Susitna-Watana Hydroelectric Project Document ARLIS Uniform Cover Page

Title: Instream Flow Study Program: helicopter safety procedures manual, 2012 - draft	**SuWa 300**
Author(s) – Personal: Michael R. Lilly, David Brailey	
Author(s) – Corporate: ABR, Inc.-Environmental Research Services R2 Resource Consultants Geo-Watersheds Scientific	
AEA-identified category, if specified:	
AEA-identified series, if specified: Health, safety, and environmental series	
Series (ARLIS-assigned report number): Susitna-Watana Hydroelectric Project document number 300	**Existing numbers on document:** GWS.TR.12.02
Published by: [Anchorage, Alaska : Alaska Energy Authority?, 2012]	**Date published:** May 30, 2012
Published for: Alaska Energy Authority	**Date or date range of report:**
Volume and/or Part numbers:	**Final or Draft status, as indicated:** Draft
Document type: Procedure manual	**Pagination:** ix, 16, 1, 1 leaves
Related work(s):	**Pages added/changed by ARLIS:**
Notes:	

All reports in the Susitna-Watana Hydroelectric Project Document series include an ARLIS-produced cover page and an ARLIS-assigned number for uniformity and citability. All reports are posted online at http://www.arlis.org/susitnadocfinder/

ARLIS
Alaska Resources Library & Information Services

SUSITNA-WATANA HYDRO

INSTREAM FLOW STUDY PROGRAM: HELICOPTER SAFETY PROCEDURES MANUAL, 2012 - DRAFT

Health, Safety, and Environmental Series

R44 helicopter on Susitna River gravel bar, 5/2/12, M. Lilly.

by
Michael R. Lilly and David Brailey

May 2012

Susitna-Watana Hydroelectric Project
FERC No. P-14241

Report GWS.TR.12.02

INSTREAM FLOW STUDY PROGRAM: HELICOPTER SAFETY PROCEDURES MANUAL, 2012 – DRAFT

Health, Safety, and Environmental Series

by
Michael R. Lilly[1], David Brailey[2]

An Instream Flow Study Program Procedures Manual Prepared For: The Alaska Energy Authority

813 W. Northern Lights Blvd.
Anchorage, AK 99503

by

ABR, Inc.—Environmental Research & Services
P.O. Box 80410
Fairbanks, AK 99708
&
R2 Resource Consultants
15250 N.E. 95th Street
Redmond, Washington 98052-2518
&
Geo-Watersheds Scientific
PO Box 81538
Fairbanks, Alaska, 99708

May 30, 2012
Susitna-Watana Hydroelectric Project
Report Number GWS.TR.12.02

[1]Geo-Watersheds Scientific, Fairbanks, AK
[2]Brailey Hydrologic, Anchorage, AK

Recommended Citation:
Lilly, M.R., Brailey, D. 2012. Instream Flow Program: Helicopter Safety Procedures Manual, 2012 – Draft: Health, Safety, and Environmental Series. Geo-Watersheds Scientific, Report GWS.TR.12.02. Fairbanks, Alaska. 16 pp (plus appendices).

Fairbanks, Alaska
May 2012

For additional information write to:

Alaska Energy Authority
813 W. Northern Lights Blvd.
Anchorage, AK 99503

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

DISCLAIMER

This document was prepared to address specific safety issues associated with work sponsored by the Alaska Energy Authority (AEA). Neither the AEA, nor any of their employees, make any warranty, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by any agency.

The contents of this document reflect the views of the authors, who are responsible for the accuracy of the data presented herein. The contents of the document do not necessarily reflect the views or policies of the agency or any local sponsor. Neither this work, nor its associated documentation, constitutes a standard, specification, or regulation.

