105 FERC ¶ 61, 100
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Pat Wood, III, Chairman;
William L. Massey, and Nora Mead Brownell.

Grand River Dam Authority Project No. 1494-232

ORDER APPROVING NON-PROJECT USE OF PROJECT PROPERTY

(Issued October 23, 2003)

1. On June 19, 2001, Grand River Dam Authority (Grand River), licensee of the Pensacola Project No. 1494, applied for authorization from the Commission for Arrowhead Investment & Development Company (Arrowhead) to expand and reconfigure its Arrowhead North Marina on Duck Cove of the project reservoir, Grand Lake O' the Cherokees, on the Grand/Neshoo River in northeastern Oklahoma.[1] The marina would be expanded from 9 existing docks with 111 boat slips and a service station to 11 docks with 175 boats slips and a new service station. As discussed below, we are granting the application with certain modifications and conditions.[2]

**BACKGROUND**

2. Grand Lake, which extends 66 miles upstream of the Pensacola Project dam, has a surface area of 46,500 acres and about 1,300 miles of shoreline. The reservoir's normal

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[1]Grand River supplemented its application by filings of April 8, August 26, and September 23, 2002; and January 23, 2003.

[2]The Pensacola Project license includes a standard provision authorizing the licensee to grant permission for certain types of non-project use and occupancy of project lands and waters without prior Commission approval. See 59 FERC & 62,073 (1992 license order) at 63,231 (Article 410). However, the marina facilities proposed by Arrowhead are not within the scope of uses set forth under Article 410, and thus can only be permitted if the licensee files, and the Commission approves, an application to amend the license to allow the facilities and uses in question.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



maximum water surface elevation is 745 feet Pensacola Datum (PD).[3] The project boundary is at the 750-foot PD contour line; thus, the Commission regulates only a strip of land (of varying horizontal distance, depending on the steepness of the terrain) around the reservoir's perimeter.

3. The Commission relicensed the Pensacola Project in 1992.[4] Under the approved recreation plan for the project, shoreline development is currently controlled by demand and site availability.[5] The recreation plan requires Grand River to monitor, through the license term, recreation use and shoreline development levels at the project and to periodically file the results with the Commission.[6]

**PROPOSED MARINA EXPANSION**

4. Duck Creek cove is a three-mile-long arm of Grand Lake that enters the main body of the reservoir about five miles north of the project dam. The cove varies in width from about 2,600 feet at its mouth to about 700 feet in its upper reaches. Arrowhead Marina, one of seven marinas in the cove, is located on the western shore in the cove's mid-section, in an area with numerous points and inlets and extensive commercial and residential development.

5. Arrowhead's nine existing docks are positioned around one of these points and along the shoreline of an adjacent inlet. The width of the cove narrows considerably at the marina site. As measured from shoreline to shoreline at elevation 750 feet mean sea level,[7] the cove ranges from about 1,015 to 1,315 feet wide at this location. As discussed

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[3] PD (Pensacola Datum) is 1.07 feet higher than NGVD (National Geodetic Vertical Datum), which is a national standard for measuring elevations above sea level.

[4] See n.1.

[5] 84 FERC & 62,144 (1998) (order approving recreation plan).

[6] Id. at p. 64,232. The reports are due April 1, 2003, and every six years thereafter. Based on the results of these reports, the Commission may require changes to the long-term recreation management of the project lands and waters. On July 2, 2003, Grand River filed its first report, which has been reviewed and accepted by the Commission staff. See September 30, 2003 letter from Commission staff to the licensee.

[7] PD (see n.3) and mean sea level are comparable elevations at this project.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



in more detail in the environmental assessment (EA) prepared by Commission staff in this proceeding, Arrowhead proposes to remove four of the existing docks (54 slips) and replace them with six larger, redesigned docks (104 slips); and extend the length of a fifth dock that runs parallel to the shoreline and increase its slips from 10 to 24.[8] The water surface area of the new and expanded docks would increase from approximately 200,000 to 390,000 square feet. The expanded marina would consist of 11 floating docks with 175 boat slips and a new fuel and service facility.[9] The new docks would be floating docks, and their installation would not require any dredging or other land-disturbing activity.[10]

6. The Commission issued public notice of the application. The U.S. Department of the Interior, the U. S. Fish and Wildlife Service (FWS), and the Oklahoma Department of Wildlife Conservation (Oklahoma DWC) filed comments that do not oppose the proposed expansion, but express concern that continued shoreline development will have cumulative impacts on fish and wildlife habitat and shoreline access.[11] Three owners of

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[8]The remaining four docks (47 slips) will be essentially unchanged.

[9]Arrowhead will install roofs over 73 of the slips on the docks along the outer edges of the new section.

[10]At the site where the existing marina connects to the shoreline, Arrowhead has constructed a two-tiered, 780-foot-long, 14-foot-high concrete flood wall. The wall, apparently part of Arrowhead=s modernization of its onshore facilities, is located partially on project lands. The wall was constructed in November 2001 without prior Commission approval. Grand River, again without prior Commission approval, subsequently conveyed to Arrowhead the project lands on which the wall is located, in exchange for Arrowhead's conveyance to Grand River of an equivalent amount of nearby shoreline land for inclusion within the project. Arrowhead plans to add a third, 10-foot-high, upper tier to the wall. By letter of December 19, 2002, Commission staff notified Grand River that the unauthorized construction of the wall and conveyance of project lands were violations of its license, and directed Grand River to file, by March 19, 2003, an after-the-fact application for approval of the wall construction and conveyance of project lands. The March 19 deadline was subsequently extended to June 30, 2003. Grand River filed a response on July 3, 2003, contesting the need for the after-the-fact application. The matter of the requested amendment application is not related to the instant proceeding, and it will therefore be considered separately.

[11]See comments filed August 9, 2001 (Interior); October 22, 2002 (FWS); and November 18, 2002 (Oklahoma DWC).

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



lakefront property in the vicinity of the marina, Mike Brady, Cheryl B. Creekmore, and James P. Freeman, filed motions to intervene in opposition to the proposal.[12] Ten other persons and entities also filed comments in opposition.[13] Grand River filed letters from 389 individuals and entities expressing support for the marina expansion, asserting, among other things, that the expansion would have a beneficial impact on local area tax revenues and the economy of the project area.[14]

7. Those that oppose the marina expansion argue that it will (1) increase boating congestion, navigational safety hazards, and ambient noise in the Duck Cove channel, (2) degrade the visual character and scenic quality of the cove's shoreline, and (3) adversely affect property values, public shoreline access, fisheries, wildlife, riparian and aquatic habit, water quality, and shoreline stability. They also assert that the proposed expansion violates Grand River's reservoir management regulations that limit the length of dock protrusions into project waters. Several commenters and intervenors ask that the Commission prohibit any further permitting of commercial docks and slips on Grand Lake until the licensee provides information on the lake's boating carrying capacity and submits a comprehensive shoreline management plan for the project.[15]

8. The Commission staff conducted a site visit on May 1, 2002, and, on September 19, 2002, issued a draft EA, which recommended approval of the proposed marina expansion with additional staff-recommended measures to mitigate adverse impacts. Intervenors and commenters opposed to the marina expansion commented on the draft EA, reiterating their earlier concerns. The final EA, which addresses these comments, is being issued with this order.

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[12]The interventions were late, but were granted pursuant to the Commission=s regulations. 18 C.F.R. ' 385.214(d) (2003).

[13]See the filings of Jack R. Lenhart (August 31, 2001, and June 13, 2002); Boone, Smith, Davis Hurst & Dickman, representing a group of nearby landowners (September 17, 2001); Duck Creek Homeowners Association (June 19, 2002); Annette O. Willis (November 7, 2002); Janette O. Layne (November 7, 2002); Sierra Club (November 7, 2002); Janie Brady (November 12, 2002); Rudy Herman (November 12, 2002); Lisa Luce (November 12, 2002); and the Oklahoma State Bass Federation (December 12, 2002).

[14] See Grand River's May 28, 2002 filing.

[15]See n.6.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



**DISCUSSION**

9. We have reviewed Grand River's application in this proceeding pursuant to the Federal Power Act's (FPA) comprehensive development public interest standard, as informed by relevant license terms, e.g., the approved recreation plan, public and agency comments on the proposed non-project use, and the EA.[16]

10. The record indicates that there would be no significant adverse impacts on fish and wildlife, air and water quality, ambient noise levels, or shoreline access.[17] The proposal is expected to have beneficial impacts on employment, tax revenues and tourism.[18] The proposed facilities do not represent a new use for the cove, but they would result in some adverse impacts on the visual character and scenic quality of the landscape in the vicinity of marina.[19]

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[16]See, e.g., Grand River Dam Authority, 85 FERC & 61,171 at 61,673 (1998).

[17]EA, Sections 5.2 and 6.1. This order requires the installation of aquatic habitat structures to offset the effect of the marina expansion on fish populations.

The licensee reports that 90 percent of the reservoir's shoreline is safely accessible to the general public by land without trespassing. There are 30 informal public access areas, 46 boat ramps with a total of 64 boat launching lanes, 10 marinas, 3 tailwater fishing facilities, 11 fishing piers, and 7 swimming areas located at the project. According to the licensee, these facilities, which are free to the public, are used at 30 to 80 (for the 10 public marinas) percent of their capacity. See licensee's FERC Form 80, "Licensed Hydropower Development Recreation Report," filed July 14, 2003. The licensee must file a Form 80 every six years. 18 C.F.R. ' 18.11 (2003). The latest Form 80 was due April 1, 2003, and filed July 14, 2003.

[18]Id., Section 5.2.8.

[19]Id., Section 5.2.7.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



11. We have considered and addressed this issue in an earlier case involving expansion of another marina in Duck Cove.[20] There, we said:[21]

> As noted, under the project's recreation plan approved in 1998, shoreline development is currently controlled by demand and site availability. Moreover, it appears that the counties surrounding the lake have no land use planning mechanisms [footnote omitted]. Consequently, landowners living along the shoreline could have no realistic expectation that their environs would remain undisturbed, whether by additional residences and their associated docks or by commercial developments built to serve the growing recreational boating market.

12. While boating densities in the lake and the cove continue to increase, we agree with the EA's finding that the proposed marina expansion, with staff's recommended measures, would result in only moderate long-term adverse impacts to boating use and navigational safety.[22] To accommodate increasing numbers of boats in the cove, Grand River has established boat-traffic control lanes to lessen conflicts between smaller and larger boats and has imposed speed limits within these lanes. Given the distance (150 feet) between the marina=s proposed perimeter docks from the cove's 200-foot-wide navigation lane in the center of the cove's channel, the impact of boats entering and leaving the expanded marina should not be a significant navigational safety concern.[23] To ensure that this is the case, we adopt the EA's recommendation to require a slight change in the location of several slips on the perimeter of the expanded marina.[24]

13. Several intervenors and commenters oppose the proposal on the ground that the expanded marina would exceed the limits established in Grand River's reservoir rules and

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[20] Grand River Dam Authority, 89 FERC & 61,139 (1999).

[21] Id. at 61,399.

[22] See EA, Sections 5.2.5 and 6.1.

[23] Id., Section 5.2.5.

