BNSF Technical Manual for the Tri-Cities Planning Standard Area

Technical Manual Description: This manual was developed in accordance with WAC 173-182-349 and is for planning purposes only. It includes equipment appropriate for the operating environment on the Columbia River and can be used to show how recovery and storage systems could be put together and applied to the recovery and storage planning standards.

Technical Manual Planning Standard: Tri-Cities

Plan Holders Covered by the Manual: BNSF

Oil Types the Technical Manual Covers: I-V

Worst Case Discharge: worst case discharge volume of 12,642 bbls

Recovery and storage volume requirements based on the worst case discharge

	Boom (ft)	Recovery (bbls/day)	Storage (bbls)
Hour 6	5,000	1,264	1,264
Hour 12	20,000 Additional	6,312	6,312
Hour 24	More as Necessary	12,624	12,624

Technical Manual Planning Assumptions

Vessels and boom for GRPs are not represented in the technical manual. The focus of the manual is the recovery and storage systems. Workboats will be used only once. Additional BNSF owned and contracted equipment not listed in this manual can be found on the Western Response Resource List (www.wrrl.us).

Training Level Personnel Described in the Recovery and Storage Tactics

Response Personnel hold current 8, 24 or 40 hour HAZWOPER certification in compliance with 29 CFR 1910.120 and WAC 296-824-300. Where required by USCG regulation, personnel that have vessel crewing assignments and responsibilities hold appropriate USCG Merchant Mariner Licenses and Endorsements.

Updates and Distribution

This planning document does not bind BNSF or its' contractors to use specific tactics during a spill or drill or guarantee what will occur in an actual spill event. Information is subject to change. Version Created April 16, 2018.

Task Force Equipment Summary

The table below summarizes task force equipment that is detailed on the following pages. There are links that will lead to corresponding task force pages with further detail.

Hour 6 Task Forces

Task Force Number	Description of Tactic	Recovery EDRC (bbls/day)	Liquid Storage (bbls)	Boom (ft)	People
RG-DIV-A-06	Source Recovery	130	1040	3000	26
RG-GRP-06	Nearshore Oil Recovery - Disc and Drum Skimmers	1360	280	12600	12
Hour 6 Requirements:		1264	1264	5000	-
Hour 6 Totals:		1490	1320	15600	38

Hour 12 Task Forces

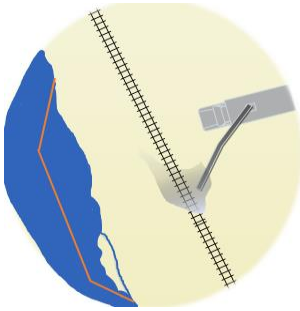
Task Force Number	Description of Tactic	Recovery EDRC (bbls/day)	Liquid Storage (bbls)	Boom (ft)	People
RG-GRP-12	GRP Collection Strategies (Drum, Brush)	4482	1033	6500	35
RG-GRP2-12	GRP Collection Strategies (Belt, Weir)	4774	1743	19300	15
RG-BORS-12	On Water Collection - Boom Oil Recovery System (Buster/Desmi)	288	906	10600	10
SG-LND-12	Land Based Storage Equipment	0	2174	0	0
SG-OW-12	On-Water Storage Equipment	0	1910	1720	0
Hour 12 Requirements:		6312	6312	25000	-
Hour 12 Totals:		11034	9086	53720	98

Hour 24 Task Forces

Task Force Number	Description of Tactic	Recovery EDRC (bbls/day)	Liquid Storage (bbls)	Boom (ft)	People
RG-MRCO-24	On-Water Recovery-Marco Belt Skimmers	21528	1786	3420	43
RG-SWB-24	On-Water Recovery-Disc/Brush Skimmers	2715	1200	180	9
RG-SWRB-24	On-Water Recovery-Marco Belt Skimmers	17940	500	1600	18
SG-LND-24	Land Based Storage Equipment	0	3120	0	0
Hour 24 Requirements:		12624	12624	>25000	-
Hour 24 Totals:		53217	15692	58920	168

Tri-Cities Technical Manual - (06 hour) - Source Recovery System Detail

RG-DIV-A-06



Tactic purpose and description: The purpose of this tactic is for collection/recovery at the source of the spill. Vacuum trucks may remove oil from full/partially full derailed tank cars and remove thick slicks of oil from the surface of the river. A Guzzler/Airmover can be used to pothole and remove impacted soil and gravel. Roll-off boxes, frac tanks, and additional empty tank cars may all be used for additional storage for recovered oil. Boom can be deployed along the shoreline as source containment and a portable skimmer and vac truck can be used to recover product within the containment boom.

Operating environment: Source of the oil spill. This may include terrestrial and shoreside environments.

Night Operations (describe how this system is capable to support night ops): Transfers and nearshore skimming operations using the vacuum trucks are both possible during the night with adequate lighting.

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): 12 Hour: 26 personnel / 24 Hour: 52 personnel to simultaneously operate the below listed equipment. Personnel requirements may vary dramatically depending on the amount of source recovery necessary and the number of impacted train cars.

Recovery Device Detail:

Owner	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
CHES	33745	Skimmer	Skimmer-PS-3	Drum Skimmer	Elastec TDS 118	130	0	0	1	Pasco	WA	Warehouse
CHES	33716	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 120bbl, 250gpm	0	120	0	1	Pasco	WA	Warehouse
CHES	33705	Vehicle	Vehicle-VT-2	Vacuum Truck	Liquide Vac 70bbl, 250gpm	0	70	0	1	Moses Lake	WA	Yard
NRCES	28267	Vehicle	Vehicle-VT-2	Vacuum Truck	Kenworth 70 bbl	0	70	0	1	Pasco	WA	Yard
NRCES	28285	Vehicle	Vehicle-VT-3	Vactor Truck (Guzzler)	Supersucker air mover	0	60	0	2	Pasco	WA	Yard
NRCES	31800	Vehicle	Vehicle-VT-3	Vactor Truck (2155)	Kenworth Hydroexcavator	0	60	0	2	Seattle	WA	Yard
NRCES	31799	Vehicle	Vehicle-VT-3	Vacuum Truck (2092)	Sterling Supersucker Highrail	0	60	0	2	Spokane	WA	Yard

Tri-Cities Technical Manual - (06 hour) - Source Recovery System Detail												RG-DIV-A-06
Storage and Other Support Equipment Detail:												
Owner	**wrrlID**	**Resource**	**Kind Type**	**Identification**	**Specifications**	**Recovery EDRC**	**Liquid Storage**	**Boom**	**People**	**Home Base**	**State**	**Staging**
NRCES	28491	Vessel	Vessel-SKF-0	Lund Skiff 6548	Workboat 12'	0	0	0	2	Pasco	WA	Trailer 3196, yard
CHES	31221	Vessel	Vessel-SKF-0	Work Boat	21', 115HP	0	0	0	2	Clackamas	OR	Trailered
NRCES	28532	Vessel	Vessel-WB-4	Green Lund #2	Workboat 20', 60hp	0	0	0	2	Pasco	WA	Trailer 6553
CHES	33733	Vehicle	Vehicle-VT-3	Vactor Truck	Combo Air Mover, 10cy	0	48	0	1	Spokane	WA	Warehouse
CHES	31238	Vehicle	Vehicle-VT-3	Vactor Truck (9001)	Combo Air Mover, 10cy	0	48	0	1	Clackamas	OR	Warehouse
CHES	31239	Vehicle	Vehicle-VT-3	Guzzler Truck	Air Mover, 10cy	0	48	0	1	Clackamas	OR	Warehouse
CHES	33674	Vehicle	Vehicle-VT-3	Vactor Truck	Combo Air Mover, 10cy	0	48	0	1	Clackamas	OR	Warehouse
CHES	33675	Vehicle	Vehicle-VT-3	Vactor Truck	Combo Air Mover, 10cy	0	48	0	1	Clackamas	OR	Warehouse
CHES	33676	Vehicle	Vehicle-VT-3	Guzzler Truck	Air Mover, 10cy	0	48	0	1	Clackamas	OR	Warehouse
CHES	33677	Vehicle	Vehicle-VT-3	Guzzler Truck	HighRail, Air Mover, 10cy	0	48	0	1	Clackamas	OR	Warehouse
CHES	31308	Vehicle	Vehicle-VT-3	Vactor Truck (4325)	Combo Air Mover, 10cy	0	48	0	1	Kent	WA	Yard
CHES	31324	Vehicle	Vehicle-VT-3	Vactor Truck	Combo Air Mover, 10cy	0	48	0	1	Kent	WA	Yard
CHES	33694	Vehicle	Vehicle-VT-3	Vactor Truck	Combo Air Mover, 10cy	0	48	0	1	Kent	WA	Yard
NRCES	30046	Boom	Boom-B-3	Contractor boom	12" Acme	0	0	1000	0	Pasco	WA	Flatbed Trailer
CHES	33794	Boom	Boom-B-3	Hard Boom	18"	0	0	2000	0	Pasco	WA	Warehouse
CHES	33710	Equipment	Equipment-M-0	Dewatering Drop Box	25 yard	0	120	0	0	Pasco	WA	Warehouse

