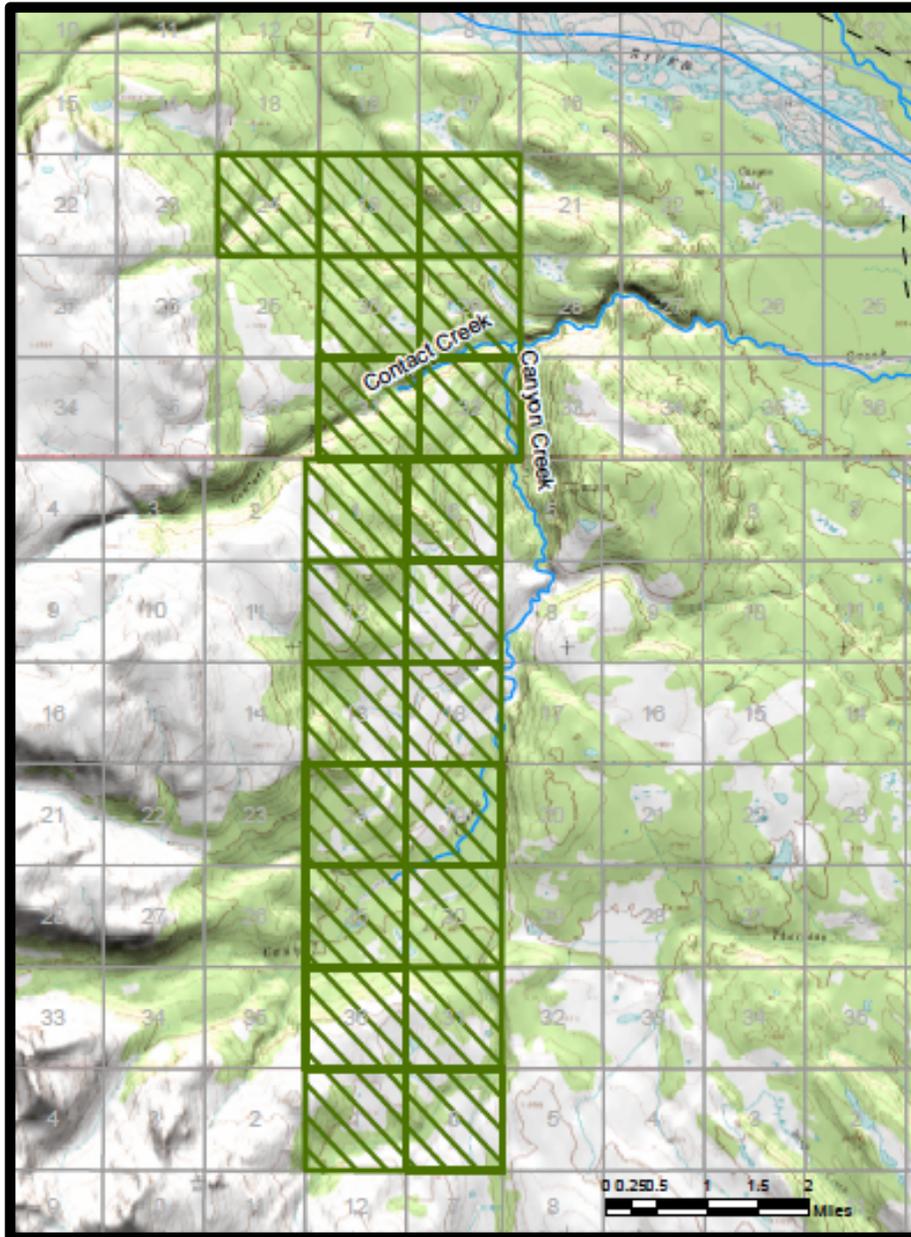


# Coal Exploration Application

Flatlands Energy Corporation  
11401 Olive Lane  
Anchorage, AK 99515



May 9, 2018

**Flatlands Energy Corporation  
Coal Exploration Application**

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## Section I. Summary of the Application

Flatlands Energy Corporation is applying to conduct coal exploration activities on coal lease ADL 553937 in the Susitna Coal Basin west of Skwentna. The primary coal exploration activities would be helicopter-supported drilling of up to 20 exploration holes on the lease area during 2018 and 2019. Six to 12 holes are anticipated to be drilled prior to mid-October 2018. Other exploration activities may include geologic mapping and taking water samples from the wells and from surface water locations in the area. There would be limited disturbance associated with any activity. No roads will be constructed, and no camp will be maintained in the area; crews will be flown in from off-site, generally in two shifts per day. Each exploration hole will be reclaimed before the drill and all equipment leave that site, except that, up to three holes will remain for water quality monitoring. Those holes will be removed when they are no longer needed.

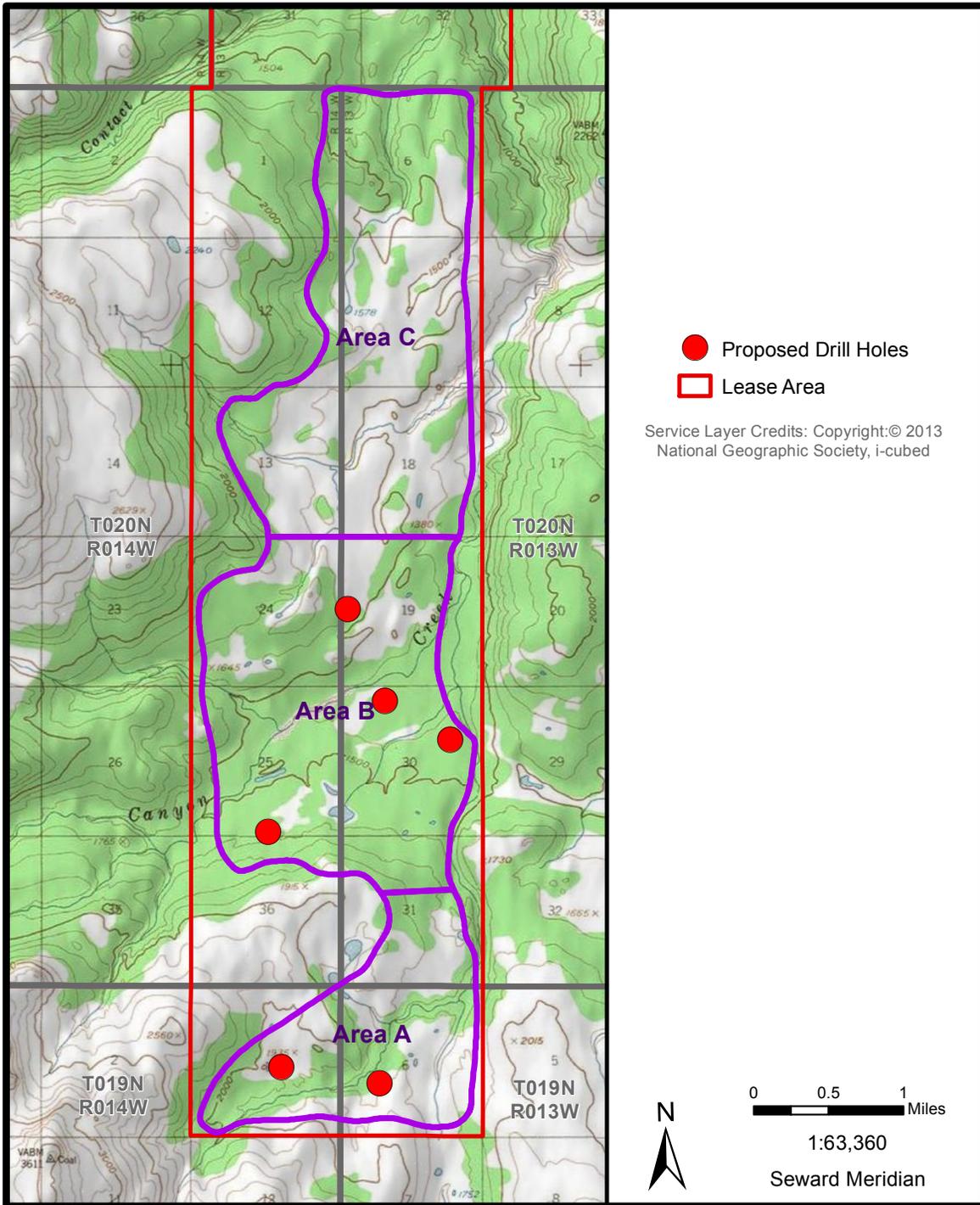
Exploration will begin soon after the exploration permit is issued. In 2018, it will end approximately 6 weeks later. The company expects that the permit will be issued in time for 6-12 holes to be drilled during 2018. In any case, work will stop, any disturbance will be reclaimed, and all equipment removed from the site by mid-October. Winter operations are not anticipated. The project may resume in 2019 after break-up to finish the remaining holes. All drilling will be finished by mid-October that year as well. This permit is applying for up to 20 holes to be drilled over two years.

**History.** The Mining & Minerals Division of Mobil Oil Corporation (Mobil) began exploring for coal in the Susitna Coal Basin in the 1970's and ceased operations in the early 1980's. Exploration work stopped, and Mobil let the coal leases lapse. Additional regional exploration was completed during the 1980s by other parties. Several geologic reports since 1966 provide data on coal quality and petrography, recently updated as part of the "Reconnaissance Coal Study in the Susitna Basin" (Alaska Division of Geological & Geophysical Surveys, 2014).

**Drilling.** Exploration holes will be located to achieve two objectives. The first objective is to locate holes to confirm some of Mobil's drilling conclusions using modern technology and standards. Up to six holes are planned for that purposes. These locations are the red locations noted as "Proposed Drill Holes" in Figure 1. These will be near selected Mobil historic holes and will focus on the same drilling targets (coal seams).

Up to an additional 14 holes will be located based, in part on the results of the six initial holes, information from outcrops or other information gathered in the field, and on interpretations of the resulting data. The purpose will be to extend the Mobil information with respect to the south end of the lease area, confirm continuity, depth, and coal grade, and similar purposes. Because these holes will be located based on field information, they are not shown in Figure 1. They will not be located within 100 feet of a catalogued anadromous fish stream, nor within 100 feet of a waterbody large enough to be visible on the 1:63,360 USGS map (Tyonek D-5 quadrangle). In no case will the project allow discharge of drilling muds or drill cuttings to reach surface water. While these holes are not precisely located, the general areas are as follows, using the areas depicted in Figure 1: up to 2 in Area A; 6 in Area B; and 6 in Area C. For more information, please see discussion for 11 AAC 90.163(a)(2)(c), Page III-3

Figure 1. Coal Exploration Area



**Off-site Accommodations, Labor Force, and non-drilling work.** Crews will be housed off-site. A helicopter will be used to move the drill, and to transport crews to and from the site. Work will occur 24 hours/day using two, 12-hour shifts. The total workforce will include those below, though many will be absent from the site at any one time:

- 5 drillers, including the supervisor;
- 3 geologists, including the site supervisor;
- 2-3 pad builders;
- 1-2 data loggers
- helicopter pilot & mechanic; and
- occasional visitors such as the project manager, water quality samplers, or environmental specialist.

In general, two drillers and one geologist will be present at the site at all times. Surveyors will be on site 3-4 times during the project, two or three pad builders will be on site at to erect the drill pad, and 1-2 data loggers will spend approximately a half day at each hole. Others may come and go depending on the work.

Geologists will observe the drillers and the drill core, and be transported by helicopter to outcrops or other features for geologic sampling and mapping. The project may include water quality sampling, in which case scientists may come to the site to sample groundwater from the well or surface water locations. Surveyors will periodically be on site to locate drill hole locations or other features. Geophysical loggers will mostly work off-site but will periodically visit the site as holes are completed. It is likely that visitors may be periodically be on site.

**Water Use.** The project is requesting to use up to 15 gpm to supply the drill, but at a maximum daily use of no more than 5,000 gpd. A water source will typically supply a single drill hole. Each source will be used for a few days, and in all cases a single source will be used for less than 10 days. This volume of water use is less than a significant amount of water as outlined in 11 AAC 93.035 and therefore does not require DNR to issue a water right or temporary water use authorization.

The project is separately applying for a Fish Passage Permit from the Department of Fish and Game for the potential water sources not listed in the department's anadromous waters catalogue, and for a Fish Habitat Permit for the anadromous portion of Canyon Creek. For more information, please see the discussion for 11 AAC 167(n) on Page III-12

**Reclamation.** Except for minor excavation with hand tools to level the drill platform or to construct a trench for drill cuttings, no significant ground disturbance is expected under the exploration program. Any disturbance will be filled in/regraded by hand. In each case, segregated topsoil will be replaced on the top of the disturbance. Reclamation for each hole will be completed before the drill and crew leave that particular site and begin drilling a new hole, except that up to three holes may remain for gathering water quality information. Once activities at each site is complete, including reclamation, the project will not install any markers. The expectation is that the holes will be indistinguishable from undisturbed areas by the next season. In the case of water quality monitoring wells, the casing will be elevated approximately two feet above the ground surface, and a locking cover will be installed on the casing, and a flag will extend at least six feet above the ground surface, most likely a wooden lathe with surveyor's

tape. The monitoring wells will be removed when no longer needed. The project will maintain a bond with DNR adequate to remove the wells. The bond will remain until the wells are removed.

Per DNR policy, the drill holes will be completely filled using a 50% bentonite and 50% cuttings. The near-surface casing will be removed. Once the monitoring wells are removed, they will be reclaimed to the same standard.

**ALASKA DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF MINING LAND & WATER  
COAL EXPLORATION**

<input checked="" type="checkbox"/> New Permit <input type="checkbox"/> Renewal
--

**Notice of Intent to Explore  
and  
Exploration Application**

The Alaska Surface Coal Mining Control and Reclamation Act requires that any person who intends to conduct coal exploration which **will not** substantially disturb the natural land surface complete and file with the Department of Natural Resources a notice of intent to explore. **The completion of Parts A (including submission of the required permit fee), B, and D of this form will meet these requirements.** This form must be received at least thirty (30) days prior to commencement of the exploration.

