

**Lake Mead National Recreation Area**  
**Best Management Practices**  
**Watercraft and Marina Operations**  
**Dry Boat Storage and Boat Repair Services**

PREPARED BY  
UTILITY SYSTEMS BRANCH  
DIVISION OF MAINTENANCE AND ENGINEERING  
LAKE MEAD NATIONAL RECREATION AREA

CONCURRENCE AND APPROVAL:

<u>                  /signed/                  </u> Steven N. Spearman Environmental Protection Specialist/ Utility Systems Leader	<u>10/30/96</u> Date
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<u>                  /signed/                  </u> James D. Vanderford Chief, Park Maintenance and Engineering	<u>10/31/96</u> Date
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<u>                  /signed/                  </u> Alan O'Neill Superintendent	<u>10/31/96</u> Date
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These standards are supplemental to National Park Service (DOI-NPS) concessions contract compliance criteria, and provide methodology regarding operating practices for boat yards (SIC code 3732), marinas (SIC code 4493) and hull cleaning operations (SIC code 4499). These activities fall under regulations promulgated by the U.S. Environmental Protection Agency (USEPA) in 1990 and are listed at 40 CFR 122.26(b)(14).

Additionally, marinas within Lake Mead National Recreation Area (LMNRA) in Nevada are covered by General Stormwater Permit #GNV0022233, issued to DOI-NPS by the Nevada Division of Environmental Protection, dated May 14, 1993. The permit requires 1) the use of BMPs to minimize stormwater pollution, 2) annual reporting and 3) a \$200 filing and annual fee. No permit has been issued for Arizona developed areas, however, BMPs will still be implemented and followed as program technical assistance and capital improvement funding becomes available.

Matching funds (25% non-federal match required) may also be available through Section 5604 of the Federal Clean Vessel Act (CVA, P.L. 102-587, Title V, Subtitle F), Grant Program, administered through state agencies by the U.S. Fish and Wildlife Service. Additional information may be found at 59 CFR, No. 47, pp. 11290-11306. This grant program is limited to improvements to, and new construction of, watercraft sewage collection and export facilities. CVA provides 75% of project funding, provided a non-federal 25% balance is secured by the state agency responsible for administering the program. The designated agencies in both states are:

Mr. Fred Messman  
Nevada Division of Wildlife  
(702) 688-1542

Mr. James Glass  
Arizona Game and Fish Department  
Aquatic Development Branch  
(602) 789-3481

**The following BMP requirements reflect** desired conditions. They are accompanied by various implementation actions. These actions (or approved alternatives) will be required as a condition of contract renewal/compliance for marina operations. Development of alternative methods and practices is encouraged. These alternatives will be reviewed upon request, to determine if the overall goal of the requirement will be met, and how closely the alternative would adhere to accepted engineering and environmental design or practice.

#### A. BOAT CLEANING AND STORMWATER RUNOFF MANAGEMENT

**BMP requirement:** Perform cleaning operations to minimize, to the extent practicable, the release to surface waters, of cleaners and paints or other residues or wastes from in-water hull cleaning. Because there is less surface area exposure, marina contributions to polluted runoff (from rainfall) may not be as significant a problem as stormwater runoff from parking lots and shore-based maintenance areas. However, the types of operations conducted, materials used, little likelihood of immediate containment of sewage, chemical or petroleum releases, the need to export wastes and import fuels via long runs of transmission piping, and proximity to the water environment, pose significant risks of acute contamination, and therefore mandate implementation of effective pollution prevention activities.

**1) Washing and acid-washing, and scraping, sanding, painting of boat hulls, buoys and related equipment:** Concessioners will install a pretreatment apron with sump, bermed and graded to drain, connected to the NPS sanitary sewage system and of standard engineering design, to allow for mixing of approved neutralizing chemical. During acid-washing operations, the concessioner will retain waste liquids within the pretreatment sump. Such wastes will only be released at pH 6.0 - 9.0 standard units

(SUs). Any discharge to NPS collection systems of waste liquids with a pH below 6.0 or above 9.0 SUs is prohibited.

Design will include an in-line locking 1/4 turn ball valve or equivalent device, immediately downstream of the sump to retain contents of said sump until such time as a delegated responsible employee has determined that the sump contents are near-neutral and may be safely discharged to the NPS collection system. A combined sand/oil separator and mixing sump design is feasible and may be approved by the Superintendent following submission and review of engineering drawings and specifications.