Tri-Cities Technical Manual - (06 hour) - Source Recovery System Detail	RG-DIV-A-06

Offloading Detail

Offloading narrative and pump rate description: Recovered product can be pumped into storage tanks or empty tank cars. Storage tanks will eventually need to be emptied via vac truck. Average transfer/offload pump rate on the vacuum truck/trailer is 8 bbl/minute. Efficiency in loading is directly proportional to the size of the lines or hose used between the unit and the material. Heavier materials can be loaded more rapidly when skimmed, allowing air to mix with the product at the suction end of the hose. Air or steam can be injected to speed the loading of viscous materials. Materials can be discharged by gravity or pressure from the truck depending on the density or viscosity.

Mobilization Details

Mobilization method for recovery device (land/water): Land via truck

Mobilization method for each workboat(s): If needed, skiffs and workboats can be trailered and would be utilized for boom deployment

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive on scene (mobilization for all resources detailed above): ≤ 6 hours

Support resources for mobilization: Trucks

Support resources for deployment: N/A

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Dewatering Drop Box

Vactor Truck

Vacuum Truck

Elastec TDS 118 Skimmer

Tri-Cities Technical Manual - (06 hour) - Source Recovery System Detail	RG-DIV-A-06

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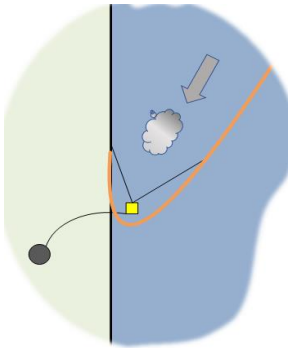
Tri-Cities Technical Manual - (06 hour) - Recovery System Detail

RG-GRP-06



Tactic purpose and description: The purpose of this tactic is nearshore or shoreside recovery of oil in a protected or shallow water operating environment. To promote the ability for continuous recovery operations, the tactic assumes that recovered oil is collected in a portable tank, tote or drum and then removed via vacuum truck. Length of boom can vary based on conditions between 100' and 1000'. Equipment listed below is for 2 shoreside skimming systems with additional vac truck storage.

Operating environment: Calm Water, Protected Water, or Shallow Water

Night Operations (describe how this system is capable to support night ops): Shoreside/Nearshore operation of skimmer is possible during the night with adequate lighting.

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): 12 personnel would be required to operate the 2 skimming systems during a 12 hour shift. If night ops were conducted 24 personnel would be needed.

Recovery Device Detail:

Owner	wrrlID	Resource	Kind Type	Indentification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
CHES	33926	Skimmer, Portable	Skimmer-PS-2	Brush Skimmer	Lamor Minimax 12	680	0	0	1	Pasco	WA	Warehouse
CHES	33927	Skimmer, Portable	Skimmer-PS-2	Brush Skimmer	Lamor Minimax 12	680	0	0	1	Pasco	WA	Warehouse

Storage and Other Support Equipment Detail:

Owner	wrrlID	Resource	Kind Type	Indentification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
CHES	31309	Vehicle	Vehicle-VT-2	Vacuum Truck	Liquide Vac 70bbl, 250gpm	0	70	0	1	Moses Lake	WA	Yard
CHES	33734	Vehicle	Vehicle-VT-2	Vacuum Truck	Liquide Vac 70bbl, 250gpm	0	70	0	1	Spokane	WA	Warehouse
CHES	31226	Vehicle	Vehicle-VT-2	Vacuum Truck	Liquide Vac 70bbl, 250gpm	0	70	0	1	Clackamas	OR	Warehouse
CHES	33658	Vehicle	Vehicle-VT-2	Vacuum Truck	Liquide Vac 70bbl, 250gpm	0	70	0	1	Clackamas	OR	Warehouse
CHES	31222	Vessel	Vessel-SKF-0	Work Boat	22', 115HP	0	0	0	2	Pasco	WA	Trailered
CHES	34956	Vessel	Vessel-SKF-0	Work Boat	15', 60HP	0	0	0	2	Pasco	WA	Trailered
CHES	34968	Vessel	Vessel-SKF-0	Power Work Boat	15', 25HP	0	0	0	2	Pasco	WA	Trailered
CHES	33787	Boom	Boom-B-3	Boom - General Purpose	onboard Skiff	0	0	600	0	Pasco	WA	Trailered
CHES	33747	Boom	Boom-B-3	Hard Boom	18"	0	0	12000	0	Pasco	WA	Warehouse

Tri-Cities Technical Manual - (06 hour) - Recovery System Detail	RG-GRP-06

Offloading Detail

Offloading narrative and pump rate description: Recovered product can be pumped into storage tanks or drums and then offloaded into vac truck when full. Product can also be directly loaded into truck and then offloaded into larger storage tanks (i.e., frac tank). Average transfer/offload pump rate on the vacuum truck is 8 bbl/minute.

Mobilization Details

Mobilization method for recovery device (land/water): Land via truck

Mobilization method for each workboat(s): Skiffs/workboats are trailered to a boat launch and would be utilized for boom deployment and skimming.

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive onscene (mobilization for all resources detailed above): ≤ 6 hours

Support resources for mobilization: Trucks, boat trailers

Support resources for deployment: Boats, shoreside/marine anchor systems

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Lamor Mini Max 10

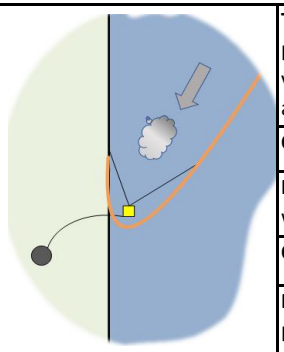
Vacuum

Drum

Tote

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail

RG-GRP-12



Tactic purpose and description: The purpose of this tactic is nearshore or shoreside recovery of oil in a protected or shallow water operating environment. To promote the ability for continuous recovery operations, the tactic assumes that recovered oil is collected in a portable tank, tote or drum and then removed via vacuum truck. Length of boom can vary based on conditions between 100' and 1000'. Equipment listed below is for 7 shoreside skimming systems with additional vac truck and tank storage.

Operating environment: Calm Water, Protected Water

Night Operations (describe how this system is capable to support night ops): Operation of skimmer is possible during the night with support vessels outfitted with navigation lights and electronics (i.e. radar, gps, etc.)

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): A 12 Hour shift would require roughly 5 personnel per system. A 24 Hour operational period would require 10 personnel per system.

