

Alexander Lake Elodea Eradication Project: Environmental Assessment

Alaska Department of Natural Resources
Division of Agriculture



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Amended: Application Area

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1.0 Introduction

Elodea spp. (Elodea) is Alaska's first invasive submersed freshwater aquatic plant. It was first documented in Alaska near Cordova in 1982 and in Anchorage in 2011. It has also been found in other parts of the state including the Copper River Delta (2012), Fairbanks (2010), the Kenai Peninsula (2013), and the Matanuska-Susitna (Mat-Su) valley (2014). This project's proposed action is located at Alexander Lake in a remote, but high-risk area for spreading. The statewide goal for invasive freshwater aquatic plants is eradication per Memorandum of Understanding between the Alaska Department of Natural Resources (ADNR), Alaska Department of Fish and Game, and the Alaska Department of Environmental Conservation.

Elodea was likely introduced into Alaska as an aquarium plant, and then deposited into nearby water bodies. It has since spread via flowing water, seasonally fluctuating water levels, and anthropogenic influences including boats, gear and float plane traffic. Eradicating Elodea from Alexander Lake is a high priority because its aggressive growth and high reliance on vegetative reproduction can displace native vegetation by creating single-species stands, increasing sedimentation, and slowing water velocities, potentially impacting the function, structure and productivity of freshwater resources. If left unmanaged, the only known Elodea infestation in the Mat-Su valley (Alexander Lake) would be a primary source for new infestations and could spread to other areas around the state, including other remote water bodies. Sand Lake is the suspected source of Elodea in Alexander Lake, which was discovered in 2014. A cabin owner at Alexander Lake and Anchorage resident has a floatplane on Sand Lake where Elodea is located in front of his residence. Elodea occurs in 82% of Sand Lake, with coverage in areas up to 100%, indicating a high risk of spread. Although Elodea was found in Lake Hood (the world's busiest floatplane lake) in 2015, Elodea's distribution was limited and sparse before treatment and is thus less of a risk for spreading. If eradication of Elodea in Alexander Lake were successful, it would limit the potential spread of Elodea elsewhere in the state.

This Environmental Assessment evaluates the direct, indirect, and cumulative environmental effects of the proposed action and alternatives. Alternatives to the proposed herbicide treatments include no action, mechanical removal, benthic barriers, and water drawdown. The ADNR has prepared this document in compliance with the National Environmental Policy Act (NEPA) under the standards of the U.S. Fish and Wildlife Services (USFWS).

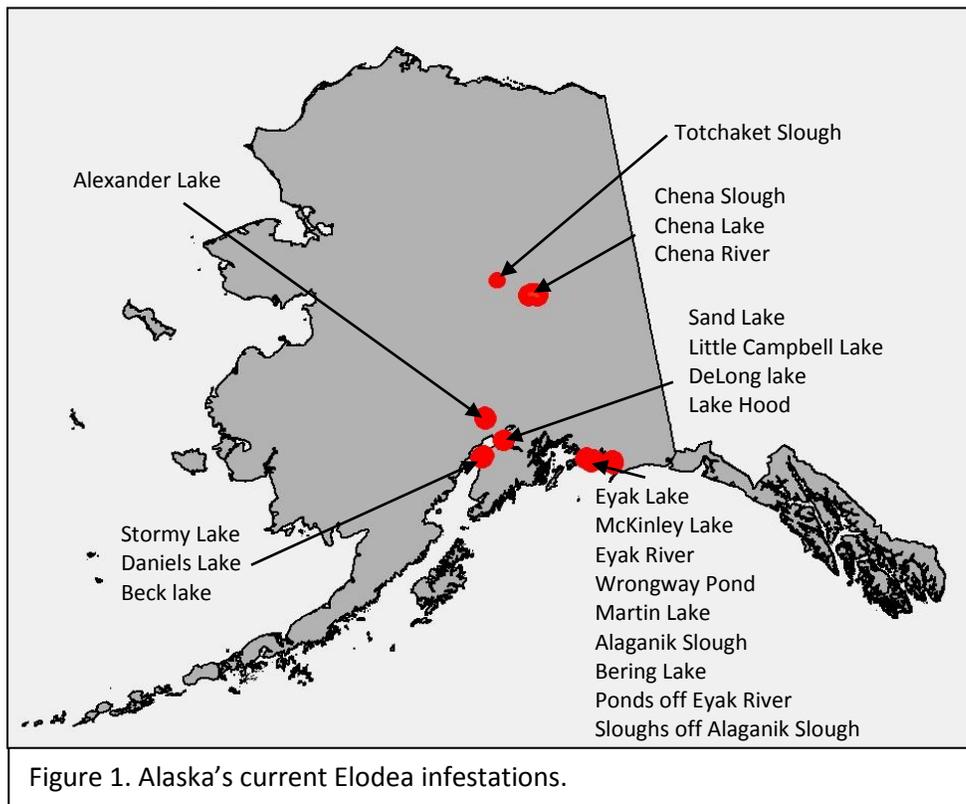
1.1 Need for Action and Project Goals

The goals and need for this project are to: 1) eradicate Elodea from Alexander Lake; 2) propose an effective method that meets ADNR's objective of eradicating Elodea while minimizing potential environmental impacts; 3) evaluate alternative approaches for managing Elodea in the Mat-Su valley; and 4) provide an opportunity for public input on the control and eradication options. ADNR will select a preferred alternative and USFWS, the agency tasked with granting Federal authority for the preferred alternative, will disclose its final decision and supporting rationale in a separate decision document.

1.2 Background: Elodea in Alaska

Elodea is a submersed aquatic plant within the Hydrocharitaceae or Tape-grass or Frog-bit Family. Elodea reproduction is primarily vegetative and readily breaks into transportable fragments, which take root in sediments. It is dioecious with separate male and female plants, and is tolerant of cold water and can survive freezing, with documented rapid invasions as far north as northern Finland (Heikkinen et al. 2009; Sand-Jensen 2000) and Norway (Rorslett et al. 1986).

The first documented occurrence of Elodea in Alaska was in 1982 in Eyak Lake, Cordova, within the Copper River watershed. It was the first record of Elodea in a comprehensive statewide vegetation study by the University of Alaska Fairbanks with over 1,500 aquatic plant specimens (Wurtz et al. 2013). Elodea was found in Chena Slough near Fairbanks in 2009 and in Chena Lake and Chena River in 2011. Elodea was also discovered in three Anchorage lakes in 2011; DeLong, Little Campbell, and Sand. In 2012, Elodea was found in Stormy and Daniels lakes on the Kenai Peninsula, and in McKinley Lake on the Copper River Delta. Elodea was found in another Kenai Peninsula lake, Beck Lake, in 2013. In 2014, Alexander Lake and Bering Lake, including adjacent sloughs on the Copper River Delta were discovered to have Elodea. The most recent discoveries include Lake Hood, the world’s busiest floatplane airport, and Totchaket Slough in the interior of Alaska in 2015. It has been found in a total of 21 lakes, rivers and sloughs, in both populated and remote areas of Alaska (Figure 1).; however, the three Kenai Peninsula lakes may be eradicated in 2016.



Suitable habitat for Elodea in Alaska may increase in response to global climate change from physical and chemical changes to freshwater systems. For example, bioclimatic models of future Elodea distribution in Europe suggest that Elodea will continue to aggressively colonize

farther north (Heikkinen et al. 2009). *E. canadensis* is highly competitive with most vegetation, similar to other invasive aquatic plants including Brazilian waterweed (*Egeria densa*) and African Elodea (*Lagarosiphon major*), under a wide variety of water temperature conditions and variable light conditions (Riis et al. 2012).

1.2.1 Elodea Impacts

Elodea is a particularly injurious aquatic plant outside of its native range and is easily spread. Float planes and boats can transport fragments from dense Elodea beds to other nearby waterways. For example, it is likely that a float plane from Sand Lake was the vector for the Elodea introduction to Alexander Lake. The likely initial vectors in of Elodea were dumping's of aquaria used by hobbyists or school classrooms. The sooner Elodea is eradicated from Alexander Lake, the more likely it is that other water bodies in the state will remain free of Elodea.

Elodea can develop into dense, single species stands that prevent light from reaching other species and limit water movement as well. Stands can experience 5-6 year growth cycles, possibly related to iron availability and 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 infestations, which thereby affect fish, amphibian, and invertebrate populations. Elodea can impede recreational activities such as fishing, boating, and swimming. In higher latitudes of Norway, dense stands of Elodea introduced after 1970 were likely the cause of decreasing native macrophyte species and local extinctions of *Najas flexilis*, one of the most endangered species in Norway (Mjelde et al. 2012). Elodea has impacted Chinook salmon by reducing available spawning habitat with increased sedimentation in a regulated California river (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).

Elodea and other aquatic invasive species can reduce property values on infested lakes. Thus, policies to prevent invasions can provide significant benefits to lakefront properties and community members. A study in New Hampshire found a 21-43% decline in property values associated with an infestation of variable milfoil, which can clog water bodies, crowd out native aquatic plant species, and reduce recreational activities like boating and swimming (Halstead et al. 2003). In a Wisconsin study of 170 lakes infested with Eurasian watermilfoil, property values were reduced by an average of 13% (Horsch and Lewis 2009). A similar study in Washington also with Eurasian watermilfoil showed a 19% decline in property values (Olden and Tamayo, 2014).

1.3 Legal Authorities

Alaska Statue 03.05.027 states that ADNR shall oversee the enforcement of regulations regarding noxious weeds, invasive plants, and coordinate with other agencies, public groups, and private organizations to control noxious and invasive plants. It also mandates that a state coordinator implement a comprehensive plan including early detection and rapid response to regulate and control the entry of prohibited noxious and invasive plants into the state. In 2013, ADNR formally recognized Elodea as a noxious aquatic plant in Alaska. It is ADNR's legal

responsibility to remove the threat imposed by invasive Elodea and develop a plan to coordinate an effective interagency response, to delineate, contain, and when feasible, implement a plan to eradicate Elodea. ADNR is currently developing an Elodea management plan for statewide eradication.

1.4 Proposed Action

Eradicate Elodea from Alexander Lake in the Mat-Su Valley using a systemic herbicide. Fluridone in pelleted form will be used. Eradicating Elodea will allow native aquatic plants to repopulate, return habitats toward their natural state, and reduce the threat of this highly invasive species from spreading to other water bodies in the state. Eradicating Elodea will also reduce potential damage to native fish species resulting from habitat degradation or loss.

The expected time for the initial herbicide treatments to occur is early summer 2016. This will ensure maximum effectiveness in controlling Elodea by applying the herbicide relatively early in the growing season when Elodea plants are actively growing and taking up the herbicide throughout the plant.

1.5 Location of Project

Alexander Lake is located in the Seward Meridian at T19N, R9W, Sections 4, 3, 9, 10, 14, 15, 16, and 22 (Figure 2). Deep, Fox, Clear, and Bear creeks all discharge from surrounding wetland areas from the lower Skwentna district into Alexander Lake. Alexander Lake discharges into Alexander Creek; 42-miles of low velocity, winding, clearwater habitat with numerous backwater side-sloughs and oxbow channels. Alexander Creek eventually empties into the west side of the Susitna River approximately 8 river miles upstream of Cook Inlet.

1.5.1 Elodea Survey Results and Lake Characteristics

Invasive freshwater plants were not known to occur in the Mat-Su until August 2014 when Elodea was found in Alexander Lake during an Alaska Department of Fish and Game (ADF&G) Northern Pike (*Esox lucius*) survey. The discovery of Elodea in Alexander Lake occurred because an ADF&G field crew member was familiar identifying Elodea, and happened to check a minnow trap near the infestation.

