

# **CARIBBEAN REGIONAL RESPONSE TEAM SURFACE WASHING AGENT TESTING AND EVALUATION PROTOCOL**

## **I. Introduction**

Guidelines for authorizing the use of chemicals listed on the NCP Product Schedule are found in NCP Subpart J and Section 300.310, Phase III. The OSC may use chemicals and other materials to restrain the spread of oil, to protect public health, welfare and the environment. Section 300.910 requires that the RRT address the desirability of using appropriate dispersants, surface washing agents, surface collecting agents, bioremediation agents, or miscellaneous oil spill control agents listed on the NCP Product Schedule. Regional Contingency Plans (RCP) also include applicable preauthorization plans and address the specific contexts in which such products should and should not be used.

The Caribbean Regional Response Team (CRRT) has determined that there is not a need to develop pre-authorization for the use of surface washing agents. The CRRT does not feel that the effective use of surface washing agents would be subject to a time-critical window of opportunity, as is the case with other countermeasures such as dispersants, in-situ burning, or solidifiers. Therefore, the use of surface washing agents will be on a case-by-case basis, and reviewed by the incident-specific CRRT prior to authorizing any application.

This protocol addresses the testing and evaluation of surface washing agents listed on the NCP Product Schedule. The test protocol identifies specific practices to be followed for evaluating the effectiveness and biological impacts of test applications of surface washing agents to recover oil discharged to environments within the Caribbean Region. Any post-test decision to operationally use surface washing agents must receive concurrence from the Environmental Protection Agency (EPA) and the affected commonwealth or territory, in consultation with the Department of the Interior and National Oceanic and Atmospheric Administration natural resource trustees.

## **II. Criteria for Considering the Use of Surface Washing Agents**

The CRRT recognizes that in certain circumstances, the complete physical containment, collection, and removal of oil discharges may not be possible. While physical control and recovery techniques are the traditional response measures, other countermeasures also need to be considered. The use of surface washing agents may be considered to prevent a substantial threat to the public health or welfare, or to minimize serious environmental damage. This protocol sets forth criteria by which surface washing agents may be applied to the waters within the Caribbean Region.

Surface washing agents may be of the “lift and float” type, whereby oil is lifted from the surface of the oiled substrate or material and then fully floats on the surface of the water. Some surface washing agents “lift and disperse” the oil, making effective containment and recovery of the released oil more limited or impossible depending on the degree of dispersing action. Generally,

the CRRT prefers use of a “lift and float” type surface washing agent in order to enhance recovery. However, some circumstances may warrant consideration of other products that lift and disperse or lift and partially disperse.

The [Selection Guide for Oil Spill Applied Technologies](#) provides good surface washing agent evaluation information and comparisons of products on the current NCP Product Schedule. This information should be reviewed prior to submitting any request for use to the CRRT.

Initial evaluation of the type of oil and impacted shoreline is required prior to testing surface washing agents on a spill. Surface washing agents work best with Type IV heavy crude oil. However, light and medium crude oil can weather to heavier crude over time as constituents of the oil volatilize. A bucket test should be conducted to determine if the removed oil would likely float so it can be collected when re-mobilized (See Section IV: Test Preparation Procedures). If the removed oil sinks, it may be more difficult to collect and could adversely impact benthic communities. Shoreline types best suited for the use of surface washing agents include man-made structures, rip-rap, boulders, cobble, bedrock, etc., that can be cleaned without trapping removed oil in inaccessible spaces.

### **III. Constraints Governing Test Use of Surface Washing Agents**

Physical conditions play a vital role in the overall effectiveness of surface washing agents, as well as the success in recovering refloated oil. As such, the following constraints shall be observed:

1. **Water Velocity:** Current at the impacted area must be less than 1 knot. This will help ensure refloated oil does not escape containment and contaminate clean environments down current.
2. **Wave Action:** The treated area cannot be exposed to breaking waves. The surface washing agents require a soaking time, and continual bombardment will reduce effectiveness of the agent(s).
3. **Water Depth:** Approximately one foot of water should submerge the hose and strainer assembly of the pump configuration. Depth must be sufficient to facilitate the operation of portable pumps.
4. **Accessibility:** Area must be accessible to observers, monitors, sample collectors, and contract workers.
5. **Precipitation:** Application during heavy rain should be avoided. Heavy precipitation will greatly reduce product effectiveness by impacting the soaking time.
6. **Temperature:** If ambient air temperature is below 50° F, special consideration of the surface washing agent’s viscosity should be reviewed when selecting it for use. Consult

the manufacturer's recommended application criteria when practical (appended).