Recovery Device Detail:

Ownership	wrrlID	Resource	Kind Type	Indentification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
CHES	33922	Skimmer, Portable	Skimmer-PS-2	Brush Skimmer	Lamor Minimax 12	680	0	0	1	Clackamas	OR	CH727
CHES	33923	Skimmer, Portable	Skimmer-PS-2	Brush Skimmer	Lamor Minimax 12	680	0	0	1	Clackamas	OR	CH727
CHES	33924	Skimmer, Portable	Skimmer-PS-2	Brush Skimmer	Lamor Minimax 12	680	0	0	1	Clackamas	OR	CH727
CHES	33925	Skimmer, Portable	Skimmer-PS-2	Brush Skimmer	Lamor Minimax 12	680	0	0	1	Clackamas	OR	CH727
CHES	33746	Skimmer, Portable	Skimmer-PS-3	Drum Skimmer	Elastec TDS 118	130	0	0	1	Pasco	WA	Warehouse
CHES	31223	Skimmer, Portable	Skimmer-PS-3	Drum Skimmer	Elastec TDS 118	130	0	0	1	Clackamas	OR	Warehouse
CHES	31306	Skimmer, Portable	Skimmer-PS-3	Drum Skimmer	Elastec TDS 118	130	0	0	1	Kent	WA	Warehouse

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail												RG-GRP-12
Associated Vessel and Boom Detail:												
Ownership	**wrrlID**	**Resource**	**Kind Type**	**Indentification**	**Specifications**	**Recovery EDRC**	**Liquid Storage**	**Boom**	**People**	**Home Base**	**State**	**Staging**
CHES	31311	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 120bbl, 250gpm	0	120	0	1	Moses Lake	WA	Yard
CHES	33707	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 120bbl, 250gpm	0	120	0	1	Moses Lake	WA	Yard
CHES	33657	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 130bbl , 250gpm	0	130	0	1	Clackamas	OR	Yard
CHES	34957	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 120bbl, 250gpm	0	120	0	1	Spokane	WA	Yard
CHES	31312	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 120bbl, 250gpm	0	120	0	1	Kent	WA	Yard
NRCES	29802	Vehicle	Vehicle-VT-2	Vacuum Truck (2138)	Presvac, 70bbl	686	70	0	1	Portland	OR	Yard
CHES	31315	Vehicle	Vehicle-VT-2	Vac Truck	Liquide Vac 70bbl, 250gpm	0	70	0	1	Kent	WA	Yard
NRCES	28337	Vehicle	Vehicle-VT-2	Vacuum Truck (2054)	Thompson, 70 bbl	686	70	0	1	Seattle	WA	Yard
CHES	31245	Vehicle	Vehicle-VT-3	Vacuum Trailer	Liquide Vac, 10bbl	0	10	0	1	Clackamas	OR	Yard
CRC	29072	Storage	Storage-PS-4	1000 gal. Portable Storage Tanks	FastTanks Storage Tank	0	24	0	0	Portland	OR	Portland Base
CRC	29073	Storage	Storage-PS-4	1000 gal. Portable Storage Tanks	FastTanks Storage Tank	0	24	0	0	Portland	OR	Portland Base
CRC	29074	Storage	Storage-PS-4	1000 gal. Portable Storage Tank	FastTanks Storage Tank	0	24	0	0	Portland	OR	Portland Base
CRC	29075	Storage	Storage-PS-4	1000 gal. Portable Storage Tank	FastTanks Storage Tank	0	24	0	0	Portland	OR	Portland Base
CRC	29076	Storage	Storage-PS-4	1000 gal. Portable Storage Tank	FastTanks Storage Tank	0	24	0	0	Portland	OR	Portland Base
CRC	29077	Storage	Storage-PS-4	1000 gal. Portable Storage Tank	FastTanks Storage Tank	0	24	0	0	Portland	OR	Portland Base
MSRCNW	3049	Storage	Storage-PS-4	Tank, Portable	Liquitote Tank	0	7	0	0	Everett	WA	MSRC Site
MSRCNW	31278	Storage	Storage-PS-4	Tank, Portable	Liquitote Tank	0	7	0	0	Everett	WA	MSRC Site
MSRCNW	31279	Storage	Storage-PS-4	Tank, Portable	Liquitote Tank	0	7	0	0	Everett	WA	MSRC Site
MSRCNW	31280	Storage	Storage-PS-4	Tank, Portable	Liquitote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31281	Storage	Storage-PS-4	Tank, Portable	Liquitote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31282	Storage	Storage-PS-4	Tank, Portable	Liquitote Tank	0	8	0	0	Everett	WA	MSRC Site

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail										RG-GRP-12		
MSRCNW	31482	Storage	Storage-PS-4	Tank, Buoywall	Open top storage	0	14	0	0	Everett	WA	MSRC Site
NRCES	28495	Vessel	Vessel-SKF-0	Lund Skiff 6216	Workboat 12'	0	0	0	2	Portland	OR	Marine Response
NRCES	28499	Vessel	Vessel-SKF-0	Lund Skiff 6017	Workboat 12'	0	0	0	2	Portland	OR	Yard
NRCES	28486	Vessel	Vessel-SKF-0	Lund Skiff 6611	Workboat 12'	0	0	0	2	Seattle, Pier 90	WA	Trailer 3279
MSRCNW	3032	Vessel	Vessel-SKF-0	JAEGER	Seine Skiff, 18ft.	0	0	0	2	Astoria	OR	MSRC Site
MSRCNW	7487	Vessel	Vessel-SKF-0	Jon Boat #4	JB, 15ft / 25hp	0	0	0	2	Astoria	OR	MSRC Site
NRCES	28548	Vessel	Vessel-WB-4	Monarch 6024	Workboat 16'	0	0	0	1	Portland	OR	Yard
NRCES	30458	Boom	Boom-B-2	Contractor boom (3419), Kepner	20"	0	0	4500	0	Pasco	WA	Trailer 3419
MSRCNW	2970	Boom	Boom-B-2	Trailer MSRC-S41, Boom, Kepner	20"	0	0	1000	0	Seattle	WA	BP Harbor Island
MSRCNW	3004	Boom	Boom-B-2	Trailer MSRC-S40, Boom, Kepner	20"	0	0	1000	0	Seattle	WA	BP Harbor Island

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail	RG-GRP-12

Offloading Detail

Offloading narrative and pump rate description: Recovered product can be pumped into storage tanks or drums and then offloaded into vac truck when full. Product can also be directly loaded into truck and then offloaded into larger storage tanks (i.e., frac tank). Average transfer/offload pump rate on the vacuum truck is 8 bbl/minute.

Mobilization Details

Mobilization method for recovery device (land/water): Land via truck

Mobilization method for each workboat(s): Skiffs/workboats are trailered and would be utilized for boom deployment

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive onscene (mobilization for all resources detailed above): =/<12 hours

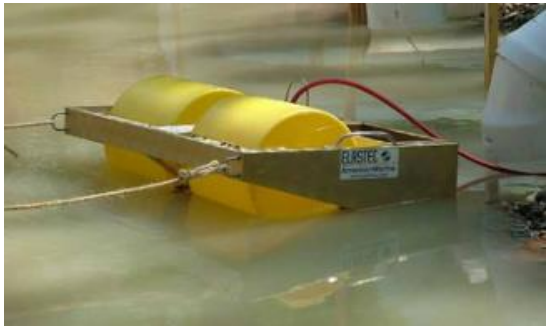
Support resources for mobilization: Trucks, boat trailers

Support resources for deployment: Boats, shoreside/marine anchor systems

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Lamor Mini Max



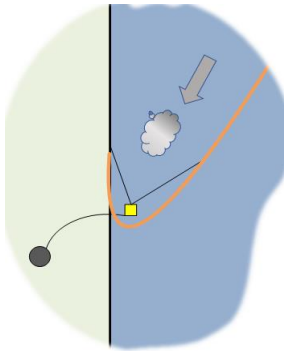
Elastec TDS 118

Vacuum Truck

Tote

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail

RG-GRP2-12



Tactic purpose and description: The purpose of this tactic is nearshore or shoreside recovery of oil in a protected or shallow water operating environment. To promote the ability for continuous recovery operations, the tactic assumes that recovered oil is collected in a portable tank, tote or drum and then removed via vacuum truck. Length of boom can vary based on conditions between 100' and 1000'. Equipment listed below is for 3 shoreside skimming systems with additional vac truck and tank storage.

Operating environment: Calm Water, Protected Water

Night Operations (describe how this system is capable to support night ops): Operation of skimmer is possible during the night with support vessels outfitted with navigation lights and electronics (i.e. radar, gps, etc.)

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): A 12 Hour shift would require roughly 5 personnel per system. A 24 Hour operational period would require 10 personnel per system.