[24] Id., Section 6.2.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



regulations,[25] and that Grand River has not issued a waiver of those rules. Through its reservoir regulations, Grand River manages all aspects of the reservoir and its shoreline for recreational, commercial, safety, and other purposes.[26] In considering whether, or under what circumstances, to authorize a non-project use of project lands or waters that Grand River lacks the delegated authority to approve, we may consider a proposal's consistency with these regulations, but we are not bound by them, nor did we adopt them as license conditions.[27]

14. As noted, while there is evidence that boating densities in the cove are increasing, such evidence does not confirm that the cove has reached its carrying capacity. Nor is there any information in Grand River's recreation monitoring report to warrant rejection or deferral of Commission action on the proposed marina expansion.[28] Grand River is in

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[25] See Appendix B of the recreation plan filed on October 3, 1997. Grand River's reservoir regulations establish guidelines for issuing permits for construction of commercial docks, providing, among other things, that piers, wharves, landings, and docks will be limited to a total maximum length perpendicular to the shoreline of 125 feet, or one-third of the distance from the adjacent shoreline, measured across the land and water of Grand Lake, to the nearest opposite shoreline, whichever distance is less. The cove in the vicinity of Arrowhead Marina is around 1,000 to 1,350 feet wide. The marina's existing docks extend about 475 feet into the cove, some 350 feet longer than the 125 feet allowed under Grand River's permitting program. Under the proposed expansion, the length of the longest dock would remain the same, but its orientation in the water would result in the marina extending an additional 30 feet (505 feet total) into the cove.

[26] Grand River states that, on the occasion of a prior dock expansion, it waived the dock length requirements as they pertain to Arrowhead Marina. See Grand River's filing of April 8, 2002.

[27] By filing of May 6, 2003, a group of landowners informed the Commission that they are seeking a determination from the Oklahoma Attorney General as to Grand River's legal authority to grant waivers of its reservoir regulations. On June 16, 2003, the Oklahoma Attorney General issued his opinion finding that Grand River has the authority to grant waivers of its regulations.

[28] See n.6, supra. The report indicates that since 1997 the total number of private and commercial boat slips within the project has declined from 7500 to 6359 (4179 private and 2180 commercial slips), primarily as the result of reconfiguring slips at some the larger marinas to accommodate a fewer number of larger boats.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



the process of preparing a comprehensive shoreline management plan for the project, and its current schedule calls for submitting the plan to the Commission by August 2004.[29] While we look forward to the implementation of such a plan for this project, we see no reason at this time to delay consideration of this amendment request until after Grand River has submitted, and we have reviewed, its plan.

15. We conclude that construction and operation of the proposed marina facilities, as conditioned herein, will not constitute a major federal action significantly affecting the quality of the human environment, will not interfere with licensed project purposes, and will be consistent with the project's recreation plan and the statutory standards by which we regulate hydropower projects. Accordingly, we will approve, with conditions, Grand River's application to permit the proposed use of project lands and waters.

The Commission orders:

(A) Grand River Dam Authority's application for non-project use of project lands and waters of the Pensacola Project (FERC No. 1494), filed on June 19, 2001, and supplemented on April 8, 2002, is approved as modified by ordering paragraph (B) below.

( B) The licensee shall include the following conditions in its commercial-use permit issued to Arrowhead Investment & Development Company (permittee), as approved in ordering paragraph (A) above:

(1) For navigational safety reasons, permittee shall modify the dock layout drawing included in its permit application. Specifically, the three 99-foot-long, external slips in the northeast corner of the layout drawing shall be rotated 90 degrees to run parallel with the shoreline to avoid potential safety hazards associated with boats entering and exiting these slips adjacent to the cove's navigational channel. Permittee shall install the subject docks as shown on the modified dock layout drawing.

(2) Permittee shall place rip-rap, boulders, or other aquatic-habitat structures along the base of the marina's shoreline wall, or at another appropriate location selected in consultation with the Oklahoma Department of Wildlife Conservation (ODWC) and with the Grand River Dam Authority's approval.

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[29] See p. 2 of Grand River's report on the progress of its development of a shoreline management plan, submitted with its recreation monitoring report filed on July 2, 2003.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



These structures shall be sized and designed, with ODWC's advice and assistance, to fully offset the habitat lost as a result of permittee's marina expansion actions.

(3) Upon discovery of any archaeological materials during construction of the marina facilities covered by the permit, permittee shall immediately stop construction activities and contact Grand River Dam Authority (GRDA or licensee), the Oklahoma Archaeological Survey (OAS), and any Native American tribes/groups that may have an interest in the discovery. Permittee shall allow the notified parties a reasonable amount of time to: (1) examine the discovered materials to evaluate their significance; and (2) provide the results of their evaluations to GRDA. The licensee shall take any OAS or tribal comments and recommendations into consideration in deciding how to proceed pursuant to license Article 409. Permittee shall implement any measures prescribed by the licensee to protect or mitigate adverse impacts to any significant resource discoveries. Any disputes that may arise between the licensee and permittee regarding such discoveries shall be submitted to the Commission for resolution.

(4) Permittee's use and occupancy of project lands and waters shall not endanger health, create a nuisance, or otherwise be incompatible with the project's overall purposes, including public recreation and resource protection.

(5) Permittee shall take all reasonable precautions to ensure that its permitted use and occupancy of project lands and waters shall occur in a manner that will protect the scenic, recreational, and other environmental values of the project.

(C) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. ' 385.713 (2003).

By the Commission. Commissioner Massey dissenting with a separate statement attached.

( S E A L )

Linda Mitry,
Acting Secretary.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

# FINAL ENVIRONMENTAL ASSESSMENT

## APPLICATION FOR NON-PROJECT USE OF PROJECT LANDS AND WATERS

**Pensacola Project**
**FERC No. 1494-232**
**Oklahoma**

**Federal Energy Regulatory Commission**
**Office of Energy Projects**
**Division of Hydropower Administration and Compliance**

**888 First Street, NE**
**Washington, DC 20426**

**October 2003**

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

# FINAL ENVIRONMENTAL ASSESSMENT

**Federal Energy Regulatory Commission**
**Office of Energy Projects**
**Division of Hydropower Administration and Compliance**

Pensacola Project
FERC Project No. 1494-232

## 1.0 APPLICATION

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|---|---|
| Application Type: | Non-Project Use of Project Lands and Waters |
| Date Filed: | June 19, 2001 |
| Applicant: | Grand River Dam Authority |
| Water Body: | Grand Lake of the Cherokees (Grand Lake) |
| Nearest Town: | Ketchum |
| County & State: | Delaware County, Oklahoma |

## 2.0 PURPOSE AND NEED FOR ACTION

On June 19, 2001, the Grand River Dam Authority (GRDA or licensee), licensee for the Pensacola Project, FERC No. 1494, filed an application for non-project use of project lands and waters. Specifically, the licensee requests Commission approval to permit Joe Harwood d/b/a Arrowhead Investment & Development Company (Arrowhead or grantee) to expand and modernize an existing marina located on the Duck Creek arm of Grand Lake, the project reservoir (GRDA, 2001c).

GRDA says that except for an approved marina expansion at Tera Miranda on Monkey Island and the installation of three additional docks at Thunder Bay Marina in Duck Creek cove, all Commission-approved dock facilities on Grand Lake have been constructed. Also, all existing marinas on the lake, including those recently constructed, are presently operating at maximum capacity. Given the current situation, the licensee says that additional marina expansions or new commercial docking facilities are needed at the project to accommodate the demand of the boating public (GRDA, 2002).

The licensee states that all major commercial-marina proposals are reviewed and approved by GRDA's Board of Directors (Board) prior to submittal to the Commission for permit authorization. In regard to the subject application, GRDA says the proposed expansion and modernization of Arrowhead Marina would: (1) not conflict with the project’s natural or historic values; (2) not disturb any historic sites; (3) not be

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



inconsistent with the project's recreation plan or its recreational uses; and (4) not have a substantial negative impact on the surrounding environment.[1]

The Commission has conducted an environmental review of Arrowhead's marina-improvement proposal in order to determine whether and under what conditions GRDA's application should be approved. As part of the review process, the Commission issued a Notice of Availability of Draft Environmental Assessment (DEA) and provided a 30-day period for interested parties to file comments. This Final EA (FEA), which addresses the comments received on the DEA, will be used to support the Commission's decisions and action on the application.

## 3.0 PROPOSED ACTION AND ALTERNATIVES

### 3.1 Proposed Marina Improvements

Arrowhead has requested GRDA to grant it a permit to replace and relocate existing docks and to construct additional docking facilities at its commercial marina on Grand Lake's Duck Creek cove. The existing marina consists of nine docks with 111 boat slips and a service station for marine fueling and for pumping out the marine-toilet holding tanks of boats (figure 1).[2] After completing the proposed improvements, the marina would have 11 docks with 175 boat slips and a new boat-service station (figure 2).

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[1] There are two marinas on Grand Lake's Duck Creek cove named "Arrowhead" – Arrowhead North and Arrowhead South (see figure 5). Arrowhead Marina-North, which is referred to as "Arrowhead Marina" in GRDA's application and in this EA, is the site of the proposed improvements.

[2] GRDA requires all marine-fueling facilities on Grand Lake to have an approved and functional pump-out facility for marine-toilet holding tanks prior to the issuance or renewal of a commercial-use permit (GRDA, 2001a). Arrowhead completed the installation of a new pump-out system at the marina in November 1999. Arrowhead's policy is to provide its pump-out service at no charge to boaters who rent a boat slip and buy all of their boating fuel from the company. Also, in support of federal regulations, Oklahoma state law, and GRDA requirements, Arrowhead's policy is to prohibit any boat to be brought into the marina that is equipped with a marine toilet, but does not have: (1) an approved, total-retention (holding tank) system installed; and (2) its overboard-discharge (Y valve) system permanently closed. Arrowhead's existing service department at the marina offers retrofit installations to bring non-conforming boats into compliance with this health and sanitation policy (Harwood, 2000).

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



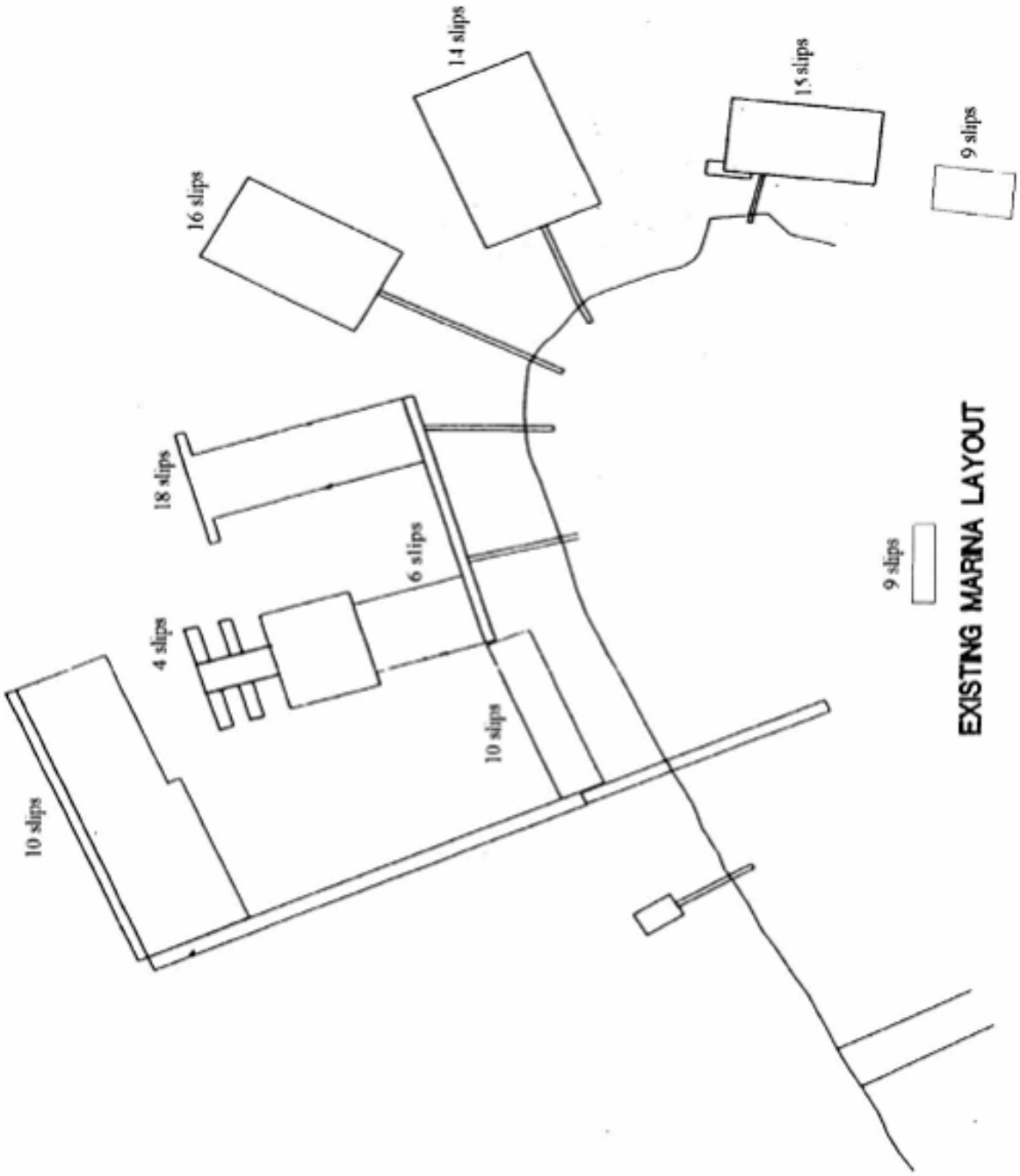


Figure 1. Layout of existing docks at Arrowhead Marina. Pensacola Project, FERC No. 1492-232, Oklahoma (source: Grand River Dam Authority, Application for Non-Project Use of Project Lands and Waters, filed June 19, 2001, as modified by staff).