Acid and base materials used in acid-washing activities should consist of those proprietary items commonly available from swimming pool supply distributors or similar outlets.

Discharges of engine and outdrive servicing wastes, rinsate or other waste liquids from boat maintenance facilities to the ground, parking lot, drainage swale, tributary or surface water is prohibited. Any discharge of unneutralized corrosive wastes to the sanitary sewer is prohibited.

**2) Do-it-yourself boat maintenance and repair:** Do-it-yourself vessel maintenance and repair activities having significant likelihood of spillage of pollutants, including oil, fuel, paints and varnishes, solvents, epoxies, mineral spirits, or other liquid wastes, are prohibited. A commercial vendor must perform these types of activities.

**3) Underwater hull cleaning:** No scraping, chipping or underwater sanding will be allowed. Newly painted boat hulls should not be cleaned for at least 90 days following final application of paint. Vessels with self-polishing or soft sloughing paint, or with excessively oxidized paint, shall not be cleaned in the water. Hull cleaning and polishing will be allowed by manual brushing or sponging only; no mechanized or powered rotary brush methods will be allowed. Those vessels known to have had anti-fouling paint compounds applied to hulls, or known to have been painted in Mexico where highly toxic tributyl tins (TBTs) are in common use as fouling inhibitors, will not be cleaned or sanded at any marina within the Lake Mead National Recreation Area. Owners of such vessels should enlist the services of a marine maintenance facility having the proper means of containment of wastes produced by such activities.

**4) Approved cleaning compounds:** Manual washing of boat decks, cabins, and related equipment, by the individual owner or by the concessioner, must be approved non-phosphate, biodegradable cleaners such as "citrus-scrub" or other approved cleaner. All reasonable precautions should be taken to reduce any wastes or cleaners entering the water, such as sweeping up of solid and particulate debris, pre-rinse with clean water and collection by wet-vac or squeegee of soapy residues for disposal in the sanitary sewer collection system.

Every time a boat exterior is washed using soap, a pollutant is introduced to surface water. Many soaps and detergents contain phosphates. Phosphates act not unlike fertilizer in water, and contribute to algae growth which can prevent light from penetrating, and can rob oxygen from other organisms when the algae die and decay. Detergents may contain other substances harmful to aquatic life.

Therefore, the best cleanser for boat hulls and decks is a supply of bristle brushes, non-toxic compounds and old-fashioned elbow grease. **Soaps and detergents that contain phosphates should be avoided whenever possible.**

### **5) Use of solvents in commercial boat and vehicle servicing:**

All solvents will be either of non-toxic biodegradable type, or will be used in a closed-loop-spent solvent recycling system.

Sludge generated as a waste product of solvent rinsing within commercial facilities shall be treated as hazardous waste and stored, transported and disposed of in a manner consistent with state agency and USEPA regulations.

Do not allow solvents or solvent wastes to enter sanitary sewers, storm drains, or gutters. Do not mix solvents or any other waste liquid with waste oil.

## **B. SOLID WASTES MANAGEMENT**

**BMP requirement:** Solid wastes will be properly disposed of; entry of solid wastes to surface waters is strictly prohibited. Littering, (cigarette butts, food wrappers, coffee grounds, styrofoam or plastic throw-away cups, cans or bottles, bait containers or tackle, auto or boat parts, clothing) is prohibited. Some of these items can result in the death of fish or birds if ingested. Concessions General Managers may wish to consider phasing such no deposit-no return items out of their water recreation inventories.

**1) Used battery storage requirements:** Store upright in approved area, using secondary containment and protection from rainfall. Provide positive additional containment for batteries leaking from ruptured cases. Have batteries removed for disposal or recycling within 60 days. Removal contractor must meet state agency and USEPA requirements for transportation and final disposition of batteries. General Managers should retain receipts of all batteries removed to document transport and method and location of disposal (or recycling).

Concessioners are required to take used batteries for disposal/recycling. Post trade-in agreement in a conspicuous manner. As appropriate, include brief text explaining environmental protection basis for core charge.

**2) Vessels:** Pursuant to 33 CFR 151.59, all vessels 26' in length or greater must display placards at least 4" by 9" visible to passengers and crew, relating to proper disposal of trash. Posting on moored vessels shall be ensured by inclusion in the respective slip rental agreement.