Recovery Device Detail:

Ownership	wrrlID	Resource	Kind Type	Indentification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
CHES	33921	Skimmer	Skimmer-PS-3	JBF Skimmer	DIP 400, Diesel hydraulic power pack	240	0	0	1	Pasco	WA	Trailered
CHES	33920	Skimmer	Skimmer-PS-3	JBF Skimmer	DIP 400, Diesel hydraulic power pack	240	0	0	1	Clackamas	OR	V335
NRCES	31796	Skimmer	Skimmer-PS-4	Weir Skimmer	1.5" Skim-Pak 2300	178	0	0	0	Seattle	WA	ER Trailer 3212

Associated Vessel and Boom Detail:

Ownership	wrrlID	Resource	Kind Type	Indentification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
CRC	29078	Storage	Storage-PS-4	1000 gal. Portable Storage Tank	FastTanks Storage Tank	0	24	0	0	Portland	OR	Portland Base
CRC	29079	Storage	Storage-PS-4	1000 gal. Portable Storage Tank	FastTanks Storage Tank	0	24	0	0	Portland	OR	Portland Base
MSRCNW	31283	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31284	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31285	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31286	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31287	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31288	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31289	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail										RG-GRP2-12		
MSRCNW	31483	Storage	Storage-PS-4	Tank, Buoywall	Open top Storage	0	28	0	0	Everett	WA	MSRC Site
MSRCNW	31484	Storage	Storage-PS-4	Tank, Buoywall	Open top storage tank	0	28	0	0	Everett	WA	MSRC Site
MSRCNW	31485	Storage	Storage-PS-4	Tank, Fastank	Open top storage tank	0	57	0	0	Everett	WA	MSRC Site
MSRCNW	31486	Storage	Storage-PS-4	Tank, Fastank	Open top storage tank	0	57	0	0	Everett	WA	MSRC Site
MSRCNW	31487	Storage	Storage-PS-4	Tank, Fastank	Open top storage tank	0	57	0	0	Everett	WA	MSRC Site
MSRCNW	31488	Storage	Storage-PS-4	Tank, Fastank	Open top storage tank	0	57	0	0	Everett	WA	MSRC Site
MSRCNW	31489	Storage	Storage-PS-4	Trailer Support, Tank, Fastank	Open top storage tank	0	57	0	0	Everett	WA	MSRC Site
CHES	31313	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 120bbl, 250gpm	0	120	0	1	Kent	WA	Yard
CHES	31314	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 120bbl Stain Less	0	120	0	1	Kent	WA	Yard
NRCES	28324	Vehicle	Vehicle-VT-1	Trailer 3135, Vacuum	PersVac, 120 bbls	686	120	0	0	Portland	OR	Yard
NRCES	28350	Vehicle	Vehicle-VT-1	Trailer 3369, Vacuum	Dragon Products, 130bbl	686	130	0	0	Portland	OR	Yard
NRCES	28325	Vehicle	Vehicle-VT-1	Vacuum Trailer (3181)	PersVac 120bbl	686	120	0	0	Seattle	WA	Yard
NRCES	29801	Vehicle	Vehicle-VT-1	Vacuum Trailer (3344)	Brenn, 120 bbl stainless	686	120	0	0	Seattle	WA	Yard
CHES	34933	Vehicle	Vehicle-VT-1	Vacuum Trailer	Liquide Vac, 120bbl, 250gpm	0	120	0	1	Moses Lake	WA	Yard
CHES	31310	Vehicle	Vehicle-VT-2	Vacuum Truck	Liquide Vac 70bbl, 250gpm	0	70	0	1	Kent	WA	Yard
NRCES	28338	Vehicle	Vehicle-VT-2	Vacuum Truck (2055)	Thompson, 70 bbl	686	70	0	1	Seattle	WA	Yard
NRCES	28339	Vehicle	Vehicle-VT-2	Vacuum Truck (2058)	Thompson T800 70bbl	686	70	0	1	Seattle	WA	Yard
NRCES	31802	Vessel	Vessel-TB-4	Shallow Water Barge Set 4	Shallow Water Barge Set, 238bbl	0	238	100	3	Seattle	WA	45' Trailer, Yard
NRCES	29788	Vessel	Vessel-WB-4	LUND skiff 6461	Workboat 20'	0	0	0	2	Astoria	OR	Trailer
NRCES	28541	Vessel	Vessel-WB-4	JETCRAFT 6464 (#9)	Workboat 20'	0	0	0	2	Portland	OR	Trailer 6473, Pac Terminal
NRCES	28545	Vessel	Vessel-WB-4	Monarch 6016	Workboat 18'	0	0	0	1	Portland	OR	Yard

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail										RG-GRP2-12		
NRCES	28554	Vessel	Vessel-WB-4	Monark 6019	Workboat 18'	0	0	0	1	Portland	OR	Yard
CRC	29157	Vessel	Vessel-WB-4	20' Workboat	20' Alumaweld II w/90 hp - Trailer (342-40)	0	0	0	1	Portland	OR	Base
MSRCNW	3128	Boom	Boom-B-2	Trailer MSRC45, Boom, Acme	18"	0	0	3500	0	Seattle	WA	BP Harbor Island
NRCES	27876	Boom	Boom-B-2	Contractor boom (3277)	20"	0	0	2000	0	Tacoma	WA	Monkey Trailer
NRCES	27847	Boom	Boom-B-2	Contractor boom (3080), Acme	20"	0	0	1000	0	Tacoma	WA	Container 3080
CHES	31480	Boom	Boom-B-3	Hard Boom	18"	0	0	12700	0	Clackamas	OR	6471

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail	RG-GRP2-12

Offloading Detail

Offloading narrative and pump rate description: Recovered product can be pumped into storage tanks or drums and then offloaded into vac truck when full. Product can also be directly loaded into truck and then offloaded into larger storage tanks (i.e., frac tank). Average transfer/offload pump rate on the vacuum truck is 8 bbl/minute.

Mobilization Details

Mobilization method for recovery device (land/water): Land via truck

Mobilization method for each workboat(s): Skiffs/workboats are trailered and would be utilized for boom deployment

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive onscene (mobilization for all resources detailed above): =/<12 hours

Support resources for mobilization: Trucks, boat trailers

Support resources for deployment: Boats, shoreside/marine anchor systems

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Vacuum Truck

Tote

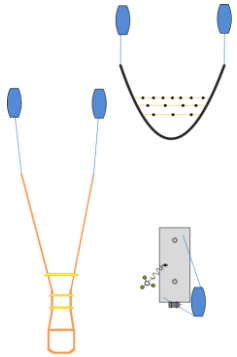
Fastank

Skim-Pak Skimmer

JBF Skimmer

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail

RG-BORS-12



Tactic purpose and description: The purpose of this tactic is to concentrate thin slicks of oil into slicks that are thick enough to recover using various skimmers. In these types of enhanced skimming operations a vessel/vessels will pull boom through more open area on the river, allowing oil to collect in the boom. Once enough oil has been accumulated, a weir skimmer or pump can be used to transfer the collected oil from the boom into temporary storage. When using the Speed Sweep or Current Buster systems two vessels will be needed to tow the 200' of boom.

Operating environment: Calm Water, Protected Water

Night Operations (describe how this system is capable to support night ops): Operation of skimmer is possible during the night with support vessels outfitted with navigation lights and electronics (i.e. radar, gps, etc.)

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): These systems systems would require roughly 15 personnel in total for a 12 hour shift. 30 personnel would be required during a 24 hour shift.

Recovery Device Detail:

Ownership	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
NRCES	32319	Boom	Boom-B-2	Speed Sweep collection system	DESMI	0	200	200	0	Seattle, South Park	WA	Trailer
NRCES	31493	Boom	Boom-B-2	Speed Sweep collection System	DESMI	0	200	200	0	Burlington	WA	Trailer 3671
MSRCNW	31075	Skimmer, Portable	Skimmer-BO-0	Current Buster #4, System B	Current Buster #4	0	196	200	0	Everett	WA	MSRC Site
NRCES	31795	Skimmer, Portable	Skimmer-PS-4	Weir Skimmer (7345)	3" Skim-pak 81300	178	0	0	0	Seattle, Pier 90	WA	Moorage, Dock Tote
MSRCNW	3050	Skimmer, Portable	Skimmer-PS-4	Slickbar Slurp, #2 Skimmer	Skimmer, weir	55	0	0	0	Spokane	WA	Big Sky Industrial
MSRCNW	3051	Skimmer, Portable	Skimmer-PS-4	Slickbar Slurp, #1 Skimmer	Skimmer, weir	55	0	0	0	Spokane	WA	Big Sky Industrial