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



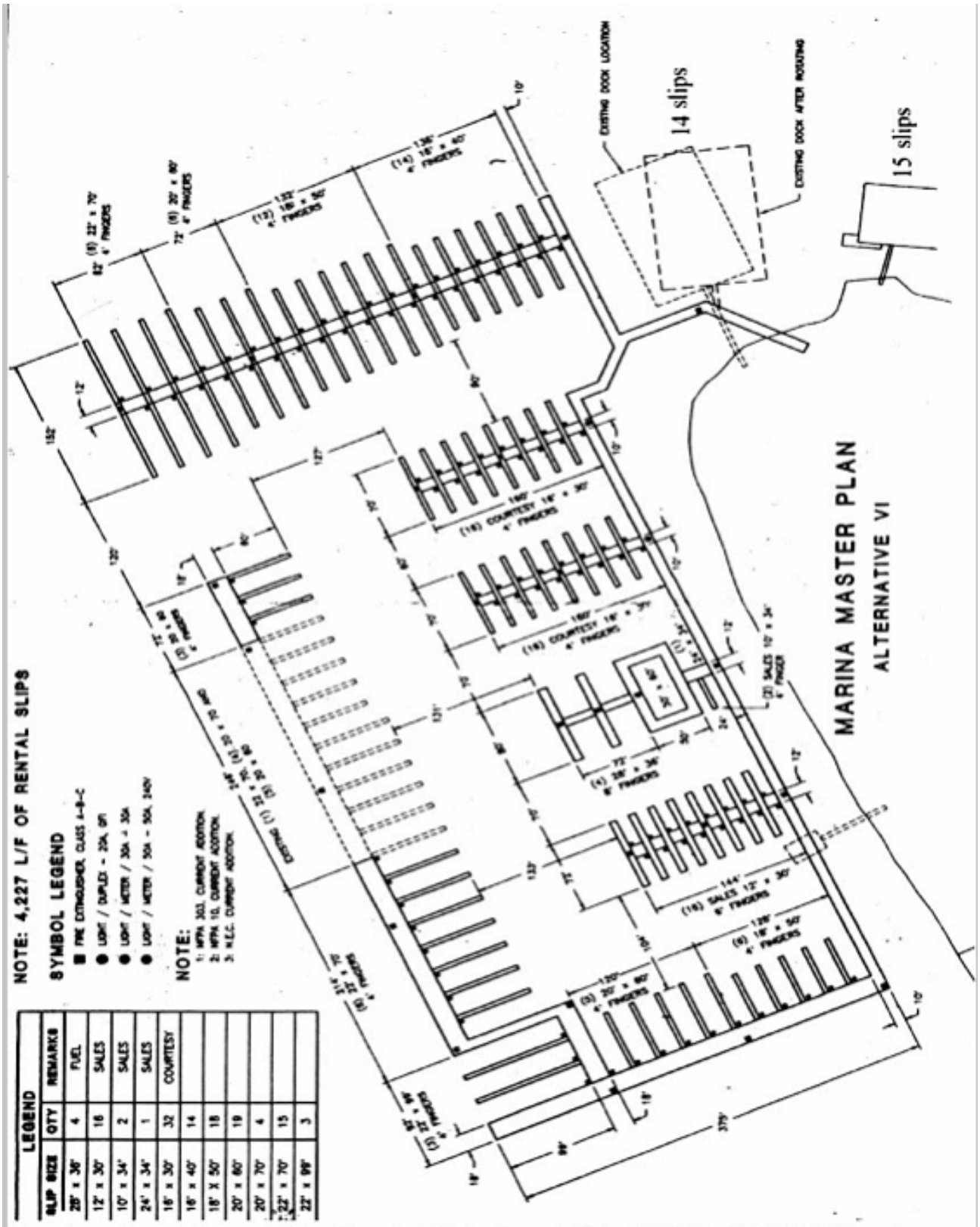


Figure 2. Layout of proposed docks at Arrowhead Marina. Pensacola Project, FERC No. 1492-232, Oklahoma (source: Grand River Dam Authority, Application for Non-Project Use of Project Lands and Waters, filed June 19, 2001)

The new perimeter-dock facilities would have the same design features as the marina's most recently constructed dock, including: (1) sheet-metal roofing; (2) galvanized-steel framing; (3) underwater trussing; and (4) plastic-tub-encased floatation (GRDA, 2001c). No dredging is proposed in connection with the dock improvements. However, the marina's existing breakwaters would be dismantled and the used tires that form these structures would be recycled. No replacement breakwaters are proposed because the new docks are designed to resist damage from waves and boat wakes.

The marina's expanded/modernized docking facilities would be used by Arrowhead Yacht Club members and other marina patrons. Four of the marina's slips would be used for boat-servicing operations, 19 slips would be used for boat sales, 32 slips would serve as courtesy docking spaces for visiting boaters, and 120 of the slips would be available for rent.

Arrowhead's expansion and modernization program for the marina also includes:

- The replacement of 16 lakeside septic tanks, including one large tank serving the marina's restaurant and yacht club, with a new off-site (one-quarter mile from the shoreline) waste-treatment system approved and permitted by the Oklahoma Department of Environmental Quality;
- Replacement of the marina's existing boat-fueling equipment and onshore fuel-storage tanks with a new fuel-storage-and-delivery system approved and permitted under U.S. Environmental Protection Agency regulations, Oklahoma Corporate Commission standards, and Oklahoma State Fire Marshall codes;
- The development of additional yacht-club facilities, including a swimming pool and sundeck, a sports bar and grill, a boat showroom and banquet facility, and additional parking areas (see figure 3; note that the drawings in this figure do not accurately depict the proposed dock facilities).
- A flood-wall/retaining-wall system along the shoreline.[3]

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[3] The first two tiers of this three-tiered wall system (see figure 3) have been constructed. The U.S. Army Corps of Engineers (COE) has granted Arrowhead an after-the-fact permit and has consented to construction activities on COE's flowage easements for the wall. In a related review, the Commission concluded that GRDA did not comply with certain non-project-use and project-land-rights provisions of the project license in its permitting of the wall and in conveying a parcel of project land to Arrowhead (FERC, 2002b). As a result of this review, the Commission has required GRDA to take certain compliance actions, consistent with its responsibilities as project licensee.

View from Land

View from Water

Figure 3. Additional yacht-club facilities to be developed at Arrowhead Marina as part of Arrowhead's expansion and modernization program. Pensacola Project, FERC No. 1494-232, Oklahoma (source: Arrowhead Investment & Development Company, website for Arrowhead Yacht Club and Marina at http://www.arrowheadok.com/expansion.htm, with staff permission).

Since the marina's lakeside septic tanks have already been removed and its new waste-treatment system has already been installed, these completed improvements are considered part of the environmental baseline in our analysis of the proposed action. Also, the existing portions of the marina's shoreline wall (see footnote 3) are considered to be a baseline condition for the proposal's environmental setting.

Since the marina's new waste-treatment system does not occupy project lands or waters, this facility is outside the scope of the intended permit. In addition, the above-listed yacht-club facilities and the storage tanks for the new boat-fueling system are located outside the project boundary and would not be covered by the permit. However, the new fuel-pump and existing pump-out equipment would be installed on the new service dock and would be covered by the permit. GRDA and COE have already permitted the marina's shoreline wall (see footnote 3).

The licensee proposes to grant the requested commercial-use permit to Arrowhead pursuant to the Rules and Regulations Governing the Use of Shorelands and Waters of GRDA (Lake Rules and Regulations). GRDA's Lake Rules and Regulations provide for the removal of permitted facilities and the cancellation of a permit, upon 30 days prior notice, for failure of the grantee to comply with the permit's conditions.

The licensee states that for most commercial-dock proposals, GRDA's Board waives the dock-placement provisions of its Lake Rules and Regulations (Article IV, Section 7) and approves such proposals "as submitted" or "as submitted, subject to certain modifications." The licensee explains that, with respect to Arrowhead Marina, these provisions were waived many years ago (GRDA, 2002). The "Marina Master Plan" drawing submitted with the application (figure 2 of this EA) contains no GRDA-imposed changes to Arrowhead's proposed dock layout with respect to dock location, dock length, slip orientation, or slip size.

### 3.2 Action Alternatives

This EA also considers the following measures that are not part of the proposed action. These action alternatives have been included in the scope of our assessment because they would mitigate adverse impacts on various project-related resources.

- Protect an appropriate amount of good-quality terrestrial habitat to compensate for the cumulative impacts of shoreline development on wildlife.

- Place aquatic-habitat structures in the littoral zone at the base of the marina's shoreline wall to offset the impacts of the marina's expansion on fish.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



- Alter the proposed dock-layout plan (figure 4) to reduce the navigational, visual, and other environmental impacts of the marina's expansion.

- Establish contingency procedures for taking into account any archaeological resources potentially discovered during the marina's expansion.

### 3.3 No-Action Alternative

Under this alternative, the Commission would not approve GRDA's non-project-use application. The licensee, in turn, could not grant Arrowhead permission to expand and modernize the marina's dock facilities, as proposed.[4] However, the marina's existing docks would remain in their present configuration and would continue to be operated and maintained in a manner consistent with Arrowhead's current commercial-use permit. This would include Arrowhead's plans for replacing the marina's boat-fuel pumps.

Also, under this alternative, Arrowhead would continue to implement those elements of its marina expansion and modernization program not covered by the permit. This includes replacing the marina's fuel storage tanks and developing the additional yacht club facilities, as described under the proposed action (Section 3.1).

Arrowhead also would complete the third tier of its shoreline wall, consistent with COE's 404-permit and consent-to-construction conditions (GRDA, 2002(c) and 2003). Among other items, these conditions require Arrowhead to compensate for lost flood-storage capacity by excavating 11,648 cubic yards of material from an approved shoreline location and disposing of the material at an upland location above elevation 757.[5]

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[4] The license for the Pensacola Project contains a standard article (article 410) delegating to the licensee the authority to grant permission for certain types of non-project use and occupancy of project lands and waters without prior Commission approval (FERC, 1992). However, Arrowhead's proposed marina improvements are not within the scope of article 410's provisions and, therefore, can only be permitted if the Commission approves GRDA's application.

[5] The third tier of the wall will be located outside the project boundary and, therefore, the wall permit GRDA has issued does not apply. However, GRDA is to report to the Commission on the extent to which it has required, or will require, Arrowhead to obtain the licensee's approval for the specific compensatory measures taken on project lands to meet COE's permit and consent conditions (FERC, 2002b).

