

# MAP 1; Katalla Project Proposed Oil & Gas Drilling by Cassandra Energy Corporation





# MAP 2; Katalla Area Overview Chugach National Forest Alternative 2



- Private Land
  - Chugach Alaska Corporation (CAC) land from former Oil and Gas Rights
  - National Forest
  - General Spur Fishing Area
  - Zones of Concentrated Fishing
  - Large Cemetery
  - Water
  - Existing Temporary Roadway
  - Trail
  - Stream
- 
- Wells Drilled between 1991 & 1992 - OPR Locations
  - Abandoned Oil Well
  - Dry Hole - shows of oil & gas
  - Dry Hole - shows of gas
  - Dry Hole - shows of oil
- 
- Wells Drilled between 1991 & 1992 - Approximate Locations
  - Abandoned Oil Well
  - Dry Hole - shows of oil & gas
  - Dry Hole - shows of gas
  - Dry Hole
- 
- ✕ Proposed Drill Site (Debraa Serran #1)
  - ✕ Proposed Drilling Location
  - 1985 Drilling Platform (R/O 1)
  - Building
  - Oil Refinery
  - ▲ Eagle Nest
  - ⊕ Staging Area



# Alternative 2 Road Location



September 16, 2002



# MAP 3; Katalla Area Overview Chugach National Forest Alternative 3



- Private Land
  - Chugach Alaska Corporation (CAC) Katalla Area Reserved Oil and Gas Rights
  - National Forest
  - General Sport Fishing Area
  - Zones of Concentrated Fishing
  - Large Centers
  - Water
  - Proposed Road Temporary Roadway (Temporary Roadway not on an existing road)
  - Existing Proposed Roadway
  - Trail
  - Stream
- 
- Wells Drilled between 1981 & 1982 - CDFP Locations
  - Abandoned Oil Well
  - Dry Hole - down of oil & gas
  - Dry Hole - down of gas
  - Dry Hole - down of oil
  - Dry Hole - down of oil & gas
  - Dry Hole - down of gas
  - Dry Hole
- 
- ✕ Proposed Crude Oil Line (Chugach Service Road)
  - ✕ Proposed Drains Location
  - ✕ 1987 Drilling Platform (2011)
  - Blasting
  - Oil Refinery
  - Oil Storage
  - Eagle Nest
  - Snapping Area

# Alternative 3 Road Location



## Legend

- Existing Temporary Road
- Proposed New Temporary Road Construction

0 195 390 780 1,170 1,560 Feet

September 16, 2002





# Alternative 4 Road Location



- Legend**
- Existing Temporary Road
  - Proposed New Temporary Road Construction



