicity

Product/ingredient name	Test	Species	Exposure	Result
Proprietary Alcohol	-	Daphnia	48 hours	Acute EC50 >10000000 ug/L
	-	Fish	96 hours	Acute LC50 710000 ug/L
	-	Daphnia	48 hours	Acute LC50 4919 mg/L
	-	Fish	96 hours	Chronic NOEC 600000 ug/L
	-	Daphnia	48 hours	Chronic NOEC 660000 ug/L

## 13 . Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## 14 . Transport information

**AERG** : Not applicable.

### Regulatory information

**DOT/IMDG/IATA** : Not regulated.

## 15 . Regulatory information

### United States

**HCS Classification** : Sensitizing material

**U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.

**SARA 302/304/311/312 extremely hazardous substances** : No products were found.

**SARA 302/304 emergency planning and notification** : No products were found.

**SARA 302/304/311/312 hazardous chemicals** : Proprietary Alcohol

**SARA 311/312 MSDS distribution - chemical inventory - hazard identification** :

Proprietary Alcohol: Immediate (acute) health hazard, Delayed (chronic) health hazard

**Clean Water Act (CWA) 307**: No products were found.

**Clean Water Act (CWA) 311**: No products were found.

**Clean Air Act (CAA) 112 accidental release prevention** : No products were found.

**Clean Air Act (CAA) 112 regulated flammable substances** : No products were found.

**Clean Air Act (CAA) 112 regulated toxic substances** : No products were found.

**State regulations** : **Connecticut Carcinogen Reporting**: None of the components are listed.

**Connecticut Hazardous Material Survey**: None of the components are listed.

**Florida substances**: None of the components are listed.

**Illinois Chemical Safety Act**: None of the components are listed.

**Illinois Toxic Substances Disclosure to Employee Act**: None of the components are listed.

**Louisiana Reporting**: None of the components are listed.

**Louisiana Spill**: None of the components are listed.

**Massachusetts Spill**: None of the components are listed.

**Massachusetts Substances**: None of the components are listed.

**Michigan Critical Material**: None of the components are listed.

**Minnesota Hazardous Substances**: None of the components are listed.

**New Jersey Hazardous Substances**: None of the components are listed.

**New Jersey Spill**: None of the components are listed.

**New Jersey Toxic Catastrophe Prevention Act**: None of the components are listed.

**New York Acutely Hazardous Substances**: None of the components are listed.

**New York Toxic Chemical Release Reporting**: None of the components are listed.

**Pennsylvania RTK Hazardous Substances**: The following components are listed:  
Proprietary Alcohol

**Rhode Island Hazardous Substances**: None of the components are listed.

**California Prop. 65** : No products were found.

**United States inventory (TSCA 8b)** : All components are listed or exempted.

### International regulations

**International lists** : This product, (and its ingredients) is (are) listed on national inventories, or is (are) exempted from being listed, in Australia (AICS), in Europe (EINECS/ELINCS), in Korea (TCCL), in Japan (METI), in the Philippines (RA6969).

## 16 . Other information

**Label requirements** : MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. MAY CAUSE EYE AND SKIN IRRITATION.

**Hazardous Material Information System (U.S.A.)** : HAZARD RATINGS

Health	1
Fire hazard	1
Physical Hazard	0
Personal protection	B

4- Extreme  
 3- Serious  
 2- Moderate  
 1- Slight  
 0- Minimal  
 See section 8 for more detailed information on personal protection.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection Association (U.S.A.)** :



**References** : ANSI Z400.1, MSDS Standard, 2004. - Manufacturer's Material Safety Data Sheet. - 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG.

**Date of issue** : 01/15/2009

**Version** : 1

**Notice to reader**

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. The data in this MSDS relates only to the specific material designated herein. Possible adverse effects (see Section 2, 11 and 12) may occur if this material is not handled in the recommended manner.

## APPENDIX 4. SONAR AS™ (FLURIDONE) PRODUCT LABEL

# Sonar<sup>®</sup> A.S.

1072.61PT

## Aquatic Herbicide



An herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, potable water sources, drainage canals and irrigation canals.

For use in New York State, comply with Section 24 (C) Special Local Need labeling for Sonar AS, SLN NY 95-0002

### Active Ingredient

fluridone: 1-methyl-3-phenyl-5-[3-(trifluoromethyl)

phenyl]-4(1*H*)-pyridinone..... 41.7%

**Other Ingredients** ..... 58.3%

**TOTAL** ..... 100.0%

Contains 4 pounds active ingredient per gallon.

## Keep Out of Reach of Children

# CAUTION / PRECAUCIÓN

Refer to the inside of the label booklet for additional precautionary information and Directions for Use including First Aid and Storage and Disposal.

**NOTICE:** Read the entire label before using. Use only according to label directions. Before buying or using this product, read *Terms and Conditions of Use*, *Warranty Disclaimer*, *Inherent Risks of Use* and *Limitation of Remedies* inside label booklet.

**Shake well before using.**

EPA Reg. No. 67690-4

EPA Est. No. 067690-NC-001

FPL20120928

Sonar is a registered trademark of SePRO Corporation.

167205

SePRO Corporation 11550 North Meridian Street, Suite 600, Carmel, IN 46032 U.S.A.

**Herbicide**

**Net contents 1 pint Nonrefillable**



## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

**CAUTION.** Harmful if swallowed, absorbed through skin, or inhaled. Avoid breathing of spray mist or contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

FIRST AID	
<b>If in eyes</b>	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"><li>• Take off contaminated clothing.</li><li>• Rinse skin immediately with plenty of water for 15 to 20 minutes.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If swallowed</b>	<ul style="list-style-type: none"><li>• Call a poison control center or doctor immediately for treatment advice.</li><li>• Have person sip a glass of water if able to swallow.</li><li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li><li>• Do not give anything by mouth to an unconscious person.</li></ul>
<b>If inhaled</b>	<ul style="list-style-type: none"><li>• Move person to fresh air.</li><li>• If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth-to-mouth, if possible.</li><li>• Call a poison control center or doctor for further treatment advice.</li></ul>

### HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. In case of emergency endangering health or the environment involving this product, call **INFOTRAC at 1-800-535-5053.**

# Sonar<sup>®</sup> A.S.

Aquatic Herbicide

FPL20120928

167204



Net contents **1 pint Nonrefillable**

## **PRECAUTIONARY STATEMENTS**

### **HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

**CAUTION.** Harmful if swallowed, absorbed through skin, or inhaled. Avoid breathing of spray mist or contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

### **Keep Out of Reach of Children**

## **CAUTION / PRECAUCIÓN**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

<b>FIRST AID</b>	
<b>If in eyes</b>	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"><li>• Take off contaminated clothing.</li><li>• Rinse skin immediately with plenty of water for 15 to 20 minutes.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If swallowed</b>	<ul style="list-style-type: none"><li>• Call a poison control center or doctor immediately for treatment advice.</li><li>• Have person sip a glass of water if able to swallow.</li><li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li><li>• Do not give anything by mouth to an unconscious person.</li></ul>

*(continued)*

### FIRST AID *(continued)*

**If inhaled**

- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth-to-mouth, if possible.
- Call a poison control center or doctor for further treatment advice.

### HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. In case of emergency endangering health or the environment involving this product, call **INFOTRAC** at **1-800-535-5053**.

## ENVIRONMENTAL HAZARDS

Do not apply to water except as specified on the label. Do not contaminate water by disposal of equipment washwaters. Do not apply in tidewater/brackish water. Lowest rates should be used in shallow areas where the water depth is considerably less than the average depth of the entire treatment site, for example, shallow shoreline areas. Trees and shrubs growing in water treated with Sonar A.S. herbicide may occasionally develop chlorosis. Follow use directions carefully so as to minimize adverse effects on non-target organisms.

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## DIRECTIONS FOR USE

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It is a violation of Federal law to use this product in a manner inconsistent with its labeling. Read all Directions for Use carefully before applying.

**SHAKE WELL BEFORE USING.**

## STORAGE AND DISPOSAL

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

**Pesticide Storage:** Store in original container only. Do not store near feed or foodstuffs. In case of leak or spill, use absorbent materials to contain liquids and dispose as waste.

**Pesticide Disposal:** Wastes resulting from use of this product may be used according to label directions or disposed of at an approved waste disposal facility.

### Container Handling

**Nonrefillable Container. DO NOT reuse or refill this container.** Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

**Triple rinse containers small enough to shake (capacity  $\leq 5$  gallons) 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  $\frac{1}{4}$  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.

**Triple rinse containers too large to shake (capacity  $> 5$  gallons) as follows:** Empty the remaining contents into application equipment or a mix tank. Fill the container  $\frac{1}{4}$  full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand the container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Repeat this procedure two more times.

*Continued*

## **STORAGE AND DISPOSAL** (con't)

**Pressure rinse as follows:** Empty the remaining contents into application equipment or mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank, or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

**Refillable Container.** Refill this container with pesticide only. **DO NOT** reuse this container for any other purpose. Triple rinsing the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. Triple rinse as follows: To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10% full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times.

When this container is empty, replace the cap and seal all openings that have been opened during use; return the container to the point of purchase or to a designated location. This container must only be refilled with a pesticide product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transport. **DO NOT** transport if this container is damaged or leaking. If the container is damaged, or leaking, or obsolete and not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling, if available, or dispose of container in compliance with state and local regulations.

## **PRODUCT INFORMATION**

Sonar A.S. herbicide is a selective systemic aquatic herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, drainage canals and irrigation canals, including dry or de-watered areas of these sites. Sonar A.S. is absorbed from water by plant shoots and from hydrosol by the roots of aquatic vascular plants. For in-water treatments, it is important to maintain the specified concentration of Sonar A.S. in contact with the target plants for a minimum of 45 days. Rapid water movement or any condition which results in rapid dilution of Sonar A.S. in treated water will reduce its effectiveness. In susceptible plants, Sonar A.S. inhibits the formation of carotene. In the absence of carotene, chlorophyll is rapidly degraded by sunlight. Herbicidal symptoms of Sonar A.S. appear in seven to ten days and appear as white (chlorotic) or pink growing points. Under optimum conditions, 30 to 90 days are required before the desired level of aquatic plant management is achieved with Sonar A.S. Species susceptibility to Sonar A.S. may vary depending on time of year, stage of growth, and water movement. For best results, apply Sonar A.S. prior to initiation of weed growth or when weeds begin active growth. Application to mature target plants may require an application rate at the higher end of the specified rate range and may take longer to control.

Sonar A.S. is not corrosive to application equipment.

The label provides recommendations on the use of a chemical analysis for the active ingredient. SePRO Corporation recommends the use of an Enzyme-Linked Immunoassay (ELISA Test) for the determination of the active ingredient concentration in the water. Contact SePRO Corporation for the utilization of this test, known as a FasTEST, for the incorporation of this analysis in your

treatment program. Other proven chemical analyses for the active ingredient may also be used. The chemical analysis, a FasTEST, is referenced in this label as the preferred method for the rapid determination of the concentration of the active ingredient in the water.

Application rates are provided in ounces or quarts of Sonar A.S. to achieve a desired concentration of the active ingredient in parts per billion (ppb). **The maximum application rate or sum of all application rates is 90 ppb in ponds and 150 ppb in lakes, reservoirs and static canals per annual growth cycle.** This maximum concentration is the amount of product calculated as the target application rate, NOT determined by testing the residues of the active ingredient in the treated water.

### **Product Use Precautions**

- **Obtain Required Permits:** Consult with appropriate state or local water authorities before applying this product. Permits may be required by state or local public agencies.
- **Chemigation:** Do not apply Sonar A.S. through any type of irrigation system.
- **Hydroponic Farming:** Do not use Sonar A.S. treated water for hydroponic farming.
- **Greenhouse and Nursery Plants:** Do not use Sonar A.S. treated water for irrigating greenhouse or nursery plants. Use of an approved assay should confirm that residues are < 1 ppb.
- **Water Use Restrictions Following Applications With Sonar A.S. (Days)**

Application Rate	Drinking†	Fishing	Swimming	Livestock/Pet Consumption	Irrigation††
Maximum Rate (150 ppb) or less	0	0	0	0	See irrigation instructions below

† Note below, under Potable Water Intakes, the information for application of Sonar A.S. within ¼ mile (1,320 feet) of a functioning potable water intake.

†† Note below, under Irrigation, specific time frames or fluridone residues that provide the widest safety margin for irrigating with fluridone treated water.

- Potable Water Intakes:** In lakes and reservoirs or other sources of potable water, do not apply Sonar A.S. at application rates greater than 20 ppb within one-fourth mile (1,320 feet) of any functioning potable water intake. At application rates of 6 - 20 ppb, Sonar A.S. may be applied where functioning potable water intakes are present. **NOTE: Existing potable water intakes which are no longer in use, such as those replaced by potable water wells or connections to a municipal water system, are not considered to be functioning potable water intakes.**
- Irrigation:** Irrigation from a Sonar A.S. treated area may result in injury to the irrigated vegetation. Follow these precautions and inform those who irrigate from areas treated with Sonar A.S. of the irrigation time frames or water assay requirements presented in the table below. Follow the following time frames and assay directions to reduce the potential for injury to vegetation irrigated with water treated with Sonar A.S. Greater potential for crop injury occurs where Sonar A.S. treated water is applied to crops grown on low organic and sandy soils.



Application Site	DAYS AFTER APPLICATION		
	Established Tree Crops	Established Row Crops/Turf/Plants	Newly Seeded Crops/Seedbeds or Areas to be Planted Including Overseeded Golf Course Greens
Ponds and Static Canals †	7	30	Assay required
Canals	7	14	Assay required
Lakes and Reservoirs ††	7	14	Assay required
Dry or De-watered Canals †††	0	0	†††

† For purposes of Sonar A.S. labeling, a pond is defined as a body of water 10 acres or less in size. A lake or reservoir is greater than 10 acres.

†† In lakes and reservoirs where one-half or greater of the body of water is treated, use the pond and static canal irrigation precautions. When applying Sonar A.S. to exposed sediments of aquatic sites such as lakes and reservoirs, follow these time frames prior to using water for irrigation once sites are reflooded.

††† When Sonar A.S. is applied to exposed sediments of dry or de-watered canals, allow canals to refill for a minimum of 24 hours before using water for irrigation.

Where the use of Sonar A.S. treated water is desired for irrigating crops prior to the time frames established above, the use of a FastEST assay is recommended to measure the concentration in the treated water. Where a FastEST has determined that the concentrations are less than 10 parts per billion, there are no irrigation precautions for irrigating established tree crops, established row crops or

turf. For tobacco, tomatoes, peppers or other plants within the Solanaceae Family and newly seeded crops or newly seeded grasses such as overseeded golf course greens, do not use Sonar A.S. treated water if measured fluridone concentrations are greater than 5 ppb. Furthermore, when rotating crops, do not plant members of the Solanaceae family in land that has been previously irrigated with fluridone concentrations in excess of 5 ppb. It is recommended that an aquatic specialist be consulted prior to commencing irrigation of these sites.

### **PLANT CONTROL INFORMATION**

Sonar A.S. selectivity is dependent upon dosage, time of year, stage of growth, method of application and water movement. The following categories, controlled, partially controlled, and not controlled are provided to describe expected efficacy under ideal treatment conditions using higher to maximum label rates. Use of lower rates will increase selectivity of some species listed as controlled or partially controlled. Additional aquatic plants may be controlled, partially controlled, or tolerant to Sonar A.S. Consult an aquatic specialist prior to application of Sonar A.S. to determine a plant's susceptibility to Sonar A.S.

**NOTE: algae (chara, nitella, and filamentous species) are not controlled by Sonar A.S.**

### **Vascular Aquatic Plants Controlled by Sonar A.S.:**

#### **Submersed Plants:**

- bladderwort (*Utricularia* spp.)
- common coontail (*Ceratophyllum demersum*)
- common elodea (*Elodea canadensis*)
- egeria, Brazilian elodea (*Egeria densa*)
- fanwort, cabomba (*Cabomba caroliniana*)
- hydrilla (*Hydrilla verticillata*)
- naiad (*Najas* spp.)
- pondweed (*Potamogeton* spp., except Illinois pondweed)
- watermilfoil (*Myriophyllum* spp., except variable-leaf milfoil)

**Emerald Plants:**

spatterdock (*Nuphar luteum*)

water-lily (*Nymphaea* spp.)

**Floating Plants:**

common duckweed (*Lemna minor*)

**Shoreline Grasses:**

paragrass (*Urochloa mutica*)

**Vascular Aquatic Plants Partially Controlled by Sonar A.S.:****Submersed Plants:**

Illinois pondweed (*Potamogeton illinoensis*)

limnophila (*Limnophila sessiliflora*)

tapegrass, American eelgrass (*Vallisneria americana*)

watermilfoil-variable-leaf milfoil (*Myriophyllum heterophyllum*)

**Emerald Plants:**

alligatorweed (*Alternanthera philoxeroides*)

American lotus (*Nelumbo lutea*)

cattail (*Typha* spp.)

creeping waterprimrose (*Ludwigia peploides*)

parrotfeather (*Myriophyllum aquaticum*)

smartweed (*Polygonum* spp.)

spikerush (*Eleocharis* spp.)

waterpurslane (*Ludwigia palustris*)

watershield (*Brasenia schreberi*)

**Floating Plants:**

common watermeal (*Wolffia columbiana*)†

salvinia (*Salvinia* spp.)

**Shoreline Grasses:**

barnyardgrass (*Echinochloa crusgalli*)

giant cutgrass (*Zizaniopsis miliacea*)

reed canarygrass (*Phalaris arundinaceae*)

southern watergrass (*Hydrochloa caroliniensis*)

torpedograss (*Panicum repens*)

† Partial control only with Sonar A.S. applied at the maximum labeled rate.

## **Vascular Aquatic Plants Not Controlled by Sonar A.S.:**

### **Emersed Plants:**

American frogbit (*Limnobium spongia*)

arrowhead (*Sagittaria* spp.)

bacopa (*Bacopa* spp.)

big floatingheart, banana lily (*Nymphoides aquatica*)

bulrush (*Scirpus* spp.)

floating waterhyacinth (*Eichhornia crassipes*)

pickerelweed, lanceleaf (*Pontederia* spp.)

rush (*Juncus* spp.)

water pennywort (*Hydrocotyle umbellata*)

### **Floating Plants:**

waterlettuce (*Pistia stratiotes*)

### **Shoreline Grasses:**

maidencane (*Panicum hemitomon*)

## **MIXING AND APPLICATION DIRECTIONS**

The aquatic plants present in the treatment site should be identified prior to application to determine their susceptibility to Sonar A.S. It is important to determine the area (acres) to be treated and the average depth in order to select the proper application rate. Do not exceed the maximum labeled rate for a given treatment site per annual growth cycle.

**Shake Sonar A.S. well before using.** Add the specified amount of Sonar A.S. to water in the spray tank during the filling operation. Agitate while filling and during spraying. Surface or subsurface application of the spray can be made with conventional spray equipment. Sonar A.S. can also be applied near the surface of the hydrosol using weighted trailing hoses. A spray volume of 5 to 100 gallons per acre may be used. Sonar A.S. may also be diluted with water and the concentrated mix metered into the pumping system.

### **Tank Mix Directions**

Sonar A.S. may be tank mixed with other aquatic herbicides and algaecides to enhance efficacy and plant selectivity. Refer to the companion herbicide or algaecide label for use directions, precautions, and restrictions on use.

### **Application to Ponds**

Sonar A.S. may be applied to the entire surface area of a pond. For single applications, rates may be selected to provide 45 to 90 ppb to the treated water. Use the higher rate within the rate range where there is a dense weed mass, when treating more difficult to control species, and for ponds less than 5 acres in size with an average depth less than 4 feet. Application rates necessary to obtain these concentrations are shown in the following table. For additional application rate calculations, refer to the *Application Rate Calculation—Ponds, Lakes and Reservoirs* section of this label. Split or multiple applications may be used where dilution of treated water is anticipated; however, the sum of all applications must not exceed a total of 90 ppb per annual growth cycle.

Average Water Depth of Treatment Site (feet)	Quarts of Sonar A.S. per Treated Surface Acre to Achieve		Fluid Ounces of Sonar A.S. per Treated Surface Acre to Achieve	
	45 ppb	90 ppb	45 ppb	90 ppb
1	0.12	0.24	3.8	7.7
2	0.24	0.49	7.7	15.7
3	0.37	0.73	11.8	23.4
4	0.49	0.98	15.7	31.4
5	0.61	1.22	19.5	39.0
6	0.73	1.46	23.4	46.7
7	0.85	1.70	27.2	54.4
8	0.98	1.95	31.4	62.4
9	1.10	2.19	35.2	70.1
10	1.22	2.44	39.0	78.1

### **Application to Lakes and Reservoirs**

The following treatments may be used for treating both whole lakes or reservoirs and partial areas of lakes or reservoirs (bays, etc.). For best results in treating partial lakes and reservoirs, Sonar A.S. treatment areas should be a minimum of 5 acres in size. Treatment of areas smaller than 5 acres or treatment of narrow strips such as boat lanes or shorelines may not produce satisfactory results due to dilution by untreated water. Rate ranges are provided as a guide to include a wide range of environmental factors, such as, target species, plant susceptibility, selectivity and other aquatic plant management objectives. Application rates and methods should be selected to meet the specific lake/reservoir aquatic plant management goals.