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail												RG-BORS-12
Associated Vessel and Boom Detail:												
Ownership	**wrrlID**	**Resource**	**Kind Type**	**Identification**	**Specifications**	**Recovery EDRC**	**Liquid Storage**	**Boom**	**People**	**Home Base**	**State**	**Staging**
CRC	30051	Boom	Boom-B-2	20" Boom	American Marine	0	0	2000	0	Boardman	OR	20' Connex box on
NRCES	27867	Boom	Boom-B-2	Trailer 3408, American Marine	20"	0	0	1000	0	Astoria	OR	Trailer 3408
NRCES	27865	Boom	Boom-B-2	Trailer 6166, American Marine	12"	0	0	1000	0	Portland	OR	Trailer 6166/Pac
CRC	29136	Boom	Boom-B-3	12" Boom	American Marine (includes WRRL ID 29060)	0	0	2000	0	Portland	OR	SWB 109-29 (PFR Fire
MSRCNW	3137	Boom	Boom-B-3	Trailer MSRC60, Boom, Acme	12"	0	0	3500	0	Tacoma	WA	MSRC Site
CRC	29060	Storage	Storage-PS-4	Shallow Water Barge	30' Kvichak (includes boom from WRRL ID 29136)	0	110	0	0	Portland	OR	Portland Fire & Rescue
CRC	29058	Storage	Storage-PS-4	Shallow Water Barge	30' American Eagle	0	100	0	0	Portland	OR	Portland Base Trailer# 320-
CRC	29059	Storage	Storage-PS-4	Shallow Water Barge	30' American Eagle	0	100	0	0	Portland	OR	Portland Base
CHES	33919	Vessel	Vessel-WB-4	Work Boat	28', Landing Craft, 250hp outboard	0	0	0	2	Pasco	WA	Trailered
NRCES	28561	Vessel	Vessel-WB-4	Sea Hawk	28' Union bay / twin 150hp	0	0	0	2	Seattle, South Park	WA	Trailer 6601
NRCES	29783	Vessel	Vessel-WB-4	Sea Falcon	28' Union bay / twin 150hp	0	0	0	2	Seattle, South Park	WA	Trailer
MSRCNW	7490	Vessel	Vessel-WB-4	Response 5	Work Boat, 28'	0	0	0	2	Everett	WA	MSRC Site
CHES	34967	Vessel	Vessel-WB-4	Power Work Boat	30', 2X225 HP	0	0	500	2	Pasco	WA	Trailered

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail	RG-BORS-12

Offloading Detail

Offloading narrative and pump rate description: Recovered product can be pumped into on water storage in the form of portable barge sets or liquitotes. When full, these can be offloaded into larger tanks on land using pumps or vac trucks. Product can also be offloaded directly into the vac trucks for further transport or be directly loaded into truck and then offloaded into larger storage tanks (i.e., frac tank). Average transfer/offload pump rate is 8 bbl/minute.

Mobilization Details

Mobilization method for recovery device (land/water): Land via truck/trailer

Mobilization method for each workboat(s): Skiffs/workboats are trailered and would be utilized for boom deployment

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive on scene (mobilization for all resources detailed above): =/<12 hours

Support resources for mobilization: Trucks, boat trailers

Support resources for deployment: Boats, shoreside/marine anchor systems

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Skimmer placed in containment boom for enhanced skimming

Shallow Water Barge Set

Desmi Speed Sweep

Tri-Cities Technical Manual - (12 hour) - Recovery System Detail	RG-BORS-12

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Tri-Cities Technical Manual - (12 hour) - Storage System Detail

SG-LND-12

Tactic purpose and description: The purpose of this tactic is to set up a a group of storage tanks and bladders. These may be set up in an interim waste collection site to collect product in one location until disposal procedures can be finalized.

Operating environment: On land. Over water transfers may take place in Calm Water, Protected Water, or Shallow Water

Night Operations (describe how this system is capable to support night ops): Shoreside/Nearshore transfers are possible during the night with adequate lighting.

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): Personnel may not be required as vac trucks and vessels are already equipped with crew. Personnel may be required if frequent transfers are taking place, however this personnel requirement will vary depending on the situation.

Storage Device Detail:

Ownership	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
NRCES	28305	Storage	Storage-PS-4	Portable Tank	Hoover Group Inc 350gal	0	8	0	0	Seattle, South Park	WA	Yard
NRCES	28312	Storage	Storage-PS-4	Bladder Tank	Canflex FCB-43E Bladder	0	100	0	0	Seattle, South Park	WA	Trailer 3280
NRCES	28314	Storage	Storage-PS-4	Portable Tank	550 Gal Steel Liquid Tote Tank	0	13	0	0	Seattle, South Park	WA	Yard
NRCES	28315	Storage	Storage-PS-4	Portable Tank	550 Gal Steel Liquid Tote Tank	0	13	0	0	Seattle, South Park	WA	Yard
NRCES	28316	Storage	Storage-PS-4	Portable Tank	550 Gal Steel Liquid Tote Tank	0	13	0	0	Seattle, South Park	WA	Yard
NRCES	28317	Storage	Storage-PS-4	Portable Tank	550 Gal Steel Liquid Tote Tank	0	13	0	0	Seattle, South Park	WA	Yard
MSRCNW	3043	Storage	Storage-PS-4	Morris, Tank, Portable	Buoywall Tank	0	14	0	0	Everett	WA	MSRC Site
MSRCNW	7588	Storage	Storage-PS-2	Towable Storage Bladder	TSB, 500BBL system	0	500	0	0	Everett	WA	MSRC Site, Flatrack
MSRCNW	7589	Storage	Storage-PS-2	Towable Storage Bladder	TSB, 500BBL system	0	500	0	0	Everett	WA	MSRC Site, Flatrack
MSRCNW	7590	Storage	Storage-PS-2	Towable Storage Bladder	TSB, 500BBL system	0	500	0	0	Everett	WA	MSRC Site, Flatrack
MSRCNW	7591	Storage	Storage-PS-2	Towable Storage Bladder	TSB, 500BBL system	0	500	0	0	Everett	WA	MSRC Site, Flatrack

Tri-Cities Technical Manual - (12 hour) - Storage System Detail	SG-LND-12

Offloading Detail

Offloading narrative and pump rate description: Product can be offloaded using pumps and vac trucks into the various forms of storage. Average transfer/offload pump rate is 8 bbl/minute.

Mobilization Details

Mobilization method for recovery device (land/water): Via trucks/trailers

Mobilization method for each workboat(s): N/A

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive on scene (mobilization for all resources detailed above): =/< 12

Support resources for mobilization: Personnel may be needed to construct tanks initially, trucks and trailers

Support resources for deployment: N/A

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Buoywall Tank

550 gal steel tank

500 bbl Towable Storage Bladder

Tri-Cities Technical Manual - (12 hour) - Storage System Detail

SG-OW-12

Tactic purpose and description: The purpose of this tactic is to set up a a group of on-water storage through bladders and barge sets. These could be split up amongst the on-water recovery groups as needed, or may be set up together as a stationary off-loading area to collect product in one location until disposal procedures can be finalized.

Operating environment: Calm Water, Protected Water, or Shallow Water

Night Operations (describe how this system is capable to support night ops): Nearshore operation is possible during the night with adequate lighting and with support vessels outfitted with navigation lights and electronics (i.e. radar, gps, etc.)

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): Personnel may not be required as vessels are already equipped with crew. Personnel may be required if frequent transfers are taking place, or if oversight is needed, however this personnel requirement will vary depending on the situation.

Storage Device Detail:

Ownership	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
CRC	29063	Storage	Storage-PS-4	2500 gal. Towable Bladder	American Marine	0	60	0	0	Portland	OR	Portland Base
CRC	29064	Storage	Storage-PS-4	2500 gal. Towable Bladder	American Marine	0	60	0	0	Portland	OR	Portland Base
CRC	29065	Storage	Storage-PS-4	2500 gal. Towable Bladder	American Marine	0	60	0	0	Portland	OR	Portland Base
CRC	29066	Storage	Storage-PS-4	2500 gal. Towable Bladder	American Marine	0	60	0	0	Portland	OR	Portland Base
CRC	29067	Storage	Storage-PS-4	2500 gal. Towable Bladder	American Marine	0	60	0	0	Portland	OR	Portland Base
NRCES	28311	Storage	Storage-PS-4	Bladder Tank	Canflex FCB-43E Bladder	0	100	0	0	Anacortes	WA	Net Shed
CRC	29068	Storage	Storage-PS-4	1000 gal. Bladder	American Marine	0	23	0	0	Astoria	OR	Tongue Point
CRC	29069	Storage	Storage-PS-4	500 gal. Bladder	American Marine	0	11	0	0	Astoria	OR	Tongue Point
NRCES	31803	Vessel	Vessel-TB-4	Shallow Water Barge Set 5	Shallow Water Barge Set, 238bbl	0	238	100	3	Portland	OR	45' Trailer, Yard
NRCES	31804	Vessel	Vessel-TB-4	Shallow Water Barge Set 6	Shallow Water Barge Set, 238bbl	0	238	100	3	Portland	OR	Swan Island Dock
MSRCNW	7546	Vessel	Vessel-TB-4	Shallow Water Barge 123	Shallow Water Barge, non	0	400	60	0	Tacoma	WA	MSRC Site
MSRCNW	7558	Vessel	Vessel-TB-4	Shallow Water Barge 21	Shallow Water Barge	0	400	60	0	Port Angeles	WA	Fairchild Airport
CRC	29056	Storage	Storage-PS-4	Shallow Water Barge	30' American Eagle	0	100	0	0	Longview	WA	Port of Longview
NRCES	28283	Storage	Storage-PS-4	Bladder Tank	Dracone Canflex	0	100	0	0	Port Angeles	WA	Container on chassis