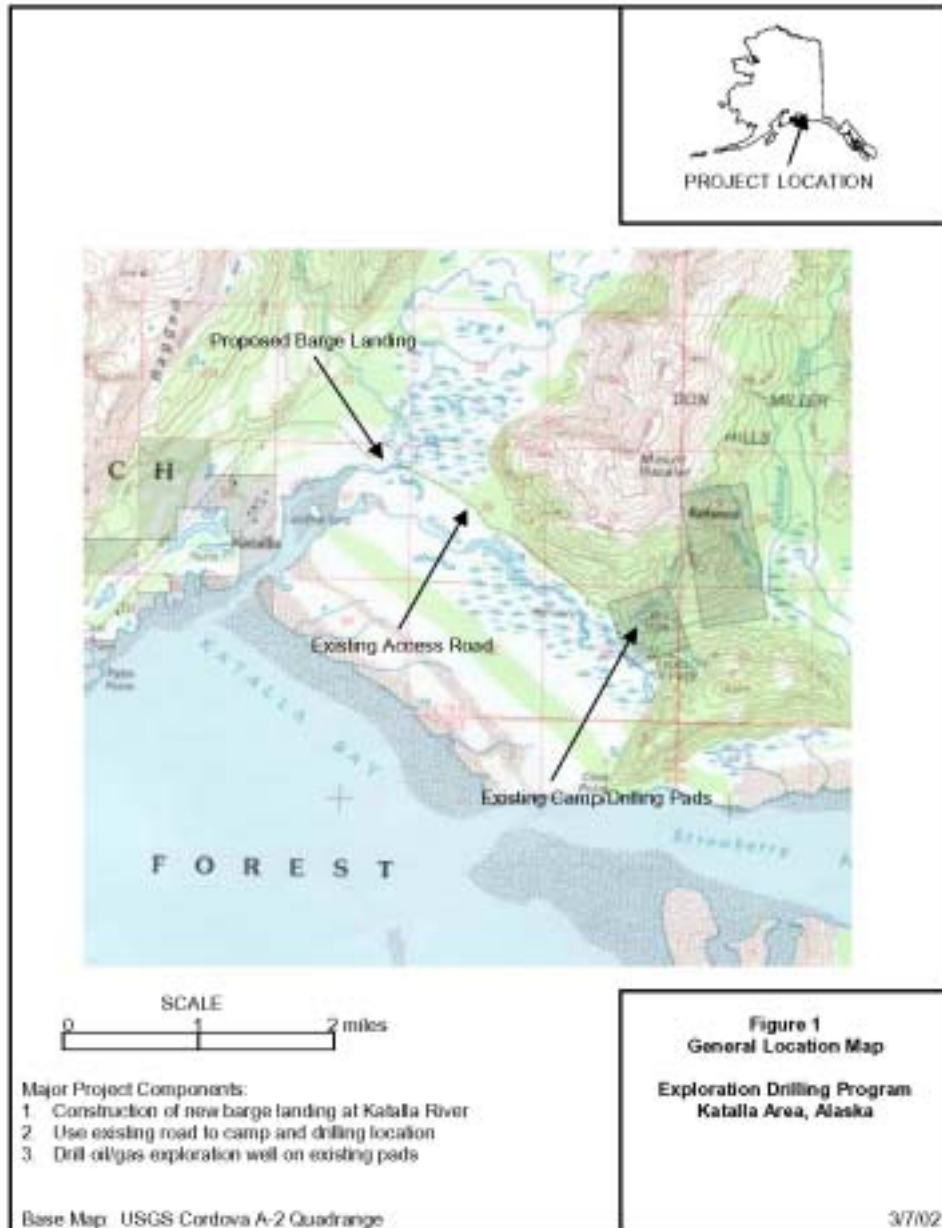
September 9, 2002

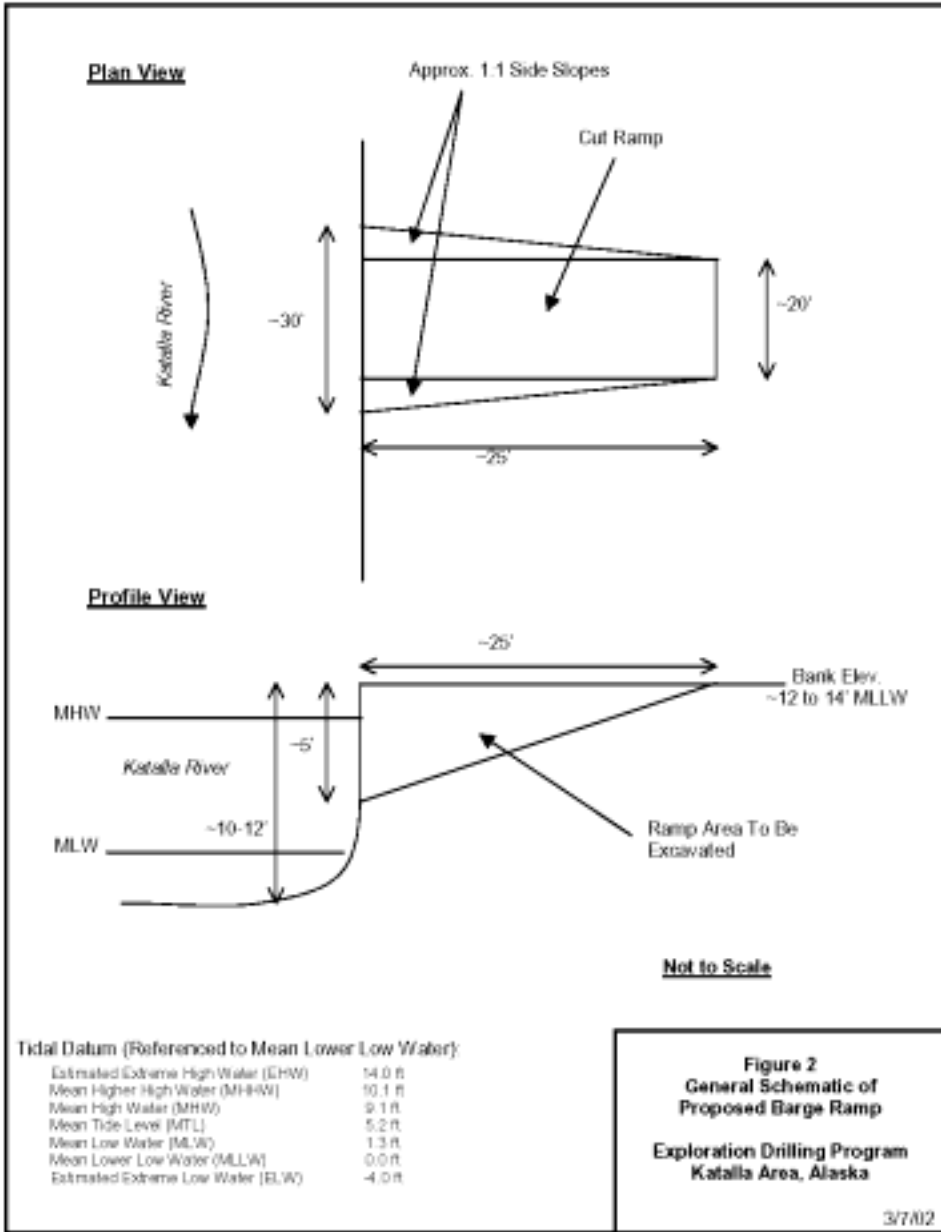


**Appendix B, Location of Large and Small Barge Landing Areas (see attached file).**



**Appendix C, General Location Map Showing Small Barge Landing Ramp in Alternative 2, Schematic of Proposed Barge Ramp and Aerial Photos of Location of Access Ramp to the Katalla River.