## A. Whole Lake or Reservoir Treatments (Limited or No Water Discharge)

### Single Application to Whole Lakes or Reservoirs

Where single applications to whole lakes or reservoirs are desired, apply Sonar A.S. at an application rate of 10 to 90 ppb. Application rates necessary to obtain these concentrations in treated water are shown in the following table. For additional rate calculations, refer to the *Application Rate Calculation—Ponds, Lakes, and Reservoirs* section of this label. Choose an application rate from the table below to meet the aquatic plant management objective. **Where greater plant selectivity is desired such as when controlling Eurasian watermilfoil and curlyleaf pondweed, choose an application rate lower in the rate range.** For other plant species, SePRO recommends contacting an aquatic specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. Use the higher rate within the rate range where there is a dense weed mass or when treating more difficult to control plant species. Retreatments may be required to control more difficult to control species or in the event of a heavy rainfall event where dilution of the treatment concentration has occurred. In these cases, a second application or more may be required; however, the sum of all applications cannot exceed 150 ppb per annual growth cycle. Refer to the section of this label entitled, *Split or Multiple Applications to Whole Lakes or Reservoirs*, for guidelines and maximum rate allowed.

<b>SINGLE APPLICATION OF SONAR A.S.</b>				
<b>Average Water Depth of Treatment Site (feet)</b>	<b>Quarts of Sonar A.S. per Treated Surface Acre to Achieve</b>		<b>Fluid Ounces of Sonar A.S. per Treated Surface Acre to Achieve</b>	
	<b>10 ppb</b>	<b>90 ppb</b>	<b>10 ppb</b>	<b>90 ppb</b>
1	0.03	0.24	1.0	7.7
2	0.05	0.49	1.6	15.7
3	0.08	0.73	2.6	23.4
4	0.11	0.98	3.2	31.4
5	0.14	1.22	4.5	39.0
6	0.16	1.46	5.1	46.7
7	0.19	1.70	6.1	54.4
8	0.22	1.95	7.0	62.4
9	0.24	2.19	7.6	70.1
10	0.27	2.44	8.6	78.1
11	0.30	2.68	9.6	86.0
12	0.32	2.93	10.2	93.8
13	0.35	3.17	11.2	101.4
14	0.38	3.42	12.1	109.4
15	0.41	3.66	13.1	117.1
16	0.43	3.90	13.8	124.8
17	0.46	4.15	14.7	132.2
18	0.49	4.39	15.7	140.5
19	0.51	4.63	16.3	148.2
20	0.54	4.88	17.3	156.2



### Split or Multiple Applications to Whole Lakes or Reservoirs

To meet certain plant management objectives, split or multiple applications may be desired in making whole lake treatments. Split or multiple application programs are desirable when the objective is to use the minimum effective dose and, through the use of a water analysis, e.g. a FasTEST, add additional Sonar A.S. to maintain this lower dose for the sufficient time to ensure efficacy and enhance selectivity. Water may be treated at an initial application of 4 to 50 ppb. Additional split applications should be conducted to maintain a sufficient concentration for a minimum of 45 days or longer. **In controlling Eurasian watermilfoil and curlyleaf pondweed and where greater plant selectivity is desired, choose an application rate lower in the rate range.** For other plant species, SePRO recommends contacting an aquatic specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. When utilizing split or multiple applications of Sonar A.S., the utilization of a FasTEST is strongly recommended to determine the actual concentration in the water over time. For split or multiple applications, the sum of all applications must not exceed 150 ppb per annual growth cycle.

**NOTE:** In treating lakes or reservoirs that contain functioning potable water intakes and the application requires treating within  $\frac{1}{4}$  mile of a potable water intake, no single application can exceed 20 ppb. Additionally, the sum of all applications cannot exceed 150 ppb per annual growth cycle.

## **B. Partial Lake or Reservoir Treatments**

Where dilution of Sonar A.S. with untreated water is anticipated, such as in partial lake or reservoir treatments, split or multiple applications may be used to extend the contact time to the target plants. The application rate and use frequency of Sonar A.S. in a partial lake is highly dependent upon the treatment area. An application rate at the higher end of the specified rate range may be required and frequency of applications will vary depending upon the potential of untreated water diluting the Sonar A.S. concentration in the treatment area. Use a rate at the higher end of the rate range where greater dilution with untreated water is anticipated.

### Treatment Areas Greater Than ¼ Mile from a Functioning Potable Water Intake

For single applications, apply Sonar A.S. at application rates from 30 to 150 ppb. Split or multiple applications may be made; however, the sum of all applications cannot exceed 150 ppb per annual growth cycle. Split applications should be conducted to maintain a sufficient concentration in the target area for a period of 45 days or longer. The use of a FasTEST is recommended to maintain the desired concentration in the target area over time.

### Treatment Areas within ¼ Mile of a Functioning Potable Water Intake

In treatment areas that are within ¼ mile of a potable water intake, no single application can exceed 20 ppb. When utilizing split or multiple applications of Sonar A.S. for sites which contain a potable water intake, a FasTEST is required to determine the actual concentration in the water. Additionally, the sum of all applications cannot exceed 150 ppb per annual growth cycle.

## **Application Rate Calculation — Ponds, Lakes and Reservoirs**

The amount of Sonar A.S. to be applied to provide the desired ppb concentration of active ingredient in treated water may be calculated as follows:

**Quarts of Sonar A.S. required per treated surface acre =**  
Average water depth of treatment site (feet) x Desired ppb concentration of active ingredient x 0.0027

For example, the quarts per acre of Sonar A.S. required to provide a concentration of 25 ppb of active ingredient in water with an average depth of 5 feet is calculated as follows:

$$5 \times 25 \times 0.0027 = 0.33 \text{ quarts per treated surface acre}$$

When measuring quantities of Sonar A.S., quarts may be converted to fluid ounces by multiplying quarts to be measured x 32. For example, 0.33 quarts x 32 = 10.5 fluid ounces.

**NOTE:** Calculated rates may not exceed the maximum allowable rate in quarts per treated surface acre for the water depth listed in the application rate table for the site to be treated.

## **Application to Sediments of Dry or De-Watered Aquatic Sites**

For application of Sonar A.S. to sediments of dry or de-watered aquatic sites, including exposed sediments of lakes or reservoirs, irrigation canals, non-irrigation canals and drainage canals, apply a maximum of 2 quarts of Sonar A.S. per surface acre per annual growth cycle. Apply Sonar A.S. evenly to the sediment surface, but not above the high water line, with a minimum spray solution of 30 to 100 gallons per surface acre. High levels of organic matter in treated sediments may reduce efficacy. Sonar A.S. may be applied with other aquatic herbicides labeled for this use.

Please contact your SePRO Aquatic Specialist for further use recommendations.

## **Application to Drainage Canals and Irrigation Canals**

### Static Canals:

In static drainage and irrigation canals, apply Sonar A.S. at the rate of 30 to 150 ppb per treated surface acre. The maximum application rate or sum of all application rates cannot exceed 150 ppb per annual growth cycle.

### Moving Water Canals:

The performance of Sonar A.S. will be enhanced by restricting or reducing water flow. In slow moving bodies of water use an application technique that maintains a concentration of 15 - 40 ppb in the target area for a minimum of 45 days. Sonar A.S. can be applied by split or multiple broadcast applications or by metering in the product to provide a uniform concentration of the herbicide based upon the flow pattern. The use of a FasTEST is recommended to maintain the desired concentration in the target area over time.

### Static or Moving Water Canals Containing a Functioning Potable Water Intake

In treating a static or moving water canal which contains a functioning potable water intake, applications of Sonar A.S. greater than 20 ppb must be made more than ¼ mile from a functioning potable water intake. Applications less than 20 ppb may be applied within ¼ mile from a functioning potable water intake; however, if applications of Sonar A.S. are made within ¼ mile of a functioning potable water intake, a FasTEST must be utilized to demonstrate that concentrations do not exceed 150 ppb at the functioning potable water intake.

## **Application Rate Calculation — Moving Water Drainage and Irrigation Canals**

The amount of Sonar A.S. to be applied through a metering system to provide the desired ppb concentration of active ingredient in treated water may be calculated as follows:

1. Average flow rate (feet per second) x average canal width (ft.) x average canal depth (ft.) x 0.9 = CFS (cubic feet per second).
2. CFS x 1.98 = acre feet per day (water movement)
3. Acre feet per day x desired ppb x 0.0027 = Quarts of Sonar A.S. required per day

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## **TERMS AND CONDITIONS OF USE**

If terms of the following *Warranty Disclaimer, Inherent Risks of Use* and *Limitation of Remedies* are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, to the extent consistent with applicable law, use by the buyer or any other user constitutes acceptance of the terms under *Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies*.

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## **WARRANTY DISCLAIMER**

SePRO Corporation warrants that the product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, SEPRO CORPORATION MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

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## **INHERENT RISKS OF USE**

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It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of SePRO Corporation or the seller. To the extent consistent with applicable law, all such risks shall be assumed by buyer.

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## **LIMITATION OF REMEDIES**

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To the extent consistent with applicable law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories) shall be limited to, at SePRO Corporation's election, one of the following:

- (1) Refund of purchase price paid by buyer or user for product bought, or
- (2) Replacement of amount of product used.

To the extent consistent with applicable law, SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the *Warranty Disclaimer*, *Inherent Risks of Use* and this *Limitation of Remedies* cannot be varied by any written or verbal statements or agreements. No employee or sales agent of SePRO Corporation or the seller is authorized to vary or exceed the terms of the *Warranty Disclaimer* or this *Limitation of Remedies* in any manner.

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## NOTES



# Sonar<sup>®</sup> A.S.

## PRECAUTIONARY STATEMENTS

### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

**CAUTION.** Harmful if swallowed, absorbed through skin, or inhaled. Avoid breathing of spray mist or contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.

#### FIRST AID

<b>If in eyes</b>	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15 to 20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes; then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If on skin or clothing</b>	<ul style="list-style-type: none"><li>• Take off contaminated clothing.</li><li>• Rinse skin immediately with plenty of water for 15 to 20 minutes.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If swallowed</b>	<ul style="list-style-type: none"><li>• Call a poison control center or doctor immediately for treatment advice.</li><li>• Have person sip a glass of water if able to swallow.</li><li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li><li>• Do not give anything by mouth to an unconscious person.</li></ul>
<b>If inhaled</b>	<ul style="list-style-type: none"><li>• Move person to fresh air.</li><li>• If person is not breathing, call 911 or an ambulance; then give artificial respiration, preferably mouth-to-mouth, if possible.</li><li>• Call a poison control center or doctor for further treatment advice.</li></ul>

#### HOTLINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. In case of emergency endangering health or the environment involving this product, call **INFOTRAC at 1-800-535-5053.**

FPL20120928

**Aquatic Herbicide**

167204

**Net contents 1 pint**

**Nonrefillable**

## APPENDIX 5. REWARD™ (DIQUAT) MATERIAL DATA SAFETY SHEET

**Syngenta Crop Protection, Inc.**  
**Post Office Box 18300**  
**Greensboro, NC 27419**

**In Case of Emergency, Call**  
**1-800-888-8372**

**1. PRODUCT IDENTIFICATION**

Product Name: **REWARD LANDSCAPE AND AQUATIC HERBICIDE** Product No.: A12872A  
 EPA Signal Word: Warning  
 Active Ingredient(%): Diquat dibromide (37.3%) CAS No.: 85-00-7  
 Chemical Name: [6,7-dihydrodipyrido(1,2-a:2',1'-c)pyrazinediium dibromide]  
 Chemical Class: Bipyridilium (dipyridilium) contact herbicide  
 EPA Registration Number(s): 100-1091 (formerly 10182-404) **Section(s) Revised: All sections**

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen
Diquat dibromide (37.3%)	Not Established	0.5 mg/m <sup>3</sup> TWA (total dust); 0.08 mg/m <sup>3</sup> TWA (respirable dust)	0.5 mg/m <sup>3</sup> TWA**	No

\*\* recommended by NIOSH

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.

**3. HAZARDS IDENTIFICATION**
Symptoms of Acute Exposure

Harmful if inhaled or swallowed. Dust, mist or vapor irritating to eyes and respiratory tract. May cause skin irritation.

Hazardous Decomposition Products

Can decompose at high temperatures forming toxic gases.

Flammable hydrogen gas may be formed on contact with aluminum. See "Conditions to Avoid", Section 10.

Physical Properties

Appearance: Dark brown liquid

Odor: Odorless

Unusual Fire, Explosion and Reactivity Hazards

This product may form flammable and explosive hydrogen gas when in contact with aluminum.

**4. FIRST AID MEASURES**

Have the product container, label or Material Safety Data Sheet with you when calling Syngenta (800-888-8372), a poison control center or doctor, or going for treatment.

Ingestion: If swallowed: Call Syngenta (800-888-8372), a poison control center or doctor immediately for treatment advice. Have the person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so after calling 800-888-8372 or by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

- Eye Contact: If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.
- Skin Contact: If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.
- Inhalation: If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call Syngenta (800-888-8372), a poison control center or doctor for further treatment advice.

#### Notes to Physician

There is no specific antidote if this product is ingested.

Treat symptomatically.

#### Medical Condition Likely to be Aggravated by Exposure

None known.

## **5. FIRE FIGHTING MEASURES**

### Fire and Explosion

- Flash Point (Test Method): Not Applicable
- Flammable Limits (% in Air): Lower: % Not Applicable Upper: % Not Applicable
- Autoignition Temperature: Not Applicable
- Flammability: Not Applicable

### Unusual Fire, Explosion and Reactivity Hazards

This product may form flammable and explosive hydrogen gas when in contact with aluminum.

### In Case of Fire

Use dry chemical, foam or CO2 extinguishing media. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. If water is used to fight fire, dike and collect runoff.

## **6. ACCIDENTAL RELEASE MEASURES**

### In Case of Spill or Leak

Control the spill at its source. Contain the spill to prevent it from spreading, contaminating soil, or entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Section 8. If a solid, sweep up material and place in a compatible disposal container. If a liquid, cover entire spill with absorbing material and place into compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition.

## **7. HANDLING AND STORAGE**

This product reacts with aluminum to produce flammable hydrogen gas. Do not mix or store in containers or systems made of aluminum or having aluminum fittings.

Store the material in a well-ventilated, secure area out of reach of children and domestic animals. Do not store food, beverages or tobacco products in the storage area. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

## **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION AND PACKAGING OF THE PRODUCT.**

**FOR COMMERCIAL APPLICATIONS AND ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.**

- Ingestion: Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

- Eye Contact: Where eye contact is likely, use chemical splash goggles. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
- Skin Contact: Where contact is likely, wear chemical-resistant (such as nitrile or butyl) gloves, coveralls, socks and chemical-resistant footwear. For overhead exposure, wear chemical-resistant headgear.
- Inhalation: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below exposure limits. A NIOSH-certified combination air-purifying respirator with an N, P or R 95 or HE class filter and an organic vapor cartridge may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a pressure demand atmosphere-supplying respirator if there is any potential for uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance: Dark brown liquid
- Odor: Odorless
- Melting Point: Not Available
- Boiling Point: Not Available
- Specific Gravity/Density: 1.20 g/mL @ 68°F (20°C)
- pH: 4-6

### Solubility in H<sub>2</sub>O

Diquat dibromide: 718,000 mg/L @ 68°F (20°C) and pH 7.2

### Vapor Pressure

Diquat dibromide: <10(-8) mmHg @ 77°F (25°C)

## 10. STABILITY AND REACTIVITY

- Stability: Stable under normal use and storage conditions.
- Hazardous Polymerization: Will not occur.
- Conditions to Avoid: Concentrate should not be stored in aluminum containers. Spray solutions should not be mixed, stored or applied in containers other than plastic, plastic-lined steel, stainless steel or fiberglass.
- Materials to Avoid: Strong alkalis and anionic wetting agents (e.g., alkyl and alkylaryl sulfonates). Corrosive to aluminum.
- Hazardous Decomposition Products: Can decompose at high temperatures forming toxic gases. Flammable hydrogen gas may be formed on contact with aluminum. See "Conditions to Avoid", Section 10.

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity/Irritation Studies (Finished Product)

- Ingestion: Slightly Toxic  
Oral (LD50 Rat) : = 600 mg/kg body weight
- Dermal: Moderately Toxic  
Dermal (LD50 Rabbit) : = 260 mg/kg body weight
- Inhalation: Moderately Toxic  
Inhalation (LC50 Rat) : = 0.121 mg/l air - 4 hours
- Eye Contact: Irritant
- Skin Contact: Not Available
- Skin Sensitization: Not Available

### Neurotoxicity

Diquat dibromide: No evidence for neurotoxic effects in rats dosed up to 400 ppm ion in the diet for 13 weeks.

### Reproductive Effects

Diquat dibromide: Mutagenicity: No evidence in in vivo assays.

Development Toxicity: In rabbit studies a small percentage of fetuses had minor defects at 3 and 10 mg ion/kg/d.

#### Chronic/Subchronic Toxicity Studies

Diquat dibromide: Kidney weight decreases and cataracts seen in dogs at 12.5 mg ion/kg/d.

#### Carcinogenicity

Diquat dibromide: No evidence of carcinogenicity in rat and mouse studies.

#### Other Toxicity Information

None.

#### Toxicity of Other Components

Not Applicable

#### Target Organs

##### Active Ingredients

Diquat dibromide: Eye, kidney

##### Inert Ingredients

: Not Applicable

## **12. ECOLOGICAL INFORMATION**

#### Summary of Effects

Diquat dibromide:

This material is toxic to fish and wildlife.

#### Eco-Acute Toxicity

Diquat dibromide: Rainbow Trout 96-hour LC50 21 mg/L

Mirror Carp 96 hours LC50 67 mg/L

#### Eco-Chronic Toxicity

Diquat dibromide: Not Available

#### Environmental Fate

Diquat dibromide:

No data available for the formulation. The information presented here is for the active ingredient, diquat debromide.

Sorption: Extremely tightly adsorbed to (negatively-charged) soil particles due to its dicationic nature. Diquat is primarily adsorbed to clay, less so to OM. Diquat bound to soil is unavailable for plant uptake and is largely unavailable to soil microbes.

Koc: Average is 1,000,000 mL/g (estimated).

Photodegradation: Losses probably occur on sprayed leaf surfaces and on dead and decaying vegetation.

Photochemical decomposition of diquat has been measured in the lab by irradiating thin layers of soil, but has not been unequivocally demonstrated under field conditions.

Other degradation: Certain microbe species in soil-less culture media decompose diquat. However, they degrade diquat bound to soil slowly or not at all.

Persistence: Typical half-life is 1000 d. Diquat is highly persistent due to strong binding to clay and unavailability to microbes. Diquat in soil is not taken up by plants, so any crop can be seeded at any time after application.

Mobility: Immobile in soil.

Volatilization: No losses.

## **13. DISPOSAL CONSIDERATIONS**

#### Disposal

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local, state, and federal health and environmental regulations.

