



## IN-SITU BURNING, POOLED OIL

### OBJECTIVE & STRATEGY

ISO

The objective of In-situ Burning, Pooled Oil is to remove oil that has been mechanically pooled or has collected in natural depressions on land. In-situ Burning, Pooled Oil may be used to augment mechanical removal of oil if mechanical removal is not feasible or would cause additional damage to the environment. It is most effective when it is deployed as soon as possible after the oil has impacted an area so that volatile components can be utilized in burning the oil.

The general strategy is to:

1. Identify the location and extent of the spill.
2. Determine that mechanical recovery is not feasible.
3. Obtain regulatory approval through the Unified Command.
4. Review and follow the current In-situ Burning Guidelines.
5. Select equipment and a configuration that best supports the operating environment.
6. Mobilize personnel, response equipment and fire suppression equipment to the location.
7. Concentrate oil in natural depressions, ice pits, snow berms or other constructed features.
8. Ignite the isolated pooled oil.
9. Constantly monitor the burn and surrounding area to ensure safe operations and containment of the fire.
10. Remove any burn residuals from the site.

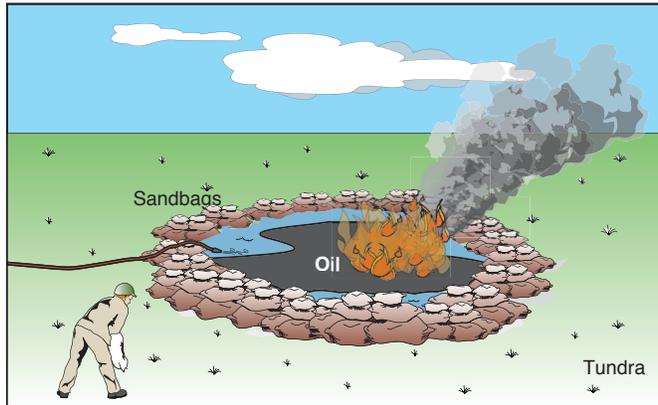


Figure ISO-1. In-situ Burning, Pooled Oil on tundra.

### TACTIC DESCRIPTION

In-situ burning, pooled oil systems generally consist of a containment mechanism, an ignition system and fire suppression equipment. Oil must be fairly fresh, collected in sufficient quantity to sustain combustion and have a minimum thickness of:

- 2-3 mm (1/16 - 1/8 of an inch) for crude oil
- 3-5mm (1/8 - 3/16 of an inch) for diesel and weathered crude

## In-Situ Burning, Pooled Oil



- 5-10mm (3/16 -3/8 of an inch) for emulsions, intermediate fuel oils, and Bunker C

Oil that has been in contact with water cannot be greater than 50% emulsified.

If the oil has not naturally collected, utilize the tactics in Pits, Trenches, and Slots or Dikes, Berms, and Dams to concentrate the oil (Figure ISo-1). Once collected, the oil should be isolated from other combustion sources to ensure that the fire remains contained and controlled. With adequate fire suppression equipment and personnel present, the oil can be ignited. Ignition systems for small fresh oil spills can be a handheld torch (propane weed burner or flare) or gelled fuel (NAPALM) that is placed in the oil and ignited. For larger areas, a helicopter equipped with a heli-torch may be used to ensure rapid ignition and provide aerial monitoring of the burn. The burning should be done in a controlled fashion and requires adequate personnel and equipment to monitor the burning process. If residues from heavy oils and crude are produced, these should be mechanically removed after the burn.

### Operating Environments

In-situ Burning, Pooled Oil is recommended for use on land where risks of wild fires are minimum. This would include solid surfaces such as ice, rock, gravel, mud flats and other similar shorelines. Pooled oil may also be burned on tundra, marshes and other land where there is a low danger of igniting an uncontrolled wildfire. Burning in wooded environments is not recommended.

#### ISo-1 TUNDRA OR MARSH

Tundra and marsh environments present challenges for operations due to their sensitivity. Plywood sheeting or similar material can be used to establish pathways for foot and ATV traffic to the site. When possible, mechanically remove recoverable oil before igniting any unrecoverable oil. To protect the root systems and prevent uncontrolled wildfire, the spill area should be isolated with a dike or berm built utilizing sand bags or other material. Then the area is flooded with water to an approximate depth of 1/2 - 1 inch. The floating oil can then be ignited and burned.