CONVERSION FACTORS, UNITS, WATER QUALITY UNITS, VERTICAL AND HORIZONTAL DATUM, ABBREVIATIONS AND SYMBOLS

Conversion Factors

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter (mm)
inch (in.)	2.54	centimeter (cm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
acre	43560	square feet (ft^2)
acre	0.4047	hectare (ha)
square foot (ft^2)	$3.587X10^{-8}$	square mile (mi^2)
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
gallon (gal)	3.785	liter (l)
gallon (gal)	3785	milliliter (ml)
cubic foot (ft^3)	23.317	liter (l)
Acre-ft	1233	cubic meter (m^3)
	Velocity and Discharge	
foot per day (ft/d)	0.3048	meter per day (m/d)
square foot per day (ft^2/d)	.0929	square meter per day (m^2/d)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/sec)
	Hydraulic Conductivity	
foot per day (ft/d)	0.3048	meter per day (m/d)
foot per day (ft/d)	0.00035	centimeter per second (cm/sec)
meter per day (m/d)	0.00115	centimeter per second (cm/sec)
	Hydraulic Gradient	
foot per foot (ft/ft)	5280	foot per mile (ft/mi)
foot per mile (ft/mi)	0.1894	meter per kilometer (m/km)
	Pressure	
pound per square inch (lb/in^2)	6.895	kilopascal (kPa)

Units
For the purposes of this document, both US Customary and Metric units were employed. Common regulations related to water use in Alaska use combinations of both US Customary and Metric units. The choice of "primary" units employed depended on common reporting standards for a particular property or parameter measured. Whenever possible, the approximate value in the "secondary" units was also provided in parentheses.

Physical and Chemical Water-Quality Units:
Temperature:
Water and air temperature are given in degrees Celsius (°C) and in degrees Fahrenheit (°F). Degrees Celsius can be converted to degrees Fahrenheit by use of the following equation:

$°F = 1.8(°C) + 32$

Vertical Datum:
"Sea level" in the following document refers to the National American Vertical Datum of 1988 (NAVD 88), a geodetic datum derived for United States, Canada, Mexico, and Central America. NAVD88 is based on a geocentric origin and the *Geodetic Reference System 1980.* The vertical datum for the project will be NAVD88 orthometric heights based on the Geoid09 model which was built from NAD83 CORS96 epoch 2002.00 ellipsoid heights.

Horizontal Datum:
The horizontal datum for all locations in this document is the World Geodetic System 1984, otherwise known as WGS84. In most Alaska locations, this is close to the North American Datum of 1983.

Abbreviations, Acronyms, and Symbols

AC	Actual conductivity
ADOT&PF	Alaska Department of Transportation and Public Facilities
ADNR	Alaska Department of Natural Resources
AEA	Alaska Energy Authority
ASTM	American Society for Testing and Materials
atm	Atmospheres
C	Celsius (^{o}C)
cm	Centimeters
DVM	Digital voltage multi-meter
F	Fahrenheit (^{o}F)
ft	Feet
GWS	Geo-Watersheds Scientific
in	Inches
kg	Kilograms
km^2	Square kilometers
kPa	Kilopascal
lb/in^2	Pounds per square inch
m	Meters
mi^2	Square miles
mm	Millimeters
mV	Millivolt
NGVD	National Geodetic Vertical Datum
NRCS	Natural Resources Conservation Service
QA	Quality assurance
QC	Quality control
USACE	U.S. Army Corps of Engineers, Alaska District
USGS	U.S. Geological Survey
WWW	World Wide Web

ACKNOWLEDGEMENTS

This material has been prepared for work supported by the Alaska Energy Authority. Technical reviews were provided by Jayhawk Air staff.

Instream Flow Study Program: Helicopter Safety Procedures Manual, 2012 – Draft

Health, Safety, and Environmental Series

1.0 INTRODUCTION

The Alaska Energy Authority (AEA) is preparing a License Application that will be submitted to the Federal Energy Regulatory Commission (FERC) for the Susitna-Watana Hydroelectric Project (Project) using the Integrated Licensing Process (ILP). The Project is located on the Susitna River, which drains a 20,000 square-mile watershed in southcentral Alaska (Figure 1). The Project's dam site (Watana Dam) will be located at River Mile (RM) 184. The results of this study and of other proposed studies will provide information needed to support the FERC's National Environmental Policy Act (NEPA) analysis for the Project license.

A variety of hydrologic and water-quality models will be needed to assess the Project's impact on river hydraulics, temperatures, ice processes, sediment transport, aquatic resources, and terrestrial resources. A hydraulic flow-routing model of the Susitna River downstream of Watana Dam will be required for the Project impact assessment. USACE's HEC-RAS (River Analysis System) model is being considered for this purpose because of its ability to simulate hourly fluctuations in water-surface elevation caused by load-following operations. Results of the routing model will be used as input for other models needed to simulate various physical and biological processes.