Characteristic Waste: Not Applicable

Listed Waste: Not Applicable

## 14. TRANSPORT INFORMATION

### DOT Classification

Corrosive Liquid, N.O.S. (diquat dibromide, 37.3%), 8, UN1760, PGIII

### B/L Freight Classification

Herbicides, NOIBN

### Comments

International Transportation

Corrosive Liquid, N.O.S. (diquat dibromide, 37.3%), Class 8, UN1760, PGIII

## 15. REGULATORY INFORMATION

### EPCRA SARA Title III Classification

Section 311/312 Hazard Classes: Acute Health Hazard  
Chronic Health Hazard

Section 313 Toxic Chemicals: Not Applicable

### California Proposition 65

None

### CERCLA/SARA 302 Reportable Quantity (RQ)

None

### RCRA Hazardous Waste Classification (40 CFR 261)

Not Applicable

### TSCA Status

Exempt from TSCA, subject to FIFRA

## 16. OTHER INFORMATION

### NFPA Hazard Ratings

Health: 2  
Flammability: 1  
Instability: 0

### HMIS Hazard Ratings

Health: 2  
Flammability: 1  
Reactivity: 0

0	Minimal
1	Slight
2	Moderate
3	Serious
4	Extreme

For non-emergency questions about this product call:

1-800-334-9481

Original Issued Date: 04/11/2002

Revision Date:

Replaces:

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

RSVP# : SCP-955-00349A

End of MSDS

## APPENDIX 6. REWARD™ (DIQUAT) PRODUCT LABEL





# REWARD<sup>®</sup>

PULL HERE TO OPEN ►

## Landscape and Aquatic Herbicide

**TO PREVENT ACCIDENTAL POISONING, NEVER PUT INTO FOOD, DRINK, OR OTHER CONTAINERS, AND USE STRICTLY IN ACCORDANCE WITH ENTIRE LABEL.**

**DO NOT USE THIS PRODUCT FOR REFORMULATION.**

*Active Ingredient:*

Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2',1'-c) pyrazinediium dibromide] \_\_\_\_\_ - 37.3%

*Other Ingredients:* \_\_\_\_\_ 62.7%

*Total:* \_\_\_\_\_ 100.0%

*Contains 2 lbs. diquat cation per gal. (3.73 lbs. diquat dibromide per gal.)*

**KEEP OUT OF REACH OF CHILDREN.**

### WARNING/AVISO

*Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)*

*See additional precautionary statements on label.*

*EPA Reg. No. 100-1091*

*EPA Est. 100-TX-001*

*Product of United Kingdom*

*Formulated in the USA*

**SCP 1091A-L2C 0605**

## 2.5 gallons

Net Contents



## Reward® Landscape and Aquatic Herbicide

FIRST AID	
<b>If on skin or clothing</b>	<ul style="list-style-type: none"><li>• Take off contaminated clothing.</li><li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If in eyes</b>	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>If swallowed</b>	<ul style="list-style-type: none"><li>• Call a poison control center or doctor immediately for treatment advice.</li><li>• Have person sip a glass of water if able to swallow.</li><li>• Do not induce vomiting unless told to do so by the poison control center or doctor.</li><li>• Do not give anything by mouth to an unconscious person.</li></ul>
<b>If inhaled</b>	<ul style="list-style-type: none"><li>• Move person to fresh air.</li><li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible.</li><li>• Call a poison control center or doctor for further treatment advice.</li></ul>
<b>NOTE TO PHYSICIANS</b> To be effective, treatment for diquat poisoning must begin <b>IMMEDIATELY</b> . Treatment consists of binding diquat in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination, and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis.	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment.	
<b>HOTLINE NUMBER</b> For 24-Hour Medical Emergency Assistance (Human or Animal) or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident), Call <b>1-800-888-8372</b>	

### PRECAUTIONARY STATEMENTS

#### Hazards to Humans and Domestic Animals

##### WARNING / AVISO

May be fatal if absorbed through skin. Harmful if swallowed or inhaled. Causes substantial, but temporary, eye injury. Causes skin irritation. Contact with irritated skin, or a cut, or repeated contact with intact skin may result in poisoning. Do not get in eyes, on skin, or on clothing. Avoid breathing vapor or spray mist. Do not feed forage from treated crops to livestock. Keep livestock and pets out of treated fields and crop areas.

#### Personal Protective Equipment (PPE)

Some materials that are chemical-resistant to this product are: barrier laminate, butyl rubber  $\geq 14$  mils, nitrile rubber  $\geq 14$  mils. If you want more options, follow the instructions for Category A on an EPA Chemical Resistance Category Selection Chart.

#### Mixers, Loaders, Applicators and other handlers must wear:

- Coveralls over short-sleeved shirt and short pants or coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, mixing, or loading
- Face shield when mixing or loading

**Exception:** After this product has been diluted to 0.50% Reward or less in water (i.e., the labeled rate for some spot applications), applicators for AQUATIC SURFACE APPLICATIONS must, at a minimum, wear (Note - Mixers and Loaders for this application method must still wear the personal protective equipment (PPE) as described in the above section):

- Long-sleeved shirt and long pants
- Shoes plus socks
- Waterproof gloves
- Protective eyewear

## Reward® Landscape and Aquatic Herbicide

**Exception:** At a minimum, applicators for AQUATIC SUBSURFACE APPLICATIONS must wear (Note - Mixers and Loaders for this application method must still wear the personal protective equipment (PPE) as described in the above section):

- Short-sleeved shirt and short pants
- Waterproof gloves
- Chemical-resistant footwear plus socks

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

### Engineering Control Statements

Mixers and loaders supporting aerial applications are required to use closed systems that provide dermal protection. The closed system must be used in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4)]. When using the closed system, mixers and loaders' PPE requirements may be reduced or modified as specified in the WPS.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

### User Safety Recommendations

#### Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing. Prolonged contact of the product with the skin may produce burns.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

### Environmental Hazards

This pesticide is toxic to aquatic invertebrates. **For Terrestrial Uses**, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water. **For Aquatic Uses** do not apply directly to water except as specified on this label.

## CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

**NOTICE:** Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product should be followed carefully. It is impossible to eliminate all risks inherently associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of SYNGENTA CROP PROTECTION, Inc. or Seller. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold SYNGENTA and Seller harmless for any claims relating to such factors.

SYNGENTA warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, subject to the inherent risks referred to above, when used in accordance with directions under normal use conditions. This warranty does not extend to the use of the product contrary to label instructions, or under abnormal conditions or under conditions not reasonably foreseeable to or beyond the control of Seller or SYNGENTA, and Buyer and User assume the risk of any such use. SYNGENTA MAKES NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ABOVE.

In no event shall SYNGENTA or Seller be liable for any incidental, consequential or special damages resulting from the use or handling of this product. **THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF SYNGENTA AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF SYNGENTA OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

SYNGENTA and Seller offer this product, and Buyer and User accept it, subject to the foregoing conditions of Sale and Limitations of Warranty and Liability, which may not be modified except by written agreement signed by a duly authorized representative of SYNGENTA.

## DIRECTIONS FOR USE

It is a violation of federal law to use this product in a manner inconsistent with its labeling.

**READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.**

# Reward® Landscape and Aquatic Herbicide

**Do not apply this product through any type of irrigation system.**

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

## AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

**Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 24 hours.**

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is:

- Coveralls over short-sleeved shirt and short pants, or coveralls over long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material
- Chemical-resistant footwear plus socks
- Protective eyewear
- Chemical-resistant headgear for overhead exposure

## NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

**Keep all unprotected persons out of operating areas or vicinity where there may be drift.**

**For terrestrial uses,** do not enter or allow entry of maintenance workers into treated areas, or allow contact with treated vegetation wet with spray, dew, or rain, without appropriate protective clothing until spray has dried.

**For aquatic uses,** do not enter treated areas while treatments are in progress.

## STORAGE AND DISPOSAL

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

### Pesticide Storage

Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Do not contaminate feed, foodstuffs, or drinking water. Do not store or transport near feed or food. Store at temperatures above 32°F. For help with any spill, leak, fire, or exposure involving this material, call 1-800-888-8372.

### Pesticide Disposal

Open dumping is prohibited. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

### Container Disposal

Do not reuse container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

### For Bulk And Mini-Bulk Containers

When the container is empty, replace the cap and seal all openings that have been opened during use and return the container to the point of purchase, or to a designated location named at the time of purchase of this product. This container must be refilled with this pesticide product. **DO NOT REUSE THE CONTAINER FOR ANY OTHER PURPOSE.** Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transporting. Do not transport if this container is damaged or leaking. If the container is damaged, leaking or obsolete, contact Syngenta Crop Protection at 1-800-888-8372. If not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling. Disposal of this container must be in compliance with state and local regulations.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

**CONTAINER IS NOT SAFE FOR FOOD, FEED, OR DRINKING WATER!**

# Reward® Landscape and Aquatic Herbicide

## SPECIFIC USE DIRECTIONS

Reward Landscape and Aquatic Herbicide is a nonvolatile herbicidal chemical for use as a general herbicide to control weeds in commercial greenhouses and nurseries; ornamental seed crops (flowers, bulbs, etc. – except in the state of California); landscape, industrial, recreational, commercial, residential, and public areas; turf renovation (all turf areas except commercial sod farms); dormant established turfgrass (bermudagrass, zoysiagrass – nonfood or feed crop); and aquatic areas. Absorption and herbicidal action is usually quite rapid with effects visible in a few days. Reward Landscape and Aquatic Herbicide controls weeds by interfering with photosynthesis within green plant tissue. Weed plants should be succulent and actively growing for best results. Rinse all spray equipment thoroughly with water after use. Avoid spray drift to crops, ornamentals, and other desirable plants during application, as injury may result. Application to muddy water may result in reduced control. Minimize creating muddy water during application. Use of dirty or muddy water for Reward Landscape and Aquatic Herbicide dilution may result in reduced herbicidal activity. Avoid applying under conditions of high wind, water flow, or wave action.

### SPRAY DRIFT MANAGEMENT

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

The following drift management requirements must be followed to avoid off-target movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications, public health uses, or to applications using dry formulations.

- The distance of the outermost nozzles on the boom must not exceed  $\frac{3}{4}$  the length of the wingspan or rotor.
- Nozzles must always point backward parallel with the air stream and never be pointed downward more than 45 degrees.

Where states have more stringent regulations, they should be observed.

### Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (See **Wind, Temperature and Humidity, and Temperature Inversions**).

### Controlling Droplet Size

- **Volume** - Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with higher rated flows produce larger droplets.
- **Pressure** - Do not exceed the nozzle manufacturer's recommended pressures. For many nozzle types, lower pressure produces larger droplets. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of Nozzles** - Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle Orientation** - Orienting nozzles so that the spray is released parallel to the airstream produces larger droplets than other orientations and is the recommended practice. Significant deflection from horizontal will reduce droplet size and increase drift potential.
- **Nozzle Type** - Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce the largest droplets and the lowest drift.

### Boom Length

For some use patterns, reducing the effective boom length to less than  $\frac{3}{4}$  of the wingspan or rotor length may further reduce drift without reducing swath width.

### Application Height

Applications should not be made at a height greater than 10 ft. above the top of the target plants, unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces exposure of droplets to evaporation and wind.

### Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase with increasing drift potential (higher wind, smaller drops, etc.).

### Wind

Drift potential is lowest between wind speeds of 2-10 mph. However, many factors, including droplet size and equipment type, determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **Note:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect spray drift.

### Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

# Reward® Landscape and Aquatic Herbicide

## Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog, however, if fog is not present inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

## Sensitive Areas

The pesticide should only be applied when the wind is blowing away from adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops).

## COMMERCIAL GREENHOUSES AND NURSERIES

For general weed control in commercial greenhouses (beneath benches), field grown and container stock, and other similar areas, Reward Landscape and Aquatic Herbicide may be applied preplant or postplant preemergence in field grown ornamental nursery plantings or postemergence as a directed spray. Reward Landscape and Aquatic Herbicide may also be applied preemergence in ornamental seed crops (except in the state of California). Avoid contact with desirable foliage as injury may occur. Do not use on food or feed crops.

**Spot spray:** 1-2 qts. Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of water, or 0.75 oz. (22 mls.) Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water.

**Broadcast:** 1-2 pts. Reward Landscape and Aquatic Herbicide in a minimum of 15 gals. of water per acre. Add the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of spray mixture. Use an adequate spray volume to insure good coverage.

## ORNAMENTAL SEED CROPS (FLOWERS, BULBS, ETC.) EXCEPT IN THE STATE OF CALIFORNIA

For preharvest desiccation of ornamental seed crops. NOT FOR FOOD OR FIBER CROPS.

**Broadcast (Air or Ground):** 1.5-2 pts. Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per acre in sufficient water (minimum of 5 gals. by air; 15 gals. by ground) for desiccation and weed burndown. Repeat as needed at no less than 5-day intervals up to three applications. Do not use seed, screenings, or waste as feed or for consumption.

## DIRECTIONS FOR LANDSCAPE, INDUSTRIAL, RECREATIONAL, COMMERCIAL, RESIDENTIAL, AND PUBLIC AREAS

Reward Landscape and Aquatic Herbicide provides fast control of broadleaf and grassy weeds in industrial, recreational, golf course, commercial, residential, and public areas.

Reward Landscape and Aquatic Herbicide is a nonselective herbicide that rapidly kills undesirable above ground weed growth in 24-36 hours. Avoid application of Reward Landscape and Aquatic Herbicide to desirable plants.

Reward Landscape and Aquatic Herbicide is a contact/desiccant herbicide; it is essential to obtain complete coverage of the target weeds to get good control. Improper application technique and/or application to stressed weeds may result in unacceptable weed control. For best results, apply to actively growing, young weeds.

Difficult weeds (such as perennial or deeply-rooted weeds) can often be controlled by tank mixing Reward Landscape and Aquatic Herbicide with other systemic-type herbicides. Refer to other product labels for specific application directions.

For residual weed control, tank mix Reward Landscape and Aquatic Herbicide with a preemergent herbicide labeled for the intended use site. When mixing Reward Landscape and Aquatic Herbicide with another herbicide, it is recommended to mix just a small amount first to determine if the mixture is physically compatible before proceeding with larger volumes.

Syngenta has not tested all possible tank mixtures with other herbicides for compatibility, efficacy or other adverse effects. Before mixing with other herbicides Syngenta recommends you first consult your state experimental station, state university or extension agent.

**Grounds maintenance weed control:** Reward Landscape and Aquatic Herbicide can be used as a spot or broadcast spray to control weeds in public, commercial and residential landscapes, including landscape beds, lawns, golf courses and roadsides. Reward Landscape and Aquatic Herbicide can also be used for weed control around the edges and nonflooded portions of ponds, lakes and ditches.

**Trim and Edge weed control:** Reward Landscape and Aquatic Herbicide can be used to eliminate undesired grass and broadleaf plant growth in a narrow band along driveways, walkways, patios, cart paths, fence lines, and around trees, ornamental gardens, buildings, other structures, and beneath noncommercial greenhouse benches. Vegetation control with Reward Landscape and Aquatic Herbicide is limited to the spray application width. Do not exceed the labeled rate of Reward Landscape and Aquatic Herbicide as excessive rates may result in staining of concrete-based materials.

Reward Landscape and Aquatic Herbicide, since it does not translocate systemically, can be used as an edging or pruning tool when precisely applied to select areas of grass or to undesirable growth on desirable ornamental bedding plants, ground covers, etc.

## Reward® Landscape and Aquatic Herbicide

**Industrial weed control:** Reward Landscape and Aquatic Herbicide can be used as a spot or broadcast spray either alone or in combination with other herbicides as a fast burndown or control weeds in rights-of-ways, railroad beds/yards, highways, roads, dividers and medians, parking lots, pipelines, pumping stations, public utility lines, transformer stations and substations, electric utilities, storage yards, and other non-crop areas.

**Spot spray:** Apply either 1-2 qts. of Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 100 gals. water, or 0.75 oz. (22 mls.) Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water.

**Broadcast:** 1-2 pts. Reward Landscape and Aquatic Herbicide per acre in sufficient water to insure good spray coverage. Add the labeled rate of 75% or greater nonionic surfactant per 100 gals. spray mixture. Greater water volumes are necessary if the target plants are tall and/or dense. It is recommended that 60 gals. or greater water volume be used to obtain good coverage of dense weeds.

### **TURF RENOVATION (ALL TURF AREAS EXCEPT COMMERCIAL SOD FARMS)**

To desiccate golf course turf and other turf areas prior to renovation, apply 1-2 pts. of Reward Landscape and Aquatic Herbicide per acre plus the labeled rate of a 75% or greater nonionic surfactant in 20-100 gals. of water (4 teaspoons of Reward Landscape and Aquatic Herbicide plus the labeled rate of a 75% or greater nonionic surfactant per 1 gal. of water) using ground spray equipment. Apply for full coverage and thorough contact with the turfgrass. Apply only when the turf is dry, free from dew and incidental moisture. For enhanced turf desiccation, especially in the case of thick turfgrass, water volumes should approach 100 gals. of water per acre.

For **suppression** of regrowth and quick desiccation of treated turfgrass, Reward Landscape and Aquatic Herbicide may be mixed with other systemic nonselective or systemic postemergence grassy weed herbicides. Refer to other product labels for specific application directions and restrictions.

Avoid spray contact with, or spray drift to, foliage of ornamental plants or food crops.

Do not graze livestock on treated turf or feed treated thatch to livestock.

### **DORMANT ESTABLISHED TURFGRASS (BERMUDAGRASS, ZOYSIAGRASS), NONFOOD OR FEED CROP**

For control of emerged annual broadleaf and grass weeds, including Little Barley\*, Annual Bluegrass, Bromes including Rescuegrass, Sixweeks fescue, Henbit, Buttercup, and Carolina Geranium in established dormant bermudagrass lawns, parks, golf courses, etc.

Apply 1-2 pts. Reward Landscape and Aquatic Herbicide per acre in 20-100 gals. of spray mix by ground as a broadcast application. Add the labeled rate of a 75% or greater nonionic surfactant per 100 gals. of spray mixture.

Bermudagrass must be dormant at application. Application to actively growing bermudagrass may cause delay or permanent injury. Users in the extreme Southern areas should be attentive to the extent of dormancy at the time of application.

\*For control of Little Barley, apply Reward Landscape and Aquatic Herbicide prior to the mid-boot stage.

### **AQUATIC USE DIRECTIONS**

#### **New York – Not for Sale or Use in New York State without Supplemental Special Local Needs Labeling.**

Necessary approval and/or permits must be obtained prior to application if required. Consult the responsible State Agencies (i.e., Fish and Game Agencies, State Water Conservation authorities, or Department of Natural Resources).

Treatment of dense weed areas may result in oxygen loss from decomposition of dead weeds. This loss of oxygen may cause fish suffocation. Therefore, treat only  $\frac{1}{3}$  to  $\frac{1}{2}$  of the water body area at one time and wait 14 days between treatments.

For best results on submersed weeds, Reward Landscape and Aquatic Herbicide should be applied to actively growing (photosynthesizing) weeds when water temperatures have reached or exceeded approximately 50°F, typically during the Spring or early Summer.

For application only to **still water** (i.e. ponds, lakes, and drainage ditches) where there is minimal or no outflow to public waters.

and/or

For applications to **public waters** in ponds, lakes, reservoirs, marshes, bayous, drainage ditches, canals, streams, rivers, and other slow-moving or quiescent bodies of water for control of aquatic weeds. For use by:

- Corps of Engineers; or
- Federal or State Public Agencies (i.e., Water Management District personnel, municipal officials); or
- Applicators and/or Licensees (Certified for aquatic pest control) that are authorized by the State or Local government.

Treated water may be used according to the following table or until such time as an approved assay (example: PAM II Spectromatic Method) shows that the water does not contain more than the designated maximum contaminant level goal (MCLG) of 0.02 mg/l. (ppm) of diquat dibromide (calculated as the cation).

## Reward® Landscape and Aquatic Herbicide

### Water Use Restrictions Following Applications With Reward Landscape And Aquatic Herbicide (Days)

Application Rate	Drinking	Fishing and Swimming	Livestock/ Domestic Animals Consumption	Spray Tank Applications** and Irrigation to Turf and Landscape Ornamentals	Spray Tank Applications** and Irrigation to Food Crops and Production Ornamentals
2 gals./surface acre	3 days	0	1 day	3 days	5 days
1 gal./surface acre	2 days	0	1 day	2 days	5 days
0.75 gal. /surface acre	2 days	0	1 day	2 days	5 days
0.50 gal./surface acre	1 day	0	1 day	1 day	5 days
<b>Spot Spray*</b> (< 0.5 gal./surface acre)	1 day	0	1 day	1 day	5 days

\*Add a nonionic surfactant (with at least 75% of the constituents active as a spray adjuvant) at the rate recommended by the manufacturer.

\*\*For preparing agricultural sprays for food crops, turf or ornamentals (to prevent phytotoxicity), do not use water treated with Reward Landscape and Aquatic Herbicide before the specified time period.

When the contents of more than one spray tank is necessary to complete a single aquatic application, no water holding restrictions apply between the consecutive spray tanks.

No applications are to be made in areas where commercial processing of fish, resulting in the production of fish protein concentrate or fish meal, is practiced. Before application, coordination and approval of local and/or State authorities must be obtained.

#### Floating and Marginal Weeds Including:

Water lettuce, *Pistia stratiotes*

Water hyacinth, *Eichhornia crassipes*

Duckweed, *Lemna* spp.

Salvinia spp. (including *S. molesta*)

Pennywort (*Hydrocotyle* spp.)

Frog's Bit<sup>1</sup>, *Limnobium spongia*

Cattails, *Typha* spp.

<sup>1</sup>Not for use in California

Reward Landscape and Aquatic Herbicide may be applied by backpack, airboat, spray handgun, helicopter, airplane, or similar application equipment that results in thorough spray coverage.

**Spot Treatment:** Apply Reward Landscape and Aquatic Herbicide at 2 quarts per 100 gallons spray carrier (0.5% solution) with an approved aquatic wetting agent at 0.25-1.0% v/v (1 quart to 1 gallon per 100 gallons water). For cattail control, Reward Landscape and Aquatic Herbicide should be applied prior to flowering at the maximum application rate (8 quarts of Reward Landscape and Aquatic Herbicide/100 gallons spray carrier) plus the wetting agent. Repeat treatments may be necessary for complete control.

Spray to completely wet target weeds but not to runoff. Densely packed weeds or mats may require additional applications due to incomplete spray coverage. Re-treat as needed. For best results, re-treat weed escapes within 2 weeks of the initial treatment.

**Broadcast Treatment:** Apply Reward Landscape and Aquatic Herbicide at the rate of 0.5-2.0 gallons per surface acre in sufficient carrier along with 16-32 oz./A of an approved wetting agent. Re-treat as necessary for densely populated weed areas. Good coverage is necessary for control of the target weeds.

For duckweed control, apply Reward Landscape and Aquatic Herbicide at 1-2 gallons/A.