**







Aerial Photo of Proposed Barge Ramp



Oblique Photo of Proposed Barge Ramp Site

Figure 3  
Photos of Proposed Ramp Location  
Exploration Drilling Program  
Katala Area, Alaska

3/7/02

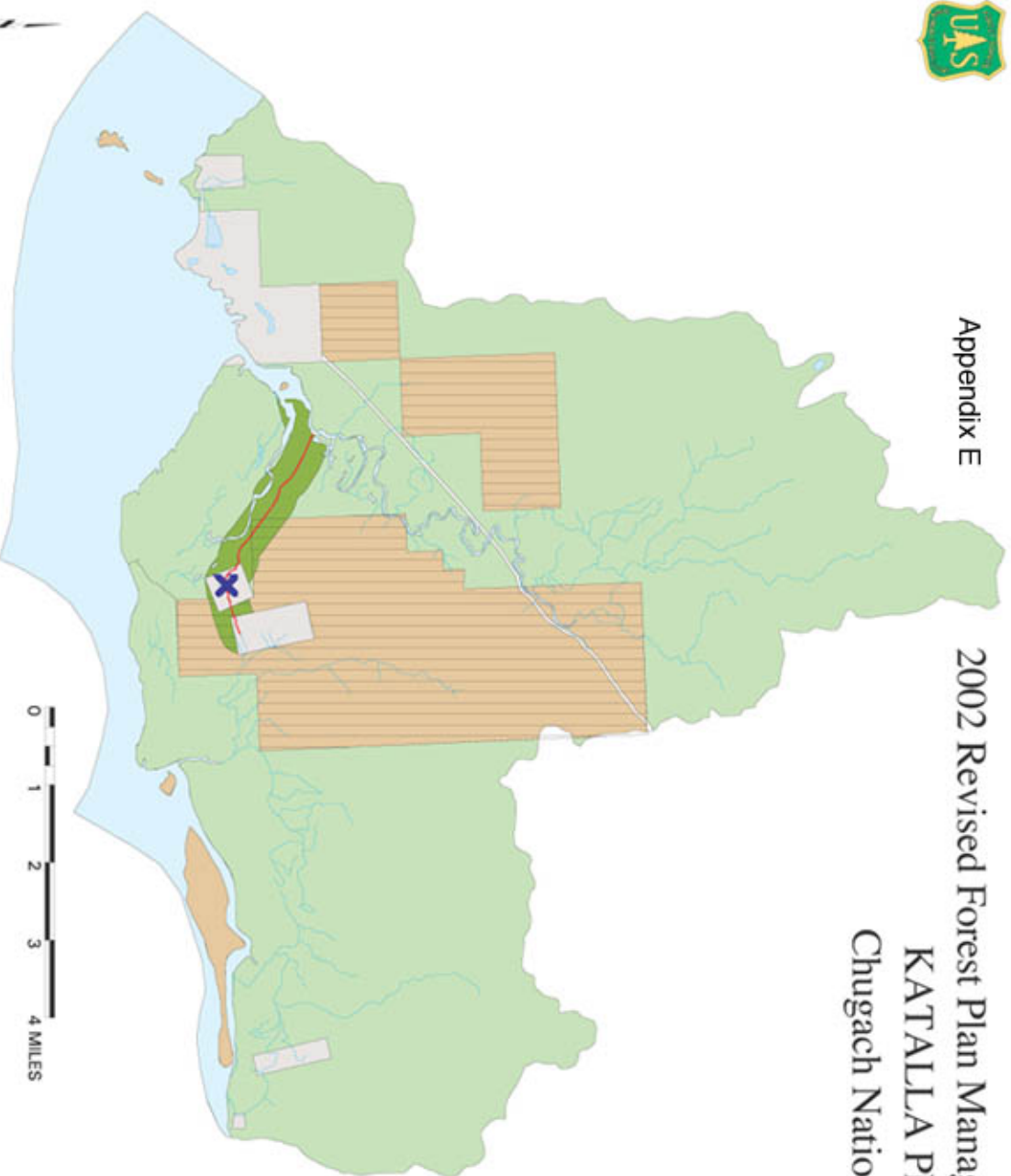
**Appendix D, Photo Examples of Rig Matting used for Temporary Road Base.**