The Act requires that any person who intends to conduct coal exploration which **will** substantially disturb the natural land surface must file a complete application for exploration. **The completion of Parts A (including submission of the required permit fee), B, C, and D of this form will meet the applicant's submission requirements.** The application should be submitted approximately three months prior to the anticipated commencement of exploration.

**Substantial disturbance means an impact on land, water, or air resources by activities such as blasting; mechanical excavation (excluding the use of light, portable field equipment); drilling or enlarging coal or water exploratory holes or wells; and construction of roads, structures, trails, aircraft landing and marine docking areas.**

Please submit one hard copy and one electronic copy of all application materials as specified by the department.

Reference: Alaska Statute 27.21.200; 11 AAC 90.161 to 11 AAC 90.167.

**PART A: GENERAL INFORMATION                      Ref: 11 AAC90.161; 11 AAC 90.163**

- 1.1 Name of Applicant: Flatlands Energy Corporation  
     Contact: Robert Power, President and CEO
- 1.2 Address of Applicant: 11401 Olive Lane  
                                   Anchorage, Alaska 99515
- 1.3 Telephone Number: 403-850-5373
- 1.4 If applicable, provide the following information for the representative who will be present and responsible for the exploration activities.
- 1.5 Name of Representative: Bob Loeffler; Jade North, LLC
- 1.6 Address of Representative: 2543 Brooke Drive; Anchorage, AK 99517
- 1.7 Telephone Number: 907-250-4621
- 1.8 Email Address: bobl@jadenorth.com

**2.0 Location of the Exploration**

- 2.1 Legal Description (attach additional pages as needed): See Attachment A

Township	Range	Section	Aliquot Part	Meridian	Acres

- 2.2 Number of Acres in Exploration Area: 'Approximately 8,960 acres
- 2.3 Number of Acres of Federal Land (if applicable): N/A
- 2.4 USGS 1:250,000 or 1:63,360 Quadrangle Names: Tyonek D-5
- 2.5 Distance and Direction to Nearest Community (in miles): Closest point of exploration area is 18 miles WSW from Skwentna airport
- 2.6 Attach map of exploration site and adjacent area. See Attachment C

**3.0 Period of Exploration**

- 3.1 Begin (Month/Year): See text at §161(a)(2) & §163(a)(2)(D)
- 3.2 End (Month/Year): See text at §161(a)(2) & §163(a)(2)(D)

**4.0 Ownership of Surface/Subsurface Mineral Estate**

If the surface or the mineral estate is owned or leased by someone other than the applicant, answer 4.1 - 4.5, as appropriate (**attach additional pages as needed**).

- 4.1 Surface Owner
  - Name: State of Alaska (General domain state land)
  - Address: \_\_\_\_\_
  - Telephone Number: \_\_\_\_\_

- 4.2 Mineral Estate Owner
  - Name: State of Alaska (General domain state land)
  - Address: \_\_\_\_\_
  - Telephone Number: \_\_\_\_\_

- 4.3 Surface Land Leaseholder
  - Lease #: None
  - Name: \_\_\_\_\_
  - Address: \_\_\_\_\_
  - Telephone Number: \_\_\_\_\_

- 4.4 Mineral Estate Leaseholder
  - Lease #: Flatlands Energy Corporation
  - Name: \_\_\_\_\_
  - Address: \_\_\_\_\_
  - Telephone Number: \_\_\_\_\_

- 4.5 Adjacent Surface & Mineral Estate Leaseholders
  - Lease #: None
  - Name: \_\_\_\_\_
  - Address: \_\_\_\_\_
  - Telephone Number: \_\_\_\_\_

See §161(a)(5)

4.6 Right to Enter: Provide a statement describing the basis by which the applicant claims the right to enter the land for the purposes of conducting exploration and reclamation, Reference relevant federal, state, and local government prospecting permits or lease documents. Attach copies of supporting documents, as appropriate.

**5.0 Fees**

**Ref: 11 AAC 90.011**

5.1 Permit Fee \$ 500 Attach receipt. (Refer to fee schedule below)

Exploration - notice of intent \$100

Exploration - substantial disturbance \$500 + cost of all public notices

We understand we will be billed for the cost of public notices

**PART B: NOTICE OF INTENT TO EXPLORE**

**6.0 Intention to Explore**

6.1 Describe intended exploration activities, including major pieces of equipment and their use. See Text

6.2 Will exploration activities substantially disturb the natural surface of the land?

YES  NO

If yes, proceed to Part C; if no, answer 6.3 and proceed to Part D. (See definition on page 1 of this form.)

6.3 Describe practices to be used to protect the environment from adverse impacts resulting from exploration activities. See Text

**PART C: EXPLORATION PERMIT APPLICATION**

**Ref: 11 AAC 90.163;  
11 AAC 90.167**

**7.0 Exploration Area Description**

Note: all technical data in this application must be accompanied by:

- 1) names of persons and organizations who gathered and analyzed data;
- 2) dates of data collections and analysis;
- 3) description of procedures used; and
- 4) names, addresses and positions of officials of each agency consulted.

Attachment B

7.1 Indicate type(s) of surface disturbance: blasting, mechanical excavation, Drilling, altering coal or water exploration holes and wells, road or trail construction or modification, aircraft landing construction/modification, marine docking facility construction/modification, construction of structures, placement of excavated material or debris on surface, other, specify \_\_\_\_\_

Summary of application

7.2 Provide a map of at least a scale of 1:63,360 enlarged 2.5 times (~1:25000), showing the following existing surface features:

Attachment C

- a. existing roads and trails;
- b. occupied dwellings and other structures;
- c. pipelines, airfields and marine docking facilities;

- d. bodies of water; .
- e. historic, archeological and cultural features;
- f. topographic and drainage features; and
- g. habitats of endangered or threatened species.

§163(a)(2)(A) 7.3 Using existing information, briefly describe, with cross references to the map in 7.2, the surface topography, geology, surface waters, predominant land use, and other physical features.

§163(a)(2)(A) 7.4 Using existing information, briefly describe, with cross references to the map in 7.2, vegetation cover and important habitats of fish, wildlife and plants.

§163(a)(2)(A) 7.5 Does the exploration area include critical habitat of threatened or endangered species; or species such as eagles, migratory birds or other animals protected by state or federal law; or habitats of unusually high value for fish and wildlife?  
 YES  NO

If yes, describe impact, control measures, management techniques and monitoring methods to be utilized to protect these species and habitats.

§163(a)(2)(B) 7.6 Does the exploration area include known archeological resources; or districts, sites, structures or objects listed on the National Register of Historic Places?  
 YES  NO

If yes, identify and describe, and describe protection measures to be implemented.

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**8.0 Exploration and Reclamation Methods**

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Attachment C 8.1 Provide a map of at least a scale of 1:63,360 enlarged 2.5 times, showing the following exploration and reclamation features (if appropriate, this may be combined with the map required under 7.2):

- a. the area to be disturbed by exploration and reclamation; .
- b. access routes, including new roads, trails or other transportation facilities to be constructed, and existing facilities to be used or modified;
- c. proposed excavations and trenches;
- d. water or coal exploratory holes to be drilled or altered;
- e. earth or debris disposal areas; f. sediment control measures, such as sediment ponds and structures for diverting overland flow, if required; and
- g. other exploration or reclamation features.

Most not applicable See description under §167 8.2 Provide a description of exploration and reclamation methods and a discussion of how the exploration will comply with the performance standards in 11 AAC 90.167. Cross-referencing the map in 8.1, describe, at a minimum, the following:

- a. types and uses of equipment;
- b. design, construction, maintenance and removal of any proposed new roads, trails or other transportation facilities;
- c. alteration and restoration of existing transportation facilities;
- d. blasting procedures;
- e. earth or debris disposal;
- f. backfilling and regrading of all excavations, artificial flat areas, embankments or other disturbed areas to their approximate original contour;
- g. topsoil removal, storage and redistribution;

- h. seed mix, application rates, seeding method and other procedures to be implemented in the establishment of a vegetative cover on all disturbed areas;
- i. procedures for plugging and abandoning exploration holes, boreholes, wells or other exposed underground openings;
- j. procedures and control practices to be implemented to minimize disturbance to the prevailing hydrologic balance, including, if necessary, sedimentation control;
- k. handling and disposal of known acid-forming or toxic-forming materials, if any; and
- l. removal of all facilities and equipment.

8.3 Provide a time table for each phase of exploration and reclamation including starting and ending date, type of disturbance, area of disturbance, and reclamation measures.

See summary Also, various sections

8.4 Give an estimate of the quantity of coal to be removed during the exploration. Specify method used to measure quantity.

Negligible §163(a)(2)(E)

8.5 Give a detailed estimate of the cost of reclamation of all areas to be affected by exploration activities.

§167(b)

**PART D: EXPLORATION ON LANDS UNSUITABLE FOR MINING**

**Ref: 11 AAC 90.165**

9.1 Does the proposed exploration area include any area previously designated as unsuitable for all or certain types of mining by the Commissioner of Natural Resources?

YES  NO

If yes, respond to 9.2 and 9.3. . .

9.2 Indicate petition name and number: \_\_\_\_\_

9.3 Describe the basis for the designation of the area as unsuitable for mining and why exploration in the area is not incompatible with the values or features which led to the designation of the area.

The applicant states to the best of his or her knowledge and belief that all statements made in the notice of intent to explore or in the application to explore are true and correct.

Applicant's Name: Robert Power Title: President & CEO  
 Address: 743 Railway Ave, Suite 693 Canmore Alberta T1W 1P2  
 Applicant's Signature: [Signature] Date: May 2/18  
 Subscribed and sworn before me by Robert Power this the 2 day of MAY, 2018  
 Notary Public: \_\_\_\_\_ My commission expires N/A

JAMIE D. STEWART  
 Lawyer, Notary Public  
 Suite 225, 1001 6th Avenue  
 Canmore, Alberta, Canada T1W 3L8



[SEAL]

Note: Attach a copy of power of attorney, or resolution of Board of Directors that grants signature authority)

### Section III. Regulation-specific Information

This section provides information required by ASCMCRA law and regulations. It follows the organization of the regulations: 11 AAC 90.161, 163, and 167. The regulation is in italics and the require information is in normal font below each regulation.

#### 11 AAC 90.161

*§161(a)(1) the name, address and telephone number of the person seeking to explore and the person who will be present at and responsible for conducting the exploration activities;*

Person seeking to explore:  
Flatlands Energy Corporation  
11401 Olive Lane  
Anchorage, AK 99515  
Tele: 403-850-5373  
E-mail: [info@alaskaasia.com](mailto:info@alaskaasia.com)

Person present and responsible:  
Bob Loeffler, Managing Partner  
Jade North, LLC  
2543 Brooke Drive  
Anchorage, Alaska 99517  
Tele: 907-250-4621  
E-mail: [bobl@jadenorth.com](mailto:bobl@jadenorth.com)

*§161(a)(2) a statement of the period of intended operations;*

This application requests permission to begin exploration as soon as the permit is issued during summer 2018. In 2018, exploration will continue for six weeks, or until freeze-up occurs, generally mid-October. The project may continue during summer 2019, most likely beginning soon after spring break-up. In any case, 2019 activities will end by freeze-up, expected mid-October. In addition, the project may take quarterly water quality samples through expiration date of the permit. (After the permit expires, the project assumes that helicopter-supported water quality sampling may be done on state land as an allowed use under 11 AAC 96.

*§161(a)(5) an explanation of the right of the person seeking to explore to enter and conduct exploration activities;*

The company listed under §161(a)(1) intends to conduct exploration work on coal lease ADL 553937. The lease owner has changed the corporation name from DNR records at the time of the award of the lease. The company name is now Flatlands Energy Corporation.

## 11 AAC 90.163

*§163(a)(2) an exploration and reclamation plan of operations that includes:  
(a)(2)(A) a brief description of the proposed area, cross-referenced to the map required under (4) of this section, including available information on the following:*

*surface topography; geologic, surface water, and other physical features;*

The region which houses the lease area lies on the lower east flank of Dickason Mountain in the Susitna Coal Basin. Canyon and Contact Creeks are the major drainages within the lease area. Topography in the region is moderately to very rugged, with elevations ranging from 800 feet at the confluence of Canyon and Contact Creeks in section 29, T21N, R13W, to 2,500 feet in the southern end of the area. Contact Creek and the lower portion of Canyon Creek cut a particularly steep, narrow gorge through the northern part of the sale area.

The particular area of the exploration is generally rolling above the incised Canyon Creek. There are a few small lakes, but no large bodies of water. Portions of the area is forested with white and black spruce, birch, black cottonwood, alder, willow, and aspen. Portions of the higher ground are covered with mixed shrubs and tundra. Several distinct types of wetlands may occur within the lease area as well.<sup>1</sup>

*vegetative cover;*

The lease area includes forest, shrublands and wetlands, though wetlands comprise only 4.7% of the lease area based on a review of the U.S. Fish and Wildlife Service Wetlands Inventory. The shrublands outside wetlands are generally willow and alder. Dwarf shrub and dwarf scrub vegetation communities dominate higher elevations within the lease area including snowbeds, alpine drainage channels, and exposed slopes in the western portions of the lease area. Forest areas includes black and white spruce with the white spruce dominating on flat to gently sloping areas with well-drained soils, and black spruce dominating in poorly drained areas. The forest also includes broadleaf forest areas with paper birch as the dominant species, although cottonwood and aspen are present in some areas. There is also mixed forest including all of the major tree species above. The understory to these areas include typical Alaskan species including devil's club, horsetail, Labrador tea, blueberries, rusty menziesia, highbush cranberries, prickly rose, bluejoint reedgrass, mosses and lichens.<sup>2</sup>

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<sup>1</sup> This information is adapted from the DNR Final Best Interest Finding for ADL 553937, page 13. July 5, 2013.

<sup>2</sup> This information is adapted from the DNR Final Best Interest Finding, pages 57-62.

*fish, wildlife, and plants, including any endangered or threatened species listed under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 – 1543);*

Canyon Creek and its tributaries, including those in the lease area, are catch-and-release for rainbow trout, within Unit 4 of the Department of Fish and Game Susitna River Drainage. Fishing in Canyon Creek north of the exploration area requires single-hook artificial lures.

