

Coal Exploration Application

**Flatland Energy Corporation
Skwentna, AK**

June 8, 2022

**Alaska Asia Clean Energy Corporation
Coal Exploration Application**

Table of Contents

Section I. Summary of the ApplicationI-1

Section II. DNR Application Form..... II-1

Section III. Regulation-specific Information.....III-1

- 11 AAC 90.161 III-1
- 11 AAC 90.163 III-2
- 11 AAC 90.167 III-6

Attachments..... Following Page III-12

- Attachment A. Legal Description of Exploration Area**
- Attachment B. Response to Application Question 7.0**
- Attachment C. Maps**
- Attachment D. SDS Information**
- Attachment E. Letter of Ownership and Right of Entry**
- Attachment F. Climate/Weather Information**
- Attachment G. Fuel Handling Plan**

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 are helicopter-supported drilling of up to 20 exploration wells during 2022 and 2023. The wells are primarily for hydrologic monitoring, though the project may collect geologic core and other information from the wells. Other exploration activities may include geologic mapping and taking water samples from the wells and from surface water. Transducer-type stage measuring devices may be installed on area streams. The project expects to install approximately six, though one or two additional could be installed if analysis of the hydrology finds that more are useful. The final activity would be to install a meteorologic station. 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. Each exploration site will be reclaimed before the drill and all equipment leaves that site, except that the well itself may remain for water quality monitoring. The wells will be removed when they are no longer needed.

Exploration will begin soon after the exploration permit is issued. The company expects that the permit will be issued in time for the holes to be drilled during August or September 2022. In any case, work will stop, any disturbance other than the hydrologic monitoring wells will be reclaimed, and all equipment removed from the site by the end of October. Winter operations are not anticipated. If needed, the project may resume in 2023 after break-up and will be finished by the end of October that year as well.

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).

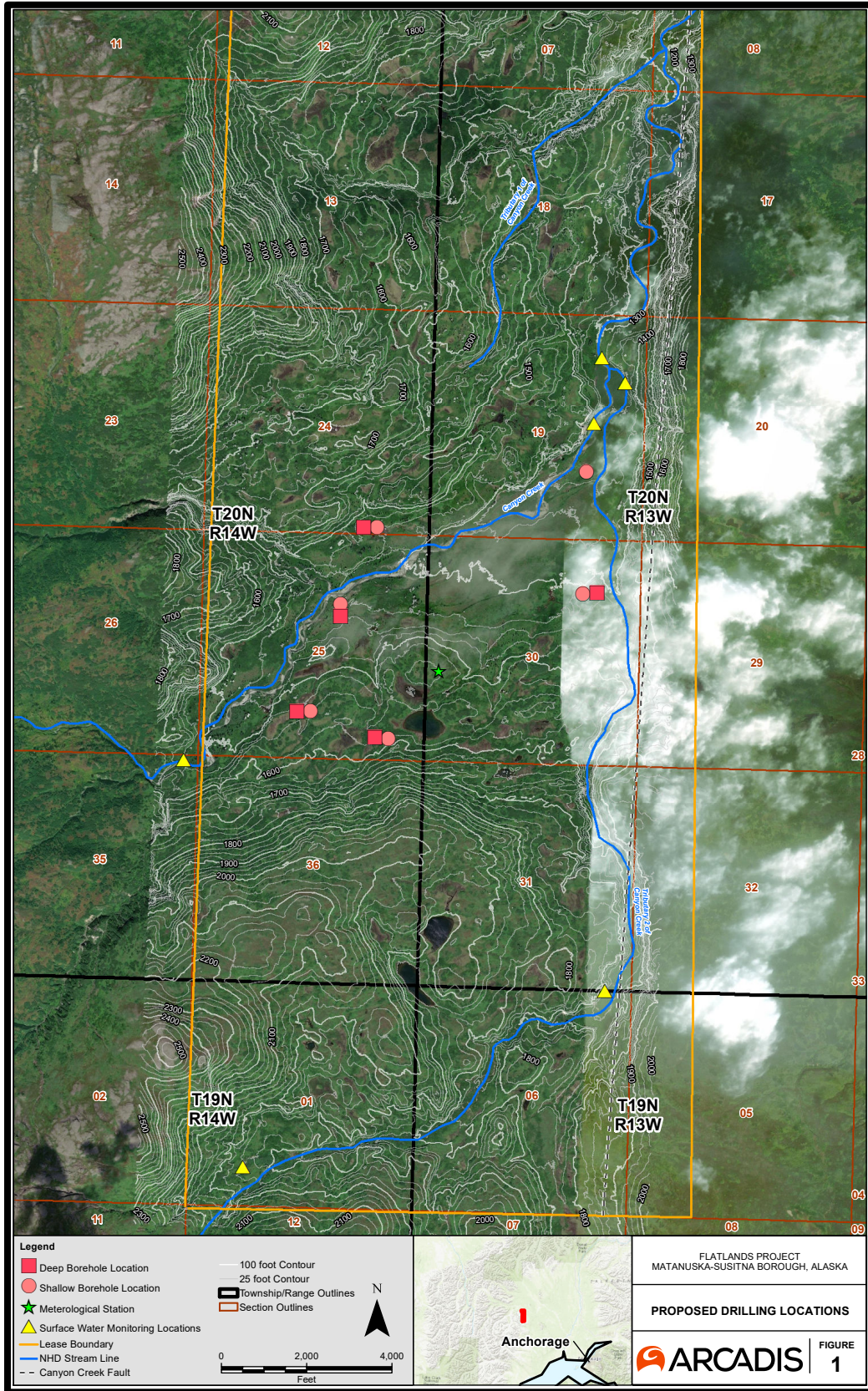
On August 9, 2018, DNR Division of Mining, Land and Water issued Surface Coal Exploration Permit No E-1601 to Flatlands Energy Corporation to drill up to 20 exploration holes. The permit term expired August 10, 2020. The company drilled 7 exploration holes. DNR required the company to put up a bond of \$17,160 to cover the potential reclamation liability. All holes and associated disturbance were reclaimed before the end of the permit term, except that the company left timbers at a single site for future exploration. This project will remove those timbers from their present location and re-use them to construct the drilling pads. Currently, DNR is holding \$3,197 of the original bond to cover the removal of the timbers; the remainder of the bond has been returned to the company after DNR inspected reclamation from the 2018 work.

Drilling. Exploration holes will be located to achieve two objectives. The primary objective is to provide hydrologic information on groundwater hydrologic conditions and water quality. The secondary objective is to gather geologic information from the core.

The 11 holes will be located as noted in Figure 1. Figure 1 shows six well locations. Twin wells will be drilled at five of the six locations: one shallower and one deep. The deep hole will be up to 350 feet. The remaining four holes will be located depending on the results from the initial wells. They will be within the project area. All well locations are more than 100 feet of a stream used by salmon. In no case will the project allow discharge of drilling muds or drill cuttings to reach surface water. The figure also shows the meteorologic station and stream sampling locations. For more information, please see discussion for 11 AAC 90.163(a)(2)(c).

Meteorologic Station. A small meteorologic station will be located as indicated in Figure 1. It will include instruments to measure temperature, wind speed, precipitation and similar parameters.

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. The project has yet not determined whether work will occur 24 hours/day using two shifts, or whether drilling will occur in a single, half-day shift. The total workforce will include:

- 3 drillers, including the supervisor;
- geologist;
- helicopter pilot & mechanic; and
- occasional visitors such as the project manager, water quality samplers, or environmental specialists.

In general, three drillers and one geologist will be present at the site during active drilling. One or two data loggers will spend approximately a half day at each hole. Others may come and go depending on the work.