# 2002 Revised Forest Plan Management Area Prescriptions KATALLA PROJECT Chugach National Forest



- Management Area Prescription (Revised Forest Plan, July 2002)
- 135 – ANILCA 501(b)-1
- 213 – ANILCA 501(b)-2
- 521 – Minerals Management
- 522 – Transportation/Utility Corridor
- Private Land
- Water
- Chugach Alaska Corporation (CAC) Katalla Area Reserved Oil and Gas Rights
- Existing Temporary Roadway
- Proposed Drilling Site (Jessica Stevens #1)



## **Appendix F, Response to Comments on First Version of the Katalla Environmental Assessment.**

These are the comments and questions submitted in response to the first 30-day public review and comment period of the Environmental Assessment (EA) on April 30, 2002. Where there has been a need for more discussion or discussion in relation to the alternatives, the responses to these comments have been incorporated into the revised EA.

### **Policy Issues**

**Comment:** Discuss the project in regard to the new Revised Forest Plan.

**Response:** The Revised Forest Plan is being implemented. Chapter 1 of this EA discusses the plan, the land use prescription, land management goals, and other topics relevant to this project.

**Comment:** Several commenters stated that we should prepare an Environmental Impact Statement (EIS) that addresses the prospect of full development. Another commenter quoted the Code of Federal Regulations, which states that a project may have significant effects even if the effect is beneficial and if the effects are likely to be highly controversial. In those cases, an EIS may be required.

**Response:** The finding of no significant impact will be made in the decision notice and will contain an explanation based on significance criteria. Chapter one of the EA gives a description of what would happen if commercial quantities of oil and gas were found. It is under this scenario that an EIS may be written for full development.

The analysis in this EA has found so far that the proposed activities do not appear to have significant effects, and these are of a minor or of a temporal nature. An example would be the positive effects of increased employment, which is certainly important to the individuals employed, but would only last the duration of the project, estimated to be two years.

Many comments asking for an EIS focused on the adverse effects of an oil spill. It should be emphasized that the proposed actions do not call for oil pipelines, transfer facilities, or transport of oil with tankers, which would increase the risk of spills. There is a remote chance that a major spill (greater than 1,000 barrels) could occur from a well blowout (Husky Oil Operations Limited, 2001). However, two mechanical prevention measures would need to fail, and for the most adverse scenario, both high-pressure gas and liquid oil would need to be present. The Division of Oil and Gas, Alaska Department of Natural Resources (2000) reports, "There has never been an oil spill from a platform blowout in Alaska," although other reports indicate there have been blowouts with gas only. While any major spill would be tragic, the Oil Discharge Prevention and Contingency Plan describes the prevention measures and the actions that would be taken to contain a spill.

Since the first EA was written, several other measures have been added as mitigation that would reduce the effects on bears, guided fishing and hunting businesses, migratory birds, and pink salmon. These effects were the ones that appeared to be questioned the most. Although there are still unavoidable adverse effects, such as the anglers being disturbed by barge traffic and noise in the latter part of the season, some of the guides that would be most affected said that the changes would help matters (Ellis, Gratias, Ranney, personal communications).

**Comment:** The EA needs to discuss the cumulative effects of this project in regard to the proposed Carbon Mountain Road and a road from the Carbon Mountain area to Point Matin or Strawberry Point.

**Response:** This is addressed in the cumulative effects section of this EA.

**Comment:** The EA needs to consider the Presidential Executive Order 13212: Actions to Expedite Energy-Related Projects.

**Response:** Executive Order 13212 states that “... agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. The agencies shall take such action to the extent permitted by law and regulation, and where appropriate.” The Chugach National Forest has made this project a top priority for staff members, however, there are a number of complex issues, including the effects on commercial guiding businesses in the immediate area, possible effects on wildlife, and the presence of important salmon spawning areas. There has been substantial public comment that has raised additional issues and concerns. The Forest Service is doing its best to expedite matters while still ensuring safety, health, and environmental protections, and complying with the numerous laws and regulations that relate to oil drilling. As required in other sections of this Executive Order, the Forest Service is working closely with other federal agencies and the State of Alaska with its permitting process.

**Comment:** Native rights must be honored with the approval of the project.

**Response:** Chapter one of the EA describes the mineral, access, and development rights agreed to in the 1982 Chugach Natives Incorporated (CNI) Settlement Agreement. The proposed action is to approve the Plan of Operations and issue a special use permit, which would fulfill the Native rights under the agreement. The purpose of the EA as stated in Chapter one, is to determine what mitigation measures and other conditions are necessary to protect the surface resources of federal lands and conduct the project in an environmentally responsible manner.