#### Submersed Weeds Including:

Bladderwort, *Utricularia* spp.

Hydrilla, *Hydrilla verticillata*

Watermilfoils (including Eurasian), *Myriophyllum* spp.

Pondweeds<sup>1</sup>, *Potamogeton* spp.

Coontail, *Ceratophyllum demersum*

Elodea, *Elodea* spp.

Brazilian Elodea, *Egeria densa*

Naiad, *Najas* spp.

Algae<sup>2</sup>, *Spirogyra* spp. and *Pithophora* spp.

<sup>1</sup>Reward Landscape and Aquatic Herbicide controls *Potamogeton* species except Richardson's pondweed, *P. richardsonii*.

<sup>2</sup>Suppression only. For control of *Spirogyra* and/or *Pithophora*, use Reward Landscape and Aquatic Herbicide in a tank mix with an approved algacide.



## Reward® Landscape and Aquatic Herbicide

For severe weed or algae infestations, the use of an approved algaecide either as a pretreatment to the Reward Landscape and Aquatic Herbicide application or in a tank mix, may result in enhanced weed control.

To control submersed weeds, apply Reward Landscape and Aquatic Herbicide in water at 0.5-2.0 gallons per surface acre (per 4 foot water depth). For severe weed infestations, use the 2.0 gallon per surface acre rate. For best results, re-treat as necessary on 14-21 day intervals. The table below shows how many gallons of Reward Landscape and Aquatic Herbicide to apply per surface acre based on water depth.

	Gallons of Reward Landscape and Aquatic Herbicide per Surface Acre			
	Average Water Depth			
	1 Foot	2 Feet	3 Feet	4 Feet
1 gallon/acre rate	0.25 gal.	0.50 gal.	0.75 gal.	1.0 gal.
2 gallon/acre rate	0.50 gal.	1.0 gal.	1.5 gals.	2.0 gals.

**Note:** For water depths of 2 feet or less including shorelines, do not exceed 1 gallon per surface acre.

**Subsurface Applications:** Where the submersed weed growth, especially Hydrilla, has reached the water surface, apply either in a water carrier or an invert emulsion through boom trailing hoses carrying nozzle tips to apply the dilute spray below the water surface to insure adequate coverage.

**Bottom Placement:** Where submersed weeds such as Hydrilla, Bladderwort, or Coontail have reached the water surface and/or where the water is slowly moving through the weed growth, the use of an invert emulsion carrier injecting diluted Reward Landscape and Aquatic Herbicide near the bottom with weighted hoses may improve control. The addition of a copper based algaecide may improve control. If algae are present along with the submersed weeds, a pretreatment with a copper based algaecide may improve overall control.

**Surface Application for Submersed Aquatic Weeds:** Apply the recommended rate of Reward Landscape and Aquatic Herbicide as a spray in sufficient carrier to fully cover the target area. Applications should be made to ensure complete coverage of the weed areas. In mixed weed populations, use the high rate of application as indicated by weeds present. For dense submersed weeds or water over 2 feet deep, a surface spray is not recommended (Reward Landscape and Aquatic Herbicide should be applied subsurface in these situations.)

**If posting is required by your state or tribe – consult the agency responsible for pesticide regulations for specific details.**

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For non-emergency (e.g., current product information), call  
Syngenta Crop Protection at 1-800-334-9481.

Syngenta Crop Protection, Inc.  
Greensboro, North Carolina 27409  
www.syngenta-us.com

**SCP 1091A-L2C 0605**

# Reward® Landscape and Aquatic Herbicide



## Landscape and Aquatic Herbicide

TO PREVENT ACCIDENTAL POISONING, NEVER PUT INTO FOOD, DRINK, OR OTHER CONTAINERS, AND USE STRICTLY IN ACCORDANCE WITH ENTIRE LABEL.

DO NOT USE THIS PRODUCT FOR REFORMULATION.

Active Ingredient:	
Diquat dibromide [6,7-dihydrodipyrdo (1,2-a:2',1'-c) pyrazinedium dibromide] . . . . .	37.3%
Other Ingredients:	62.7%
Total:	100.0%

Contains 2 lbs. diquat cation per gal. (3.73 lbs. diquat dibromide per gal.)

See additional precautionary statements on label.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

EPA Reg. No. 100-1091  
EPA Est. 100-TX-001

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Product of United Kingdom  
Formulated in the USA

Syngenta Crop Protection, Inc.  
Greensboro, North Carolina 27409  
www.syngenta-us.com

SCP 1091A-L2C 0605

**2.5 gallons**  
Net Contents

## KEEP OUT OF REACH OF CHILDREN. WARNING/ AVISO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

### FIRST AID

**If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

**If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**If swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.

**If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

**NOTE TO PHYSICIANS:** To be effective, treatment for diquat poisoning must begin **IMMEDIATELY**. Treatment consists of binding diquat in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination, and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

**HOT LINE NUMBER:** For 24-Hour Medical Emergency Assistance (Human or Animal) or Chemical Emergency Assistance (Spill, Leak, Fire, or Accident), Call 1-800-888-8372.

## Precautionary Statements

### Hazards to Humans and Domestic Animals WARNING/AVISO

May be fatal if absorbed through skin. Harmful if swallowed or inhaled. Causes substantial, but temporary, eye injury. Causes skin irritation. Contact with irritated skin, or a cut, or repeated contact with intact skin may result in poisoning. Do not get in eyes, on skin, or on clothing. Avoid breathing vapor or spray mist. Do not feed forage from treated crops to livestock. Keep livestock and pets out of treated fields and crop areas.

### Environmental Hazards

This pesticide is toxic to aquatic invertebrates. For **Terrestrial Uses**, do not apply directly to water, or to areas where surface water is present, or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water. For **Aquatic Uses** do not apply directly to water except as specified on this label.

## STORAGE AND DISPOSAL

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

### Pesticide Storage

Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Do not contaminate feed, foodstuffs, or drinking water. Do not store or transport near feed or food. Store at temperatures above 32°F. For help with any spill, leak, fire, or exposure involving this material, call 1-800-888-8372.

### Pesticide Disposal

Open dumping is prohibited. Pesticide wastes are toxic. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

### Container Disposal

Do not reuse container. Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or if allowed by State and local authorities, by burning. If burned, stay out of smoke.

### For Bulk And Mini-Bulk Containers

When the container is empty, replace the cap and seal all openings that have been opened during use and return the container to the point of purchase, or to a designated location named at the time of purchase of this product. This container must be refilled with this pesticide product. **DO NOT REUSE THE CONTAINER FOR ANY OTHER PURPOSE.** Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transporting. Do not transport if this container is damaged or leaking. If the container is damaged, leaking or obsolete, contact Syngenta Crop Protection at 1-800-888-8372. If not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling. Disposal of this container must be in compliance with state and local regulations.

For minor spills, leaks, etc., follow all precautions indicated on this label and clean up immediately. Take special care to avoid contamination of equipment and facilities during cleanup procedures and disposal of wastes. In the event of a major spill, fire, or other emergency, call 1-800-888-8372, day or night.

**CONTAINER IS NOT SAFE FOR FOOD, FEED, OR DRINKING WATER!**

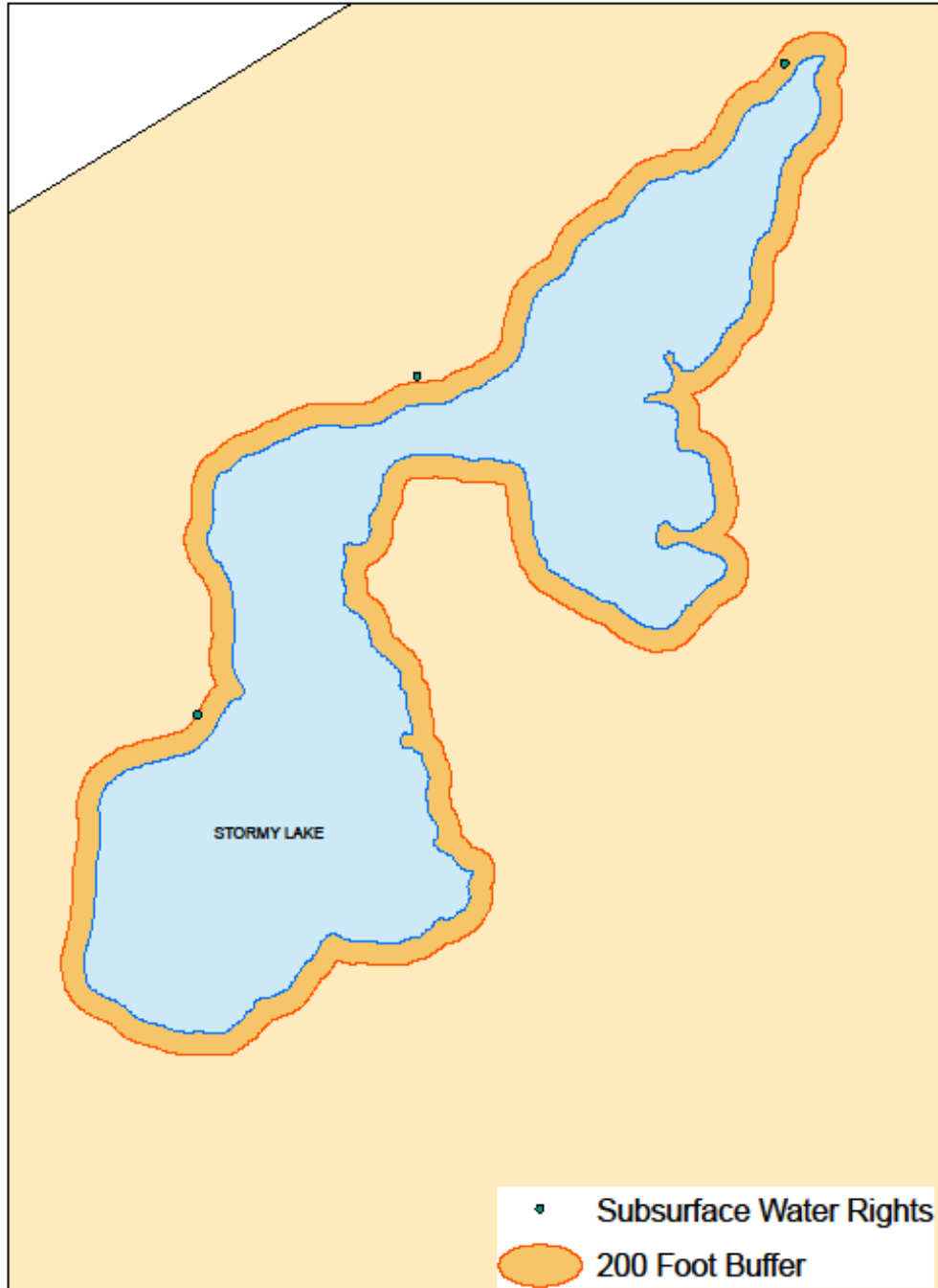


**APPENDIX 7. STORMY LAKE WATER QUALITY DATA COLLECTED IN 2006 AND 2007.<sup>a</sup>**

Measured parameters	2007				2008									
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	
Site 1 (middle of northern lake basin)														
Temperature (Celcius)	15.5	5.8	2.5	2.0	2.8	2.8	2.9	3.4	7.9	12.9	14.0	14.5	13.2	
Specific Conductivity (S/cm)	0.06	0.05	0.05	0.06	0.03	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	
Disolved Oxygen (mg/L)	6.9	10.8	15.2	11.3	9.7	6.6	9.4	8.3	10.2	8.7	7.4	6.7	8.5	
ph	6.9	6.5	8.4	7.5	7.2	7.3	7.3	7.6	7.5	7.4	7.5	7.6	7.8	
Visibility (m)	5.5	3.5	3.5	4.5	N/A	3.5	5.7	1.5	3.0	3.4	3.2	3.4	3.0	
Ice thickness (in)				13	20	25	24	25						
Site 2 (middle of lake near deepest area)														
Temperature (Celcius)	N/A	6.4	2.8	2.3	2.7	3.0	3.1	3.3	7.5	11.6	13.5	13.9	12.7	
Specific Conductivity (S/cm)	N/A	0.05	0.05	0.06	0.07	0.08	0.06	0.07	0.06	0.06	0.06	0.06	0.06	
Disolved Oxygen (mg/L)	N/A	10.9	14.8	11.7	10.1	6.4	8.0	7.8	10.0	9.3	9.4	6.4	6.8	
ph	N/A	7.2	6.7	7.5	7.1	7.2	7.4	7.6	7.4	7.5	7.5	7.5	7.6	
Visibility (m)	N/A	4.0	3.5	3.8	N/A	4.2	5.7	1.8	2.2	3.6	3.5	3.1	2.6	
Ice thickness (in)				14	N/A	22	24	25						
Site 3 (middle southern lake basin)														
Temperature (Celcius)	15.9	6.2	2.8	1.9	2.5	2.6	2.7	3.1	7.8	12.1	13.7	14.2	13.3	
Specific Conductivity (S/cm)	0.05	0.05	0.05	0.06	0.11	0.06	0.06	0.07	0.34	0.06	0.06	0.06	0.06	
Disolved Oxygen (mg/L)	7.7	10.8	14.7	12.8	11.4	8.1	10.6	10.0	10.1	9.9	8.2	6.5	8.8	
ph	6.9	6.8	6.6	7.6	7.2	7.3	7.3	7.8	7.5	7.5	7.5	7.5	7.9	
Visibility (m)	5.5	3.5	3.5	4.5	N/A	4.0	5.7	1.8	2.5	3.6	4.1	3.1	2.7	
Ice thickness (in)				14	N/A	22	24	25						
<sup>a</sup> Mean values obtained by average of reading throughout water column taken at one meter intervals.														

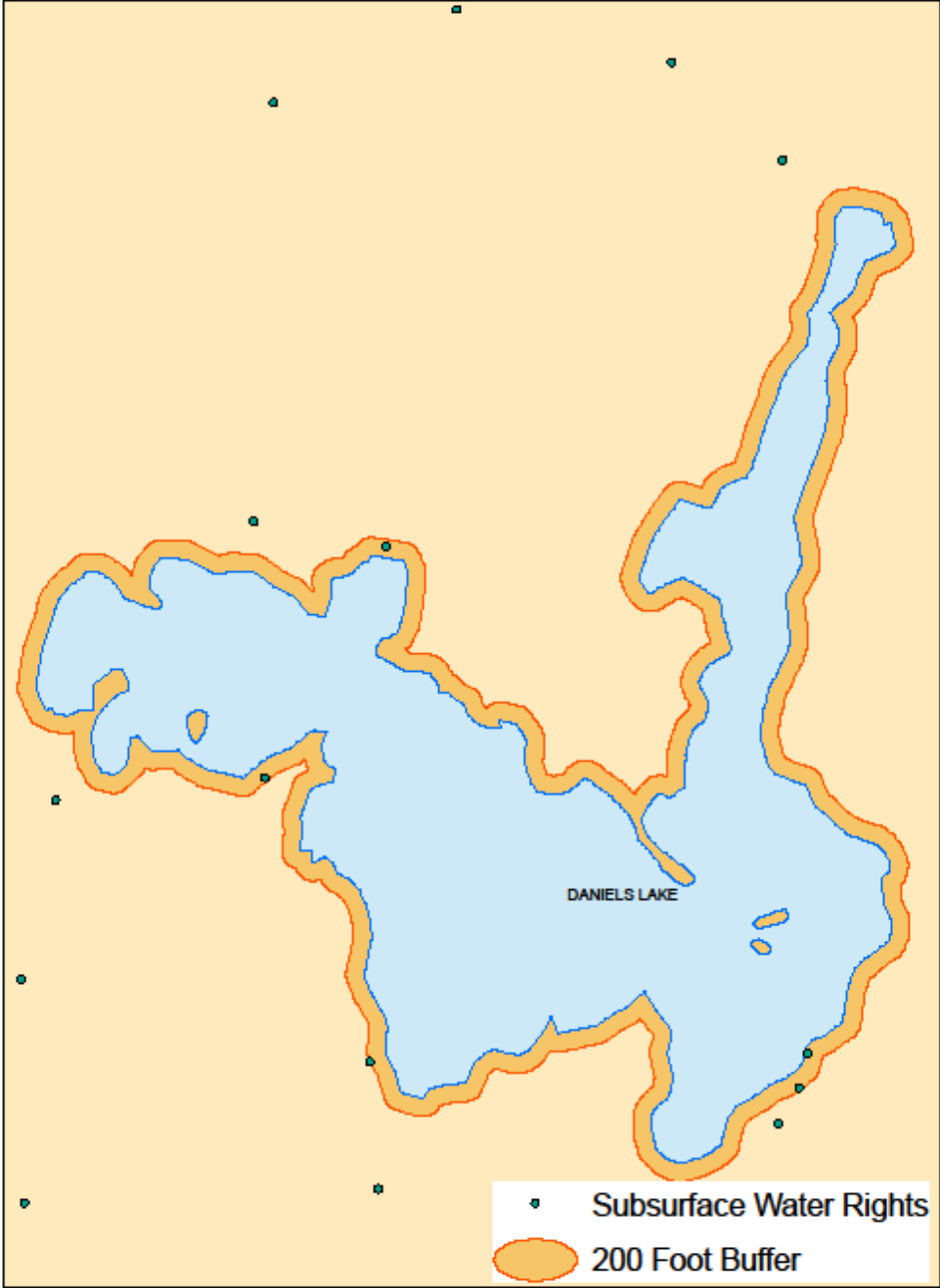
APPENDIX 8. STORMY LAKE AREA WELLS

Stormy Lake



APPENDIX 9. DANIELS LAKE AREA WELLS

Daniels Lake



## APPENDIX 10. SAFETY AND SECURITY PLANS

### A. Worker Safety Training

All employees involved in the Stormy Lake and Daniels Lake Elodea Project must be trained annually on how to safely use fluridone and diquat and must only work under the supervision of a Certified Applicator. Training is based on Hazard Communication Standard (29 CFR 1910.1200). All the information in the training must be in written form and employees must sign a written record verifying the training in a Record of Pesticide Training and Training Outline.

Required training will consist of the following topics listed below:

1. verbal warning of the information and warnings on the product(s) label and MSDS
2. review of the information on the products labels and SOP that include what chemicals are in the products, first aid and health warnings, proper use of PPE, and directions of applying rotenone should include instruction on 1) application site, 2) dosage rate, 3) application methods and equipment, 4) dilution instructions, 5) application timing and frequency, and 6) restricted entry interval
3. Review of the products MSDS that includes 1) how fluridone or diquat can affect health, 2) what to do in an emergency (first aid) listed on the MSDS, 3) information on the need to wear PPE, how to care for PPE and what PPE cannot protect from (Found on MSDS), 4) information on the meaning of safety statements and safety rules for handling pesticides (See Supplement B), and 5) rights as an employee and where to find out more information on rotenone to include job safety information, safety leaflets, MSDS information, when and where the pesticide will be applied, the name of the pesticide(s) and the EPA registration number.
4. Instruction on the Application of fluridone or diquat – review how application equipment works, application timing and calibration, and the proper use of PPE listed on the product label.

### B. Worker Safety Plan

#### Purpose

This safety plan is intended to identify and mitigate the potential safety hazards associated with the ADNR plan to eradicate elodea from Stormy and Daniels Lakes.

#### Objectives

1. Maintain an accident & injury free project
2. Provide appropriate training and documentation for employees and volunteers
3. Ensure the use of controls, safe work practices and “Personal Protective Equipment” (PPE)
4. Ensure compliance with OSHA requirements for workplace safety
5. Ensure the safety of participants and the public through work-zone entry control
6. Ensure appropriate medical treatment in the event an injury occurs

The eradication of elodea will be accomplished by the application of two commercial formulations of pesticides, Sonar (fluridone) and Reward (diquat).

The project leader has the primary authority to monitor and assess hazardous and/or unsafe situations and develop measures for assuring personnel safety. The project leader will be available on site during the application phase of the project to oversee aspects of the safety plan.

Table A16-1: Emergency Situation Response and Numbers

Type of Emergency	Action	Contacts	Number
Sonar (fluridone) or Reward (diquat) is swallowed	Do not induce vomiting. Call a physician, National Pesticide Information Center, or Poison Control Center	Emergency Services	911
Sonar (fluridone) is inhaled	Move victim to fresh air, give CPR if not breathing. Call Emergency Services first. If needed call Pesticide Information Center or Poison Control Center.	National Pesticide Information Center	800-858-7378
Sonar (fluridone) or Reward (diquat) gets in eyes	Hold eyelids open and gently rinse slowly with water for 15-20 minutes. Call Emergency Services first. If needed call Pesticide Information Center or Poison Control Center.	National Poison Control Center	800-222-1222
Sonar (fluridone) or Reward (diquat) is on skin or clothing	Take off contaminated clothing, rinse skin with water for 15-20 minutes. Call Emergency Services first. If needed call Pesticide Information Center or Poison Control Center.		