The flow-routing modeling objectives will require field data-collection programs. Many of these efforts will require various applications of helicopter support for transporting field crews, field gear, sling loads of heavy equipment, and general logistical support. Safe use of helicopter resources and associated logistics is a primary objective for the study and the study field staff. This procedure operations manual is part of the Health, Safety and Environmental (HSE) series of manuals to help the study field staff conduct safe and effective field programs.

All study field staff will read this manual at the beginning of each field trip and keep a copy of the manual at each camp location. Key frequency and other information will be kept in field books for reference during all field work. Helicopter pilots will be given a copy of the manual and asked to review and follow its recommendations and implement safer practices whenever required. A copy of the manual will be kept in all helicopters used for the study during study operations.

2.0 STUDY AREA

The primary study area includes the Susitna River mainstem channel between RM 75 and RM 184 (Figure 1). Additional measurements will be performed at inactive USGS stations at RM 26 (Susitna Station), RM 223 (Susitna R. near Cantwell), and in the Susitna delta to help support other studies taking place in these regions. Cross-section and discharge measurements will only be taken at the Susitna River at Susitna Station gauging station in the lower Susitna Watershed. The two additional stations downstream will focus on water-level measurements to help characterize tidal influences in the lower river. The locations of these stations are preliminary at this time and will be finalized after permitting conditions are identified for the lower river.

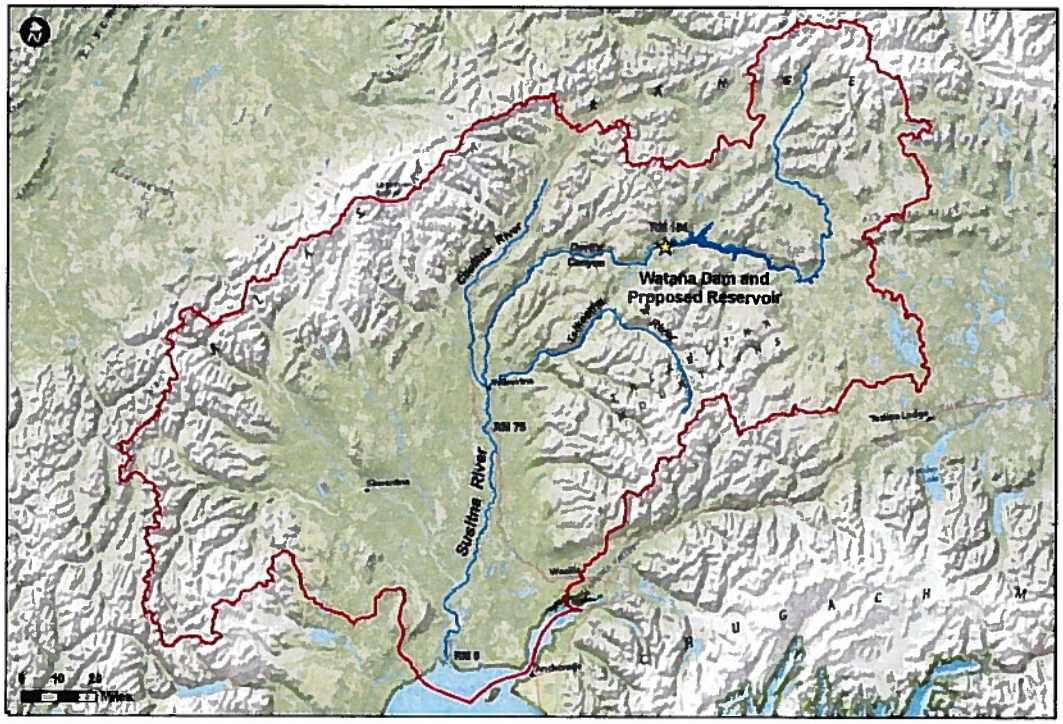

Figure 1. Map of Susitna Watershed. Helicopter flight operations can occur within this area and from points of to/from flight origins.