DF&G's anadromous waters catalogue lists Canyon Creek as an anadromous fish stream within T20N R13W, Section 19, and up to a small area in the northeast portion of T20N R14W, Section 25 in what is listed as Area B in Figure 1. The catalogue lists that stretch of Canyon Creek in Area B as used for Coho and King Salmon rearing. Downstream of Section 19 (i.e., north of Section 19), east of Area C, the catalogue lists those two species as "present."

According to the 2013 DNR Best Interest Finding, page 70, there are no upland threatened or endangered species within the exploration area.

*(a)(2)(B) a description of known cultural or historic resources listed or eligible for listing on the National Register of Historic Places and known archaeological features within the proposed exploration area. The commission will, in the commissioner's discretion, require additional information regarding known or unknown historic or archaeological resources if these resources are likely to be affected by activities under this section;*

DNR's 2013 Final Best Interest Finding, page 13, provides that "There are no known historical or archeological sites within the lease sale area." To confirm the 2013 conclusion, project personnel contacted McKenzie Johnson at the Office of History and Archaeology on May 1, 2018. Ms. Johnson confirmed that there were no known historical or archeological sites within the lease sale area.

*(a)(2)(C) a description of the methods to be used to conduct coal exploration and reclamation including, types and uses of equipment, drilling, blasting, road or other transportation facility construction, and earth and debris disposal areas;*

The current drilling program is intended to recover coal core for logging and off-site analysis. Core with an approximate diameter of 4 inches will be logged and removed off-site. As indicated previously, six holes will be located to confirm Mobile's drilling locations (see Figure 1), and up to 14 additional holes will be located based, in part on the results of these six holes, in part on information from outcrops or other information gathered in the field, and in part on interpretations of this information made in the office. As these are not yet located, they are not provided in Figure 1. They will not be located within 100 feet of a catalogued anadromous fish stream, nor within 100 feet of a waterbody large enough to be visible on the 1:63,360 USGS map (Tyonek D-5 quadrangle). In no case will the project allow discharge of drilling muds or drill cuttings to reach surface water. While these holes are not precisely located, the general areas are as follows, using the areas depicted in Figure 1: up to 2 in Area A; 6 in Area B; and 6 in Area C.

The drilling will use a standard, tricone or diamond core drill. The project will drill one hole at a time, using a single drill rig. The average depth is expected to be 350-feet with a maximum depth of approximately 800 feet. The hole diameter will be approximately 4-inches. The holes will be cased through the surface gravels, and in any unstable portions of the formation.

The drilling will be helicopter supported, no roads or trails will be constructed. The drill platforms will be on runners to minimize ground disturbance. In some cases, minor grading will be required to level the platform, which will be roughly 20' x 20'. If levelling is required, topsoil and organics will be segregated so that it can be returned to the top of the disturbance during reclamation. The drilling will use non-toxic drilling muds: AMC 206, AMC EZEE Drill, AMC Plug and AMC Box Fix. The SDS information for these muds are provided in Attachment D.

Surface disturbance will be limited to occasional hand-leveling and potentially hand-excavation of a 4-foot shallow trench. Drill depth is expected to average 350 feet, though some holes may be drilled to a maximum depth of 800 feet. There will be no blasting, road or other transportation facilities constructed and no earth and debris disposal areas.

Drilling fluids will be recycled using a tank, but some drill cuttings and water may come from the well and will be directed to a small trench near the platform. The trench will be hand-excavated and will be roughly 1-foot wide, 6-inches to 1-foot deep and four-feet long. In no case will any discharge from the tank or trench be allowed within 100 feet of an anadromous stream, or within 100 feet of a stream or lake large enough to be noted on the area USGS map. In addition, in no case will the project allow discharge of drilling muds or drill cuttings to reach other surface water.

*(a)(2)(D) an estimated timetable for each phase of exploration and reclamation;*

As noted previously, exploration will begin soon after the exploration permit is issued. It will end approximately 6 weeks later in 2018 or by mid-October. We expect that all of the twinning holes and possible a few other holes will be drilled in 2018; it depends on whether there is enough time between permit approval and freeze-up. In any case, by mid-October work will stop, any disturbance will be reclaimed, and all equipment removed from the site. Winter operations are not anticipated. The project may resume after break-up in 2019. It will also finish by freeze-up which is expected by mid-October.

Reclamation at each site will occur before the drill and crew leave the site, except for one to three wells that may be left for water quality monitoring. The company has included in this permit application a reclamation bond that is adequate to remove the groundwater monitoring wells when no longer needed. Once removed, they will be reclaimed in the same manner as the exploration holes; see the introductory section of this application and the reclamation information supplied under §167(l).

*(a)(2)(E) the estimated amounts of coal to be removed and a description of the methods to be used to determine those amounts.*

Negligible coal will be removed. The only coal to be removed is a core from each of the seams in the drill holes and potentially hand channel samples if suitable outcrops are located. It will be transported off site.

*(a)(2)(F) the documentation required under (b) and (c) of this section if the applicant proposes to remove more than 250 tons of coal; and*

Not applicable. The applicant not proposing to remove more than 250 tons of coal.

*(a)(2)(G) a description of how the exploration activities will comply with 11 AAC 90.167.*

See the section later in this application that provides the information required by 11 AAC 90.167.

*§163(a)(3) the names and address of all owners and leaseholders of record of the surface land and the mineral estate in the area to be explored.*

The land and mineral estate within the lease area is owned by the State of Alaska, managed by DNR, Division of Mining, Land and Water. The exploration area is within Coal Lease ADL 553937. The leaseholder is Flatlands Energy Corporation. According to DNR's interactive land status mapping system, there are no other surface or mineral estate owners, lessees, or permit holders in or adjacent to the lease area.

*§163(a)(4) a map of the 1:63:360 scale series enlarged at least 2.5 times showing, based on available information, the area to be disturbed by the proposed exploration and reclamation activities, including existing roads, structures, pipelines, and the proposed location of trenches, roads, rights-of-way and other access routes, land excavations to be conducted, water or coal exploratory holes and wells to be drilled or altered, earth or debris disposal areas, bodies of water, historic, archeological and cultural features, topographic and drainages features, and the habitats of endangered or threatened species identified in (2)(a) of this section; and*

Figure 2 is at the scale indicated in this regulation. Note that there are no existing roads, structures, pipelines, proposed trenches, proposed rights-of-way and other access routes. Other than the incidental disturbance noted earlier, there is no excavation, historic archaeological or cultural features, and no threatened or endangered species.

*§163(a)(5) a statement as to whether coal exploration is proposed for an area designated unsuitable for mining under AS 27.21.260.*

The area is not designated unsuitable for mining under AS 27.21.260.

*§163(b) and (c) Extraction of more than 250 tons of coal under an exploration permit...*

These two subsections are not applicable. This application does not propose extracting more than 250 tons of coal.

*§163(d) The commissioner's determination under 11 AAC 90.002(b) must be made in writing. The commissioner shall base the determination on a demonstration by the applicant that includes the information required under (c) of this section and:*

*(1) evidence that sufficient coal reserves are available to demonstrate that the amount of coal to be removed is not the total reserve, but is a sampling of a larger reserve; and*

The amount of coal being withdrawn from a 4-inch core and several hand channel samples is inconsequential relative to the size of the reserve. Coal reserves are demonstrated in Table 3.2 of the DNR 2013 Final Best Interest Finding, page 42.

*(2) an explanation of why other means of exploration are not adequate to determine the quality of the coal or the feasibility of developing a surface coal mining operation.*

The method of retrieving the coal — helicopter supported drilling without a field camp; reclaiming and removing equipment at the end of the season and when exploration ends — is the most environmentally benign method of gaining access to the coal. Few, if any, short- or long-term impacts are expected. There are no less intrusive alternatives for acquiring a small amount of coal distributed throughout the deposit.

## 11 AAC 90.167

*§167(a) Coal exploration that substantially disturbs the land surface and associated reclamation operations must be conducted to minimize, to the extent practical, environmental damage. The operations must comply with this section; however, the commissioner will, in his or her discretion, waive certain requirements of this section upon a written finding that the requirement will be superseded by subsequent permitted operations. The commissioner will, in his or her discretion, impose additional performance standards to minimize environmental damage if the particular type of exploration activity requires them.*

This subsection does not require specific information from the application. However, this application does not request waiver of any of the performance standards of this section.

*§167(b) The commissioner will, in his or her discretion, require a performance bond. In determining the amount and conditions of the band and the criteria for bond release, the commissioner will consider the relevant provisions of 11 AAC 90.201 – 11 AAC 90.213 and will specify the bond amount, conditions, and release criteria in the decision under 11 AAC 90.165(e).*

The reclamation bond will cover the cost of DNR completing the planned reclamation, should the applicant not reclaim the site. Reclamation of each well site will be accomplished before the drill and crew leave that site. Therefore, the greatest amount of potential disturbance that would be required to be reclaimed would be a single drill site and the removal of three water quality monitoring wells. The project estimates that reclamation of this magnitude could be completed in a single, 10-hour day with a helicopter and two laborers.

<b>Category</b>	<b>Cost</b>
Helicopter	\$7,500
Laborers	\$1,200
Materials	\$4,000
Seeding	\$ 500
Subtotal	\$13,200
Contingency @ 30%	\$3,960
<b>Total</b>	<b>\$17,160</b>

Helicopter cost is estimated from an informal survey of helicopter rates; the estimated cost is \$1,200/hr. This is based on informal estimates from 4 companies for a helicopter that seats five people (or four people and gear). The distance from Merrill Field to the northernmost part of the exploration area is approximately 80 miles. We presume two round-trips to Anchorage at approximately 1.6 hours/trip. Further, we estimate 3 hours of helicopter time in the field, for a total of 6.2 hours or \$7,500.

Labor Cost is estimated from the Alaska Department of Labor Website using Davis Bacon Wages for the region south of N73° Latitude and West of W138° Longitude. We assumed a group I, general laborer for \$58/hr. The total cost of 20 hours of labor equals approximately \$1,200.<sup>3</sup> A single 10-hour day is likely to be able to reclaim up to four wells including filling the well bore, cutting and pulling the near-surface casing, reclaiming any hand-excavated disturbance (if any), and seeding (if necessary).

Materials were estimated from experience at \$1,000/well, or \$4,000 total.

Seed costs are minimal given the agency's preference to rely upon natural revegetation. (See information provided for §167(j)). In addition, the disturbed area is likely to be a few tens of square feet per well. To ensure these costs are covered the bond estimate includes an allowance for \$500 for seed costs.

Finally, the bond estimate includes a 30% contingency for unforeseen costs such as additional helicopter time or the reclamation time to go over 10 hrs.

*§167(c) The applicant must utilize impact control measures, management techniques and monitoring methods to protect endangered or threatened species listed under the Endangered Species Act of 1973 (16 U.S.C. Sec 1531 et Seq.), and their critical habitats; species such as eagles, migratory birds or other animals protected by state or federal law, and their habitats; and habitats of unusually high value for fish and wildlife.*

There are no threatened and endangered species in the exploration area (2013 DNR Best Interest Finding, page 70), confirmed by the U.S. Fish and Wildlife Service mapping explained below. There are few trees, and tree clearing is unlikely. In the unlikely event that minimal clearing is required, it will not occur during the migratory bird treaty clearing prohibition, May 1 – July 15. The drilling, mapping, nor water sampling will not affect streams, fish habitats or fish populations.

To update the 2013 Best Interest Finding conclusion, the project consulted the U.S. Fish and Wildlife Service's interactive mapping system titled, "IPaC: Information for Planning and Consultation" on May 3, 2018. The interactive mapping system confirmed that there are "No threatened and endangered species expected to occur" in the exploration area, and that "There are no migratory birds of conservation concern expected to occur" in the exploration area.

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<sup>3</sup> <http://labor.alaska.gov/lss/forms/pamp600-040118.pdf>.

*§167(d) The applicant must protect any cultural resources or districts, sites, buildings, structures or objects listed on the National Register of Historic Places, except to the extent approved jointly by the commissioner and the agency with jurisdiction over the protected place.*

Nothing in the exploration area is either listed or has been determined eligible for the National Register of Historic Places. [See also response to §163(a)(2)(B)].

*§167(e) Construction of new roads, aircraft runways, and marine facilities must be limited to the minimum necessary for the approved exploration and reclamation activities. Travel must be confined to existing roads, trails, runways, and marine facilities when excessive damage to vegetation or rutting of the land surface could result.*

No aircraft runways, or marine facilities will be constructed. There are no existing trails or roads to the exploration area, and none will be constructed.

*§167(f) Existing roads, trails, runways, and marine facilities may be used under the following conditions: (1) All applicable federal, state, and local requirements must be met. (2) If the road, trail, runway or marine facility is significantly altered or its use contributes additional suspended solids to streamflow or runoff, (j) of this section applies to those portions of the activity. (3) After exploration and reclamation activities are completed, the road, trail, runway, or marine facility must be restored to a condition equal to or better than the pre-exploration condition.*

No existing roads, trails, runways, or marine facilities will be used.

*§167(g) Roads, trails, runways, and marine facilities constructed or significantly altered for the exploration and reclamation activities must comply with 11 AAC 90.491 for design, construction, maintenance and removal. The commissioner will, in his or her discretion, require the use of rolligons and air-cushioned vehicles or winter roads when necessary to minimize environmental impacts.*

No existing roads, trails, runways, or marine facilities will be used.

*§167(h) Excavations, artificial flat areas, or embankments created during exploration must be returned to the approximate original contour when no longer needed.*

Any excavation will be accomplished by hand. If needed, hand excavation will include leveling for the runners of the drilling platform, or a hand-dug trench roughly 1-foot wide, 6-inches to 1-foot deep and four-feet long. Each excavation will segregate the topsoil from the underlying material. Any disturbance will be reclaimed by filling in the disturbance with the topsoil on top. Reclamation of small potential disturbances will mimic the ground's original contour. It is also quite likely that no significant grading will be required during the life of this exploration application.