### Access During the Treatment Phase

During the treatment phase of the project, access to the treated waterbodies shall only be accessible to authorized and appropriately trained personnel. Because much of the land surrounding the treatment area is public, notifications posted at access points to the advising all to not enter the treatment waters until detoxification occurs and informed so by ADNR. Signage will also be place at potential access area to the treated waterbodies in accordance to ADEC regulations. To ensure the safety of the public and the media, access to any work zones or restricted area will be under the direct control of the project leader. Interested visitors, observers and members of the media shall be restricted to a designated observation area(s) unless approved and escorted by a designated member of the project team. In the event a visitor, observer or media representative is granted access to work zones or restricted areas, the individual shall follow all procedures established by the project supervisor or access will be immediately revoked.

The potential hazards associated with the eradication of elodea from Stormy and Daniels Lakes can be categorized into the following five groups:

1. pesticide exposure
2. non-pesticide chemical exposure
3. spills

4. general safety hazards
5. heat stress to workers

## **C. Safety Training Plan**

Training will ensure that all affected employees are appropriately trained for their assigned tasks. All training, existing or new, shall be documented using ADNR's "Safety Certification" form for all training performed. All training and safety related documentation will be maintained by the project leader.

### **1. Pesticide Exposure**

#### **a. Pesticide Application Supervision**

The use of pesticides will be supervised, on site, by at least one ADNR employee who has obtained his or her Qualified Applicator Certificate in the Aquatic Category from the Alaska Department of Environmental Conservation.

#### **b. Pesticide Safety Training**

All ADNR employees involved with the Stormy and Daniels Lake Elodea Project will receive pesticide safety training specific to the use of Sonar (fluridone) and Reward (diquat).

#### **c. Pesticide Safety Equipment and Procedures**

All ADNR employees who handle opened containers of Sonar™ or Reward™ including all mixers, loaders, applicators, and other handlers (except pilots) must wear at a minimum, the following PPE:

1. coveralls, over long-sleeved shirt and long pants
2. chemical-resistant gloves
3. chemical-resistant footwear plus socks
4. protective eyewear
5. a NIOSH-approved tight-fitting full-face cartridge or canister respirator with any N, R, P, or HE filter; or a NIOSH-approved helmet or hood-style respirator with a dust/mist filter with MSHA/NIOSH approval number prefix TC-21C; or a NIOSH-approved N95 filtering face piece or half-face negative pressure air purifying respirator with P100 HEPA filter cartridges; or a powder purifying respirator (PAPR) with P100 HEPA filter cartridges

Exception: waterproof waders may be worn in place of coveralls, chemical-resistant apron and chemical-resistant footwear.

Exception: dust/mist respirator may be worn in place of NIOSH full-face cartridge or canister respirator described above when applying moist Sonar™ powder/gelatin/sand mixtures. This exception is not applicable to preparing the powder/gelatin/and mixture. Additionally, employees must use appropriate respiratory protective equipment when handling powdered forms of Sonar™. Employees working with undiluted Sonar™ or Reward™ must use at a minimum half-mask air-purifying respirators with organic-vapor removing cartridges with prefilters (P100) approved for pesticides (MSHA/NIOSH prefix TC-23C).

All ADNR employees who handle opened containers of Sonar™ or Reward™ including all mixers, loaders, applicators, and other handlers (except pilots) must wear at a minimum, the following PPE:

1. coveralls, over long-sleeved shirt and long pants
2. chemical-resistant gloves
3. chemical-resistant footwear plus socks
4. protective eyewear



5. a dust/mist respirator. In addition, mixers, loaders, and others exposed to the concentrate, through cleaning equipment or spills must wear a chemical-resistant apron

Exception: waterproof waders may be worn in place of coveralls, chemical-resistant apron and chemical-resistant footwear.

ADNR employees who are required to wear respirators shall be provided respiratory protection training that includes instruction on how to properly fit and test a respirator. Respirators will be assigned to each applicator by their team leader. Respirators will be cleaned at the end of each shift and stored in appropriate containers provided to each user. The use of respirators associated with rotenone use will be in full compliance with the regulations described in OAR 437-002-0120, (OrOSHA Subdivision I, Personal Protective Equipment).

All equipment must be clean and in good repair at the start of each work day. Respirators shall be cleaned at the end of each day and stored in an approved container. Each employee who handles rotenone products will be issued one set of coveralls and gloves. Ripped or otherwise damaged equipment will be replaced as soon as possible. Extra sets of coveralls, gloves and eye protection (equal to approximately 50% of the total number of rotenone handlers) will be available in the event of equipment damage. Respirator cartridges must be changed daily. Extra respirators and cartridges will also be available at the project site.

#### **d. Washing Facilities**

Clean water, soap, and single-use towels for routine washing of the hands and face and emergency washing of the entire body will be available at the loading zone. Bottled saline eyewash solution will be available onboard all watercraft actively engaged in applying any chemical and available onsite for all drip station operators and backpack applicators including at the onsite storage location.

#### **e. Emergency Medical Care**

See Emergency Response Chart for actions required for various fluridone or diquat exposures.

#### **f. Pesticide Emergencies or Illnesses**

Employees who suspect that they have become ill by the use of fluridone or diquat products must go immediately to one of the designated onsite First Aid Stations and notify their team leader. A first aid station will be located at the onsite pesticide staging or storage area. First aid kits will also be kept in each application boat and at each drip station site including disposable wipes and eye wash rinses bottles. If an illness or emergency occurs, the project supervisor will be immediately notified of the situation. If necessary, the employee will be instructed to remove his or her work clothing, rinse with clean water, and dress in clean clothing. In the event of a rotenone product exposure to the eyes, the employee's eyes shall be immediately flushed with large amounts of water for at least 15 minutes. The employee will be attended by an onsite First Aid Crew and, if necessary, will be taken to the appropriate medical care facility. Copies of all rotenone product

MSDS sheets will be available to all application teams and extras copies available at the onsite storage location and a copy will be provided to any other medical professionals, as needed.

## **2. Non-Pesticide Chemical Exposure**

No non-pesticide chemicals are anticipated for use in this project. If any non-pesticide chemicals are to be used, the following safety measures will be employed.

#### **a. Personal Protective Equipment**

Employees will be instructed to handle the non-pesticide compound in such a manner as to reduce the potential for dust generation.

ADNR and USFWS employees who are required to wear respirators shall be provided respiratory protection training that includes instruction on how to properly fit and test a respirator. Respirators will be cleaned at the end of each shift and stored in appropriate containers provided to each user.

**b. Washing Facilities**

Clean water, soap, and single-use towels for routine washing of the hands and face and emergency washing of the entire body will be available at the field staging station. An emergency eye wash station will also be located at the same location.

**c. Emergency Medical Care**

See the pesticide Emergency Response Chart for general action guidelines for any non-pesticide chemical exposure.

**d. Emergencies or Illnesses**

Employees who suspect that they have become ill by the use of non-pesticide chemicals must go immediately to one of the designated First Aid station or storage site. The project supervisor will be immediately notified of the situation. If necessary, the employee will be instructed to remove his or her work clothing, shower, and dress in clean clothing. In the event of exposure to the eyes, the employee's eyes shall be immediately flushed with large amounts of water for at least 15 minutes. The employee will be attended by the First Aid team, if necessary, will be taken to the appropriate medical care facility. A copy of any non-pesticide chemical material safety data sheets will be available onsite at the deactivations station, deactivation crew work vehicles and a copy provided, if needed, to any other medical professionals.

**3. Spills**

In the case of accidental release for fluridone or diquat products, refer to Section E, the Spill Plan. Spilled materials should still be used in the treatment process.

**4. General Safety Hazards**

Among the general safety hazards that may be encountered during this project are general slips and falls, falls into water, improper lifting techniques, work around heavy equipment and watercraft, and potential exposure to elevated noise levels. These potential safety hazards will be evaluated and mitigated via appropriate work area safety training and monitoring.

The primary goal will be to eliminate exposure, use of appropriate engineering to remove the hazard, appropriate machine/equipment guarding, and proper work practice training or personal protective equipment (PPE). The priority for mitigating hazards will be in this order.

The loading of pesticide containers onto application boats will occur in the loading zone which will be posted as a "No Entry Area" or "Restricted Entry Area". No employee will be allowed within a permitted entry loading zone without, appropriate safety equipment, and work coveralls. Forklift operation zones will be delineated and a general foot traffic restriction will be enforced in those zones.

Employees shall be required to wear life vests at all times while on boats and/or docks. Life vests shall be worn in addition to the pesticide application safety gear.

**5. Heat Stress**

Heat stress is a potential hazard to employees due to the requirements related to personal protective equipment. The wearing of moisture-impervious clothing (Tyvek) may be used to reduce employee exposure to pesticides. The use of moisture-impervious clothing, however, increases the employee's potential for heat stress by reducing the potential for body temperature cooling via sweat evaporation. All ADNR and USFWS personnel will be fully informed of the hazards related to heat stress. Further, ADNR and USFWS personnel will be required to drink liquids frequently (~every 20 minutes of work) take appropriate work breaks and

participate in heat stress monitoring. Personnel that suspect that they are suffering from the effects of heat stress will be instructed to go immediately to one of the designated onsite First Aid Stations. The project supervisor shall be immediately notified.

## **D. Site Security Plan**

Stormy Lake is accessed by a public boat launch and public beach. Daniels Lake is all in private ownership. Direct landowner notifications, public announcements (newspaper ads and ADNR news releases) and treatment site posted signage will announce the period the treatments will be scheduled and will strongly advise against entry into treated waters until detoxification is confirmed. Access to pesticide loading zones will be “restricted access” and will be marked with ribbon tape and posted with appropriate warning signage. Only ADNR and USFWS employees or other approved treatment personnel that are wearing appropriate PPE can enter the restricted area.

The primary security concern will be the onsite storage of equipment and fluridone and diquat products. Depending on application schedule, and rate, onsite storage may not be necessary. If necessary, all equipment will be secured in locked facilities, in a locked and enclosed area, either an enclosed trailer, truck(s) with side racks at least six feet above the ground, or surrounded by a temporary fence at least six feet tall. All enclosures will have appropriate warning and notification signage posted and the enclosures will be locked when unattended.

Onsite storage of boats will be done by tethering boats securely to shore near the boat launch area and ignition keys will be removed. All application equipment and PPE will be stored in locked boat compartments, in enclosed nearshore storage enclosures, or removed from the site. Items like generators/pumps may be left in the open deck of the boat as long as they are cabled and locked to the boat.

The boat launch/storage site may be attended continuously by ADNR and USFWS staff or by contracted security to ensure vandalism does not occur. Alaska Wildlife Protection Troopers and State of Alaska Park Rangers will be notified beforehand of the scheduled treatment period (including storage) and will be asked to periodically patrol the storage sites and respond to any reported criminal or trespass issues should any arise related to the treatment.

## **E. Spill or Crisis Contingency Plan**

### **a. Spill Response**

If a spill occurs, the sequence in a workers response should be to Control, Contain and Clean up the spill (when practical). Workers should not expose themselves unnecessarily to chemicals from a spill and should wear PPE if attempting to control the spill. If a spill is large and dangerous, call for help first. The project supervisor must be notified as soon as possible.

When possible, workers should take immediate steps to control the release of the product being spilled such as stopping a leak by righting a turned over container, putting a leaking container into a larger container, or pumping liquids from a leaking container into another container.

Try to contain the spill when practical; sand/dirt can be used to berm around a spill area or pads and/or sand can be placed on the spill to help absorb it. Powdered pesticide formulations can be misted with water to reduce spreading by wind drift.

Once the spill is contained, responders will clean up the spill by sweeping or shoveling the contaminated materials into a container lined with a heavy plastic bag. Bleach or chlorine can be used to neutralize the

spilled area. Then add absorbent materials to area being cleaned to help collect the contaminated neutralizing material.

To reduce the possibility of an accidental spill during transport, all product containers will be tethered securely into the transporting vehicle or trailer. To move the product containers to vehicles or boats, loading ramps or a forklift will be used to move the containers so direct manual lifting can be reduced. If a spill occurs, a spill response kit will be available this kit will also accompany the transport of any pesticide product. The spill response kit will contain shovels to remove contaminated soil, a large plastic container to hold contaminated material/soil (50 gallon volume), absorbent pads, activated charcoal (10 gallons), dry sand (10 gallons), plastic garbage bags, personnel protective equipment, a 100-foot roll of 3-6 foot impervious barrier, pesticide transfer hand pump and a gallon of bleach.

Any contaminated soil will be treated as if it were pure pesticide, and PPE will be worn to clean up the spill. If there is a spill outside of the treatment area and there is a chance it could enter surface waters out of the project area, then the disposal of the contaminated soil to an approved landfill may be required. For any spill onto soil near a treatment area, the contaminated soil will be removed and treated as if it were the pure pesticide and applied to the treatment area. Activated charcoal will be mixed into the soil where it was excavated at a rate of 100 to 1 (charcoal to active ingredient) as suggested online at [www.buyactivatedcharcoal.com](http://www.buyactivatedcharcoal.com).

Washing of equipment contaminated from a spill or equipment leaks can be accomplished by washing first with water from the treatment area then with a solution of bleach (1:10 ratio bleach to water) followed by washing with a strong soap and water solution.

Accidental pesticide spills of any size that result in the pesticide not entering the treatment area will be immediately reported by the project supervisor to the ADEC hazardous spill number (1-907-269-3063), the local ADEC Office (1-907-262-5210), Kenai Peninsula Borough Emergency Services (1-907-262-4792), and the Kenai Borough Emergency Management Office (1-907-262-4910). In addition CHEMTREC provides access to emergency response information and technical assistance from chemical industry experts and can be contacted for emergency assistance only at 1-800-424-9300. Local and State Law enforcement should be notified if a spill occurs on a public highway. For diquat or fluridone product information the National Pesticide Information Center can also be contacted at: 800-858-7378.

These emergency phone numbers will be provided to all project personnel and should be with them at all times when working on the project so they can make emergency calls. All workers should have access to a cell phone which will be the primary means of distance communication.

#### **b. Product Inventory**

The estimated amount of each product that will be used in each treatment area is estimated to be 200 gallons liquid pesticide or 150 lbs. of powdered pesticide.

#### **c. Storage/Staging Areas**

Storage of large quantities of diquat or fluridone product (>30 gallons liquid product or 110 lbs of powdered product) when the storage arrangement is not capable of draining spilled product into a waterbody destined for treatment, the product will be stored within a bermed area lined with a plastic fabric capable of containing all the pesticide product. A spill response kits and PPE will be onsite at all storage locations including emergency contact numbers.

When possible, onsite storage of pesticide delivered to individual lakes/streams will be stored in such a way that an accidental spill would drain towards the waterbody destined to be treated.

Locations of loading/staging areas are not yet selected but are generally described in Section C.

#### **d. Incident/Crisis Command**

In the event of a serious spill, fire, serious injury, etc., workers should first call 911. All incidents such as such as spills, accidents or any potential crisis should be immediately reported by the worker observing it to their team leader. The team leader will assess the situation and respond with assistance (if prudent) and inform the project supervisor as soon as possible. The project supervisor will decide if additional actions should be taken including notifying the Regional Research Coordinator or emergency services.

Crises typically result from adverse public reaction to, or excessive media interest in, an unplanned event during or following the treatment. In the event of a crisis related to some aspect of the pesticide treatment, an Incident Command System will be implemented. The incident plan will consist of:

1. Who the worker should report to
2. Define the problem, identify issues, selection of a crisis team, gather facts, identify a spokesperson
3. Centralize control of information
4. Communicate and negotiate at the highest level of authority
5. Contain the problem quickly

## APPENDIX 11. APDES PERMIT



THE STATE  
of **ALASKA**  
GOVERNOR SEAN PARNELL

Department of Environmental  
Conservation

DIVISION OF WATER  
Wastewater Discharge Authorization Program

555 Cordova Street  
Anchorage, Alaska 99501-2617  
Main: 907.269.6285  
Fax: 907.334.2415  
[www.dec.alaska.gov/water/wwdp](http://www.dec.alaska.gov/water/wwdp)

June 14, 2013

Brianne Blackburn  
Plant Materials Center  
5310 S. Bodenburg Spur Rd.  
Palmer, AK 99645

Re: Permit No: AKG870001 Stormy Lake, Daniels Lake, Bishop Creek - DNR

Dear Permittee:

This email/letter acknowledges that you have submitted an updated Notice of Intent form to be covered under the APDES Pesticide General Permit (PGP). The permittee is authorized to discharge to Waters of the US under the terms and conditions of this permit thirty (30) calendar days after acknowledgment of receipt of the permittee's completed NOI is posted on ADEC's Water Permit Search website (<http://www.dec.state.ak.us/Applications/Water/WaterPermitSearch/Search.aspx>).

As stated above, this letter acknowledges receipt of a Notice of Intent. However, it is not an ADEC determination of the validity of the information you provided. Your eligibility for coverage under the Permit is based on the validity of the certification you provided. Your signature on the Notice of Intent certifies that you have read, understood, and are implementing all of the applicable requirements. An important aspect of this certification requires that you correctly determine whether you are eligible for coverage under this permit.

As you know, the PGP requires you to have developed and begun implementing a Pesticide Discharge Management Plan (PDMP); establishes technology-based effluent limitations, water quality, monitoring, corrective action, record keeping, and annual reporting requirements. You must also comply with any additional location-specific requirements applicable to Alaska. Additional information regarding the Alaska Pesticide General Permit can be found at: <http://dec.alaska.gov/water/wnpssc/stormwater/PesticideGP.html>

For tracking purposes, the following number has been assigned to your Notice of Intent Form: AKG870001.

If you have any questions regarding the above, please contact me at 907-334-2288 or via email at [James.Rypkema@alaska.gov](mailto:James.Rypkema@alaska.gov).

Sincerely,

James Rypkema  
Section Manager, Storm Water and Wetlands

Enclosure: NOI

cc: w/enclosure (email)  
Karin Hendrickson, DEC-EH/Pesticides  
Franci Havemeister, DNR



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
 WASHINGTON, DC 20460  
 NOTICE OF INTENT (NOI) OF COVERAGE UNDER THE PESTICIDE  
 GENERAL PERMIT (PGP) FOR DISCHARGES FROM THE APPLICATION  
 OF PESTICIDES

Form Approved  
 OMB No.  
 2040-0284

Submission of this completed Notice of Intent (NOI) constitutes notice that the Operator identified in Section B intends to be authorized to discharge pollutants to Waters of the United States within the pest management area identified in Section C under EPA's Pesticide General Permit. Submission of this NOI constitutes notice that the party identified in Section B of this form has read, understands, and meets the eligibility conditions of Part 1 of the permit; agrees to comply with all applicable terms and conditions of the permit; and understands that continued authorization under the permit is contingent on maintaining eligibility for coverage. To be granted coverage, all information required on this form must be completed. Please read and make sure you comply with all permit requirements, including the requirement for large entities to prepare a Pesticide Discharge Management Plan (PDMP) prior to NOI submittal. Refer to the instructions at the end of this form to complete your NOI.

**Electronic Submission Waiver (skip if submitting through EPA's eNOI system)**

I hereby acknowledge my waiver request from the use of EPA's electronic Notice of Intent system (eNOI) because my use of eNOI will incur undue burden or expense over my use of this paper NOI form.

Briefly describe the reason why use of the electronic system causes undue burden or expense.

eNOI not available

**A. Notice of Intent Status**

1. Mark whether this is the first time you are requesting coverage under the Pesticide General Permit or if this is a change of information for a discharge already covered under the Pesticide General Permit. If this is a change of information, supply the NPDES permit tracking number for the discharge.

a.  Original NOI Submission

AKG870001

b.  NOI Change of Information:

AKG870000

(NPDES Permit Tracking Number)

Please note: When selecting A.1.b please fill out Section B (Operator Name and Mailing Address) and the fields of the NOI that need to be modified.

**B. Operator Information**

1. Operator Name: AK Department of Natural Resources

2. IRS Employer Identification Number (EIN): 92-6001185

3. Operator Type (check one):

- a.  Federal government
- b.  State government
- c.  Local government
- d.  Mosquito control district (or similar)
- e.  Irrigation control district (or similar)
- f.  Weed control district (or similar)

g.  Other: If other, provide brief description of type of operator:

4. Are you a large entity as defined in Appendix A of the permit? (check one):

Yes  No

Please note: If you answer "Yes" to question 4 you are required to develop a Pesticide Discharge Management Plan (PDMP) and submit an Annual Report reflecting all pesticide uses for which you are requesting permit coverage under this NOI.

5. In which state are your pest management areas located? Please specify only one state per NOI:

AK

6. Mailing Address:

a. Street: 5310 S Bodenburg Spur Rd

b. City: Palmer c. State: AK d. ZIP Code: 99645

e. Telephone: 907-745-8785 Ext. f. Fax: 907-746-1568

g. Contact Name: Briannne Blackburn

h. E-mail: Briannne.Blackburn@alaska.gov



**C. Pest Management Areas: Complete Section C for each Pest Management Area for which coverage under EPA's Pesticide General Permit is desired. Copy this section for non-electronic submissions.**

Pest Management Area # 1 of ## 1

1. Pest Management Area Name: Kenai Peninsula

Provide a map of the location of the Pest Management Area (attach map) or describe the location of the Pest Management Area in detail.