Geologists will both observe the drillers and may be transported by helicopters to outcrops or other features for geologic sampling and mapping. In addition, 2-3 hydrologic sampling personnel will come to the well sites to take water quality samples, or to supervise well development and testing. A hydrologic sampling crew will also visit stream sampling sites located in Figure 1, and possibly other stream sampling sites nearby. Geophysical loggers will mostly work off-site but will periodically work at site as holes are completed. It is likely that visitors may periodically be at the site.

Surface Water Sampling. Two or three individuals will occasionally be in the area to take water quality samples from area streams. They will be transported by helicopter. A few sample episodes are expected each year, in which the samplers visit pre-designed sample sites. In addition to taking one or more grab samples from each site to measure water quality, they may install transducers to measure hydrologic stage. The transducer is a small instrument placed on the streambed which measures pressure. It is connected via a cable to a small recording instrument on land and may be stabilized by a piece of rebar. All equipment and rebar will be removed from the site after there is no further need for water quality sampling or streamflow measurements at the site. Samplers will also take samples from the ground-water monitoring wells.

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 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. 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 is separately applying for a Fish Passage Permit from the Department of Fish and Game for the potential water sources without anadromous fish and for a Fish Habitat Permit for the anadromous portion of Canyon Creek. Information collected in 2019 areas beyond Department's anadromous waters catalogue may sometimes be used by anadromous fish. The project will apply for a Fish Habitat Permit if it withdraws water from these sources, whether or not they are listed in DF&G Catalogue of Anadromous Waters.

For more information, please see the discussion for 11 AAC 167(n).

Reclamation. Except for minor excavation to level the drill platform or to construct a sump for drill cuttings, no significant ground disturbance is expected. 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 site and begin drilling a new hole, except that the well casing will 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, except for the well casing. The casing will be elevated approximately two feet above the ground surface, a locking cover will be installed on the casing, and a flag will extend at least four 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 season following the time the wells are removed, the locations should be indistinguishable from the surrounding area.

Per DNR policy, the drill holes will be completely filled using a 50% bentonite and 50% cuttings. The near-surface casing will be removed.

Section II. DNR Application Form

Permit # / Notice # _____

**ALASKA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING LAND & WATER
COAL EXPLORATION
Notice of Intent to Explore
and
Exploration Application**

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

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: Flatland Energy Corporation
Contact: Robert Power, President and CEO
- 1.2 Address of Applicant: c/o Skwentna Roadhouse; PO Box 110
Willow, AK 99688
- 1.3 Telephone Number: 907-600-4638
- 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 5,120 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 Attachment E

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 \$ 1,400 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.

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 _____

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:

- 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.

8.0 Exploration and Reclamation Methods

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):

- Attachment C
- 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.

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:

- Most not applicable
See description
under §167
- 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.

See summary
Also, various sections
Negligible
§163(a)(2)(E)
§163(a)(2)(E)
§167(b)
§167(b)

- 8.2 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.
- 8.4 Give an estimate of the quantity of coal to be removed during the exploration. Specify method used to measure quantity.
- 8.5 Give a detailed estimate of the cost of reclamation of all areas to be affected by exploration activities.

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: R Power Title: President

Address: 693-743 Railway Ave Conroe AB

Applicant's Signature: [Signature] Date: 10 June 2022

Subscribed and sworn before me by _____ this the 10 day of June, 2022.

Notary Public: L.M. Power My commission expires N/A.



Note: Attach a copy of power of attorney, or resolution of Board of Directors (the 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
c/o Skwentna Roadhouse
PO Box 110
Willow, AK 99688
Tele: 907-600-4638
E-mail: info@alaskaasia.com
Business License 2153412 valid until 12/31/23

Local contact:

Bob Loeffler, Partner
Jade North, LLC
2543 Brooke Drive
Anchorage, Alaska 99517
Tele: 907-250-4621
E-mail: 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 2022. Field activities will end by the end of October. The project may continue during summer 2023, most likely beginning soon after spring break-up, ending before the end of 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)(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 entire area is state land. There are no existing permits or leases other than the coal lease.

§161(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, 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, archeologic and cultural features, topographic and drainage features and the habitats of endangered or threatened species identified in (2)(A) of this section;

See Appendix C.

§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. Note that the DNR LAS system shows a different owner. The lease owner has changed the corporation's name from DNR records at the time of the award of the lease. The company name is now Flatlands Energy Corporation. Information documenting the name change was submitted to DNR as part of the 2018 Exploration Application. A resolution by the corporation board authorizing the individual signing this application to sign for the board is provided in Attachment E.

§161(a)(6) a description of how the environment will be protected from the adverse impacts of the proposed exploration activities.

See Section I, Summary of the Application, and other sections of this application.

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 lease 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.¹

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. A planning-level wetlands inventory completed for the project shows roughly a similar amount of wetlands acreage. 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.²

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."

Information gathered for this project in 2019 shows a small amount of these species (< 25/reach) use the mainstem through the lease area and Tributaries 1.33 and 1.34. The project will apply for a Title 16 Anadromous Fish Habitat permit for any water used by salmon, whether or not the water is from a reach currently listed in DF&G's anadromous waters catalogue.

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

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

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

was confirmed using U.S. Fish and Wildlife Service maps in 2018 and again this year. See discussion for §167(c).

(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. To reconfirm the conclusion, project personnel contacted Ms. Meitl at the Office of History and Archaeology. She confirmed this conclusion in an e-mail on May 31, 2022.

(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 drilling program is intended to determine subsurface hydrologic information including water quality. The wells will be drilled with SME-45 Drill. Core will be removed from some but possibly not all of the holes and will be removed off-site. If the hole is not cored, drill cuttings will be deposited in a sump or spread on the nearby tundra. The locations are not within 100 feet of a catalogued anadromous fish stream, or any stream used by salmon. In no case will the project allow discharge of drilling muds, drill cuttings, or produced water to reach surface water. The holes will be drilled to a maximum depth of 350-feet. The hole diameter will be approximately 4-inches. The holes will be cased, and sections screened off so that water quality and hydrologic parameters may be tested. The well may be developed using pump tests. If so, produced water will be allowed to seep into the nearby tundra but will not enter surface water or wetlands.

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: Barroid Easy Mud Plus, Soda Ash, and QuikGel Drilling Bentonite. The SDS information for these muds is provided in Attachment D.

Surface disturbance will be limited to occasional hand-leveling and potentially hand-excavation of a 4-foot shallow trench or sump. 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 or sump near the platform. The trench or sump 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 a stream used by salmon. In addition, in no case will the project allow discharge of drilling muds, drill cuttings, or produced water 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 by the end of October. We expect that all of the wells will be drilled in 2022; it depends on whether there is enough time between permit approval and freeze-up. In any case, by the end of October work will stop, any disturbance will be reclaimed, and all equipment will be removed from the site. Winter operations are not anticipated. The project may resume after break-up in 2023, if needed. It will also finish by freeze-up which is expected by the end of October.

Reclamation at each site will occur before the drill and crew leave the site, except the well casings will remain for water quality monitoring. The company has included in this permit application a reclamation bond that is adequate to reclaim the sites and to remove the groundwater monitoring wells when no longer needed.

(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.

(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.³ 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

Appendix C provides maps at the scale indicated in this regulation. Note that there are no existing roads, structures, pipelines, proposed trenches, proposed rights-of-way, or 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), (c), and (d) Extraction of more than 250 tons of coal under an exploration permit...

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

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.

³ DNR's LAS system indicates the lease is owned by a corporation with a different name. The corporation changed its name to Flatlands Energy Corporation. Documentation of the name change was provided to DNR in 2018.

