



December 2008

BIG LAKE – Frequently Asked Questions Regarding Petroleum Hydrocarbons

The State Department of Environmental Conservation (DEC) found that during periods of high recreation, Big Lake water quality exceeds water quality standards designed to protect human health and aquatic life. Below are answers to some of the common questions we have received. For more information visit the web sites listed on page 4 or call us at 269-3066.

Q1. What made DEC think to start monitoring for petroleum hydrocarbons in Big Lake?

A1. The public raised concerns about potential pollution from the heavy use of the lake for motorized transportation and recreation. National and state studies have shown that heavy use by motorized watercraft can lead to pollution of waters by petroleum hydrocarbons. In response to the concern, DEC took action to monitor the water quality in Big Lake.

Q2. Alaska has some of the most stringent petroleum hydrocarbon standards in the nation. Aren't you being too protective?

A2. No. The petroleum hydrocarbon standards are designed to be protective of Alaska's waterways and abundant fisheries. These standards were adopted into state regulation in 1979 and have been reviewed for scientific validity as recently as 2005.

Q3. Why does the DEC claim motorized watercrafts are the source of the petroleum hydrocarbon pollution? What about other possible sources?

A3. Other possible sources were also investigated. DEC's studies looked at the drainage from Meadow Creek where it enters Big Lake as well as areas in the lake without high motorized usage. The data clearly indicated the hydrocarbon contamination was associated with motorized watercraft usage and exceeded the state water quality standard. The effect of an individual motorized watercraft on the lake may seem minimal; however, when multiplied by the many users of Big Lake, water quality impacts become evident.

Q4. The lake has such a large volume of water and drains to Fish Creek. Is there really a problem?

A4. Yes. The DEC study shows that during high use periods in the summer months, the amount of petroleum hydrocarbons in portions of the lake is more than what the state water quality standards allow to protect aquatic life.

Q5. Does the state water quality standard for petroleum hydrocarbons average the results over a certain time period?

A5. No. According to state water quality regulations, individual samples are evaluated to see if they exceed the water quality standard. Measurements used to make the determination of impairment are not averaged out over a specific period of time. The DEC looks at all of the sampling results to see if the pollution is persistent and ongoing in order to make an impairment determination.

Q6. I heard the DEC used a motorized boat during sample collection. Didn't you just sample your own motor's pollution?

A6. No. The project followed a strict quality assurance, quality control plan which required us to ensure we did not capture any impact from our sampling boat. If we had been sampling the output of our boat, we would not have gotten results showing no hydrocarbons. Also, the sampling did not "chase exhaust pipes" of other boats around the lake, but focused on taking samples that represent the actual in-water conditions in various areas of the lake.

Q7. How long does the petroleum hydrocarbon stay in the water?

A7. This depends on several environmental factors such as wind speed, wave action, the amount of mixing in the water and temperature. Other factors influencing how long various hydrocarbon compounds stay in the water column include the rate of

consumption by bacteria, chemical breakdown by sunlight and interactions with suspended particles (these are sometimes referred to as degradation rates). The relative importance of the various factors depends on the characteristics of each of the compounds and of the lake itself. The sampling the DEC will be conducting in 2009 will measure hydrocarbon levels over a specific time period to see how they fluctuate.

Q8. Are the fish and water fowl being contaminated?

A8. It is possible that over time fish and wildlife could be negatively affected. Compounds in petroleum hydrocarbons are highly toxic and impact small aquatic insects that serve as the food source of fish and wildlife. Petroleum hydrocarbons contain known carcinogens such as Benzene and Benzo(a)pyrene. The effects of exposure to these compounds may not be immediately seen in aquatic life but may show up later depending on several environmental and biological factors. Sampling fish tissue for hydrocarbons, however, is not an effective method to determine if the hydrocarbons are causing negative impacts. The water sample results indicate a frequency and duration of petroleum contamination that may adversely affect the fish and other aquatic life.

Q9. Is Big Lake safe to swim in if the impaired area is adjacent to the beach?

A9. Yes. The water quality standard for primary contact recreation (such as swimming) is no film, sheen or discoloration on the surface or floor of

the waterbody or adjoining shorelines. At Big Lake, no sheen was seen on the water surface at any of the sampling sites. However, fish and other aquatic life that live in the water are much more sensitive to low levels of petroleum.