#### ISo-2 ICE, SNOW

In-situ burning in ice and snow environments presents the opportunity to remove large amounts of oil with minimal environmental damage. Oil should be pooled using berms, pits or natural depressions (Figure ISo-2).



Figure ISo-2. In-situ Burning, Pooled Oil in ice and snow environment.





## In-Situ Burning, Pooled Oil

Oil incorporated in snow can be plowed into piles and ignited if there is enough oil present to sustain the burn. The resulting oily water and residue can then be removed using recovery systems.

### ISO-c CONCRETE, ROCK, AND GRAVEL SURFACES

In-situ Burning on concrete, rock, and gravel surfaces should be used as a last option after mechanical recovery tactics have been deemed not feasible. The effects of heat on the structural integrity of materials should be considered. The oil can be contained with the use of natural depressions or through the use of sand bag berms or other materials.

### Deployment Configurations

Work is begun on an upwind edge of the oiled area to minimize the amount of smoke the responders are exposed to and to reduce the risk of further spreading of the oil.

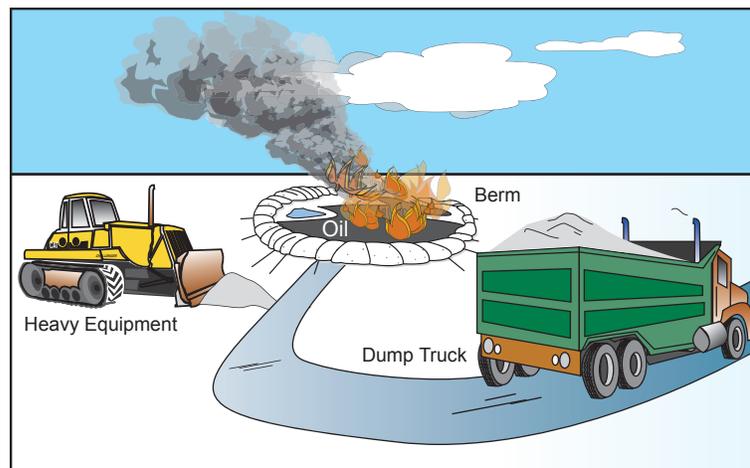


Figure ISO-3. Construction of berms to contain oil for burning.

### Residue Recovery

The amount and type of residue that remains after burning operations may vary depending upon a number of factors. Most burns result in taffy-like layers of weathered, viscous material that is relatively buoyant. The burn residue can normally be picked up with large strainers or hand tools, with viscous-oil sorbents, or with standard viscous-oil skimmers.





## DEPLOYMENT CONSIDERATIONS AND LIMITATIONS

### SAFETY

- Consider the possible effects of smoke on responders and populated areas.
- Consider respiratory protection for responders. This protection should be readily available in case the wind shifts.
- Communication and clear understanding of responsibilities is crucial to execution and safety during the burn process.
- Anticipate and prevent secondary fires.
- Wind conditions should be monitored to ensure responder safety and fire control. Burning operations should not occur in winds exceeding 15 knots.
- Fire retardant clothing and other PPE should be worn by responders as required by the incident-specific Site Safety Plan.

### DEPLOYMENT

- Consider the possible effects of smoke on wildlife.
- An open burn permit from ADEC and approval through the Unified Command must be obtained prior to commencing burn operations.
- Refined products generally burn more efficiently and produce less residue, but can contain higher toxicity.
- Place plywood across tundra/marsh that must be traversed.
- Root systems should not be burned to allow for regeneration.
- Burn residuals must be removed from the site.

## REFERENCES TO OTHER TACTICS

Other tactics associated with In-situ Burning, Pooled Oil include:

-  • On-land Recovery
-  • In-situ Burning, Oily Vegetation
-  • Pits, Trenches, and Slots
-  • Dikes, Berms, and Dams

## EQUIPMENT AND PERSONNEL RESOURCES

Resources for this tactic include ignition systems, fire suppression equipment, and response personnel. Configuration and specific resources required will be determined by site conditions, spilled oil type and volume, area of coverage, and resource availability. Resource sets may need to be refined as site-specific requirements dictate.