**3) Pets:** Pets shall be monitored to ensure humane treatment. Wastes will be manually collected for disposal in a timely manner. Pet wastes may be disposed of by sanitary dump station or by wrapping or bagging and placing in area dumpsters. Sweeping or dumping of pet wastes into the water from any shore or marina area is strictly prohibited.

## **C. PETROLEUM CONTROL MANAGEMENT**

**BMP requirement:** Every effort will be made to reduce the amount of fuel and oil entering surface waters.

**1) Boaters will be discouraged from "topping off" fuel tanks. Public education messages should be prominently posted to encourage boaters to maintain clean bilges.** Boaters should install in-line, air-fuel separators, use absorbent pads to catch overflow, allow for expansion of fuel during warm weather, maintain vessel mechanical systems in good condition, and practice good housekeeping when it comes to fueling watercraft.

**2) Bilges, draining of, from trailered watercraft and boat servicing requiring wasting of water to perform engine cooling system checks or other checks:** No at-large, indiscriminate draining of contaminated boat bilges or contaminated engine coolant water will be allowed. Non-contaminated coolant water may be wasted to the sanitary sewer via floor drains. Provide concrete apron, bermed and graded to drain, with approved wash rack of standard design. Wash rack is to be followed by a sand/oil separator, of sufficient capacity to accommodate draining of bilges during times of peak visitation, and consistent with standard engineering design. Separators must be plumbed in to the NPS sanitary sewer by direct piping connection. The separator must be monitored and serviced on a regular basis, to preclude the overflow of grit or oil-laden wastewater to the sanitary sewer or ground surface. Wastes removed from sand/oil separators shall be disposed of in accordance with state primacy agency regulations.

**3) Draining of bilges to surface water from moored watercraft:** Draining of bilges inside marina areas is allowed (pursuant to NRS 488.320 in Nevada), provided no evidence of spillage of fuel, oil or any non-biodegradable waste, or sewage, is present upon visual examination by the operator, and provided the discharged bilge does not create an oily sheen on the surface of the water. These same criteria apply to vessels operating or moored in Arizona waters, pursuant to ACRR R18-11-108 et seq.

Draining of bilges containing gross contamination is prohibited pursuant to NRS 488.320 in Nevada and ACRR R18-11-204 et seq. in Arizona. Vessels having grossly contaminated bilges must connect to a collection system supplied by the concessioner for pumping and export of such wastes. Such collection system shall be approved by the Superintendent and will consist of the necessary hoses, hardware, pumps, sand/oil separator and sanitary sewer connections sufficient to service those boat owners who wish to use this service. The alternative will be to trailer and remove from the water any boat exhibiting contaminated bilge, for servicing at an approved facility. Any discharge of contaminated bilge requiring cleanup efforts shall be reported to the area ranger by the concessions marina or General Manager.

33 CFR 155.330 requires all vessels with propulsion machinery to have capacity to retain oily mixtures on board. A fixed or portable means to discharge oily waste to a reception facility is required. Boat operators should use buckets and absorbent pads to remove gross oily sheen from bilge prior to discharge.

**4) Provision of Containment for Absorbents:** Providing for the proper storage and disposal of fuel and oil soaked absorbent pads for moored vessels is the responsibility of the slip renter, shall be incorporated into slip rental agreements, and shall be done with due consideration for pollution control and life safety, and in accordance with primacy agency environmental regulations and the Uniform Fire Code.

Dispersants should not be used to clean up spilled fuel or oil. These only break product down into droplets, and can make it more bioavailable (readily taken up into the food chain).

Any automatic activation of bilge pumps from unoccupied moored vessels shall be investigated by the General Manager as a potentially reportable spill, until proven otherwise. Should such investigation confirm the release of a contaminant, concessions staff shall make a reasonable attempt to collect such bilge discharge for proper disposal and minimization of impact to the water environment, enter the vessel by any means necessary to disable the automatic pump function, determine the cause of the contaminant leak and pump activation, and stop the leak.

Marina operators may impound and immediately remove from the water any vessel that they determine is

in imminent danger of sinking, with the owner of the vessel bearing the cost for such removal and storage of the vessel.

Watercraft operators needing to pump bilges prior to, or while underway should be encouraged to do so provided the accumulated bilge consists of reasonably clean water and was not caused by fuel, oil, sewage or other waste spill or overflow. Whenever reasonably practicable, vessels discharging bilge wastes should be outside the breakwater or marina entrance areas.

