

ON-SHORE AND OFF-SHORE PPE SELECTION MATRIX FOR OIL SPILL EXPOSURES

Guidance for Common Oil Spill Scenarios

The Oil Spill Personal Protective Equipment (PPE) Matrix provides recommendations on the protective equipment for workers who respond to oil spills. This guidance is an update of the original matrix developed in 2010 during the Deepwater Horizon Unified Command response.

The 2010 PPE Matrix was the result of a joint collaborative effort by BP safety staff, the U.S. Coast Guard (USCG), the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), and State and local partners and their contractors. This update, developed by the National Response Team ([NRT](#)) Worker Health and Safety Subcommittee, reflects advancements in safety equipment, and best practices achieved over the last decade.

Oil spill response work involves hazardous materials cleanup, response, recovery, and handling. Oil spill response workers may be exposed to a variety of hazards from oil and chemicals, such as volatile organic compounds, oil byproducts, dispersants, detergents, degreasers, and bioremediation products. These workers may also be exposed to environmental factors such as heat or cold stress.

Workers responding to an oil spill have a right to a safe and healthy workplace. Employers are responsible for ensuring that safe work environment. During oil spill response, recovery, and cleanup, workers need to be protected from hazards and exposures on land and in oceans, estuaries, rivers, lakes, and ponds. Engineering controls and administrative controls can significantly reduce health risks for workers. But if the risks are not eliminated or adequately reduced, supplementing those controls with the proper use of appropriate personal protective equipment (PPE) will minimize workers' exposures.

This Matrix can be used in conjunction with a comprehensive risk assessment (e.g., job hazard analysis ([JHA](#)) or an Incident Action Plan Safety Analysis (Incident Command System [ICS-215A](#))) for oil spill response operations. The On-Scene Coordinator or Safety Officer will evaluate the nature of the spill and the potential hazards for affected workers. Based on this data, they will determine the best means to comply with OSHA safety and health regulations to protect workers involved in all response operations. Please contact the Department of the Interior U.S. Fish and Wildlife Service regarding contaminated fish, wildlife, and rescued animals.

The Matrix provides examples of common scenarios for on-shore and off-shore oil spills but does not prescribe PPE for every worker exposure or scenario, nor does it identify all PPE options. In all cases, employers must identify potential hazards and provide a protocol to mitigate them. For example, if the JHA assessment requires respiratory protection, the employer must provide the employee with a medical exam, fit-testing, written program, user seal checks and training, as required by OSHA standards ([1910.134](#)).

The PPE recommendations in this document address general oil spill cleanup and response work, but not all potential risks or all scenarios involved in these activities. For more information on oil spill response, consult The National Institute of Environmental Health Science's (NIEHS's) [Oil Spill Cleanup: Safety and Health Awareness for Oil Spill Cleanup Workers \(Booklet\)](#) or The National Institute for Occupational Safety and Health (NIOSH) [Emergency Response Topic Page](#).