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



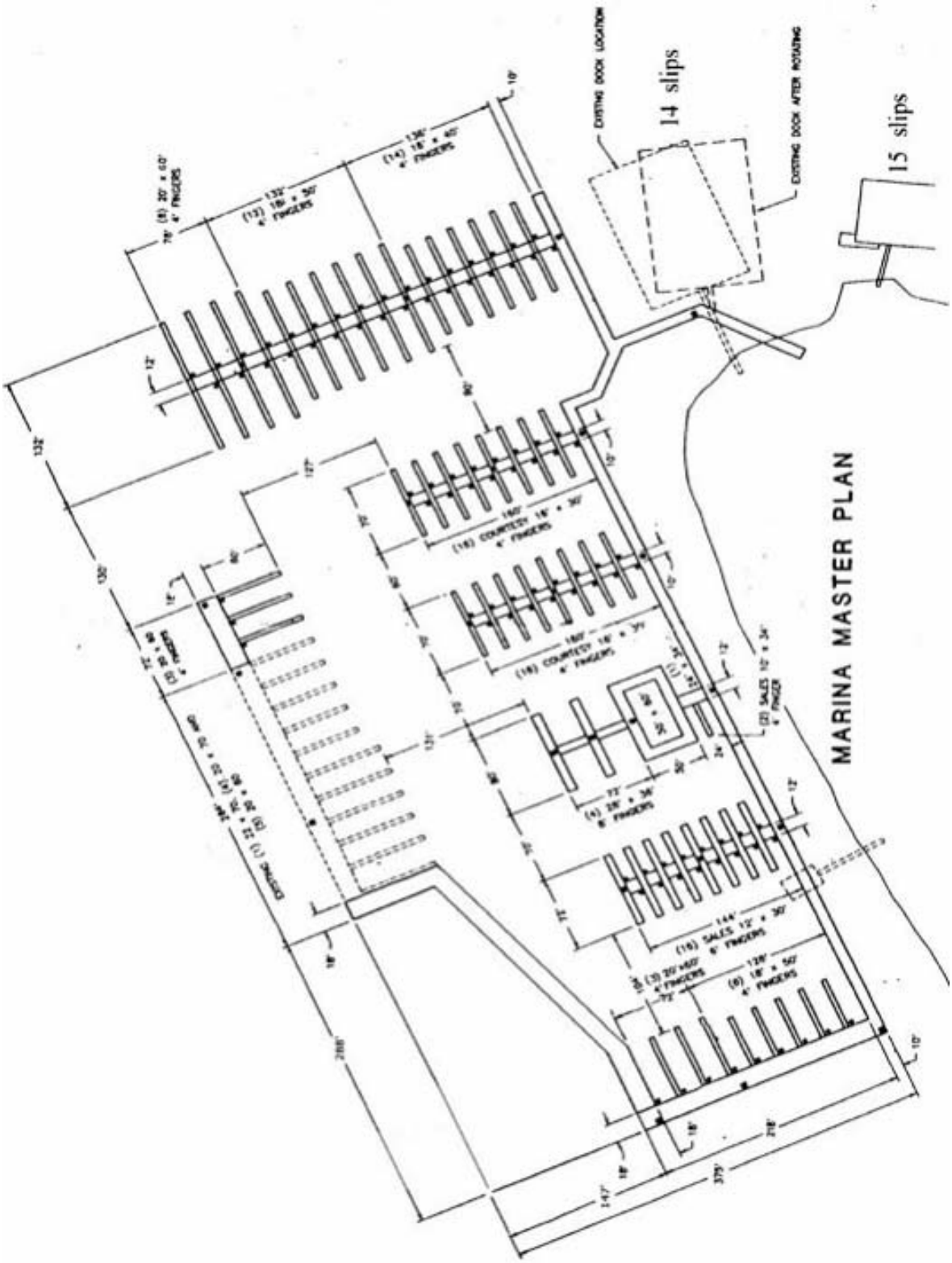


Figure 4. Alternative dock layout, with exterior corners beveled, to reduce navigational, visual, and other environmental impacts. Pensacola Project, FERC No. 1494-232. (sources: Grand River Dam Authority, Application for Non-Project Use of Project Lands and Waters, filed June 19, 2001, as modified by staff).

### 3.4 Alternative Considered but Eliminated from Further Analysis

In pertinent part, the dock-placement provisions of GRDA's Lake Rules and Regulations: (1) limit docks to a maximum total length, perpendicular to the shoreline, of 125 feet or 1/3 the distance from the adjacent shoreline to the nearest opposite shoreline, whichever is less; and (2) require the boat slips of installed docks to be oriented perpendicular to the shoreline, with only one opening to the waterfront side of the dock. For these provisions, the term "shoreline" is defined as contour elevation 750 feet mean sea level (msl) on Grand Lake (GRDA, 2001a).

If the above provisions were applied to Arrowhead's proposal, the replaced, relocated, and new docks would require an extensive amount of additional shoreline. Also, considering the number and size of the additional docks and slips proposed, a substantial amount of near-shore dredging would likely be required to accommodate the larger boats that would use these facilities. Further, a considerable amount of additional on-shore development would be required to secure and provide access to the docks.

Expanding the marina in conformance with GRDA's dock-placement standards would minimize further open-water obstruction and navigational constriction. However, considering the scope and magnitude of Arrowhead's proposal, this type of dock configuration would result in: (1) far greater construction, operation, and maintenance costs; (2) unacceptable levels of impact on the natural- and scenic-resource values and conditions of the project; and (3) excessive degrees of conflict and encroachment with respect to other shoreline uses and occupancies. Therefore, this alternative has been eliminated from further environmental analysis.

## 4.0 AGENCY CONSULTATION AND PUBLIC INVOLVEMENT

The licensee's application documents GRDA's efforts to consult with appropriate resource agencies. By letter dated May 21, 2001, GRDA provided information about the proposed marina improvements to the following agencies and requested comments related to their respective interests and expertise: (1) the U.S. Army Corps of Engineers, Tulsa District (COE); (2) the U.S. Fish and Wildlife Service (FWS); (3) the Bureau of Indian Affairs (BIA); (4) the Oklahoma Department of Wildlife Conservation (ODWC); (5) the Oklahoma Historical Society/State Historic Preservation Officer (OHS/SHPO); (6) the Oklahoma Archaeological Survey/State Archaeologist (OAS/SA); and (7) the Office of the State Fire Marshall (OSFM). ODWC, OAS/SA, and OHS/SHPO were the only agencies that responded to the licensee's consultation letter.

By letter dated May 24, 2001, ODWC states it has no comment on, nor objection to, the proposed marina improvements. By letter dated May 25, 2001, OAS/SA provided comments on the identification and evaluation of archaeological resources that may be

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



affected by Arrowhead's proposal. By letter dated June 19, 2001, OHS/SHPO finds that there are no historic properties affected by the proposal.

The licensee placed a notice of Arrowhead's marina-improvement proposal in *The Vinita Daily Journal*, *The Grove Sun Daily*, and the *Grand River Chronicle*. GRDA received no comments on the proposal in response to these local newspaper notices.

On June 28, 2001, the Commission issued a notice of GRDA's application. The Notice of Application, which solicited comments, motions to intervene, and protests, was published in *The Federal Register* and the following local newspapers: *The Vinita Daily Journal* (Craig County), *The Daily Times* (Mayes County); *The Miami News Record* (Ottawa County); and *The Delaware County Journal* (Delaware County). The deadline for filing responses to the notice was August 10, 2001.

The U.S. Department of the Interior, Office of Environmental Policy and Compliance (DOI) was the only entity to file a timely response to the Commission's June 28 notice. By letter filed August 9, 2001, DOI expresses its general concern about the cumulative impacts of project shoreline development on fish and wildlife, wetlands, and threatened and endangered species. However, DOI does not provide any site-specific comments regarding the proposed improvements to Arrowhead Marina.

The Commission received the following additional filings related to Arrowhead's proposal after the deadline for responding to its application notice. Although the filings marked with an asterisk do not reference the project number assigned to this application (P-1494-232), they include comments and information associated with this case.

| Entity | Filing Date | Type of Filing |
|---|---|---|
| Jack R. Lenhart | August 31, 2001 | Comments* |
| Jack R. Lenhart | September 5, 2001 | Comments* |
| Mike Brady | September 7, 2001 | Intervention/Protest |
| Boone, Smith, Davis, Husrt & Dickman (BSDHD)[6] | September 17, 2001 | Comments* |
| Cheryl B. Creekmore | September 17, 2001 | Comments* |

[6] BSDHD is a law firm representing homeowners on Duck Creek cove.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



| Entity | Filing Date | Type of Filing |
|---|---|---|
| Duck Creek Homeowners Association (DCHA) | October 12, 2001 | Comments |
| DCHA | November 6, 2001 | Comments* |
| James P. Freeman | November 28, 2001 | Intervention/Protest |
| Cheryl Lenhart | January 8, 2002 | Comments* |
| Mike Brady | February 12, 2002 | Comments |
| Mike Brady | February 12, 2002 | Comments |
| DCHA | April 6, 2002 | Comments* |
| DCHA | April 19, 2002 | Comments |
| Stephen S. Adams | April 29, 2002 | Comments* |
| Edward B. Leinbach | May 8, 2002 | Comments |
| DCHA | May 14, 2002 | Comments |
| Oklahoma Office of the State Fire Marshall (OSFM) | May 21, 2002 | Comments |
| Shipley, Jennings & Champlin, P.C. (SJC)[7] | May 23, 2002 | Comments |
| Grand River Dam Authority (GRDA) | May 28, 2002 | Comments |
| Jack R. Lenhart | May 30, 2002 | Comments |
| Edward B. Leinbach | June 6, 2002 | Comments |
| DCHA | June 11, 2002 | Comments |
| Edward B. Leinbach | June 12, 2002 | Comments |
| Jack R. Lenhart | June 13, 2002 | Comments |
| DCHA | June 19, 2002 | Comments |
| Jack R. Lenhart | July 1, 2002 | Comments |
| DCHA | July 15, 2002 | Comments |
| Cheryl B. Creekmore | July 16, 2002 | Comments* |
| Mike Brady | July 16, 2002 | Comments |

As noted above, only one other agency has provided comments on the application. By letter filed May 21, 2001, OSMF states that all plans for the proposed marina expansion must be approved by that office.

GRDA's May 28, 2002 filing forwards copies of 389 letters in support of Arrowhead's marina-improvement program. Five of these letters are from business and civic organizations, eight are from adjoining property owners, 66 are from Duck Creek homeowners, 33 are from Arrowhead Marina employees, 202 are from Grand Lake

[7] SJC is a law firm representing Mr. Joe Harwood, the owner/operator of Arrowhead Marina.

homeowners, 69 are from other interested parties, and 6 are from elected government officials.

The above filings raise a number of environmental issues that are relevant to the proposed action. The "Environmental Analysis" section of this EA considers the information and comments contained in these filings that pertain to the following resource-related concerns.

- Effects on shoreline stability and soil erosion
- Effects on wildlife and riparian habitat
- Effects on water quality and lake-bed sedimentation
- Effects on fisheries and littoral habitat
- Effects on wetlands
- Effects on threatened and endangered species
- Effects on boating use and navigational safety
- Effects on shoreline access
- Effects on reservoir flowage
- Effects on archeological and historic properties
- Effects on the visual character and scenic quality of the landscape
- Effects on ambient noise levels
- Effects on the equitable distribution of commercial docks
- Effects on business employment, tax revenues, and tourism
- Effects on property values
- Effects on residential dockage

Other issues raised in the above filings that are outside the scope of this EA are: (1) the licensee's policies and procedures for processing permit applications; (2) requirements for the placement of docks in GRDA's Lake Rules and Regulations; (3) COE and Commission review proceedings for the partially-completed shoreline wall at Arrowhead Marina; and (4) the membership and agenda of DCHA.