§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, except that the well itself will remain for hydrologic monitoring. Therefore, the greatest amount of potential disturbance that would be required to be reclaimed would be a single drill site and the removal of up to 20 water quality monitoring wells. The project estimates that reclamation of this magnitude could be completed in three, 10-hour days with a helicopter and two laborers.

Category	Cost
Helicopter	\$15,959
Laborers	\$3,900
Materials	\$5,000
Seeding	\$1,000
Subtotal	\$25,859
Contingency @ 30%	\$7,758
Total Bond	\$33,617
Bond held by DNR	\$3,197
New Funds Required	\$30,042

Helicopter cost is estimated from an informal survey of helicopter rates; the estimated cost is \$1,023/hr for a R44 helicopter, including fuel. This helicopter holds seats four people (or three people and gear). The distance from Merrill Field to the northernmost part of the exploration area is approximately 80 miles. We presume two roundtrips to Anchorage each day at approximately 1.6 hours/trip. Further, we estimate 2 additional hours of helicopter time in the field, for a total of 5.2 hours per day or 15.6 hours total: \$15,959.

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 \$65/hr.⁴ The total cost of 60 hours of labor equals approximately \$3,900. Three, 10-hour days is expected to be able to reclaim the wells including filling the well bore, cutting and pulling the near-surface casing, reclaiming any hand-excavated disturbance (if any), and seeding (if necessary). Work is made easier by the fact that the wells are paired: two adjacent wells.

Materials were estimated from experience at \$250/well, or \$5,000 total.

⁴ https://www.labor.state.ak.us/lss/forms/Pamphlet_600_Issue_44.pdf

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 \$1,000 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 40 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 and reconfirmed on May 24, 2022. 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.

§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 Center⁵ is an "upland interior seeding mixture" with:

- 'Nortran' Tufted Hairgrass 40%
- 'Arctared' Red Fescue - 15%
- 'Boreal' Red Fescue - 15%

⁵ Casey Dinkel, DNR Plant Materials Center, personal conversation and e-mail, May 4, 2018.

'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 \$1,000. 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 are likely to be more than sufficient. Therefore the \$1,000 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 disturbance indicate the potential for erosion, the project will implement appropriate BMPs from DEC's User's Manual for Gravel/Rock Aggregate Extraction Projects.⁶

§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

⁶ Many of the BMPs in that manual (available from: http://dec.alaska.gov/water/wnpspc/protection_restoration/bestmgmtpractices/gravel.htm) are only appropriate for larger projects.

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 except for the well themselves which will remain to monitor groundwater.

§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. 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 method⁷ or the float method.⁸

§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. If an R/C drill is used, the cuttings will be placed in a sump or distributed near the well.

§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.

⁷ 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.

⁸ 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 $\text{Streamflow} = (\text{average width}) \times (\text{average depth}) \times (\text{average velocity})$.

Attachment A
Coal Exploration Area, Township Range Description

All descriptions are within the Seward Meridian

T20N, R13W Sections 19, 30, 31	1,920 acres
T20N, R14W Sections 24, 25, 36	1,920 acres
T19N, R13W Section 6	640 acres
<u>T19N, R14W, Section 1</u>	<u>640 acres</u>
Total: 5,120 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. However, the application did use fisheries data collected for the project in 2019. That data was collected by Owl Ridge Natural Resources Consultants, Inc. (907-433-3448; www.owlridge.com). 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

Ron L. Pichler, President
Denali Drilling, Inc.
8240 Petersburg Street
Anchorage, AK 99507
907-440-2290; rpichler@ak.net

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

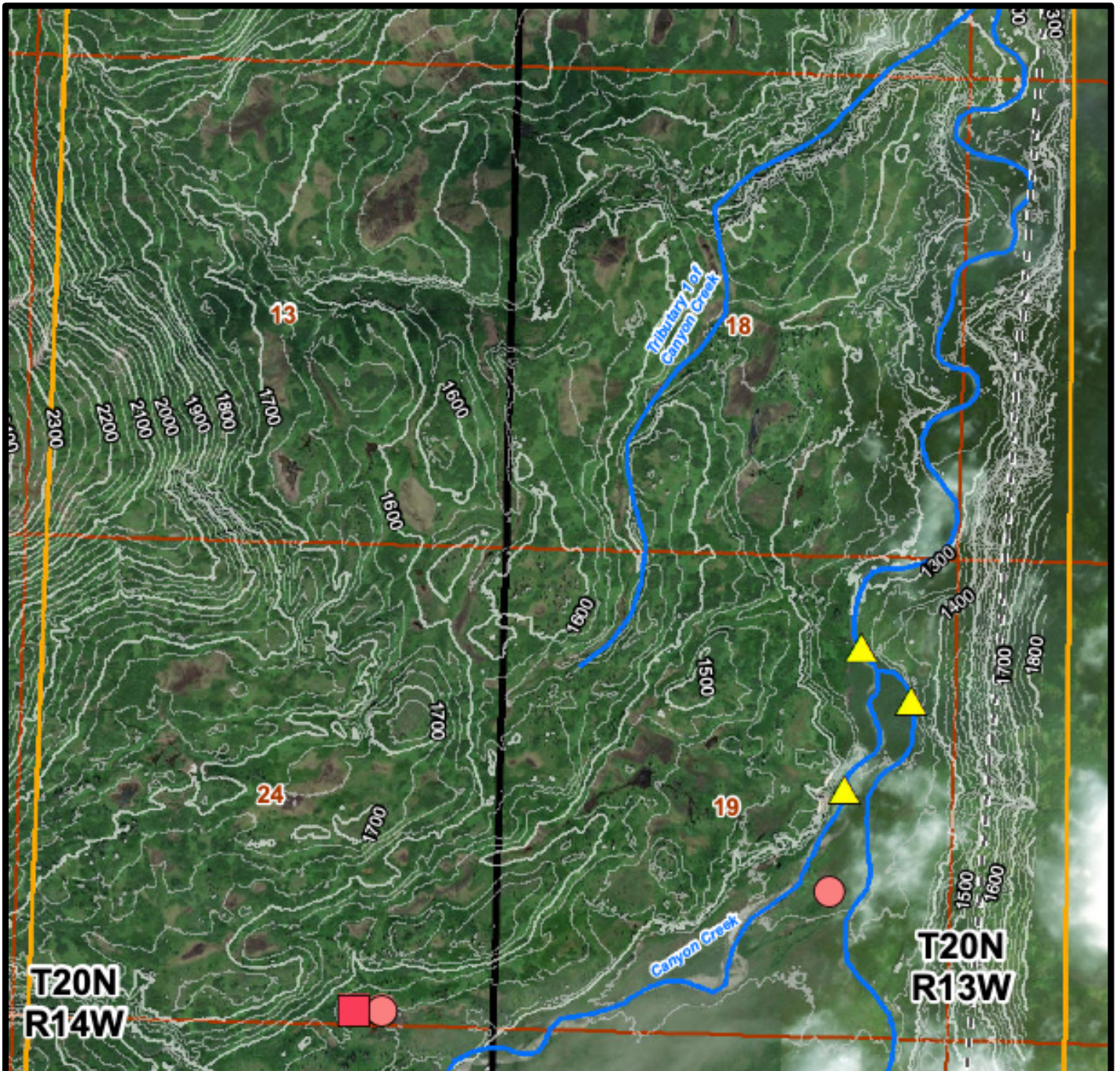
Sarah Meitl, Archaeologist 2
Department of Natural Resources, Office of History and Archaeology
550 W 7th Ave; Suite 1310
Anchorage, AK 99501-3577