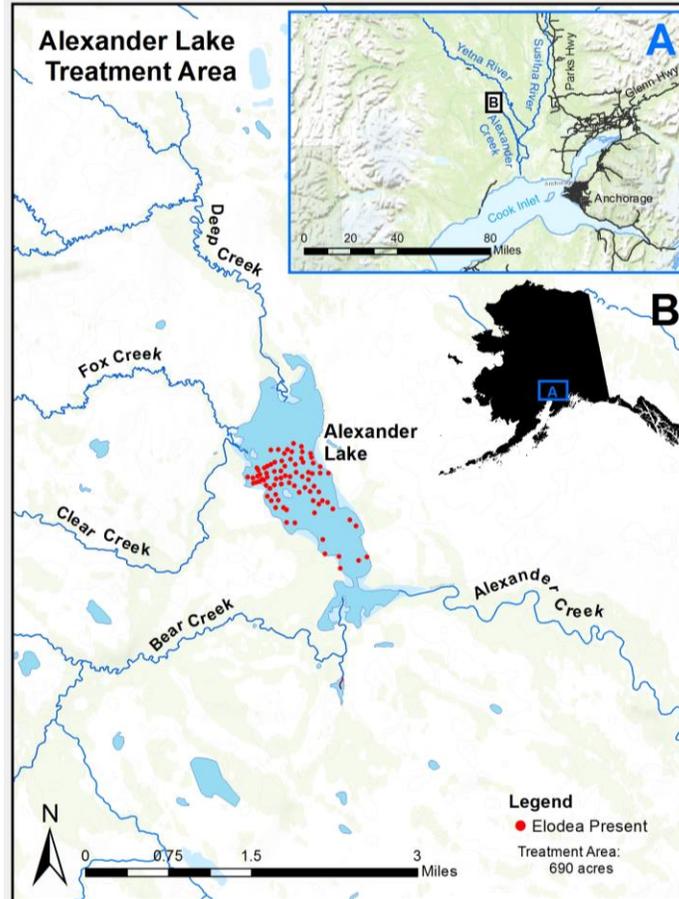
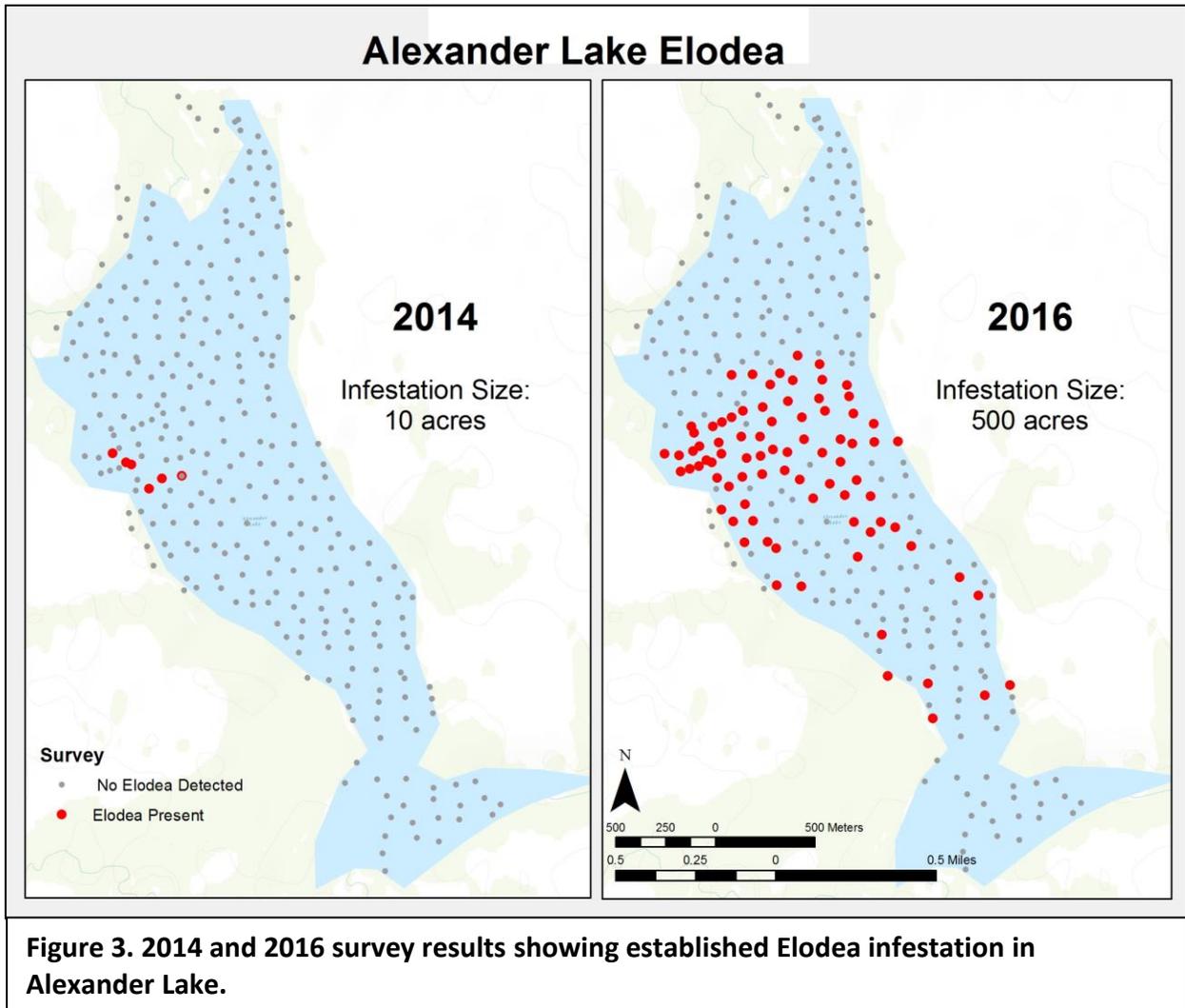


Figure 2. Location of Alexander Lake and contributing creeks in Alaska.

In September 2014, shortly after the discovery of Elodea, a comprehensive vegetation survey of Alexander Lake was completed by ADNR and ADF&G. A grid of 300 points were surveyed using a method that involved throwing a sampling rake attached to a length of rope, as well as visual detection since Alexander Lake’s depth did not exceed 5 feet. A total of 20 species of both submersed, emergent, and shoreline vegetation were collected, with 2% of the sample points having Elodea present. Elodea was observed to be sparsely distributed covering ~10 acres in the west-central part of the lake (Figures 2 and 4). In 2015, a follow-up “windshield” visual survey was completed to see if Elodea had spread from the previous season. Elodea was more abundant and more densely populated within the ~10 acres, but had not spread. However, floating fragments were observed ~1,600 feet from a rooted plant, travelling south towards the Alexander Creek. In August of 2016, consistent with survey methods completed in the 2014 survey, a throw rake was used to sample the same 300 survey points in Alexander Lake, quantifying vegetation density with rake fullness, and identification of specific aquatic plant species, both native and invasive. Of these 300 survey points in 2016, a total of 80 had Elodea present in 2016, covering an estimated 500 acres with rooted, established Elodea (Figure 3.). Most survey sites with Elodea present had densities up to and close to 100% and floating fragments were observed floating through the channel on the south end of the lake.



A total of 50 other lakes in the Mat-Su have been assessed by Cook Inlet Aquaculture Association (CIAA), local Soil and Water Conservation Districts, and ADNR since 2011 and no invasive aquatic plants have been found (Figure 4). At this time, the distribution of Elodea in the Mat-Su area is thought to include only Alexander Lake. The most recent surveys for Elodea were completed by CIAA in lakes targeted as high risk because of floatplane accessibility from Lake Hood and other Anchorage infestation sites. However, as shown in Figure 4, there are thousands of waterbodies in the Mat-Su that have not been surveyed.

The Alexander drainage contains abundant emergent and submerged macrophytes throughout its waters, which have aided in the system being one of the most productive Chinook salmon fisheries in the entire Mat-Su basin. However, invasive Northern Pike introduced in the late 1960s, have decimated what was once likely a multimillion dollar sport fishing industry in Alexander Creek. Since 2008, the fishery has been closed due to salmon returns being well below escapement goals, while continued eradication efforts of Northern Pike remain a priority for Alaska Department of Fish and Game (ADF&G). Preliminary results of the ADF&G project show promising results of Chinook salmon growing in numbers. If Elodea becomes established in the Alexander drainage basin, including side-channel slough habitats, it would provide excellent nursery habitat for invasive Northern Pike and therefore hinder on-going efforts to bolster salmon productivity.

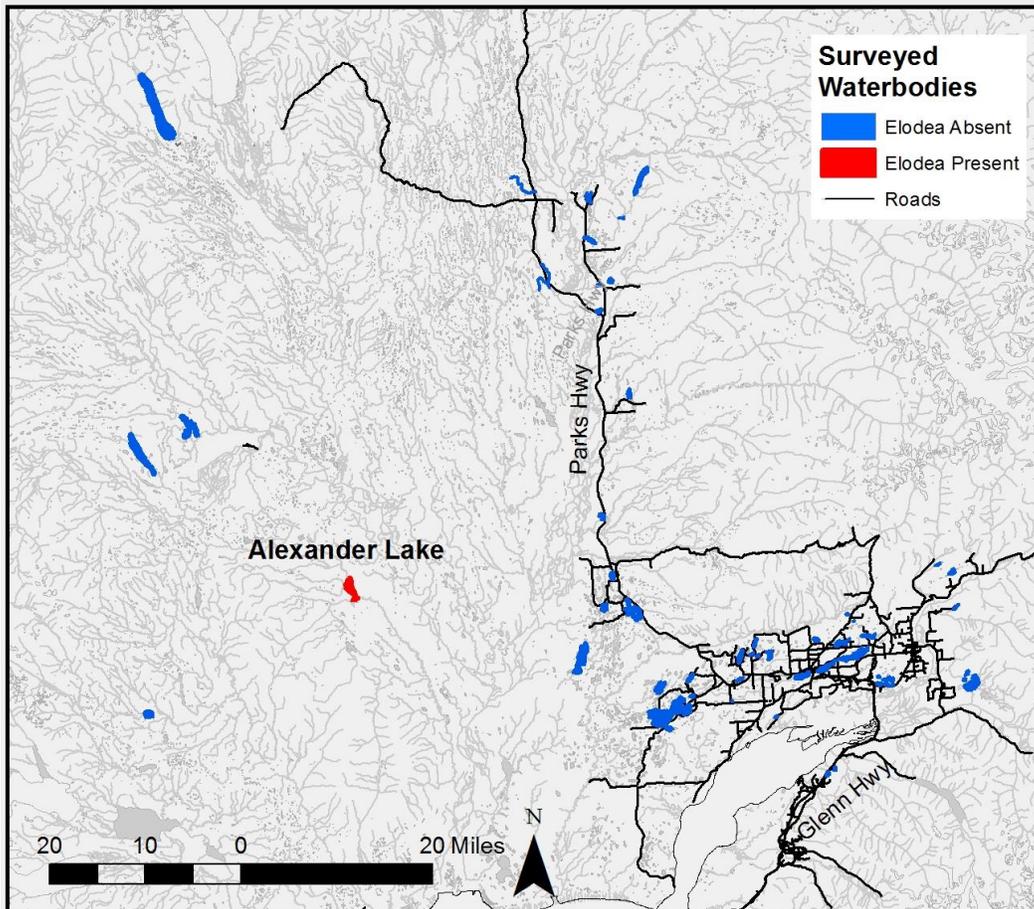
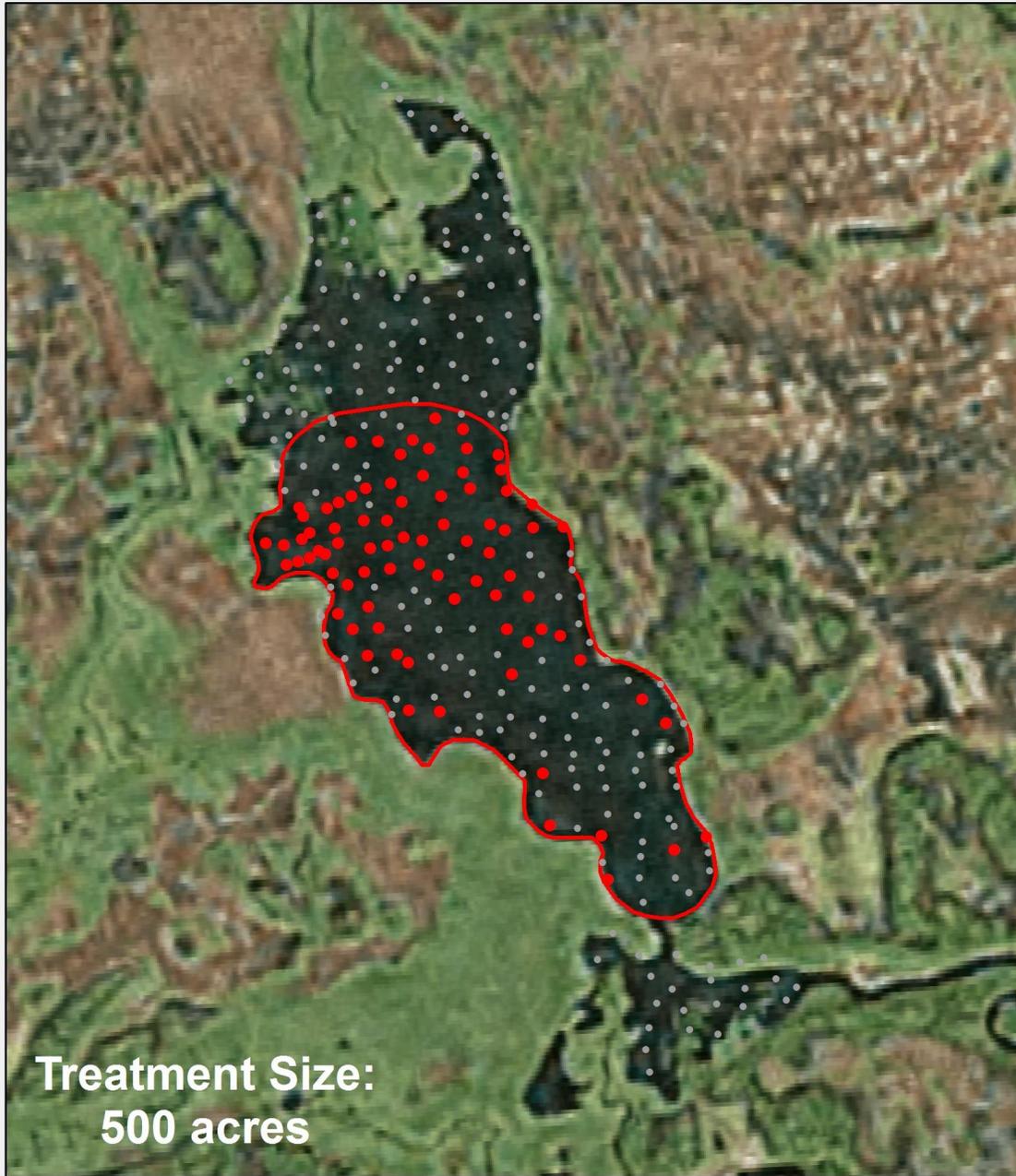