See attached general location map

2. Are any of your activities for which you are requesting coverage under this NOI occurring on Indian Country Lands?  Yes  No

If yes, identify the reservation or otherwise describe those areas:

3. Are any of your activities (in this pest management area) for which you are requesting coverage under this NOI occurring on areas considered "federal facilities" as defined by the permit?  Yes  No

4. Mailing address and contact information of the pesticide applicator (or check here  if same as provided in Section B):

a. Street:

b. City:  c. State:  d. ZIP Code:

e. Telephone:  -  -  Ext  f. Fax:  -  -

g. Contact Name:

h. E-mail:

5. Pesticide Use Patterns to be included in this Pest Management Area (check all that apply):

- a.  Mosquito and Other Flying Insect Pest Control      c.  Animal Pest Control  
b.  Weed and Algae Pest Control      d.  Forest Canopy Pest Control

6. Receiving Waters (check one):

- a.  Coverage requested for all Waters of the United States within the Pest Management Area identified above.  
b.  Coverage requested specifically for the following Waters of the United States within the Pest Management Area identified above.  
Daniels Lake, Stormy Lake, Bishop Creek (at outflow of Daniels Lake)

c.  Coverage requested for all Waters of the United States within the Pest Management Area identified above except for:

7. Tier 3 Waters

Is coverage requested for discharge to a Tier 3 water (Outstanding National Resource Water) of the United States?  Yes  No

If yes, answer a and b:

- a. Name of Tier 3 water(s): \_\_\_\_\_  
b. Provide rationale for determination that pesticide discharge is necessary to protect water quality, the environment, and/or public health and that any such discharge will not degrade water quality or will degrade water quality only on a short-term or temporary basis:

8. Water Quality Impaired Waters

Operators are not eligible for coverage under this permit for any discharges from a pesticide application to Waters of the United States if the waters are identified as impaired by a substance which is either an active ingredient of the pesticide designated for use or is a degradate of such an active ingredient. See Part 1.1.2.1 of the permit. Check one:

- a.  Waters are NOT impaired by any substance which is either an active ingredient of a pesticide to be discharged or a degradate of such an active ingredient  
b.  Waters are on a current state list as being impaired by a substance which is either an active ingredient of a pesticide to be discharged or a degradate of such an active ingredient; however, evidence is attached documenting that the waters are no longer impaired.

**D. Endangered Species Protection: Complete Section D for each Pest Management Area for which coverage under EPA's Pesticide General Permit is desired. Copy this section for non-electronic submissions.**

Pest Management Area # 1 of ## 1

1. Identify the criterion for which you are eligible for permit coverage as it applies to Federally Listed Threatened or Endangered Species (i.e., Species) and/or Federally Designated Critical Habitat (i.e., Habitat) (check one):

- a.  Pesticide application activities will not result in a point source discharge to one or more Waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern, as defined in Appendix A, of the PGP.
- b.  Pesticide application activities for which permit coverage is being requested will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, but consultation with NMFS under Section 7 of the Endangered Species Act (ESA) has been concluded for pesticide application activities covered under the PGP. Consultations can be either formal or informal, and would have occurred only as a result of a separate federal action. The consultation addressed the effects of pesticide discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in either:
  - i. A biological opinion from NMFS finding no jeopardy to federally-listed species and no destruction/adverse modification of federally-designated critical habitat; or
  - ii. Written concurrence from NMFS with a finding that the pesticide discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat.
- c.  Pesticide application activities for which permit coverage is being requested will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, but all "take" of these resources associated with such pesticide application activities has been authorized through NMFS' issuance of a permit under section 10 of the ESA, and such authorization addresses the effects of the pesticide discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. (The term "take" means to harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. See Section 3 of the Endangered Species Act, 16 U.S.C. § 1532 (19).)
- d.  Pesticide application activities were, or will be, discharged to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, but only in response to a Declared Pest Emergency Situation.
- e.  Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP. Eligible discharges include those where the Decision-maker includes in the NOI written correspondence from NMFS that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of adverse effects to NMFS Listed Resources of Concern.
- f.  Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP. Eligible discharges include those from pesticide application activities that are demonstrated by the Decision-maker as not likely to adversely affect NMFS Listed Resources of Concern or that the pest poses a greater threat to the NMFS Listed Resources of Concern than does the discharge of the pesticide.

2. If you checked criterion d or criterion f above, provide the following information for all discharges to Waters of the United States containing NMFS Listed Resources of Concern identified within the pest management area for which permit coverage is being requested. For discharges pursuant to criterion d, Declared Pest Emergency Situations, information for items a through g should also include any discharges that have already occurred prior to NOI submission as well as the activities you performed in the 15 day period before submission of this NOI was required. In some cases, implementation of pest management measures as specified in the permit involves a degree of "adaptive management" such that exact timing and quantities of applications cannot be determined in advance for the duration of the permit. In such cases, the permittee must provide the required information to the extent feasible and consistent with the implementation of the selected pest management measures.

a. Describe the location of the pest management area in detail or provide a map of the location:

\_\_\_\_\_

b. Pest(s) to be controlled:

\_\_\_\_\_  
\_\_\_\_\_

c. Pesticide product(s) to be discharged and method of application: \_\_\_\_\_

d. Planned quantity and rate of discharge(s) for each method of application: \_\_\_\_\_

e. Number of planned discharges: \_\_\_\_\_

f. Approximate date(s) of planned discharge(s): \_\_\_\_\_

g. Your rationale supporting your determination that you meet the criterion for which you are submitting this NOI, including appropriate measures to be undertaken to avoid or eliminate the likelihood of adverse effects. For certifications pursuant to Criterion D, indicate whether the discharge is likely to adversely affect NMFS Listed Resources of Concern and, if so, any feasible measures to avoid or eliminate such adverse effects (attach additional pages as necessary):

\_\_\_\_\_  
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\_\_\_\_\_

**E. Certification**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. On the basis of my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name: F r a n c i s H a v e m e i s t e r

Title: D i r e c t o r o f A g r i c u l t u r e D N R

E-Mail: F r a n c i s . H a v e m e i s t e r @ a l a s k a . g o v

Signature/Responsible Official: Francis Havemeister Date: 05 / 30 / 2013

**NOI Preparer (Complete if NOI was prepared by someone other than the certifier)**

Preparer Name: B r i a n n e B l a c k b u r n

Organization: A K D N R - D i v i s i o n o f A g r i c u l t u r e

Phone: 9 0 7 - 7 4 5 - 8 7 8 5 Ext [ ] [ ] [ ] Date: 0 5 / 3 0 / 2 0 1 3

E-Mail: B r i a n n e . B l a c k b u r n @ a l a s k a . g o v

**Instructions for Completing the Notice of Intent (NOI) for Coverage Under the Pesticide General Permit (PGP) for Discharges from the Application of Pesticides**

**Who Must File a NOI with EPA?**

Any Operator, as described in the Part 1.2.2 of the permit and meeting the eligibility requirements identified in Part 1.1 of the permit and Table 1 below must submit a complete and accurate NOI. As required in the permit, only certain Operators that are also Decision-makers must submit NOIs.

**Table 1. Decision-Makers Required to Submit NOIs**

PGP Part/ Pesticide Use	Which Decision-Makers Must Submit NOIs?	For Which Pesticide Application Activities?
All four use patterns identified in Part 1.1.1	Any Decision-maker with an eligible discharge to a Tier 3 water (Outstanding National Resource Water) consistent with Part 1.1.2.2	Activities resulting in a discharge to a Tier 3 water
All four use patterns identified in Part 1.1.1	Any Decision-maker with an eligible discharge to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A	Activities resulting in a discharge to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A
1.1.1(a) - Mosquito and Other Flying Insect Pest Control	Any Agency for which pest management for land resource stewardship is an integral part of the organization's operations.	All activities resulting in a discharge for which the Federal or State agency is responsible for pest control
	Mosquito control districts, or similar pest control districts	All activities resulting in a discharge for which the Decision-maker is responsible for pest control
	Local governments or other entities that exceed the annual treatment area threshold identified here	Adulticide treatment if more than 6,400 acres during a calendar year
1.1.1(b) - Weed and Algae Pest Control	Any Agency for which pest management for land resource stewardship is an integral part of the organization's operations.	All activities resulting in a discharge for which the Federal or State agency is responsible for pest control
	Irrigation and weed control districts, or similar pest control districts	All activities resulting in a discharge for which the Decision-maker is responsible for pest control
	Local governments or other entities that exceed the annual treatment area threshold identified here	Treatment during a calendar year if more than either: 20 linear miles OR 80 acres of water (i.e., surface area)
1.1.1(c) - Animal Pest Control	Any Agency for which pest management for land resource stewardship is an integral part of the organization's operations.	All activities resulting in a discharge for which the Federal or State agency is responsible for pest control
	Local governments or other entities that exceed the annual treatment area threshold identified here	Treatment during a calendar year if more than either: 20 linear miles OR 80 acres of water (i.e., surface area)
1.1.1(d) - Forest Canopy Pest Control	Any Agency for which pest management for land resource stewardship is an integral part of the organization's operations.	All activities resulting in a discharge for which the Federal or State agency is responsible for pest control
	Local governments or other entities that exceed the annual treatment area threshold identified here	Treatment if more than 6,400 acres during a calendar year

If you have questions about whether you need to file an NOI or questions about completing the form, see [www.epa.gov/npdes/pesticides](http://www.epa.gov/npdes/pesticides) or contact the NOI Center toll free at 866-352-7755.

One NOI can be submitted for multiple pest management areas in a state for which you are seeking permit coverage; however, no more than one state can be included on any single NOI form.

**When to File the NOI Form?**

Do not file your NOI until you have obtained and thoroughly read a copy of the permit. A copy of the permit is on EPA's website ([www.epa.gov/npdes/pesticides](http://www.epa.gov/npdes/pesticides)). The permit describes procedures to ensure your eligibility, prepare your Pesticide Discharge Management Plan (PDMP), and complete the NOI form questions—all of which must be done before you sign the NOI certification statement attesting to the accuracy and completeness of your NOI. You will also need a copy of the permit once you have obtained coverage so that you can comply with the implementation requirements of the permit. Note: PDMP is not required for 1) any application made in response to a Declared Pest Emergency Situation, as defined in Appendix A of the permit; and 2) any Decision-maker that is required to submit an NOI solely because their application results in a point source discharge to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit.

**All eligible discharges are authorized for permit coverage through January 12, 2012 without submission of an NOI. For any discharges after January 12, 2012, Decision-makers meeting the eligibility requirements identified in the Part 1.1 of the permit and Table 1 must submit a complete and accurate NOI according to Tables 2, and 3 and consistent with the requirements of the Part 1.2 of the permit. For example, for discharges occurring on or before January 12, 2012 but continuing after January 12, 2012, NOIs are due no later than January 3, 2012 to ensure uninterrupted coverage.**

**Table 2. NOI Submittal Deadlines and Discharge Authorization Dates for Discharges from the Application of Pesticides<sup>1</sup>**

*After January 12, 2012, any eligible discharge for which an NOI is required must submit an NOI consistent with the earliest due date identified below. If EPA receives an NOI on or before January 2, 2012 (or on or before December 12, 2011, for discharges to Waters of the United States containing NMFS Listed Resources of Concern), uninterrupted coverage continues.<sup>2</sup> NOI due dates for any discharges occurring on or after January 12, 2012 are as follows:*

Operator Type	NOI Submission Deadline	Discharge Authorization Date <sup>3</sup>
Any Decision-maker with any discharge to Waters of the United States containing NMFS Listed Resources of Concern, except for those discharges in response to a Declared Pest Emergency Situation, as defined in Appendix A. <sup>5</sup>	At least 30 days before any discharge to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A. <sup>5</sup>	No earlier than 30 days after EPA posts on the Internet a receipt of a complete and accurate NOI. <sup>3,5</sup>
Any Decision-maker with a discharge in response to a Declared Pest Emergency for which that activity triggers the NOI requirement identified in Part 1.2.2, except for any discharges to Waters of the United States containing NMFS Listed Resources of Concern.	At least 30 days after beginning discharge.	Immediately upon beginning to discharge for activities conducted in response to a Declared Pest Emergency Situation.
Any Decision-maker with any discharge to Waters of the United States containing NMFS Listed Resources of Concern, in response to a Declared Pest Emergency Situation, as defined in Appendix A.	Within 15 days after beginning to discharge in response to a Declared Pest Emergency Situation.	Immediately upon beginning to discharge for activities conducted in response to a Declared Pest Emergency Situation for a period of at least 60 days. <sup>4</sup>
Any Decision-maker that exceeds any annual treatment area threshold.	At least 10 days before exceeding an annual treatment area threshold.	No earlier than 10 days after EPA posts on the Internet receipt of a complete and accurate NOI.
Any Decision-maker otherwise required to submit an NOI as identified in Table 1	At least 10 days before any discharge for which an NOI is required	No earlier than 10 days after EPA posts on the Internet receipt of a complete and accurate NOI.

- <sup>1</sup> State, territory and tribal specific requirements in addition to the requirements in this table are provided in Part 9.0.
- <sup>2</sup> On the basis of a review of an NOI or other information, EPA may delay authorization to discharge beyond any timeframe identified in Table 2, determine that additional technology-based and/or water quality-based effluent limitations or other conditions are necessary, or deny coverage under this permit and require submission of an application for an individual NPDES permit, as detailed in Part 1.3 of the permit.
- <sup>3</sup> Within 30 days after EPA posts on the Internet receipt of a complete and accurate NOI, for those areas with NMFS Listed Resources of Concern, as defined in Appendix A of the permit, NMFS will provide EPA with a determination as to whether it believes the eligibility criterion of "not likely to adversely affect listed species or designated critical habitat" has been met, could be met with conditions that NMFS identifies, or has not been met. EPA expects to rely on NMFS' determination in deciding whether to withhold authorization. If NMFS does not provide EPA with this information within 30 days of EPA posting on the Internet receipt of a complete and accurate NOI, the discharges will be authorized 30 days after EPA posts on the Internet receipt of a complete NOI.
- <sup>4</sup> In any Declared Pest Emergency Situation in areas with Waters of the United States containing NMFS Listed Resources of Concern, NMFS will have 30 days after submission of an NOI to provide EPA with a determination as to whether the eligibility criteria of "not likely to adversely affect listed species or designated critical habitat" has been met, could be met with conditions that NMFS identifies, or has not been met. EPA expects to rely on NMFS' determination in deciding whether to allow continued permit coverage and if additional conditions are necessary. If NMFS does not provide EPA with a recommendation within 30 days of EPA posting on the Internet receipt of a complete and accurate NOI, authorization for these discharges will continue. If EPA identifies additional permit conditions, or includes additional permit conditions recommended by NMFS, as necessary to qualify discharges as eligible for coverage beyond 60 days under the PGP, those conditions remain in effect for the life of the permit.
- <sup>5</sup> EPA may authorize certain discharges in less than 30 days, but no fewer than 10 days, for any discharges authorized under Criterion B, C, or E of Part 1.1.2.4 (for which NMFS has already evaluated the effects of these discharges).

Operator Type	NOI Submission Deadline	Discharge Authorization Date
Any Decision-maker with any discharge to Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, not identified on a previously submitted NOI for this permit. This includes changes in any treatment area, pesticide product, method or rate of application, or approximate dates of applications.	At least 30 days before beginning to discharge in that newly identified treatment area unless discharges are in response to a Declared Pest Emergency Situation in which case not later than 15 days after beginning discharge.	No earlier than 30 days after EPA posts on the Internet receipt of a complete and accurate NOI unless discharges are in response to a Declared Pest Emergency Situation in which case coverage is available immediately upon beginning to discharge from activities conducted in response to Declared Pest Emergency Situation.

**Where to File the NOI Form**

The Decision-maker must prepare and submit the NOI using EPA's electronic Notice of Intent system (eNOI) available on EPA's website ([www.epa.gov/npdes/pesticides/enoi](http://www.epa.gov/npdes/pesticides/enoi)) unless eNOI is otherwise unavailable or the Decision-maker has filed a waiver from the requirement to use eNOI for submission of the NOI. The Electronic Submission Waiver is at the top of this form. Decision-makers waived from the requirement to use eNOI for NOI submission must certify to EPA on this form that use of eNOI will incur undue burden or expense over the use of the paper NOI form and then provide a basis for that determination.

EPA will immediately post on the pesticides eNOI Website all NOIs received. Late NOIs will be accepted, but authorization to discharge will not be retroactive.

If you file a waiver from using eNOI; you must send the NOI to one of the addresses listed below.

Via United States Mail:

United States Environmental Protection Agency  
 Office of Water, Water Permits Division  
 Mail Code 4203M, ATTN: NPDES Pesticides  
 1200 Pennsylvania Avenue, NW  
 Washington, DC 20460

Via overnight/express delivery:

United States Environmental Protection Agency  
 Office of Water, Water Permits Division  
 EPA East Building - Room 7420, ATTN: NPDES Pesticides  
 1201 Constitution Avenue, NW  
 Washington, DC 20004  
 Phone: 202-564-9545

If you have questions, contact EPA's Pesticides Notice Processing Center toll free at 866-352-7755.

- If you file a paper NOI, submit the original with a signature in ink. Do not send copies. Also, faxed copies will not be accepted.
- If you are required to develop a PDMP, that document does not need to be submitted for review unless specifically requested by EPA. You must keep a copy of your PDMP on-site or otherwise make it available to facility personnel responsible for implementing provisions of the permit.

**Completing the NOI Form**

To complete this form, type or print in uppercase letters in the appropriate areas only. Please make sure you complete all questions. Make sure you make a photocopy for your records before you send the completed original form to the address above. You may also use this paper form as a checklist for the information you will need when filing an NOI electronically via EPA's Pesticides eNOI System.

**Section A. NOI Status**

1. Indicate if this is the first time you are requesting coverage under the permit or if this is a change of information.
- a. Check this box if this is the first time you are requesting coverage under the permit for these discharges. If this is the first time you are requesting coverage, refer to Table 2 for NOI submittal deadlines and discharge authorization dates. Note: All eligible discharges are authorized for permit coverage through January 12, 2012 without submission of an NOI.

**Table 3. NOI Change of Information Submittal Deadlines and Discharge Authorization Dates**

Operator Type	NOI Submission Deadline	Discharge Authorization Date
Any Decision-maker requiring permit coverage for a pest management area not identified on a previously submitted NOI for this permit, except for discharges to any: (1) Tier 3 water, or (2) Waters of the United States containing NMFS Listed Resources of Concern. Except for such waters, changes other than identification of a new pest management area or a new pesticide use pattern do not require a revised NOI submittal.	At least 10 days before beginning to discharge in that newly identified area unless discharges are in response to a Declared Pest Emergency Situation in which case not later than 30 days after beginning discharge.	No earlier than 10 days after EPA posts on the Internet the receipt of a complete and accurate NOI unless discharges are in response to a Declared Pest Emergency Situation in which case coverage is available immediately upon beginning to discharge from activities conducted in response to Declared Pest Emergency Situation.
Any Decision-maker discharging to a Tier3 water not identified by name on a previously submitted NOI for this permit, except for Tier 3 waters containing NMFS Listed Resources of Concern	At least 10 days before beginning to discharge in that newly identified area unless discharges are in response to a Declared Pest Emergency Situation in which case not later than 30 days after beginning discharge.	No earlier than 10 days after EPA posts on the Internet the receipt of a complete and accurate NOI unless discharges are in response to a Declared Pest Emergency Situation in which case coverage is available immediately upon beginning to discharge from activities conducted in response to Declared Pest Emergency Situation.

- b. Check this box if this is a change of information for a discharge already covered under the permit. If this is a change of information, supply the NPDES permit tracking number that you received in your confirmation letter or e-mail from EPA's Pesticide Notice Processing Center. You can find the tracking number assigned to your previous NOI using EPA's eNOI System ([www.epa.gov/npdes/pesticides/enoi](http://www.epa.gov/npdes/pesticides/enoi)). For additional details regarding a change of information, see Table 3. Also fill out Section B of this form (Operator Name and Mailing Address) and the associated fields of information that need to be modified on the NOI.

#### Section B. Operator Information

1. Provide the legal name of the person, firm, public organization or any other public entity that is the Decision-maker for the pesticides applications described in this notice. A Decision-maker is an Operator who has control over the decision to perform pesticide applications including the ability to modify those decisions that result in a discharge to Waters of the United States.
2. Provide the Employer Identification Number (EIN from the Internal Revenue Service (IRS)), commonly referred to as your tax payer ID number. If the operator does not have an EIN, enter "N/A" in the space provided.
3. Indicate the type of Operator: federal government, state government, local government, mosquito control district (or similar), irrigation control district (or similar), weed control district (or similar), or other. If other, provide brief description of type of Operator in the space provided.
4. Indicate whether or not you are a "large entity" as defined in Appendix A of the permit. Note that if you are a large entity, you are required to develop a Pesticide Discharge Management Plan (PDMP) and submit future Annual Reports reflecting all pesticide uses for which you are requesting permit coverage under this NOI.
5. Indicate which state your pest management areas are located. Specify only one state per NOI. If there is more than one state, additional NOIs must be submitted.
6. Provide the Decision-maker's mailing address, telephone number, fax number (optional), name, and e-mail address. Correspondence will be sent to this address.