Associated Vessel and Boom Detail:

Ownership	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
NRCES	31776	Boom	Boom-B-3	Contractor boom (3279), Kepner	12"	0	0	1400	0	Seattle, Pier 90	WA	Trailer 3279

Tri-Cities Technical Manual - (12 hour) - Storage System Detail	SG-OW-12

Offloading Detail

Offloading narrative and pump rate description: Product can be offloaded from vessels using pumps into the various forms of storage. Average transfer/offload pump rate is 8 bbl/minute.

Mobilization Details

Mobilization method for recovery device (land/water): Trucks, trailers

Mobilization method for each workboat(s): N/A

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive on scene (mobilization for all resources detailed above): =/< 12 hours

Support resources for mobilization: trucks and trailers

Support resources for deployment: Personnel may be needed to construct and deploy barges, tanks and bladders initially, shoreside cranes will help to deploy barges

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

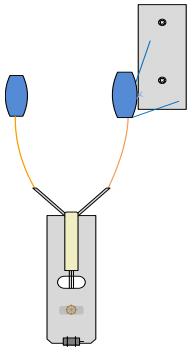
Photographs of equipment:

Shallow Water Barge Set

Towable Bladder

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail

RG-MRCO-24



Tactic purpose and description: In this tactic, Marco type belt skimmer vessels will be deployed, along with smaller skiffs and boom in order to create an enhanced skimming operation. Shallow water barge sets will be utilized for on water storage. The equipment bellow could create up to 6 enhanced skimming systems.

Operating environment: Calm Water, Protected Water

Night Operations (describe how this system is capable to support night ops): Operation of skimmer is possible during the night with support vessels outfitted with navigation lights and electronics (i.e. radar, gps, etc.)

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): 12 Hour: 43 personnel / 24 Hour: 86 personnel

Recovery Device Detail:

Ownership	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
NRCES	28261	Vessel	Vessel-OSRV-3	Trailer 6169, Belt Skimmer Vessel	Marco/IC	3588	30	0	2	Portland	OR	Trailer 6169
NRCES	28263	Vessel	Vessel-OSRV-3	Belt Skimmer Vessel (6059)	Marco/1C, #1	3588	30	0	2	Seattle, South Park	WA	Trailer 6067
NRCES	28264	Vessel	Vessel-OSRV-3	Belt Skimmer Vessel (6060)	Marco/1C, #2	3588	30	0	2	Seattle, South Park	WA	Trailer 6066
MSRCNW	30802	Vessel	Vessel-OSRV-3	30-10, harbor skimmer 30'	Skimmer, Marco	3588	24	0	2	Portland	OR	Pacific Terminals
NRCES	28262	Vessel	Vessel-OSRV-3	Belt Skimmer Vessel	BeachMaster/Marco/I-I	3588	30	0	2	St. Helens	OR	Moorage
MSRCNW	3030	Vessel	Vessel-OSRV-3	PEREGRINE	Skimmer, Marco	3588	28	0	2	Everett	WA	MSRC Site

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail												RG-MRCO-24
Associated Vessel and Boom Detail:												
Ownership	**wrrlID**	**Resource**	**Kind Type**	**Identification**	**Specifications**	**Recovery EDRC**	**Liquid Storage**	**Boom**	**People**	**Home Base**	**State**	**Staging**
NRCES	27877	Boom	Boom-B-2	Contractor boom (3280)	20"	0	0	1000	0	Seattle, South Park	WA	Trailer 3280
NRCES	27879	Boom	Boom-B-2	Contractor boom (3283)	20"	0	0	1000	0	Seattle, Swissport	WA	Trailer 3283
NRCES	31777	Boom	Boom-B-3	Contractor boom (3279), Kepner	10"	0	0	1000	0	Seattle, Pier 90	WA	Trailer 3279
CHES	31305	Vessel	Vessel-SKF-0	Work Boat	22', 115HP	0	0	0	2	Kent	WA	Trailered
NRCES	30267	Vessel	Vessel-TB-4	Shallow Water Barge Set 2	Shallow Water Barge Set, 238bbl	0	238	100	3	Burlington	WA	45' Trailer, Yard
CRC	29051	Vessel	Vessel-TB-4	Shallow Water Barge	30' American Eagle	0	100	0	2	Portland	OR	Portland Base Trailer#321-
MSRCNW	7554	Vessel	Vessel-TB-4	Shallow Water Barge 19	Shallow Water Barge, non	0	400	60	0	Astoria	OR	MSRC Site, Trailer
MSRCNW	7566	Vessel	Vessel-TB-4	Shallow Water Barge 25	Shallow Water Barge, non	0	400	60	0	Astoria	OR	MSRC Site
NRCES	30792	Vessel	Vessel-TB-4	Shallow Water Barge Set 1	Shallow Water Barge Set, 238bbl	0	238	100	3	Aberdeen	WA	45' Trailer, Yard
NRCES	31801	Vessel	Vessel-TB-4	Shallow Water Barge Set 3	Shallow Water Barge Set, 238bbl	0	238	100	3	Aberdeen	WA	45' Trailer, Yard
NRCES	29780	Vessel	Vessel-WB-4	Work Skiff # 1 (WS 1)	18' Willapa 90hp	0	0	0	2	Pasco	WA	Trailer 6599, yard
CHES	33918	Vessel	Vessel-WB-4	Work Boat	28' Landing Craft, Twin 115hp outboard	0	0	0	2	Clackamas	OR	Trailered
NRCES	28534	Vessel	Vessel-WB-4	Green Lund # 5	Workboat 20', 75 HP Mercury	0	0	0	2	Seattle, South Park	WA	Yard
CRC	31080	Vessel	Vessel-WB-4	20' Workboat	20' Alumaweld III w/90hp - Trailer# 352-40	0	0	0	1	Portland	OR	Portland Base
NRCES	28553	Vessel	Vessel-WB-4	Monark 6018	Workboat 18'	0	0	0	1	Portland	OR	Warehouse
NRCES	29781	Vessel	Vessel-WB-4	Work skiff # 4	18' Willapa 90hp outboard	0	0	0	2	Port Angeles	WA	Trailered
NRCES	29782	Vessel	Vessel-WB-4	Work skiff #5	18' Willapa 90hp outboard	0	0	0	2	Seattle, Pier 90	WA	Moorage
MSRCNW	7563	Vessel	Vessel-WB-4	Shallow Water Barge 25	Work Boat, WB-30 <29'	0	0	0	3	Astoria	OR	MSRC Site
MSRCNW	7567	Vessel	Vessel-WB-4	Shallow Water Barge 19	Work Boat, WB-28 <29'	0	0	0	3	Astoria	OR	MSRC Site, Trailer

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail	RG-MRCO-24

Offloading Detail

Offloading narrative and pump rate description: Recovered product can be pumped into storage tanks or drums and then offloaded into vac truck when full. Product can also be directly loaded into truck and then offloaded into larger storage tanks (i.e., frac tank).