Figure 4. Elodea surveys completed in the Mat-Su valley since 2011. Gray lines indicate waterbodies that have not been surveyed for Elodea.

Alexander Lake is 690 surface acres. The maximum depth varies seasonally with changes in flux inputs and outputs but does not exceed 8 feet, and averages 4.5 feet in depth. The volume of Alexander Lake is 2760 acre-feet. The proposed treatment area covers most of Alexander Lake and includes the current extent of the infestation and a buffer totaling 500 acres (Figure 5).

Alexander Lake Treatment Area



540 270 0 540 Meters

0.5 0.25 0 0.5 Miles

N

□ Treatment Extent

• No Elodea Detected

• Elodea Present

Figure 5. 2016 Elodea survey showing distribution of Elodea (red dots) and survey points (grey dots).

2.0 Alternatives

In this section, alternative methods are assessed for the eradication of invasive Elodea. These alternatives include no action, suction harvesting or mechanical removal, suppression of growth by benthic barriers, drawdown, and eradication using an herbicide.

2.1 Alternative 1: No Eradication or Control of Elodea (No Action Alternative)

The no action alternative would maintain the status quo and Elodea populations would remain in Alexander Lake. As long as Elodea remains in Alexander Lake, there is a high risk of spread via float planes to adjacent lakes and water bodies, and most importantly back into the already treated Lake Hood, which is located 50 miles away in Anchorage and has up to 50,000 aircraft operations annually. There is also a high risk of natural dispersal of Elodea from its current extent in the lake downstream to Alexander Creek because of the likelihood of fragmentation by recreationalists. Elodea can also be spread naturally via Alexander Creek and by humans and their gear, and possibly waterfowl. Spread of Elodea could be very detrimental to the ecological and recreational values of water bodies throughout the region due to the prevalence of vectors of transport, thus, the no action alternative is not a viable alternative.

2.2 Alternative 2: Mechanical Removal

Mechanical removal via suction dredge, dragline, cutting, or similar mechanical treatments has a high risk of further spreading Elodea. Because Elodea is easily broken into small pieces when disturbed, mechanical treatments are likely to make the Elodea problem worse. Mechanical treatments have not been successful with Elodea removal except where removal is done merely to reduce biomass on an annual basis (Texas A&M, 2016). Mechanical removal would not eradicate Elodea in the lakes, and may only serve to increase the density of Elodea and increase the risk of spread, rather than eradicate the population.

2.3 Alternative 3: Benthic Barriers

A benthic barrier covers the sediment like a blanket, compressing aquatic plants while reducing or blocking light. Using benthic barriers in Alexander Lake would be impractical and expensive. The organic-rich thick lake sediments would be difficult to anchor tarps in, and installation would require trained divers to cover the entire 500 acres or more Alexander Lake. Benthic barriers may be effective in suppressing growth or potentially eradicating Elodea (Laitala et al. 2012) in areas where the population in the littoral zone is sparse, but this would not be possible in the Alexander Lake due to the large infested area, and maintenance need for barriers to eradicate vegetation. In areas with thick biomass, benthic barriers would not be effective in controlling Elodea, and could affect native vegetation populations. Benthic barriers may reduce biomass or prevent growth after several years of application, but would not eradicate Elodea from the lakes (Laitala et al. 2012).

2.4 Alternative 4: Drawdown or Draining

Lowering water levels expose great amounts of sediment and plant beds, allowing vegetation to desiccate and eventually could become eradicated. Water level drawdown often occurs regularly in reservoirs for power generation, flood control, or irrigation and rarely in an area

without a water level control structure. Draining Alexander Lake would not be a practical alternative because of the size, complexity, and impacts on associated wetlands of the lake. Due to the discharge and influx rates into Alexander Lake from four contributing creeks, drawdown or draining would be logistically nearly impossible. Alexander Lake lacks an existing engineered drain and would therefore need structural changes for drawdown to be effective, which would be expensive. Lake drawdown would also have many irreversible and detrimental unwanted side effects such as impacts to adjacent wetlands, Chinook salmon spawning habitat, and wildlife, and extended loss of use while the lakes refill. Draining the lake would still leave some water that would require chemical treatment or manual removal of all plant fragments to ensure Elodea did not survive.

2.5 Alternative 5: Fluridone Treatment (Proposed Action)

ADNR's proposed action involves eradicating established populations of Elodea from Alexander Lake using the systemic herbicide fluridone: SonarONE™ (pelleted formulation). Multiple treatments spanning 3 or more years may be necessary to completely remove the Elodea population from the lake.

This alternative offers the highest probability of achieving the goal of completely eradicating Elodea from Alexander Lake and preventing it from spreading to other water bodies and maintaining the ecological integrity of Alaska's waterways because of the least amount of non-target impacts and cost effectiveness of working in a remote location.

2.5.1 Description of Fluridone

Fluridone is a systemic herbicide that is absorbed through leaves, shoots, and roots of susceptible plants and interferes with the synthesis of RNA, proteins, and carotenoid pigments in plants, and disrupts photosynthesis. Disruption of photosynthesis prevents the formation of carbohydrates that are necessary to sustain the plant (Durkin 2008).

In field studies, fluridone did not adversely affect water quality parameters such as pH, dissolved oxygen, color, dissolved solids, hardness, nitrate nitrogen, total phosphates, and turbidity (McCowen et al. 1979). Field tests in mixed invasive and native submersed aquatic vegetation showed 95% to 100% reductions in a year in invasive populations with native plant cover retention of approximately 70% (Madsen et al. 2002). Treatment of Michigan lakes resulted in drastic reductions in invasive Eurasian watermilfoil, increases in native submersed aquatic vegetation, and increases in size and abundance of native fish populations (Schneider 2000).

Several formulations of fluridone are approved for use in Alaska by the Alaska Department of Environmental Conservation. Fluridone may be applied to an entire water body (whole-lake) or on smaller infestations within a water body (partial-lake). For whole-lake treatments, fluridone is generally applied as a liquid by boat through surface or underwater drip equipment depending on the size and distribution of the infested areas. For partial-lake treatments, fluridone is often applied as time-release pellets; which is proposed for Alexander Lake. In both cases, applications take place under appropriate conditions for boating, by avoiding high winds or wave action. The herbicide would be applied following all directions on the U.S.

Environmental Protection Agency (USEPA) approved label and would not exceed the maximum cumulative concentration of 150 ppb.

All USEPA approved herbicides have undergone extensive testing to determine toxicity levels through acute (high doses for short periods of time) and chronic (long-term exposure) studies on animals (USEPA 1986). Fluridone has been tested in both acute and chronic toxicity studies, as well as studies examining potential genetic, cancer, and reproductive effects. Fluridone has not been shown to result in the development of tumors, adverse reproductive effects and offspring development, or genetic damage (USEPA 1986). Fluridone has been extensively tested for efficacy in treating aquatic plants, including long-term residue monitoring studies by USEPA, SePRO Corporation, as well as non-governmental, and non-industry entities.

USEPA has approved the application of fluridone in water used for drinking as long as residue levels do not exceed 0.15 parts per million (ppm), which is equivalent to 150 parts per billion (ppb). One ppm is equivalent to approximately one second in 12 days or one foot in 200 miles. Concentrations of the active ingredient fluridone up to 150 ppb (0.15 ppm) are allowed in potable water sources. However, application rates greater than 20 ppb within one-fourth mile (1,320 feet) of any functioning potable water intake is restricted. The proposed treatment concentrations of 5-15 ppb are well below the 150 ppb allowable limit in water used for drinking (USEPA 1986). Human contact with fluridone can occur through swimming in treated waters, drinking treated waters, consuming fish from treated waters, or by consuming meat, poultry, eggs, or milk from livestock that were provided water from treated waters. Alexander Lake has no commercial agricultural use, so human exposure through livestock is unlikely. There are no private wells identified within 200 feet of the treatment area that utilize Alexander Lake for drinking water in the ADNR Well Log Tracking System (WELTS) and there are no USEPA restrictions on the use of fluridone-treated water for swimming, fishing or consumption by livestock or pets when used according to label directions (USEPA 1986). Restrictions include the use of treated water on greenhouse and nursery plants, hydroponic farming, and turf that have known concentrations more than 1 ppb.

The maximum non-toxic dose for humans is characterized by the “no-observed-effect-level” (NOEL) for herbicides. The dietary NOEL (i.e., the highest dose ingested at which no adverse effects were observed in laboratory test animals) is approximately 8 mg of fluridone per kg of body weight per day (8mg/kg/day). A 70-kg (150 lb) adult would need to drink more than 1,000 gallons of water containing the maximum legal allowable concentration of fluridone in potable water (15 ppm) for to receive an equivalent dose. A 20-kg (40 lb) child would need to drink approximately 285 gallons of fluridone-treated water in a day to receive a NOEL-equivalent dose. Therefore, the risk to humans and all mammals is negligible even if fluridone-treated water was ingested directly after treatment. Because fluridone is only applied intermittently and in limited areas, and because it degrades over time in the environment, long-term continuous exposure for humans would not likely occur when the proposed action is completed.

Fluridone has minimal to no toxic effects on mammals, fish and birds. 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 bees, amphipods, daphnids, midges, chironomids), earthworms, fish (fathead minnows *Pimephales promelas*, channel catfish *Ictalurus punctatus*, mosquitofish *Gambusia affinis*, rainbow trout *Oncorhynchus mykiss*, and other aquatic animals (Hamelink et al. 1986; Kamarianos et al. 1989; Muir et al. 1982; McCowen et al. 1979). Dermal exposure (skin contact) of test animals to fluridone has shown minimal to no toxicity on mammals from acute, concentrated contact. Chronic dermal exposure in mammals showed no signs of toxicity and only slight skin irritation. Mammals given varying fluridone doses up to 1,400 ppm per day excreted fluridone metabolites within 72 hours (McCowen et al. 1979). A dietary NOEL for fluridone was established for birds that feed on aquatic plants and insects. The risk to birds from fluridone via diet was considered negligible. The acute median lethal concentration of fluridone was 4.3 (+/- 3.7) mg/L for invertebrates and 10.4 (+/- 3.9) mg/L for fish. Fish in treated ponds showed 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 sediments had higher rates of fluridone intake and persistence than other insects (Muir et al. 1982). Honeybees and earthworms were not particularly sensitive to fluridone, even when directly dusted or placed in treated soil (Kamarianos et al. 1989).