*§167(i) Topsoil must be removed, stored, and redistributed on disturbed areas as necessary to assure successful revegetation.*

See response to §167(h), above.

*§167(j) All disturbed areas must be reseeded or planted to the same seasonal characteristics of growth as the original vegetation. The vegetative cover must be capable of stabilizing the soil against erosion. Revegetation must be carried out in a manner that encourages prompt vegetative cover and recovery of productivity levels compatible with the approved post-exploration land use. If both the pre-exploration and post-exploration land use is intensive agriculture, planting of crops normally grown will meet the requirements of this section.*

The project will use an appropriate seed mix approved by the DNR Plant Materials Center to reseed appropriate disturbed areas. The seed mix recommended by the Plant Materials Center<sup>4</sup> is an “upland interior seeding mixture” with:

- 'Nortran' Tufted Hairgrass 40%
- 'Arctared' Red Fescue - 15%
- 'Boreal' Red Fescue - 15%
- 'Wainwright' Slender wheatgrass - 20%
- Annual Rye grass - 10%

The project will use that or a similar seed mix (if some species are not commercially available). Disturbed areas appropriate for reseeded are those which surface organics, including vegetation, which are re-spread on the disturbance do not substantially cover the disturbance area, and which are large enough to have the potential to potentially generate erosion.

The company expects that the total disturbance for the project, as described previously, will be very small. The total that warrants re-seeding will be smaller yet and possibly negligible.

The company has included an allowance for seeding in the reclamation bond of \$500. This appears more than enough. On most drill sties, no seeding is likely to be needed as the minimal disturbance should be reclaimed by re-spreading topsoil and surface organics including vegetation. The Plant Materials Center indicates that the typical application rate is one pound of seeds per 1,000 square feet. As the project disturbance is expected to be minimal, a few pounds of seed is likely to be more than sufficient. Therefore the \$500 in the reclamation bond should be more than the actual cost of purchasing and spreading seed.

The best method to ensure vegetative cover is to minimize disturbance of the existing cover (i.e., minimize or avoid disturbance). By putting the drill platform on runners and minimizing the need for disturbance, the project will maintain the native cover. The next best method is to re-spread topsoil, organics and stockpiled vegetation back on the disturbed area. These are the preferred methods. Should the unexpected occur and

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<sup>4</sup> Casey Dinkel, DNR Plant Materials Center, personal conversation and e-mail, May 4, 2018.

disturbance indicate the potential for erosion, the project will implement appropriate BMPs from DEC's User's Manual for Gravel/Rock Aggregate Extraction Projects.<sup>5</sup>

*§167(k) Except for small and temporary diversions of overland flow of water around new roads, runways, marine facilities, drill pads, and support facilities, no ephemeral, intermittent or perennial stream may be diverted. Overland flow must be diverted in a manner that prevents erosion and complies with all other applicable federal and state laws and regulations.*

No ephemeral, intermittent or perennial stream will be diverted. No significant diversion of overland flow is expected.

*§167(l) Each exploration hole, borehole, well, or other exposed underground opening must comply with 11 AAC 90.303 – 11 AAC90.305.*

Per DNR policy, the drill holes will be reclaimed using a 50% bentonite and 50% cuttings. The near-surface casing will be removed. Each well will be reclaimed before the drill and crew leave that site. Once the monitoring wells are removed, they will be reclaimed to the same standard. The area immediately surrounding the drill hole will be mounded to promote run-off away from the drill collar.

In the event that there are inadequate drill cuttings, the project will obtain fine-grained material from adjacent to the drill site. The project will scrape away organic top layer; use the fine-grained sediment, smooth the small barrow pit to blend into the landscape, and finally replace the organic material on top. With respect to seeding the area, see answer to §167(j), above.

The relevant SDS Sheets for drilling fluids that may be used at the site are included as Attachment D.

*§167(m) all facilities and equipment must be removed when no longer needed, unless the commissioner approves retention for a specified period to (1) provide additional environmental quality data; (2) reduce or control the on- and off-site effects of the activities; (3) facilitate future operations under an approved permit or exploration approval.*

All equipment and facilities will be removed at the end of exploration for that season with the potential to leave one to three wells to monitor groundwater.

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<sup>5</sup> Many of the BMPs in that manual (available from: [http://dec.alaska.gov/water/wnpssc/protection\\_restoration/bestmgmtpractices/gravel.htm](http://dec.alaska.gov/water/wnpssc/protection_restoration/bestmgmtpractices/gravel.htm)) are only appropriate for larger projects.

*§167(n) Exploration and reclamation must minimize disturbance to the prevailing hydrologic balancing, including, if necessary, sedimentation control measures that comply with 11 AAC 90.329 and 11 AAC 90.331 or other measures required by the commissioner.*

No activities within this exploration application will affect the prevailing hydrologic balance in any manner.

The project is requesting to use up to 15 gpm to supply the drill, but at a maximum daily use of no more than 5,000 gpd. A water source will typically supply a single drill hole. Each source will be used for a few days, and in all cases a single source will be used for less than 10 days. This volume of water use is less than a significant amount of water as outlined in 11 AAC 93.035 and therefore does not require DNR to issue a water right or temporary water use authorization.

The specific water sources cannot be located from existing maps and photos. They will be located in the field based on criteria and procedures described below. The water sources may include water from Canyon Creek and from other streams or lakes, including small rills not marked on the USGS map. The sources will be within areas A, B, and C in Figure 1 (including the portion of Canyon Creek which is outside but adjacent to Area C). To protect fish which may be present, the project will screen a box 2-feet on a side (or similar volume) protecting the water intake with a screen of 1/8-inch or smaller mesh. All locations will be within 1,500 feet of the drill from locations that have adequate volume of flowing water. In general, sources closer to the drill location and with larger flow will be the priority.

The project will not directly take more than 25% from flowing water; therefore, it will not take water from streams flowing less than 60 gpm. However, some of the rills and small steep gullies are likely to have a lower flow. For streams between 30 and 60 gpm or too small to accommodate a 2-foot square screen box, an alternative gravity method of water withdrawal will be used. A 1.5 inch or smaller pipe with a 1/8-inch screened end will be inserted in the stream at a slight slope for gravity drainage through the pipe to a container from which to pump water to the drill site. Overflow from the container will be diverted back into the stream from which it came. Fuel for the pump will not be stored within 100 feet of surface water.

For small streams that may be less than 60 gpm, the project will measure streamflow using the bucket method<sup>6</sup> or the float method.<sup>7</sup>

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<sup>6</sup> See State of Washington Department of Ecology publication “Estimating Discharge and Streamflow” The publication is available at <https://fortress.wa.gov/ecy/publications/documents/0510070.pdf>, and a copy has been provided to DNR, Coal Regulatory Program. See page 6 & 7.

<sup>7</sup> The float method involves locating a uniform reach near the withdrawal site, measuring the average width and depth (potentially using multiple depth measurements), and introducing a float to the water to measure average velocity. Streamflow is calculated as  $\text{Streamflow} = (\text{average width}) \times (\text{average depth}) \times (\text{average velocity})$ .

*§167(o) Known acid-forming or toxic forming materials must be handled and disposed of in compliance with 11 AAC 90.335 and 11 AAC 90.445 or other measures required by the commissioner.*

No known acid-forming or toxic materials will be handled or disposed of. The coal cores will be transported off-site.

*§167(p) The person conducting exploration activities must have available for review on-site the approval granted under 11 AAC 90.165.*

No information requested.

**Attachment A**  
**Coal Exploration Area, Township Range Description**

All descriptions are within the Seward Meridian

T20N, R13W Sections 6, 7, 18, 19, 30, 31	3,840 acres
T20N, R14W Sections 1, 12, 13, 24, 25, 36	3,840 acres
T19N, R13W Section 6	640 acres
<u>T19N, R14W, Section 1</u>	<u>640 acres</u>
Total: 8,960 acres	

**Attachment B**  
**Response to Application Question 7.0**

DNR's Coal Exploration Application, Question 7.0 requests:

*1) names of persons and organizations who gathered and analyzed data;*

No original environmental data was gathered for this application. Some environmental data was taken from DNR's 2013 Final Best Interest Finding. Individuals who provided information for this application are listed below.

Bob Loeffler  
Jade North, LLC  
907-250-4621; [bobl@jadenorth.com](mailto:bobl@jadenorth.com)

Steve Denton  
Denton Civil and Mineral  
907 322-5972; [sdenton@alaskaasia.com](mailto:sdenton@alaskaasia.com)

Bill Ellis  
Alaska Earth Sciences  
907-522-4664; [wellis@alaskaearthsciences.com](mailto:wellis@alaskaearthsciences.com)

*2) dates of data collections and analysis;*

*3) description of procedures used; and*

No original environmental data was gathered for this application.

*4) names, addresses and positions of officials of each agency consulted.*

Russ Kirkham, Coal Regulatory Manager  
Department of Natural Resources, Division of Mining, Land and Water  
550 W 7th Ave; Suite 900b  
Anchorage, AK 99501-3577

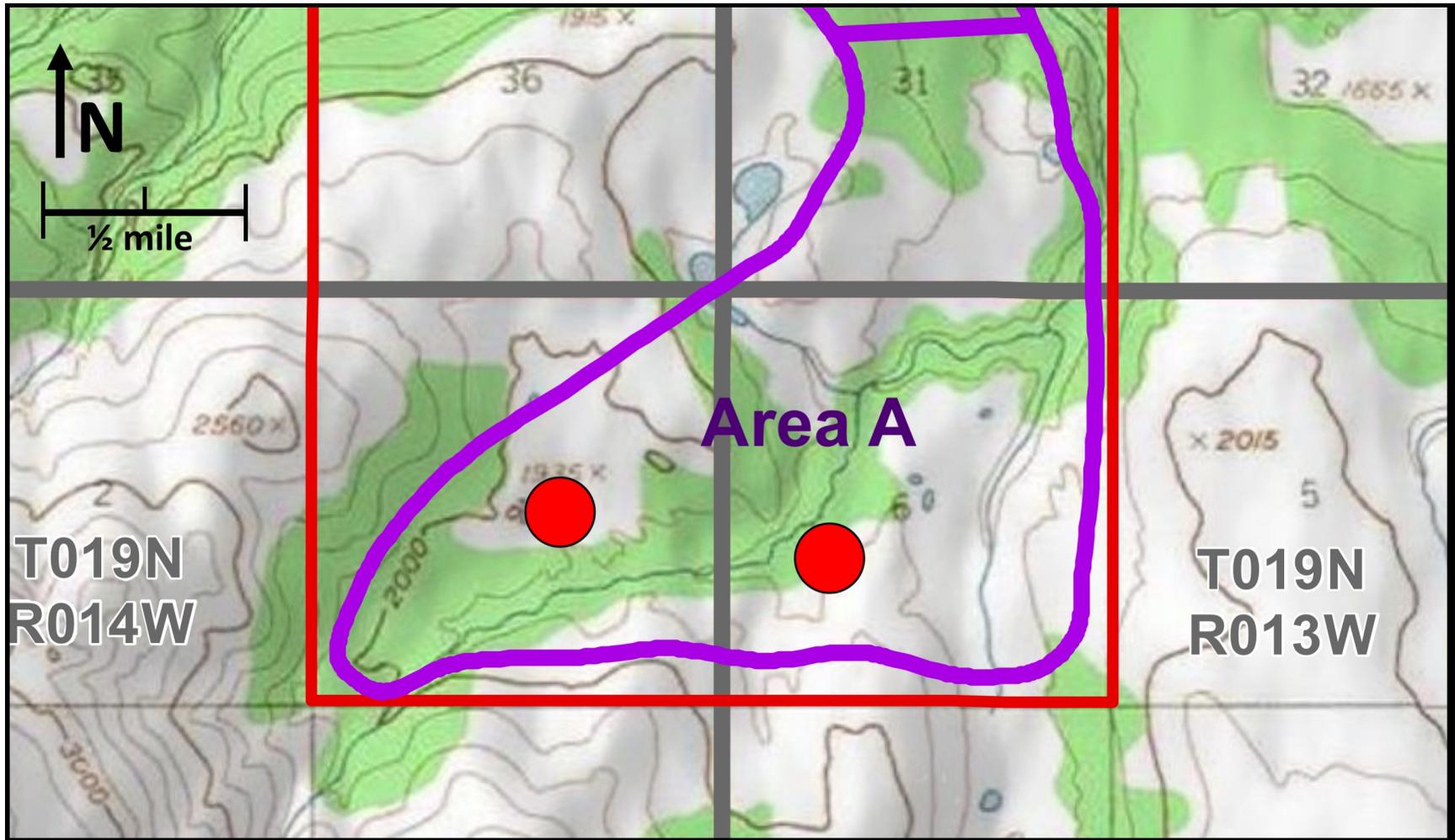
Jenny Wynne, Natural Resources Manager II, Water Section  
Department of Natural Resources, Division of Mining, Land and Water  
700 Airport Way  
Fairbanks, AK 99709-4699

