

## **Appendix C: Job Safety Risk Assessment Templates for Disinfecting Field Gear**

- **OPERATING HOT WATER PRESSURE WASHERS (Page 2)**
  
- **DISINFECTING FIELD GEAR WITH QUATERNARY AMMONIUM COMPOUNDS (Page 6)**
  
- **DISINFECTING FIELD GEAR WITH CHLORINE BLEACH (Page 10)**

**Organizational and Operational Risk Assessment Worksheet**

1. Forest or Unit : <b>TEMPLATE EXAMPLE</b>	Location:	Prepared by (Name / Duty Position):	2. Page _____ of _____
3. Work Project/ Activity <b>OPERATING HOT WATER PRESSURE WASHERS</b>	4. Initial Assessment Date:	5. Date of this assessment update:	6. Version of

7. Worksheet Instructions:

- For each hazard identified in box 8, the local district/unit is to complete boxes 12 and 13 with specific implementation controls and personnel assigned unique to the activity and location.
- Additional hazards unique to this location or unit may need to be documented in box 8 by the local district/unit.

8. Identified Hazards	9. Assess the Hazards: Initial Risk rating from risk matrix				10. Initial Proposed Control Measures Developed for Identified Hazards/Risks:	11. Assess the Hazard's Residual Risk:				12. How to Implement the Controls: (To be completed on the local unit)	13. Assigned to: (To be completed on the local unit)
(Be Specific)	L	M	H	E	(Be Specific)	L	M	H	E	(Be Specific)	(Be Specific)
Unfamiliarity with Equipment			X		To reduce the risk of injury, read operating instructions carefully before using. Know how to stop the machine and bleed pressure quickly. Be thoroughly familiar with the controls.	X					
Physical Protection		X			High pressure spray can cause debris to become airborne and fly at high speeds. To avoid personal injury, wear eye, hand and foot safety devices. Keep operating area clear of all persons.	X					
Risk of fire			X		Do not add fuel when the product is operating or still hot.	X					
Handling Hazardous Fuels				X	Do not confuse gasoline and fuel oil tanks. Keep proper fuel in proper tank. Don't use oil containing gasoline, solvents or alcohol. A mix up can result in fire and/or explosion	X					

**CONTINUED**

8. Identified Hazards	9. Assess the Hazards: Initial Risk from matrix				10. Control Measures Developed for Identified Hazards: <i>(Specific measures taken to reduce the probability of a hazard/risks)</i>	11. Assess the Hazard's Residual Risk:				12. How to Implement the Controls:	13. Assigned to:
<b>(Be Specific)</b>	L	M	H	E	<b>(Be Specific)</b>	L	M	H	E	<b>(Be Specific)</b>	<b>(Be Specific)</b>
Refueling				X	Allow engine to cool for 1-2 minutes before refueling. If fuel is spilled, make sure area is dry before testing the spark plug or starting the engine. (Fire and/or explosion may occur if this is not done.) Refuel gasoline engines: outdoors; with the engine stopped; with no source of ignition within 10 feet of dispensing point; and with allowance for fuel expansion in hot weather.	X					
High Pressures			X		High pressure will cause personal injury or equipment damage. Keep clear of nozzle. Use caution when operating. Do not direct discharge stream at people, or severe injury or death will result.  Before disconnecting discharge hose from water outlet, turn burner off and open spray gun to allow water to cool below 100° before stopping the machine. Then open spray gun to relieve pressure. Failure to properly cool down or maintain the heating coil may result in a steam explosion.  Never run pump dry or leave spray gun closed longer than 1-2 minutes.	X					
High Pressure Nozzle		X			Grip cleaning wand securely with both hands before starting. Failure to do this could result in injury from a whipping wand.	X					

14. Remaining Risk Level After Control Measures Are Implemented: (CIRCLE HIGHEST REMAINING RISK LEVEL)	<b>LOW</b> (Supervisor)	<b>MEDIUM</b> (Program Manager Staff Officer)	<b>HIGH</b> (District Ranger)	<b>EXTREME</b> (District Ranger or Forest Supervisor)

15. RISK DECISION AUTHORITY: **(Approval/Authority Signature Block)** (If Initial Risk Level is Medium, High or Extremely High, Brief Risk Decision Authority at that level on Controls and Control Measures used to reduce risks) **(Note: if the person preparing the form signs this block, the signature indicates only that the appropriate risk decision authority was notified of the initial risk level, control measures taken and appropriate resources requested; and that the risk was accepted by the decision authority.)**

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(Signature)

## RISK ASSESSMENT MATRIX

As we have learned, successful management of risk demands commitment and leadership from top management to the smart employees in the field. We must continue to work towards agreement on how we define and manage tolerable risk and discourage attitudes of apathy or fatalism. Clearly we cannot completely eliminate the risk. Moreover, sardonic remarks that the only way to avoid the danger is to stay out of the woods do not add value to the discussion. On the other hand, we must not engage full on with heads down and surrender our fate to so called luck, or simply dismiss the concern as an inherent, unavoidable part of a risky job. We have the experience and capability to safely manage hazards and are obligated to seize every opportunity to do better.