Q10. Did the DEC purposefully take samples at times when there would be high recreational use of the lake?

A10. Yes. The sampling plan was intentionally designed to look at times and locations where we expected to find higher concentrations of pollutants, but it also included sampling times and locations where we expected to find lower concentrations. This helped us determine the range of contamination and helped us get a better understanding of the degree of the problem.

Q11. Does the DEC receive additional funding if there are more waters reported as polluted?

A11. No. States are required to identify impaired waters under the federal Clean Water Act. There are no federal financial incentives for states to identify impaired waters. However, there are limited Clean Water Act funds available to States to assist in the clean-up of some of these impaired waters.

Q12. Is the DEC just trying to find a way to issue restrictions and regulations?

A12. No. The mission of the DEC by state statute is to protect human health and the environment. In many situations regulations are not needed or are not the best approach if the

problem is addressed through other means. The approach the DEC is pursuing with Big Lake is not through regulations but through cooperation and different lake management techniques such as promoting clean boating and fueling practices. DEC also encourages the use of newer Direct Fuel Injected 2-stroke motors or 4-stroke motors, which are more fuel efficient and much less polluting than older 2-stroke motors.

Q13. Isn't the water sampling data collected in 2004 and 2005 too old to make decisions on now?

A13. No. Big Lake was officially listed as impaired in 2006 when this data was new. The DEC is confident that management decisions made now will be meaningful in helping to restore and protect the water quality of Big Lake for years to come.

Q14. The summers of 2004 and 2005 were unusually hot and lake usage was up. This seems like an unfair time to sample.

A14. It is true that the summers of 2004 and 2005 were hot and dry with a lot of recreational use of Big Lake and the summer of 2008 was cool and wet with less recreational use of the lake. Weather in Alaska is unpredictable. If future summers are hot and dry again, lake usage would most likely increase as well. The overall trend, though, is that the population and by extension recreation use in the area is increasing.

Q15. Why doesn't DEC collect data now and show there is no impairment?

A15. The DEC is planning on collecting water quality data starting in

the summer of 2009 in conjunction with working with the community and other resource agencies to implement measures that are expected to help reduce levels of petroleum hydrocarbons in the lake. If the 2009 water quality sampling shows that the petroleum hydrocarbon levels are below the standard, then this could help in a future determination that the lake is no longer impaired.

Q16. How does Big Lake get off the Clean Water Act Section 303(d) list of impaired waters (Category 5 in the Integrated Report)?

A16. Under the federal Clean Water Act, the EPA provides three means for removing a water from the 303(d) list of impaired waters. The 303(d) list is also called Category 5 in the Integrated Report. State's must either (1) develop a Total Maximum Daily Load document; (2) develop a waterbody recovery plan following EPA's required elements including a commitment to implement; or (3) demonstrate through monitoring that the waterbody is no longer impaired. The monitoring done to remove Big Lake from the 303(d) list must be similar in duration and number of samples to the monitoring

done that led to the impairment listing. Before Big Lake is removed from the impaired list, there must also be assurances that the water quality standards will continue to be met. The DEC is pursuing a combination of options 2 and 3. Even with options 1 and 2 above, a water is still considered impaired until monitoring demonstrates water quality standards are consistently being met.

Q17. Where can I get more information on Alaska's waterbody listing process and what the different categories mean?

A17. This information is in Alaska's Integrated Water Quality & Assessment Report ("Integrated Report"):
www.dec.state.ak.us/water/wqsar/waterbody/integratedreport.htm

Q18. How do I get involved with helping to improve Big Lake's water quality?

A18. If you haven't done so already, please contact Laura Eldred at the DEC office in Wasilla in order to receive information on upcoming DEC meetings to discuss Big Lake water quality. Ph: 376-1855 or email laura.eldred@alaska.gov

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DEC's Big Lake water quality reports:
www.dec.state.ak.us/water/wnpssc/protection_restoration/big_lucille_lakes_wqreports.htm

State Water Quality Standards, Chapter 70:
www.dec.state.ak.us/regulations/index.htm