



## BEACH BERMS & EXCLUSION DAMS

### OBJECTIVE & STRATEGY

BB

The objective of Beach Berms and Exclusion Dams is to exclude spilled oil from impacting sensitive resources by constructing a barrier from natural materials. Beach Berms and Exclusion Dams are embankment structures built-up from the existing terrain (Figure BB-1). Dams are typically deployed at the mouths of inlets, lagoons, or streams to exclude oil from entering the area as the tide rises. Beach berms are used to prevent oil from entering the upper inter-tidal zone or over washing the storm berm and impacting sensitive habitat behind the storm berm. The tactic may be deployed in conjunction with a recovery tactic such as Passive Recovery or Shore-side Recovery. Beach Berms and Exclusion Dams are most effective when they are deployed prior to the spilled impacting an area.



Figure BB-1. Beach berm construction.

The general strategy is to:

1. Identify the location and trajectory of the spill or potential spill,
2. Select a configuration that best supports the operating environment and available resources,
3. Identify, locate and mobilize equipment and personnel to the location,
4. Construct berm or dam using local materials and ensure it does not leak using plastic or geotextile lining,
5. Monitor the berm or dam to ensure that it remains intact, and
6. If oil collects on or behind the berm or dam, utilize an appropriate recovery tactic to remove it.

### TACTIC DESCRIPTION

Beach Berm and Exclusion Dam systems are primarily constructed from local materials, soils, sand, rock and gravel, using heavy earth moving equipment for larger areas, as in Figure BB-1, and hand tools



for smaller areas. The materials are moved and placed to create a physical barrier to the migration of oil into the sensitive area. To construct a berm, typically, beach materials are removed from the beach area and piled at or directly above the high tide mark. The berm may be covered with secured plastic sheeting or geotextile to reduce erosion and oil penetration. Dams are similar, but are constructed in an inlet to exclude the migration of water and oil into an area (Figure BB-2). If there is a constant water out-flow of the area, consider the use of an underflow dam (Figure BB-3). Consideration must also be given as to whether the flow into the protected area could breach or undermine the dam. These systems are configured depending on the operating environment, type of beach, type of oil, the state of weathering, and available equipment.

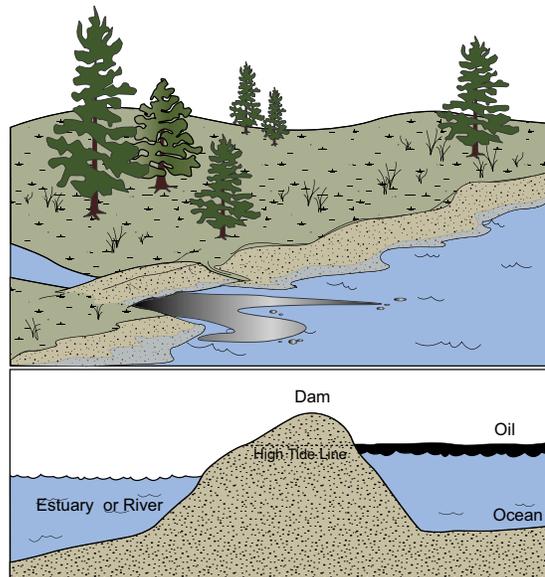


Figure BB-2. Exclusion dam construction.

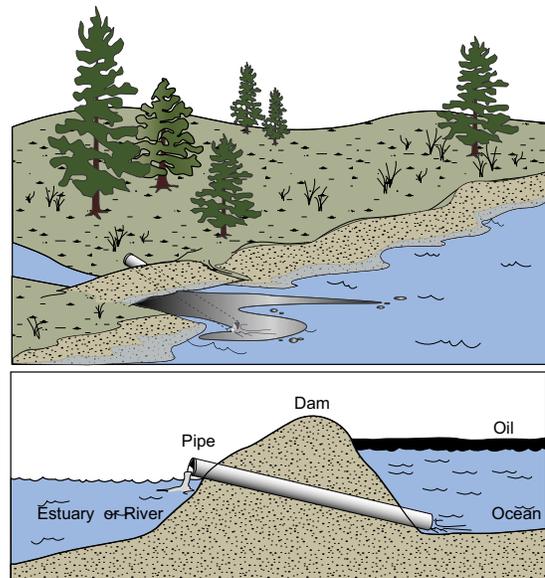


Figure BB-3. Underflow dam construction.