NRT PPE SELECTION MATRIX FOR ON-SHORE OIL SPILLS

Task #	Task Title	Task Description & Requirements	HEAD		EYES			FACE	EARS	HANDS			BODY								FEET			ADDITIONAL CONSIDERATIONS				
			Sun Hat/ Sun Screen	Hard Hat	Sun Glasses (8)	Safety Glasses (7), (8)	Safety Goggles	Face Shield	Hearing Protection	Nitrile 26-40 mil Heavy Use Gloves	Nitrile 11-26 mil Light Use Gloves	Abrasion Resistant Work Gloves	Respiratory Protection (RP)	Hi-Visible Garment	Barrier Apron and/or Barrier Sleeves and/or Barrier Pants	Breathable Barrier Suit for Solids	Breathable Barrier Suit for Solids and Light Splash	Impervious Suit for Extended Oil Contact	Chest Waders/ Hip Boots	USCG Approved PFD	Safety Boots	Boot Covers	Rubber Boots					
1	Manual Removal of Solid Tar Balls, Oiled Materials, and Manual Scraping (Shoreline Cleanup)	Solid tar balls or patties are removed using shovels, rakes and buckets, etc. Oiled sediments and debris are removed by hand, shovels, rakes, wheel barrows, etc. No surf entry, oil is scraped from substrate using hand tools.	X	(1)		X	(4)	(4)				(4)	(4)	X (OUTER)	(4)	(6)	(4)	(4)	(4)	(4)	(4)	(4)	(2)	(3),(5)	(4)	X	Safety footwear, rubber boots or latex boot covers w/steel toe boots will be used if steel toes are required. Body protective apparel and suit selection based on-site conditions/work practices.	
2	Mechanical Sand Rake (Shoreline Cleanup)	Solid tar balls or patties are removed by mechanical device. Upgrade PPE for unloading and maintenance tasks as needed.	X	(1)		X				X													(2)	X	X			
3	Manual Cutting of Oiled Vegetation	Oiled vegetation is cut by hand, collected and stuffed into bags or containers for disposal. Performed using machete, shearing tools, garden tools, and power tools etc.	X	(1)		X	(4)	(4)	(4)				(4)	X (OUTER)	(4)	(6)	(4)	(4)	(4)	(4)	(4)	(4)	(2)	(3),(5)	(4)	X	Cut resistant sleeves as required. Suit selection based on site conditions and work practices.	
4	Manual Sorbent Application (Shoreline Cleanup)	Sorbents are applied manually to contaminated areas to soak up oil.	X	(1)		X	(4)							X	(4)	(6)	(4)	(4)	(4)				(2)	(3),(5)	(4)	X	Suit selection based on site conditions. Note: Some sorbents may pose an inhalation hazard because they contain particulates.	
5	Manual Sorbent Retrieval (Shoreline Cleanup)	Sorbents are retrieved manually to contaminated areas to soak up oil.	X	(1)		X	(4)			X					(4)	(6)	(4)	(4)	(4)	(4)	(4)	(4)	(2)	(3),(5)	(4)	X	Suit selection based on site conditions. Note: Some sorbents may pose an inhalation hazard because they contain particulates.	
6	Tideline Boom Deployment and Maintenance (Shoreline Cleanup)	Deployment of clean boom and moving of boom at tideline.	X	(1)		X	X						(4) (INNER)	X (OUTER)	(4)	(6)	(4)	(4)	(4)	(4)	(4)		(2)	(3)	(4)	X	Suit selection based on site conditions/work practices.	
7	Snare Boom Operations	Snare boom is deployed into/retrieved from the water (including tidal pools) from shore.	X	(1)		X	X	(4)					(X) (INNER)	X (OUTER)	(4)	(6)	(4)	(4)	(4)	(4)	(4)	(4)	(2)			X	Goggles and faceshield for boom retrieval only.	
8	Sump and Pump/Vacuum Truck/Portable Skimmers	Oil collects in sumps, natural depressions or behind booms. Oil is removed by skimmers and vacuum equipment/trucks.	X	X		X	(4)	(4)	X		(4)		(4) (INNER)	X (OUTER)	(4)	(6)	(4)	(4)	(4)	(4)	(4)	(4)	(2)	X	(4)			
9	Decon - Low Pressure Cleaning	< 100 psi (e.g. garden hose, powered sprayer)	X	(1)		X	(4)						X		(4)	(6)			X	(4)			(2)			X		
10	Decon - High and Medium Pressure Cleaning	High and medium pressure water spray flushes oil from substrate and is channeled to recovery points. Applies to pressure washers between 100 and 2,500 psi operating range.	X	(1)				X	X	X	X				(4)	(6)			X	(4)			(2)	X	X		PPE alone is not sufficient. Detailed training required on pressure washer use. Task needs to be continually monitored to assess the need for additional PPE. For additional guidance, see the NIOSH PPE Guide.	
11	Bioremediation Agents Application	Comprised of microbes, nutrients, enzymes, or a combination intended to encourage the oil degradation. Applied with sprayer or spreader then may be rototilled or raked into the soil. Products may take days to degrade oil. Not for use in water bodies.	X (4)					X	(4)	4								X								X	Refer to product Safety Data Sheet (SDS) to select and verify proper PPE. Note: Respiratory protection may be needed.	
12	Surface Washing Agents Application, Collection and Disposal	Only used on solid surfaces such as beaches and rock (not an on-water tool) to lift and float oil to better absorb, vacuum, skim or collect the oil for disposal. Area should be boomed prior to application. Applied with pressure washers. Oil should be collected for disposal using vacuum.	X (4)	X				X			X							X								X	Refer to product SDS to select and verify proper PPE. Note: Respiratory protection may be needed.	
13	In-Situ Burning (ISB)	ISB involves controlled burning of spilled oil. Unburned oil and residue may need to be recovered after the burn. Special Monitoring of Applied Response Technologies (SMART) teams gather air monitoring data.	(4)		X (8)	X (8)	X							X (Fire Resistant)	(4)													Land and enclosed water bodies. Air Quality Monitoring, Weather and Smoke Management considerations are required. SMART Monitoring teams gather air monitoring data. Note: Fire Resistant clothing is required for this activity. PPE requirements may vary based on the burn location and conditions.