A variety of stations will be installed in the main river corridor along with a series of data-network repeater stations at various high points to help serve data network needs. The installation of these stations may require sling load operations for station installation activities. The primary base of operations for the study field crews will be in Talkeetna.

3.0 COMMUNICATIONS

Communication is a critical part of any safety plan. Communication by project teams and helicopter operators needs to occur at several different levels. Project teams need to communicate field plans, including anticipated schedules, locations, type of work, and planned helicopter resources to multiple entities, including AEA, other project teams working in the area, and any AEA helicopter logistics coordinators that may be active during field efforts. Helicopter pilots need to communicate on common frequencies used in the study areas to other helicopters that may be working for the project or other entities, and to airport flight services when working in the vicinity of local airports such as Talkeetna and Willow.

The Very High Frequency (VHF) civil aviation band extends from 108 to 136 MHz. The range between 118 and 136 MHz (720 channels if for general aviation communication. 123.1 MHz is a common Search and Rescue/Civil Air Patrol frequency. Ground crews have to use different frequencies for handheld radios than air to air frequencies. Helicopters need to be able to monitor the Project ground-to-air preferred frequencies over their headset communication systems.

Planning and safety meetings will occur at the beginning of each day and will include pilot briefings, trip-plan confirmations, and evaluation of any safety concerns.

The following practices should be considered by helicopter flight pilots;

- Monitor radio frequency 123.6 MHz while working in the vicinity of the Talkeetna Airport, coordinating with Talkeetna Flight Services when required;
- Monitor radio frequency 122.9 MHz while working in the general middle and upper basin areas;
- The preferred frequency for ground to air communications is 151.625 or 154.600 MHz;
- Anticipate other helicopter operators in area and report location periodically or when contact is made with another helicopter(s) working in the same area;
- When coming into contact with other helicopters new to the area, inform pilots of general activities and potential hazards in the main operating areas;
- Pilots will carry a satellite phone with the helicopter and cards to give out with the satellite phone number to field crews. The helicopter satellite phone will be used primarily for emergency communications. Pilots will record the satellite phone numbers of field crews they are supporting to help communicate with ground crews in emergency situations;
- Pilots will ensure the helicopter emergency location transmitter (ELT) is functioning each day and that all passengers are briefed on its location and operation;
- Field crews will be using helicopter helmets. Standard communication ports should be available for each passenger seat and tested to be functional each day.

The following communication practices should be considered on behalf of the helicopter passengers;

- Monitor radio frequency 122.9 MHz for helicopter frequencies while working in the general middle and upper basin areas;
- The preferred frequency for ground to air communications is 151.625 or 154.600 MHz;
- The pilot will contact field crews on the radio using the air-to-ground fruencies when coming in for pickup or checking on status of field crews, radios should be kept on and in a location to easily access;
- Only one person should communicate with the aircraft;
- Describe landing zones, when new to the pilot in question;
- Describe any hazards such as trees, poles, wires, etc.;
- Give wind direction. Note that wind direction is reported by the direction from which the wind originates;
- Notify pilot when aircraft is in sight of your location;
- Stand with back facing upwind with hands raised overhead;
- Leave landing zone when helicopter is on ¼ mile final or when directed by pilot;
- Approach aircraft only under the direction of the pilot;
- Never, under any circumstances, approach from the rear of the helicopter, always approach from front or side;
- Remain at landing zone until helicopter departs;
- Field crews will carry a satellite phone with the crew and cards to give out with the satellite phone number to helicopter pilots. The field-crew satellite phone will be used study related and emergency communications. Field crews will record the satellite phone numbers of pilots they are using to help communicate with pilots in emergency situations;
- Field crews will also use Spot emergency transmitter devices to assist in tracking and communication with other study staff or emergency responders as a backup to satellite phones and VHF radios.

4.0 GEAR LOADING/UNLOADING

Field crews will typically have a variety of gear to take with them on personnel flights, or gear only flights. Gear should be packed in small bundles or pieces so it can be easily packed in the helicopter and handled by a single individual, such as the pilot. Any sharp objects should have sharp edges or points covered and protected. Cardboard and duct tape can often serve this purpose.