**Comment:** The National Marine Fisheries Service has recommended that if payable quantities of oil and gas are found, there should be a multi-agency group that will work on a general management plan for an Environmental Impact Statement.



**Response:** USDA Forest Service officials have indicated that this is a good idea. During the course of the current project, the State of Alaska, Division of Governmental Coordination has organized meetings between CEC and state and federal agencies involved in the permitting process. A similar process or a more formal effort to work more closely together could be done.

**Economic Effects** - A more detailed discussion of the economic effects has been included in the revised EA. Following are some short responses to the comments.

**Comment:** The EA needs to describe the economic benefits this project would provide to Chugach Alaska Corporation shareholders, other Native corporations through their revenue sharing agreements, and the local communities and their economies. The EA should also note that these benefits would be lost if the “no action” alternative is selected.

**Response:** The discussion of economic effects has been expanded in the revised EA to address these issues. It should be noted that the economic benefits are hard to quantify since it is not known whether there are sufficient quantities of gas and oil for development beyond the proposed exploratory activities. Other information, such as the amount of money invested in the corporation, salaries, equipment costs, where supplies will be purchased, etc. are proprietary and are not in the public record.

Mr. William Stevens, president of Cassandra Energy Corporation, has stated that the exploratory operations could employ as many as 66 workers at peak times and 44 to 48 at other times. He said that he will try to hire at least 10% CAC shareholders, which would include residents of Cordova, Tatitlek, and Chenega Bay - the communities nearest to the project area. These would be year-round positions for the duration of the project (two years). Obviously, if the proposed activity is not permitted, the jobs and other economic benefits would not be created. Mr. Stevens anticipates the use of boat and air service companies in Cordova, lodging and restaurants in Cordova when crews change, and miscellaneous purchases. To say much more than this, however, would be speculative.

**Comment:** The economic benefits of the proposed exploration activities need to be balanced with the potential economic impacts to the guided fishing and hunting businesses, and the local economy.

**Response:** In the original EA it was assumed that the main project mobilization with its higher level of barge traffic (50 to 60 barges over two months) could occur during the main fishing and hunting seasons in the fall. The Alaska Department of Fish and Game has recently decided to impose a timing restriction so that there is no barge traffic during the time pink salmon are spawning in the Katalla River, which is roughly from August to mid-September. This would reduce the impacts to the sportfishing for coho salmon along the Katalla River, which occurs from August to the end of September, with the peak from mid August to mid September. The fall hunting is mainly from September to October, so there would be barge traffic during most of this period. However, hunting can occur away from the lower river, so there would be less of an effect.

The applicant has also stated that if the project is approved, the project start-up could begin in the winter of 2002-2003. This would eliminate the heavy barge traffic during the hunting and fishing seasons. There would still be about two to three barge trips per week to bring supplies. Thus, there would be this reduced level of barge traffic during the spring bear hunting season, part of the fall hunting season, and the last few weeks of the coho salmon season.

One guide stated that he could move his clients to more remote locations to avoid disturbances caused by barge traffic (Kirk Ellis, e-mail). This would add the extra cost of flying to those locations (some flying is done anyway), but he probably wouldn't have to cancel hunts.

Barges on the river would detract from the wilderness-like experience for the sportfishing clients. Guides could take their clients to areas upstream from the barge operations, since the coho salmon will have moved farther upstream by September, but they would still have to pass the barges. The presence of a barge two or three times per week could cause clients to cancel or not return, but since the expectations of the clients vary, the effect cannot really be quantified.

Large numbers of drilling workers crowding the fishing areas could mar the experience for those seeking relative solitude and uncrowded conditions. Estimating the number of workers fishing and the number of clients that would be affected would be speculative because of the personal preferences and tolerances of the individuals involved. Mr. Stevens has proposed voluntarily restricting the number of anglers from his camp that go fishing at any given time and says he is willing to work out a solution with the outfitters and guides (William Stevens CEC president, telephone conversation).

The project could have some positive effects for the lodge owners. During the mobilization period before the camp at the drilling area is set up, workers will need accommodations. They could be lodged at the existing cabins, which would be a source of income for the owners in a season when they do not normally have clients. Government agency employees have already rented cabins while conducting surveys and other business. If oil field development were to occur, it is possible that the cabins could be used for lodging industry personnel or regulatory agency employees. The private lands could be leased for access, storage, or other purposes.

**Comment:** Oil and gas production is necessary for the nation's security and economic well-being, thus the permit should be approved.

**Response:** Chapter one of the EA describes how the Revised Forest Plan relates to the proposed exploratory gas and oil drilling. The plan specifically designates the Katalla project area as a Mineral Management Area upon approval of the Plan of Operations. This recognizes that oil and gas production is an appropriate use of National Forest lands and, by implication, is a benefit to the nation. The purpose of the EA is to compare the potential benefits of the project with the possible social and environmental effects.

