

Field Environment, Safety, and Health Plan

Date: Jan. 8, 2014	Author: Mark Weiland, Co-Project Investigator
Project #: 65331	Project Title: Two-Dam Acoustic Telemetry Study

Describe Activities:

The goal of this integrated two-dam study is to evaluate the overall performance of structural and operational improvements designed to benefit juvenile salmonids migrating downstream through dams. The study will estimate dam-passage and route-specific survival rates for yearling Chinook salmon and steelhead at McNary Dam (MCN) in the spring and subyearling Chinook salmon at McNary Dam (MCN) and John Day Dam (JDA) in the summer of 2014. The study at each dam will be based on a virtual paired-reference-release design evaluated relative to performance standards stipulated in the 2008 Federal Columbia River Power System Biological Opinion (FCRPS BiOp) and the 2008 Columbia River Fish Accords.

General Work activities include:

1. Preseason preparation of equipment at the North Bonneville Field Station and setup and maintenance of hundreds of computers and acoustic telemetry electronic systems required for collection of acoustic tag-detection data at the dams
2. As in years past, we will reinstall additional 2-inch diameter fixed pipes at the north end of the spillway and south of the turbine units at JDA. In addition, we will reinstall a hydrophone north of the spillway at the PUD units, and single hydrophones at the south fish ladder entrances, and one hydrophone on the north wall near the navigation locks at MCN
3. Deploying fixed location underwater receivers (est. 180 hydrophones), miles of signal cable, and data-acquisition electronics in mobile trailers at both dams
4. Deploying and servicing about 60 autonomous underwater receivers (autonomous nodes) at 10 river cross sections between River km 472 (rkm) above MCN and rkm 236 near Bonneville Dam Forebay
5. Plumbing and cleaning tanks for collecting and holding fish and setup of fish collection and surgery stations at the JDA Smolt Monitoring Facility (SMF)
6. Daily fish surgery sessions to implant acoustic and PIT tags in fish (over 64 days)
7. Release of tagged fish by boats along line transects across the river at rkm 503, 468 and 451 rkm during spring season; and 503, 468, 451, 346, and 325 during summer season
8. Daily monitoring and weekly downloading of data from about 45 data-acquisition computers
9. Troubleshooting and repair of failed cabled hydrophones, cables, amplifiers, or computer components in data acquisition systems, and replacement of failed autonomous nodes
10. Removing research equipment from the dams and river at the end of the study

The USACE will hold mandatory safety meetings at each dam to familiarize all workers with requirements for dam access and to provide a preseason safety briefing to identify work hazards and clearance procedures before anyone can receive a badge to allow access to a lock and dam project.

Activity 1:

Preparation of equipment for deployment will mostly occur at the North Bonneville Field Station, which consists of office space at 390 Evergreen Drive, leased warehouse space at 380 Evergreen Drive, and USACE warehouse space at 458 Evergreen Drive. There is a safety plan for warehouse space and that plan will be required reading for anyone preparing equipment within North Bonneville warehouse space. Eric Fischer is the project manager for all warehouse space and will brief all personnel on hazards, safety

requirements and training requirements for the use of specific power tools. Only properly trained and authorized personnel will be permitted to use certain tools, which are clearly identified as restricted access tools.

Preparations of equipment in warehouse space will include checking the installations of GPS and DSP cards in over 45 rack-mounted computers, setup of the latest data acquisition software, and ghosting of data acquisition partition images. Old cables will be repaired. Testing will be conducted to ensure hydrophones and autonomous nodes are performing properly prior to installation at dams or in the reservoirs between dams. Hydrophones and quad-channel amplifiers will receive through-system testing with a standard computer setup and cable set prior to transport to the dams. Wire rope cables for deploying pairs of hydrophone trolleys and attaching autonomous nodes to anchors will be cut to deployment-specific lengths and rigged to have swaged end loops with thimbles and shackles.

Activity 2:

Prepped equipment will be transported to specific dams in pickup trucks or on a flatbed trailer. Personnel must furnish proof of a valid unrestricted driver's license before they can operate vehicles. Boat operators must have a boating certification card from Washington or Oregon, meet all PNNL small vessel and commercial vehicle requirements for towing and operating specific boats, and go through an on-water briefing and evaluation with the boat custodian. All personnel working on dams must follow the USACE and dam-specific rules, regulations, and safety requirements. Personnel also must adhere to Battelle/PNNL safety requirements described in this plan.

Electronic equipment delivered to dams will be set up in rack mounts inside mobile trailers located on the forebay decks. In general, a single data-acquisition system consists of an uninterruptable power supply, computer with GPS and DSP cards, a 4-channel amplifier, signal cable, and four hydrophones. For example, outfitting JDA to listen for acoustically tagged juvenile salmon migrating downstream will require 23 of these data-acquisition systems and four mobile trailers. There will also be three mobile trailers of electronics at MCN.

Activity 3:

Cabled hydrophones will be mounted on trolleys designed to be lowered into either 4-inch or 8-inch diameter slotted and fixed pipe on main piers at each dam. The trolleys weigh approximately 25 pounds. The trolley/hydrophone assemblies will be deployed either from the deck with the assistance of a davit and winch system or by boat where pipes do not extend to deck level. Retrieval of equipment will be conducted in the same manner as installation. All work activities must follow USACE requirements. When a work boat is used, a safety boat with two crew members will be on location. Miles of low voltage signal cable will be routed from the top of piers to instrument trailers following procedures established for each dam. Galvanized steel cable trays at MCN and JDA will be used to route cable along the face of dam structures to electronic equipment trailers leased from Pacific Mobile.

Activity 4:

Activity 4 will begin in mid-April, when about 60 autonomous nodes will be deployed by boat in arrays at 10 cross sections of the river away from the dams. Each deployment will be rigged with a 75 pound anchor, a 1- to 6-ft long lead of 3/16 inch wire rope between the anchor and an acoustic release mechanism, 4-ft length of rope with floats, and a 4-ft long autonomous node. After the initial deployment, these nodes will be retrieved to download data at two week intervals. Batteries will be changed at monthly intervals. Deployment and retrieval of autonomous nodes also require boat operations and a team of at least two people. Other than concerns with operating in rough weather, the most risky boat operations occur when acoustic releases fail to open and the team must drag for nodes on the bottom of the river. Most dragging operations are successful and pose no danger to the crew, but on rare occasions an anchor may be thoroughly wedged or buried in sediments, and wrapping it with a drag

line literally ties the recovery boat to the river bottom. Therefore, the deck hand is required to have a sharp knife or other cutting device handy at all times to cut the drag ropes in the event that fouled lines begin to jeopardize boat stability. Recovery of a node that cannot be safely dragged with a single boat should be postponed until two boats are available for the effort.