- Equipment bulk weights/sizes (for data station components, etc.) will be entered into forms/spreadsheets and will be available to all personnel involved in the transportation and loading of the equipment. Weights will also be placed on all gear over five pounds, written on duct tape with permanent markers so the weight can be easily read from a distance of 10 feet;
- Loading/unloading of gear on helicopter racks will be conducted under the explicit direction of the pilot;
- Bungees or other rigging gear needed for affixing gear to the helicopter racks will be provided by the helicopter pilot;
- NOTE: all hazardous or explosive items will be discussed with the pilot before loading and clearly marked. Bear Spray is a common item that should never be carried in the inside of the helicopter crew compartment unless inside of an approved containment device. Generally, bear spray will be carried on the outside of the helicopter crew compartment. Gasoline and other fuels should generally be carried outside the helicopter crew compartment, unless directed to be inside by the pilot. Shotguns and other firearms used for bear protection should be unloaded.

4.1 Sling Loads

Some of the equipment required for Task 2 (boats, motors, jet ski) and Task 5 (battery boxes, tripods) must be transported as sling loads. Sling loads are dangerous operations and should only be carried out after careful pre-planning with the pilots actively used for the day. Sling load gear can develop static discharges which can shock ground staff if contacts are made in the wrong order. Sling loads can be dropped, either by accident, or intentionally if the pilot detects a danger to the helicopter. Sling loads must be unhooked by ground staff with the helicopter hovering directly overhead. Radio communication is not possible under these conditions, yet the pilot must be notified when the load reaches the ground, when the hook is free, or when sling load operations must be aborted. Sling load transfers should not be conducted unless signal protocols have been discussed and are understood by both ground staff and pilot.

- Sling load items need to be weighed and clearly marked (e.g. duct tape and permanent marker) for safe loading;
- Rigging of sling loads will be conducted under the explicit direction of the pilot;
- Netting and rigging gear for sling loads will be provided by the helicopter pilot;
- Signals for the approach, touch-down, unhooking, and emergency jettison of the load will be verbally reviewed by both the ground staff and the pilot;
- Field staff should wear safety vests or other bright clothing to help the pilot easily see them on the ground. Camouflage clothing and jackets should not be used

when coordinating with helicopter pilots. It is important the pilot see all ground crew members.

- Sling Load Limits
  - R44 – The weight limit for general sling loads in good weather conditions is 800 pounds. This may change based on type of load, and how well it transports through the air.
  - A-Star – The weight limit for general sling loads in good weather conditions is xxxx pounds. This may change based on type of load, and how well it transports through the air.

5.0 SAFETY RESPONSIBILTY

Safety is a general responsibility of all study staff and pilots. Looking out for each other, other hazards and using the "buddy" system is important for safe helicopter support operations. Safety is always the first priority before work activities. With good planning and communication, this will never result in a compromise in conducting study activities.

5.1 General Helicopter Safety Considerations

- Never hold anything above eye level.
- No smoking or running within 50 feet of the helicopter.
- Large groups should be kept 100 feet from the helicopter at all times.
- Assure that all personal equipment is secure (i.e. no hats, loose jackets, floatation vests, etc. that can be blown away or up into the rotor system).
- Think before you act, communicate with the pilot actively

5.2 Passenger Responsibilities

1. Pay attention to the pilot's briefing. Before you fly, it's important to know what is expected of you. The pilot will tell you when to enter and exit the helicopter along with how to wear your seatbelt after boarding. He will let you know if you need to stay in your seat or if you can move around.
2. Do not approach the helicopter until you receive a positive indication from the pilot to approach. Always make eye contact with the pilot and await clear signal that you are safe to approach.
3. Watch the rotors. Always approach the helicopter from the front right or left, never approach the helicopter from the rear and never approach the rear tail rotor. If the rotors are turning, only approach the helicopter on signal from the pilot and always remain in the pilot's direct line of site. Stand low in a crouch as you approach a helicopter on level ground for this allows for extra space between you and the rotors. If you are able, walk up a hill towards the helicopter from the front. Approaching the helicopter this way gives the pilot a clear vantage point; he or she can see where you are. Never approach a helicopter from uphill or above, or from behind the helicopter. Wait for the pilot's signal before moving toward the aircraft.
4. Keep track of light and loose items. Securing your personal belongings is important as light weight items can quickly blow away as you near the helicopter. Let the item go if it is already flying out of your hands. You could get hurt if you try to chase it.
5. Keep long cargo horizontal when approaching and loading a running helicopter. Long items, such as poles or rods, are a safety hazard that could accidentally be moved into the rotor zones. Never hold anything higher than eye level when working beneath the main rotors.
6. Understand the helicopter's safety zones. The front at the right or the left of the helicopter is the most acceptable place to approach it. Walking up directly in front of the helicopter is ok, but, the pilot will always prefer that you arrive from the front left or right angles. The back of the helicopter is the most dangerous place

to stand or walk. The pilot can't see you from behind and this is a restricted access route. Never approach from the back of a helicopter.