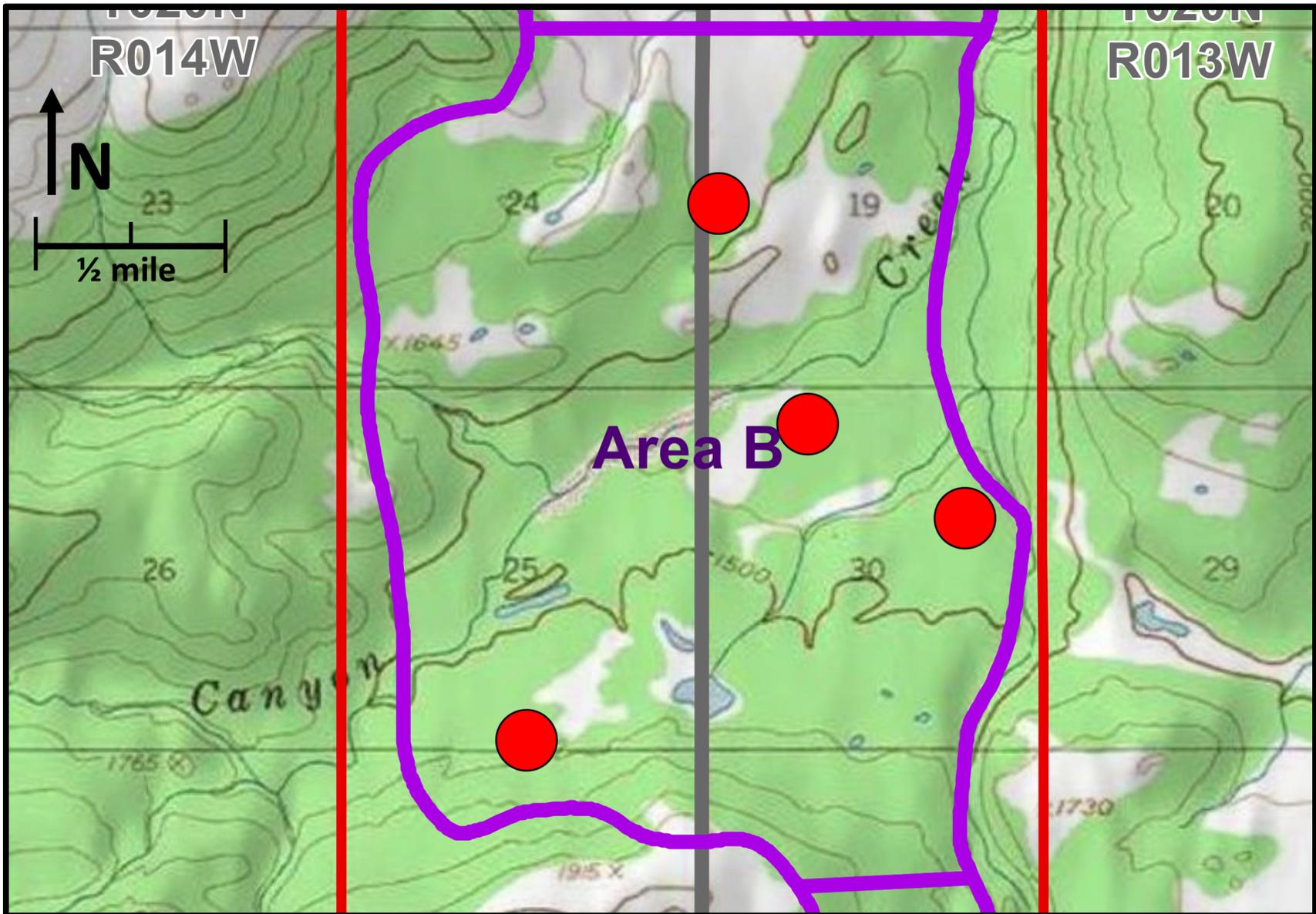
Ron Benkert, Fish and Game Coordinator  
Alaska Department of Fish and Game, Habitat Division  
1800 Glenn Highway, Suite 6  
Palmer, AK 99645-6736

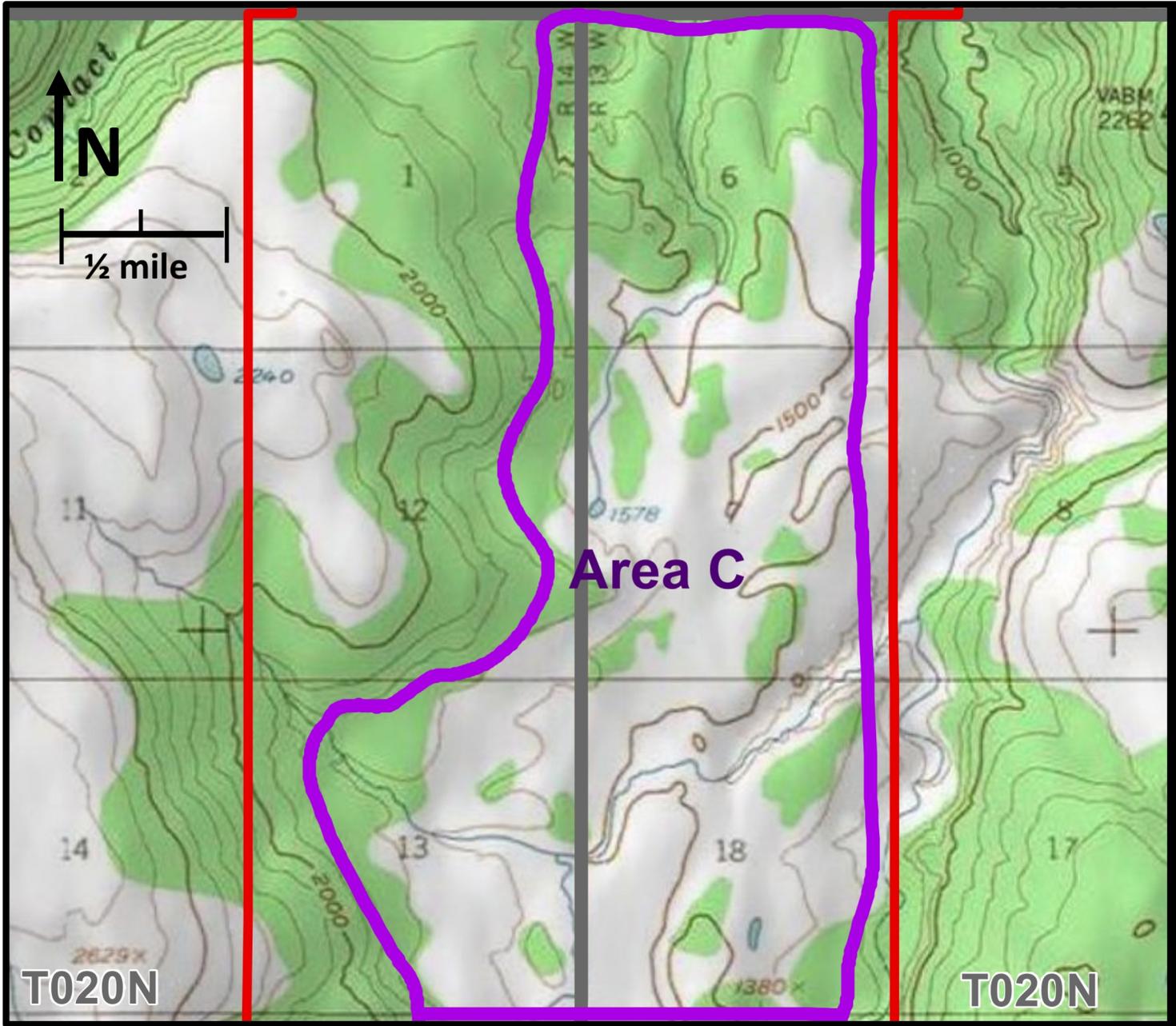
**Attachment C  
Required Maps**

Maps are 1:63,360; enlarged at least 2.5 times

The figures in this attachment are enlargements of portions of Figure 1. In each figure North is to the top of the page and the sections are one-mile squares.







# Attachment D. SDS Information



## AMC PLUG

### AMC

Chemwatch: 4902-93

Version No: 10.1.1.1

Safety Data Sheet according to WHS and ADG requirements

Chemwatch Hazard Alert Code: 1

Issue Date: 11/02/2017

Print Date: 04/03/2018

L.GHS.AUS.EN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

Product name	AMC PLUG
Other means of identification	Not Available

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Drilling fluids compound. Lost circulation material.
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### Details of the supplier of the safety data sheet

Registered company name	AMC
Address	216 Balcatta Rd, Balcatta WA 6021 Australia
Telephone	+61 (8) 9445 4000
Fax	+61 (8) 9445 4040
Website	www.amcmud.com
Email	amc@imdexlimited.com

### Emergency telephone number

Association / Organisation	Chemwatch
Emergency telephone numbers	1800 039 008
Other emergency telephone numbers	Not Available

## CHEMWATCH EMERGENCY RESPONSE

Primary Number	Alternative Number 1	Alternative Number 2
1800 039 008	1800 039 008	+612 9186 1132

Once connected and if the message is not in your preferred language then please dial 01

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

**NON-HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS.** According to the WHS Regulations and the ADG Code.

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	1	1
Toxicity	0	0
Body Contact	0	0
Reactivity	1	1
Chronic	0	0

0 = Minimum  
1 = Low  
2 = Moderate  
3 = High  
4 = Extreme

<b>Poisons Schedule</b>	Not Applicable
<b>Classification</b>	Not Applicable

**Label elements**

<b>Hazard pictogram(s)</b>	Not Applicable
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<b>SIGNAL WORD</b>	<b>NOT APPLICABLE</b>
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**Hazard statement(s)**

Not Applicable

**Precautionary statement(s) General**

<b>P101</b>	If medical advice is needed, have product container or label at hand.
<b>P102</b>	Keep out of reach of children.

**Precautionary statement(s) Prevention**

Not Applicable

**Precautionary statement(s) Response**

Not Applicable

**Precautionary statement(s) Storage**

Not Applicable

**Precautionary statement(s) Disposal**

Not Applicable

**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS****Substances**

See section below for composition of Mixtures

**Mixtures**

CAS No	%[weight]	Name
25608-12-2	>90	<u>potassium polyacrylate</u>

**SECTION 4 FIRST AID MEASURES****Description of first aid measures**

<b>Eye Contact</b>	<p>If this product comes in contact with eyes:</p> <ul style="list-style-type: none"> <li>▶ Wash out immediately with water.</li> <li>▶ If irritation continues, seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
<b>Skin Contact</b>	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▶ Other measures are usually unnecessary.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>▶ Immediately give a glass of water.</li> <li>▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.</li> </ul>

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

**SECTION 5 FIREFIGHTING MEASURES****Extinguishing media**

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

**Special hazards arising from the substrate or mixture**

<b>Fire Incompatibility</b>	<ul style="list-style-type: none"> <li>▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result</li> </ul>
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### Advice for firefighters

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear breathing apparatus plus protective gloves in the event of a fire.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ Combustible solid which burns but propagates flame with difficulty; it is estimated that most organic dusts are combustible (circa 70%) - according to the circumstances under which the combustion process occurs, such materials may cause fires and / or dust explosions.</li> <li>▶ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions).</li> </ul> <p>Combustion products include:</p> <ul style="list-style-type: none"> <li>’, carbon monoxide (CO)</li> <li>’, carbon dioxide (CO<sub>2</sub>)</li> <li>’, other pyrolysis products typical of burning organic material.</li> </ul>
<b>HAZCHEM</b>	Not Applicable

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid contact with skin and eyes.</li> </ul>
<b>Major Spills</b>	<ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> </ul>

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ Limit all unnecessary personal contact.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> <li>▶ Organic powders when finely divided over a range of concentrations regardless of particulate size or shape and suspended in air or some other oxidizing medium may form explosive dust-air mixtures and result in a fire or dust explosion (including secondary explosions)</li> <li>▶ Minimise airborne dust and eliminate all ignition sources. Keep away from heat, hot surfaces, sparks, and flame.</li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store below 38 deg. C.</li> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> </ul>

### Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ Lined metal can, lined metal pail/ can.</li> <li>▶ Plastic pail.</li> </ul>
<b>Storage incompatibility</b>	<p>Avoid contamination of water, foodstuffs, feed or seed.</p> <ul style="list-style-type: none"> <li>▶ Avoid reaction with oxidising agents</li> </ul>

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Not Available

## AMC PLUG

### EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
AMC PLUG	Not Available	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
potassium polyacrylate	Not Available	Not Available

### MATERIAL DATA

#### Exposure controls

<b>Appropriate engineering controls</b>	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
<b>Personal protection</b>	
<b>Eye and face protection</b>	<ul style="list-style-type: none"> <li>▶ Safety glasses with side shields</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.</li> </ul>
<b>Skin protection</b>	See Hand protection below
<b>Hands/feet protection</b>	<p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.</p> <ul style="list-style-type: none"> <li>▶ polychloroprene.</li> </ul>
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	<p>No special equipment needed when handling small quantities.</p> <p><b>OTHERWISE:</b></p> <ul style="list-style-type: none"> <li>▶ Overalls.</li> </ul>
<b>Thermal hazards</b>	Not Available

#### Respiratory protection

Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	P1 Air-line*	- -	PAPR-P1 -
up to 50 x ES	Air-line**	P2	PAPR-P2
up to 100 x ES	-	P3 Air-line*	-
100+ x ES	-	Air-line**	PAPR-P3

\* - Negative pressure demand \*\* - Continuous flow

A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO<sub>2</sub>), G = Agricultural chemicals, K = Ammonia(NH<sub>3</sub>), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- ▶ Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- ▶ The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- ▶ Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- ▶ Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- ▶ Use approved positive flow mask if significant quantities of dust becomes airborne.
- ▶ Try to avoid creating dust conditions.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

## Information on basic physical and chemical properties

<b>Appearance</b>	White solid crystals; insoluble in water.   Particle size ~, -5mm.		
<b>Physical state</b>	Divided Solid	<b>Relative density (Water = 1)</b>	1.48
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	Not Available
<b>pH (as supplied)</b>	Not Applicable	<b>Decomposition temperature</b>	Not Available
<b>Melting point / freezing point (°C)</b>	Not Available	<b>Viscosity (cSt)</b>	Not Applicable
<b>Initial boiling point and boiling range (°C)</b>	Not Applicable	<b>Molecular weight (g/mol)</b>	Not Applicable
<b>Flash point (°C)</b>	Not Applicable	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Applicable	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Applicable	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	Not Available	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Applicable
<b>Lower Explosive Limit (%)</b>	Not Available	<b>Volatile Component (%vol)</b>	Not Applicable
<b>Vapour pressure (kPa)</b>	Not Applicable	<b>Gas group</b>	Not Available
<b>Solubility in water (g/L)</b>	Immiscible	<b>pH as a solution (1%)</b>	Not Applicable
<b>Vapour density (Air = 1)</b>	Not Applicable	<b>VOC g/L</b>	Not Available