Activity 5 and 6:

Personnel doing preseason work to plumb tanks and to set up the tagging facility (Activity 5) or working as part of the tagging team during spring and summer (Activity 6) must have had a USACE access and safety briefing and have a JDA badge. The John Day SMF is located on the JDA Project and access is controlled by a gate and guard. Visitors are not required to obtain a badge, but must be on the gate list of authorized personnel, which requires a request for temporary access and provision of each visitor's name, place of birth, and date of birth to the Project On-Site or Over-Site Manager. Visitors must be escorted in project property. Each dam has similar requirements and project specific badges for all contractors.

John Day SMF setup requires the installation of several small tanks with temporary in/out lines. The water flow into the tanks typically is a combination of flex-tube hosing and glued pvc. Tank effluent runs directly into the floor drains to avoid having to glue the tank effluent lines. Shade cloth and styrofoam insulation are installed to keep tanks at the river temperature during the summer time. Detailed tank logs and tank labels are also installed.

Fish for all activities will be obtained from a sample of fish collected at the SMF at JDA. Fish collection takes 30 min to 1 hour daily. All fish collected in the monitoring facility are lightly anesthetized with MS-222. Sorters then separate the species of interest from the by-catch species. All fish handling is done with latex or nitrile gloves. Once fish are collected, they are transferred to holding tanks next to the sorting station using 5 gallon buckets. The buckets can be full or only partially full depending on ability of the person to transfer the fish safely.

Juvenile fish will be surgically implanted with PIT and acoustic tags in the SMF at JDA. All personnel involved with this work will be properly trained and must adhere strictly to PNNL North Bonneville/MSL and USACE guidelines for collecting, handling, surgically implanting, and holding fish. Surgeons will have exposure to the fish anesthetic MS-222 and equipment disinfectant, Nolvason. All surgeons and fish handlers wear gloves during the procedure. Small 2mm long micro blades are used to make the incision in the fish for tag implantation. Suture materials have swaged needles for closing incisions. All sharps are placed in properly marked containers for disposal. Heat-tolerant surgical instruments are disinfected with Hot Bead sterilizers in a protective case between uses in accordance with PNNL-IACUC and USACE guidelines. Each night, the JDA SMF solid tables and gear are wiped or soaked with/in Virkon solution, and all heat tolerant structures are autoclaved. As buckets of fish and water are moved around the facility, if water spills squeegees are available to clear the spill off the floor. There is an ample number of people to assist with moving buckets to ensure that no one becomes strained over the day.

Activity 7:

Tagged fish will be released into the river upstream of MCN (rkm 503), in the tailrace below MCN (rkm 468), above Blalock Islands (rkm 451), in the tailrace below JDA (rkm 346), and near a boat launch at Celilo, OR (rkm 325) by a two person team in a boat. Boat operators must be preapproved by the North Bonneville boat custodian and must meet state and PNNL Vessel Operations requirements for 2013 before operating or towing a PNNL or any leased vessels. Any PNNL staff or PNNL-contractor will be required to complete commercial motor vehicle training prior to driving any vehicle with a gross vehicle weight rating or gross combination weight rating, inclusive of a towed unit, of 4,536 kg (10,001 pounds). Five gallon buckets of fish tagged the previous day will be loaded into Bonar totes in pickup trucks and hauled to at most, two of the three sites every day from about April 29th through May 31st in spring and, at most, to four of the five sites every day from about June 11th through July 17th in summer. Releases at

the upstream site near Walla Walla, Washington, will alternate daily between daytime and nighttime releases each season. Releases at downstream sites will be timed to assure mixing of fish released at upstream and downstream sites, and therefore also will have alternating day and night release times. There will be five release waypoints along a line transect at each release location. At each waypoint, the boat will be put in neutral and fish buckets will be submerged over the side so that fish can voluntarily swim out of the bucket. It is possible that the boat may have to make two trips to release all buckets of fish. Boats will be stored near release sites at Port Kelley, WA; the MCN tailrace; above Blalock Islands, WA; the JDA tailrace to minimize towing of boats. Fish haul times have to be standardized to about 1.8 hours for the Port Kelley, WA release site, 1.7 hours for the MCN tailrace and above Blalock Islands, WA release sites, and 0.6 hours for the JDA tailrace and Celilo releases.

Activity 8:

Downloading data from computers on dams involves going to each mobile trailer at a dam, shutting down from four to eight computer systems per trailer, swapping hard drives, and then rebooting each system to resume data acquisition. All hard drives are easily removable from the front panel of each computer by pressing a quick-release latch so computer cases do not have to be opened. The only reason that computers would have to be opened would be if there was a problem with the computer itself, GPS, or DSP cards, and then protocols stipulate that the computer must be shut down and unplugged before the case is opened.

Activity 9:

Troubleshooting failed cabled systems is a systematic process that may involve swapping hydrophones, cables, amplifiers, or computer components to resolve the problem and typically involves two or three people with handheld VHF radios. All components on the "wet" side of the amplifier (cables and hydrophones) are low voltage. Amplifier and computer parts run at 110V and must be shut off and unplugged before cases are opened to test components.

Activity 10 and 11:

Clearing equipment at the end of the study will entail removal of all equipment and chemical waste stored at either JDA or MCN and transporting back to North Bonneville office and warehouse. All personnel will have had gas cylinder and hazardous materials transportation training. Demobilization (Activity 11) is a systematic process that first involves shutting down power to computer systems and amplifiers. Some trolleys are pulled from deck level by hand or by using a trailer mounted davit and winch system. Boats are used to retrieve autonomous nodes from arrays or trolleys in pipes that do not extend up to deck level. After equipment is retrieved, it is loaded into trucks and hauled to North Bonneville warehouse facilities where it is cleaned, tested, repaired (if needed), and stored. Boats and trailers also are cleaned and serviced.