7. Exit with safety in mind. When departing a helicopter with the rotors running, move slowly and methodically, carrying your personal equipment to the front left or right of the helicopter to a point well clear of the main rotor, if possible. Maintain control of your belongings in the rotor wash and, when you are clear of the rotors or in a safe location, crouch and remain stationary until the helicopter has departed the area. There may come a time when you have to leave the helicopter while it is still hovering just above the ground. Wait for the pilot's signal and then exit the helicopter slowly and without making any sudden movements.
8. Be visible. To ensure safe and prompt sightings of personnel on the ground by helicopter pilots, appropriate measures should be taken. Wearing camouflaged clothing is discouraged and bright safety vests should be available at all times and used as appropriate.
9. Personal Protective Equipment (PPE) is important. Study teams should wear helicopter helmets (helmets will be provided by GWS for Tasks 2 and 5, all other tasks evaluate their needs and resources as necessary). All personnel must wear some form of hearing protection. Personnel who are flying surveys in the helicopter are required to wear PPE (Nomex clothing), personnel who are working outdoors and ferried by helicopter should evaluate their PPE needs. Safety glasses should be used as appropriate, particularly when preparing for a helicopter pick up or other situation where loose dirt and debris could be agitated.
10. Be Prepared. Passengers are encouraged to bring a small survival kit that can be stored in a pocket in the clothing they are wearing on them at all times while traveling by helicopter. Appendix A contains a list of items that should be included in personal safety kits. Field crews that are dropped off in the field should have a safety bag that contains fire and shelter supplies. Appendix B contains a list of suggested items. This is to ensure that if a quick departure from a helicopter is necessary, as in an emergency situation, that field members still have basic survival gear available. Weather and helicopter mechanical problems can result in field crews not being picked up and spending a night in the field. It is also suggested that appropriate attire be evaluated before flight. Layers of non-synthetic, or Nomex, clothing are suggested to prevent personal injury if heat or fire is encountered in an emergency. Passengers will be familiarized with basic helicopter safety precautions during pre-flight briefings (including the locations of emergency shut offs, fire extinguishers, and communication systems).

5.3 Pilot Responsibilities

1. Stay with your helicopter unless it is in a secure area. If you leave your helicopter in a visible location, animals (bears) may tamper with it and damage helicopter parts.
2. Inspect the helicopter before flying. Verifying that everything on your aircraft is in working order is critical because you will avoid potential problems while flying.

Check around the helicopter noting if the switches are working properly and confirm that you have enough fuel.

3. Take note of any strange vibration sounds. These noise changes are an indication of possible abrupt engine failure. Find a safe place to land if you hear anything strange with the vibration levels of the helicopter. Inspect every aspect of the helicopter after you have landed before resuming your flight plan.
4. Avoid making takeoffs or landings downwind. You could lose control of your helicopter. Taking off or landing downwind is an especially dangerous maneuver at high altitudes,
5. Keep rotor RPM's above their critical low readings. You can avoid seriously injuring other passengers or yourself if you keep the rotors moving, even during a crash landing, according to the Robinson Helicopter Company.

Landing Zone (LZ) Requirements

- 100' x 100' minimum preferred
- Obstruction-free: No wires, trees, poles, etc.
- 2 paths of approach/departure
- Mark remote LZ with bright flagging to help indicate wind direction and any hazards. Discuss markings of LZ zones with your helicopter pilots
- Area should be level and free of loose debris, such as brush that has been cleared
- Illuminate nearby obstructions at night
- Have field staff wait at the edge of the LZ in a position that will place them on the upwind side and in clear site of the pilot.