7. Wind: High wind may play a vital role in the effectiveness of certain surface washing agents.

Special consideration areas are notable for environmental sensitivity, treaty protection, government designation, important public value and private ownership. If testing is proposed in the following areas, additional consultation with the appropriate manager or owner shall be undertaken prior to test application:

1. Vital Resources: Surface washing agent testing is not recommended near operating water intakes. Oil lifted from the substrate may disperse into the water column or escape floating containment, potentially fouling water supplies.
2. Threatened & Endangered Species (Federal and State listed) and designated critical habitats: OSCs shall follow the MOA regarding Oil Spill Planning and Response Activities under the NCP and the ESA, including any required consultation with the Services. OSCs should also consult with the governing state agency regarding any recommended measures to avoid or minimize impacts to state-listed species and their habitats. All field-related activities, including but not limited to sample collection, vessel operations, and booming locations and installation, need to be coordinated with the trustees as part of the avoidance and minimization measures developed to protect T&E species.
3. Federal, State or local areas of significance: Such areas include, but are not limited to, units of the National Park Service, commonwealth and territorial parks, the National Wildlife Refuge System, Federal Wilderness Areas, the Wild and Scenic Rivers System, National Marine Sanctuaries, National Estuarine Research Reserves, and National Forests. Test applications on such lands are subject to all conditions imposed by the managing authorities.
4. Historic/Archeological Resources: OSCs shall follow the [Programmatic Agreement on Protection of Historic Properties during Emergency Response under the NCP](#), to identify, avoid, and/or mitigate potential impacts.
5. Private landowners: OSCs should notify landowners of their intent to conduct test applications of surface washing agents on privately-owned property and give special consideration to any concerns expressed by the landowners.

#### **IV. Test Preparation Process**

OSCs shall follow this protocol to ensure the physical conditions and special considerations are met and have been adequately addressed prior to continuing consideration of testing surface washing agents. The following processes and procedures shall be used to guide further action:

1. Identify, notify and coordinate with stakeholders to include incident specific CRRT notification of the intent to initiate test preparation.
2. Select one or more of the NCP listed surface washing agents based on environmental conditions.
3. Conduct a bucket test to determine if removed oil will float or sink. If it floats, note the time it takes for the water column to become clear (all particles float to the surface). If the oil sinks, then the use of surface washing agents is not appropriate.
4. Contact surface washing agent supplier to:
  - a. Identify cost
  - b. Determine availability
  - c. Consider transportation
  - d. Invite surface washing agent representative to participate

#### **V. Test Application Procedures**

1. Identify test areas and control area boundaries
  - a. Select a minimum of two representative test areas that 5 gallons of product will adequately cover (approximately 300 to 500 square feet total) and clearly mark the areas.
  - b. Set aside a representative control area similar to the test areas for comparison
  - c. Obtain Global Positioning System (GPS) location points defining each area
  - d. Include a map of the area identifying the test and control areas
2. Effectiveness criteria and monitoring procedures:
  - a. Estimates of effectiveness of a surface washing agent for removing oil are

determined by comparing results from tests of oiled substrates with and without application of a candidate product. Therefore, washing the representative control set-aside with on-site water in a manner equivalent to the treated test area with the surface washing agent should be compared for a measure of effectiveness.