Mobilization Details

Mobilization method for recovery device (land/water): Land via truck

Mobilization method for each workboat(s): Skiffs/workboats are trailered and would be utilized for boom deployment

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive on scene (mobilization for all resources detailed above): =/< 24 hours

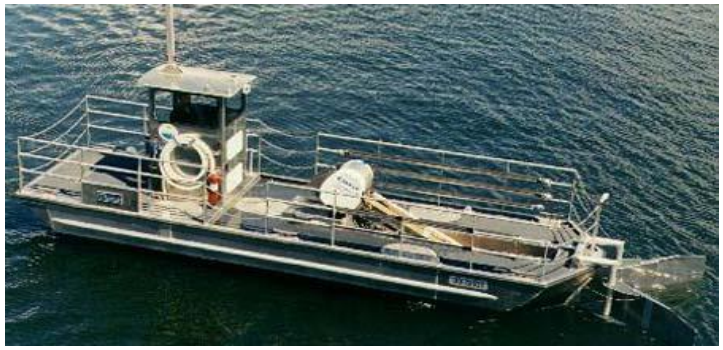
Support resources for mobilization: Trucks, boat trailers

Support resources for deployment: Boats, shoreside/marine anchor systems

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Marco Skimmer



Marco Skimmer

Shallow Water Barges

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail	RG-MRCO-24

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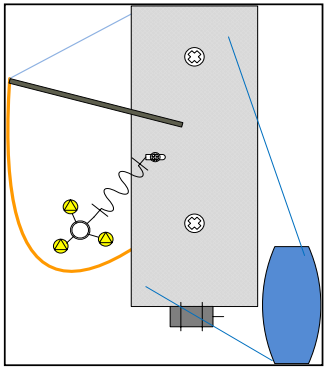
Tri-Cities Technical Manual - (24 hour) - Recovery System Detail

RG-SWB-24



Tactic purpose and description: This tactic uses shallow water barges, skimmers and work boats to create additional enhanced skimming systems. The equipment bellow can be used to create one system using self-propelled barges, and two that require a workboat for propulsion. These systems work to move through the water, collecting oil in boom until a thick enough layer to skim has been gathered.

Operating environment: Calm Water, Protected Water

Night Operations (describe how this system is capable to support night ops): Operation of skimmer is possible during the night with support vessels outfitted with navigation lights and electronics (i.e. radar, gps, etc.)

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): 12 Hour: 9 personnel / 24 Hour: 18 personnel

Recovery Device Detail:

Ownership	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
MSRCNW	29594	Skimmer, Portable	Skimmer-PS-3	Shallow Water Barge 23	Skimmer, QME Tri	905	0	0	0	Portland	OR	Pacific Terminals
MSRCNW	7550	Skimmer, Portable	Skimmer-PS-3	Shallow Water Barge 133	Skimmer, QME Tri	905	0	0	0	Anacortes	WA	In Water
MSRCNW	24671	Skimmer, Portable	Skimmer-PS-3	Shallow Water Barge 51	Skimmer, QME Tri	905	0	0	0	Bellingham	WA	Colony Wharf

Associated Vessel and Boom Detail:

Ownership	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
MSRCNW	7549	Equipment	Equipment-M-0	Shallow Water Barge 133	Propulsion unit W/ Crane	0	0	0	3	Anacortes	WA	In Water
MSRCNW	7562	Vessel	Vessel-TB-4	Shallow Water Barge 23	Shallow Water Barge, non	0	400	60	0	Portland	OR	Pacific Terminals
MSRCNW	7551	Vessel	Vessel-TB-4	Shallow Water Barge 133	Shallow Water Barge, Self	0	400	60	0	Anacortes	WA	In Water
MSRCNW	7570	Vessel	Vessel-TB-4	Shallow Water Barge 51	Shallow Water Barge, non	0	400	60	0	Bellingham	WA	Colony Wharf
MSRCNW	7555	Vessel	Vessel-WB-4	Shallow Water Barge 23	Work Boat, WB-29 <29'	0	0	0	3	Portland	OR	Pacific Terminals
MSRCNW	7547	Vessel	Vessel-WB-4	Shallow Water Barge 51	Work Boat, WB-1 <29'	0	0	0	3	Bellingham	WA	Colony Wharf

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail	RG-SWB-24

Offloading Detail

Offloading narrative and pump rate description: Recovered product can be pumped into storage tanks or drums and then offloaded into vac truck when full. Product can also be directly loaded into truck and then offloaded into larger storage tanks (i.e., frac tank).

Mobilization Details

Mobilization method for recovery device (land/water): Land via truck

Mobilization method for each workboat(s): Skiffs/workboats are trailered and would be utilized for boom deployment

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive on scene (mobilization for all resources detailed above): =/< 24 hours

Support resources for mobilization: Trucks, boat trailers

Support resources for deployment: Boats, shoreside/marine anchor systems

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

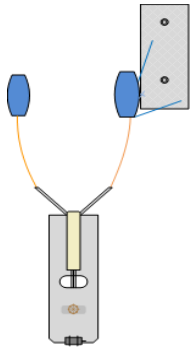
Photographs of equipment:

Shallow Water Barge (Non-Self Propelled)

Shallow Water Barge (Self Propelled)

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail

RG-SWRB-24



Tactic purpose and description: In this tactic, Marco type belt skimmer vessels will be deployed, along with smaller skiffs and boom in order to create an enhanced skimming operation. Shallow water barge sets will be utilized for on water storage. The equipment bellow could create up to 5 enhanced skimming systems.

Operating environment: Calm Water, Protected Water

Night Operations (describe how this system is capable to support night ops): Operation of skimmer is possible during the night with support vessels outfitted with navigation lights and electronics (i.e. radar, gps, etc.)

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): 12 Hour: 18 personnel / 24 Hour: 36 personnel

Recovery Device Detail:

Ownership	wrrlID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
CRC	29053	Vessel	Vessel-OSRV-3	Shallow Water Recovery Barge	30' Kvichak w/ Marco Belt Skimmer (includes boom from WRRL ID 29148)	3588	100	0	2	Portland	OR	Portland Base
CRC	29055	Vessel	Vessel-OSRV-3	Shallow Water Recovery Barge	30' American Eagle w/ Marco Belt(includes boom from WRRL ID 29151)	3588	100	0	2	Portland	OR	Portland Base
CRC	29054	Vessel	Vessel-OSRV-3	Shallow Water Recovery Barge	30' Kvichak w/ Marco Belt Skimmer (includes boom from WRRL ID 29150)	3588	100		2	Astoria	OR	Tongue Point
CRC	29052	Vessel	Vessel-OSRV-3	Shallow Water Recovery Barge	30' Kvichak w/ Marco Belt (includes boom from WRRL ID 29149)	3588	100	0	2	Clatskanie	OR	Columbia Pacific Bio-Refinery
CRC	29057	Vessel	Vessel-OSRV-3	Shallow Water Recovery Barge	30' Kvichak w/ Marco Belt Skimmer (includes boom from WRRL ID 29147)	3588	100	0	2	Longview	WA	Port of Longview

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail												RG-SWRB-24
Associated Vessel and Boom Detail:												
Ownership	**wrrlID**	**Resource**	**Kind Type**	**Identification**	**Specifications**	**Recovery EDRC**	**Liquid Storage**	**Boom**	**People**	**Home Base**	**State**	**Staging**
CRC	29149	Boom	Boom-B-3	12" Boom	American Marine (includes WRRL ID 29052)	0	0	400	0	Clatskanie	OR	SWRB 103-29 (Columbia Pacific Bio Refinery)
CRC	29147	Boom	Boom-B-3	12" Boom	American Marine (includes WRRL ID 29057)	0	0	400	0	Longview	WA	SWRB 106-29 (Port of Longview)
CRC	29148	Boom	Boom-B-3	12" Boom	American Marine (includes WRRL ID 29053)	0	0	400	0	Portland	OR	SWRB 102-29 (Portland Base)
CRC	29150	Boom	Boom-B-3	12" Boom	American Marine (includes WRRL ID 29054)	0	0	400	0	Astoria	OR	SWRB 101-29 (Tongue Point)
CRC	29041	Vessel	Vessel-SKF-0	14' Skiff	14' Skiff w/15 hp	0	0	0	1	Clatskanie	OR	Portland Base (Trailer 315-40)
CRC	29043	Vessel	Vessel-SKF-0	14' Skiff	14' Skiff w/15 hp	0	0	0	1	Portland	OR	Trailer 346-40
CRC	29045	Vessel	Vessel-SKF-0	16' Skiff	16' Skiff w/ 25hp	0	0	0	1	Clatskanie	OR	Columbia PacificBio-Refinery: Trailer (332-40)
CRC	29039	Vessel	Vessel-WB-4	20' Workboat	20' Alumaweld I w/115 hp - Trailer (331-40)	0	0	0	1	Portland	OR	Portland Base
CRC	30499	Vessel	Vessel-WB-4	18' Skiff	18' Skiff w/ 25hp Trailer 348-40	0	0	0	1	Portland	OR	Portland Base
CRC	30500	Vessel	Vessel-WB-4	18' Skiff	18' Skiff w/ 25hp	0	0	0	1	Portland	OR	Portland Base (Trailer 349-40)
CRC	33907	Vessel	Vessel-WB-4	Interceptor	25' Alumaweld Workboat	0	0	0	2	Portland	OR	Portland Base

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail	RG-SWRB-24

Offloading Detail

Offloading narrative and pump rate description: Recovered product can be pumped into storage tanks or drums and then offloaded into vac truck when full. Product can also be directly loaded into truck and then offloaded into larger storage tanks (i.e., frac tank).