Issues related to the licensee's permitting process will be discussed, as appropriate, in the Commission's order on this case. The Commission will consider the need to examine the standards and guidelines GRDA uses to implement its permit program on the basis of the project record. COE and Commission reviews related to the marina's shoreline wall system have been handled as separate but related proceedings (see footnote 3). Relevant information resulting from these proceedings has been considered in our review and processing of this case. Organizational matters internal to DCHA are not relevant to this case and are not addressed in this EA.

By letter dated October 12, 2001, the Commission requested the licensee to provide additional information on Arrowhead's proposal. By letter filed April 8, 2002,

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



GRDA submitted the requested information, including its response to each of the issues raised in Brady's motion-to-intervene and protest.[8] By letter filed July 16, 2002, Brady replied to GRDA's additional-information submittal. The supplemental information provided in GRDA's April 8 filing and the supporting information contained in Brady's July 16 reply filing are considered in the following "Environmental Analysis" section. By notice issued April 14, 2003, late intervention was granted to Brady and Freeman in this case.[9]

By letter dated April 17, 2002, the Commission provided notice to interested parties that Commission staff would be visiting the project on May 1, 2002. Also, on April 23, 2002, the Commission issued a notice of the project visit. The notice was published in *The Federal Register* and in *The Vinita Daily Journal* and *The Tulsa World* newspapers. The letter and notice stated that the purpose of the visit was to observe existing land and water uses and environmental resource conditions at Arrowhead Marina and other shoreline developments on Duck Creek cove. The letter and notice also stated that those individuals who were interested could accompany staff during a scheduled tour of the cove.

On May 1, 2002, Commission staff visited the project. Staff began the visit by conducting two information sessions at Arrowhead Marina. Approximately 110 individuals participated in the two sessions, including: (1) officials from GRDA and the the GRDA Lakes Advisory Commission; (2) staff from the offices of U.S. Senators Don Nickles and Jim Inhofe and Congressman Brad Carson; (3) federal, state, and local resource agency representatives; (4) local marina owners and operators and yacht club members; (5) Duck Creek homeowners; and (6) other interested persons who have made

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[8] The Commission did not request the licensee to respond to Freeman's motion-to-intervene and protest because the two issues he raises are essentially the same as two of the issues contained in Brady's filing.

[9] Rule 214 of the Commission's Rules of Practice and Procedure (18 CFR § 385.214) lists the factors that may be considered in acting on a late intervention motion. These considerations include whether: (1) the movant had good cause for failing to file a timely motion; (2) any disruption of the proceeding might result from granting the intervention; (3) the movant's interest is not adequately represented by other parties in the proceeding; (4) any prejudice to, or additional burdens upon, the existing parties might result from granting the intervention; and (5) the motion conforms to the required contents of an intervention motion. Our Notice Granting Late Interventions found that Brady's and Freeman's late motions to intervene will not unduly delay or disrupt the proceeding, or prejudice other parties to it.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



case-related filings with the Commission. Reporters from three area newspapers were also in attendance.

During the information sessions, staff presented the status of the Commission's review of Arrowhead's marina-improvement proposal and answered general and procedural questions concerning this case. After these sessions, staff conducted a site/facility survey of Arrowhead Marina and toured the shorelines of Duck Creek cove. The land-based phase of the tour consisted of stops at Thunder Bay and Harbors View Marinas and the project's public boat-launch area. The tour also included a visual examination of the entire cove by boat. About 25 individuals participated in both phases of the shoreline tour.

A series of color photographs were taken during the staff's survey/tour of Arrowhead Marina and Duck Creek cove. These photographs, and other staff observations made during the visit, have been considered in our environmental analysis of Arrowhead's proposal.

On September 19, 2002, the Commission issued a Notice of Availability of Draft Environmental Assessment for the subject application. Also, by letter dated September 19, 2002, the Commission provided notice of the DEA's availability to each of the individuals who had attended the public information sessions held during the Commission staff's May 1, 2002 project visit. The following entities filed comments on the DEA in response to the notice and letter. We respond to the comments contained in these filings in Appendix A.

| Entity | Date Filed |
|---|---|
| FWS | October 22, 2002 |
| Donald Read | November 1, 2002 |
| ODWC | November 4, 2002 |
| Cheryl Lenhart | November 4, 2002 |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



| Entity | Date Filed |
|---|---|
| Cheryl B. Creekmore [10] | November 6, 2002 |
| Annette O. Willis | November 7, 2002 |
| Janette O. Layne | November 7, 2002 |
| Judith A. Read | November 7, 2002 |
| Sierra Club | November 7, 2002 |
| DCHA | November 8, 2002 |
| Janie Brady | November 12, 2002 |
| Rudy Herrmann | November 12, 2002 |
| Lisa Luce | November 12, 2002 |
| DCHA | November 15, 2002 |
| DCHA | November 18, 2002 |
| Oklahoma State B.A.S.S. Federation | December 12, 2002 |

## 5.0 ENVIRONMENTAL ANALYSIS

### 5.1 General Setting

The Pensacola Project is located about 78 miles northeast of Tulsa on the Grand (Neosho) River in Craig, Delaware, Mayes, and Ottawa Counties, Oklahoma. In addition to hydropower generation, project lands and waters are used for flood control, water supply, recreation, and environmental resource protection (FERC, 1992).

The project dam impounds Grand Lake 'O The Cherokees (Grand Lake). The lake extends approximately 66 miles upstream from the dam and has about 1,300 miles of shoreline. Grand Lake has a surface area of 46,500 acres and a storage capacity of 1,680,000 acre-feet at a normal maximum water surface elevation of 745 feet Pensacola Datum (PD).[11]

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[10] Cheryl Creekmore's filing includes a late motion to intervene. This motion was granted, along with the other two late intervention motions previously discussed in this section of the EA (see footnote 9).

[11] PD (Pensacola Datum) is 1.07 feet higher than NGVD (National Geodetic Vertical Datum), which is a national standard for measuring elevations above sea level.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



Most land surrounding Grand Lake is privately owned and many areas along its shorelines have become highly developed with commercial resorts, private homes and condominiums, municipal and state parks, marinas, and private docks. The licensee manages the lake's shorelines via a permitting system and operates a lake patrol to monitor and inspect permitted shoreline uses and to enforce its boating regulations (FERC, 1992).

Reservoir water levels fluctuate according to a rule curve established by article 401 of the project's license. License article 401, as amended, requires water levels to be maintained between elevations 741 and 744 feet PD, in accordance with seasonal target levels (FERC, 1996).

Duck Creek cove is located about three miles east of the Town of Ketchum (figure 5). This three-mile-long arm of Grand Lake runs approximately north-south and enters the main body of the reservoir about five miles north of the project dam. The cove varies in width from about 2,600 feet at its mouth to about 700 feet in its upper reaches. State Highway 85 runs parallel to and one mile west of the cove, providing easy access to the residential and recreation-based developments in the Duck Creek area. The topography of the area is characteristic of the rolling terrain of the Ozark Plateau.

Arrowhead Marina is located in the mid-section of Duck Creek cove on its western shore. As shown on figure 5, the marina is situated in an area of the cove with numerous points and inlets and extensive commercial and residential development. Arrowhead's existing docks are positioned around one of these points and along the shoreline of an adjacent inlet. The width of the cove narrows considerably at the marina site. As measured from shoreline to shoreline at elevation 750 feet msl, the cove ranges from about 1,015 to 1,315 feet wide at this location. This includes an approximate 35-foot horizontal change in the location of the 750-foot contour elevation as a result of the construction of the first tier of Arrowhead's shoreline wall (see discussion of Arrowhead's wall on page 5 and in footnote 3).

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



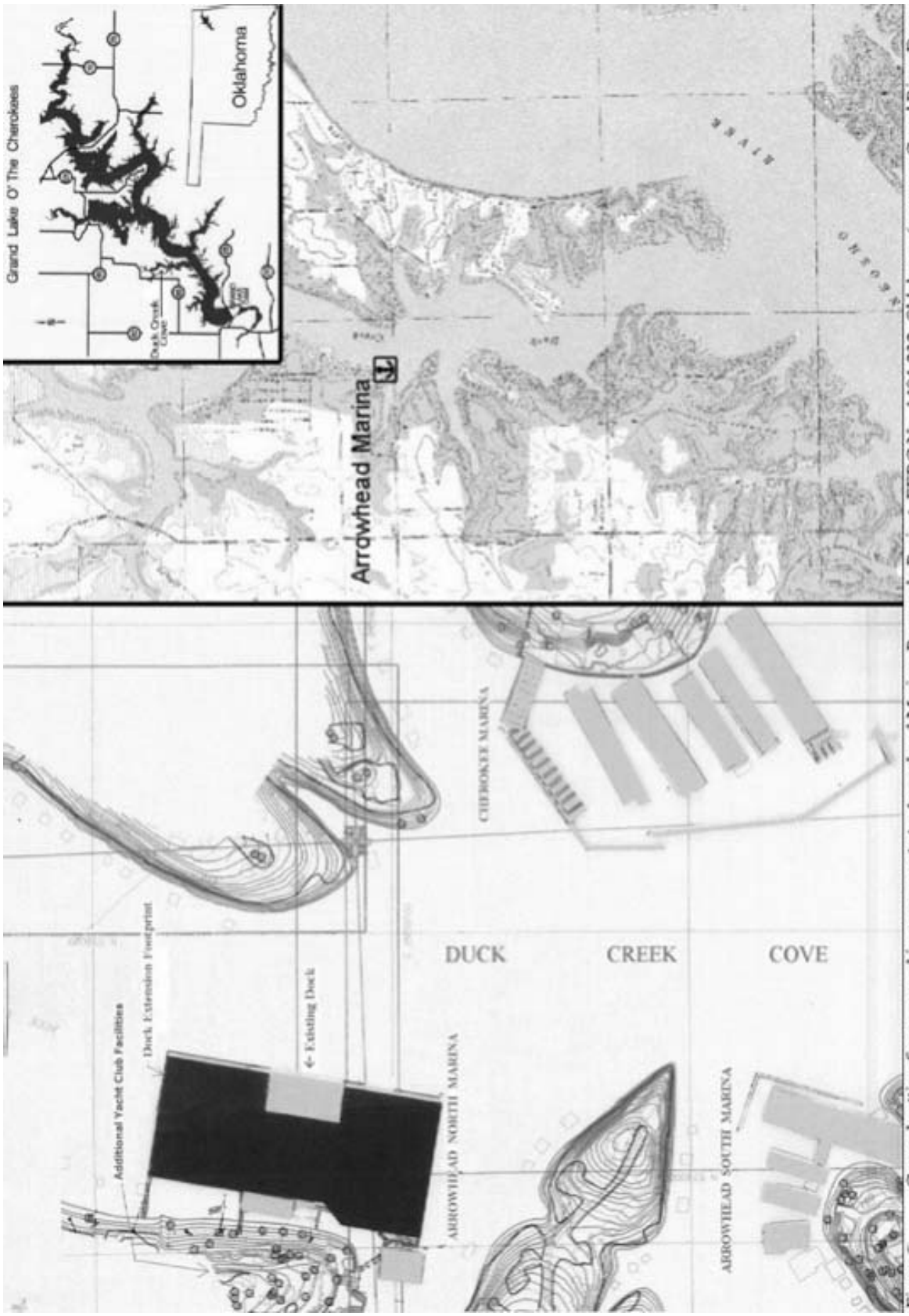


Figure 5. General setting for proposed improvements to Arrowhead Marina. Pensacola Project, FERC No. 1494-232, Oklahoma (sources: Grand River Dam Authority, Application for Non-Project Use of Project Lands and Waters, filed June 19, 2001; Mike Brady, Response to GRDA's April 8, 2002 Additional Information Filing, filed July 6, 2002, as modified by staff).