- b. 8oz. (125ml) sample jars should be used to collect run-off wash water from all areas where the surface washing agent was applied for quantifying estimated effectiveness. Note the relative difference of floating oil in the jars from the two areas. Photodocumentation of the jars is required.
3. Water and sediment sampling in control and test areas for Total Petroleum Hydrocarbon (TPH) analysis
  - a. Using 1-liter sample jars, collect a background water sample in an adjacent non-impacted area in addition to subsurface water samples from inside and outside of the boom in the test areas and down gradient of boomed areas immediately prior to surface washing agent application. During washing operations, collect 1-liter subsurface water samples from inside and outside of the boom in the test areas and down gradient of boomed areas at 10-minute increments until 30 minutes after final wash process.
  - b. Label water sample jars with a unique identifier and include media type, date, time, location (GPS), depth, and surface washing agent used, and store in a cool to cold container for shipment to EPA-approved lab for quick turn around analysis in accordance with EPA-approved protocol.
  - c. Using 8 oz. (250 ml) jars, collect sediment samples in test areas immediately prior to surface washing agent application and following washing process.
  - d. Label sediment sample jars with a unique identifier and include media, date, time, location (GPS), depth, and surface washing agent used, and store in a cool to cold container for shipment to EPA-approved lab for quick turn around analysis in accordance with EPA-approved protocol.
  - e. Document the process and interpret analytical results.
4. Toxicity procedures to evaluate surface washing agent impacts to aquatic life
  - a. Choose a laboratory to run the aquatic toxicity tests.
  - b. Collect one-gallon (4-liter) subsurface water samples in brown glass containers at each sampling site.

- c. Collect a water sample from an unimpacted area (background/control), from an area near the shoreline inside the boom and from an area downstream outside the boom prior to the application of the shoreline cleaner.
  - d. Collect a water sample inside and outside the boom and a sample downstream after the shoreline cleaner is washed from the rocks into the surface water.
  - e. Label sample jars with a unique identifier and include date, time, location (GPS), depth, and shoreline cleaner used, and store in a cool to cold container for shipment to EPA-approved lab for quick turn around analysis in accordance with EPA-approved protocol.
  - f. Ask the laboratory to conduct 48-hour EC<sub>50</sub>/LC<sub>50</sub> acute toxicity tests and 7-day chronic toxicity tests for *Ceriodaphnia dubia* using the American Society for Testing and Materials (ASTM) guidelines.
  - g. Compare the results from the 48-hour EC<sub>50</sub>/LC<sub>50</sub> and the 7-day tests to assess whether application of the shoreline cleaner has the potential to adversely affect aquatic life.
  - h. Document the process and interpret analytical results.
5. Booming and recovery procedures:
- a. Identify current direction and velocity.
  - b. Use a float to determine distance of boom placement from the shoreline based on the time it takes for the oil in the bucket test to float to the top and the water becomes clear.
  - c. Install a double boom around the test and control areas at the appropriate distance.
  - d. Use appropriate absorbent material inside the boom for oil recovery and if possible utilize more aggressive removal equipment (i.e., vacuum pumps, portable skimmer, etc.) to remove the oil.
6. Site specific product application procedures are to be in accordance with the manufacturers recommended application procedures.

## **VI. Reporting**

The RRT requires that documentation of use and an after-action/lessons learned report be provided following a cleanup. The RRT may specify what to provide in the documentation and may condition use as appropriate for the incident. Generally, the RRT will require photos, estimates of effectiveness, recovery estimates, amount of product used, and amount of oil/area treated. Test applications may be required prior to granting full operational use approval.

The following outline is recommended for documentation reporting to the CRRT:

- a. Cover
  - Title
  - Date
  - Agency
  - Preparer
- b. Introduction
  - Spill summary
  - Test date
  - Test location
  - Landowner notified
  - Physical conditions
  - Type of oil(s) treated
  - Surface washing agent(s) tested
  - Test participants
- c. Test Procedures
  - Bucket test
  - Field test
  - Measuring effectiveness
  - Sampling for TPH
  - Toxicity testing
  - Booming and recovery
- d. Results
  - Effectiveness of bucket test
  - Effectiveness of field test and recovery
  - TPH
  - Toxicity
- e. Test Conclusions
  - Oil recovered/not recovered

- Oil dispersed/not dispersed
- Oil-cleaner mix toxic/nontoxic

f. Recommendations

- Proceed no further
- Coordinate/consult for operational use
- Conditions

Following each use of this protocol, the OSC will provide observations, lessons learned and suggested changes to the CRRT Co-Chairs. Changes to this document will be made as appropriate. Lessons learned from each application of this protocol will be submitted for inclusion in the Selection Guide for Oil Spill Applied Technologies.