Fluridone has low bioaccumulation potential in fish, bird, or mammal tissues. Irrigation of crops using water treated with fluridone led to only “residue” amounts in forage crops; containing 0.05ppm after being fortified with 0.1 ppm (West and Day 1988). Livestock consumption of fluridone-treated water resulted in negligible levels of fluridone in lean meat and milk. Fluridone manufacturer recommendations indicate livestock can consume fluridone-treated water. The tolerance level for drinking milk is the same as for water: 0.15 ppm (West and Day 1988).

Fluridone is removed from treated water by degradation from sunlight, adsorption to sediments, and absorption by plants. In partially treated water bodies, dilution reduces the level of herbicides more rapidly following application. In field studies, fluridone (various formulations) decreased logarithmically with time after treatment and was undetectable between 64 and 69 days after treatment (Langeland and Warner 1986). In other studies, fluridone levels decreased rapidly to values below detection levels after 60 days, 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).

Applicators of fluridone will have some risk of exposure. However, there is no expected risk of exposure to the public from drift. Applicators must avoid breathing particle dust, and avoid contact with skin, eyes, or clothing, and must wash thoroughly with soap and water after handling and wash exposed clothing before reusing. Fluridone used according to label instructions minimizes risk to applicators. Fluridone labels from SonarONE™ are included in Appendix 6.1 and the Material Data Safety Sheet (MSDS) is available in Appendix 6.2.

2.5.2 Description of proposed fluridone treatment

The Alexander Lake Elodea population has spread at an unprecedented rate, infesting a total of 500 acres by 2016 (Figure 5). However, because Alexander Lake does not exceed 8 feet in depth, the entire lake is suitable habitat for Elodea and is anticipated to keep spreading throughout the system if not managed. A treatment plan has been developed for Alexander Lake to maximize control of Elodea and concentrations will be maintained within the target range over the course of the treatments.

The success rates of fluridone for treating Elodea exceed 95% (DiTomaso et al. 2013). Treating Alexander Lake during the growing season (June through September) is preferred because plants are actively growing, aiding uptake and translocation of the herbicide through the plant's tissues. Aquatic herbicides are more effective at warmer temperatures. Due to the influx and discharge rates of Alexander Lake diluting herbicides, no liquid formulations of fluridone will be used. This helps ensure the desired target concentration is reached and maintained long enough for effective control as the pellets slowly release fluridone. The projected time necessary to eradicate Elodea in Alexander Lake is approximately 3 years. An additional fall application of pelleted slow-release fluridone will be applied to maintain target concentrations under the ice during winter.

The proposed treatment includes applying the initial treatment of fluridone 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. Unlike most other native submersed aquatic plants, Elodea does not appear to completely senesce. In February 2013, when Elodea was sampled on the Kenai Peninsula beneath 2 feet of snow and ice in Stormy and Daniels lakes, it was obvious the Elodea was green, vibrant and photosynthesizing under the ice. In February of 2014, Anchorage lakes surveys indicated the same.

Herbicide will be applied from an air boat or motorboat using DEC-certified applicators. Pelleted fluridone will be distributed on the lake surface by an electric disk-driven spreader or high-velocity blower applicator. The application rate will be calibrated to ensure that desired concentrations are achieved. Titration tests have been conducted with Elodea samples from a lake on the Kenai Peninsula to calculate optimal concentrations required for effective control in Alaska and these results have guided treatment concentrations applied at Alexander Lake. The target concentration is 5-20 ppb, and the sum of all applications in a given season will not exceed 150 ppb. The treatment plan is to maintain the target concentration of fluridone for at least 2 years; long enough to effectively eradicate Elodea. To ensure target concentrations are maintained, water samples will be collected from several sites in Alexander Lake, at the surface, every few weeks. Based on the water sample results additional fluridone may be added.

Public notification of the herbicide applications will be conspicuously posted on signs at all public access points of entry and exit at each lake. Signs will remain posted for at least 24 hours after the applications with contact names, phone numbers, time of application, and any appropriate label restrictions per Alaska Department of Environmental Conservation and

Municipality of Anchorage requirements. All public notifications related to the fluridone treatments will include two consecutive newspaper notices at least 30 days before the first application including information about product name, EPA registration number, quantity of mixed herbicide and treatment locations. Individuals who have cabins on Alexander Lake who have provided ADNR with contact information will also be notified.

3.0 Affected Environment

This section identifies and describes the ecological and human health impacts of the proposed action. Potential impacts are described with three broad subject areas: physical environment, biological environment, and human health. The description and comments will focus on issues identified as potential concerns by ADNR.

3.1 Physical Environment

3.1.1 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?		X			
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce lake productivity or fertility?		X			
c. Destruction, covering or modification of any unique geologic or physical features?		X			
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?		X			

3.1.2 Water Resources

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Discharge into, or any alteration of, surface water quality including but not limited to temperature, dissolved oxygen, and turbidity?			X		See comment 3.1.2a.
b. Changes in drainage patterns or rate and amount of surface runoff?		X			
c. Alteration of the course or magnitude of flood water or other flows?		X			
d. Changes in the amount of surface water in any water body or creation of a new water body?		X			

e. Exposure of people or property to water related hazards such as flooding?		X			
f. Changes in the quality of groundwater?		X			See comment 3.1.2f
g. Changes in the quantity of groundwater?		X			
h. Increase risk of contamination of surface or groundwater?			X		See comments 3.1.2a, 3.1.2f
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 comment 3.1.2f
k. Will the project affect a designated floodplain?		X			
l. Will the project result in any discharge that would affect federal or state water quality regulations standards? (Also see 2a)			X		See comment 3.1.2l

Comment 3.1.2a. This project would apply an herbicide to surface waters to eradicate an invasive aquatic plant. The anticipated impacts would be short-term. Fluridone (brand name Sonar, USEPA Registration Number 67690-45 for Sonar ONE™) is registered by both the USEPA and the Alaska Department of Environmental Conservation and are deemed safe for use to eradicate invasive aquatic plants when applied according to label instructions.

The active ingredient in the product is fluridone. The pelleted formulation has a fluridone concentration of 5%. Regardless of formulation or application rate, the application will not exceed 150 ppb cumulatively in any one season. Spill prevention measures will be undertaken to reduce the likelihood of spills. Spill risk will be minimized by implementing standard operating procedures to ensure the proper handling of fluridone products as detailed by the label.

Long-term water quality is not expected to decrease with the application of fluridone to Alexander Lake. Application of fluridone is expected to eradicate Elodea, which will increase decaying and dead biomass within the lake as the Elodea plants break down. This could result in temporary increases in organic material suspended in the lakes, and a decrease in dissolved oxygen levels (McCowen et al. 1979). The algae levels within the three lakes may also increase as a result of the decrease in Elodea, though algal levels in spring are typically low Alexander Lake. Increase in algae may reduce visibility within the lakes and decrease dissolved oxygen. However, any changes or impacts to water quality resulting from an increase in algae are expected to be short-term and minor.

Long-term water quality may improve with the reduction of the large biomass of Elodea in these lakes, and native submersed aquatic vegetation is expected to increase.

Comment 3.1.2f: The primary soil types in Alexander Lake are similar and generally consist of a thin top layer of organics, covering a sandy, silt loam and gravelly till interbedded with layers of clay. Most of the soils are moderately to highly permeable and glacial in origin (Munk et al. 2004). Fluridone readily binds to organic and clay particles, and is unable to travel more than a few inches through lake sediments (Muir et al. 1980). Therefore, it is not expected to contaminate groundwater resources.

Comment 3.1.2i: The treatments would be confined to the partial lake treatment area in Alexander Lake. Any treated water discharged from the Alexander Lake outlet would not have a fluridone concentration that exceeds the 0.15 ppm threshold. As required by state regulation, ADNOR has submitted a pesticide use permit application to the Alaska Department of Environmental Conservation, which must be approved prior to any fluridone treatments.

3.2 Biological Environment

3.2.1 Air Resources

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?			X		See comment 3.2.1a
b. Creation of odors?		X			
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 3.2.1a: Emissions from airboat or outboard motors would be produced, but are expected to dissipate rapidly.

Pelleted fluridone are not volatilized and present no or minimal airborne or drift risk.

3.2.2 Vegetation

Will the proposed action result in:	Impact Unknown	None	Minor	Potentially significant	Can impact be mitigated
a. Changes in the diversity, productivity or				X	See

abundance of plant species (including trees, shrubs, grass, crops and aquatic plants)?					comment 3.2.2a
b. Alteration of a plant community?				X	See comment 3.2.2b
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. Adverse effects on wetlands, or prime and unique farmland?		X			

Comment 3.2.2a and 3.2.2b: The desired outcome of the proposed project is eradication of Elodea. Elodea forms a substantial portion of the submersed aquatic vegetation in the treatment area of Alexander Lake. Elodea grows both in single species stands, with other aquatic plant species in Alexander Lake. Fluridone is applied at low concentrations so that potential impacts to other aquatic plant species are minimized while impacts to Elodea, due to its high sensitivity to fluridone, are maximized. The aquatic plant community is expected to return to one comprised entirely of native species because the seed bank of native vegetation will not be affected by fluridone, along with vegetation upstream from the treatment site. As the Elodea decays and before native vegetation can recover, dissolved oxygen levels could be reduced up to 25%, but because of the slow mode of action by fluridone, abrupt or large swings in dissolved oxygen are not likely (McCowen et al. 1979). As Elodea continues to decompose, water clarity, dissolved oxygen, and nutrient levels are expected to return to normal levels. Eradication of Elodea may create a more favorable environment in which native plants can compete with Elodea (Rybicki and Landwehr 2007).

Operations would be based at private cabins, which would avoid trampling of lakeside and nearshore vegetation. Prior to removing boats and equipment, all equipment would be carefully inspected to ensure that Elodea is not transported to other waterbodies.

Fluridone is a systemic herbicide that can affect plants that are sensitive to this herbicide if treated water is used as irrigation. Watering with treated lake water could potentially kill garden plants and lawns. According to the USEPA approved label, fluridone use is restricted for irrigating greenhouse or nursery plants unless concentrations are less than 1 ppb. Lakeside property owners will be notified of this restriction by phone call or on-site visits. Restrictions would also be posted on the ADNR project website and on project notice signs in public access areas around the lakes.

3.2.3 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 mammals or bird species?			X		See comment 3.2.3b
c. Changes in diversity or abundance of other species?			X		See comment 3.2.3c
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 or their habitat?		X			See comment 3.2.3d
i. Will the project introduce or export any species not presently or historically occurring in the receiving location?		X			

Comment 3.2.3b: Mammals: Although the infested Anchorage lakes range from unpopulated to densely populated areas, mammals can inhabit and utilize lake water year-round. Ingestion of treated waters by mammals is expected to have minimal to no effects because of the enzymatic action in animal's digestive tracts (Durkin 2008) and the low herbicide concentration used in the lake treatments. Thus, there are minimal to no adverse effects expected to mammals from drinking treated lake water.

Waterfowl: Waterfowl will likely be present and could be temporarily displaced from Alexander Lake's treatment site due to treatment activities (i.e., boats). Because of the close proximity and availability of other waters to the project area there should be minimal or no impacts to waterfowl during project activities.

It is possible that birds may ingest treated water, consume aquatic plants, fish or aquatic invertebrates that have been exposed to or affected by treated water. Ingestion or exposure to treated water is unlikely to have any effects at the proposed treatment levels because the toxicity of fluridone to waterfowl and other birds is low. USEPA categorizes fluridone for acute toxicity in birds as *Practically Nontoxic* based on >5000 ppm in both mallards and quail (reference). Ingesting fish exposed to fluridone will also have minimal or no impact on birds, because fish do not bioaccumulate fluridone. Ingesting invertebrates from treated water may introduce trace amounts of herbicides to bird digestive systems. Studies indicate that low amounts of fluridone are metabolized and excreted by birds (Hamelink et al. 2009, Muir et al. 1982). However, all of the laboratory examples regarding effects of fluridone on animals involved laboratory specimens subjected to unusually high concentrations of herbicides, which far exceed any concentrations proposed in this project. Thus, we expect minimal, short-term or no or impacts to waterfowl or other birds.