## **Environmental Effects**

**Comment:** Past drilling activity has not caused any significant environmental damage and the proposed drilling should have even less because of new technology and regulations.

**Response:** Overall, the past activities seem to have been relatively benign. The fish and wildlife populations of the area appear healthy, and the hunters and anglers come to the area because of the relatively pristine, natural setting. In regard to the proposed exploratory drilling, it is the purpose of this EA and the NEPA process to disclose and analyze any possible effects through public comment, consultation with other federal and state agencies, and the review of the permit applications and Plan of Operations. As this comment suggests, the goal is to use the review process and the best available technology to ensure that there are no significant adverse effects.

**Comment:** The proposed activities will have minimal effects to National Forest land.

**Response:** Since the drilling activity itself would occur on private lands, the only effects on National Forest land would be the clearing of up to 2.0 acres of land for a staging area in all three action alternatives, a short ramp in Alternative 2, 0.5 mile of road in Alternative 3, and 550 feet of road in Alternative 4. The staging areas proposed in Alternatives 2 and 4 would be in an old Sitka spruce forest that could take about 250 years to achieve old-growth conditions again unless management practices such as thinning are implemented (Kessler 1982). It is possible that spills or other accidents could affect National Forest lands, but the probability of accidents is low and the Oil Discharge Prevention and Contingency Plan includes measures to minimize effects.

**Comment:** Drilling mud and cuttings should be reinjected, no reserve pits should be allowed.

**Response:** The Plan of Operations call for reinjecting, incinerating, or solidifying the cuttings and muds. Those wastes that cannot be incinerated or reinjected will be stored in a proper container and shipped to an appropriate disposal site.

**Comment:** All standards of the Alaska Department of Natural Resources and Department of Fish and Game should be included to ensure that there is no effect to Essential Fish Habitat.

**Response:** The Plan of Operations must include approved permits from all of the relevant State and Federal agencies before the Forest Service can approve it. Thus, all standards will be included.

**Comment:** Bear populations in the Katalla area could be adversely affected due to the large number of drilling workers that would hunt in their spare time. Bear harvest increased during past periods of oil drilling activity. Guides feel that it took 10 years for

the brown bear population in the Katalla River valley to recover. One guide states that over-harvest of black bear could end his business for 10 years. State harvest limits may protect populations over a large area, but are not sufficient to protect the local abundance that the people in the Katalla area depend on. One guide states that the applicant should agree to restrict the bear hunting activities of his employees and include this in the terms of the permit.

**Response:** The applicant, Mr. William Stevens, president of CEC, has discussed the issue with Dave Crowley, ADF&G area wildlife manager. Mr. Stevens stated in an e-mail message: "Since that conversation we have determined that no bear hunting will be allowed by employees while staying at the camp and, as on any drillsite, no unauthorized firearms will be allowed." The only authorized firearms would be for protection from bears. With these voluntary restrictions, little or no hunting is anticipated.

Including hunting limits in the terms of the permit, as the commenter requested, is beyond the authority of the federal government to restrict individual hunting rights, which are regulated by the State of Alaska.

**Comment:** One guide questioned whether the bear harvest reported by ADF&G was accurate. He stated that in 1985, one guide's inquiries indicated that oil camp workers had killed seven bears. The EA does not mention the possibility that bear harvest was not reported or under-reported.

**Response:** The EA states that the number of bears harvested in 1985 was seven (two black bear and five brown bear). These figures were for the Katalla Valley area. Additional information provided by ADF&G indicates that five brown bear and 11 black bear (16 total) were harvested in the Katalla *region*, which includes the Katalla Valley, the Don Miller Hills to the east and the Ragged Mountains area to the west. It is possible that some of the oil workers shot bears in these areas. No bears were reported shot in defense of life and property (DLP takings) in 1985. Since the regulations require that all sport harvest and DLP takings of bears must be reported to ADF&G, any non-reporting would be illegal. Illegal activities are always a possibility, whether committed by guides, guided hunters, or non-guided hunters.

**Comment:** Increased numbers of drilling workers will increase fishing and hunting pressure. The local populations could decline. The EA mentions that the current fish and game regulations harvest limits manage for sustainable populations, but there is a difference between the currently abundant resources and sustainable levels. "The reduction of a population from plentiful to sustainable is important to local users and to the richness of an area's ecosystem, and the EA must account for it."

**Response:** The hunting issue is discussed above and no increase in hunting pressure is anticipated from drilling workers. William Stevens, president of CEC, has also proposed limiting the number of workers fishing at any one time and not allowing the use of camp freezers for storing fish. He said that he would allow workers to bring some fish for the cook to prepare for immediate consumption. These measures should limit the number of

fish the workers keep and protect the populations. Terry Zeznock, landowner, commented that the guide that operates from his land allows clients to only keep six fish and about 25% do not keep any. One mitigation measure mentioned in the EA is that the Forest Service will monitor harvests to see if a problem develops. Maintaining abundant resources is important, especially salmon, which are a major source of nutrients in the local ecosystems.