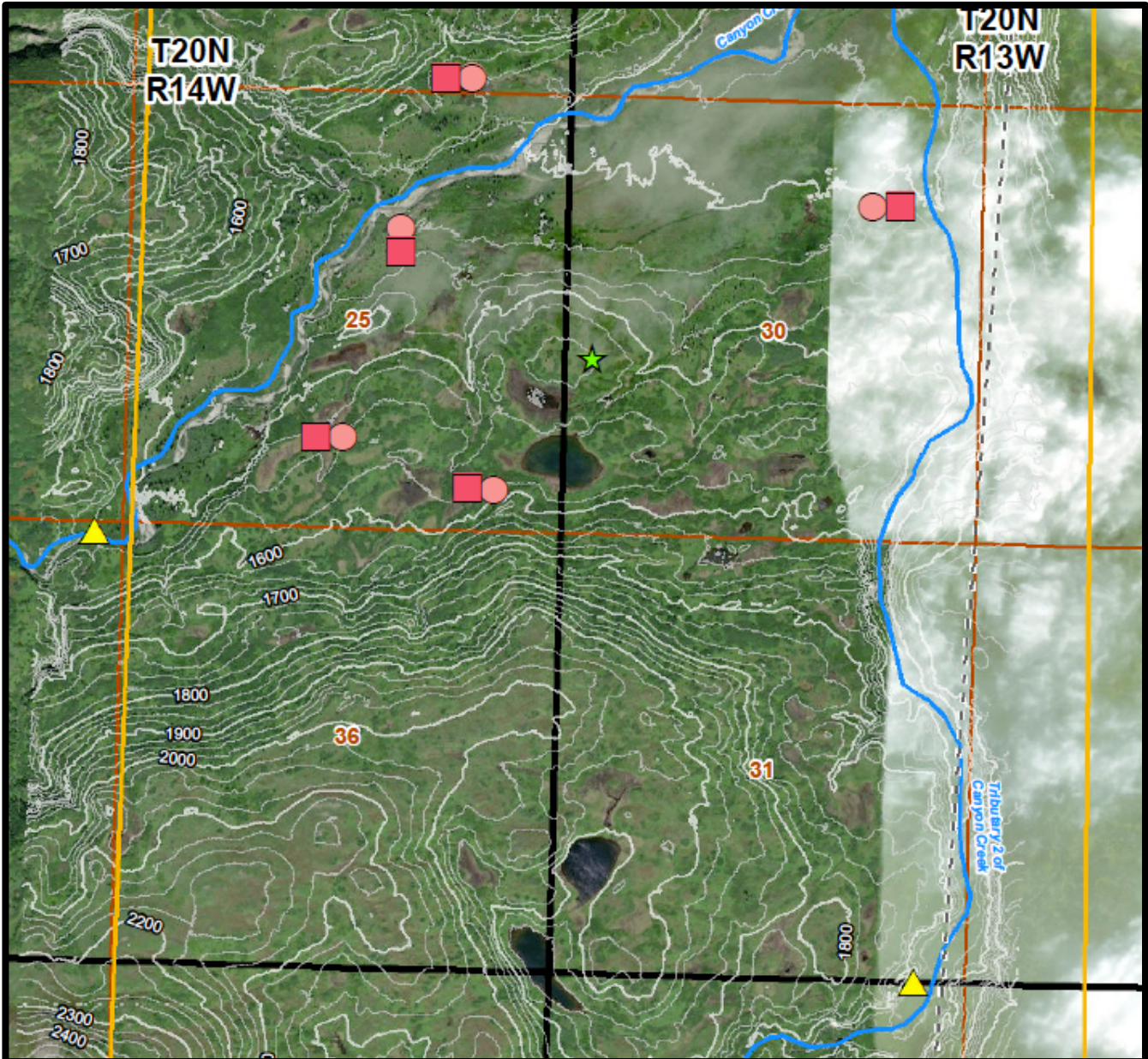
**Attachment C
Required Maps**

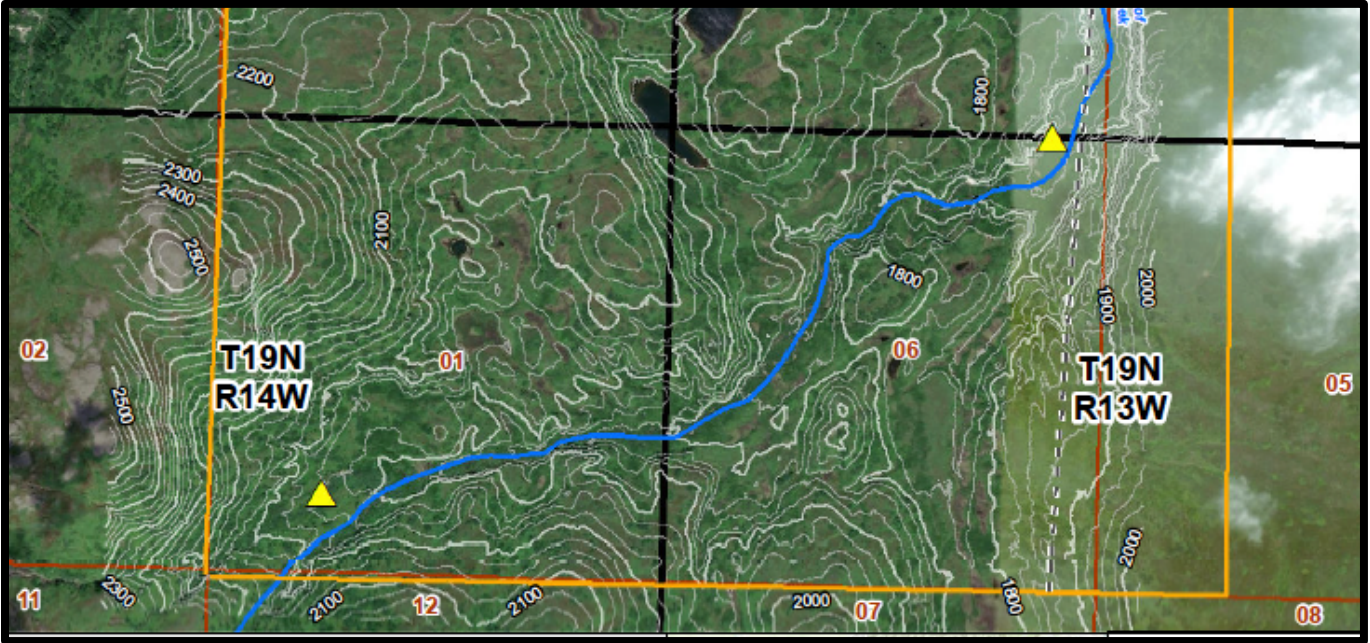
Maps are 1:63,360; enlarged at least 2.5 times

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.

Part 1 of 3







Attachment D SDS Information

The following pages provide SDS information for Barroid Easy Mud Plus, Soda Ash, and QuikGel Drilling Bentonite

SAFETY DATA SHEET

Product Trade Name: EZ-MUD® PLUS

Revision Date: 24-Sep-2018

Revision Number: 25

1. Identification

1.1. Product Identifier

Product Trade Name: EZ-MUD® PLUS
Synonyms None
Chemical Family: Blend
Internal ID Code HM003646

1.2 Recommended use and restrictions on use

Application: Additive
Uses advised against No information available

1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier

Baroid Fluid Services
Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000

Halliburton Energy Services, Inc.
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada
Telephone: 1-403-231-9300

Prepared By Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:

Emergency Telephone Number 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

As adopted by the competent authority, this product does not require an SDS or hazard warning label.