Work Locations:

North Bonneville office and warehouse

MCN and JDA dam projects

Fish release sites (Port Kelley, WA; MCN tailrace; Above Blalock Islands, WA; JDA tailrace; and Celilo, OR

Autonomous node array sites (MCN forebay (472 rkm); MCN tailrace 468 rkm); Above Blalock Islands, WA (451 rkm); Below the Blalock Islands (422 rkm); JDA forebay (351 rkm); JDA tailrace (346 rkm); Celilo (325 rkm); TDA forebay (311 rkm); Hood River (275 rkm); and BON forebay (236 rkm)

ES&H Hazards:

<input checked="" type="checkbox"/> Chemical – MS-222, Ethanol, Virkon, Nolvason	<input checked="" type="checkbox"/> Electrical hazards	<input checked="" type="checkbox"/> Traffic	<input checked="" type="checkbox"/> Fatigue/physical stress
<input checked="" type="checkbox"/> Biological – Fish	<input checked="" type="checkbox"/> Powered equipment	<input type="checkbox"/> Off-road vehicles	<input type="checkbox"/> Hazardous flora/fauna
<input type="checkbox"/> Radiological	<input checked="" type="checkbox"/> Manual lifting	<input checked="" type="checkbox"/> Boats/water hazards	<input checked="" type="checkbox"/> Hazardous activities nearby
<input type="checkbox"/> NIR: Lasers/RF/magnetic field	<input type="checkbox"/> Working alone	<input type="checkbox"/> U/W diving	<input type="checkbox"/> Other dangerous environment
<input checked="" type="checkbox"/> Waste generation/treatment/disposal	<input checked="" type="checkbox"/> Work at heights	<input type="checkbox"/> Aviation	
<input checked="" type="checkbox"/> Other ES&H risks: Noise while drilling concrete	<input checked="" type="checkbox"/> Industrial site	<input checked="" type="checkbox"/> Environmental/temp extremes	
	<input type="checkbox"/> Use of Fire Arms		

Risk Analysis

(describe level of risk associated with the work activities and why it is acceptable)

Working on USACE projects and on and over the water at the dam is considered to be a moderate risk activity with the use of personal protection equipment (PPE: gloves, hard hat, steel toed safety shoes, eye protection, and in some cases hearing protection), fall protection, and PFDs. All activities at the project site must comply with the US Army Corps of Engineers safety program requirements as well as PNNL requirements outlined in this plan.


Hazard Mitigation

(for each activity list specific hazards of concern and mitigation methods)

When new activities are anticipated that are not described in this procedure, the new activities must first be evaluated and approved by the project manager. The project manager has the ultimate responsibility to ensure the safe conduct of the work, and may require consultation with management and/or Worker Safety and Health representative prior to making changes to procedures or protocols. Staff members have the right and responsibility to stop work immediately, when convinced a situation exists that places themselves, their coworkers, or the environment in danger.



Note: For further information regarding the identified controls, see more detailed guidance referenced in PNNL’s HDI System and/or the USACE Safety Manual (EM 385-1-1, dated 15 September 2008).


ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
Daily Work Planning	Consider all hazards	Safety meetings shall be conducted for all personnel to discuss work planned, anticipated hazards, and control measures.	01.A.01, 02, 03 01.C.01, 02	Integrated Environment, Safety and Health (ISM)






ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
All activities at dams	Loss of access control Falling objects, working with heavy tools and equipment	If issued, identification badges shall be worn and visible at all times. Minimum PPE: Hard hats, long pants, and steel toed boots shall be worn at all times.	05.A.01, 05, 06, 07, 08, 10 05.D 05.E	Personal Protective Clothing and Equipment
Work near transformers or load machinery	Noise	Wear ear plugs to protect hearing. Ear plugs will be on site and available.	5.C	Noise
Work on the forebay deck, near crane operations, storage and other hazardous areas	Falling objects Deck openings Crane movement Vehicle traffic Slipping / tripping hazards.	Personnel shall watch for warning signal lights, signs, and personnel hand signals. Be alert to dangerous situations, avoid horse play, and know emergency procedures. Personnel shall wear the appropriate PPE as required (hard hat, long pants, gloves, steel-toed boots, reflective or highly visible work vest, etc.).	1.A.01, 02, 03 1.B 2.A 3.A.01 3.B 4.A 5.H	
Driving vehicles on the dam	Striking equipment or personnel due to congestion in work areas, limited turning space, other traffic, and work equipment. Struck by loads from overhead cranes	Have a license to drive. Follow all posted speed limits. Use seat belts. Drive defensively and don't use cell phone when operating vehicle. Do not block deck traffic with vehicles. Non-essential vehicles shall be parked outside of project security fencing. Pass gantry crane when lights flashing only if signaled by crane operator. Use orange cones around parked vehicle and cables located on roadway.	18.A 18.C	Vehicles for Business Purposes Motor Vehicle and Property Damage Accidents
Vehicle Parking	Unintended movement of vehicle	Vehicles shall not be left unattended until the motor has been shut off, the key removed (unless local regulations prohibit), parking brake set, and gear engaged in low, reverse, or park. If stopped on a hill or grade, front wheels shall be turned or hooked into the curb or the wheels securely	18.C.10	 Parking Memo 2011.pdf



ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
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Material handling, storage, and work with heavy, rough, or abrasive objects.	Cuts, bruises, and abrasions	Gloves and steel-toed boots shall be provided and worn. Use safe lifting practices and get help or use material handling equipment for heavier loads.	5.A.08, 10 14A 14B 14C	Personal Protective Clothing and Equipment
Working with and around cranes	Moving cranes and suspended loads Falling loads Pinch points between loads and rigging. Tripping hazards	A certified crane contractor and operator will be contracted to do all hoisting of heavy materials. Qualified and experienced Battelle staff shall be utilized to work around cranes. Personnel will be familiar with hand signals. Personnel may have to guide suspended loads into position. Do not stand or walk under a load. Be aware of hand and foot pinching hazards.	5.A 8.B 16.C.04	Hoisting, Rigging, Forklifts, and Aerial Lifts
Welding, cutting, or brazing	Non-ionizing radiation Thermal burns Compressed gases, fire. Radiation, burns, gases, fire	Battelle staff will not be welding, brazing, or cutting with a torch. A contractor may have to modify equipment mounts on site with a welder, therefore, if standing near this type of work, face, eye, and hand protection required. Other protective clothing to be worn if necessary. Welding must be at least 35 ft away from flammable or combustible materials. Cover deck openings in work area. Cylinders should be in cart or otherwise secured to protect valves and regulators from damage. Have extinguisher available.	10A-10F	Fire Prevention when Working with Open Flame, Welding, Cutting, or Grinding Compressed Gases
Working with power or hand tools	Entanglement of clothing, hair, rings, etc. High velocity particles from grinding and cutting.	Keep loose clothing, hair, etc. clear of work. Face and/or eye protection shall be worn when loose or flying materials are present. Use hearing protection for excessive noise levels. Gloves shall be worn while operating stationary power tools (e.g., drill	5.B.01 13.A 13.B 13.C 13.D	Tools and Machinery Noise Personal Protective Clothing and

ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
	Cuts and abrasions. Elevated noise levels	press, grinder, lathe, etc.). Always cut away from body.		Equipment
Long hours working in boats or on dams	Fatigue or physical stress	Individuals shall not be scheduled to work more than 12 hours, including travel time, in any 24-hour period. Work schedules shall consider fatigue factors and optimize continuous periods available for uninterrupted sleep. The employee is responsible for reporting to work properly rested and fit for duty. Stop work before risks to safety increase. The team leader should stay aware how his or her physical condition and how coworkers are performing. Nobody should work to beyond their routine physical limits, short on sleep, or sick.	19.A.02.e	
Working in elevated areas such as piers or decks without hand rails and over deep water.	Falls > 6' Drowning	Any work conducted at heights > 6 ft will require a specific fall protection work plan (form attached below). Identify or install safe attachment points capable of supporting 5,000 pounds of weight and have them inspected by a qualified engineer. Current fall protection training is mandatory When working from boats or in open areas along the water, personnel will wear PFD's. PFD's will be checked prior to and after each use. Defective PFD's will be removed from service & replaced.	05.F 05.H 05.J 21.C 21.D; 21.H 22.J	Fall Protection
Using Electrical Equipment	Electrical shock	Do not use any electrical item that is defective or shows evidence of damage that could expose a worker to injury until repaired and tested. Lock out equipment specific power sources	11.A 11.A – 11.K	Electrical Safety Lockout/ Tag out

ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
Batteries	Shock, chemical exposure, toxic vapor, explosion	<p>prior to any electrical work.</p> <p>Use grounded (3-prong plug) tools and extension cords rated for hard or extra hard usage. Portable cord and plug equipment and extension cords shall be inspected daily before use for any defects of the following:</p> <ul style="list-style-type: none"> • Loose parts • Deformed/damaged or missing pins • Damage to outer jacket or insulation • Evidence of internal damage such as pinched or crushed outer jacket <p>Damaged corded equipment and extension cords will be removed from service until repaired or replaced.</p> <p>Electrical cords will be protected from damage caused by foot traffic, vehicles, sharp corners, projections and pinching.</p> <p>GFCIs will be used and function tested daily before use.</p> <p>See Material Safety Data Sheets (MSDS):</p> <div style="text-align: center;">  Lead-acid battery.pdf </div> <div style="text-align: center;">  Lithium Battery.pdf </div>	11.G	

ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
<p>Fish tagging according to standardized Portland District Guidelines</p> <p>Anesthetizing fish; sterilizing instruments;</p>	<p>Slips on wet surfaces.</p> <p>Lacerations from scalpels or punctures from suture needles.</p> <p>Potential for secondary infections from exposure to disease causing organisms.</p> <p>Chemical contact: Potential exposure to MS-222, chlorohexadine/ Nolvason, Virkon or Ethanol</p> <p>Irritation to nose, throat, and lungs. Potential allergic skin reaction.</p>	<p>Wear boots with rubber soles or equivalent traction.</p> <p>PPE and safe work practices – put sharp tools away when not in use. Move slowly around working surgeons. Use sharps container for disposal of scalpels and suture needles.</p> <p>Have first aid kit available with wound care disinfectants and antibiotic ointments.</p> <p>Vinyl, latex or nitrile gloves, and safety glasses used with diluted solutions (see attached MSDS for MS-222 Tricaine Methanesulfonate and 70% Ethanol) MS-222 powder is measured on a scale located within a laboratory hood and transferred to a Nalgene variable-volume dispensing bottle. While under the hood, distilled water is added to the bottle and the lid is tightened. The container is shaken until the powder dissolves. MS-222 should be stored in a dark, cool location. If skin contact with MS-222 powder or solution occurs, wash with soap and water. 70% ethanol is made from 95% ethanol and distilled water also under a laboratory hood. Ethanol should be stored in a flammable cabinet.</p> <p>Keep the tagging area well-ventilated to reduce over-exposure of ethanol fumes.</p> <p>The JDA SMF and BON SMF both have eye/body wash station on site.</p> <p>Refer to the following Material Safety Data Sheets:</p>	<p>01.A.01 05</p> <p>0.6.B</p>	<p>Biological Materials</p> <p>Compressed Gases</p> <p>Hazards Associated with Cryogenic Liquids</p> <p>Working with Chemicals</p> <p> Guide-Ethanol.pdf</p>

ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
Fish tagging according to standardized Portland District Guidelines		 Chlorhexidine.pdf  Ethanol.pdf  Finquel-MS222.pdf  virkonAquatic.pdf		
Anesthetizing fish; sterilizing instruments;	Waste generation/treatment/disposal Waste generation/treatment/disposal (Continued)	MS-222 Tricaine Methanesulfate Discharge approval item # 150205: follow conditions for discharge to rivers listed in approval (expires Oct 31, 2012). Ethanol (ethyl alcohol 95%/70%) used as sterilization agent, will be transported, stored and managed as hazardous material. Evaluate periodically per HDI Waste Management at PNNL facilities. Ensure that waste is accumulated and managed for the hazards contained within it and for biological waste material is accumulated and returned to PNNL facilities. If available and the client offers disposition through there approved waste management systems is allowed. Labels with hazard information and warnings Manufacturer guidance. Store and manage ethanol as hazardous material, manage and dispose per HDI Waste Management subject  Discharge Permit-MS-222.pdf	0.6.B	Effluent Management Waste Management (hazardous and biological) Also Chemical Use and Disposition guidance - Page 25
Transporting Fish	Traffic Accidents	All personnel will follow HDI guidelines for motor vehicle operation and PNNL Guidance on Fish Transport:	20.B.01 2.D	Moving compressed gas cylinders; Operating

ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
Transporting Fish		 Guide-Fish Transport		vehicles
	Accidents; Injury, Drowning; Launching and recovering. Impact with Facilities, Parked Cars and Docks. Falling (as being thrown from boat) Impacts with Other Boats or Obstacles. Adverse Weather Conditions.	<p>Follow EM 385-1-1 for life jacket requirements and type. The boat will have sufficient room, freeboard, and stability to safely carry cargo and crew with consideration given to the weather and water conditions in which it will be operated. Stay alert to weather bulletins. Boat work will be cancelled if wind conditions exceed 25 mph. All personnel also have the authority to cancel boat work if they do not feel comfortable with prevailing conditions.</p> <p>A float plan will be filed prior to each day's activity. The float plan will include all individuals on the boat. The boat will be operated by a qualified operator who has experience with the boat and is familiar with the work location. The boat used will be appropriate for the work to be done. The motorboat shall meet minimum flotation requirement of the Coast Guard. Use a spotter and have adequate mirrors. Check areas before backing. Prepare lines, bumpers, plugs, oars, fuel, etc. before launching. The boat will carry at least one Type B-II fire extinguisher. Watch for obstructions in the water. Do not operate boats beyond factory requirements for speed and maneuvering. Maximum passenger number and weight will be posted on the boat and number of passengers and crew shall not exceed the number of Coast Guard approved Type III PFDs aboard. Every crew member will wear a Type III PFD and the boat</p>	19.F01-19.F05	Boat Operations:  HDI-Boat Ops.pdf Safe Boating Practices Minimum Equipment Required for Boats Response to Boat Accidents

ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
		<p>will have at least one Type IV PFD aboard. PFD's will be inspected prior to and after each use for defects which would alter their strength or buoyancy. Defective PFD's will be removed from service and replaced.</p>		
<p>Transporting & releasing fish and servicing autonomous nodes</p>	<p>Carbon Monoxide, potential exposure. CO sampling was conducted in FY 09 (IH Case 5880) and determined that staff exposures are below established exposure limits. The highest readings occurred in the stern while idling or in reverse.</p>	<p>Minimize idling time while docked or limit staff time in the stern while idling. CO cannot be seen or smelled, but it can kill you or make you sick. Know the symptoms of CO poisoning:</p> <ul style="list-style-type: none"> • Headache • Confusion • Fatigue • Seizures • Dizziness Loss of consciousness • Nausea <p>Get to fresh air and seek medical help immediately if you or a co-worker has these symptoms!</p> <p>CO from engine exhaust builds up inside and outside the boat in areas near exhaust vents. Stay away from these areas while propulsion engines, generator, or other internal combustion equipment are running. Schedule regular engine and exhaust system maintenance inspections by experienced and trained technicians.</p> <p>Be aware that dangerous concentrations of CO can accumulate within seconds.</p>		
	<p>Strains from lifting</p> <p>Strains from lifting</p>	<p>Use proper lifting techniques and team lifting for heavier loads.</p> <p>Determine the weight of the object(s)</p> <ul style="list-style-type: none"> • >20 kilograms consider >1 person for lift or use lifting device • <20 kilograms, 1 person should be able to lift. 	<p>14.A.01 14.A.04d</p>	

ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
Transporting & releasing fish and servicing autonomous nodes (Continued)		<p>Consider >1 person for lift or lifting device if:</p> <ul style="list-style-type: none"> ▪ Awkward lift ▪ Repetitive lift ▪ Employee lifting has previous injury/illness that could be aggravated <p>▪ When Lifting:</p> <ul style="list-style-type: none"> • Keep objects close to your body • Do not twist while lifting • Lift with legs and not your back • Use caution when lifting over your head • Minimize repetitive lifts 		
Transporting & releasing fish and servicing autonomous nodes (Continued)	Hyperthermia or Hypothermia	<p>Workers with injuries/illness that could be aggravated, contact Worker Safety & Health Representative</p> <p>Dress for weather conditions (cold, rain, heat)</p> <p>Hyper/hypothermia: Hypothermia, or severe decrease in body temperature, must be guarded against if work at the site takes place during temperatures below 65° F.</p> <p>Wear appropriate clothing. Wear several layers of loose clothing. Layering provides better insulation. Tight clothing reduces blood circulation. Warm blood needs to be circulated to the extremities. When choosing clothing, be aware that some clothing may restrict movement resulting in a hazardous situation. Make sure to protect the ears, face, hands and eyes in extremely cold weather. Boots should be waterproof and insulated. Wear a hat; it will keep your whole body warmer. (Hats reduce the amount of body heat that escapes from your head.)</p>	06.I01-06.I13	Controlling Thermal Stress Hazards in the Workplace

ACTIVITY	HAZARD(S)	PREVENTATIVE OR MITIGATIVE MEASURES	REFERENCE EM 385-1-1	REFERENCE HDI
	Hyperthermia or Hypothermia (Continued)	<p>Move into warm locations during work breaks; limit the amount of time outside on extremely cold days. Carry cold weather gear, such as extra socks, gloves, hats, jacket, blankets, a change of clothes, and a thermos of hot liquid.</p> <p>Include a thermometer and chemical hot packs in your first aid kit. Avoid touching cold metal surfaces with bare skin. Monitor your physical condition and that of your coworkers.</p> <p>Hyperthermia or heats stroke is the result of significant overexposure to the factors of heat stress. Heat stroke is usually identified with a body temperature that increases to greater than 104 degrees F. Symptoms are chills, irritability, hot and dry skin, convulsions leading to unconsciousness. Heat stroke is prevented by limiting or gradual increase (acclimation) of work load during extreme temperature conditions, take frequent breaks in shaded or cooled areas, and consume plenty of liquids prior to and during work activities.</p>		

Fall Protection Work Plan

<p><i>Employees must review and sign this Fall Protection Work Plan prior to starting work. This plan must be posted at the job site for the duration of the work activities. Affected employees must be trained in accordance with 000701, Fall Protection. Upon completion of work or when Fall Protection Work Plan expires, forward plan to ESH&Q Directorate at MSIN P7-75.</i></p>			
Plan Start Date: _____	End Date: _____		
Job Location/Description: _____	Area _____	Building _____	Location _____
<p>1. Identify potential fall hazard(s).</p>			

- | | |
|---|--|
| <input type="checkbox"/> Elevating work platforms (boom-operated) | <input checked="" type="checkbox"/> Leading edge |
| <input type="checkbox"/> Excavations | <input type="checkbox"/> Scaffold erection/disassembly |
| <input checked="" type="checkbox"/> Floor openings/skylights | <input checked="" type="checkbox"/> Stairways |
| <input type="checkbox"/> Hazardous processes/equipment | <input type="checkbox"/> Wall openings |
| <input checked="" type="checkbox"/> Ladders (fixed >20ft; portable >25 ft) | <input type="checkbox"/> Other |

Describe the hazard(s) (including specific dimensions):

The hazard is working on top of piers about 15-25 ft above the water on the forebay side of the dam to repair failed signal cables or hydrophones. Tie off must meet project specific requirements (USACE). For example, at Bonneville Dam, double tie-offs points meeting specifications of the Project engineer were installed in 2007 and have been used each year when transducers failed and needed to be replaced (late April-August 8th). The hazard is the leading edge of a pier that workers could fall over. The tie-off points for required two 6-ft lanyards are located so that it would be nearly impossible for a work to fall over the edge, and if a fall did occur, the worker would be suspended only 2-3 ft below the edge of the pier. At BON spillway piers, there is a 4-inch wide concrete sill around the pier about 4 ft below the leading edge that a fallen conscious worker could stand on and use to climb back onto the pier. Conditions will vary with the project and therefore project specific criteria will apply and need to be approved by the local USACE safety officer.