**5) Vessels:** Pursuant to 33 CFR 155.450(a), all vessels greater than 26' in length must display a placard not less than 5 by 8 inches, made of durable material, instructing passengers and crew as to the proper methods of waste oil disposal. Posting on moored vessels shall be ensured by inclusion in the respective slip rental agreement.

#### D. LIQUID MATERIALS AND FIRE SUPPRESSION MANAGEMENT

**BMP requirement:** Provide and maintain appropriate storage, transfer, containment, and disposal facilities for liquid materials, such as oils, solvents, antifreeze, paints; encourage waste minimization practices and recycling of these products. Ensure life safety practices and equipment meets Uniform Fire Code.

**1) Fire extinguishers, storage of flammables or hazardous liquids:** Concessioners shall consult the local agency having enforcement authority for, or expertise in, the Uniform Fire Code, to determine the type and number of fire extinguishers required at all boat repair service and dry storage areas, and quantities of flammable materials allowed. Written reports of inspection by these entities shall be retained on site.

Curbs, berms or other barriers, with canopy, should be used in these areas for secondary spill containment. Separate containers should be available and clearly labeled for the disposal of waste oil, gasoline, used anti-freeze, diesel, kerosene or mineral spirits. Public access to these areas will be restricted.

**2) Spill containment equipment:** Spill containment equipment such as sand, vermiculite, boom, absorbent diapers, etc. will be conveniently located, in good condition, well-stocked and readily accessible. All employees will receive training in the use of such items for the containment and clean up of minor spills.

**3) Fire-fighting Foam:** All foams used for marina and watercraft fire suppression shall be of formulations approved by the respective primacy agency as non-toxic to aquatic life and safe for discharge to water environments.

**4) Spill Prevention, Control and Countermeasure (SPCC) manual and MSDSs:** A spill prevention and control procedures manual, approved by the Superintendent, will be maintained at each fueling facility. The General Manager will maintain a master copy such that the contents may be updated from time to time as new products, information, or regulations become available. MSDSs will be maintained on-site and read and initialed by all employees who are actively involved in boat servicing or whose duties may bring them into direct physical contact with fuel, sewage or cleaning or servicing chemicals.

Employees working in boat or vehicle repair and dry storage areas will read the manuals and sign a

statement certifying that they have read and understand the contents of the manual. Such statement shall be maintained on file and periodically updated.

#### E. POTABLE WATER SUPPLY MANAGEMENT

**BMP requirement:** Through joint effort with NPS, maintain effective cross connection control program; ensure adequate separation and monitoring of, water/sewer/fuel transmission piping. Ensure approved disinfection, flushing and bacteriological sampling prior to placing into service any new or repaired water piping.

**1) Cross-connection control:** The NPS Cross Connection Control and Backflow Prevention Plan will apply to concessioner facilities. All distributed water connections receiving potable supply water from NPS facilities will be protected by approved backflow prevention devices or air gaps. Such devices will be installed and maintained in a manner consistent with the above-referenced plan.

Any new connection or change in service involving NPS water systems may be approved in writing by the District Facility Manager upon recommendation of the area Filter Plant Operator or Backflow Prevention Specialist.

Dump station rinse hoses will be clearly labeled and backflow protected, and will be installed such that direct physical contact with vessel sewage holding tanks cannot occur.

#### F. SEWAGE WASTES AND FACILITY MANAGEMENT

**BMP requirement:** Install, maintain and operate sewage collection and export and restroom facilities to eliminate the release of sewage to surface waters. Design these facilities to allow ease of access. Electrical and mechanical components will fail-safe. Post signage to promote proper use by the boating public. Pumpout stations should be reliable, corrosion resistant, easy to use and clean, conveniently located, with low maintenance.

Restrooms are not acceptable for emptying portable toilets.

Handwashing facilities should be readily available.

Submersible pumps should be specifically designed for handling sewage, i.e., be of grinder type, or be capable of passing a 3-inch sphere, or be fitted with a screened suction. All pumps should be safe, functional and efficient. Motors and switches should be ignition protected. Pumps should be selected to pump against the maximum head developed by lake elevation changes and suction and force main friction losses. The suction connection to the boat should have appropriate adapters to ensure a clean, tight connection to various boat discharge fittings.