Comment 3.2.3c: Other species that could be present during this project include zooplankton, aquatic insects, and other birds. Similar to mammals, fluridone has minimal to no effects because of the enzymatic action in animal's digestive tracts (Durkin 2008) and the low herbicide concentration used in the lake treatments.

Invertebrates: Micro- and macroinvertebrates can be affected by fluridone, and its effects on aquatic macroinvertebrate populations vary. However, effects are expected to be minimal because most insects and earthworms are not sensitive to fluridone at low concentrations (Haag and Buckingham 1991). The only study that found reduced biomass of macroinvertebrates (fly larvae; *Hydrellia*) used fluridone at concentrations of 4600-9200 ppb (Haag and Buckingham 1991); far exceeding EPA approved label concentrations. Another study conducted at low fluridone concentrations (5 ppb) for the treatment of milfoil, a similar concentration and with similar species as in our proposed project, found no negative effects on macroinvertebrate biomass (Cheruvilil et al. 2000).

Because of their short life cycles, high dispersal ability, and generally high reproductive potential, aquatic invertebrates are capable of rapid recovery from disturbance (Matthaei et al. 1996; Boulton et al. 1992; Anderson and Wallace 1984). Recolonization of aquatic invertebrates (e.g., mayflies and caddis flies) in the treated lakes would occur via aerial dispersal of adult invertebrates from adjacent areas. No impacts on benthic organisms were reported in field studies where fluridone treatment was >1000 ppb (Durkin 2008).

Amphibians: Wood frogs are the only amphibians in the Mat-Su area and presumably inhabit the area around Alexander Lake. Wood frogs mate in the spring and their offspring quickly develop from eggs to tadpoles to frogs. Adult frogs may be more resistant than earlier life stages to herbicide affects; however, there is no published literature available to examine amphibian effects of fluridone (Durkin 2008).

Fish: Fish in ponds showed no fluridone metabolites in their systems after treatment (Kamarianos et al. 1989). Chronic studies showed no effects on fathead minnows or channel

catfish, and demonstrated rapid rates of metabolic excretion (Hamelink et al. 2009, Muir et al. 1982). The acute median lethal concentration of fluridone for fish was 10.4 +/- 3.9 mg/L (Hamelink et al. 2009, Muir et al. 1982).

Comment 3.2.3d

Threatened and Endangered Species

There will be no effects to any threatened or endangered species. Cook Inlet beluga whales are the only threatened or endangered species found in the Cook Inlet drainage, but are not located in or near the project area. Any herbicide potentially discharged from the lakes would be highly diluted and would be below detectable levels by the time it reached Cook Inlet.

3.3 Human Environment

3.3.1 Public and Worker Safety and Health

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 of an accident or other forms of disruption?			X		See comment 3.3.1a
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 comment 3.3.1a
d. Will any chemical toxicants be used?			X		See comment 3.3.1c

Comment 3.3.1a: The primary risk of human exposure to hazardous substances from this project would be to the herbicide applicators. To minimize exposure risk, all applicators would wear personal protective equipment as stipulated by the fluridone product label. The fluridone application would also be supervised by an Alaska Department of Environmental Conservation certified aquatic herbicide applicator.

Fluridone will be transported, handled, applied, and stored according to the label specifications to minimize the possibility of human exposure or a spill. Accidental spills are a concern and a spill response plan has been developed, along with a general safety plan, for all aspects of the project. If a spill occurs, pelleted fluridone would be physically picked up.

Comment 3.3.1c: Although herbicides are widely used to control unwanted species, public concerns have been raised regarding health and human safety. Fluridone is an EPA-registered herbicide that has been approved for use by ADEC.

Any risks to human health during application (particularly to applicators) will be minimized by following a safety plan, including proper use of safety equipment. Orientation meetings will be

held prior to all applications to cover planned activities, as well as spill prevention and response. People recreating in the area would not be at risk from chemical toxicants when the lakes are being treated. Public notifications through news releases, signs, and ADNR personnel in the project area should be adequate to keep any potential recreationists from being exposed to waters during the day of the treatment.

3.3.2 Recreational and 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 any existing land use?		X			
b. Conflict 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			

3.3.3 Aesthetics

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 to public view?		X			
b. Alteration of the aesthetic character of a community or neighborhood?			X		See comment 3.3.3b
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings?			X		See comment 3.3.3c
d. Will any designated or proposed wild and scenic rivers, trails or wilderness areas be impacted?		X			

Comment 3.3.3b: Alexander Lake’s treatment site is close to a cabin, who’s owner will be notified of the days of treatment. Any alterations of the aesthetic character of the lake environments would be minor and limited to the days of the treatments.

Comment 3.3.3c: Removal of Elodea may improve boating, float plane operations, or angling quality at Alexander Lake, which could increase recreational use. The long-term benefits of eradicating this invasive plant population would outweigh any short-term, and minor, recreational impacts associated with the actual herbicide treatment. Any loss of recreational

opportunities are expected to be short-term, minor, and directly associated with the actual herbicide treatment and immediately thereafter.

3.3.4 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. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?				X	See comment 3.3.4b
c. Potentially conflict substantively with 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		X		See comment 3.3.4e
f. Have any expected organized opposition or generate substantial public controversy?	X		X		See comments 3.3.4e,f

Comment 3.3.4b: There is always some potential that a crisis or emergency could result from this project due to unforeseen accidents in a remote location. The site, safety and storage plans developed will minimize the risk that a crisis or emergency occurs. The plans will also provide a structured and planned response should a crisis or emergency occur.

Comment 3.3.4e and 3.3.4f: In general, the use of herbicides can generate controversy. Outreach efforts by ADNR will help educate the public on the safe and effective use of fluridone and the benefits of eradicating Elodea from Alexander Lake. Several conversations with cabin owners and other stakeholders have helped this education effort, and will continue throughout the course of the project. It is unknown if this project will have any significant opposition.

The following permits and approvals are needed prior to the proposed treatment:
 Alaska Department of Environmental Conservation: Alaska Pollution Discharge Elimination System (APDES) Permit (Appendix 5.1) and Pesticide Use Permit
 ADNR Division of Mining Land and Water Land Use Permit

These permits will be added to the Appendix in this environmental assessment as they are approved.

4.0 Consultation and Coordination

Following the public meeting and notice for this environmental assessment, ADNR will incorporate public comments received and subsequent ADNR responses into this document. The revised document will then be submitted to USFWS to comply with the National Environmental Policy Act (NEPA) process to determine whether a Finding of No Significant Impact (FONSI) will be issued for the preferred action. Other major authorizations required to approve the preferred action include ADEC issuance of a Pesticide Use Permit, compliance with the Alaska Pollutant Discharge Elimination System (APDES), and approval by ADNR.

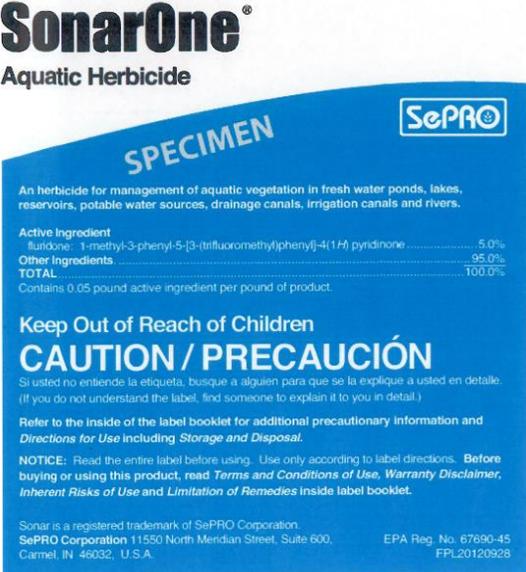
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4.1 Appendix EPA Pesticide Label



SonarOne[®]
Aquatic Herbicide

SePRO

SPECIMEN

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

Active Ingredient
fluridone: 1-methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridinone 5.0%
Other Ingredients 95.0%
TOTAL 100.0%
Contains 0.05 pound active ingredient per pound of product.

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.)
Refer to the inside of the label booklet for additional precautionary information and Directions for Use including 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.
Sonar is a registered trademark of SePRO Corporation.
SePRO Corporation 11550 North Meridian Street, Suite 600, Carmel, IN 46032, U.S.A. EPA Reg. No. 67690-45 FPL20120928

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION. Harmful if Swallowed. Causes moderate eye irritation. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Avoid contact with eyes or clothing. Wear protective eyewear.
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.)

FIRST AID	
If swallowed	<ul style="list-style-type: none"> 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 a poison control center or doctor. Do not give anything by mouth to an unconscious person.
If in eyes	<ul style="list-style-type: none"> Hold eye open and rinse slowly and gently with water for 15 to 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 on skin or clothing	<ul style="list-style-type: none"> Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 to 20 minutes. Call a poison control center or doctor for treatment advice.
If inhaled	<ul style="list-style-type: none"> 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 outside the intended treatment area 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 SonarOne herbicide may occasionally develop chlorosis. Follow use directions carefully so as to minimize adverse effects on non-target organisms.

DIRECTIONS FOR USE
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.

PRODUCT INFORMATION
SonarOne herbicide is a selective systemic aquatic herbicide for management of aquatic vegetation in fresh water ponds, lakes, reservoirs, drainage canals, irrigation canals, and rivers. SonarOne is a pelleted formulation containing 5% fluridone. SonarOne is absorbed from water by plant shoots and from hydrosol by the roots of aquatic vascular plants. It is important to maintain SonarOne in contact with the target plants for as long as possible. Rapid water movement or any condition which results in rapid dilution of SonarOne in treated water will reduce its effectiveness. In susceptible plants, SonarOne inhibits the formation of carotenes. In the absence of carotenes, chlorophyll is rapidly degraded by sunlight.
Herbicidal symptoms of SonarOne appear in 7 - 10 days and appear as white (chlorotic) or pink growing points. Under optimum conditions 30 - 90 days are required before the desired level of aquatic weed management is achieved with SonarOne. Species susceptibility to SonarOne may vary depending on time of year, stage of growth and water movement. For best results, apply SonarOne 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.
SonarOne is not corrosive to application equipment.
This label provides recommendations on the use of a chemical analysis for the active ingredient. SePRO Corporation recommends the use of High-Performance Liquid Chromatography (HPLC) for the determination of the active ingredient concentration in the water. Contact SePRO Corporation to incorporate this test, known as a FasTEST, into your treatment program. Other proven chemical analyses for the active ingredient may also be used. The 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 pounds of SonarOne to achieve a desired concentration of the active ingredient in part per billion (ppb). The maximum application rate or sum of all application rates is 90 ppb in ponds and 150 ppb in lakes and reservoirs per annual growth cycle. This maximum concentration is the amount of product calculated as the target application rate, NOT determined by testing the concentrations of the active ingredient in the treated water.

Use Precautions and Restrictions

- Obtain Required Permits:** Consult with appropriate state or local water authorities before applying this product to public waters. Permits and/or posting treatment notification may be required by state or local public agencies.
- New York State:** Application of SonarOne is not permitted in waters less than two (2) feet deep, except as permitted under FIFRA Section 24(c), Special Local Need registration.
- Hydroponic Farming:** Do not use SonarOne treated water for hydroponic farming unless a FasTEST has been run and confirmed that concentrations are less than 1 ppb.
- Greenhouse and Nursery Plants:** Consult with SePRO Corporation for site-specific recommendations prior to any use of SonarOne treated water for irrigating greenhouse or nursery plants. Without site-specific guidance from SePRO, do not use SonarOne treated water for irrigating greenhouse or nursery plants unless a FasTEST has been run and confirmed that concentrations are less than 1 ppb.

• **Water Use Restrictions Following Application with SonarOne (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 SonarOne within ¼ miles (1,320) feet of a functioning potable water intake.