## 5.2 Marina-Improvement Proposal

This section of the EA analyzes the impacts of the proposed marina improvements on the project's environmental resources. Although GRDA's permit would include only those improvements that would occupy project lands and waters, our environmental analyses also cover those elements of Arrowhead's expansion and modernization program not covered by the permit (see section 3.1).

The direct and indirect effects of the proposed boat-dock and service-dock improvements (covered by the permit) are analyzed first under each of the following resource sections. These effects are then analyzed within each section, from a cumulative impact standpoint, along with the effects of replacing the marina's fuel-storage tanks and developing the additional yacht-club facilities (not covered by the permit).[12] Also, the waste-treatment improvements recently completed at the marina and the marina's partially-constructed shoreline wall system are considered in the context of our cumulative impact analyses. The geographic and temporal scope of these analyses vary with each resource and issue under consideration.

### 5.2.1 Terrestrial Resources

Affected Environment

*Shoreline Stability and Soil Erosion* - The shorelines of Grand Lake are primarily composed of stony-silt-loam soils on 5- to 20-percent slopes. This soil composition also occupies timbered upland ridges in cherty limestone areas. The soil surface layer is dark grayish brown in the upper two inches and pale brown in the lower horizon. The subsoil, which is a brown, stony-silty-clay loam, is about 60 percent chert by volume (GRDA, 2002a).

The licensee says that significant shoreline erosion has occurred in certain areas of Duck Creek cove, including the Arrowhead Marina site. The licensee also says this erosion appears to be the result of natural lake and weather conditions and natural channel flow. Creekmore, a 15-year resident of Duck Creek cove, contends that the high volume of large and powerful boats and personal watercraft operating in this arm of the

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[12] The Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act define "cumulative impact" as the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions over time.

lake have eroded the shorelines as well. The licensee states that in only a very few isolated incidents could this erosion be attributed to boat traffic (GRDA, 2002).

*Wildlife and Riparian Habitat* - Low areas and stream corridors in the project area are typically dominated by eastern cottonwood (*Populus deltoides*), willow (*Salix* spp.), greenash (*Fraxinus pennsylvanica*), elm (*Ulmus* spp.), and maple (*Acer* spp.). Generally, all woody vegetation at or below about 746 feet PD elevation has developed since 1940 because prior to the construction of the reservoir, all woody vegetation around Grand Lake's perimeter and below that elevation was removed.

The additional yacht club facilities planned for Arrowhead Marina will be developed in an area of the marina site that is currently occupied by two rental cabins. This site area's vegetative cover consists of several large trees and a grass lawn. Approximately one third of this area is currently disturbed ground and is devoid of vegetation. Also, the shoreline wall that fronts this area has displaced any natural riparian vegetation that may have previously existed at the site.

Wildlife in upland deciduous forests around Grand Lake include white-tailed deer, striped skunk, raccoon, fox squirrel, opossum, eastern cottontail, and red fox. Raptors such as bald eagle, barred owl, red-tailed hawk, and red-shouldered hawk may also use the area.

Migrating and wintering waterfowl frequent Grand Lake and its adjacent wetlands. From September through January, gadwell, green-winged teal, and snow geese are frequent winter residents. During spring migration, blue -winged teal, northern shoveler, lesser scaup, and ruddy duck are common on Grand Lake. Canada geese, wood ducks, and mallards are year-round residents, while pelicans frequent the lake from February to November.

In a study included in the 1989 Proceedings of the Oklahoma Academy of Science, Stancill et al. found that the mallard duck (*Anas platyrhynchos*) was the only upland nesting waterfowl species that appeared to reproduce on Grand Lake and associated wetlands (OAS, 1989). Mallard broods were observed exclusively in developed areas of the lake. The study estimated that the overall mallard production on the reservoir was about 491. It was suggested that fluctuating water levels probably would destroy nests and limit nesting waterfowl success on adjacent upland sites.

Wood duck (*Aix sponsa*) was the only cavity-nesting waterfowl species observed and most of the wood duck production occurred on associated wetlands, especially along tributary creeks, and rivers. The study suggested that brooding cover is the limiting factor for wood duck production on Grand Lake and that enhancement of brooding cover would be more beneficial to wood duck production than installation of artificial nesting structures. Other waterfowl species observed included northern shovelers (*Spatula*

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



*clypeata*)and blue-winged teal (*A. discors*) from March to April, but no nest or broods were noted.

DOI states that wildlife habitat quality in portions of the project area has clearly declined during the life of the project. To support this observation, DOI says that aerial photographs of Grand Lake's shorelines show substantially increased development and the loss of riparian habitat over time.

Environmental Effects

*Shoreline Stability and Soil Erosion* - Several of the comment letters filed in support of Arrowhead's proposal state that the marina's shoreline wall would provide erosion and sedimentation benefits. Although the lower two tiers of this wall system are now in place, we will first discuss these wall-related issues from a pre-construction standpoint.

There is no documented evidence in the Commission record indicating that prior to construction of the wall, erosion and sedimentation was a problem at this location. We understand that GRDA did permit a considerable amount of dredging to be performed along the shoreline in preparation for its construction.[13] However, we have no information on the actual amount of dredged material removed from this shoreline littoral zone or where this removed material was placed. We also have no information on the amount of sedimentation that may have occurred during the wall-construction period.

The existing wall at the marina has stabilized any erosion that was previously occurring along the shoreline. However, this stabilization could have been provided by a much smaller wall or by other methods that may have created additional habitat for riparian species and allowed wildlife better access to the water. The currently unfilled depression behind the second tier of the existing wall would provide good protection against sedimentation during construction of the additional yacht club facilities. However, once this construction is complete, there will be substantially more impervious surfaces above the wall. If surface drainage on the site is not captured and appropriately directed to an off-site retention pond, significantly more sediment-laden runoff could reach Duck Creek as a result of this development. The licensee indicates that Arrowhead has prepared a stormwater management plan for the development to address this site drainage problem (GRDA, 2002a).

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[13] DCHA's filings indicate that the permit GRDA issued to Arrowhead on July 26, 2000 for construction of the marina's shoreline wall system provided for the removal of approximately 650 cubic yards of dredged material from an area approximately 540 feet long by 12 feet wide.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



*Wildlife and Riparian Habitat* - Wildlife and waterfowl are not likely to extensively use the marina area because of the area's developed condition and its ongoing use by marina patrons. Nevertheless, the proposed construction of additional docks and the resultant increases in boat traffic and human disturbance would further discourage wildlife use along this section of shoreline. Because no new ground-disturbing activities are required to upgrade the docks, as proposed, affects on existing wildlife communities are expected to be minimal and temporary.

Although the proposed dock improvements would not result in any loss of available wildlife habitat, the marina's additional yacht-club facilities will result in wildlife habitat losses. Specifically, several large trees will be removed in the construction of these facilities. In an area where there is a lot of development pressure, such as Duck Creek cove, species that are displaced by further development may find it more difficult to relocate. Neither Arrowhead nor GRDA propose any measures to compensate for this adverse ecological effect.

DOI comments that habitat for migratory birds and other wildlife has been reduced by shoreline vegetation clearing, dredging, the construction of docks and other waterfront facilities, increased boat traffic, and other disturbances related to shoreline development permits. DOI also comments that this reduction in habitat has occurred one permit at a time, without mitigation, and with less and less undisturbed habitat for displaced wildlife to move to. As observed during the Commission staff's recent visit to the project, there is a lack of contiguous shoreline lands with good-quality habitat for riparian wildlife species in Duck Creek cove. The proposed improvements to Arrowhead Marina would contribute to this cumulative adverse effect on the terrestrial components of the cove's ecosystem.

### 5.2.2 Aquatic Resources

Affected Environment

*Water Quality and Lake-Bed Sedimentation* - The Oklahoma Water Resources Board (OWRB) monitors numerous water quality parameters on Grand Lake under the state's Beneficial Use Monitoring Program. OWRB's monitoring program samples 12 sites to represent the riverine, transitional, and lacustrine zones of the lake, as well as the major embayment arms of the water body. The trophic status of the lake is assessed using Carlson's Trophic State Index (TSI) and chlorophyll-a as the indicator parameter of primary interest. Calculated TSI values indicate that the lake is eutrophic (FERC, 2002a).

The high nitrogen levels in the lake are primarily attributable to the migration of chicken litter by-products from neighboring states through subterranean aquifers and the lake's tributaries. The State of Oklahoma has been involved in several recent law suits and is currently contemplating additional legal action to address this problem (GRDA, 2002). Other sources of the lake's high-nutrient and seasonally-low-dissolved-oxygen levels are surface runoff and leachate from residential lawns and septic systems along the shorelines. Water quality in the immediate vicinity of Arrowhead Marina has improved as a result of Arrowhead's recent removal of 16 septic tanks and laterals lines from the marina site and its off-site installation of a new waste treatment system.

Shoreline soil erosion has resulted in accelerated lake-bed sedimentation rates in Duck Creek cove and in other areas of the lake. The wall recently constructed at Arrowhead Marina has halted any erosion that may have been occurring along that section of shoreline; however, ground-disturbing activities during its construction may have contributed to sediment deposition in the adjacent littoral zone (see section 5.2.1).

Elevated water-turbidity levels occur in the lake's littoral zone during, and for several days after, moderate to large storm events (FERC, 2002a). Turbidity levels are also exacerbated during peak boating periods, due to the resuspension of accumulated sediment deposits by wake-generated waves. The boat traffic controls GRDA has recently implemented on Duck Creek cove (see section 5.2.5) have alleviated this problem.

Boating-related activities are also having other degrading effects on the lake's water quality. Petroleum products are released into the water from boat engines and from accidental drips and spills during boat-fueling operations. As Creekmore and others report to have witnessed, overboard discharges of marine-toilet effluent and other pollutants are also occurring in violation of GRDA's Lake Rules and Regulations.

The licensee conducts regular water-quality monitoring on Grand Lake to determine if boating or other activities are impairing the lake's beneficial uses and values (FERC, 2002a). Also, GRDA has prescribed lake-wide sanitation rules to protect public health and water quality. Among other requirements, these rules prohibit: (1) the discharge, deposit, or dumping of bottles, cans, garbage, rubbish, refuse, debris, wreckage, bilge water containing oil and grease, and any other materials of any kind into the lake and upon the lake's adjacent shorelands; (2) the disposal of sewage in the waters and on the shorelands of the lake; and (3) the operation of a vessel equipped with a marine toilet which is not a total retention system in accordance with federal regulations regarding marine toilets. The licensee's lake patrol is responsible for monitoring user compliance with these requirements; any violations are subject to GRDA enforcement (GRDA, 2001a).

*Fisheries and Littoral Habitat* - Grand Lake's important game fish species include largemouth bass, spotted bass, crappie, white bass, channel and blue catfish, and paddlefish. In 1999, Grand Lake was ranked number 4 of 21 lakes in Oklahoma for its quality bass fishing (FERC, 2002a). The lake and the tailwater below the project dam produce consistently good recreational fishing for paddlefish. The downstream tailwater area produced the state record paddlefish in 1992, weighing 112 pounds (ODWC, 2002a). Channel catfish, sampled in 1998, were moderately abundant. Crappie and blue catfish, sampled in 1998 and 1999, had below average numbers. Other species of fish in Grand Lake, determined either from gill netting or seining efforts, include: bluegill, longear sunfish, freshwater drum, smallmouth buffalo, river carpsucker, golden redhorse, flathead catfish, gizzard shad, brook silverside, and logperch (FERC, 2002a).

Annual largemouth and spotted bass sampling data collected by ODWC have been examined by the Commission's staff for trends over the past decade. Data were available for 1990, 1994, 1996, 1998, 2000, 2001. Calculations included in the reviewed data include catch per unit effort, size distribution, number of "quality"-size fish, number of "preferred"-size fish,[14] and mean relative weight (a condition calculation derived from several elements). Annual changes in the reviewed data are not of a magnitude we consider significant. The data indicate a healthy bass fishery and do not show any strong patterns regarding bass population sizes, individual fish size, or fish condition for the period examined.