Mobilization Details

Mobilization method for recovery device (land/water): Land via truck

Mobilization method for each workboat(s): Skiffs/workboats are trailered and would be utilized for boom deployment

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive on scene (mobilization for all resources detailed above): =/< 24 hours

Support resources for mobilization: Trucks, boat trailers

Support resources for deployment: Boats, shoreside/marine anchor systems

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Recovery Barge w/ Marco Belt Skimmer

Tri-Cities Technical Manual - (24 hour) - Recovery System Detail	RG-SWRB-24

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Tri-Cities Technical Manual - (24 hour) - Storage System Detail	SG-LND-24

Tactic purpose and description: The purpose of this tactic is to set up a a group of storage tanks. These liquitotes and frac tanks may be set up in a storage staging area to collect product in one location until disposal procedures can be finalized.

Operating environment: On land. Over water transfers may take place in Calm Water, Protected Water, or Shallow Water

Night Operations (describe how this system is capable to support night ops): Shoreside/Nearshore transfers are possible during the night with adequate lighting.

Oil type skimmer is optimized for: Group I, II, III, IV, and V based on conditions and oil type.

Minimum number of personnel for a 12 hour shift (also list 24 hour shift if the system conducts night operations): Personnel may not be required as vac trucks and vessels are already equipped with crew. Personnel may be required if frequent transfers are taking place, however this personnel requirement will vary depending on the situation.

Storage Device Detail:

Ownership	wrrIID	Resource	Kind Type	Identification	Specifications	Recovery EDRC	Liquid Storage	Boom	People	Home Base	State	Staging
MSRCNW	31290	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31291	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31292	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31293	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31294	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31295	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31296	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31297	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31298	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31299	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31300	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31301	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31302	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31303	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site
MSRCNW	31304	Storage	Storage-PS-4	Tank, Portable	Liqultote Tank	0	8	0	0	Everett	WA	MSRC Site

Tri-Cities Technical Manual - (24 hour) - Storage System Detail										SG-LND-24		
NRCES	LOI-01	Storage	Storage-PS-4	Tank, 21k Frac	LOI Tank Co-Rain for Rent	0	500	0	0	Multiple	WA	Multiple
NRCES	LOI-02	Storage	Storage-PS-4	Tank, 21k Frac	LOI Tank Co-Rain for Rent	0	500	0	0	Multiple	WA	Multiple
NRCES	LOI-03	Storage	Storage-PS-4	Tank, 21k Frac	LOI Tank Co-Rain for Rent	0	500	0	0	Multiple	WA	Multiple
CHES	LOI-04	Storage	Storage-PS-4	Tank, 21k Frac	LOI Tank Co-Rain for Rent	0	500	0	0	Multiple	WA	Multiple
CHES	LOI-05	Storage	Storage-PS-4	Tank, 21k Frac	LOI Tank Co-Rain for Rent	0	500	0	0	Multiple	WA	Multiple
CHES	LOI-06	Storage	Storage-PS-4	Tank, 21k Frac	LOI Tank Co-Rain for Rent	0	500	0	0	Multiple	WA	Multiple

Tri-Cities Technical Manual - (24 hour) - Storage System Detail	SG-LND-24

Offloading Detail

Offloading narrative and pump rate description: Product can be offloaded using pumps and vac trucks into the various forms of storage. Average transfer/offload pump rate is 8 bbl/minute.

Mobilization Details

Mobilization method for recovery device (land/water): Via trucks/trailers

Mobilization method for each workboat(s): N/A

Transit speeds (include any alternatives granted by Ecology): N/A

Time for the entire system to arrive on scene (mobilization for all resources detailed above): =/< 24

Support resources for mobilization: Personnel may be needed to construct tanks initially, trucks and trailers

Support resources for deployment: N/A

Training (describe training requirements for operating the recovery equipment): Minimum 24 Hour HAZWOPER / Support crew 8 Hour HAZWOPER

Photographs of equipment:

Tote

Frac Tank

Tri-Cities Technical Manual - (24 hour) - Storage System Detail	SG-LND-24

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BNSF Technical Manual for the Tri-Cities Planning Standard Area

Technical Manual Description: This manual was developed in accordance with WAC 173-182-349 and is for planning purposes only. It includes equipment appropriate for the operating environment on the Columbia River and can be used to show how recovery and storage systems could be put together and applied to the recovery and storage planning standards.

Technical Manual Planning Standard: Tri-Cities

Plan Holders Covered by the Manual: BNSF

Oil Types the Technical Manual Covers: I-V

Worst Case Discharge: worst case discharge volume of 12,642 bbls

Recovery and storage volume requirements based on the worst case discharge

	Boom (ft)	Recovery (bbls/day)	Storage (bbls)
Hour 6	5,000	1,264	1,264
Hour 12	20,000 Additional	6,312	6,312
Hour 24	More as Necessary	12,624	12,624

Technical Manual Planning Assumptions

Vessels and boom for GRPs are not represented in the technical manual. The focus of the manual is the recovery and storage systems. Workboats will be used only once. Additional BNSF owned and contracted equipment not listed in this manual can be found on the Western Response Resource List (www.wrrl.us).

Training Level Personnel Described in the Recovery and Storage Tactics

Response Personnel hold current 8, 24 or 40 hour HAZWOPER certification in compliance with 29 CFR 1910.120 and WAC 296-824-300. Where required by USCG regulation, personnel that have vessel crewing assignments and responsibilities hold appropriate USCG Merchant Mariner Licenses and Endorsements.

Updates and Distribution

This planning document does not bind BNSF or its' contractors to use specific tactics during a spill or drill or guarantee what will occur in an actual spill event. Information is subject to change. Version Created April 16, 2018.

Task Force Equipment Summary

The table below summarizes task force equipment that is detailed on the following pages. There are links that will lead to corresponding task force pages with further detail.

Hour 6 Task Forces

Task Force Number	Description of Tactic	Recovery EDRC (bbls/day)	Liquid Storage (bbls)	Boom (ft)	People
RG-DIV-A-06	Source Recovery	130	1040	3000	26
RG-GRP-06	Nearshore Oil Recovery - Disc and Drum Skimmers	1360	280	12600	12
Hour 6 Requirements:		1264	1264	5000	-
Hour 6 Totals:		1490	1320	15600	38

Hour 12 Task Forces

Task Force Number	Description of Tactic	Recovery EDRC (bbls/day)	Liquid Storage (bbls)	Boom (ft)	People
RG-GRP-12	GRP Collection Strategies (Drum, Brush)	4482	1033	6500	35
RG-GRP2-12	GRP Collection Strategies (Belt, Weir)	4774	1743	19300	15
RG-BORS-12	On Water Collection - Boom Oil Recovery System (Buster/Desmi)	288	906	10600	10
SG-LND-12	Land Based Storage Equipment	0	2174	0	0
SG-OW-12	On-Water Storage Equipment	0	1910	1720	0
Hour 12 Requirements:		6312	6312	25000	-
Hour 12 Totals:		11034	9086	53720	98

Hour 24 Task Forces

Task Force Number	Description of Tactic	Recovery EDRC (bbls/day)	Liquid Storage (bbls)	Boom (ft)	People
RG-MRCO-24	On-Water Recovery-Marco Belt Skimmers	21528	1786	3420	43
RG-SWB-24	On-Water Recovery-Disc/Brush Skimmers	2715	1200	180	9
RG-SWRB-24	On-Water Recovery-Marco Belt Skimmers	17940	500	1600	18
SG-LND-24	Land Based Storage Equipment	0	3120	0	0
Hour 24 Requirements:		12624	12624	>25000	-
Hour 24 Totals:		53217	15692	58920	168