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

- **Potable Water Intakes:** Concentrations of the active ingredient fluridone up to 150 ppb are allowed in potable water sources; however, in lakes and reservoirs or other sources of potable water, do not apply SonarOne at application rates greater than 20 ppb within one-fourth (1/4) mile (1,320 feet) of any functioning potable water intake. At application rates of 8-20 ppb, SonarOne may be applied within ¼ mile where functioning potable water intakes are present. **NOTE:** Existing potable water intakes which are no longer in use, such as those replaced by connections to potable water wells or a municipal water system, are not considered to be functioning potable water intakes.
- **Irrigation:** Irrigation with SonarOne treated water may result in injury to the irrigated vegetation. Follow these precautions and inform those who irrigate from areas treated with SonarOne of the irrigation time frames or water FasTEST requirements presented in the table below. Follow the following time frames and FasTEST directions to reduce the potential for injury to vegetation irrigated with water treated with SonarOne. Greater potential for crop injury occurs where SonarOne 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	FasTEST required
Canals	7	7	FasTEST required
Rivers	7	7	FasTEST required
Lakes and Reservoirs ^{††}	7	7	FasTEST required

[†] For purposes of SonarOne 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.

Where the use of SonarOne treated water is desired for irrigating crops prior to the time frames established above, use the FasTEST to measure the concentration in the treated water. Where a FasTEST has determined that 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 SonarOne treated water if 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 a SePRO Aquatic Specialist be consulted prior to commencing irrigation of these sites.

PLANT CONTROL INFORMATION

SonarOne 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 SonarOne. It is recommended to consult a SePRO Aquatic Specialist prior to application of SonarOne to determine a plant's susceptibility to SonarOne. **NOTE:** algae (chara, nitella, and filamentous species) are not controlled by SonarOne.

Vascular Aquatic Plants Controlled By SonarOne: [†]

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)

Floating Plants:

salvinia (*Salvinia* spp.)
 duckweed (*Lemna*[†], *Spirodela*[†], and *Landoltia* spp.)
 mosquito fern (*Azolla caroliniana*)[†]

Shoreline Grasses:

paragrass (*Urochloa mutica*)

[†] Species denoted by a dagger (†) are native plants that are often tolerant to fluridone at lower use rates. Please consult a SePRO Aquatic Specialist for recommended SonarOne use rates (not to exceed maximum labeled rates) when selective control of exotic species is desired.

Vascular Aquatic Plants Partially Controlled By SonarOne:

Submersed Plants:

Illinois pondweed (*Potamogeton illinoensis*)
 limnophilla (*Limnophila sessiliflora*)
 tapegrass, American eelgrass (*Vallisneria spiralis*)
 watermilfoil-variable-leaf (*Myriophyllum heterophyllum*)

Emerald Plants:

alligatorweed (*Alternanthera philoxeroides*)
 American lotus (*Nelumbo lutea*)
 cattail (*Typha* spp.)
 creeping waterprimrose (*Ludwigia peploides*)
 parrotfeather (*Myriophyllum aquaticum*)
 smartweed (*Polygonum* spp.)
 spatterdock (*Nuphar luteum*)
 spikerush (*Eleocharis* spp.)
 waterlily (*Nymphaea* spp.)
 waterpurslane (*Ludwigia palustris*)
 watershield (*Brasenia schreberi*)

Shoreline Grasses:

barnyardgrass (*Echinochloa crusgalli*)
 giant cutgrass (*Zizaniopsis millacea*)
 reed canarygrass (*Phalaris arundinacea*)
 southern watergrass (*Hydrochloa carolinensis*)
 torpedograss (*Panicum repens*)

Vascular Aquatic Plants Not Controlled By SonarOne:

Emerald Plants:

American frogbit (*Limnobium spongia*)
 arrowhead (*Sagittaria* spp.)
 bacopa (*Bacopa* spp.)
 big floatingheart, banana lily (*Nymphoides aquatica*)
 bulrush (*Scirpus* spp.)
 pickerelweed, lanceleaf (*Pontederia* spp.)
 rush (*Juncus* spp.)
 water pennywort (*Hydrocotyle* spp.)

Floating Plants:
floating waterhyacinth (*Eichhornia crassipes*)
waterlettuce (*Pistia stratiotes*)

Shoreline Grasses:
malden cane (*Panicum hemitomon*)

NOTE: Algae (chara, nitella, and filamentous species) are not controlled by SonarOne.

APPLICATION DIRECTIONS

The aquatic plants present in the treatment site should be identified prior to application to determine their susceptibility to SonarOne. 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.

Application to Ponds

SonarOne may be applied to the entire surface area of a pond. For single applications, rates may be selected to provide 30 - 90 ppb to the treated water, although actual concentrations in treated water may be substantially lower at any point in time due to the slow-release formulation of this product. When treating for optimum selective control, lower rates may be applied for sensitive target species. 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 in treated water 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 should total 30 - 90 ppb and must not exceed a total of 90 ppb per annual growth cycle.

Average Water Depth of Treatment Site (feet)	Pounds of SonarOne per Treated Surface Acre	
	45 ppb	90 ppb
1	2.5	5.0
2	5.0	10.0
3	7.5	15.0
4	10.0	20.0
5	12.5	25.0
6	15.0	30.0
7	17.0	34.0
8	19.5	39.0
9	22.0	44.0
10	24.5	49.0

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, SonarOne 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.

NOTE: In treating lakes or reservoirs that contain potable water intakes and where the application requires treating within one-fourth (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.

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 SonarOne at an application rate of 16 - 90 ppb. Application

rates necessary to obtain these concentrations in treated water 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. 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 a SePRO 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 or in the event of a heavy rainfall event where dilution 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.

Average Water Depth of Treatment Site (feet)	Pounds of SonarOne Per Treated Surface Acre	
	16 ppb	90 ppb
1	0.9	5.0
2	1.7	10.0
3	2.6	15.0
4	3.5	20.0
5	4.3	25.0
6	5.2	30.0
7	6.0	34.0
8	6.9	39.0
9	7.8	44.0
10	8.6	49.0
11	9.5	54.0
12	10.4	59.0
13	11.2	64.0
14	12.1	68.0
15	13.0	73.0
16	13.8	78.0
17	14.7	83.0
18	15.6	88.0
19	16.4	93.0
20	17.3	98.0

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 to maintain this lower dose for the sufficient time to ensure efficacy and enhance selectivity. Under these situations, use the lower rates (16 - 75 ppb) within the rate range. 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 a SePRO Aquatic Specialist in determining when to choose application rates lower in the rate range to meet specific plant management goals. For split or repeated applications, the sum of all applications must not exceed 150 ppb per annual growth cycle.

B. Partial Lake or Reservoir Treatments

Where dilution of SonarOne 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 SonarOne 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 SonarOne concentration in the treatment area. Use a rate at the higher end of the rate range where greater dilution with untreated water is anticipated.

Application Sites Greater Than ¼ Mile from a Functioning Potable Water Intake

For single applications, apply SonarOne at application rates from 45 - 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.

Application Sites 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 repeated applications of SonarOne 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 SonarOne to be applied to provide the desired ppb concentration of active ingredient equivalents in treated water may be calculated as follows:

$$\begin{aligned} & \text{Pounds of SonarOne required per treated acre} = \\ & \text{Avg. water depth of treatment site} \times \\ & \text{Desired ppb concentration of active ingredient equivalents} \times 0.054 \end{aligned}$$

For example: the pounds per acre of SonarOne required to provide a concentration of 25 ppb of active ingredient equivalents in water with an average depth of 5 feet is calculated as follows:

$$5 \times 25 \times 0.054 = 6.75 \text{ pounds per treated surface acre.}$$

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

Application to Drainage Canals, Irrigation Canals and Rivers

Static Canals

In static drainage and irrigation canals, apply SonarOne at the rate of 20 - 40 pounds per surface acre.

Moving Water Canals and Rivers

The performance of SonarOne will be enhanced by restricting or reducing water flow. In slow moving bodies of water use an application technique that maintains a concentration of 10 - 40 ppb in the applied area for a minimum of 45 days. SonarOne 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 or Rivers Containing a Functioning Potable Water Intake

In treating a static or moving water canal or river which contains a functioning potable water intake, applications of SonarOne 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 SonarOne are made within ¼ mile from a functioning water intake, a FasTEST must be utilized to demonstrate that concentrations do not exceed 150 ppb at the potable water intake.

Application Rate Calculation — Drainage Canals, Irrigation Canals and Rivers

The amount of SonarOne 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 (ft. per second) x average width (ft.) x average 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 0.054 = pounds SonarOne required per day.

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, contain material 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 ≤ 50 pounds) as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank, or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Triple rinse containers too large to shake (capacity >50 pounds) as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ 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.

Pressure rinse as follows: Empty the remaining contents into application equipment or mix tank. 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.

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*.

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.

INHERENT RISKS OF USE

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.

LIMITATION OF REMEDIES

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.

* Sonar is a registered trademark of SePRO Corporation
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11550 North Meridian Street, Suite 600
Carmel, IN 46032, U.S.A.

6.2 Material Safety Data Sheets for Pesticides

Conforms to HazCom 2012/United States

SAFETY DATA SHEET



SonarOne® Aquatic Herbicide

Section 1. Identification

GHS product identifier : SonarOne® Aquatic Herbicide

Other means of identification : Not available.

EPA Registration No. : 67690-45

Relevant identified uses of the substance or mixture

Aquatic herbicide.

Supplier's details : 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: 317-580-8290
Monday - Friday, 8am to 5pm E.S.T.
www.sepro.com

Emergency telephone number (with hours of operation) : INFOTRAC - 24-hour service 1-800-535-5053

The following recommendations for exposure controls and personal protection are intended for the manufacture, formulation and packaging of this product. For applications and/or use, consult the product label. The label directions supersede the text of this Safety Data Sheet for application and/or use.

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2B
AQUATIC HAZARD (LONG-TERM) - Category 3

GHS label elements

Signal word : Warning

Hazard statements : Causes eye irritation.
Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention : Avoid accidental release to the environment. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Response : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Not applicable.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : None known.

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**Section 3. Composition/information on ingredients**

Substance/mixture : Mixture
 Other means of identification : Not available.

CAS number/other identifiers

CAS number : Not applicable.

Ingredient name	%	CAS number
Proprietary ingredient 2	40 - 80	-
Proprietary ingredient 3	10 - 40	-
Proprietary ingredient 4	10 - 40	-
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4-pyridone	5	59756-60-4
Proprietary ingredient 1	1 - 5	-

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

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.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures**Description of necessary first aid measures**

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. If irritation persists, get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. 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.
- Skin contact** : Flush contaminated skin with plenty of water. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed**Potential acute health effects**

- Eye contact** : Causes eye irritation.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.





Section 4. First aid measures

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

- 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.
- Specific treatments** : No specific treatment.
- 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.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.
- Specific hazards arising from the chemical** : This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
halogenated compounds
metal oxide/oxides
- Special protective actions for fire-fighters** : No special measures are required.
- 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.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

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Section 6. Accidental release measures

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). May be harmful to the environment if accidentally released in large quantities.

Methods and materials for containment and cleaning up

Spill : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid dust generation. Do not dry sweep. Vacuum dust with equipment fitted with a HEPA filter and place in a closed, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid accidental release to the environment. 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.

Advice on general occupational hygiene : 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. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : 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.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

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.



Section 8. Exposure controls/personal protection

- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

- Physical state** : Solid. [Pellets.]
- Color** : Brown to gray.
- Odor** : Faint earthy/musty.
- Odor threshold** : Not available.
- pH** : 7.8 [Conc. (% w/w): 31%]
- Melting point** : Not available.
- Boiling point** : Not available.
- Flash point** : Not applicable.
- Burning time** : Not available.
- Burning rate** : Not available.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not available.
- Lower and upper explosive (flammable) limits** : Not available.
- Vapor pressure** : Not available.
- Vapor density** : Not available.
- Relative density** : 1.02 at 20°C
- Solubility** : Not available.
- Solubility in water** : Insoluble. Pellet disintegrates in water.
- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.

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**Section 9. Physical and chemical properties**

SADT : Not available.