2. Identify fall protection system(s) to be provided.

- Fall restraint (warning lines, bodybelt/lanyard/anchorage point, etc.)
- Fall arrest (full body harness/lanyard/anchorage point, etc.)
- Other

Describe system specifications:

Full fall arrest harness and two 6-ft lanyards clipped to separate anchor points (BON) or one lanyard clipped to one USACE approved anchor point (other dams).

3. Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of the fall protection system to be used.

- | | |
|---|--|
| <input checked="" type="checkbox"/> Inspect for damage, wear, mildew | <input checked="" type="checkbox"/> Inspect integrity of stitching |
| <input checked="" type="checkbox"/> Locking capabilities of retractable lanyard | <input type="checkbox"/> Manufacturer's assembly/disassembly instructions are attached |
| <input checked="" type="checkbox"/> Inspect for tightness of lifeline | <input type="checkbox"/> Other |

4. Describe the correct procedures for handling, storing, and securing tools and materials.

Most tools are kept in pockets of workers on the pier or in a bag tied off to a secure anchor point.

5. Describe the method of providing overhead protection for workers who may be in, or pass through, the area below the work site.

- | | |
|--|---|
| <input type="checkbox"/> Barricading | <input type="checkbox"/> Toeboards/screens on scaffolds |
| <input checked="" type="checkbox"/> Hard hats required | <input checked="" type="checkbox"/> Warning lines/signs |
| <input type="checkbox"/> Toeboards or covers on floor openings | <input type="checkbox"/> Other |

Describe the protection:

During installation and removal of trolleys with hydrophones, workers on top of the pier only need to lower or retrieve a signal cable to workers on a boat below the pier, and they can safely do this without climbing out on top of piers. Workers in the boat must wear hard hats. In-season repair of hydrophones or cables is the only time that workers need to access the pier top and work with tools to retrieve trolleys, disconnect hydrophones, and redeploy trolleys, and no boat is ever present below the work site at these times so there is no hazard from dropping tools.

6. Describe the method for prompt, safe removal of injured workers.

The USACE has boom trucks and trained personnel to help recover a fallen worker so the standard procedure will be to call the control room at the dam (numbers are on laminated cards kept with access badges) and request assistance.

Emergency phone numbers:

- ⇒ 375-2400 DOE Richland operations
- ⇒ (360) 683-4151 Sequim operations
- ⇒ Call 911 All other operations

Describe the location of the phone: Emergency phones in blue boxes or cell phone

7. Identify the method used to determine the adequacy of attachment points.

- Evaluation by a qualified engineer
- Existing engineering/design documents
- Manufacturer's data

Describe the method:

All tie-off points must meet specifications provided by the USACE

Approvals:

Responsible Supervisor: _____ Date: _____

Safety and Health Representative: _____ Date: _____

Qualified Engineer (Required for Fall Arrest Systems): _____ Date: _____

Trained staff working onsite under this plan:

Signature

Print Name

PR No.

Date

<u>Signature</u>	<u>Print Name</u>	<u>PR No.</u>	<u>Date</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Additional Information

Dam Access/Security/Identification/Safety

All personnel that will work on the project must be cleared with the Corps of Engineers security office at each dam. Each worker must have a dam-specific badge that is visible at all times.

All personnel will attend project specific orientation, safety, and security briefings by the Corps of Engineers and project officials to work on each of the four dams. The rules outlined in those briefings are final and failure to follow instructions can result in denial of access for work.

Personal Protective Clothing

Hard hats shall be worn at all times to protect from falling objects and overhead hazards. Impact resistant steel toed shoes will be worn on each dam. A box of disposable hearing plugs will be provided if any areas have high noise levels. Note; hard hats and steel toed shoes are a universal requirement for work on all Portland District dams and a high visibility reflective vest is also worn when working on road decks at any of the four dams.

First Aid Kit / Flashlight

First aid kits and flashlights will be available in every work trailer and truck.

Housekeeping

Keep the work areas, particularly on the intake deck clear. Pick up scraps and debris at the end of the work day and dispose properly.

Night work

Working at night may result in poor visibility of the work area and surroundings. Therefore, familiarize yourself with work area, watch your footing, and use additional lighting as necessary. Work only within handrails at night. Know locations of emergency telephones, fire extinguisher, and first aid kits. Use the buddy system if necessary.

Cellular and Dam Phones

At least one member of the crew conducting work at JDA or TDA is required to carry a cell phone and a pager. The pager will be used for communication between the project Control Room officials and the crew leader. The cell phone is used for communication off the dam itself and with project officials. Pagers and cell phones are not required for crews at BON, but all personnel are required to know how to access operators in the control room using project phones in blue boxes on all decks or by cell phone. Dam phones to the Control Room are the method for initiating emergency response at all dams. The number to dial the Control Room is also clearly posted on every phone. You also may use a cell phone to call the control room as described in dam-specific instructions below.

EMERGENCY RESPONSE

NOTE: FOR ALL EMERGENCIES ON DAMS, YOU MUST CONTACT THE DAM CONTROL ROOM FIRST. THE CONTROL ROOM PERSONNEL WILL INITIATE A 911 CALL, IF NECESSARY, AND COORDINATE THE REQUIRED EMERGENCY RESPONSE. When the situation permits, call an emergency / accident contact from one of the lists on pages 18-20.

EMERGENCY RESPONSE:

McNary Dam: First call MCN Control Room extension: 231; by cell phone: 541-922-2231
Off the dam: First call 911

When the emergency has stabilized, call one of the emergency / accident contacts listed below. That contact will notify the PNNL single point of contact (Fire, Injury, Spill, and Vehicle Accident Reporting) at (509) 375-2400 and a Technical Group Manager.

Hospital: Good Shepherd Medical Center
610 Northwest 11th Street, Hermiston, OR 97838
Phone: (541)667-3400

Directions to Good Shepherd Medical Center from McNary Dam: Exiting the dam, take a slight right and then a left onto Devore St. Take Devore St. south and continue straight onto Hwy 395 south. After five miles, turn right onto W. Elm Ave./Co 1240. Follow W. Elm Ave. for one mile before turning left onto 11th St. The hospital will be immediately on the left.

NON-EMERGENCY RESPONSE: Call one of the contacts listed below.

Emergency / Accident Contact List*:

James Hughes	Office (509) 371-6802 Cellular (509) 308-6907
Mark Weiland, Principle Investigator	Office (509) 427-5923 Cellular (360) 798-2666
Christa Woodley, Principle Investigator	Office (509) 427-8546 Cellular (530) 400-5871
David Geist, Technical Group Leader:	Office (509) 371-7165 Cellular (509) 521-3390
Charlie Brandt, Chief Operating Officer, Coastal Sciences:	Office (509) 371-7165 Cellular (509) 554-0291
Michael Fullmer, S&H Representative	Office (509) 372-6370

- This contact will notify the PNNL single point of contact (Fire, Injury, Spill, and Vehicle Accident Reporting) at 509-375-2400.