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A problem when you have a number of possible risks is to decide which ones are worthy of further attention. The Risk Assessment Matrix is a simple graphical tool widely used in many professions worldwide to help prioritize risks.

There are two main dimensions to risk: (a) How likely it will occur (probability) and (b) The impact/effect (severity) that it would have, should it occur. One familiar model of quantifying risk is to assign a numeric value to these risks and to multiply these together. However, a problem with this quantitative approach is that high-probability/low-impact risks get the same score as high-impact/low-probability risks. The following Risk Assessment Matrix is a widely recognized and more effective method to assess risk.

The Risk Assessment Matrix simply puts Probability (likelihood) and Severity (effect/impact) on two sides of an x-y chart and then the risk are placed within this two-dimensional space (see chart below). This gives several advantages:

- High-probability/low-impact and high-impact/low-probability risks are differentiated.
- You can visually compare risk, thus asking the question ‘is this one more or less likely then that one?’ This plays to the human cognitive preference for paired comparison rather than absolute evaluation.
- Then the risks can be addressed from top right down to bottom left. High-probability/low-impact and high-impact/low-probability risk of equal risk exposure score will tend to be evaluated at around the same time.
- The process can be done on the wall with flipchart-paper, on a paper or computer format, or in many cases in your head.

Risk Assessment Matrix			HAZARD PROBABILITY (Likelihood)				
			Frequent	Likely	Possible	Seldom	Unlikely
			A	B	C	D	E
Severity (Effect/impact)	<b>Catastrophic:</b> Fatal, life threatening or permanent disability	I	Extreme (4)	E	H		M
	<b>Major:</b> Severe injury or illness. Long term disability and/or Lost time	II		H		M	L
	<b>Moderate:</b> Medical treatment-no permanent injury or illness, and/or restricted duty	III	High (3)	M		L	
	<b>Minor:</b> First aid - Minor cuts, bruises, or sickness. No lost time/restricted duty	IV	Medium (2)	Low (1)			
Risk Tolerance Rating Criteria							
Extreme - 4		High - 3		Medium - 2		Low - 1	
<b>Unacceptable:</b> Likely harm from an event must not be accepted. Must be reduced with administrative barriers of protection and/or engineering controls. Eliminate or avoid risk to maintain sufficient safeguards.		<b>Intolerable:</b> Should be reduced with administrative and/or engineering controls. Risk should not be tolerated save in special/limited circumstances.		<b>Tolerable:</b> Tolerable if further risk reduction (cost, time, effort) would be grossly disproportionate to improvement gained.		<b>Acceptable:</b> Negligible given common safe job procedures are applied. Continual vigilance necessary to maintain assurance that risk remains at this level.	

**Organizational Risk Management**

**Organizational and Operational Risk Assessment Worksheet**

1. Forest or Unit : <b>EXAMPLE TEMPLATE</b>	Location:	Prepared by (Name / Duty Position):	2. Page _____ of _____
3. Work Project/ Activity <b>DISINFECTING FIELD GEAR WITH QUATERNARY AMMONIUM COMPOUNDS (e.g., Quat 128, Green Solutions)</b>	4. Initial Assessment Date:	5. Date of this assessment update:	6. Version of _____

7. Worksheet Instructions:

- For each hazard identified in box 8, the local district/unit is to complete boxes 12 and 13 with specific implementation controls and personnel assigned unique to the activity and location.
- Additional hazards unique to this location or unit may need to be documented in box 8 by the local district/unit.

8. Identified Hazards	9. Assess the Hazards: Initial Risk rating from risk matrix				10. Initial Proposed Control Measures Developed for Identified Hazards/Risks:	11. Assess the Hazard's Residual Risk:				12. How to Implement the Controls: (To be completed on the local unit)	13. Assigned to: (To be completed on the local unit)
(Be Specific)	L	M	H	E	(Be Specific)	L	M	H	E	(Be Specific)	(Be Specific)
Chemical Contact			X		Concentrated quat compounds are corrosive and can cause irreversible eye damage and skin burns. Wear protective clothing including safety glasses or goggles and impervious gloves.	X					
Swallowed Chemical		X			If chemical is swallowed, drink a glassful of water and call a physician. Do not induce vomiting	X					
Eye Contact			X		Wear PPE. Remove contact lenses if present. Flush eyes with copious amounts of water for at least 15 minutes. If irritation persists, see a doctor. When preparing quat solutions in the field each crew member should carry 1 quart of water at a minimum for use as an eye flush	X					
Storage and Transport	X				Store in an air tight container upright in a cool, dry area, and avoid heat above 110° F. In case of spill, flood areas with large quantities of water. Do not reuse empty container. Do NOT allow product to enter storm drains, lakes, streams, or other bodies of water.	X					