#### Section C. Pest Management Area: Information for each Pest Management Area for which coverage under EPA's Pesticide General Permit is desired.

1. Indicate whether you are submitting an NOI for multiple pest management areas. A pest management area is the area of land, including any water, for which you have responsibility and are authorized to conduct pest management activities as covered by this permit (e.g., if you are a mosquito control district, your pest management area is the total area of the district). You must complete a Section C for each pest management area. If you are submitting an NOI for only one area, enter "1" of "1." If you are submitting NOIs for multiple pest management areas, enter the number for the NOI for which you are requesting coverage followed by the total number of pest management areas for which you are requesting coverage. Enter the name of the pest management area. Attach a map of the pest management area or describe the location of the pest management area in the space provided.
2. Indicate whether pesticide application will occur on Indian County Lands, and if so, provide the name of the reservation, if applicable.
3. Indicate whether pesticide application will occur on a Federal Facility, as defined in Appendix A of the permit.
4. Enter the mailing address of the contact person for the pest management area. If this address is the same as the Decision-maker's mailing address, indicate that by checking the box. If it is a different address, enter the mailing address, telephone number, fax number (optional), contact name, and e-mail address.
5. Indicate the pesticide use patterns for the pest management area for which the NOI is required. For additional information regarding pesticide use patterns, see Part 1.1.1 of the permit. Check all the use patterns that apply to the pest management area.
6. Indicate if permit coverage is being requested for all Waters of the United States within the pest management area or if permit coverage is being requested to specific Waters of the United States within the pest management area. If specific waters are being requested, write the names of the waterbodies. If permit coverage is being requested for all waters of the United States within the pest management area except for specific waterbodies, name those specific waterbodies in the space provided. EPA's Water Locator Tool can help you identify the closest receiving water to your facility (<http://cfpub.epa.gov/npdes/stormwater/mdltool.cfm>).
7. Indicate if permit coverage is being requested to discharge to a Tier 3 (Outstanding National Resource Water) Water of the United States. If yes, write the name(s) of the Tier 3 water(s) in the space provided. Describe and demonstrate why it is necessary to apply the pesticide discharge to protect the water quality, environment, and/or public health and that any such discharge will not degrade water quality or will degrade water quality only on a short-term or temporary basis.

8. Verify that waters within the pest management area are either not impaired by substances which are either active ingredients in the pesticide planned for use or degradates of such active ingredients, OR that evidence shows that the target waters in question are no longer impaired. See Part 1.1.2.1 of the permit for more information on discharges to Water Quality Impaired Waters.

#### Section D. Endangered Species Protection. Complete Section D for each Pest Management Area for which coverage under EPA's PGP is desired.

Identify the Pest Management Areas, corresponding to those in Part C.

1. Coverage under the permit is available only for discharges and discharge-related activities, as defined in Appendix A of the permit, that are not likely to jeopardize the continued existence of any species that are federally-listed as endangered or threatened ("listed") under the Endangered Species Act (ESA) and not likely to result in the adverse modification or destruction of habitat that is federally-designated as critical under the ESA ("critical habitat") except as provided in criterion b, c, and for at least 60 days, d, below. For a subset of listed species and critical habitat, identified as NMFS Listed Resources of Concern and defined in Appendix A, there are specific criteria for determining eligibility. To demonstrate eligibility, you must meet one or more of the six criteria (a-f) for the entire term of coverage under the permit.
2. If you checked criterion d or criterion f, you are required to provide a description of the location of the pest management area or a map of the location, the pest(s) to be controlled, pesticide product(s) to be discharged and method of application, planned quantity and rate of discharge(s) for each application method, number of planned discharges, approximate date(s) of planned discharge(s), and the rational supporting your determination that you meet the criterion for which the Decision-maker is submitting this NOI and documentation demonstrating the finding of "not likely to adversely affect." If you certify under criteria f and do not hear from EPA within 30 days, you may assume your discharge is authorized. For certifications pursuant to Criterion d, indicate whether the discharge is likely to adversely affect NMFS Listed Resources of Concern and, if so, any feasible measures to avoid or eliminate such adverse effects. If you are certifying under criterion d (which allows you to discharge 15 days before you even submit your NOI), your NOI should describe both the pest emergency activities you plan to do after you submit your NOI as well as the activities you performed in that 15 day period before you had to submit the NOI. See Part 1.1.2.4 of the permit for more information regarding Endangered and Threatened Species and Critical Habitat Protection. If you certify under criterion d and do not hear from EPA, you may assume that permit authorization continues unless notified otherwise. EPA may authorize certain discharges in less than 30 days, but no fewer than 10 days, for any discharges authorized under criterion b, c, or e (for which NMFS has already evaluated the effects of these discharges). If you certify under one of these criteria and do not hear from EPA within 30 days, you may assume your discharge is authorized.

#### Section E. Certification

Enter the certifier's printed name and title. Sign and date the form. For more information about the certification statement and signature, see Appendix B of the permit. (CAUTION: An unsigned or undated form will not be accepted.) Federal statutes provide for severe penalties for submitting false information. Federal regulations require this application to be signed as follows:

*For a corporation:* by a responsible corporate officer, means:

- (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or
- (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated activity including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

*For a partnership or sole proprietorship:* by a general partner or the proprietor; or

*For a municipal, state, federal, or other public facility:* by either a principal executive or ranking elected official.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the PDMP contact or a consultant for the certifier's signature), include the name, organization, phone number and e-mail address of the NOI preparer.

**Paperwork Reduction Act Notice**

The public reporting and recordkeeping burden for this collection of information is estimated to average 2.5 hours or 150 minutes per response.

Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed NOI form to that address.





**C. Pest Management Areas: Complete Section C for each Pest Management Area for which coverage under EPA's Pesticide General Permit is desired. Copy this section for non-electronic submissions.**

Pest Management Area # 1 of ## 1

1. Pest Management Area Name: Kenai Peninsula

Provide a map of the location of the Pest Management Area (attach map) or describe the location of the Pest Management Area in detail.

See attached general location map

2. Are any of your activities for which you are requesting coverage under this NOI occurring on Indian Country Lands?  Yes  No  
 If yes, identify the reservation or otherwise describe those areas:

3. Are any of your activities (in this pest management area) for which you are requesting coverage under this NOI occurring on areas considered "federal facilities" as defined by the permit?  Yes  No

4. Mailing address and contact information of the pesticide applicator (or check here  if same as provided in Section B):

a. Street: P O B o x 2 1 3 9

b. City: S o l d o t n a c. State: A K d. ZIP Code: 9 9 6 6 9 -

e. Telephone: 9 0 7 - 2 6 0 - 2 8 1 5 Ext  f. Fax:

g. Contact Name: J o h n M o r t o n

h. E-mail: J o h n \_ M \_ M o r t o n @ f w a . g o v

5. Pesticide Use Patterns to be included in this Pest Management Area (check all that apply):

- a.  Mosquito and Other Flying Insect Pest Control c.  Animal Pest Control  
 b.  Weed and Algae Pest Control d.  Forest Canopy Pest Control

6. Receiving Waters (check one):

- a.  Coverage requested for all Waters of the United States within the Pest Management Area identified above.  
 b.  Coverage requested specifically for the following Waters of the United States within the Pest Management Area identified above:  
Daniels Lake, Stormy Lake  
 c.  Coverage requested for all Waters of the United States within the Pest Management Area identified above except for:

7. Tier 3 Waters

Is coverage requested for discharge to a Tier 3 water (Outstanding National Resource Water) of the United States?  Yes  No  
 If yes, answer a and b:

- a. Name of Tier 3 water(s): \_\_\_\_\_  
 b. Provide rationale for determination that pesticide discharge is necessary to protect water quality, the environment, and/or public health and that any such discharge will not degrade water quality or will degrade water quality only on a short-term or temporary basis:

8. Water Quality Impaired Waters

Operators are not eligible for coverage under this permit for any discharges from a pesticide application to Waters of the United States if the waters are identified as impaired by a substance which is either an active ingredient of the pesticide designated for use or is a degradate of such an active ingredient. See Part 1.1.2.1 of the permit. Check one:

- a.  Waters are NOT impaired by any substance which is either an active ingredient of a pesticide to be discharged or a degradate of such an active ingredient  
 b.  Waters are on a current state list as being impaired by a substance which is either an active ingredient of a pesticide to be discharged or a degradate of such an active ingredient; however, evidence is attached documenting that the waters are no longer impaired.

**D. Endangered Species Protection: Complete Section D for each Pest Management Area for which coverage under EPA's Pesticide General Permit is desired. Copy this section for non-electronic submissions.**

Pest Management Area # 1 of ## 1

1. Identify the criterion for which you are eligible for permit coverage as it applies to Federally Listed Threatened or Endangered Species (i.e., Species) and/or Federally Designated Critical Habitat (i.e., Habitat) (check one):

- a.  Pesticide application activities will not result in a point source discharge to one or more Waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern, as defined in Appendix A, of the PGP.
- b.  Pesticide application activities for which permit coverage is being requested will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, but consultation with NMFS under Section 7 of the Endangered Species Act (ESA) has been concluded for pesticide application activities covered under the PGP. Consultations can be either formal or informal, and would have occurred only as a result of a separate federal action. The consultation addressed the effects of pesticide discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in either:
  - i. A biological opinion from NMFS finding no jeopardy to federally-listed species and no destruction/adverse modification of federally-designated critical habitat; or
  - ii. Written concurrence from NMFS with a finding that the pesticide discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat.
- c.  Pesticide application activities for which permit coverage is being requested will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, but all "take" of these resources associated with such pesticide application activities has been authorized through NMFS' issuance of a permit under section 10 of the ESA, and such authorization addresses the effects of the pesticide discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. (The term "take" means to harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. See Section 3 of the Endangered Species Act, 16 U.S.C. § 1532 (19).)
- d.  Pesticide application activities were, or will be, discharged to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, but only in response to a Declared Pest Emergency Situation.
- e.  Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP. Eligible discharges include those where the Decision-maker includes in the NOI written correspondence from NMFS that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of adverse effects to NMFS Listed Resources of Concern.
- f.  Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more Waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP. Eligible discharges include those from pesticide application activities that are demonstrated by the Decision-maker as not likely to adversely affect NMFA Listed Resources of Concern or that the pest poses a greater threat to the NMFS Listed Resources of Concern than does the discharge of the pesticide.

2. If you checked criterion d or criterion f above, provide the following information for all discharges to Waters of the United States containing NMFS Listed Resources of Concern identified within the pest management area for which permit coverage is being requested. For discharges pursuant to criterion d, Declared Pest Emergency Situations, information for items a through g should also include any discharges that have already occurred prior to NOI submission as well as the activities you performed in the 15 day period before submission of this NOI was required. In some cases, implementation of pest management measures as specified in the permit involves a degree of "adaptive management" such that exact timing and quantities of applications cannot be determined in advance for the duration of the permit. In such cases, the permittee must provide the required information to the extent feasible and consistent with the implementation of the selected pest management measures.

- a. Describe the location of the pest management area in detail or provide a map of the location:  
\_\_\_\_\_
- b. Pest(s) to be controlled:  
\_\_\_\_\_  
\_\_\_\_\_
- c. Pesticide product(s) to be discharged and method of application: \_\_\_\_\_
- d. Planned quantity and rate of discharge(s) for each method of application: \_\_\_\_\_
- e. Number of planned discharges: \_\_\_\_\_
- f. Approximate date(s) of planned discharge(s): \_\_\_\_\_
- g. Your rationale supporting your determination that you meet the criterion for which you are submitting this NOI, including appropriate measures to be undertaken to avoid or eliminate the likelihood of adverse effects. For certifications pursuant to Criterion D, indicate whether the discharge is likely to adversely affect NMFS Listed Resources of Concern and, if so, any feasible measures to avoid or eliminate such adverse effects (attach additional pages as necessary):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**E. Certification**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. On the basis of my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Printed Name: P r a n c i H a v e m e i s t e r

Title: D i r e c t o r o f A g r i c u l t u r e D N R

E-Mail: P r a n c i . h a v e m e i s t e r @ a l a s k a . g o v

Signature/Responsible Official: Franci Havemeister Date: 03 / 20 / 2013

**NOI Preparer (Complete if NOI was prepared by someone other than the certifier)**

Preparer Name: B r i a n n e B l a c k b u r n

Organization: A K D N R - D i v i s i o n o f A g r i c u l t u r e

Phone: 9 0 7 - 7 4 5 - 8 7 8 5 Ext [ ] [ ] [ ] Date: [ ] / [ ] / [ ] [ ] [ ] [ ]

E-Mail: b r i a n n e . b l a c k b u r n @ a l a s k a . g o v

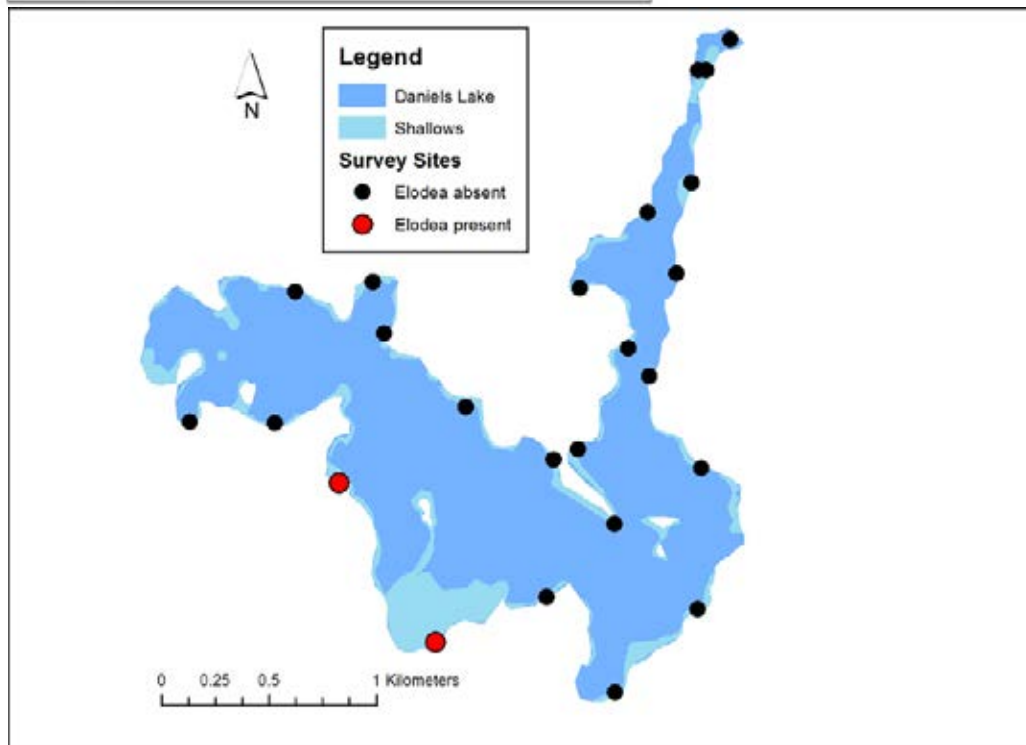
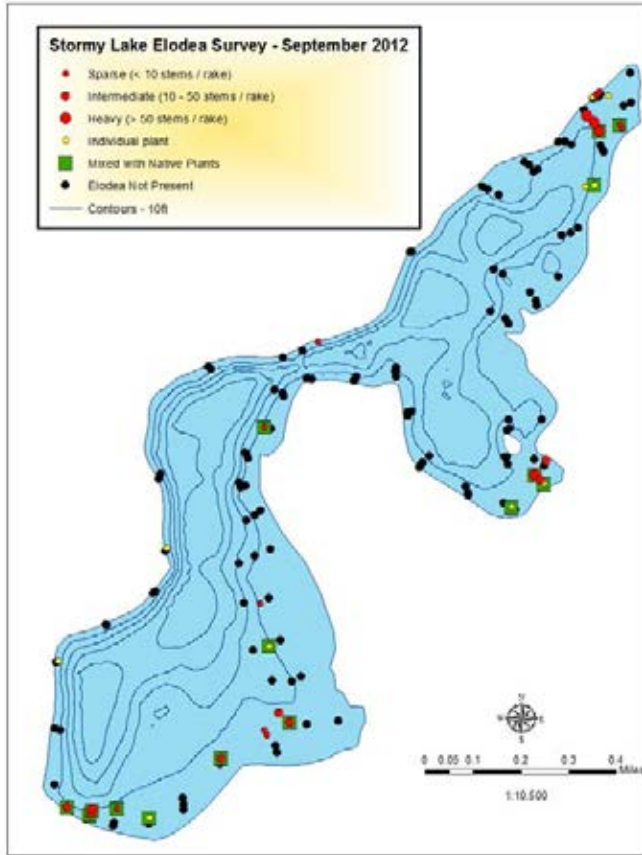
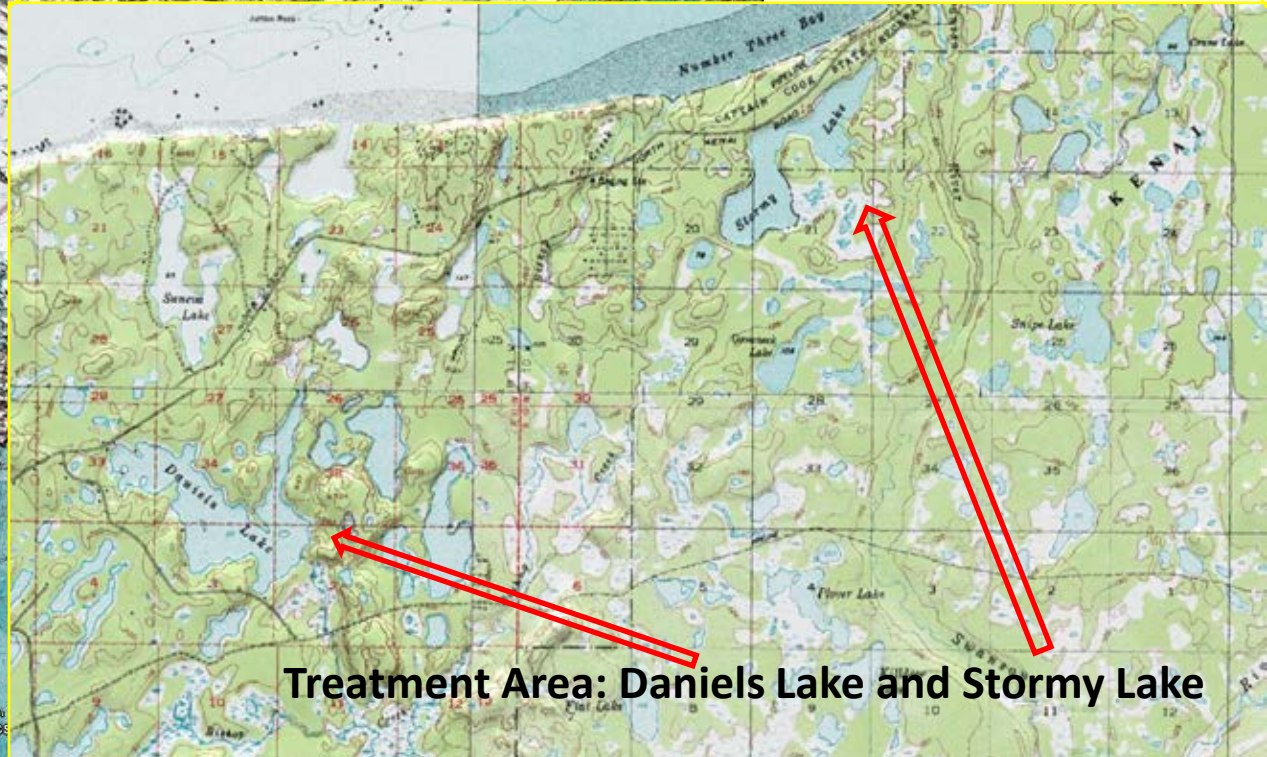
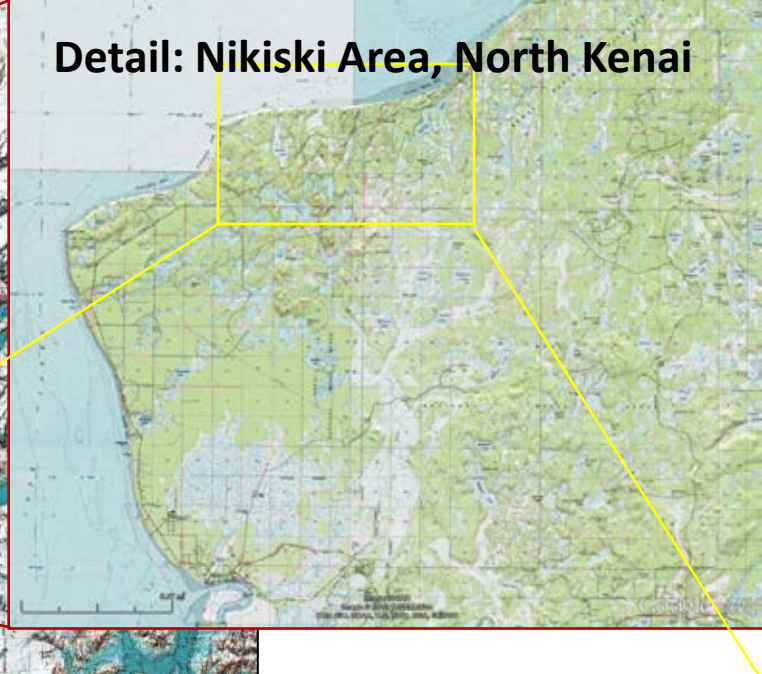


Figure 1a, 1b. Distribution of *Elodea nuttallii* x *canadensis* in Stormy Lake based on rake throws in Sep 2012 and in Daniels Lake based on sampling with a modified chimney brush through the ice in Feb 2013.