Not classified

2.2. Label Elements

Hazard Pictograms

Signal Word: Not Classified

Hazard Statements Not Hazardous

Precautionary Statements

Prevention None
Response None
Storage None
Disposal None

2.3 Hazards not otherwise classified

None known

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Hydrotreated light petroleum distillate	64742-47-8	10 - 30%	Asp. Tox. 1 (H304)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	1 - 5%	Acute Tox. 3 (H301) Eye Corr. 1 (H318) Aquatic Acute 2 (H401) Aquatic Chronic 3 (H412)

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

Inhalation If inhaled, move victim to fresh air and seek medical attention.
Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Skin Wash with soap and water. Get medical attention if irritation persists. Remove contaminated shoes and discard.
Ingestion Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

4.2 Most important symptoms/effects, acute and delayed

Causes eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

5.2 Specific hazards arising from the substance or mixture

Special exposure hazards in a fire

Decomposition in fire may produce harmful gases. Use water spray to cool fire exposed surfaces.

5.3 Special protective equipment and precautions for fire-fighters

Special protective equipment for firefighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Ensure adequate ventilation.

See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling

Handling Precautions

Avoid contact with eyes, skin, or clothing. Avoid breathing vapors. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Information

Store away from oxidizers. Keep container closed when not in use. Product has a shelf life of 12 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Hydrotreated light petroleum distillate	64742-47-8	Not applicable	Not applicable
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Not applicable	Not applicable

8.2 Appropriate engineering controls

Engineering Controls

A well ventilated area to control dust levels. Local exhaust ventilation should be used in areas without good cross ventilation.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

Not normally needed. But if significant exposures are possible then the following respirator is recommended:

Organic vapor respirator with a dust/mist filter. (A2P2/P3)

Hand Protection

Impervious rubber gloves.

Skin Protection

Rubber apron.

Eye Protection

Chemical goggles; also wear a face shield if splashing hazard exists.

Other Precautions

None known.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid	Color	White to gray
Odor: Mild hydrocarbon	Odor Threshold:	No information available

<u>Property</u> Remarks/ - Method	<u>Values</u>
pH:	No data available
Freezing Point / Range	No data available
Melting Point / Range	No data available
Pour Point / Range	No data available
Boiling Point / Range	175 °C / 347 °F
Flash Point	> 93 °C / > 200 °F (PMCC)
Flammability (solid, gas)	No data available
Upper flammability limit	No data available
Lower flammability limit	No data available
Evaporation rate	< 1
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	1
Water Solubility	Partly soluble
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

VOC Content (%)	No data available
------------------------	-------------------

10. Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

Keep away from heat, sparks and flame.

10.5. Incompatible materials

Strong oxidizers.

10.6. Hazardous decomposition products

Ammonia. Oxides of nitrogen. Carbon monoxide and carbon dioxide.

11. Toxicological Information

11.1 Information on likely routes of exposure

Principle Route of Exposure Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics**Acute Toxicity**

Inhalation May cause mild respiratory irritation.
Eye Contact In vitro tests indicate that the product is not an eye irritant.
Skin Contact May cause mild skin irritation.
Ingestion May cause mild gastric distress.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data**Toxicology data for the components**

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Hydrotreated light petroleum distillate	64742-47-8	>5000 mg/kg-bw (rat) (similar substance)	>2000 mg/kg-bw (rabbit) (similar substance)	>5.2 mg/L (rat, 4 h, vapor) (similar substance)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	200-300 mg/kg-bw (rat)	>2000 mg/kg-bw (rabbit)	No data available

Substances	CAS Number	Skin corrosion/irritation
Hydrotreated light petroleum distillate	64742-47-8	Non-irritating to the skin (similar substances)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Non-irritating to the skin Not a dermal irritant

Substances	CAS Number	Serious eye damage/irritation
Hydrotreated light petroleum distillate	64742-47-8	Non-irritating to rabbit's eye (similar substances)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Causes severe eye irritation which may damage tissue. Causes serious eye damage (similar substances)

Substances	CAS Number	Skin Sensitization
Hydrotreated light petroleum distillate	64742-47-8	Did not cause sensitization on laboratory animals (guinea pig) (similar substances)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Did not cause sensitization on laboratory animals (guinea pig)

Substances	CAS Number	Respiratory Sensitization
Hydrotreated light petroleum distillate	64742-47-8	Based on available data, the classification criteria are not met.
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	No information available

Substances	CAS Number	Mutagenic Effects
Hydrotreated light petroleum distillate	64742-47-8	In vitro tests did not show mutagenic effects. In vivo tests did not show mutagenic effects. (similar substances)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	In vitro tests did not show mutagenic effects. In vivo tests did not show mutagenic effects. (similar substances)

Substances	CAS Number	Carcinogenic Effects
Hydrotreated light petroleum distillate	64742-47-8	Did not show carcinogenic effects in animal experiments (similar substances)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Did not show carcinogenic effects in animal experiments (similar substances)

oxy-, branched		
Substances	CAS Number	Reproductive toxicity
Hydrotreated light petroleum distillate	64742-47-8	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments. (similar substances)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydr oxy-, branched	69011-36-5	Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.
Substances	CAS Number	STOT - single exposure
Hydrotreated light petroleum distillate	64742-47-8	No significant toxicity observed in animal studies at concentration requiring classification.
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydr oxy-, branched	69011-36-5	No significant toxicity observed in animal studies at concentration requiring classification.
Substances	CAS Number	STOT - repeated exposure
Hydrotreated light petroleum distillate	64742-47-8	No significant toxicity observed in animal studies at concentration requiring classification. (similar substances)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydr oxy-, branched	69011-36-5	No significant toxicity observed in animal studies at concentration requiring classification.
Substances	CAS Number	Aspiration hazard
Hydrotreated light petroleum distillate	64742-47-8	Aspiration into the lungs may cause chemical pneumonitis including coughing, difficulty breathing, wheezing, coughing up blood and pneumonia, which can be fatal.
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydr oxy-, branched	69011-36-5	Not applicable

12. Ecological Information

12.1. Toxicity

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Hydrotreated light petroleum distillate	64742-47-8	ErL50(72 h)>10000 mg/L (Skeletonema costatum)	LC50(96 h)>10000 mg/L (Scophthalmus maximus) NOELR(28 d)>1000 mg/L (fish)	No information available	LC50(48 h)>10000 mg/L (Acartia tonsa) NOELR(21 d)=1000 mg/L (Daphnia magna)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	IC50(72 h)=1-10 mg/L (Desmodesmus subspicatus)	LC50(96 h)=1-10 mg/L (Cyprinus carpio)	No information available	EC50(48 h)=1-10 mg/L (Daphnia magna) EC50(21 d)=0.37 mg/L (Daphnia magna)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Hydrotreated light petroleum distillate	64742-47-8	Readily biodegradable (68.1% @ 28d)
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Readily biodegradable (> 60% @ 28d)

12.3. Bioaccumulative potential

Substances	CAS Number	Bioaccumulation
Hydrotreated light petroleum distillate	64742-47-8	No information available
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	LogPow=4.9

12.4. Mobility in soil

Substances	CAS Number	Mobility
------------	------------	----------

Hydrotreated light petroleum distillate	64742-47-8	No information available
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	No information available

12.5 Other adverse effects

No information available

13. Disposal Considerations**13.1. Waste treatment methods**

Disposal methods Disposal should be made in accordance with federal, state, and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. Transport Information**US DOT**

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

Canadian TDG

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

IMDG/IMO

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

IATA/ICAO

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

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

Special Precautions for User None

15. Regulatory Information**US Regulations**

US TSCA Inventory All components listed on inventory or are exempt.