The commenter's letter mentions the importance of the resources to local users several times. It should be noted that there are no residents of Katalla, and Cordova is the closest community, about 56 miles away with no road access. One of the guides lives in Cordova, but the others live in other areas of Alaska or out of state. We believe that almost all of the fishing and hunting around Katalla is guided, and the clients are from outside of the local area and many from out of state.

**Comment:** Fish and wildlife effects should be monitored and documented for future analysis.

**Response:** The EA proposes to monitor coho salmon harvests, conduct coho salmon spawning counts if harvests are high, observe barge traffic in the river and its effect on the substrate in spawning areas, monitor eagle nests, monitor bear harvest, and monitor the roads for possible erosion and its effects on streams. The use of water from Arvesta Creek would be authorized under a permit from the State of Alaska and would be monitored by state agencies to ensure water flows do not drop below the permitted levels. All of the data and observations collected would be documented in agency reports.

**Comment:** The ADF&G Habitat Division, U.S. Fish and Wildlife Service, and others suggested having the barge landing site about 500 feet downstream from the site proposed in Alternative 2. They felt that there would be less disturbance of the river bank at this location and less of a chance for introducing sediments into the river and downstream spawning channels.

**Response:** The Forest Service has met with these agencies and discussed this proposal. It is being considered and analyzed as Alternative 4 in the revised EA.

**Comment:** Additional alternatives could include building a road from the Strawberry Harbor area or Katalla Slough.

**Response:** The Katalla Slough channel was measured and was found to be too shallow for barges. Access from Strawberry Harbor would require about 1.5 miles of new road, crossing streams and wetlands. The other alternatives would require much less road building, so this alternative was eliminated from detailed study in the revised EA (chapter 2).

**Comment:** CEC has proposed having a barge landing site downstream from the airstrip. If the barges occupy the main channel of the river, they could interfere with float planes that use the river for landing.

**Response:** As mentioned above, if the main mobilization takes place during the winter, barge traffic is prohibited when pink salmon are present, and only two or three barges per week arrive at other times, the conflicts would be infrequent. There may be ample room for the barges and planes at the same time at high tide, but the size of the plane, wind speed and direction, and the load will determine how much area the planes will need to take off and land. Bob Britch of Northern Consulting Group, who is working on the permits for CEC, agreed that barge schedules, flight needs, and other information can be shared to reduce potential conflicts.

**Comment:** The Oil Discharge Prevention And Contingency Plan (ODPC Plan) should take into consideration the lack of access and low tides. Equipment must be staged so it is available at all tides and not stored 3.5 to 4 miles away.

**Response:** A revision of the ODCP Plan (May 8, 2002) has a discussion of the effects of the tides on spill responses and acknowledges the necessity of having high tides to move equipment upstream. The revised plan states that there will be spill response equipment staged at the drilling site and camp area and also at the Katalla area. The Katalla equipment would include, among other things, small skiffs and absorbent booms for spills in the Katalla River or Katalla Slough. The small skiff could operate along the river at lower tides. Spills at the drilling site or along the road would be handled with equipment stored at the camp and drilling site. The Alaska Department of Environmental Conservation will be responsible for approving the plan. It is currently reviewing the plan, as well as these and other comments.

**Comment:** The possibility of the introduction of exotic plant species needs to be considered and a prevention plan developed.

**Response:** Plant surveys were conducted on National Forest land with all plants identified to species or genus. No exotic plants were found. The USDA Forest Service Guide to Noxious Weed Prevention Practices indicates that the most likely methods of exotic plant transmission would be from transporting roots or seeds contained in mud or dirt in equipment tracks or tires and the use of non-native plant species for revegetation and erosion control. Cleaning equipment before transporting it to the area will minimize the risks of transmission. Only native species will be used for revegetation.

**Comment:** The potential impacts of an oil spill need to be addressed. Recent studies indicate that even very minute quantities of oil can have chronic effects on marine and terrestrial populations.

**Response:** Additional discussion has been added to the revised EA about the potential impacts of oil spills. The Oil Discharge Prevention and Contingency Plan also presents more detailed discussions of how CEC would respond to oil spills of varying sizes, with scenarios including the spill of fuel from a tank truck accident, rupture of a fuel storage tank, and an oil well blowout. It should be noted here that the proposed activities do not

include the building of oil pipelines, large oil storage facilities, or transporting oil in tankers.