Viscosity : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : Reactive or incompatible with the following materials: oxidizing materials.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information**Information on toxicological effects****Acute toxicity**

Product/ingredient name	Result	Species	Dose	Exposure
SonarOne® Aquatic Herbicide	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
SonarOne® Aquatic Herbicide	Eyes - Mild irritant	Rabbit	-	-	-
	Skin - Mild irritant	Rabbit	-	-	-

Sensitization

Product/ingredient name	Route of exposure	Species	Result
SonarOne® Aquatic Herbicide	skin	Guinea pig	Not sensitizing

Mutagenicity

There is no data available.

Carcinogenicity

There is no data available.

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

There is no data available.

Specific target organ toxicity (repeated exposure)

There is no data available.

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Section 11. Toxicological information

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact : Causes eye irritation.
Inhalation : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness
Inhalation : No known significant effects or critical hazards.
Skin contact : No known significant effects or critical hazards.
Ingestion : No known significant effects or critical hazards.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.
Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.
Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : No known significant effects or critical hazards.
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.

Numerical measures of toxicity

Acute toxicity estimates

There is no data available.



**Section 12. Ecological information****Toxicity**

Product/ingredient name	Result	Species	Exposure
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4-pyridone	Acute EC50 3 mg/L Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 8 mg/L Fresh water	Crustaceans - Eucyclops sp.	48 hours
	Acute LC50 1.8 mg/L Fresh water	Fish - Sander vitreus	96 hours
	Chronic NOEC 0.2 mg/L Fresh water	Daphnia - Daphnia magna	21 days
	Chronic NOEC 0.43 mg/L	Fish - Oncorhynchus tshawytscha	75 days

Persistence and degradability

There is no data available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4-pyridone	3.18	-	low

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-

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Section 14. Transport information

Environmental hazards	No.	No.	No.
Additional information	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined
United States inventory (TSCA 8b): All components are listed or exempted.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Fluridone	5	No.	No.	No.	Yes.	No.

SARA 313

No products were found.

State regulations

Massachusetts : None of the components are listed.

**Section 15. Regulatory information**

- New York** : None of the components are listed.
New Jersey : The following components are listed: Proprietary ingredient 2
Pennsylvania : The following components are listed: Proprietary ingredient 2

California Prop. 65

No products were found.

International regulations

- International lists** : **Australia inventory (AICS)**: Not determined.
China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): Not determined.
Taiwan inventory (CSNN): All components are listed or exempted.

Chemical Weapons : Not listed**Convention List Schedule I Chemicals****Chemical Weapons** : Not listed**Convention List Schedule II Chemicals****Chemical Weapons** : Not listed**Convention List Schedule III Chemicals****Section 16. Other information****Hazardous Material Information System (U.S.A.)****Health** : 1 * **Flammability** : 0 **Physical hazards** : 0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

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

National Fire Protection Association (U.S.A.)**Health** : 1 **Flammability** : 0 **Instability** : 0

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

- Date of issue mm/dd/yyyy** : 09/15/2015
Date of previous issue : 04/15/2013
Version : 4
Revised Section(s) : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16.
Prepared by : KMK Regulatory Services Inc.

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Date of issue : 09/15/2015

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Section 16. Other information

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

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.



Appendix 6.3: APDES Permit

Please note: Maps are not current to new 2016 survey results.

	<p>THE STATE of ALASKA GOVERNOR BILL WALKER</p>	<p>Department of Environmental Conservation</p>
		<p>DIVISION OF WATER Wastewater Discharge Authorization Program</p>
		<p>555 Cordova Street Anchorage, Alaska 99501-2617 Main: 907.269.6285 Fax: 907.334.2415 www.dec.alaska.gov/water/wwdp</p>
<p>February 26, 2016</p>		
<p>State of Alaska, Dept. of Natural Resources Attention: Heather Stewart 5310 S. Bodenburg Spur Palmer, Alaska 99645</p>		
<p>Re: AKG870017: Alexander Lake, DNR, Elodea-Fluidone</p>		
<p>Dear Ms. Stewart:</p>		
<p>This letter acknowledges that you have submitted a Notice of Intent (NOI) form to be covered under the APDES Pesticide General Permit (PGP). As the permittee, you are authorized to discharge to waters of the U.S. under the terms and conditions of this permit ten (10) calendar days after acknowledgment of receipt of the permittee's completed NOI is posted on ADEC's Storm Water Permit Search website (http://dec.alaska.gov/Applications/Water/WaterPermitSearch/Search.aspx).</p>		
<p>As stated above, this letter acknowledges receipt of a NOI. 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 NOI 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.</p>		
<p>As you know, the PGP requires you to have developed and begun implementing a Pesticide Discharge Management Plan (PDMP) and establishes additional monitoring, corrective action, record keeping, and annual reporting requirements. You must also comply with any additional location-specific requirements applicable to Alaska.</p>		
<p>For tracking purposes, the following number has been assigned to your Notice of Intent Form: AKG870017.</p>		
<p>If you have any questions regarding the above, please contact me at 907-334-2288 or via email at James.Rypkema@alaska.gov.</p>		
<p>Sincerely,</p>		
<p> James Rypkema Section Manager, Storm Water and Wetlands</p>		
<p>Enclosure: NOI</p>		
<p>cc: w/enclosure (email) Karin Hendrickson, Pesticide Program Coordinator, DEC-EH/Pesticides</p>		
<p>AKG870017 Auth.docx</p>		



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.

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

AKG870017

b. NOI Change of Information: _____ (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: H e a t h e r S t e w a r t

2. IRS Employer Identification Number (EIN): 9 2 - 6 0 0 1 1 8 5

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: A K

6. Mailing Address:

a. Street: 5 3 1 0 S . B o d e n b u r g S p u r

b. City: P a l m e r c. State: A K d. ZIP Code: 9 9 6 4 5 -

e. Telephone: 9 0 7 - 7 4 5 - 8 7 2 1 Ext _____ f. Fax: _____ - _____ - _____

g. Contact Name: H e a t h e r S t e w a r t

h. E-mail: h e a t h e r . s t e w a r t @ a l a s k a . g o v

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: Alexander Lake, Matanuska-Susitna Borough

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

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):

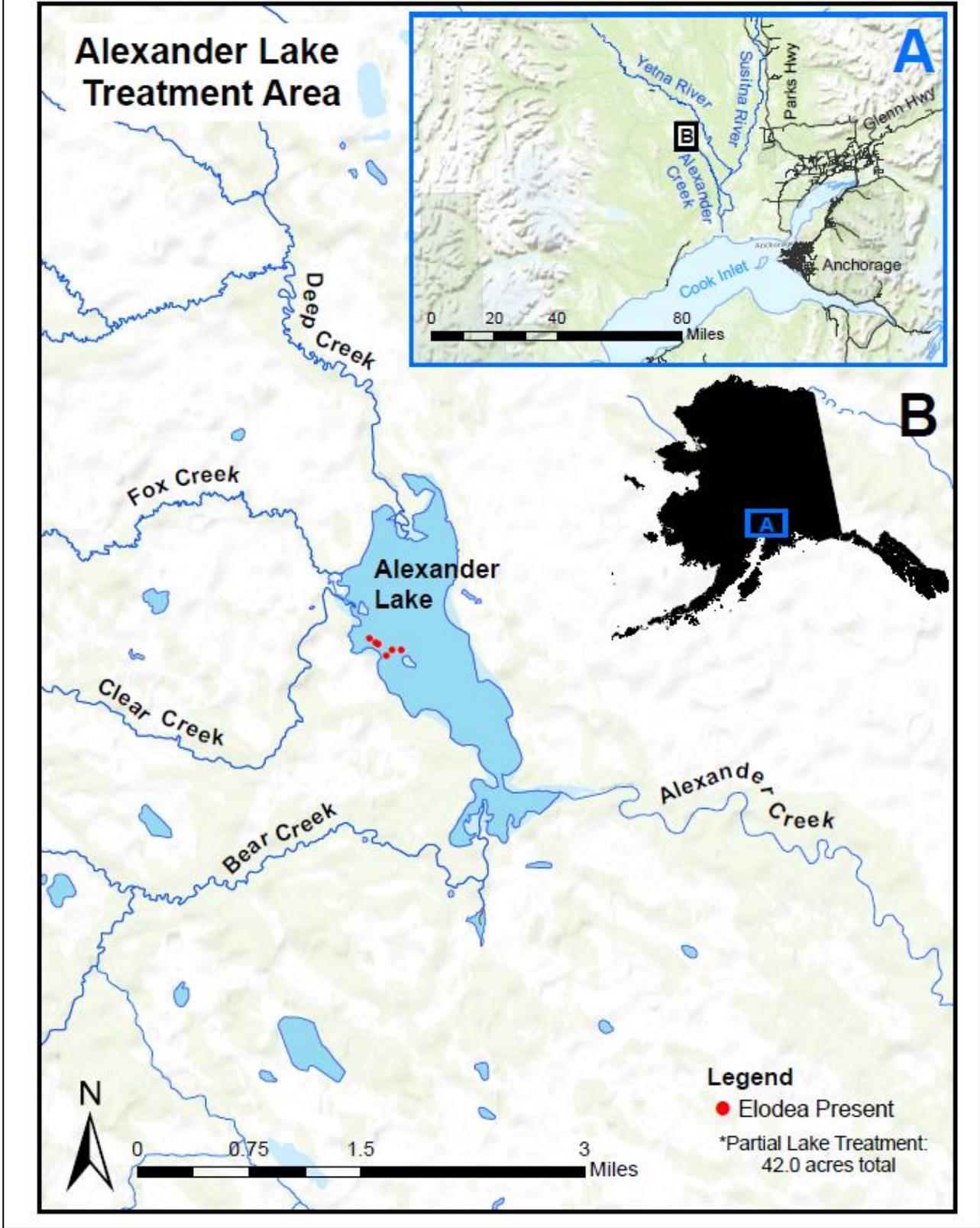
- a. Pesticide application activities will not result in a point source discharge to one or more Waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern, as defined in Appendix A, of the PGP.
- b. Pesticide application activities for which permit coverage 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 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 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.

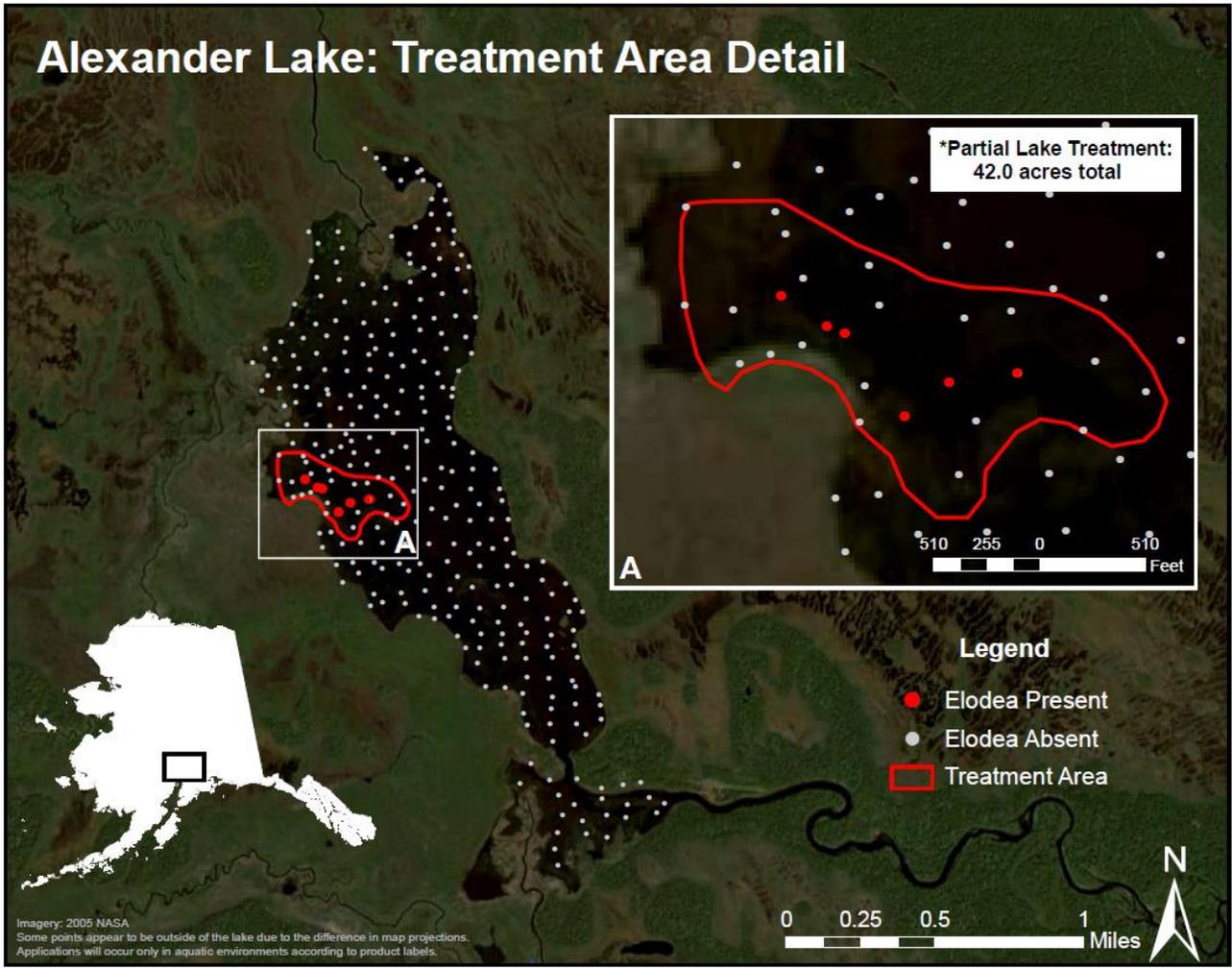
- a. Describe the location of the pest management area in detail or provide a map of the location:

- 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):



Alexander Lake: Treatment Area Detail



Appendix 6.4: DEC Pesticide Use Permit



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Environmental Conservation

DIVISION OF ENVIRONMENTAL HEALTH
Pesticide Control Program

1700 E. Bogard Road Bldg. B, Ste. 103
Wasilla, Alaska 99654
Main: 907.376.1856
Toll free: 800.478.2577
Fax: 907.376.2382

April 15, 2016

Heather Stewart
Natural Resource Specialist III
Alaska Plant Materials Center
5310 S Bodenburg Spur
Palmer, AK 99645

Subject: Permit to Apply Pesticides #16-AQU-04

Dear Ms. Stewart:

The Department of Environmental Conservation (DEC) has completed its evaluation of your request for a permit for the application of the pesticide **SonarOnc**, EPA Registration Number **67690-45** with active ingredient **flouridone** to waters of the state to control invasive **elodea** in **Alexander Lake**, **Matanuska Susitna Area**, 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).

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.

Sincerely,

A handwritten signature in blue ink, appearing to read "Lori Aldrich".

Lori Aldrich
Acting 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.: 16-AQU-04
Date Issued: April 15, 2016
Date Effective: May 25, 2016
Date Expires: December 31, 2020

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:

Heather Stewart
Natural Resource Specialist III
Alaska Plant Materials Center
5310 S Bodenburg Spur
Palmer, AK 99645

for the purpose of applying the pesticide **SonarOne**, EPA Registration Number **67690-45** with active ingredient **Fluridone** to waters of the state to control nuisance aquatic vegetation in Alexander Lake Matanuska Susitna Area, Alaska.

The permit holder shall manage and apply the pesticide in accordance with 18 AAC 90 and the permit application materials submitted March 4, 2016. 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. Monitor downstream areas of the outflow of Alexander Lake for impacts to vegetation. Visual monitoring shall be conducted every other day for a period of one week after each treatment. Notify the DEC Pesticide Program immediately of any detected impacts.
6. 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
7. 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.
8. Immediately report any spill or accident, alleged accident, or complaint to the DEC Pesticide Program at 1-800-478-2577.
9. Ensure that decontamination, safety, and spill cleanup supplies are available at the treatment site at all times during application.
10. 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).
11. 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, 2020**, or upon completion of the above described project, whichever comes first, and may be revoked in accordance with 18 AAC 90.540.



Lori Aldrich
Acting Solid Waste & Pesticides Program Manager

Appendix 6.5: DNR Land Use Permit



THE STATE
of ALASKA
GOVERNOR BILL WALKER

Department of Natural Resources

DIVISION OF MINING, LAND & WATER
Southcentral Regional Office

550 West 7th Avenue, Suite 900C
Anchorage, Alaska 99501-3577
Main: 907.269.8503
TDD: 907.269.8411
Fax: 907.269.8913

May 24, 2016

Alaska Department of Natural Resources
Division of Agriculture
Attn: Heather Stewart
5310 S. Bodenburg Spur
Palmer, AK 99645

RE: Alexander Lake Invasive Aquatic Plant Control
Expires: October 31, 2018

LETTER OF ENTRY

Dear Ms. Stewart:

The Department of Natural Resources, Division of Mining, Land and Water hereby grants the Alaska Department of Natural Resources, Division of Agriculture (ADNR/DOA) a "Letter of Entry" authorization to enter upon state lands for the express purpose of applying legal amounts of herbicide authorized by the Department of Environmental Conservation in Alexander Lake for the purpose of controlling invasive aquatic Elodea. Parking, equipment storage, staging work, and the launching/use of vessels to support the project are authorized within the following sections: Section 3, 4, 9, 10, 15, 16, & 22, Township 19 North, Range 09 West, of the Seward Meridian.

The Southcentral Region Land Office Division of Mining, Land and Water is hereby providing this letter allowing for entry for the purpose of conducting and completing the above described project. This Letter of Entry is subject to the following terms and conditions:

- The terms of this Letter of Entry will remain in effect from May 24, 2016 through October 31, 2018.
- This Letter of Entry does not convey any interest in state land and as such is revocable immediately, with or without cause. The ADNR/DOA, its contractors and sub-contractors are authorized to make exclusive use of the projects site, but are not authorized to preclude or restrict public access on and through the project area.

- All operations must be conducted in a manner that will assure minimum conflict with other users of the area. This Letter of Entry is subject to the principles of the public trust doctrine specifically the right of the public to use navigable waterways and the land beneath them for navigation, commerce, fishing, hunting, protection of areas for ecological study, and other purposes, must be protected.
- All activities at the site shall be conducted in a manner that will minimize the disturbance to the natural character of the Lake beds.
- All waste generated by the ADNR/DOA, its contractors and sub-contractors under this Letter of Entry will be removed or otherwise disposed of as required by state and federal law. Waste in this paragraph means all discarded matter, including but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes and discarded equipment.
- Abandonment of equipment is prohibited on state lands.
- Refueling of equipment and the storage of petroleum products on state owned submerged lands is prohibited.
- Sorbent material in sufficient quantity to handle operational spills must be on hand at all times for use in the event of a fuel spill. The ADNR/DOA, its contractors and sub-contractors shall give immediate notice of any fuel spill or other pollutants to the ADEC.
- The ADNR/DOA, its contractors and sub-contractors are responsible for cleaning up any oil spills or other pollutants, which result from any activities associated with this Letter of Entry. Should any unlawful discharge, leakage, spillage, emission or pollution of any type due to project activities, the ADNR/DOA, at its own expense, shall be obligated to clean the area to the reasonable satisfaction of the State of Alaska. Any fuel, oil, or other pollutant discharge or spill shall be reported immediately to Jeffrey Green, Division of Mining, Land and Water, Southcentral Region Land Office at (907) 269-8568.

The ADNR/DOA, its contractors and sub-contractors shall immediately notify ADEC by telephone, and immediately afterwards send ADEC a written notice by facsimile, hand delivery, or first class mail, informing ADEC of: any unauthorized discharges of oil to water, any discharge of hazardous substances other than oil; and any discharge or cumulative discharge of oil greater than 55 gallons solely to land and outside an impermeable containment area. If a discharge, including a cumulative discharge, of oil is greater than 10 gallons but less than 55 gallons, or a discharge of oil greater than 55 gallons is made to an impermeable secondary containment area, ADNR/DOA shall report the discharge within 48 hours, and immediately afterwards send ADEC a written notice by facsimile, hand delivery, or first class mail. Any discharge of oil, including a cumulative discharge, solely to land greater than one gallon up to 10 gallons must be reported in writing on a monthly basis. The posting of information requirements of 18 AAC75.305 shall be met. Scope and Duration of Initial Response Actions (18 AAC 75.310) and reporting requirements of 18 AAC 75, Article 3 also apply.

The ADNR/DOA, its contractors and sub-contractors shall supply ADEC with all follow-up incident reports. Notification of a discharge must be made to the nearest ADEC Area Response Team during working hours: Anchorage (907) 269-7500, fax (907) 269-7648; Fairbanks (907) 451-2121, fax (907) 451-2362; Juneau (907) 465-5340, fax (907) 465-2237. The ADEC oil spill report number outside normal business hours is (800) 478-9300.

- The Regional Manager reserves the right to grant other interests to the subject areas consistent with the public trust doctrine. The State of Alaska makes no representations or warranties whatsoever, either expressed or implied, as to the existence, number, or nature of such valid existing rights.
- The ADNR/DOA may not assign or transfer, in part or whole, this Letter of Entry to another party.
- The ADNR/DOA must obtain advance written approval from the Regional Manager prior to making any changes or improvements to the project sites or their operations as authorized by this Letter of Entry.
- This Letter of Entry does not relieve the ADNR/DOA from securing other necessary state, federal and local permits. This Letter of Entry does not provide authorization for travel on private property.
- The ADNR/DOA, its contractors and sub-contractors shall observe all federal, state and local laws and regulations applicable to the authorized areas, including regulations for the protection of fish and wildlife, and shall keep all premises in a neat, orderly, and sanitary condition.
- The ADNR/DOA its contractors and sub-contractors shall enter and commence activities on State lands at its own risk. The ADNR/DOA shall inform and ensure compliance with these stipulations by its agents, employees, and contractors (including subcontractors at any level). The ADNR/DOA must indemnify the State of Alaska against and hold it harmless from any and all claims, demands, suits, loss, liability, and expense for injury to or death of persons and damage to or loss of property arising out of or connected with the exercise of the privileges covered by the letter of entry.
- The Regional Manager shall have the authority to suspend all activities on State lands associated with this Letter of Entry. Such a suspension notice shall remain in force until corrective action is taken. If corrective action is not taken within seventy-two hours after receipt of written notice, this Letter of Entry will be terminated. The Regional Manager shall have the right, but not the obligation, to undertake corrective action at the expense of the ADNR/DOA when such action is necessitated by neglect on the part of the ADNR/DOA to perform corrective action within a seventy-two hour period following receipt of written notice to take corrective action.
- Alaska Historic Preservation Act: If cultural or paleontological resources are discovered as a result of this activity, work that would disturb such resources must be stopped and the State Historic Preservation Office be contacted immediately at (907) 269-8720.
- This Letter of Entry is issued for a specific use. Use of the project areas for purposes other than those specified constitutes a breach of this authorization and may result in revocation. This Letter of Entry is revocable immediately upon violation of any of the stipulations listed above or upon failure to comply with any applicable laws, statutes and regulations (state and federal).

As a reminder, should the ADNR/DOA consider this project to be successful and plan continuation of this project after the expiration date of October 31, 2018 per this Letter of Entry, the ADNR/DOA or their sponsor will be required to obtain the appropriate DNR/DMLW authorization.

Any questions regarding any aspect of this Letter of Entry shall be directed to Jeff Green, Department of Natural Resources, Southcentral Region Land Office, Division of Mining, Land and Water, 550 W. 7th Ave., Suite 900C, Anchorage, AK 99501, or telephone (907) 269-8568.

Sincerely,



Clifford Larson
Natural Resource Manager

CC/jg

Appendix 6.6: Scoping Summary

The Alexander Lake Elodea Eradication EA public commenting period was open from May 27th until June 25th, 2016, and again from September 9, 2016 to September 23rd, 2016. It was publically posted on the State of Alaska’s DNR Public Notice webpage and the Division of Agriculture website, in the Community for Noxious and Invasive Plant Management (CNIPM) listserve, on social media under the CNIPM Facebook page, and in community outreach listserves including the Alaska Conservation Foundation’s weekly “What’s Up?” Community Capacity publication.

Only one public comment was submitted in response to this EA during the first public commenting period. The comment submitted addressed the need for a water withdrawal permit with the Alaska Department of Fish and Game if suction harvesting were to be completed. Because this EA is for the application of a pelleted fluridone formulation, no water will be used during the proposed application.