EMERGENCY RESPONSE:

John Day Dam: First call Control Room (Deck box: 4333; by cell phone: 541-298-9712)

Off the dam: First call 911

When the emergency has stabilized, call one of the emergency / accident contacts listed below. They will notify the PNNL single point of contact (Fire, Injury, Spill, and Vehicle Accident Reporting) at (509) 375-2400 and a Technical Group Manager.

Hospital: Mid-Columbia Medical Center

1700 E 19th Street. The Dalles, OR 97058

Phone: (541)296-1111

Directions to Mid-Columbia Medical Center from Interstate 84 westbound: Take Exit 85 (The Dalles). Drive south across the overpass and turn right at intersection onto E. 2nd St.. Take the first sharp left onto Brewery Grade (east up the hill). At the top of the hill, turn right on Dry Hollow Rd. Follow Dry Hollow up the hill to the second stop sign (19th Street). Turn left on 19th Street and follow it to Mid-Columbia Medical Center. (Following the blue hospital "H" signs will lead you directly to the hospital).

NON-EMERGENCY RESPONSE: Call one of the contacts listed below.

Emergency / Accident Contact List*:

Mark Weiland, Principle Investigator Office (509) 427-5923
Cellular (360) 798-2666

Christa Woodley, Principle Investigator Office (509) 427-8546
Cellular (530) 400-5871

David Geist, Ecology Technical Group Leader: Office (509) 371-7165
Cellular (509) 554-0291

Charlie Brandt, Chief Operating Officer, Coastal Sciences: Office (509) 371-7165
Cellular (509) 554-0291

Michael Fullmer, S&H Representative Office (509) 372-6370

- This contact will notify the PNNL single point of contact (Fire, Injury, Spill, and Vehicle Accident Reporting) at 509-375-2400.

EMERGENCY RESPONSE:

Bonneville Dam: FIRST call Control Room (Blue box: dial 2223); by cell phones: 541-374-8338; Let dam operators coordinate the response.

Off the dam: FIRST call 911

When the emergency has stabilized, call one of the emergency / accident contacts listed below. They will notify the PNNL single point of contact (Fire, Injury, Spill, and Vehicle Accident Reporting) at (509) 375-2400 and a Technical Group Manager.

Hospital:

Near or on the dam:

Providence Hood River Hospital

811 13th St. Hood River, OR 97031

Phone: (541) 386-3911

Directions:

I-84 East to Hood River; take first exit for Westcliff Drive (US 30 and turn right onto Cascade Drive; travel about 1.3 miles and turn right onto 13th; travel two block south up hill

Hospital:

Camas/Vancouver area:

Southwest Washington Med Center

400 NE Mother Joseph pl. Vancouver, WA 98664

Phone: (360) 256-3258

Directions:

Take Hwy 14 to I-205 North; Exit onto Mill Plain Blvd west (2nd Mill Plain exit); travel west 1.1 miles, and turn right onto NE Mother Joseph Place

NON-EMERGENCY RESPONSE: Call one of the contacts listed below.

Emergency / Accident Contact List*:

Christa Woodley, Principle Investigator Office: (509) 427-8546
Cellular: (530) 400-5871

Mark Weiland, Principle Investigator Office (509) 427-5923
Cellular (360) 798-2666

Charlie Brandt, Chief Operating Officer, Coastal Sciences: Office (509) 371-7165
Cellular (509) 554-0291

David Geist, Ecology Technical Group Leader: Office (509) 371-7165
Cellular (509) 554-0291

Michael Fullmer, S&H Representative Office: (509) 372-6370

- This contact will notify the PNNL single point of contact (Fire, Injury, Spill, and Vehicle Accident Reporting) at 509-375-2400.

The following describes the methods and process for ensuring ethanol used in the field to support fish tagging and other related processes is properly managed:

1. The process requires the use of ethanol as a disinfectant, as such a 70% blend of ethanol and water is used. The 70% solution is derived from using 95% ethanol and mixing with water to create the 70% solution. This process is normally conducted in a laboratory or PNNL facility or a client's facility depending on the project and location where the processes will be performed.
2. As the 70% solution is used it degrades and is checked periodically to ensure effectiveness during the process. If needed 95% ethanol is added to the less than 70% solution to bring it back to full strength and at times sediment and other material is removed from the less than 70% solution, again this is done at a PNNL or client facility.
3. As required some of the processes are required to be conducted in the field and the 70% solution is bottled and transported to the location. It is used and recollected and transported back to the facility.
4. The process is repeated numerous times until one of two conditions happen:
 - First condition, at times the less than 70% solution builds up sediment and material from use in the bottom of container. To ensure that the material is still viable for use sediment and other material is removed from the container and usable less than 70% solutions is transferred to another container and evaluated for use and recharged as necessary. The material remaining in the original less than 70% container is evaluated to determine if there are any viable uses for this remaining solution if so it is processed for redistribution or if there is no viable use the material is accumulated for disposition.
 - The second condition is that the project ends and the 70% solution is no longer needed for the processes and the material is evaluated for redistribution by other projects or purposes such as cleaning, analytical use, etc. If no use is found follow actions in item 6, contact the ECR/FSR.
5. The transfer and evaluation of the less than 70% solution, similar to the recharging process of the less than 70% solution is performed at a facility.
6. Once the material is no longer needed by the project, contact the ECR or FSR for redistribution or disposition. Until such time the material is managed as a chemical product. If the client provided the material return to the client.

The following should be performed to ensure the proper handling, storage and disposition of ethanol: {some of the requirements may or may not be applicable however understanding and complying with these subject areas is required}

1. The ethanol should be procured and managed as a chemical under HDI work control Chemicals-General: <https://hdi.pnl.gov/hdi/workcontrols/viewWorkControl.aspx?wcid=10050>
2. Movement or transportation of chemicals [Prepare Hazardous Material for Transport](#) and [Transport Equipment, Materials or Specimens](#) HDI work flows and (Transporting Materials of Trade (MOT) training and exhibit). Point of Contact is the Hazardous Material Transportation Officer.
3. Manage the ethanol as required under property management: https://business.pnl.gov/property/Property_Management_Manual/sec3_07.stm
4. Accumulation, managing and disposition of waste under HDI Manage Waste work flow: <https://hdi.pnl.gov/document/93D5B914-8378-4D3F-9574-5F9685022275.aspx>

The following describes the methods and process for ensuring and chemicals used in the field to support fish studies and other related processes are properly managed:

1. Any process requiring the use of chemicals as a disinfectant, a blend of chemicals and water, antiseptic, or any other use in the field should be done to ensure no hazardous waste is generated unless it can be properly managed, transported and disposed of in accordance with HDI subject areas. Any solution derived from using chemicals and mixing with water to create the solutions should be handled and managed as product until the solution/material/product is returned to a facility.
2. If the solution is used and degrades it should be checked periodically to ensure effectiveness during the process. It should be returned to a facility before it can no longer be of beneficial use for proper disposition at a facility. If possible chemicals should be added to the weaker solution to bring it back to full strength and at times sediment and other material be removed from a weaker solution to maintain a beneficial use as long as possible when in the field. If possible this is done at a PNNL or client facility.
3. As required some of the processes are required to be conduct in the field and the weaker solutions/product/material is containerized/bottled and transported to the location. It is used and recollected and transported back to the facility.
4. A recharging processes should be repeated numerous times until one of two conditions happen:
 - a. First condition, at times the weaker solution builds up sediment and material from use in the bottom of container. To ensure that the material is still viable for use sediment and other material is removed from the container and usable weaker solutions is transferred to another container and evaluated for use and recharged as necessary (conducted as a facility or client facility if possible). The material remaining in the original container is evaluated to determine if there are any viable uses for this remaining solution if so it is processed for redistribution or if there is no viable use the material is accumulated for disposition (conducted as a facility or client facility if possible).
 - b. The second condition is that the project ends and the solutions/product/material are no longer needed for the processes and the solutions/product/material is evaluated for redistribution by other projects. If no use is found follow actions in item 6, contact the ECR/FSR.
5. The transfer and evaluation of the weaker solution, similar to the recharging process of the weaker solution is performed at a facility.
6. Once the material is no longer needed by the project, contact the ECR or FSR for redistribution or disposition. Until such time the material is managed as a chemical product. If the client provided the material return to the client. **If any of these steps cannot prevent the generation of hazardous waste contact the ECR/FSR prior to declaring and generating waste to discuss requirements.**

The following should be performed to ensure the proper handling, storage and disposition of chemicals: {some of the requirements may or may not be applicable however understanding and complying with these subject areas is required}:

1. The chemicals should be procured and managed as a chemical under HDI Working with Chemicals: <https://hdi.pnl.gov/private/standard/03/0300t010.htm>

Two-Dam Acoustic Telemetry Study: Field Environment, Safety, and Health Plan

2. Movement or transportation of chemicals (Transporting Materials of Trade (MOT)):
<https://hdi.pnl.gov/standard/66/6602d010.htm>
3. Accumulation, managing and disposition of waste under HDI Managing Waste:
<https://hdi.pnl.gov/standard/0f/0f00t010.htm>

Guidance for PNNL Fish Transport (Rev 1)

The following guidance is provided for PNNL personnel that are involved and must transport fish for projects and work activities approved through normal business review and approval:

1. A government, Battelle private or leased/rental vehicle must be used as stated in the applicable HDI work flows and work controls. Rental vehicle should be under an authorized Battelle/PNNL contract. If private vehicle is only option then the Manager and hazardous material transportation officer (HMTO) must approve.
2. Training Course 1868 - Materials of Trade (per 49 CFR 173.6): Personnel are trained in accordance with the regulations and must comply with packaging and weight requirements.
3. If the hazardous material has associated hazards that impact the worker then an ES&H plan should be developed, particularly for field work/Non-IOPS space locations.
 - Establish Special Controls (ES&H Plan)
4. The material will be handled, stored, moved, and managed in accordance with the HDI subject area: Working with Chemicals.
5. Department of Transportation requirements will be implemented for all containers, including compressed gas cylinders, refer to HDI work flows and work controls [Prepare Hazardous Material for Transport](#) and [Transport Equipment, Materials or Specimens](#).
 - The following information is provided in addition to the Materials of Trade Requirements: [49 CFR 173.302\(c\)](#). (c) Notwithstanding the provisions of §§173.24(b)(1) and paragraph (f) of this section, an authorized cylinder containing oxygen continuously fed to tanks containing live fish may be offered for transportation and transported. ****This exemption allows the use of a cylinder to be opened during transportation.****
6. (ES&H) The oxygen cylinders that will be used must be secured, upright and have a valve cap on the cylinder. The 331 lab 151 wet lab has valve caps designed to be used with a regulator. The following are a picture of the cylinder cap (left) that should be used and a harness for rental vehicles (right):



Note: Please maintain this document with ES&H Plans in the field so that vehicle drivers and others understand the requirements when transporting aquatic animals and hazardous material. Any questions on transportation or safety requirements should be directed to the applicable HMTO or SME when they arise or clarification is required on HDI work flows and work controls requirements.

The following should be performed to ensure the proper handling, storage, movement and management of hazardous material: {some of the requirements may or may not be applicable however understanding and complying with these subject areas is required}

1. The material should be procured and managed as a chemical under HDI work control Chemicals-General: <https://hdi.pnl.gov/hdi/workcontrols/viewWorkControl.aspx?wcid=10050>
2. Movement or transportation of chemicals [Prepare Hazardous Material for Transport and Transport Equipment, Materials or Specimens](#) HDI work flows and (Transporting Materials of Trade (MOT) training and exhibit). Point of Contact is the Hazardous Material Transportation Officer.
3. Develop special controls for R&D activities HDI. <https://hdi-portal.pnl.gov/document/eceb485e-82ed-4fc5-8317-8ede44872b83/d8d0f9ee-c967-4283-9f98-155890bf0ee2.aspx>

APPROVALS

Role	Print Name	Signature	Date
System-wide Installation Oversight	James Hughes, Eric Fischer		
On-Site Managers, MCN	Incoming staff (JSH)		
Oversight Manager, MCN	James Hughes		
On-Site Manager, JDA	Scott Carpenter		
Oversight Manager, JDA	Mark Weiland		
On-Site Manager, BON	Christa Woodley		
Tagging Manager	Eric Fischer		
Scheduling Manager	James Hughes		
Release Manager	John Vavrinec		
Release Oversight Manager	Christa Woodley		
Node / Hydrophone Testing & Servicing Managers	Scott Titzler, Darin Etherington		
Oversight Managers – Nodes & Hydrophones	Mark Weiland		
Fish Condition Manager	Christa Woodley		
Project Managers, JDA/MCN survival	Mark Weiland, Christa Woodley		
S&H Representative	Mike Fullmer		
TGM, Ecology	Dave Geist		
TGM, Instrumentation Dev Lab	Ken Auberry		
TGM, Hydrology	Mike Fayer		
TGM, Environmental Assessment	Brian Opitz		
Chief Operating Officer, MSL	Charlie Brandt		