- (1) Required only when overhead or bump hazards are present. Sun hat may be required when hard hat is not required.
- (2) Personal Flotation Device (PFD) is required when working on docks, vessels, and if entering water/surf where water level exceeds knee height.
- (3) Safety boots (e.g. steel-toe or composite) are required based on worksite conditions.

- (4) To be worn when JHA identifies hazards that exist that warrant the use of this protection and/or other PPE (e.g. safety glasses, respiratory protection) selection and use will be determined by conducting a field [JHA](#) or [ICS 215A](#) assessment prior to task initiation.
- (5) Wear snake boots/gaiters based on risk.

- (6) Required when working around heavy equipment or Utility Terrain Vehicles (UTV's).
- (7) Only clear lenses shall be used at night.
- (8) Only polarized or reflective lenses shall be used during the day, unless site conditions and job tasks warrant clear lenses.

*** Hazard assessments will be performed by Site Safety Officers, Site Supervisors or Team leads that have been trained in conducting hazard assessments and the associated incident field form(s) being used, with input from the Incident Command (IC)/Unified Command (UC)/Health Safety Officer (HSO) as requested.



NRT PPE SELECTION MATRIX FOR OFF-SHORE OIL SPILLS

Task #	Task Title	Task Description & Requirements	HEAD		EYES			FACE	EARS	HANDS			BODY									FEET			ADDITIONAL CONSIDERATIONS			
			Sun Hat/ Sun Screen	Hard Hat	Sun Glasses (8)	Safety Glasses (7), (8)	Safety Goggles	Face Shield	Hearing Protection	Nitrile 26-40 mil Heavy Use Gloves	Nitrile 11-26 mil Light Use Gloves	Abrasion Resistant Work Gloves	Respiratory Protection (RP)	Hi - Visible Garment	Barrier Apron and/or Barrier Sleeves and/or Barrier Pants	Breathable Barrier Suit for Solids	Breathable Barrier Suit for Solids and Light Splash	Impervious Suit for Extended Oil Contact	Chest Waders/ Hip Boots	USCG Approved PFD	Fire Resistant Clothing	Safety Boots	Boot Covers	Rubber Boots				
1	Manual Cutting of Oiled Vegetation	Oiled vegetation is cut by hand, collected and stuffed into bags or containers for disposal. Performed from boat using machete, shearing tools, garden tools, etc.	X	(1)		X	(4)	(4)				(4)	(6)	(4)	(4)	(4)	(4)	(4)	(2)		(3)	(4)	X	Cut resistant sleeves as required. Suit selection based on site conditions.				
2	Manual Sorbent Application (Shoreline Cleanup from Vessel)	Sorbents are applied manually into the water from boats to contaminated areas to soak up oil.	X	(1)		X	(4)						(4)	(6)	(4)	(4)	(4)		X		(3),(5)	(4)	X	Suit selection based on site conditions.				
3	Manual Sorbent Retrieval (Shoreline Cleanup from Vessel)	Sorbents are retrieved manually from the water by boat.	X	(1)		X	(4)						(4)	(6)	(4)	(4)	(4)		X		(3),(5)	(4)	X					
4	Clean Boom Deployment (Hard Boom)	Deployment of clean boom.	X	(1)		X									(4)				X		X							
5	Boom Retrieval (Hard Boom)	Retrieval of oiled boom.	X	(1)		X	(4)								(4)	(INNER)	X	(OUTER)	(4)		X	(4)		Suit selection based on site conditions.				
6	Snare Boom Operations	Snare boom is deployed/retrieved into the water (also tidal pools) from boats.	X	(1)		X	X	(4)							(4)	(INNER)	X	(OUTER)	(4)	(6)	(4)	(4)	(4)	(2)	Goggles and faceshield for boom retrieval only.			
7	Sump and Pump/ Vacuum Truck/ Portable Skimmers	Oil collects in sumps, natural depressions or behind booms. Oil is removed by skimmers and vacuum equipment/trucks.	X	X		X	(4)	(4)	X						(4)	(INNER)	X	(OUTER)	(4)	(6)	(4)	(4)	(4)	(4)				
8	Skimming Operations (Outside 5 Mile Radius from Source)	Use of skimming resources to remove oil from the water. Activities include retrieval and skimmer operations including recovered oil transfer.	X	(1)		X	(4)	(4)	(4)						(4)	(INNER)	X	(OUTER)	(4)		(4)				If using heavy nitrile gloves, abrasion resistant work gloves are not required.			
9	Skimming Operations (Inside 5 Mile Radius from Source)	Use of skimming resources to remove oil from the water. Activities include retrieval and skimmer operations including recovered oil transfer.	X	(1)		X	(4)	(4)	(4)						(4)	(INNER)	X	(OUTER)	(4)		(4)			X	Workers must be respiratory program qualified. If using heavy nitrile gloves, abrasion resistant work gloves are not required.			
10	Decon - Low Pressure Cleaning	< 100 psi (e.g. garden hose, Hudson sprayer)	X	(1)		X	(4)	(4)							(4)	(6)								X				