# Overview Map: Kenai Peninsula, Alaska



# Detail: Nikiski Area, North Kenai



# Treatment Area: Daniels Lake and Stormy Lake

37.7 mi

Image IBCAO  
Data SIO, NOAA, U.S. Navy, NGA,  
Image © 2013 TerraMetrics

**APPENDIX 12. DEC PESTICIDE USE PERMIT AND PUBLIC NOTICE**



THE STATE  
of **ALASKA**  
GOVERNOR SEAN PARNELL

Department of Environmental  
Conservation

DIVISION OF ENVIRONMENTAL HEALTH  
Pesticide Control Program

1700 East Bogard Rd., Bldg. B, Ste. 103  
Wasilla, Alaska 99654  
Main: 907.376.1856  
Toll free: 800.376.1870  
Fax: 907.376.2382

June 3, 2013

Brianne Blackburn  
Division of Agriculture  
5310 S. Bodenburg Spur Rd.  
Palmer, AK 99645

Subject: Permit to Apply Pesticides, # **13-AQU-01**

Dear Ms. Blackburn,

The Department of Environmental Conservation (DEC) has completed its evaluation of your request for a permit for the application of the pesticide **Reward Landscape and Aquatic Herbicide**, EPA Registration Number **100-1091** with the active ingredient diquat dibromide to waters of the state to control invasive Elodea in Stormy and Daniels Lakes, near Nikiski, Alaska. DEC is issuing the enclosed permit in accordance with Alaska Statute 46.03.330 and Title 18, Chapter 90.525 of the Alaska Administrative Code (18 AAC 90.525) for a period not to exceed five years.

Any person who disagrees with this decision may request an adjudicatory hearing in accordance with 18 AAC 15.195 - 18 AAC 15.340, or an informal review by the Division Director in accordance with 18 AAC 15.185. Informal review requests must be delivered to the Division Director, Alaska Department of Environmental Conservation, 555 Cordova Street, Anchorage, AK 99501 within 15 days of the permit decision. Adjudicatory hearing requests must be delivered to the Commissioner of the Department of Environmental Conservation, 410 Willoughby Avenue, Suite 303, Juneau, Alaska 99801, within 30 days of the permit decision. In both cases, please also send a copy of the request to ADEC Pesticide Program, 1700 E. Bogard Road, Building B Suite 103, Wasilla, AK 99654. If a hearing is not requested within 30 days, the right to appeal is waived. More information about the submission of a request for an informal review or adjudicatory hearing may be found at [www.dec.state.ak.us/commish/ReviewGuidance.htm](http://www.dec.state.ak.us/commish/ReviewGuidance.htm).

Sincerely,

A handwritten signature in blue ink, appearing to read "R. Blankenburg".

Robert J. Blankenburg, P.E.  
Solid Waste & Pesticides Program Manager

Enclosure

STATE OF ALASKA  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
555 CORDOVA STREET  
ANCHORAGE, ALASKA 99501

**PERMIT TO APPLY PESTICIDES**

Permit No.: 13-AQU-01  
Date Issued: June 3, 2013  
Date Effective: July 13, 2013  
Date Expires: December 31, 2017

The Alaska Department of Environmental Conservation (ADEC), under authority of Alaska Statute 46.03.330 and Title 18, Chapter 90.525 of the Alaska Administrative Code (18 AAC 90.525), hereby grants a Permit to Apply Pesticides to:

Brianne Blackburn  
Division of Agriculture  
5310 S. Bodenburg Spur Rd.  
Palmer, AK 99645

for the purpose of applying the pesticide **Reward Landscape and Aquatic Herbicide**, EPA Registration Number **100-1091** with the active ingredient diquat dibromide to waters of the state to control invasive Elodea in Stormy and Daniels Lakes, near Nikiski, Alaska.

The permit holder shall manage and apply the pesticide in accordance with 18 AAC 90 and the permit application materials submitted April 3, 2013 through April 8, 2013. In addition, the following permit conditions and stipulations are required:

1. Apply pesticide only when target plants are actively growing.
2. Use pesticides only in the manner specified by the label instructions. Adhere to all the requirements specified by the pesticide product label.
3. Ensure that pesticides are applied only by a person properly certified by DEC to apply such pesticides, or a person under the direct supervision of a person so certified.
4. Apply pesticides using properly calibrated equipment, and in strict compliance with safety precautions.
5. Public notification signs must be posted prior to pesticide application at each point of access to the lake, as specified in 18 AAC 90.630(a). Signs shall remain posted at the treatment site until application is complete.
6. Monitor downstream areas of the outflow of each lake for impacts to vegetation. Visual monitoring shall be conducted every other day for a period of one week after treatment. Notify the DEC Pesticide Program immediately of any detected impacts.
7. Maintain the following records for each pesticide used. Records must be available to DEC upon request:
  - Product name



- EPA registration number
  - Target pest
  - Date and time of application
  - Location of drip stations
  - Method of application
  - Weather conditions during application
  - Amount of pesticide used
  - Location and size of treatment area
  - Names of applicators
  - Purchase, storage, and disposal information
8. Dispose of empty pesticide containers in accordance with label directions and 18 AAC 90.615(a). Any burning of pesticide containers must be done in compliance with 18 AAC 50.
  9. Immediately report any spill or accident, alleged accident, or complaint to the DEC Pesticide Program at 1-800-478-2577.
  10. Ensure that decontamination, safety, and spill cleanup supplies are available at the treatment site at all times during application.
  11. Store all pesticide containers securely, as required by 18 AAC 90.615(d). Post a warning notice on the outside of each storage area in compliance with 18 AAC 90.615(e)-(h).
  12. No later than **March 31** of each year throughout the duration of the permit, submit a written Summary of Treatment Results in accordance with 18 AAC 90.535. This summary must include the following information:
    - Product name
    - EPA registration number
    - Target pest
    - Dates and times of application
    - Method of application
    - Weather conditions during applications
    - Total amount of pesticide used
    - Location and size of treatment area
    - Names of applicators
    - Purchase, storage, and disposal information
    - Assessment of success or failure of the treatments
    - Any observed effect on human health, safety or welfare, animals, or the environment

In addition to the above stipulations, the ADEC Pesticide Program may monitor treatments to ensure compliance with 18 AAC 90 and the Permit Conditions and Stipulations.

This permit expires on **December 31, 2017**, or upon completion of the above described project, whichever comes first, and may be revoked in accordance with 18 AAC 90.540.

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Robert J. Blankenburg, P.E.  
Solid Waste & Pesticides Program Manager

# PUBLISHER'S AFFIDAVIT

UNITED STATES OF AMERICA, }  
STATE OF ALASKA } ss:

Denise Reece being first duly sworn, on oath deposes and says:

That I am and was at all times here in this affidavit mentions, Supervisor of Legals of the Peninsula Clarion, a newspaper of general circulation and published at Kenai, Alaska, that the Permit to Apply Pesticides

AO-10-9379

a printed copy of which is hereto annexed was published in said paper one each and every day for two successive and consecutive days in the issues on the following dates:

April 12, 14, 2013

X Denise Reece

SUBSCRIBED AND SWORN to me before this 15th day of April, 2013

Jane Russell

NOTARY PUBLIC in favor for the State of Alaska.

My Commission expires 27-Aug-16



## NOTICE OF APPLICATION FOR PERMIT TO APPLY PESTICIDES

The Alaska Department of Natural Resources, Division of Agriculture has applied to the Alaska Department of Environmental Conservation (DEC) for a permit to apply herbicide to control invasive elodea in Stormy and Daniels Lakes in the Kenai Peninsula area.

The following project is proposed and is being reviewed by the appropriate regulatory programs. DEC requests comments from the public regarding the permit application. Copies of the application are available on-line or upon request.

**PROJECT NAME:** Stormy/Daniels Lake Elodea Control Aquatic Pesticide Use Permit.

**WRITTEN COMMENTS:** Comments must be received no later than 4:00 p.m. Alaska Standard Time on Tuesday, May 14th, 2013. To ensure that your comments are considered in relation to this application, please include the project name at the beginning of your comment. To be considered, comments must be submitted in writing to DEC at the following address:

Rebecca Colvin  
Department of Environmental Conservation Pesticide Program  
555 Cordova Street, Anchorage AK 99501  
Phone: 907-269-7802  
Fax: 907-269-7600  
Email: Rebecca.colvin@alaska.gov

**PROJECT SUMMARY AND LOCATION:** The Alaska Division of Agriculture has applied to DEC for an aquatic pesticide use permit to apply herbicide to portions of Stormy and Daniels Lakes in the Kenai Peninsula area.

The proposed product is Reward Landscape and Aquatic Herbicide, with EPA registration number 100-1091, and active ingredient diquat dibromide. Treatment is proposed to occur between May and September throughout the duration of the permit.

**PROJECT NEED:** Elodea is an invasive aquatic plant that has the potential to grow abundantly and compromise water quality, hinder boat and float plane traffic, reduce dissolved oxygen, and impact fisheries. Early control of this invasive plant will help prevent spread to other locations. Physical or mechanical controls are inappropriate, as these methods break the plant into fragments which can then reproduce.

### PERMIT APPLICANT:

Division of Agriculture  
5310 S. Bodenbug Spur Rd.  
Palmer, AK 99645

### FOR SPECIFIC INFORMATION REGARDING THE APPLICATION CONTACT:

Karin Hendrickson  
Department of Environmental Conservation  
Pesticide Control Program  
1700 E. Bogard Rd. #B103, Wasilla AK 99654  
Phone: (907) 376-1856  
Email: Karin.Hendrickson@alaska.gov

The State of Alaska, Department of Environmental Conservation complies with Title II of the Americans with Disabilities Act of 1990. If you are a person with a disability who may need a special accommodation in order to participate in this public process, please contact Deborah Pock at (907) 269-0291 or TDD Relay Service 1-800-770-8973/TTY or dial 711 by the close of the public comment period to ensure that any necessary accommodations can be provided.

**APPENDIX 13. USFWS PESTICIDE APPLICATION PERMIT**

Not available-permit pending

**APPENDIX 14. PUBLIC NOTICE PRINTED IN THE PENINSULA CLARION**

**PUBLIC NOTICE**  
**Availability of Draft Environmental Assessment**  
**(EA) for Stormy and Daniels Lake Elodea**  
**Eradication Project**

The Department of Natural Resources Division of Agriculture has prepared a Draft EA that considers the proposed fluridone and diquat treatment of Stormy and Daniels Lake for the purpose of eradicating the invasive aquatic elodea population and maintaining ecological integrity of the waterways on the Kenai Peninsula. Copies of the draft EA are available online at [http://dnr.alaska.gov/ag/ag\\_dn.htm](http://dnr.alaska.gov/ag/ag_dn.htm). Copies can also be obtained by contacting Brianne Blackburn, 5310 S. Bodenbug Spur Rd, Palmer, AK 99645, by phone at (907) 745-8785, or by e-mail at [brianne.blackburn@alaska.gov](mailto:brianne.blackburn@alaska.gov). Comments on the Draft EA must be submitted to Ms. Blackburn at the above mailing or e-mail address no later than 4:00pm on July 12, 2013.

**PUBLISH: 6/12, 2013**

**1239/648**

## APPENDIX 15. SUMMARY REPORT OF THE PUBLIC SCOPING PROCESS

### A. Process

The draft EA for the Stormy and Daniels Lake Elodea Eradication Project was available for public comment from June 12<sup>th</sup> to July 12<sup>th</sup>, 2013. The comment period was advertised through the local newspaper (Peninsula Clarion), on the ADNR Division of Agriculture website ([http://dnr.alaska.gov/ag/ag\\_dn.htm](http://dnr.alaska.gov/ag/ag_dn.htm)) and the Alaska Online Public Notice System (<http://aws.state.ak.us/OnlinePublicNotices/>).

### B. Comments Received

One (1) comment was received and a response was sent via email.

#### **Comment:**

*YES! PLEASE allow the eradication of Elodea on Stormy and Daniels Lakes. Please issue the permits ASAP so we can stop it before it gets out of control.*

#### **Response**

Thank you for your comment regarding the Elodea Eradication Project.

## APPENDIX 16. MEMO ON GROUNDWATER RISK FOR THE STORMY LAKE AREA

MEMORANDUM State of Alaska

**Department of Natural Resources** Main Telephone: (907) 269-8600

**Division of Mining and Water Management** Hydrology Fax: (907) 269-8947

Alaska Hydrologic Survey Personal Telephone: (907) 269-8639

E-mail: roy.ireland@alaska.gov

July 12, 2011

**To:** Rob Massengill

Alaska Dept. of Fish and Game

Fisheries Biologist

Sport Fish Div.

**From:** Roy Ireland

AK DNR, DMLW, Alaska Hydrologic Survey

Hydrologist

**Subject:** Stormy Lake

Pulled several well logs from the general area of the lake (key numbers: 2074, 17165, 17168, 17169 and 34047). These well logs show no consistency in aquifer formation and are spread over a relatively large area. There is no mention of bedrock.

As you are aware, there are relatively few wells in the area to start with, and there are no drillers within the Kenai in compliance with state statutes to submit water well logs. Accordingly, data is sparse.

I performed a search on related information and came across a pdf file of a document produced by the USGS. I was able to extract some of the information and have presented it below. Unfortunately, it was an image created from an older document and I had to do character recognition, so there may be typographic errors.

An extract from:

HYDROLOGY AND THE EFFECTS OF INDUSTRIAL PUMP1 ME

IN THE NIKISKI AREA, ALASKA

By Gordon I. Nelson

U.S. Geological Survey

water-Resources Investigations 81-685

### GEOLOGIC SETTING

#### Bedrock

Bedrock consists of moderately indurated sandstone, siltstone, claystone, and coal. No wells penetrate bedrock within the study area, and it is presumed to be deeper than 500 ft below land surface, oil and gas wells near the eastern edge of the study area have penetrated bedrock at a depth of approximately 590 ft.

The potential for producing ground water from bedrock is much less than from the overlying unconsolidated materials. Although the bedrock provides up to 50 gpm to wells in parts of the Kenai Peninsula, it is not a significant aquifer in the Nikiski area.

### Unconsolidated Sediments

The unconsolidated sediments overlying bedrock consist of mixed deposits of glacial, fluvial, lacustrine and estuarine origin. The distribution of surficial materials within the study area has been mapped by Anderson and Jones (1972) and is shown in figure 4. The till is poorly sorted and yields little water to wells. However, thin beds and stringers of fluvial sand and gravel within the till provide water to some wells. Undifferentiated drift is composed of mixed till, outwash deposits, and lacustrine sediments. Deposits of coarse sand and gravel within this unit provide more than 1,000 gal/min to some wells in the area. Outwash-plain deposits are materials that were deposited in front of ancient glaciers. They are composed of well sorted sand and gravel and have good permeability and porosity. Coastal-plain deposits occur in areas of low relief , They are composed primarily of sand and grade to stratified clay, silt, and fine sand at depth, The water table in areas of coastal plain deposits is generally within a few feet of land surface. Abandoned-channel deposits are composed of fluvial sand and gravel entrenched in older sedimentary deposits. The generally high porosity and permeability of abandoned-channel deposits give them a high potential for producing water to wells.

At a depth of about 100 ft below land surface, there is an extensive layer of clay and silt that may have been deposited in a proglacial lake (Karlstrom, 1964) or in Cook Inlet. This clay layer is underlain by a complex and poorly defined unit of mixed glacial, fluvial, and lacustrine sediments. Much of this unit is composed of fine sand that yields little water to wells. However, it also contains significant deposits of well-sorted sand and gravel that constitute the major confined aquifers of the Nikiski area. Some wells completed in these aquifers yield more than 1,000 gal/min of water.

## HYDROLOGIC SYSTEM

### Hydrologic Setting

(Omitted)...Of the water that infiltrates, some returns to the atmosphere by evaporation and transpiration, and some percolates down to the water table where it recharges the unconfined aquifer. Ground water in the unconfined aquifer flows toward streams and toward springs and the coastal bluffs where it discharges. Ground water in the unconfined aquifer also leaks downward through the clay units to recharge the deeper confined aquifers. Ground water in the confined aquifers flows toward the coast and discharges under Cook Inlet. Lakes in the Nikiski area are recharged by precipitation and by ground-water inflow. Lakes lose water to evaporation, to ground-water outflow, and to outlet streams.

### Stream flow (Omitted)...

### Aquifers

There are three major aquifers in the Nikiski area (fig, 7). The uppermost aquifer is unconfined; the lower two are confined.

The unconfined aquifer is the aquifer in which most domestic wells are completed. It is hydraulically connected to Beaver and Bishop Creeks and to many of the lakes in the area. The unconfined aquifer is recharged by precipitation, and it discharges water naturally to Cook Inlet , to creeks, and to underlying aquifers. Many springs occur along the Cook Inlet bluffs where the unconfined aquifer crops out above high tide level.



The base of the unconfined aquifer is an extensive layer of silt and clay that is termed the upper confining layer, Undulations in the upper confining layer generally conform to topography, No lakes are known to breach the upper confining layer. Locally, the low-permeability silt and clay grade laterally into fine sand having greater permeability.

The upper confined aquifer underlies the upper confining layer and is the aquifer in which most commercial and industrial wells are completed; it receives recharge from the overlying aquifer by leakage through the confining layer. It discharges water to Cook Inlet, to lower aquifers, and, in the vicinity of Bishop and Beaver Creeks, upward into the unconfined aquifer and then into the creeks. The aquifer probably crops out a short distance offshore in n Cook Inlet. Rates of recharge to the upper confined aquifer may not be uniform over the entire area; recharge may be concentrated where the confining layer is most permeable.

Although the upper confined aquifer yields large quantities of water to wells west of Cabin Lake, it is not a productive aquifer throughout the Nikiski area\* A 351-ft well drilled 1,000 ft northwest of Cabin Lake penetrated materials that were predominantly of low permeability in the depth-equivalent Interval of the upper confined aquifer. Only a 2-ft thick unit immediately below the confining layer yielded water to the well, Similarly, the well at the southeast end of section B-B' in figure 7 penetrated predominantly fine-grained materials in the interval that is the depth equivalent of the upper confined aquifer, The upper confined aquifer is poorly defined away from the industrial area.

The lower confined aquifer is separated from the upper confined aquifer by a silt and clay unit that is generally more than 100 ft thick. The lower confined aquifer is poorly defined throughout the study area. It may actually consist of many interconnected lenses and layers of sand and gravel at depths greater than 303 ft below land surface. The aquifer is probably recharged by slow leakage from the overlying aquifer. Natural flow is toward Cook Inlet. The top of the aquifer is about 200 ft below sea level, well below the floor of Cook Inlet within about 6 mi of Nikiski . The discharge area may therefore be many miles offshore.

### Lakes

The dominant control of the level of open lakes (i.e. lakes that have an outlet to a stream), is the altitude of the outlet. Changes in annual recharge or in pumping near such lakes cause the lake discharge to vary, but the lake level changes little. Daniel's Lake (fig. 8) is an open lake. Bernice Lake (fig. 8) is open when the water level is above the altitude of the outlet, 77.2 ft above sea level. However, it was a closed lake from the time the U.S. Geological Survey began to monitor lake levels in 1970 until the outlet began flowing again in 1980.

The levels of closed lakes, those without an outlet stream, fluctuate several feet from year to year. Fluctuations are caused by changes in annual recharge and by ground-water pumping. The magnitude of the fluctuations is also related to lake size, distance from the lake to a hydrologic boundary (such as a creek, a groundwater divide, or a center of pumping , and properties of the aquifer that surrounds and underlies the lake.

As you see, there is no known occurrence of bedrock (or any associated fractures) that could have facilitated migration of lake water into the confined aquifers. Flow is generally from the sediments to the water body where it is lost again to surficial outflow, evapotranspiration and possibly some reentry into the unconfined aquifer. Any migration would be filtered by the sandy, and often silty, bottoms of the lakes and streams.

As you indicate, the chemical is rapidly removed from any water moving through silty sands and gravels; accordingly, there should be minimal possibility of the chemical migrating towards any current source of potable water.

Some years back, I was made aware of a series of earthquake fractures that allowed water to migrate from one aquifer to another. I am not sure of the location, but it should not be of concern in this instance because of the sediment filtering that will occur.