## SECTION 10 STABILITY AND REACTIVITY

<b>Reactivity</b>	See section 7
<b>Chemical stability</b>	Product is considered stable and hazardous polymerisation will not occur.
<b>Possibility of hazardous reactions</b>	See section 7
<b>Conditions to avoid</b>	See section 7
<b>Incompatible materials</b>	See section 7
<b>Hazardous decomposition products</b>	See section 5

## SECTION 11 TOXICOLOGICAL INFORMATION

### Information on toxicological effects

<b>Inhaled</b>	<p>The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.</p> <p>Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.</p> <p>If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.</p>
<b>Ingestion</b>	<p>The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.</p> <p>High molecular weight material; on single acute exposure would be expected to pass through gastrointestinal tract with little change / absorption. Occasionally accumulation of the solid material within the alimentary tract may result in formation of a bezoar (concretion), producing discomfort.</p>
<b>Skin Contact</b>	<p>The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>

## AMC PLUG

<b>Eye</b>	Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result. The dust may produce eye discomfort and abrasive eye inflammation.	
<b>Chronic</b>	Long-term exposure to the product is not thought to produce chronic effects adverse to health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.  Long term exposure to high dust concentrations may cause changes in lung function (i.e. pneumoconiosis) caused by particles less than 0.5 micron penetrating and remaining in the lung. A prime symptom is breathlessness.	
<b>AMC PLUG</b>	<b>TOXICITY</b> Not Available	<b>IRRITATION</b> Not Available
<b>potassium polyacrylate</b>	<b>TOXICITY</b> Not Available	<b>IRRITATION</b> Not Available
<b>Legend:</b>	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

<b>POTASSIUM POLYACRYLATE</b>	No significant acute toxicological data identified in literature search. The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
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<b>Acute Toxicity</b>	☉	<b>Carcinogenicity</b>	☉
<b>Skin Irritation/Corrosion</b>	☉	<b>Reproductivity</b>	☉
<b>Serious Eye Damage/Irritation</b>	☉	<b>STOT - Single Exposure</b>	☉
<b>Respiratory or Skin sensitisation</b>	☉	<b>STOT - Repeated Exposure</b>	☉
<b>Mutagenicity</b>	☉	<b>Aspiration Hazard</b>	☉

**Legend:** ✘ – Data available but does not fill the criteria for classification  
✔ – Data available to make classification  
☉ – Data Not Available to make classification

## SECTION 12 ECOLOGICAL INFORMATION

## Toxicity

	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
<b>AMC PLUG</b>	Not Available	Not Available	Not Available	Not Available	Not Available
<b>potassium polyacrylate</b>	Not Available	Not Available	Not Available	Not Available	Not Available
<b>Legend:</b>	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

**DO NOT discharge into sewer or waterways.**

May be harmful to fauna if not disposed of according to Section 13 and legislative requirements. [AMC]

## Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
	No Data available for all ingredients	No Data available for all ingredients

## Bioaccumulative potential

Ingredient	Bioaccumulation
	No Data available for all ingredients

**Mobility in soil**

Ingredient	Mobility
	No Data available for all ingredients

**SECTION 13 DISPOSAL CONSIDERATIONS****Waste treatment methods**

<b>Product / Packaging disposal</b>	<p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> <li>▶ It may be necessary to collect all wash water for treatment before disposal.</li> </ul>
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**SECTION 14 TRANSPORT INFORMATION****Labels Required**

<b>Marine Pollutant</b>	NO
<b>HAZCHEM</b>	Not Applicable

**Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**SECTION 15 REGULATORY INFORMATION****Safety, health and environmental regulations / legislation specific for the substance or mixture**

**POTASSIUM POLYACRYLATE(25608-12-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Not Applicable

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (potassium polyacrylate)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (potassium polyacrylate)
Japan - ENCS	N (potassium polyacrylate)
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	Y
<b>Legend:</b>	<p>Y = All ingredients are on the inventory            N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)</p>

**SECTION 16 OTHER INFORMATION****Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

## Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average  
PC—STEL: Permissible Concentration-Short Term Exposure Limit  
IARC: International Agency for Research on Cancer  
ACGIH: American Conference of Governmental Industrial Hygienists  
STEL: Short Term Exposure Limit  
TEEL: Temporary Emergency Exposure Limit.  
IDLH: Immediately Dangerous to Life or Health Concentrations  
OSF: Odour Safety Factor  
NOAEL :No Observed Adverse Effect Level  
LOAEL: Lowest Observed Adverse Effect Level  
TLV: Threshold Limit Value  
LOD: Limit Of Detection  
OTV: Odour Threshold Value  
BCF: BioConcentration Factors  
BEI: Biological Exposure Index

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# AMC EZEE DRILL

## AMC

Chemwatch Hazard Alert Code: 0

Chemwatch: 5215-87

Issue Date: 10/12/2017

Version No: 3.1.1.1

Print Date: 04/03/2018

Safety Data Sheet according to WHS and ADG requirements

L.GHS.AUS.EN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

Product name	AMC EZEE DRILL
Other means of identification	Not Available

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Drilling fluid additive.
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### Details of the supplier of the safety data sheet

Registered company name	AMC
Address	216 Balcatta Rd, Balcatta WA 6021 Australia
Telephone	+61 (8) 9445 4000
Fax	+61 (8) 9445 4040
Website	www.amcmud.com
Email	amc@imdexlimited.com

### Emergency telephone number

Association / Organisation	Chemwatch
Emergency telephone numbers	1800 039 008
Other emergency telephone numbers	Not Available

## CHEMWATCH EMERGENCY RESPONSE

Primary Number	Alternative Number 1	Alternative Number 2
1800 039 008	1800 039 008	+612 9186 1132

Once connected and if the message is not in your preferred language then please dial 01

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

**NON-HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.**

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	0	
Toxicity	0	
Body Contact	0	
Reactivity	0	
Chronic	0	

0 = Minimum  
1 = Low  
2 = Moderate  
3 = High  
4 = Extreme

## AMC EZEE DRILL

<b>Poisons Schedule</b>	Not Applicable
<b>Classification</b>	Not Applicable

**Label elements**

<b>Hazard pictogram(s)</b>	Not Applicable
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<b>SIGNAL WORD</b>	<b>NOT APPLICABLE</b>
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**Hazard statement(s)**

Not Applicable

**Precautionary statement(s) General**

<b>P101</b>	If medical advice is needed, have product container or label at hand.
<b>P102</b>	Keep out of reach of children.

**Precautionary statement(s) Prevention**

Not Applicable

**Precautionary statement(s) Response**

Not Applicable

**Precautionary statement(s) Storage**

Not Applicable

**Precautionary statement(s) Disposal**

Not Applicable

**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS****Substances**

See section below for composition of Mixtures

**Mixtures**

CAS No	%[weight]	Name
Not Available	100	Ingredients determined not to be hazardous

**SECTION 4 FIRST AID MEASURES****Description of first aid measures**

<b>Eye Contact</b>	<p>If this product comes in contact with eyes:</p> <ul style="list-style-type: none"> <li>▶ Wash out immediately with water.</li> <li>▶ If irritation continues, seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
<b>Skin Contact</b>	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▶ Other measures are usually unnecessary.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>▶ <b>If swallowed do NOT induce vomiting.</b></li> <li>▶ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.</li> <li>▶ Observe the patient carefully.</li> <li>▶ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.</li> <li>▶ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.</li> <li>▶ Seek medical advice.</li> </ul>

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

**SECTION 5 FIREFIGHTING MEASURES**

**Extinguishing media**

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

**Special hazards arising from the substrate or mixture**

<b>Fire Incompatibility</b>	None known.
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**Advice for firefighters**

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Use water delivered as a fine spray to control fire and cool adjacent area.</li> <li>▶ <b>Do not</b> approach containers suspected to be hot.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ The material is not readily combustible under normal conditions.</li> <li>▶ However, it will break down under fire conditions and the organic component may burn.</li> </ul>
<b>HAZCHEM</b>	Not Applicable

**SECTION 6 ACCIDENTAL RELEASE MEASURES****Personal precautions, protective equipment and emergency procedures**

See section 8

**Environmental precautions**

See section 12

**Methods and material for containment and cleaning up**

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours and contact with skin and eyes.</li> </ul>
<b>Major Spills</b>	<ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> </ul>

Personal Protective Equipment advice is contained in Section 8 of the SDS.

**SECTION 7 HANDLING AND STORAGE****Precautions for safe handling**

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ Limit all unnecessary personal contact.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> </ul>

**Conditions for safe storage, including any incompatibilities**

<b>Suitable container</b>	23kg cubes
<b>Storage incompatibility</b>	Avoid contamination of water, foodstuffs, feed or seed.

**SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION****Control parameters****OCCUPATIONAL EXPOSURE LIMITS (OEL)****INGREDIENT DATA**

Not Available

**EMERGENCY LIMITS**

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
AMC EZEE DRILL	Not Available	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
Ingredients determined not to be hazardous	Not Available	Not Available

**MATERIAL DATA****Exposure controls**

<b>Appropriate engineering controls</b>	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
<b>Personal protection</b>	
<b>Eye and face protection</b>	<ul style="list-style-type: none"> <li>▶ Safety glasses with side shields</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.</li> </ul>
<b>Skin protection</b>	See Hand protection below
<b>Hands/feet protection</b>	Wear general protective gloves, eg. light weight rubber gloves. The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	No special equipment needed when handling small quantities. <b>OTHERWISE:</b> <ul style="list-style-type: none"> <li>▶ Overalls.</li> </ul>
<b>Thermal hazards</b>	Not Available

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Appearance</b>	Yellow liquid; mixes with water.		
<b>Physical state</b>	Liquid	<b>Relative density (Water = 1)</b>	Not Available
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	Not Available
<b>pH (as supplied)</b>	Not Available	<b>Decomposition temperature</b>	Not Available
<b>Melting point / freezing point (°C)</b>	Not Available	<b>Viscosity (cSt)</b>	Not Available
<b>Initial boiling point and boiling range (°C)</b>	Not Available	<b>Molecular weight (g/mol)</b>	Not Applicable
<b>Flash point (°C)</b>	Not Available	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Available	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Available	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	Not Applicable	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Available
<b>Lower Explosive Limit (%)</b>	Not Applicable	<b>Volatile Component (%vol)</b>	Not Available
<b>Vapour pressure (kPa)</b>	Not Available	<b>Gas group</b>	Not Available
<b>Solubility in water (g/L)</b>	Miscible	<b>pH as a solution (1%)</b>	6.0-8.5 (0.1% solution)
<b>Vapour density (Air = 1)</b>	Not Available	<b>VOC g/L</b>	Not Applicable

## SECTION 10 STABILITY AND REACTIVITY

<b>Reactivity</b>	See section 7
<b>Chemical stability</b>	Product is considered stable and hazardous polymerisation will not occur.
<b>Possibility of hazardous reactions</b>	See section 7
<b>Conditions to avoid</b>	See section 7
<b>Incompatible materials</b>	See section 7

## AMC EZEE DRILL

<b>Hazardous decomposition products</b>	See section 5
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## SECTION 11 TOXICOLOGICAL INFORMATION

## Information on toxicological effects

<b>Inhaled</b>	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
<b>Ingestion</b>	The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.
<b>Skin Contact</b>	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
<b>Eye</b>	Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).
<b>Chronic</b>	Long-term exposure to the product is not thought to produce chronic effects adverse to health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.
<b>AMC EZEE DRILL</b>	<b>TOXICITY</b>
	Not Available
<b>AMC EZEE DRILL</b>	<b>IRRITATION</b>
	Not Available
<b>Legend:</b>	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

<b>Acute Toxicity</b>	☉	<b>Carcinogenicity</b>	☉
<b>Skin Irritation/Corrosion</b>	☉	<b>Reproductivity</b>	☉
<b>Serious Eye Damage/Irritation</b>	☉	<b>STOT - Single Exposure</b>	☉
<b>Respiratory or Skin sensitisation</b>	☉	<b>STOT - Repeated Exposure</b>	☉
<b>Mutagenicity</b>	☉	<b>Aspiration Hazard</b>	☉

**Legend:** ✘ – Data available but does not fill the criteria for classification  
✔ – Data available to make classification  
☉ – Data Not Available to make classification

## SECTION 12 ECOLOGICAL INFORMATION

## Toxicity

AMC EZEE DRILL	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
<b>Legend:</b>	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

**DO NOT** discharge into sewer or waterways.

## Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
	No Data available for all ingredients	No Data available for all ingredients

## Bioaccumulative potential

Ingredient	Bioaccumulation
	No Data available for all ingredients

**Mobility in soil**

Ingredient	Mobility
	No Data available for all ingredients

**SECTION 13 DISPOSAL CONSIDERATIONS****Waste treatment methods**

Product / Packaging disposal	Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.
	<ul style="list-style-type: none"> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> <li>▶ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▶ Recycle wherever possible.</li> <li>▶ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.</li> </ul>

**SECTION 14 TRANSPORT INFORMATION****Labels Required**

Marine Pollutant	NO
HAZCHEM	Not Applicable

**Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**SECTION 15 REGULATORY INFORMATION****Safety, health and environmental regulations / legislation specific for the substance or mixture**

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	Y
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	Y
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	Y
<b>Legend:</b>	<p>Y = All ingredients are on the inventory</p> <p>N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)</p>

**SECTION 16 OTHER INFORMATION****Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

**Definitions and abbreviations**

PC—TWA: Permissible Concentration-Time Weighted Average  
PC—STEL: Permissible Concentration-Short Term Exposure Limit  
IARC: International Agency for Research on Cancer  
ACGIH: American Conference of Governmental Industrial Hygienists  
STEL: Short Term Exposure Limit  
TEEL: Temporary Emergency Exposure Limit.  
IDLH: Immediately Dangerous to Life or Health Concentrations  
OSF: Odour Safety Factor  
NOAEL :No Observed Adverse Effect Level  
LOAEL: Lowest Observed Adverse Effect Level  
TLV: Threshold Limit Value  
LOD: Limit Of Detection  
OTV: Odour Threshold Value  
BCF: BioConcentration Factors  
BEI: Biological Exposure Index

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# AMC BOS FIX

## AMC

Chemwatch: 5223-42

Version No: 8.1.1.1

Safety Data Sheet according to WHS and ADG requirements

Chemwatch Hazard Alert Code: 2

Issue Date: 05/15/2017

Print Date: 02/13/2018

L.GHS.AUS.EN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

Product name	AMC BOS FIX
Other means of identification	Not Available

### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Use according to manufacturer's directions.
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### Details of the supplier of the safety data sheet

Registered company name	AMC
Address	216 Balcatta Rd Balcatta WA 6021 Australia
Telephone	+61 8 9445 4000
Fax	+61 8 9445 4040
Website	www.amcmud.com
Email	amc@imdexlimited.com

### Emergency telephone number

Association / Organisation	Not Available
Emergency telephone numbers	1800 039 008 or +61 3 9573 3112,+800 2436 2255 +613 9573 3112
Other emergency telephone numbers	Not Available

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

**HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.**

#### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	0	
Toxicity	0	
Body Contact	2	
Reactivity	1	
Chronic	0	

0 = Minimum  
1 = Low  
2 = Moderate  
3 = High  
4 = Extreme

Poisons Schedule	Not Applicable
Classification [1]	Eye Irritation Category 2A
Legend:	1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI

**Label elements**

<b>Hazard pictogram(s)</b>	
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SIGNAL WORD

**WARNING****Hazard statement(s)**

<b>H319</b>	Causes serious eye irritation.
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**Precautionary statement(s) Prevention**

<b>P280</b>	Wear protective gloves/protective clothing/eye protection/face protection.
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**Precautionary statement(s) Response**

<b>P305+P351+P338</b>	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
<b>P337+P313</b>	If eye irritation persists: Get medical advice/attention.

