

same evaluation in the San Juan and Escalante inflow/sediment deposition areas. These studies will identify the hydrocarbon content of these sediments. In addition, another study is currently being conducted that examines the dynamics of sediment re-suspension and reworking in the Colorado River inflow. The monitoring plan that will be developed for the lake will include PAHs, as well as other gasoline constituents that may become re-suspended when there is down-cutting of the sediment deposits as a result of lowering lake level. The monitoring program that will be developed will also consider the most likely places for contamination, such as marina areas and areas downstream from major sediment depositional zones, if appropriate. The data from a study examining visitor effects (including hydrocarbon contamination) in three canyons will be used to develop water quality baselines for Glen Canyon National Recreation Area. A lake-wide monitoring plan will then be developed using the data gathered and the methods tested in these three studies (sediment, three canyons, and synoptic). Plan development will be guided by the Technical Advisory Committee that was formed in 1996 by the National Park Service, the Departments of Environmental Quality Water Divisions of Utah and Arizona, and other interested organizations and agencies (including the EPA) to protect Lake Powell water quality. The Technical Advisory Committee provides an excellent vehicle for establishing standards and protocols for Lake Powell that are acceptable to the EPA and states and that conform to the states' regulations developed under authority of the Clean Water Act. Benthic population sampling and bioassay may be included in the monitoring plan as determined to be appropriate by the Technical Advisory Committee. Dredging to remove sediment is not contemplated by the National Park Service.

25. One commenter stated that the water quality assessment uses assumptions that result in overestimation of potential PWC hydrocarbon emissions to the water in Lake Powell, amounting to the "most extreme adverse conditions." For example, benzo(a)pyrene concentrations in gasoline range from 0.19 to 2.8 mg/kg, and the highest value was used. Similarly, MTBE concentrations in gasoline were range from 0 to 15%, but only the highest figure was used.

*NPS Response:* In an effort to determine "what could happen," a conservative methodology was

constructed using the highest concentration of known pollutants commonly found in gasoline. The values referenced by the commenter were incorporated into the analysis to determine if the mixing layers of Lake Powell have adequate volume to mitigate the effects of carbureted two-stroke PWC engines, as well as all other two-stroke watercraft. Using this conservative approach, it was determined that the water quality impacts generated by PWC use would be negligible to minor, and that no water quality criteria for designated uses of the lake would be violated. The National Park Service is satisfied that incorporation of the given component concentration in gasoline has served this approach. Table 10 in the Final Environmental Impact Statement shows the benchmarks used in the evaluation for each pollutant.

In addition the modified preferred alternative B in the Final Environmental Impact Statement will provide an important step toward substantially reducing petroleum-related pollution by requiring PWC used in the recreation area after 2012 be 100% compliant with the EPA 2006 emission standards for gasoline marine engines. Based on the analysis presented, the National Park Service finds that the modified preferred alternative B (including the provision for continued PWC use) will not result in an impairment of park water quality.

26. One commenter stated that the assessment represents an outdated look at potential emissions from an overstated PWC population of conventional two-stroke vessels, and underestimates the accelerating changeover to four-stroke and newer technology two-stroke models. Sales of these newer models have already overtaken conventional two-stroke PWC. The commenter estimates that the changeover to PWC engines that meet the requirements of the EPA 2006 and California Air Resources Board (CARB) 2008 emission standards is occurring much more rapidly than EPA and the National Park Service have estimated. The commenter believes that the amounts of unburned fuel released at Lake Powell will decline rapidly, achieving a reduction from the 1998 baseline levels of more than 50% by 2006 and approximately 80% by 2012. The Draft Environmental Impact Statement, in contrast, only estimated a 25% reduction in hydrocarbon emissions from PWC in the Glen Canyon National Recreation Area by 2006, and only a 50% reduction by 2012.

*NPS Response:* In the water quality analysis, the assumption made by the commenter was that clean technology engines (any engine not using carbureted two-stroke technology) would be 90% cleaner than the carbureted two-stroke engines. This is based on two assumptions made by the commenter. The first is based on confidential, proprietary PWC sales and forecast data prepared by PWC manufacturers. No supporting data was supplied with the comment.

The commenter states that the data indicates that the conversion of PWC models to cleaner engines is occurring more rapidly than anticipated in the 1996 EPA analysis of the effects of the conversion rule. While the National Park Service has no reason to doubt that PWC conversions are proceeding at a greater rate than forecast by the EPA, there is no survey or similar data available at this time indicating the engine conversion at Glen Canyon is proceeding at a faster or slower rate than the EPA forecast. Therefore, use of the EPA rates is considered appropriate. The second assumption by the commenter is that 75% of the PWC at Glen Canyon would have engines that comply with the CARB conversion rule that requires marine engine manufacturers implement the EPA emission targets sooner than those outlined by the Federal rule. The commenter assumes that 50% of PWC users at Glen Canyon will be from California, and will have CARB-compliant watercraft. And that an additional 20% will have CARB-compliant vessels. The National Park Service concurs that many watercraft users at Glen Canyon have California registered PWC, and they will meet CARB standards. However, there is no data relative to PWC at Glen Canyon to confirm the 75% figure assumed by the commenter.

The National Park Service emissions calculations are conservative only in the sense that they do not specifically account for watercraft that have already been or will be converted to meet EPA or CARB standards. Under the modified preferred alternative B, PWC used in the recreation area after 2012 would be 100% compliant with the EPA 2006 emissions standards for the manufacturing of gasoline marine engines.

27. One commenter stated that the Draft Environmental Impact Statement acknowledges that hydrocarbon compounds evaporate rapidly from water and are subject to chemical breakdown, but then states that attenuating factors such as evaporation and photodegradation are not included