11	Decon - High and Medium Pressure Cleaning	Medium pressure water spray flushes oil from substrate and is channeled to recovery points. For pressure washers between 100 and 2,500 psi operating range.	X	(1)			X	X	X	X	X				(4)	(6)					(2)		X	X	PPE alone is not sufficient protection. Detailed training required on safe pressure washer use. Task needs to be continually monitored to assess the need for additional PPE. For additional guidance, see the NIOSH PPE Guide.			
12	In-Situ Burning (ISB)	Upwind end of contaminated area is ignited to burn down-wind. Respiratory protection may be required if identified in a site-specific task hazard analysis. ISB involves controlled burning of spilled oil. Surface collecting agents (herders) may be used on the oil slick before burning. The oil may be contained within a fire-resistant boom and ignited using an igniter from a helicopter. Air Quality Monitoring, Weather, and Smoke Management considerations are required. SMART Monitoring takes place down-wind of the burn to gather air monitoring data. Unburned oil and residue may need to be recovered after the burn.	(4)	(1)		X													X	X	(3)			Fire resistant glove and hoods. Emergency escape breathing device is required for each person on board. Devices are provided by vessel. Land and enclosed water bodies. Note: Special Monitoring of Applied Response Technologies (SMART). Fire resistant clothing is required for this activity.				
13	In-Situ Burning (ISB) Fire Boom Retrieval (Post Burn)	On-water booms must be collected after burn (see Item #5 Boom Retrieval above).	X	(1)	(8)	X	(4)								(4)	(INNER)	X	(OUTER)	(4)	(6)	(4)	(4)	(4)	(4)	(2)	(3)	(4)	
14	Cargo Inspections on Marine Vessels	Opening tanks and storage compartments holding collected oil and vegetation for visual inspection (H2S exposure potential).	X	(1)		X	(4)		(4)						(4)		X				X				Task needs to be continually monitored to assess the need for additional PPE.			
15	Marsh/Near-Shore Oil Assessment	SCAT-Pollution Investigation. Workers on foot, aboard small boats or ATVs patrol shorelines, marshes and bayous to assess oil impact. Workers will not be physically cleaning.	X	(1)		X			(4)						(4)	(4)				(4)	(2)		(3),(5)	(4)	(4)			
16	Dispersant Application (Aerial) and Monitoring	Used in Marine waters. Applied by airplane or helicopter. SMART Monitoring teams gather effectiveness data before, during, and after application. Dispersants must be carefully loaded on helicopters or airplanes.				X	X	X							(4)		(4)				X				Not used near shore. Refer to product Safety Data Sheets (SDS) to select and verify proper PPE.			
17	Dispersant Application (From Vessel/Boat) and Monitoring	Used in Marine waters. SMART Monitoring teams gather effectiveness data before, during, and after application.	X				X	X							(4)		(4)				X				Not used near shore. Refer to chemical SDS to select and verify proper PPE.			
18	Solidifier Application, Collection and Disposal	Chemically solidify oil to aid in collection and disposal. Solidifiers float on water and must be collected for proper disposal.	X				X								(4)						X				Sinking Agents are not permitted to be used in waters of the United States. Solidifiers float on the water and must be retrieved for disposal. Refer to the product SDS to select and verify proper PPE.			
19	Surface Collecting Agent Application (A/K/A Herders)	Herders form a surface film to control the layer thickness of oil thus pulling the oil slick inwards. Herders are sometimes used before ISB to control the oil slick size and thickness before ignition.	X				X	(4)											X		X				Refer to the product SDS to select and verify proper PPE. Note: Respiratory protection may be needed.			
20	Shoreline Cleanup and Assessment Technique (SCAT)	A systematic method for surveying an affected shoreline after an oil spill. SCAT surveys begin early in the response to assess initial shoreline conditions, and ideally continue to work in advance of operational cleanup. Surveys continue during the response to verify shoreline oiling, cleanup effectiveness, and eventually, to conduct final evaluations of shorelines to ensure they meet cleanup endpoints.	X	(1)	(8)	(4)			(4)						(4)						(4)	(2)		(3),(5)	(4)	(4)		

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