**Precautionary statement(s) Storage**

Not Applicable

**Precautionary statement(s) Disposal**

Not Applicable

**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS****Substances**

See section below for composition of Mixtures

**Mixtures**

CAS No	%[weight]	Name
Not Available	>60	Anionic water soluble polymer in emulsion
10043-01-3	<5	<u>aluminium sulfate</u>

**SECTION 4 FIRST AID MEASURES****Description of first aid measures**

<b>Eye Contact</b>	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> <li>▸ Wash out immediately with fresh running water.</li> <li>▸ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</li> <li>▸ Seek medical attention without delay; if pain persists or recurs seek medical attention.</li> <li>▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
<b>Skin Contact</b>	<p>If skin contact occurs:</p> <ul style="list-style-type: none"> <li>▸ Immediately remove all contaminated clothing, including footwear.</li> <li>▸ Flush skin and hair with running water (and soap if available).</li> <li>▸ Seek medical attention in event of irritation.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>▸ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▸ Other measures are usually unnecessary.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>▸ Immediately give a glass of water.</li> <li>▸ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.</li> </ul>

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

**SECTION 5 FIREFIGHTING MEASURES****Extinguishing media**

- There is no restriction on the type of extinguisher which may be used.

- ▶ Use extinguishing media suitable for surrounding area.

### Special hazards arising from the substrate or mixture

<b>Fire Incompatibility</b>	▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result
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### Advice for firefighters

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> <li>▶ Wear breathing apparatus plus protective gloves in the event of a fire.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ Non combustible.</li> <li>▶ Not considered to be a significant fire risk.</li> </ul> Decomposition may produce toxic fumes of: <ul style="list-style-type: none"> <li>▸ carbon dioxide (CO<sub>2</sub>)</li> <li>▸ nitrogen oxides (NO<sub>x</sub>)</li> <li>▸ metal oxides</li> <li>▸ other pyrolysis products typical of burning organic material.</li> </ul> May emit poisonous fumes.
<b>HAZCHEM</b>	Not Applicable

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

<b>Minor Spills</b>	<ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours and contact with skin and eyes.</li> </ul> Slippery when spilt.
<b>Major Spills</b>	Moderate hazard. <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> </ul> Slippery when spilt.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ Avoid all personal contact, including inhalation.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> </ul>

### Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ Polyethylene or polypropylene container.</li> <li>▶ Packing as recommended by manufacturer.</li> </ul>
<b>Storage incompatibility</b>	<ul style="list-style-type: none"> <li>▶ Avoid reaction with oxidising agents</li> <li>▶ Segregate from alcohol, water.</li> </ul>

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
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## AMC BOS FIX

Australia Exposure Standards	aluminium sulfate	Aluminium, soluble salts (as Al)	2 mg/m3	Not Available	Not Available	Not Available
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## EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
aluminium sulfate	Aluminum sulfate	38 mg/m3	64 mg/m3	380 mg/m3

Ingredient	Original IDLH	Revised IDLH
Anionic water soluble polymer in emulsion	Not Available	Not Available
aluminium sulfate	Not Available	Not Available

## MATERIAL DATA

## Exposure controls

<b>Appropriate engineering controls</b>	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
<b>Personal protection</b>	
<b>Eye and face protection</b>	<ul style="list-style-type: none"> <li>▶ Safety glasses with side shields</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.</li> </ul>
<b>Skin protection</b>	See Hand protection below
<b>Hands/feet protection</b>	<p>The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.</p> <ul style="list-style-type: none"> <li>▶ Wear chemical protective gloves, e.g. PVC.</li> <li>▶ Wear safety footwear or safety gumboots, e.g. Rubber</li> </ul>
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	<ul style="list-style-type: none"> <li>▶ Overalls.</li> <li>▶ P.V.C.</li> </ul>
<b>Thermal hazards</b>	Not Available

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

## Information on basic physical and chemical properties

<b>Appearance</b>	Opaque green liquid; solidifies on contact with water.   Viscosity: 1500cP		
<b>Physical state</b>	Liquid	<b>Relative density (Water = 1)</b>	1-1.15
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	Not Applicable
<b>pH (as supplied)</b>	Not Applicable	<b>Decomposition temperature</b>	Not Available
<b>Melting point / freezing point (°C)</b>	Not Available	<b>Viscosity (cSt)</b>	Not Available
<b>Initial boiling point and boiling range (°C)</b>	Not Available	<b>Molecular weight (g/mol)</b>	Not Applicable
<b>Flash point (°C)</b>	Not Applicable	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Available	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Applicable	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	Not Applicable	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Available
<b>Lower Explosive Limit (%)</b>	Not Applicable	<b>Volatile Component (%vol)</b>	Not Available

Vapour pressure (kPa)	Not Available	Gas group	Not Available
Solubility in water (g/L)	Reacts	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

## SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> </ul>
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

## SECTION 11 TOXICOLOGICAL INFORMATION

### Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
Ingestion	The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.
Skin Contact	<p>Limited evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic).</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p>
Eye	<p>Evidence exists, or practical experience predicts, that the material may cause eye irritation in a substantial number of individuals and/or may produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals.</p> <p>Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.</p>
Chronic	<p>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.</p> <p>Limited evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a significant number of individuals at a greater frequency than would be expected from the response of a normal population.</p> <p>Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching.</p>

AMC BOS FIX	TOXICITY	IRRITATION
	Not Available	Not Available
aluminium sulfate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >5000 mg/kg <sup>[1]</sup>	Eye (rabbit): 10 mg/24h SEVERE
	Oral (rat) LD50: >5000 mg/kg <sup>[1]</sup>	
<b>Legend:</b>	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

ALUMINIUM SULFATE	<p>Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound.</p> <p>Oral (rat) TDLo: 10138 mg/kg/8D-C</p>
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## AMC BOS FIX

Acute Toxicity	⊘	Carcinogenicity	⊘
Skin Irritation/Corrosion	⊘	Reproductivity	⊘
Serious Eye Damage/Irritation	✓	STOT - Single Exposure	⊘
Respiratory or Skin sensitisation	⊘	STOT - Repeated Exposure	⊘
Mutagenicity	⊘	Aspiration Hazard	⊘

Legend: ✗ – Data available but does not fill the criteria for classification  
 ✓ – Data available to make classification  
 ⊘ – Data Not Available to make classification

## SECTION 12 ECOLOGICAL INFORMATION

## Toxicity

AMC BOS FIX	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	Not Available	Not Available	Not Available	Not Available	Not Available
aluminium sulfate	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
	LC50	96	Fish	0.0028mg/L	4
	EC50	48	Crustacea	0.214-1.26mg/L	2
	EC50	72	Algae or other aquatic plants	0.075mg/L	2
	BCF	1080	Fish	0.264mg/L	4
	NOEC	720	Fish	0.004mg/L	4
<b>Legend:</b>	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

**DO NOT** discharge into sewer or waterways.

## Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
aluminium sulfate	HIGH	HIGH

## Bioaccumulative potential

Ingredient	Bioaccumulation
aluminium sulfate	LOW (LogKOW = -2.2002)

## Mobility in soil

Ingredient	Mobility
aluminium sulfate	LOW (KOC = 6.124)

## SECTION 13 DISPOSAL CONSIDERATIONS

## Waste treatment methods

Product / Packaging disposal	<p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT</b> allow wash water from cleaning or process equipment to enter drains.</li> <li>▶ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▶ Recycle wherever possible.</li> <li>▶ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.</li> </ul>
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## SECTION 14 TRANSPORT INFORMATION

**Labels Required**

<b>Marine Pollutant</b>	NO
<b>HAZCHEM</b>	Not Applicable

**Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**SECTION 15 REGULATORY INFORMATION****Safety, health and environmental regulations / legislation specific for the substance or mixture****ALUMINIUM SULFATE(10043-01-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Australia Exposure Standards

Australia Inventory of Chemical Substances (AICS)

Australia Hazardous Substances Information System - Consolidated Lists

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (aluminium sulfate)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	Y
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	Y
<b>Legend:</b>	Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)

**SECTION 16 OTHER INFORMATION****Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

**Definitions and abbreviations**

PC—TWA: Permissible Concentration-Time Weighted Average

PC—STEL: Permissible Concentration-Short Term Exposure Limit

IARC: International Agency for Research on Cancer

ACGIH: American Conference of Governmental Industrial Hygienists

STEL: Short Term Exposure Limit

TEEL: Temporary Emergency Exposure Limit.

IDLH: Immediately Dangerous to Life or Health Concentrations

OSF: Odour Safety Factor

NOAEL :No Observed Adverse Effect Level

LOAEL: Lowest Observed Adverse Effect Level

TLV: Threshold Limit Value

LOD: Limit Of Detection

OTV: Odour Threshold Value

BCF: BioConcentration Factors

BEI: Biological Exposure Index

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# AMC 206

## AMC

Chemwatch: 16-8182

Version No: 2.1.1.1

Safety Data Sheet according to WHS and ADG requirements

Chemwatch Hazard Alert Code: 1

Issue Date: 12/16/2015

Print Date: 04/03/2018

L.GHS.AUS.EN

### SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

#### Product Identifier

Product name	AMC 206
Other means of identification	Not Available

#### Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Process aid for industrial applications.
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#### Details of the supplier of the safety data sheet

Registered company name	AMC
Address	216 Balcatta Rd, Balcatta WA 6021 Australia
Telephone	+61 (8) 9445 4000
Fax	+61 (8) 9445 4040
Website	www.amcmud.com
Email	amc@imdexlimited.com

#### Emergency telephone number

Association / Organisation	Chemwatch
Emergency telephone numbers	1800 039 008
Other emergency telephone numbers	Not Available

#### CHEMWATCH EMERGENCY RESPONSE

Primary Number	Alternative Number 1	Alternative Number 2
1800 039 008	1800 039 008	+612 9186 1132

Once connected and if the message is not in your preferred language then please dial 01

### SECTION 2 HAZARDS IDENTIFICATION

#### Classification of the substance or mixture

**NON-HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS.** According to the WHS Regulations and the ADG Code.

#### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	0	
Toxicity	0	
Body Contact	0	
Reactivity	1	
Chronic	0	

0 = Minimum  
1 = Low  
2 = Moderate  
3 = High  
4 = Extreme

<b>Poisons Schedule</b>	Not Applicable
<b>Classification</b>	Not Applicable

**Label elements**

<b>Hazard pictogram(s)</b>	Not Applicable
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<b>SIGNAL WORD</b>	<b>NOT APPLICABLE</b>
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**Hazard statement(s)**

Not Applicable

**Precautionary statement(s) General**

<b>P101</b>	If medical advice is needed, have product container or label at hand.
<b>P102</b>	Keep out of reach of children.

**Precautionary statement(s) Prevention**

Not Applicable

**Precautionary statement(s) Response**

Not Applicable

**Precautionary statement(s) Storage**

Not Applicable

**Precautionary statement(s) Disposal**

Not Applicable

**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS****Substances**

See section below for composition of Mixtures

**Mixtures**

CAS No	%[weight]	Name
Not Available	NotSpec.	anionic polymer

**SECTION 4 FIRST AID MEASURES****Description of first aid measures**

<b>Eye Contact</b>	<p>If this product comes in contact with eyes:</p> <ul style="list-style-type: none"> <li>▶ Wash out immediately with water.</li> <li>▶ If irritation continues, seek medical attention.</li> <li>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</li> </ul>
<b>Skin Contact</b>	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> <li>▶ Flush skin and hair with running water (and soap if available).</li> <li>▶ Seek medical attention in event of irritation.</li> </ul>
<b>Inhalation</b>	<ul style="list-style-type: none"> <li>▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area.</li> <li>▶ Other measures are usually unnecessary.</li> </ul>
<b>Ingestion</b>	<ul style="list-style-type: none"> <li>▶ Immediately give a glass of water.</li> <li>▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.</li> </ul>

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

**SECTION 5 FIREFIGHTING MEASURES****Extinguishing media**

- ▶ There is no restriction on the type of extinguisher which may be used.
- ▶ Use extinguishing media suitable for surrounding area.