# In-Situ Burning, Pooled Oil

## Marsh, Tundra, and Other Land

ISO-1

Equipment	Function	Quantity	Notes
Ignition system (handheld burner, propane tank and hoses, heli-torch, or gelled fuel)	Burn pooled oil	Site-specific	Depending on configuration, oil concentration
Fire suppression system	Control burn	Site-specific	Use of multiple hand held fire extinguishers is acceptable for small areas. Consider use of tanker trucks for larger operations.
Plywood sheeting	Traversing sensitive environments; tundra/marshes	Site-specific	Use for foot and ATV traffic to access site
Sand bags	Berm materials	Site-specific	Must be adequate to create a continuous barrier to prevent oil spreading
Pumps and associated hoses	Flood tundra	1-2	Must maintain 1/2 - 1 inch of water under the burn area
Vehicle	Function	Quantity	Notes
Pick-up truck, ATV	Transportation of personnel and equipment to the site	Response-specific	Depending on number or responders
Tanker truck	Provide water to site to flood the area in dry conditions and provide fire suppression if necessary	Optional	Depends on area covered and site conditions
Helicopter	Ignite oil and provide area monitoring	Optional	Necessary if using heli-torch ignition system
Personnel	Function	Quantity	Notes
Field Team Leader	Supervises operations	1	
Skilled Technicians	Operate ignition systems and direct general technicians	2 to 4	Depending on area covered
General Technicians	Work under the direction of skilled technicians to prep areas for burning	2 to 4	Depending on area covered

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NON-MECH.

## Ice, Snow

ISO-1

Equipment	Function	Quantity	Notes
Ignition system (handheld burner, propane tank and hoses, heli-torch, or gelled fuel)	Burn pooled oil	Site-specific	Depending on configuration, oil concentration
Fire suppression system	Control burn if necessary	Site-specific	Use of multiple hand held fire extinguishers is acceptable for small areas. Consider use of tanker trucks for larger operations.
Earth moving equipment (backhoe, hand tools)	Concentrate oil by plowing or creating pits, trenches, berms	Site-specific	See tactics Pits, Trenches, and Slots or Dikes, Berms, and Dams
Vehicle	Function	Quantity	Notes
Pick-up truck, ATV	Transportation of personnel and equipment to the site	Response-specific	Depending on number or responders
Tanker truck	Provide water to site to flood the area in dry conditions and provide fire suppression if necessary	Optional	Depends on area covered and site conditions
Helicopter	Ignite oil and provide area monitoring	Optional	Necessary if using heli-torch ignition system
Personnel	Function	Quantity	Notes
Field Team Leader	Supervises operations	1	
Skilled Technicians	Operate ignition systems and direct general technicians	2 to 4	Depending on area covered
General Technicians	Work under the direction of skilled technicians to prep areas for burning	2 to 4	Depending on area covered



# In-Situ Burning, Pooled Oil



## Concrete, Rock, and Gravel Surfaces

Equipment	Function	Quantity	Notes
Ignition system (handheld burner, propane tank and hoses, heli-torch, or gelled fuel)	Burn pooled oil	Site-specific	Depending on configuration, oil concentration
Fire suppression system	Control burn if necessary	Site-specific	Use of multiple hand held fire extinguishers is acceptable for small areas. Consider use of tanker trucks for larger operations.
Vehicle	Function	Quantity	Notes
Pick-up truck, ATV	Transportation of personnel and equipment to the site	Response-specific	Depends on number or responders
Tanker truck	Provide water to site to flood the area in dry conditions and provide fire suppression if necessary	1	Depends on area covered and site conditions
Helicopter	Ignite oil and provide area monitoring	1	Necessary if using heli-torch ignition system
Personnel	Function	Quantity	Notes
Field Team Leader	Supervises operations	1	
Skilled Technicians	Operate ignition systems and direct general technicians	2 to 4	Depending on area covered
General Technicians	Work under the direction of skilled technicians to prep areas for burning	2 to 4	Depending on area covered

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