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[14] Quality-size fish are indicated in ODWC's report to be largemouth bass 300 to 380 mm total length (TL), and spotted bass 280 to 350 mm TL. Preferred-size largemouths are 380 mm TL and larger, and preferred-size spotted bass are 350 mm TL and larger.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



In discussing data interpretation with ODWC staff, it was noted that there are no immediate concerns for largemouth or spotted bass populations.[15] There are also no problems in the recruitment of young fish, indicating that successful reproduction and survival occurred in Grand Lake through the period examined. However, FWS says ODWC is finding it increasingly difficult to find shorelines in coves that are suitable for electro-fishing surveys due to extensive development in these areas (FWS, 2001b).

The existing boat docks and breakwaters at Arrowhead provide some cover and forage opportunities for fish in the area. The dredging that was recently completed during construction of the shoreline wall at the marina has increased water depths and altered substrate conditions in the adjacent littoral zone (see section 5.2.1). This may have substantially diminished the spawning and nursery habitat characteristics of this shallow-water area for adult and juvenile fish. During the Commission staff's recent survey of the marina site, it was observed that this area was entirely devoid of any rocks, boulders, or other natural substrate materials that would provide structural cover for aquatic species.

Environmental Effects

*Water Quality and Lake-Bed Sedimentation* - The construction of the new docks and boat slips would have localized short-term impacts on water quality in Duck Creek cove. Installation of the docks and associated anchoring points on the lake bottom, as well as removal of the tire breakwaters on each side of the marina, would cause sediment disturbance and a short-term increase in turbidity and suspended solids in the immediate area.

Once construction of the additional yacht-club facilities is complete, there is the potential for surface-water drainage and sediment-laden runoff after rainfall events to impact water quality. Nutrients attached to these sediments could be carried into the reservoir and affect dissolved oxygen levels and water clarity. As stated previously under section 5.2.1, the licensee indicates that Arrowhead has prepared a stormwater management plan for the development to address drainage issues (GRDA, 2002).

Potential long-term impacts on the reservoir's water quality could arise from increased boating-related point sources attributable to the marina's expansion, including petroleum products from refueling and overboard discharges of wastes. Given, the increase in the number of boats likely to use Arrowhead's fueling stations, there is greater

[15] June 26, 2002 telephone conversation between Jim Burroughs, ODWC staff, and B. Peter Yarrington, Commission staff, regarding ODWC fish sampling and data handling methods.

potential for accidental fuel spills and oil discharges from boat-fueling operations. Although Arrowhead will continue to have an out-pumping station and will continue to require all boats using the marina's facilities to have a total-retention system, some of the additional boaters resulting from the marina's expansion would likely violate GRDA's sanitation rules, especially the overboard discharging of bilge water and the dumping of waste materials from boat-cleaning activities. Replacing the marina's fuel-storage tanks and fuel pumps, as proposed, would reduce the risk of spillage and leakage from these point-source facilities due to potential structural or equipment failure.

*Fisheries and Littoral Habitat* - During construction of the additional docks and boat slips, fish would likely be temporarily displaced from the area. This would result in a short-term impact on the area's fish populations. Following construction of these facilities, the new floating structures would provide additional overhead cover for fish. However, the anchoring system proposed for these docks would not provide as much deep-water structure as docks anchored with pilings.

Arrowhead indicates it will be removing the tire breakwalls that are part of the existing dock facilities. This would also displace fish and remove prime habitat structure being used by fish in the cove. This breakwall removal, combined with the dredging that took place for construction of the marina's shoreline wall, is an adverse impact as it eliminates shallow water habitat structure that is used by fish. This could have an adverse impact on the fish populations of the cove, given how little structure currently exists in Duck Creek Cove other than boat docks.

### 5.2.3 Wetlands

According to National Wetland Inventory maps, no wetlands occur in the immediate vicinity of Arrowhead Marina. Also, no wetlands were observed at the marina site during the Commission staff's May 1, 2002 project visit. On this basis we conclude that the proposed marina improvements would have no effect on beneficial wetland functions and values.

### 5.2.4 Threatened and Endangered Species

No threatened and endangered species are known to exist in the vicinity of Arrowhead Marina. However, according to FWS, a number of federally-listed bald eagles (*Haliaeetus leucocephalus*) winter at Grand Lake and some nest in the area. FWS states that nesting bald eagles usually require about 1/4 mile of buffer from human disturbance and there are very few remaining shoreline areas at the project that would provide suitable nesting habitat (FWS, 2000). The licensee says that eagle nesting occurs, with few exceptions, at the northern end of Grand Lake, which has been set aside as a non-development area (GRDA, 2001b). No bald eagle nesting is known to occur within 1/4 mile of the marina site.

### 5.2.5 Recreation and Other Land and Water Uses

Affected Environment

*Boating Use and Navigational Safety* - The licensee states that Grand Lake is the most popular boating destination in Oklahoma. A survey conducted in conjunction with the preparation of project's recreation plan identified boating as the primary recreational activity on Grand Lake. This survey also identified Duck Creek cove as one of the lake's most frequently used boating areas. The lake and cove are used by fishing and touring boats, keeled sailboats, and many large yachts. Boating traffic increases dramatically during the summer recreation season, particularly on weekends and holidays (FERC, 2002a).

In 1992, 120 commercial boat docks and over 2,600 private boat docks were permitted on Grand Lake (FERC, 1992). By 1997, the number of private docks had risen to 3,500, but the number of permitted commercial docks remained the same (FERC, 1997). Currently there are 151 permitted commercial docks and more that 4,500 permitted private docks on the lake. The Duck Creek arm of the lake is one of the most intensively developed areas of the project and has the highest density of commercial and private docks (GRDA, 2002a).

Seven marinas are located on Duck Creek cove, along with numerous residential boat dock facilities. Jack Lenhart and Creekmore say the cove had approximately 750 commercial boat slips in 1997 and the number of commercial slips has now grown to about 900. Brady says that within a two-mile stretch of the cove, over 1,000 slips are available at commercial docks, the majority of which are designed for boats 35 feet in length or greater. Creekmore also says there are nearly 700 private boat slips in the cove that are owned by adjacent lakefront residents, many of which have been added in the last five years.

Due to the growing popularity of Grand Lake for recreational boating, boat-traffic congestion and navigational safety have become increasingly important issues. Traffic and safety concerns have arisen on the lake primarily as a result of a greater number of larger boats as opposed to the 18- to 30-foot boats that historically populated the lake (GRDA, 2002a). GRDA's Lake Rules and Regulations include a number of boating-related requirements to address these concerns. These boating provisions include speed, buffer-zone, time-of-day, and activity restrictions and prohibitions (GRDA, 2001a).

The licensee says that most of Grand Lake's large-boat traffic occurs on the Duck Creek arm of the lake (GRDA, 2002a). Creekmore says that with the approximately 1,500 boats docked in Duck Creek cove and with the large number of boaters who use the cove for recreation, this arm of the lake is an extremely congested area. According to

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



Creekmore, the above boat-number figure does not include approximately 700 personal watercraft that are docked and operated in the area.

In order to adequately and safely accommodate the increasing number of large boats docked and operated in Duck Creek cove, GRDA has progressively implemented more stringent control measures for the cove. These measures include: (1) establishing no-wake zones and traffic lanes to lessen conflicts between smaller and larger boats; (2) prohibiting skiing above Harbors View Marina and in the cove's boat traffic lanes, and prohibiting wake jumping anywhere in the cove;[16] (3) limiting boating speeds in the cove's traffic lanes to a maximum of 25 mph; and (4) increasing enforcement action and lake-patrol presence relative to GRDA's boating-safety rules (GRDA, 2002a).

GRDA states that the above boating control measures have been effective in addressing safety and congestion concerns in Duck Creek cove. In support of this claim, the licensee says that no serious boating accidents have occurred in the cove in more than five years and no multi-boat accidents have occurred since GRDA's implementation of the cove's ingress/egress lanes several years ago. Brady refutes this claim, citing letters from GRDA's files describing three serious boating accidents in the cove since 1998.

FWS states that public boating and fishing have been limited or eliminated in large areas of the lake's developed coves (FWS, 2001b). Brady states that "as a hunter and fisherman with 18 years experience as a resident on Duck Creek cove, conditions are dismal for both activities." Also, Brady notes that water-based recreational uses of the cove have been lost as a result of the imposed boating controls.

Cheryl Lenhart says that due to GRDA's boating controls, "we could actually sit out on our dock again and people could stop their boats and swim out in the cove." As a resident of Duck Creek cove since 1982, Lenhart notes that these activities had not been possible since 1990. She also notes that small rowboats and families having fun could again be seen in the cove as a result of GRDA's controls. However, Jack Lenhart states that due to large boat wakes and increased numbers of larger and faster boats, it is unsafe to ski or boat in smaller watercraft on much of the lake.

Jack Lenhart says that the commercial docks and slips that have been added in Duck Creek cove since 1997 have narrowed the waterway for boats, increased the density of boats in the cove, and put increased pressure on the cove's carrying capacity. BSDHD says that at certain points in the cove, navigational water has been reduced by more than

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[16] Wake jumping is defined in GRDA's Lake Rules and Regulations as the act of repetitively crossing another vessel's wake in such a manner that the crossing vessel's hull leaves the water.

one-third by permitted commercial docks. Brady says these commercial dock protrusions have resulted in the loss of thousands of square feet of navigable water. Staff observations during a recent boat tour of the cove confirm these comments.

The existing dock at Arrowhead Marina that protrudes the most extends about 475 feet into the waterway, as measured from the adjacent shoreline at elevation 750 feet msl. This leaves about 560 feet to the nearest opposite shoreline, as measured from the 750-foot-msl contour elevation. At the highest lake-level target elevation for the summer recreation season (elevation 744 feet PD), the remaining open water between this dock and the opposite shore is about 525 feet wide. After subtracting GRDA's 150-foot, idle-power-zone requirement adjacent to the dock and a similar allowance for near-shore water, approximately 225 feet of navigable water remains. The cove's boat-traffic-control lanes (two 100-foot-wide lanes) are located in this navigation channel.

*Shoreline Access* - Brady says that most fishermen and virtually all landowners on Grand Lake know that GRDA owns the land along the lake's shorelines up to the 750 foot elevation. Brady also says it is commonly understood that the public has the right to "park a boat, fish from, or even picnic along the water's edge when the lake level is below elevation 750."

FWS says that although most of the shoreline is open to public use, the public does not always know this and are less inclined to use shorelines that look like private property (e.g., docks, mowed lawns, and cleared vegetation) (FWS, 2001a). FWS also says that due the density and design of docks (cables anchored to the shoreline at an angle), the public has little or no access to the shoreline in many of the lake's bays and coves (FWS, 2001b). Brady contends that the shoreline wall that has been constructed at Arrowhead Marina has caused a loss of public access to project shorelands.

The project license is subject to the articles in the Commission's Form L-3 entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States" (FERC, 1992). Article 18 of Form L-3 provides that the licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the licensee for navigation and for outdoor recreational purposes. This article also provides that the licensee may reserve from public access such portions of the project's waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Given that the cove's marina developments have been permitted to occupy and use the licensee's shoreline lands for commercial facilities and operations, these lands are generally considered unsuitable and undesirable for public recreation due to safety and security concerns. Therefore, we find it reasonable to conclude that the shoreline wall constructed at Arrowhead Marina has not appreciably affected public access to project shorelands. However, staff observations during a recent tour of Duck Creek cove

confirm that public access to the cove's shorelines has been limited and constrained in many areas by commercial and residential docks and other waterfront facilities.