TSCA Significant New Use Rules - S5A2

Substances	CAS Number	TSCA Significant New Use Rules - S5A2
Hydrotreated light petroleum distillate	64742-47-8	Not applicable

Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Not applicable
--	------------	----------------

EPA SARA Title III Extremely Hazardous Substances

Substances	CAS Number	EPA SARA Title III Extremely Hazardous Substances
Hydrotreated light petroleum distillate	64742-47-8	Not applicable
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Not applicable

EPA SARA (311,312) Hazard Class

None

EPA SARA (313) Chemicals

Substances	CAS Number	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Hydrotreated light petroleum distillate	64742-47-8	Not applicable	Not applicable
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Not applicable	Not applicable

EPA CERCLA/Superfund Reportable Spill Quantity

Substances	CAS Number	CERCLA RQ
Hydrotreated light petroleum distillate	64742-47-8	Not applicable
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Not applicable

EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65

Substances	CAS Number	California Proposition 65
Hydrotreated light petroleum distillate	64742-47-8	Not applicable
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Not applicable

U.S. State Right-to-Know Regulations

Substances	CAS Number	MA Right-to-Know Law	NJ Right-to-Know Law	PA Right-to-Know Law
Hydrotreated light petroleum distillate	64742-47-8	Not applicable	Not applicable	Not applicable
Poly(oxy-1,2-ethanediyl), .alpha.-tridecyl-.omega.-hydroxy-, branched	69011-36-5	Not applicable	Not applicable	Not applicable

NFPA Ratings:

Health 0, Flammability 1, Reactivity 0

HMIS Ratings:

Health 0, Flammability 1, Reactivity 0, PPE: C

Canadian Regulations

Canadian Domestic Substances List (DSL) All components listed on inventory or are exempt.

16. Other information**Preparation Information****Prepared By**

Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date:

24-Sep-2018

Reason for Revision SDS sections updated:
2

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet

bw – body weight

CAS – Chemical Abstracts Service

d - day

EC50 – Effective Concentration 50%

ErC50 – Effective Concentration growth rate 50%

h - hour

LC50 – Lethal Concentration 50%

LD50 – Lethal Dose 50%

LL50 – Lethal Loading 50%

mg/kg – milligram/kilogram

mg/L – milligram/liter

mg/m³ - milligram/cubic meter

mm - millimeter

mmHg - millimeter mercury

NIOSH – National Institute for Occupational Safety and Health

NTP – National Toxicology Program

OEL – Occupational Exposure Limit

PEL – Permissible Exposure Limit

ppm – parts per million

STEL – Short Term Exposure Limit

TWA – Time-Weighted Average

UN – United Nations

w/w - weight/weight

Key literature references and sources for data

www.ChemADVISOR.com/

OSHA

ECHA C&L

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet

SAFETY DATA SHEET

SODA ASH

Product Trade Name:

Revision Date: 24-Apr-2017

Revision Number: 42

1. Identification

1.1. Product Identifier

Product Trade Name: SODA ASH
Synonyms: None
Chemical Family: Carbonate
Internal ID Code: HM001822

1.2 Recommended use and restrictions on use

Application: Buffer
Uses advised against: No information available

1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier

Halliburton Energy Services, Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431
Telephone: 1-281-871-6107

Halliburton Energy Services, Inc.
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada

Prepared By: Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number

Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

Serious Eye Damage/Irritation

Category 2 - H319

2.2. Label Elements

Hazard Pictograms



Signal Word:	Warning
Hazard Statements	H319 - Causes serious eye irritation
Precautionary Statements	
Prevention	P264 - Wash face, hands and any exposed skin thoroughly after handling P280 - Wear eye protection/face protection
Response	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing P337 + P313 - If eye irritation persists: Get medical advice/attention
Storage	None
Disposal	None

2.3 Hazards not otherwise classified

None known

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Sodium carbonate	497-19-8	60 - 100%	Eye Irrit. 2 (H319)

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Ingestion	Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

4.2 Most important symptoms/effects, acute and delayed

Causes eye irritation

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons

None known.

5.2 Specific hazards arising from the substance or mixture

Special exposure hazards in a fire

Decomposition in fire may produce harmful gases.

5.3 Special protective equipment and precautions for fire-fighters

Special protective equipment for firefighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.

See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling

Handling Precautions

Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Information

Store away from acids. Store in a cool, dry location. Product has a shelf life of 60 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Sodium carbonate	497-19-8	Not applicable	Not applicable

8.2 Appropriate engineering controls

Engineering Controls

Use in a well ventilated area. Localized ventilation should be used to control dust levels.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment

If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection

If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective

equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.

Hand Protection	Normal work gloves.
Skin Protection	Normal work coveralls.
Eye Protection	Dust proof goggles.
Other Precautions	None known.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Powder	Color	White
Odor: Odorless	Odor	No information available
	Threshold:	

<u>Property</u>	<u>Values</u>
Remarks/ - Method	
pH:	11.5
Freezing Point / Range	No data available
Melting Point / Range	851 °C
Boiling Point / Range	No data available
Flash Point	No data available
Flammability (solid, gas)	No data available
Upper flammability limit	No data available
Lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	2.5
Water Solubility	Partly soluble
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

Molecular Weight	105.99 g/mole
VOC Content (%)	No data available

10. Stability and Reactivity

10.1. Reactivity

Not expected to be reactive.

10.2. Chemical stability

Stable

10.3. Possibility of hazardous reactions

Will Not Occur

10.4. Conditions to avoid

None anticipated

10.5. Incompatible materials

Strong acids.

10.6. Hazardous decomposition products

Carbon monoxide and carbon dioxide.

11. Toxicological Information

11.1 Information on likely routes of exposure

Principle Route of Exposure Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics

Acute Toxicity

Inhalation	May cause mild respiratory irritation.
Eye Contact	Causes eye irritation.
Skin Contact	Not irritating to skin in rabbits.
Ingestion	Irritation of the mouth, throat, and stomach.

Chronic Effects/Carcinogenicity No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Sodium carbonate	497-19-8	4090 mg/kg (Rat) 2800 mg/kg (Rat)	2210 mg/kg (Mouse) > 2000 mg/kg (Rabbit)	2.3 mg/L (Rat) 2h

Substances	CAS Number	Skin corrosion/irritation
Sodium carbonate	497-19-8	Non-irritating to the skin

Substances	CAS Number	Serious eye damage/irritation
Sodium carbonate	497-19-8	Irritating to eyes

Substances	CAS Number	Skin Sensitization
Sodium carbonate	497-19-8	Not classified

Substances	CAS Number	Respiratory Sensitization
Sodium carbonate	497-19-8	No information available

Substances	CAS Number	Mutagenic Effects
Sodium carbonate	497-19-8	In vivo tests did not show mutagenic effects.

Substances	CAS Number	Carcinogenic Effects
Sodium carbonate	497-19-8	No information available

Substances	CAS Number	Reproductive toxicity
Sodium carbonate	497-19-8	Did not show teratogenic effects in animal experiments.

Substances	CAS Number	STOT - single exposure
Sodium carbonate	497-19-8	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	STOT - repeated exposure
Sodium carbonate	497-19-8	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	Aspiration hazard
Sodium carbonate	497-19-8	Not applicable

12. Ecological Information

12.1. Toxicity**Substance Ecotoxicity Data**

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Sodium carbonate	497-19-8	EC50 242 mg/L (Nitzschia)	TLM24 385 mg/L (Lepomis macrochirus) LC50 310-1220 mg/L (Pimephales promelas) LC50 (96h) 300 mg/L (Lepomis macrochirus)	No information available	EC50 265 mg/L (Daphnia magna) EC50 (48h) 200 – 227 mg/L (Ceriodaphnia sp.)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Sodium carbonate	497-19-8	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Substances	CAS Number	Log Pow
Sodium carbonate	497-19-8	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Sodium carbonate	497-19-8	No information available

12.5 Other adverse effects

No information available

13. Disposal Considerations**13.1. Waste treatment methods**

Disposal methods Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging Follow all applicable national or local regulations.