Within the scope of the proposed actions, major (greater than 1,000 barrels – 42,000 gallons) spills of crude oil would only occur if there was a well blowout. This could only occur if the drills hit high pressure pockets of gas and/or oil and the pressure could not be controlled through the hydrostatic pressure of the drilling muds, through the blowout prevention equipment, or other means. The detailed description of how these measures work and the responses that would be taken are discussed in detail in the discharge plan. A Canadian environmental effects assessment estimated the possibility of a major blowout as one in 2,600 annually (Husky Oil Operations Limited, 2001).

The impacts of a blowout would depend to a large degree on the amount of liquid oil and its dispersal. The Oil Discharge Prevention and Contingency Plan indicates that some blowouts are mostly gas: “Several blowouts have occurred in southcentral Alaska in the past 20 years; both were at offshore platforms in the Cook Inlet area, were a result of encountering shallow, high-pressure gas, and did not include the release of significant quantities of liquid hydrocarbons.” Belore et al. (1997) present a model on aerial dispersion of oil that factors oil flow rate, size of pipe, gas to oil ratio, and oil droplet size (varying wind speed tends to cancel its own effects). The discharge plan uses this model to conclude that nearly all of the oil would fall to the ground within 6,000 feet, which is about the distance from the drill site to the open ocean at its nearest point. Thus, most of the oil would fall on land or inland waters. Within this radius, about 58% of the area is in the Katalla Slough drainage (1,500 acres), with the remaining area in the Redwood Bay and Strawberry Harbor drainages (1,100 acres). The hills to the north, east, and south could help to contain the oil within the Katalla Slough drainage.

Perhaps one of the greatest concerns would be whether the oil could be contained so it would not contaminate fish habitat or flow into the ocean where it could affect the commercial fisheries, the Copper River Delta and the State Critical Habitat area, Bering River to the east, or, as one commenter mentioned, the Yakataga State Game Refuge to the east.

Absorbent booms, skimmers, and pumps would be used to contain oil that enters the streams. Several small skiffs, booms, and other equipment will be staged at the downstream landing site for deployment in Katalla Slough. Materials and equipment for Redwood Creek and other streams would need to be helicoptered to the sites. Most of the streams in these areas flow into protected, relatively placid estuarine channels, which could make oil recovery easier.

Actual impacts would depend on spill size, time of year, weather (for dispersal or ability to respond), and a number of other factors. Given that most of the spill would be on land and in the Katalla Slough drainage, and that the oil may be more easily contained in the slough channels, potential impacts of a spill over the full 6,000-foot radius have been added to the revised EA in chapter 3, page 81.

**Comment:** Pre-stage spill equipment to protect lagoons, river deltas, and barrier islands (Presumably Copper and Bering River deltas, Softuk Lagoon, Kanak Island, Grass Island, and others.)

**Response:** As discussed above, most of the oil would fall on the land. Booms and skiffs prestaged at the lower Katalla River landing site would be used to contain oil in the streams, before it could reach the ocean where it could travel toward the deltas, islands, and lagoons. The contingency plan calls for preparing boats and additional equipment in Cordova if needed. Response time is listed as 34 hours. The Alaska Department of Environmental Conservation is currently reviewing the plan.

**Comment:** The project should be considered in view of the possible effects to the Copper River sockeye (red) salmon run.

**Response:** The amount of oil in the ocean and Copper River Delta, where the Copper River salmon would be located, would be limited because most of the oil from a blowout would be trapped on land or would be contained within the Katalla Slough drainage. Barges could spill fuel oil and other substances, but the risk is low because the materials would be in approved containers and should not be transported in large quantities (relatively).

Adult sockeye could be affected if they came in contact with oil as they return to the rivers to spawn and pass through the coastal area. Smolts heading to sea would also be subject to exposure. Some juvenile sockeye salmon rear in estuaries and could also be affected, but generally they rear in lakes or other freshwater habitats (Thorpe 1994). Exposure would depend on the depth at which the fish are swimming and the depth to which the contaminants are mixed. In the shallow channels of the Copper River Delta, exposure may be greater than in the open ocean. Seasons, weather, amounts of contaminants, and other conditions would all be important factors.

Generally speaking, the spawning and rearing habitat for sockeye salmon are all in inland waters where the oil would not be transported (except for some estuarine rearing area). Thus, while individuals passing through the coastal areas may be affected, the habitat would remain intact.

**Comment:** One factor that should be considered is the effect a spill would have on the commercial fishing industry.

**Response:** Copper River reds and kings (chinook salmon) have been highly promoted and have gained a reputation for quality. A spill in this area, even if the fish were not contaminated, could jeopardize the reputation of the Copper River and Bering River district fish, worth an estimated \$12.9 million in 2001 (approximate ex-vessel price, ADF&G Commercial Fisheries website) and the mainstay of the Cordova economy.

As indicated previously, the probability of a major spill is low, most of the oil from a major blowout would fall on land, and the Oil Discharge Prevention and Contingency



Plan includes measures to contain spills within the Katalla watersheds, which should minimize contamination of the ocean and fishing areas.