**Special hazards arising from the substrate or mixture**

<b>Fire Incompatibility</b>	<ul style="list-style-type: none"> <li>▶ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result</li> </ul>
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### Advice for firefighters

<b>Fire Fighting</b>	<ul style="list-style-type: none"> <li>▶ Use water delivered as a fine spray to control fire and cool adjacent area.</li> <li>▶ <b>Do not</b> approach containers suspected to be hot.</li> </ul>
<b>Fire/Explosion Hazard</b>	<ul style="list-style-type: none"> <li>▶ The material is not readily combustible under normal conditions.</li> <li>▶ However, it will break down under fire conditions and the organic component may burn.</li> </ul>
<b>HAZCHEM</b>	Not Applicable

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

<b>Minor Spills</b>	<p>Slippery when spilt.</p> <ul style="list-style-type: none"> <li>▶ Clean up all spills immediately.</li> <li>▶ Avoid breathing vapours and contact with skin and eyes.</li> </ul>
<b>Major Spills</b>	<p>Slippery when spilt.</p> <ul style="list-style-type: none"> <li>▶ Clear area of personnel and move upwind.</li> <li>▶ Alert Fire Brigade and tell them location and nature of hazard.</li> </ul>

Personal Protective Equipment advice is contained in Section 8 of the SDS.

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

<b>Safe handling</b>	<ul style="list-style-type: none"> <li>▶ Limit all unnecessary personal contact.</li> <li>▶ Wear protective clothing when risk of exposure occurs.</li> </ul>
<b>Other information</b>	<ul style="list-style-type: none"> <li>▶ Store in original containers.</li> <li>▶ Keep containers securely sealed.</li> </ul>

### Conditions for safe storage, including any incompatibilities

<b>Suitable container</b>	<ul style="list-style-type: none"> <li>▶ Polyethylene or polypropylene container.</li> <li>▶ Packing as recommended by manufacturer.</li> </ul>
<b>Storage incompatibility</b>	<p>Avoid contamination of water, foodstuffs, feed or seed.</p> <ul style="list-style-type: none"> <li>▶ Avoid reaction with oxidising agents</li> </ul>

## SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

### Control parameters

#### OCCUPATIONAL EXPOSURE LIMITS (OEL)

#### INGREDIENT DATA

Not Available

#### EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
AMC 206	Not Available	Not Available	Not Available	Not Available

Ingredient	Original IDLH	Revised IDLH
anionic polymer	Not Available	Not Available

#### MATERIAL DATA

### Exposure controls

<b>Appropriate engineering</b>	Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed
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<b>controls</b>	engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
<b>Personal protection</b>	
<b>Eye and face protection</b>	<ul style="list-style-type: none"> <li>▶ Safety glasses with side shields</li> <li>▶ Chemical goggles.</li> <li>▶ Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.</li> </ul>
<b>Skin protection</b>	See Hand protection below
<b>Hands/feet protection</b>	Wear general protective gloves, eg. light weight rubber gloves. The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
<b>Body protection</b>	See Other protection below
<b>Other protection</b>	No special equipment needed when handling small quantities. <b>OTHERWISE:</b> <ul style="list-style-type: none"> <li>▶ Overalls.</li> </ul>
<b>Thermal hazards</b>	Not Available

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Appearance</b>	Milky viscous liquid with an aliphatic solvent odour, dispersible in water.		
<b>Physical state</b>	Liquid	<b>Relative density (Water = 1)</b>	Not Available
<b>Odour</b>	Not Available	<b>Partition coefficient n-octanol / water</b>	Not Available
<b>Odour threshold</b>	Not Available	<b>Auto-ignition temperature (°C)</b>	>250
<b>pH (as supplied)</b>	Not Available	<b>Decomposition temperature</b>	Not Available
<b>Melting point / freezing point (°C)</b>	Not Available	<b>Viscosity (cSt)</b>	Not Available
<b>Initial boiling point and boiling range (°C)</b>	Not Available	<b>Molecular weight (g/mol)</b>	Not Applicable
<b>Flash point (°C)</b>	Not Applicable	<b>Taste</b>	Not Available
<b>Evaporation rate</b>	Not Available	<b>Explosive properties</b>	Not Available
<b>Flammability</b>	Not Applicable	<b>Oxidising properties</b>	Not Available
<b>Upper Explosive Limit (%)</b>	Not Applicable	<b>Surface Tension (dyn/cm or mN/m)</b>	Not Available
<b>Lower Explosive Limit (%)</b>	Not Applicable	<b>Volatile Component (%vol)</b>	Not Available
<b>Vapour pressure (kPa)</b>	Not Available	<b>Gas group</b>	Not Available
<b>Solubility in water (g/L)</b>	Partly miscible	<b>pH as a solution (1%)</b>	6-8 (5g/L)
<b>Vapour density (Air = 1)</b>	Not Available	<b>VOC g/L</b>	Not Available

## SECTION 10 STABILITY AND REACTIVITY

<b>Reactivity</b>	See section 7
<b>Chemical stability</b>	<ul style="list-style-type: none"> <li>▶ Unstable in the presence of incompatible materials.</li> <li>▶ Product is considered stable.</li> </ul>
<b>Possibility of hazardous reactions</b>	See section 7
<b>Conditions to avoid</b>	See section 7
<b>Incompatible materials</b>	See section 7

<b>Hazardous decomposition products</b>	See section 5
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## SECTION 11 TOXICOLOGICAL INFORMATION

### Information on toxicological effects

<b>Inhaled</b>	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
<b>Ingestion</b>	The material has <b>NOT</b> been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.
<b>Skin Contact</b>	The liquid may be miscible with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis. The material is unlikely to produce an irritant dermatitis as described in EC Directives .
<b>Eye</b>	Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).
<b>Chronic</b>	Long-term exposure to the product is not thought to produce chronic effects adverse to health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.
<b>AMC 206</b>	<b>TOXICITY</b>
	Oral (Rat) LD50: >5000 mg/kg <sup>[2]</sup>
<b>Legend:</b>	<b>IRRITATION</b>
	Not Available
1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances	

<b>Acute Toxicity</b>	✘	<b>Carcinogenicity</b>	⊖
<b>Skin Irritation/Corrosion</b>	⊖	<b>Reproductivity</b>	⊖
<b>Serious Eye Damage/Irritation</b>	⊖	<b>STOT - Single Exposure</b>	⊖
<b>Respiratory or Skin sensitisation</b>	⊖	<b>STOT - Repeated Exposure</b>	⊖
<b>Mutagenicity</b>	⊖	<b>Aspiration Hazard</b>	⊖

**Legend:** ✘ – Data available but does not fill the criteria for classification  
 ✔ – Data available to make classification  
 ⊖ – Data Not Available to make classification

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

	ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
<b>AMC 206</b>	Not Available	Not Available	Not Available	Not Available	Not Available
<b>Legend:</b>	Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data				

Based on the toxicity of the components: [Fish -] [Danio rerio LC50 (96hr): gt;100 mg/L] [Daphnids -] [Daphnia magna EC50 (48hr): gt;100 mg/L] [Algae -] [Scenedesmus subspicatus IC50 (72hr): gt;100 mg/L] [Australian Mud]

May be harmful to fauna if not disposed of according to Section 13 and legislative requirements. [AMC]

### Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
	No Data available for all ingredients	No Data available for all ingredients

### Bioaccumulative potential

Ingredient	Bioaccumulation
	No Data available for all ingredients

**Mobility in soil**

Ingredient	Mobility
	No Data available for all ingredients

**SECTION 13 DISPOSAL CONSIDERATIONS****Waste treatment methods**

<b>Product / Packaging disposal</b>	<p>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area.</p> <ul style="list-style-type: none"> <li>▶ <b>DO NOT allow wash water from cleaning or process equipment to enter drains.</b></li> <li>▶ It may be necessary to collect all wash water for treatment before disposal.</li> <li>▶ Recycle wherever possible.</li> <li>▶ Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.</li> </ul>
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**SECTION 14 TRANSPORT INFORMATION****Labels Required**

<b>Marine Pollutant</b>	NO
<b>HAZCHEM</b>	Not Applicable

**Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS**

**Transport in bulk according to Annex II of MARPOL and the IBC code**

Not Applicable

**SECTION 15 REGULATORY INFORMATION****Safety, health and environmental regulations / legislation specific for the substance or mixture**

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	Y
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	Y
Japan - ENCS	Y
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	Y
<b>Legend:</b>	<p>Y = All ingredients are on the inventory            N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)</p>

**SECTION 16 OTHER INFORMATION****Other information**

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

## Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average  
PC—STEL: Permissible Concentration-Short Term Exposure Limit  
IARC: International Agency for Research on Cancer  
ACGIH: American Conference of Governmental Industrial Hygienists  
STEL: Short Term Exposure Limit  
TEEL: Temporary Emergency Exposure Limit.  
IDLH: Immediately Dangerous to Life or Health Concentrations  
OSF: Odour Safety Factor  
NOAEL :No Observed Adverse Effect Level  
LOAEL: Lowest Observed Adverse Effect Level  
TLV: Threshold Limit Value  
LOD: Limit Of Detection  
OTV: Odour Threshold Value  
BCF: BioConcentration Factors  
BEI: Biological Exposure Index

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## Attachment E Climate and Weather Information

An initial agency comment requested climate and weather information for the area. The nearest climate station is in Skwentna. Information from the U.S. Climate Data website<sup>8</sup> provides the information below. However, Skwentna is at approximately 150 feet above sea level while the exploration area is mostly between 1,500 and 2,000 feet above sea level. Therefore, the project area is likely between 4 and 13 degrees colder than the information below based on typical adiabatic lapse rates of 1°F/300 feet (saturated air) and 2°F/300 feet (saturated air).

	Jan	Feb	Mar	Apr	May	Jun
Average high in °F:	18	25	35	46	59	68
Average low in °F:	1	4	11	24	35	44
Av. precipitation in inch:	2.32	2.2	1.02	1.06	1.1	1.26
Days with precipitation:	-	-	-	-	-	-
Hours of sunshine:	-	-	-	-	-	-
Average snowfall in inch:	18	18	10	6	0	0
	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F:	70	66	56	40	24	20
Average low in °F:	48	45	36	24	8	4
Av. precipitation in inch:	2.24	3.46	4.25	3.23	2.2	3.5
Days with precipitation:	-	-	-	-	-	-
Hours of sunshine:	-	-	-	-	-	-
Average snowfall in inch:	0	0	0	11	22	34

Climate data for Skwentna, Longitude: -151.217, Latitude: 61.9772

Average weather Skwentna, AK - 99667 - 1981-2010 normals

Jan: January, Feb: February, Mar: March, Apr: April, May: May, Jun: June, Jul: July, Aug: August, Sep: September, Oct: October, Nov: November, Dec: December

<sup>8</sup> <https://www.usclimatedata.com/climate/skwentna/alaska/united-states/usak0226>

## **Attachment F Fuel Handling Plan**

Fuel for the exploration project will be brought in by helicopter in 55-gallon drums. Up to 6 drums will be stored at a drill site, possibly fewer. The drills and helicopters will use Jet-A diesel fuel. Fuel will be handled and stored according to the procedures below. Each drill site will have a spill response kit on-site.

### **Fuel Containment and Handling**

(6) 55-gallon drums containing Jet-A diesel will be placed in secondary containment capable of storing 110% of total volume. Appropriate secondary containment and/or diversionary structures or equipment will be provided for all oil (fuel) handling containers, equipment, and transfer areas to prevent a discharge to surface waters. The entire secondary containment system, including walls and floors, is capable of containing oil (fuel) and is constructed so that any discharge from a primary containment system, such as tank or pipe, will not escape the containment system before cleanup occurs. The following methods may be deployed for secondary containment or its equivalent: (1) Dikes, berms, or retaining walls sufficiently impervious to contain oil (fuel); (2) manufactured containments; (3) Sorbent materials. Inspections will be conducted daily or when in use; entire system to be visually checked by fueling attendant when fuel is delivered to site or transferred to equipment for signs of wear, frays, damage, leaks before fuel transfer is to begin.

### **Spill Response**

In general, the following steps are taken:

- 1) Eliminate potential for sparks sources;
- 2) If possible and safe to do so, identify and shut down source of the discharge to stop the flow;
- 3) Contain the discharge with sorbents, berms, fences, sandbags or other material;
- 4) Contact project manager;
- 5) Contact regulatory authorities and the response organization; and
- 6) Collect and dispose of recovered products according to regulation.

Alaska Department of Environmental Conservation, Spill Prevention and response has the following notification requirements;

#### **Oil/Petroleum Releases**

**To water:** any release of oil/fuel to water must be reported as soon as the person has knowledge of the discharge.

**To land:** any release to land of oil/fuel in excess of 55 gallons must be reported as soon as the person has knowledge of the discharge. Any release of oil in excess of 10 gallons but less than 55 gallons must be reported within 48 hours after a person has knowledge of the discharge.

**To impermeable secondary containment areas:** Any release of oil/fuel in excess of 55 gallons must be reported within 48 hours after the person has knowledge of the discharge.

For the purpose of establishing appropriate response procedures, this plan classifies discharges as either “minor” or “major” depending on the volume and characteristics of the material released.

#### **Response to a Minor Discharge**

A minor discharge is defined as one that poses no significant harm (or threat) to human health and safety or to the environment. Minor discharges are generally those where:

The quantity of product discharged is small (e.g., may involve less than 10 gallons of oil);

Discharged material is easily stopped and controlled at the time of the discharge;

Discharge is localized near the source;  
Discharged material is not likely to reach water;  
There is little risk to human health or safety; and  
There is little risk of fire or explosion.

Minor discharges can usually be cleaned up by project personnel. The following guidelines apply:

Immediately notify the project manager

Under the direction of the project manager, contain the discharge with discharge response materials and equipment.

Place discharge debris in properly labeled waste containers.

If discharge is more than the threshold for the State of Alaska mandatory reporting; such notification will be made to the Alaska Department of Environmental Conservation

#### Response to a Major Discharge

A major discharge is defined as one that cannot be safely controlled or cleaned up by project personnel, such as when:

The discharge is large enough to spread beyond the immediate discharge area

The discharge enters water

The discharge requires special equipment or training to clean up;

The discharged materials pose a hazard to human health or safety; or

There is a danger of fire or explosion.

In the event of a major discharge, the following guidelines apply:

All personnel should evacuate the discharge site to a safe distance;

If the project manager is not on-site, the senior on-site person notifies the project manager of the discharge and has authority to initiate notification and response.