14. Transport Information**US DOT**

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

Canadian TDG

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

IMDG/IMO

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable

Packing Group: Not applicable
Environmental Hazards: Not applicable

IATA/ICAO

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

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

Special Precautions for User None

15. Regulatory Information**US Regulations**

US TSCA Inventory All components listed on inventory or are exempt.

TSCA Significant New Use Rules - S5A2

Substances	CAS Number	TSCA Significant New Use Rules - S5A2
Sodium carbonate	497-19-8	Not applicable

EPA SARA Title III Extremely Hazardous Substances

Substances	CAS Number	EPA SARA Title III Extremely Hazardous Substances
Sodium carbonate	497-19-8	Not applicable

EPA SARA (311,312) Hazard Class

Acute Health Hazard

EPA SARA (313) Chemicals

Substances	CAS Number	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Sodium carbonate	497-19-8	Not applicable	Not applicable

EPA CERCLA/Superfund Reportable Spill Quantity

Substances	CAS Number	CERCLA RQ
Sodium carbonate	497-19-8	Not applicable

EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65

Substances	CAS Number	California Proposition 65
Sodium carbonate	497-19-8	Not applicable

U.S. State Right-to-Know Regulations

Substances	CAS Number	MA Right-to-Know Law	NJ Right-to-Know Law	PA Right-to-Know Law
Sodium carbonate	497-19-8	Not applicable	Not applicable	Not applicable

NFPA Ratings: Health 2, Flammability 0, Reactivity 0

HMIS Ratings: Health 2, Flammability 0, Physical Hazard 0, PPE: B

Canadian Regulations

Canadian Domestic Substances List (DSL) All components listed on inventory or are exempt.

16. Other information**Preparation Information**

Prepared By Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date: 24-Apr-2017

Reason for Revision SDS sections updated:
2

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet

bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

Key literature references and sources for data

www.ChemADVISOR.com/

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet

SAFETY DATA SHEET

Product Trade Name: QUIK-GEL®

Revision Date: 14-Aug-2017

Revision Number: 20

1. Identification

1.1. Product Identifier

Product Trade Name: QUIK-GEL®
Synonyms: None
Chemical Family: Mineral
Internal ID Code: HM003747

1.2 Recommended use and restrictions on use

Application: Viscosifier
Uses advised against: No information available

1.3 Manufacturer's Name and Contact Details

Manufacturer/Supplier

Baroid Fluid Services
Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000

Halliburton Energy Services, Inc.
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada

Prepared By: Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:

Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

Carcinogenicity	Category 1A - H350
Specific Target Organ Toxicity - (Repeated Exposure)	Category 1 - H372

2.2. Label Elements

Hazard Pictograms



Signal Word:	Danger
Hazard Statements	H350 - May cause cancer by inhalation H372 - Causes damage to organs through prolonged or repeated exposure if inhaled
Precautionary Statements	
Prevention	P201 - Obtain special instructions before use P202 - Do not handle until all safety precautions have been read and understood P260 - Do not breathe dust/fume/gas/mist/vapors/spray P264 - Wash face, hands and any exposed skin thoroughly after handling P270 - Do not eat, drink or smoke when using this product P280 - Wear protective gloves/protective clothing/eye protection/face protection
Response	P308 + P313 - IF exposed or concerned: Get medical advice/attention P314 - Get medical attention/advice if you feel unwell
Storage	P405 - Store locked up
Disposal	P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

2.3 Hazards not otherwise classified

This product contains Wyoming bentonite or other sorptive clays. Crystalline silica forms found in this particular clay are limited to quartz. Extreme temperatures that can generate cristobalite or tridymite are not expected to occur under realistic conditions. In addition, all quartz found in sorptive clays are considered "occluded", i.e., strongly coated with an amorphous silica surface. Occluded quartz has been experimentally-determined to be relatively non-toxic compared to unoccluded quartz. A lack of health effects found in several studies examining occupational exposure to sorptive clays also suggest that chronic inhalation of sorptive clays is not expected to result in silicosis or cancer. In light of these findings OSHA has recently exempted Wyoming bentonite and other sorptive clays from the crystalline silica PEL in §1910.1053(a)(1)(iii).

3. Composition/information on Ingredients

Substances	CAS Number	PERCENT (w/w)	GHS Classification - US
Crystalline silica, quartz	14808-60-7	1 - 5%	Carc. 1A (H350) STOT RE 1 (H372)

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Ingestion	Rinse mouth with water many times.

4.2 Most important symptoms/effects, acute and delayed

Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician

Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media

All standard fire fighting media

Extinguishing media which must not be used for safety reasons

None known.

5.2 Specific hazards arising from the substance or mixture

Special exposure hazards in a fire

None anticipated

5.3 Special protective equipment and precautions for fire-fighters

Special protective equipment for firefighters

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use appropriate protective equipment. Avoid creating and breathing dust. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing.

See Section 8 for additional information

6.2. Environmental precautions

Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up

Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. Handling and storage

7.1. Precautions for safe handling

Handling Precautions

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet. Use appropriate protective equipment.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Storage Information

Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Keep from excessive heat. Do not reuse empty container. Product has a shelf life of 36 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

Substances	CAS Number	OSHA PEL-TWA	ACGIH TLV-TWA
Crystalline silica, quartz	14808-60-7	TWA: 50 µg/m ³	TWA: 0.025 mg/m ³

Exposures to crystalline silica that result from bentonite or other sorptive clays are exempt from the PEL in §1910.1053. The PEL in §1910.1000 Table Z-3 (i.e., the formula that is approximately equivalent to 100 µg/m³) applies to occupational exposures to respirable crystalline silica from sorptive clays.

8.2 Appropriate engineering controls

Engineering Controls Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection Not normally needed. But if significant exposures are possible then the following respirator is recommended:

Dust/mist respirator. (N95, P2/P3)

Hand Protection Normal work gloves.

Skin Protection Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

Eye Protection Wear safety glasses or goggles to protect against exposure.

Other Precautions None known.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Powder **Color** Various
Odor: Mild earthy **Odor** No information available
Threshold:

<u>Property</u>	<u>Values</u>
Remarks/ - Method	
pH:	8-10
Freezing Point / Range	No data available
Melting Point / Range	No data available
Boiling Point / Range	No data available
Flash Point	No data available
Flammability (solid, gas)	No data available
Upper flammability limit	No data available
Lower flammability limit	No data available
Evaporation rate	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	2.6
Water Solubility	Partly soluble
Solubility in other solvents	No data available
Partition coefficient: n-octanol/water	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Viscosity	No data available
Explosive Properties	No information available
Oxidizing Properties	No information available

9.2. Other information

VOC Content (%) No data available

10. Stability and Reactivity

10.1. Reactivity
 Not expected to be reactive.

10.2. Chemical stability
 Stable

10.3. Possibility of hazardous reactions
 Will Not Occur

10.4. Conditions to avoid
 None anticipated

10.5. Incompatible materials
 Hydrofluoric acid.

10.6. Hazardous decomposition products
 Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).

11. Toxicological Information

11.1 Information on likely routes of exposure
Principle Route of Exposure Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics

Acute Toxicity

Inhalation

Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).

- Eye Contact**
- Skin Contact**
- Ingestion**

May cause mechanical irritation to eye.
 None known.
 None known.

Chronic Effects/Carcinogenicity

Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology

Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2). There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

This product contains Wyoming bentonite or other sorptive clays. Crystalline silica forms found in this particular clay are limited to quartz. Extreme temperatures that can generate cristobalite or tridymite are not expected to occur under realistic conditions. In addition, all quartz found in sorptive clays are considered "occluded", i.e., strongly coated with an amorphous silica surface (Wendlandt et al., 2007; Hochella and Muryama, 2010; SMI, 2014). Occluded quartz has been experimentally-determined to be relatively non-toxic compared to unoccluded quartz (Geh et al., 2006; Creutzenberg et al., 2008). A lack of health effects found in several studies examining occupational exposure to sorptive clays also suggest that chronic inhalation of sorptive clays is not expected to result in silicosis or cancer (Waxweiler et al., 1988; ACGIH, 1991; USEPA, 1996; IARC, 2005). In light of these findings OSHA has recently exempted Wyoming bentonite and other sorptive clays from the crystalline silica PEL in §1910.1053(a)(1)(iii).