#### **1) Discharge of blackwater (sewage) from watercraft:**

Any discharge of toilet wastes from any vessel or device to the land or water within the Lake Mead NRA is strictly prohibited, and may result in citation, fines and loss of marina privileges. Such discharges must be to the approved concessioner-provided collection system or, in the case of porta-potties, to either the concessioner system or the DOI-NPS recreational vehicle sanitary dump station (or other approved method). Pursuant to 33 CFR 159 et seq, NRS 488.320(5)(b), and ACRR R18-9-817, through-hull

discharges, or any fixtures which allow the direct discharge of holding tank or toilet wastes from installed toilets are prohibited. This includes marine sanitation devices (MSDs) with either flow-through discharge capability or holding tanks with overboard pumpout capabilities.

Type III MSDs (or installed toilets with holding tanks) that are U.S. Coast Guard approved are permissible. Type I and II MSDs are also permissible provided they have the following: a) permanently affixed manufacturers certification labels; b) the "Y" valve handle removed or secured so that no direct discharge can occur, i.e., so that wastes will be directed to the vessel holding tank only, and c) a means of removal of wastes via approved vessel sewage pumping and export system.

Concessioners will ensure that such conditions are met prior to granting slip privileges to any vessel.

## **2) Discharge of greywater (sink, shower), from watercraft:**

Discharge of greywater in Nevada is allowable pursuant to NAC 488.535. It is the policy of DOI-NPS to discourage the discharge of greywater within slips, adjacent to fuel docks or anywhere within harbor or breakwater areas. Operators are encouraged to discharge greywater while underway outside the above areas.

Boat owners should be advised that regulations differ between Nevada and Arizona relative to the discharge of greywater. NPS is currently working with both states to resolve this issue.

## G. PUBLIC EDUCATION MANAGEMENT

**BMP requirement:** Public education of boaters, employees and visitors should be emphasized in order to:

- prevent improper disposal of wastes;
- promote awareness of low-impact techniques and practices;
- increase awareness of the fragile nature of the desert environment, and of the environmental impact of boater wastes.

Visitors should be made aware of the various recycling programs and receptacles, battery trade-in program, contaminated fuel and oil receptacles and other BMPs. They should pack it in, pack it out; leave nothing but footprints; take nothing but photographs.

Boat engines and outdrives should be maintained in good condition to avoid unneeded repairs, excessive use of fuel and hazards of fire and explosion.

**1) Shoreline camping and picnicking:** Those operators with vessels moored in coves, at beaches or any sheltered area or attraction site, for overnight or longer should be encouraged to use low-impact camping techniques to reduce impacts to the natural environment. Examples of such techniques include:

- removal of all litter;
- straining of wet (food) wastes prior to dumping of dishwater;

- removal of scraps and debris prior to dumping ice melt;
- cleaning of bar-b-que grills in a manner which allows debris to be containerized for disposal with other solid wastes;
- use of portable or on-board toilets or "cat-hole" latrine at least 100' above the high water level;
- use of shoreline and floating vault toilets for sanitary wastes only, and not as litter receptacles;
- sensitivity to trampling of vegetation, erosion of shoreline soils, and disturbance of wildlife;
- use of fire-pans in lieu of campfire rings on beaches;
- rinsing of soap and shampoo into soils above high water level.

**2) Recommended agents:** Boaters should also use environmentally responsible products, such as citric acid scrubs, baking soda, vinegar, borax, hydrogen peroxide, lemon juice or salt. The use of short term biodegradable holding tank and portable toilet chemicals, such as vinegar, pine oil, baking soda, or other innocuous compounds (in lieu of chlorine, formaldehyde, formalin, phenol derivatives, ammonia or alcohol) is encouraged. DOI-NPS encourages concessioners to seek out vendors who stock such products, and display and actively market these non-toxic items. Here are a few examples:

PRODUCT	ALTERNATIVE
bleach	borax or hydrogen peroxide
detergent/soap	elbow grease
scouring powder	baking soda
floor cleaner	1 cp. white vinegar:2 gal. water
window cleaner	1 cp. white vinegar:1 qt. water
general cleanser	bicarb. of soda and vinegar; lemon juice combined w/ borax
toilet cleaner	brush w/ baking soda
shower cleaner	scrub w/ baking soda
aluminum cleaner	2 tbs. cream tartar:1qt. hot water
brass cleaner	Worcestershire sauce or salt/vinegar/water
copper cleaner	lemon juice and salt
chrome cleaner	apple cider vinegar

fiberglass stains

baking soda paste