**CONTINUED**

8. Identified Hazards	9. Assess the Hazards: Initial Risk from matrix				10. Control Measures Developed for Identified Hazards: <i>(Specific measures taken to reduce the probability of a hazard/risks)</i>	11. Assess the Hazard's Residual Risk:				12. How to Implement the Controls:	13. Assigned to:
<b>(Be Specific)</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>E</b>	<b>(Be Specific)</b>	<b>L</b>	<b>M</b>	<b>H</b>	<b>E</b>	<b>(Be Specific)</b>	<b>(Be Specific)</b>
Inhalation of Fumes	X				Avoid inhalation of vapor or mist; normal room ventilation is adequate.	X					
Physical or Chemical Hazards				X	Do not mix with chlorine bleach; the combination may release hazardous or explosive gases.	X					
Environmental Hazards			X		Quat compounds are highly toxic to aquatic organisms but are immobile in soil. Keep effluent containing this product at least 100 ft from lakes, ponds, streams or other waters (EPA's Reregistration Eligibility Decision for Aliphatic Alkyl Quaternaries EPA739-R-06-008 at: <a href="https://archive.epa.gov/pesticides/reregistration/web/pdf/ddac_red.pdf">https://archive.epa.gov/pesticides/reregistration/web/pdf/ddac_red.pdf</a> ). Flush to sanitary sewers if possible, but notify treatment facility if large volumes are involved.	X					

14. Remaining Risk Level After Control Measures Are Implemented: (CIRCLE HIGHEST REMAINING RISK LEVEL)	<b>LOW</b> (Supervisor)	<b>MEDIUM</b> (Program Manager Staff Officer )	<b>HIGH</b> (District Ranger)	<b>EXTREME</b> (District Ranger or Forest Supervisor)
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	<b>Major:</b> Severe injury or illness. Long term disability and/or Lost time	II		H		M	L
	<b>Moderate:</b> Medical treatment-no permanent injury or illness, and/or restricted duty	III	High (3)	M	L		
	<b>Minor:</b> First aid - Minor cuts, bruises, or sickness. No lost time/restricted duty	IV	Medium (2)	Low (1)			

Risk Tolerance Rating Criteria			
Extreme - 4	High - 3	Medium - 2	Low - 1
<b>Unacceptable:</b> Likely harm from an event must not be accepted. Must be reduced with administrative barriers of protection and/or engineering controls. Eliminate or avoid risk to maintain sufficient safeguards.	<b>Intolerable:</b> Should be reduced with administrative and/or engineering controls. Risk should not be tolerated save in special/limited circumstances.	<b>Tolerable:</b> Tolerable if further risk reduction (cost, time, effort) would be grossly disproportionate to improvement gained.	<b>Acceptable:</b> Negligible given common safe job procedures are applied. Continual vigilance necessary to maintain assurance that risk remains at this level.

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7. Worksheet Instructions:															
<ul style="list-style-type: none"> <li>For each hazard identified in box 8, the local district/unit is to complete boxes 12 and 13 with specific implementation controls and personnel assigned unique to the activity and location.</li> <li>Additional hazards unique to this location or unit may need to be documented in box 8 by the local district/unit.</li> </ul>															
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<b>(Be Specific)</b>		<b>L</b>	<b>M</b>	<b>H</b>	<b>E</b>	<b>(Be Specific)</b>				<b>L</b>	<b>M</b>	<b>H</b>	<b>E</b>	<b>(Be Specific)</b>	
Chemical Contact				X		Bleach can cause severe but temporary eye irritation and can be a skin irritant. Wear protective clothing including safety glasses or goggles and impervious gloves.				X					
Swallowed Chemical			X			If chemical is swallowed, drink a glassful of water and call a physician. Do not induce vomiting.				X					
Eye Contact				X		Wear PPE. Remove contact lenses if present. Flush eyes with copious amounts of water for at least 15 minutes. If irritation persists, see a doctor. When preparing bleach solutions in the field each crew member should carry 1 quart of water at a minimum for use as an eye flush.				X					
Storage and Transport		X				Store in an air tight container upright in a cool, dry area, and away from direct sunlight and heat to avoid deterioration. In case of spill, flood areas with large quantities of water. Do not reuse empty container. Do NOT allow product to enter storm drains, lakes, streams, or other bodies of water.				X					

CONTINUED

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<b>(Be Specific)</b>	L	M	H	E	<b>(Be Specific)</b>	L	M	H	E	<b>(Be Specific)</b>	<b>(Be Specific)</b>
Inhalation of Fumes	X				Avoid inhalation of vapor or mist and use only in a well-ventilated area	X					
Physical or Chemical Hazards			X		Product contains a strong oxidizer. Prolonged contact with metal may cause pitting or discoloration. Will damage fabrics and rubber. Do not add bleach directly to fire retardants containing ammonia, such as Phos-Chek, or with quaternary ammonium products. Mixing bleach with products containing ammonia may release hazardous or explosive gases.	X					
Environmental Hazards		X			Bleach is toxic to aquatic organisms but degrades rapidly. Do not discharge effluent containing this product into lakes, ponds, streams or other waters.	X					

14. Remaining Risk Level After Control Measures Are Implemented: (CIRCLE HIGHEST REMAINING RISK LEVEL)

**LOW**  
(Supervisor)

**MEDIUM**  
(Program Manager  
Staff Officer)

**HIGH**  
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