11.3 Toxicity data

Toxicology data for the components

Substances	CAS Number	LD50 Oral	LD50 Dermal	LC50 Inhalation
Crystalline silica, quartz	14808-60-7	> 15000 mg/kg (human)	No data available	No data available

Substances	CAS Number	Skin corrosion/irritation
Crystalline silica, quartz	14808-60-7	Non-irritating to the skin

Substances	CAS Number	Serious eye damage/irritation
Crystalline silica, quartz	14808-60-7	Non-irritating to the eye

Substances	CAS Number	Skin Sensitization
Crystalline silica, quartz	14808-60-7	No information available.

Substances	CAS Number	Respiratory Sensitization
Crystalline silica, quartz	14808-60-7	No information available

Substances	CAS Number	Mutagenic Effects
Crystalline silica, quartz	14808-60-7	Not regarded as mutagenic.

Substances	CAS Number	Carcinogenic Effects
Crystalline silica, quartz	14808-60-7	Contains crystalline silica which may cause silicosis, a delayed and progressive lung disease. The IARC and NTP have determined there is sufficient evidence in humans of the carcinogenicity of crystalline silica with repeated respiratory exposure.

Substances	CAS Number	Reproductive toxicity
Crystalline silica, quartz	14808-60-7	No information available

Substances	CAS Number	STOT - single exposure
Crystalline silica, quartz	14808-60-7	No significant toxicity observed in animal studies at concentration requiring classification.

Substances	CAS Number	STOT - repeated exposure
Crystalline silica, quartz	14808-60-7	Causes damage to organs through prolonged or repeated exposure if inhaled: (Lungs)

Substances	CAS Number	Aspiration hazard
Crystalline silica, quartz	14808-60-7	Not applicable

12. Ecological Information

12.1. Toxicity

Substance Ecotoxicity Data

Substances	CAS Number	Toxicity to Algae	Toxicity to Fish	Toxicity to Microorganisms	Toxicity to Invertebrates
Crystalline silica, quartz	14808-60-7	EC50 (72 h) =440 mg/L (Selenastrum capricornutum)(similar substance)	LL0 (96 h) =10000 mg/L (Danio rerio)(similar substance)	No information available	LL50 (24 h) >10000 mg/L (Daphnia magna)(similar substance)

12.2. Persistence and degradability

Substances	CAS Number	Persistence and Degradability
Crystalline silica, quartz	14808-60-7	The methods for determining biodegradability are not applicable to inorganic substances.

12.3. Bioaccumulative potential

Substances	CAS Number	Log Pow
Crystalline silica, quartz	14808-60-7	No information available

12.4. Mobility in soil

Substances	CAS Number	Mobility
Crystalline silica, quartz	14808-60-7	No information available

12.5 Other adverse effects

No information available

13. Disposal Considerations

13.1. Waste treatment methods

Disposal methods If practical, recover and reclaim, recycle, or reuse by the guidelines of an approved local reuse program. Should contaminated product become a waste, dispose of in a licensed industrial landfill according to federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. Transport Information

US DOT

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

Canadian TDG

UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

IMDG/IMO

UN Number Not restricted
 UN proper shipping name: Not restricted
 Transport Hazard Class(es): Not applicable
 Packing Group: Not applicable
 Environmental Hazards: Not applicable

IATA/ICAO

UN Number Not restricted
 UN proper shipping name: Not restricted
 Transport Hazard Class(es): Not applicable
 Packing Group: Not applicable
 Environmental Hazards: Not applicable

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

Special Precautions for User None

15. Regulatory Information

US Regulations

US TSCA Inventory All components listed on inventory or are exempt.

TSCA Significant New Use Rules - S5A2

Substances	CAS Number	TSCA Significant New Use Rules - S5A2
Crystalline silica, quartz	14808-60-7	Not applicable

EPA SARA Title III Extremely Hazardous Substances

Substances	CAS Number	EPA SARA Title III Extremely Hazardous Substances
Crystalline silica, quartz	14808-60-7	Not applicable

EPA SARA (311,312) Hazard Class

Chronic Health Hazard

EPA SARA (313) Chemicals

Substances	CAS Number	Toxic Release Inventory (TRI) - Group I	Toxic Release Inventory (TRI) - Group II
Crystalline silica, quartz	14808-60-7	Not applicable	Not applicable

EPA CERCLA/Superfund Reportable Spill Quantity

Substances	CAS Number	CERCLA RQ
Crystalline silica, quartz	14808-60-7	Not applicable

EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65

Substances	CAS Number	California Proposition 65
Crystalline silica, quartz	14808-60-7	carcinogen

U.S. State Right-to-Know Regulations

Substances	CAS Number	MA Right-to-Know Law	NJ Right-to-Know Law	PA Right-to-Know Law
Crystalline silica, quartz	14808-60-7	Carcinogen Extraordinarily hazardous	1660	Present

NFPA Ratings: Health 0, Flammability 0, Reactivity 0

HMIS Ratings: Health 0*, Flammability 0, Physical Hazard 0, PPE: E

Canadian Regulations

Canadian Domestic Substances List (DSL) All components listed on inventory or are exempt.

16. Other information

Preparation Information

Prepared By Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date: 14-Aug-2017

Reason for Revision SDS sections updated:
2
8
11

Additional information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet

bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

Key literature references and sources for data

www.ChemADVISOR.com/

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The

information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet

Attachment E
Letter of Ownership and Right of Entry

RESOLUTIONS OF THE BOARD OF DIRECTORS

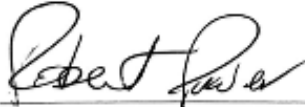
of

FLATLANDS ENERGY CORPORATION

BE IT RESOLVED:

1. That the Coal Exploration Application for 2022-2024 with respect to coal lease ADL 553937 is hereby approved; and
2. THAT the Corporation is directed to take such further actions as may be required to finalize the Application and to complete the approval process administered by the Department of natural resources; and
3. THAT the Corporation may make application for any other associated permits, approvals and/or other government approvals and pay such bonds, consulting fees or other requirements as may be appropriate to carry out the exploration program for coal lease ADL 553937; and
4. THAT any officer or director be and is here by authorized and directed to do such acts or things as may be necessary or desirable to give effect to the foregoing; and
5. THAT these resolutions may be signed by the directors in as many counterparts as may be necessary, each of which so signed will be deemed to be an original (and each signed copy sent by electronic facsimile transmission will be deemed to be an original) and such counterparts together will constitute one and the same instrument and notwithstanding the date of execution will be deemed to bear the date set forth below.

These Resolutions are hereby passed and consented to by the signature of the Corporation as at June 7, 2022.



Robert Power - Director



Hugh Bowman - Director

Flatlands Board Resolution – 2022-2023 Field Season

Attachment F Climate and Weather Information

An initial agency comment in 2018 requested climate and weather information for the area. The nearest climate station is in Skwentna. Information from the U.S. Climate Data website⁹ 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).

Climate Skwentna - Alaska

	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	2.31	2.22	1.02	1.06	1.12	1.26
Av. 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	3.21	2.21	3.50
Av. 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

⁹ <https://www.usclimatedata.com/climate/skwentna/alaska/united-states/usak0226>

Attachment G 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.