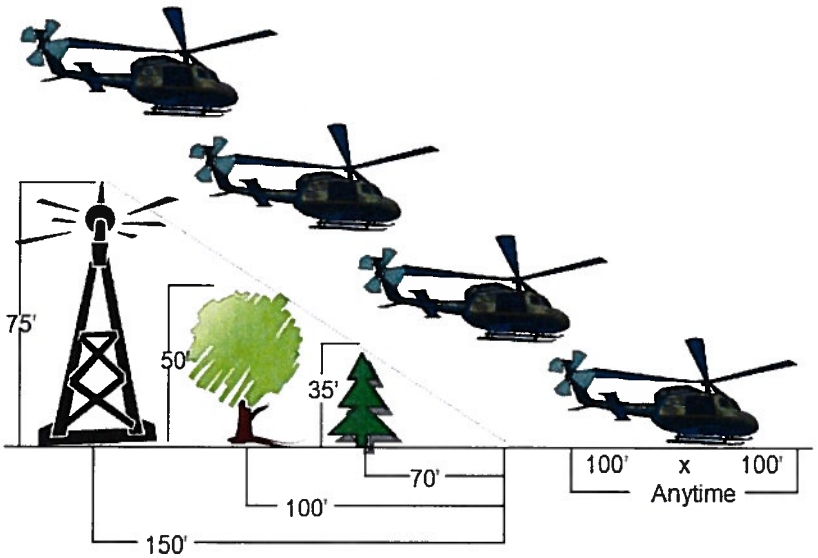

Figure 2. Helicopter clearance requirements.

6.0 SELECTED HELICOPTER HAZARDS

There are a number of known helicopter hazards in the main Susitna middle and upper watershed areas. These may not be the only hazards, as other helicopters, small planes, flocks of birds or other hazards may exist. The following hazards shown in Table 1 should be reviewed by pilots and field staff to help identify them in the field when conducting helicopter operations. Inclement weather, low sun angles, other distractions make it a joint responsibility between pilots and passengers to be aware of and on the look-out for these and other hazards.

Table 1. Known helicopter hazards in Susitna River Corridor RM 83 to RM 184.

Hazard Feature	Approximate Elevation Ft	North Latitude WGS 84	West Longitude WGS 84
Willow Airport, ~ 3 mile radius	200	N61.75482° N61° 45.289'	W150.05188° W61° 03.113'
Parks Highway Bridge, Utility Lines	300	N62.17676° N62° 10.605'	W150.17357° W150° 10.414'
Talkeetna Airport, ~5 mile radius	360	N62.32157° N62° 19.294'	W150.09272° W150° 05.563'
Railroad Bridge	700	N62.76825° N62° 46.095'	W149.69134° N149° 41.480'
Electrical Intertie	1,030	N62.82046° N62° 49.227'	W149.56735° N149° 34.041'
Old Cable Bridge	1,055	N62.81842° N62° 49.105'	W149.30360° W149° 18.216'

Figure 3. Railroad Bridge crossing the Susitna River near Gold Creek, looking upstream.

Figure 4. Electrical Intertie crossing the Susitna River upstream of Gold Creek, looking north along intertie.

Figure 5. Electrical Intertie crossing the Susitna River upstream of Gold Creek, looking south along intertie. Electrical cable orange marking balls in lower right of photo.

Figure 6. Railroad bridge and electrical intertie, Google Earth satellite photo.

Figure 7. Old cable bridge, looking downstream.

Figure 8. Old cable bridge, looking upstream.

Figure 9. Old cable bridge looking downward.

Figure 10. Old cable bridge, Google Earth satellite photo.

7.0 GUIDELINES FOR AVOIDING NESTING RAPTORS

Numerous species of birds of prey nest in the Watana study area. Cliff-nesting raptors include Golden Eagles, Gyrfalcons, and Peregrine Falcons. Tree-nesting raptors include Bald Eagles, Ospreys, and Northern Goshawks.