**Operating Environments**

Beach Berms and Exclusion Dams are utilized for the following operating environments:

- Open Water,
- Protected Water,
- Calm Water,
- Fast Water, and
- Broken Ice.

Beaches are broken down into 2 types:

- steep inclined beach – fine or coarse grained substrate
- low angled beach- fine or coarse grained substrate

**Deployment Configurations**

**BB-s STEEP INCLINED BEACH**

It is difficult to build and maintain a dam or berm on a steeply inclined fine-grain beach; especially with wave action exceeding 1 foot. These high energy beaches are typically very mobile.

Dams deployed to exclude cuts on steep beaches should be evaluated regarding the force of the water current entering the lagoon or backwater.

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# Beach Berms & Exclusion Dams

## **BB-1** LOW ANGLED BEACHES

Deployment of Beach Berms and Dams on low angled beaches works best if the wave height is less than 3 feet.

### DEPLOYMENT CONSIDERATIONS AND LIMITATIONS

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#### SAFETY

- During operation of heavy equipment a spotter should be present to ensure safe operations
- For marine transportation to the beaches, the vessel masters should have experience in the appropriate operating environment and local knowledge is preferred.
- Daily fair and foul weather evaluations are recommended, and should include distance to safe harbor, transit times and exposure of vessels.

#### DEPLOYMENT

- Do not excavate materials if activities will cause more damage than the spill.
- Consult with the Environmental Unit to determine if permits are required before constructing a beach berm or exclusion dam.
- Avoid archeological sites and biologically sensitive areas.
- Disposal of and removal of oiled construction materials should be considered prior to deployment
- Check berms and dams periodically for leakage and breaches, and top with material to ensure erosion control.
- Damming a stream mouth may block fish passage. Dams should be removed immediately when no longer needed.
- A Title 41 Fish Habitat Permit is required to work inside any anadromous stream. Due to the possibility of contaminating spawning habitat, avoid diverting and or collecting oil inside the stream mouth.

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### REFERENCES TO OTHER TACTICS

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Other tactics associated with beach berms include:

- DBD** • Dikes, Berms and Dams
- PTS** • Pits, Trenches and Slots
- CWD** • Cold-water Deluge



## Beach Berms & Exclusion Dams



### EQUIPMENT AND PERSONNEL RESOURCES

Resources for this tactic include vessels, equipment, supplies and response personnel. Configuration and specific resources required will be determined by site conditions, oil type and volume, area of coverage, and resource availability. Resource sets should be refined as site-specific requirements dictate.

#### *Beach Berms and Exclusion Dams Built with Earth Moving Equipment*



Equipment	Function	Quantity	Notes
Bulldozer, front-end loader, excavator	Construct dikes, berms, or dams	Site-specific	Depending on configuration
Supplies	Function	Quantity	Notes
Gravel, sand	Material for embankments	Site-specific	May be available on-site or may have to be transported to the location
Geotextile, plastic sheeting or other impermeable membrane	Liner to prevent the embankment from leaking	Site-specific	Care must be taken when placing the sheeting to maintain its integrity
Personnel	Function	Quantity	Notes
Field Team Leader	Supervise operations	1	May not always be on-site
Equipment Operators	Operate earth moving equipment	1 per equipment per shift	Depending on number of pieces of equipment
Spotter	Ensures safe operation of heavy equipment	1 per equipment per shift	Depending on number of pieces of equipment
General Technicians	Work under the direction of field team leader as laborers and spotters	2 to 8	Depending on configuration and pieces of equipment

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#### *Beach Berms and Exclusion Dams Built with Manual Labor*



Equipment	Function	Quantity	Notes
ATV with trailer	Moving construction materials to site	Optional	
Hand tools, shovels	Filling sand bags, modifications to structure	2 to 8	
Supplies	Function	Quantity	Notes
Gravel, sand	Material for embankments	Site-specific	May be available on-site or may have to be transported to the location
Geotextile, plastic sheeting or other impermeable membrane	Liner to prevent the embankment from leaking	Site-specific	Care must be taken when placing the sheeting to maintain its integrity
Personnel	Function	Quantity	Notes
Field Team Leader	Supervise operations	1	May not always be on-site after construction
General Technicians	Work under the direction of field team leader as laborers	2 to 8	Depending on configuration and pieces of equipment