- Precautions should be exercised from now (May) through 31 August near cliff and woodland habitats where raptor nests are occupied.
- Known raptor nest locations have been provided to all field personnel. All helicopter and ground activities are prohibited within 1,000 feet lateral and vertical distance from all known raptor nests. River travel can pass within the 1,000 foot radius, but stopping is not allowed.
- Nest location information is confidential and extremely sensitive and not to be shared outside of project personnel.
- Any previously unrecorded raptor nest locations that may be located by field personnel will be immediately reported to AEA.
- Do not approach known raptor nests. Do not approach cliff nests from behind; this increases the chances for severe responses of incubating birds (e.g., surprised departure from nests and potential injury to eggs or young).
- Do not land aircraft on the brink or top of cliffs or river bluffs with either historic or occupied raptor nests. If landings must occur at historic and unoccupied raptor nests, land and take off >1,000 ft away and restrict the amount of time on the ground at these sites. Landings are not allowed within 1,000 feet of active raptor nests.
- Camp > 1,000 feet from occupied and historic sites.
- Generally, people on the ground cause some of the most severe disturbance to raptors (e.g., missed feedings, attracting predators, expose egg and young, adults and young abandoning nests). Leave nesting areas if an occupied nest is discovered. Quickly move all personnel and equipment at least 1,000 feet from the site. If raptors are disturbed (e.g., adults screaming, diving at people or aircraft), move away from the site quickly. Again, activities above nests often are more disturbing.

Please report any evidence of raptors nesting (e.g., stick nests, vocal nestlings) to John Shook (jshook@abrinc.com) or Bob Ritchie (britchie@abrinc.com). ABR Inc.—Environmental Research & Services, P.O. Box 80410, Fairbanks, AK 99709. 907-455-6777.

8.0 SELECTED REFERENCES

Common Helicopter Models, Robinson Raven R44:
http://www.robinsonheli.com/rhc_r44_raven_series.html

Rescue Dynamics - New and Recent Articles of the Month
http://www.rescuedynamics.ca/articles/articlenew.htm

US Forest Service Fire and Aviation Management
http://www.fs.fed.us/fire/av_safety/

University of Alberta
http://safety.eas.ualberta.ca/node/67

APPENDIX A. CONTENTS OF PERSONAL SAFETY KITS

Individual Personal Safety Kit
*All contents are carried in a lightweight/waterproof bag and will be on all personnel in the field.

- Personal medical kit (enclosed in waterproof bags: gauze pads, bandages, alcohol pads, whistle)

Project Team Personal Safety Kit
*All contents are carried in a lightweight bag and will accompany every team of personnel in the field.

- Reflective vests (1 per individual)
- Field supply kit (enclosed in waterproof bag: matches, fishing supplies, compass, mirror, whistle, duct tape, fire tinder)
- Field medical kit (enclosed in waterproof bags: compass, whistle, water purifier tablets, bandages, tape, foot dressing, antibiotic ointment, hydrocortisone, alcohol pads, tweezers, antidiarrheal, pain relievers)
- Field emergency kit (emergency pressure dressing, burn wound dressing, tape, alcohol pads, tweezers, hemostats, scissors, fire starter, aerial flare, steri-strips, super glue, alcohol pads, nitrile gloves, allergy tablets, chapstick, miscellaneous medications/ointments/bandages)
- Outdoor repair kit (tape, patches, buckles, sewing kit, glue, cord, safety pins)
- Glow sticks
- Emergency blankets (1 per individual)
- Ear plugs
- Duct tape
- Tarp
- Twine and parachute cord
- Bug repellant
- Whistles
- Mirror
- Fire starting paste and tinder
- Fire starter
- Flagging Tape

APPENDIX B. CONTENTS OF OVERNIGHT SAFETY KIT

2-Person Overnight Safety Kit
*All contents are carried in a lightweight/waterproof bag and will accompany every pair of personnel in the field.

- 1 tent (with extra tent stakes)
- 2 sleeping bags
- 2 sleeping mats
- Water purifier tablets
- 2 emergency blankets
- Survival tabs (emergency food rations, approximately 15 days of nutrition to be split between 2 people)
- Field supply kit (enclosed in waterproof bag: matches, fishing supplies, compass, mirror, whistle, duct tape, fire tinder)
- Field medical kit (enclosed in waterproof bags: gauze pads, dressing, syringe, nitrile gloves, bandages, tape, foot dressing, antibiotic ointment, alcohol pads, duct tape, tweezers, antidiarrheal, pain relievers)