*Reservoir Flowage* - In operating the project reservoir for hydropower generation, GRDA controls water levels up to elevation 745 feet PD. Between reservoir elevations 745 feet PD and 755 feet PD, COE dictates flow releases from the project dam, managing for flood control (FERC, 1992). COE also manages flowage-easement lands around Grand Lake for flood control (COE, 2002). Consequently, the shoreline lands around Grand Lake are used for power-pool flowage below the 745-foot contour elevation and for flood-pool flowage over the next ten vertical feet. Since the lake's shorelands vary in slope, the horizontal extent of these flowage areas (and consequently, the water-storage capacities of the areas) also vary.

As documented in Brady's filings, the combined vertical height of the two-tiered wall at Arrowhead Marina is 14 feet (elevation 741 to elevation 755 feet PD). Brady's filings also indicate that the overall length of this shoreline wall system, including the segments located north and south of the marina's existing clubhouse, is approximately 780 feet.

In comparing photographs of the marina site to a detailed contour map of the area, we find that the shoreline wall is located approximately where contour elevation 744 feet PD previously existed before the wall was constructed. Also, this area contour map indicates that the adjacent shoreland had an approximately 6:1 (about 16 percent) slope prior to the wall's construction.

Based on the above information, we calculate that the marina's existing retaining wall and associated backfill have displaced: (1) approximately 85 cubic yards (about 0.05 acre-foot) of power-pool storage capacity; and (2) approximately 9,700 cubic yards (about 6 acre-feet) of flood-pool storage capacity.

Environmental Effects

*Boating Use and Navigational Safety* - The licensee notes that a portion of the proposed dock expansion involves the replacement of existing docks with new docks of similar size that would contain fewer slips to house larger boats. GRDA asserts that the proposed expansion would not conflict with normal boat-traffic flow because the marina's existing docks protrude into Duck Creek cove the same distance as the proposed docks. GRDA acknowledges that the expanded docking facilities would require a larger area of surface water within the cove, but contends that the impact on navigability would be insignificant in terms of the lake as a whole. In further assessing the proposal's effect on boating recreation, the licensee says the addition of 64 boat slips to an already very commercially and privately developed area would have a minor impact on recreational resources. (GRDA, 2002a).

Commenting on behalf of Arrowhead, SJC says the net increase in boat slips proposed at the marina represents an increase of only slightly more than 5 percent of the total number of existing slips in the cove. SJC also says that since the proposed dock expansion protrudes no further than Arrowhead's existing docks, there would be no increase in traffic constriction through this area. In further support of Arrowhead's proposal, SJC notes that: (1) several hundred feet of waterway would remain available for safe navigation; and (2) GRDA's traffic controls would minimize any potential adverse impact the dock expansion might otherwise have.

Responding to the above comments from GRDA and SJC, Jack Lenhart observes that the current extension of Arrowhead Marina into Duck Creek is much smaller than the proposed expansion. Lenhart contends that with the expansion, navigation would be reduced, public recreation would be eliminated, safety would be impaired, and boat density would increase. Lenhart states that the expansion would reduce the number of slips for small boats and increase the number for larger ones, adding to the cove's congestion and putting additional pressure on the cove's carrying capacity.

Brady, responding to GRDA's comments about the effects of the proposed expansion on navigation, states that navigational impact is not simply a function of dock protrusion. Other contributing factors noted by Brady are visibility and congestion. Brady also notes a number of variables related to these additional factors, including: (1) overall size of the protrusion; (2) average size of boats; (3) covered vs. uncovered slips; and (4) the eve height of roofs.

We compared the above-identified variables to: (1) Arrowhead's existing marina layout (figure 1); and (2) Arrowhead's marina-expansion master plan (figure 2). The following corresponding information provides an indication of the effect of these variables on boater visibility and boating congestion:

(1) The footprint for the portion of the marina's existing docks that protrude into the cove occupies an approximately 200,000-square-foot area; the dimensions of the most-protruding, existing dock is 245 feet long (parallel to the cove's navigation channel) by 88 feet wide (see figure 1). The overall length of the proposed dock-expansion footprint is 898 feet; the width of the expansion footprint is 432 feet on the south end and 375 feet on the north (see figure 2). The water surface area occupied by the dock-expansion footprint is approximately 390,000 square feet, or nearly twice the area occupied by the current docks.

(2) The mean length of the marina's existing boat slips is 37 feet. The mean length of the slips under the proposed dock expansion is 44 feet. The median length of the marina's slips is between 32 and 35 feet (current) and 40 feet (expanded). The following table further shows the incremental effect on recreational boating loads.

| Facility Status | Number of Slips per Slip Length | | | | | | | | | Total Slips |
|---|---|---|---|---|---|---|---|---|---|---|
| | 22ft | 25 ft | 32 ft | 35 ft | 40 ft | 50 ft | 60 ft | 70 ft | 99 ft | |
| Existing Docks | 4 | 19 | 32 | 6 | 14 | 17 | 14 | 5 | 0 | 111 |
| Proposed Docks | 0 | 9 | 48 | 7 | 28 | 33 | 28 | 19 | 3 | 175 |

(3) The number of perimeter-dock boat slips that are currently covered is 10. These 10 slips cover an approximately 20,000-square-foot area. The number of perimeter slips that would be covered under the proposed dock expansion is 73. These 73 slips would cover a total area of about 125,000 square feet. Although a large number of vertical roof-support columns would be required for the additional area covered, the low-profile design of these columns avoids any problems related to boater visibility.

(4) The eves of the roofs covering the existing and proposed perimeter docks range from 24 to 32 feet above the water surface. Therefore, eve height is not a concern in terms of boat-navigation safety. However, as observed during the Commission staff's recent boat tour of Duck Creek cove, visibility through the marina's existing perimeter dock is obstructed when the dock's boat slips are occupied by boats. Given the set-back distance of the marina's existing and proposed perimeter docks from the cove's navigation channel, dock occupancy is also not a navigational safety concern.

The distance between the proposed dock expansion footprint and the opposite shore is 500 feet at the narrowest point (see figure 5). A private boat dock is located on the opposite shore at this point, leaving less open water than needed to accommodate the existing boat-traffic lanes (200 feet) and adjacent idle-power-zone requirements (150 feet on each side of the traffic lanes). Consequently, GRDA would have to impose further boat-traffic restrictions for a short distance through this point. Any additional private docks permitted in this area in the future might require these additional restrictions to be extended further. Also, taking into account that boat-traffic congestion would be higher in this area in the future, navigational-safety considerations might necessitate restricting any further dock additions in this area.

In a July 4, 1997 aerial photographic survey of major boat concentrations on Grand Lake, 159 boats were observed using Duck Creek cove (GRDA, 1997-1998). Approximately 410 acres of the cove are available and usable for boating. Therefore, each of the 159 observed boats had about 2.6 acres of water available for recreational use, or conversely, there were about 0.4 boats using the cove per acre of available water. In comparison, a total of 591 boats were observed in all the major boat concentrations on Grand Lake during this July 4 survey, with an overall average of 11.15 acres of usable water per boat, or about 0.1 boats per available water acre.

The above survey results confirm that a large percentage of the boaters recreating on Grand Lake use Duck Creek cove. These results also confirm that boating densities

are much higher in the cove relative to the lake as a whole. These uses and densities have increased since 1997, resulting in corresponding reductions in the quality of recreational boating experiences and boating safety. The proposed expansion of Arrowhead Marina would contribute further to these effects on boating recreation.

*Shoreline Access* - In the above "Affected Environment" discussion, we conclude that the existing two-tiered wall at Arrowhead Marina has had no appreciable effect on public access to project shorelands. Adding a third tier to this wall system, as proposed, also would have no effect on shoreline access for the same reasons given in the above discussion.

*Reservoir Flowage* - GRDA's construction permit for the shoreline wall at Arrowhead Marina requires the top of the wall to be at elevation 756 feet PD to avoid a safety hazard should the lake level rise to flood stage. According to DCHA, adding the proposed third tier to the marina's existing two-tiered wall would increase the height of this wall system by six feet to elevation 761 feet PD. However, figure 3 shows that this third tier varies in height and would not be constructed around one of the wall's turrets.

Consistent with GRDA's permit, the first foot of backfill behind the wall's third tier would displace approximately 2, 000 cubic yards (about 1.2 acre-feet) of additional flood-pool storage capacity. Each additional foot of backfill behind this third tier of the wall would displace a similar incremental amount of storage capacity, should flood stage rise to that level.

### 5.2.6 Cultural Resources

OAS/SA states that an archaeological field inspection of the area potentially affected by the proposal is considered unnecessary because: (1) no known archeological sites are listed as occurring in this area; and (2) no archaeological materials are likely to be encountered, due to the area's topographic and hydrological setting. Staff observations of the marina site during a May 1, 2002 project visit confirm OHS/SHPO's comment that no historic properties would be affected by the proposed marina improvements. Also, the disturbed site conditions observed during the staff's May 1 survey of the marina confirm OAS/SA's comment that no archaeological materials would likely be encountered during construction of the proposed marina improvements. Neither Arrowhead nor GRDA propose any contingency measures for the potential discovery of archaeological resources during construction.

### 5.2.7 Landscape Aesthetics

Affected Environment

*Visual Character and Scenic Quality* - The Duck Creek arm of Grand Lake is scenic. Moderately steep slopes rise about 100 feet above water level at the mouth of the cove; the topography gradually flattens toward the back of the arm. Secondary embayments along both sides of the cove give the shorelines of the arm an undulating appearance, creating a variety of scenic vistas and viewsheds. The numerous peninsulas along the arm's shorelines are prominent and visible from the main channel of the cove. The cove's shorelands are mostly wooded.

Numerous homes and residential boat docks dot the shorelines of the arm. Protective walls of various designs and dimensions further break the visual continuity of the cove's shorelines. This progression of residential development is punctuated at certain intervals by seven commercial marinas, five of which are situated within an 0.8-mile segment in the middle of the cove. Three of these five marina complexes, including Arrowhead, are concentrated near the center of the arm (see figure 5).

In the immediate vicinity of the cove's marina developments, the shoreline landscape is visually dominated by boat docks and other commercial facilities. The marinas' docks protrude into the cove, obstructing portions of the shoreline from view.

Freeman states that until recently, homes in Play Haven Addition, which lies directly north of Arrowhead Marina, were "gifted with magnificent views of Duck Creek." Freeman also states that until 1997, Arrowhead Marina's commercial slips were primarily located in an adjoining inlet and did not interfere with the views of Play Haven homeowners. Further, Freeman states that Play Haven's loss of natural views corresponds with dramatically increased boat congestion in this section of Duck Creek cove.

Adams notes that the wall recently constructed at Arrowhead Marina "eliminates the aesthetic natural slope of the shoreline and creates a view reminiscent of a fortress." Jack Lenhart, in reference to this wall, comments that "the scenic beauty of the sloping shore is lost to a concrete wall 21 feet high and 600 feet long. Brady characterizes this wall as unsightly. However, several letters in support of Arrowhead's proposal consider the wall to be "aesthetically pleasing" or a "visual improvement." For example, Pack St.Clair, who owns 700 feet of shoreline directly across the cove from Arrowhead Marina, remarks that Arrowhead is "cleaning up the shoreline with a beautiful seawall."

As observed during the Commission staff's recent site/facility survey of Arrowhead Marina, the curvilinear form of the marina's partially-constructed wall follows the natural contour of the shoreline. The neutral color and smooth texture of the

wall visually blend with adjacent road, boardwalk, and roof surfaces. Also, the tiers and turrets included in the wall's design create "visual breaks" in the structure's overall profile. From the water and from the opposite shore, the wall is either totally concealed or partially obscured by the marina's existing docks, depending on viewing position.

*Ambient Noise Levels* - Brady comments that "peaceful and quiet enjoyment of the Duck Creek cove landscape is a natural casualty of marinas specializing in high-performance, high-noise-emitting boats." Jack Lenhart contends there has been no attempt by GRDA to reduce noise levels in the cove. The licensee says that except during major summer holidays and summer weekends, Duck Creek cove is relatively quiet. The licensee mentions that in the past there have been excessive-noise events in the cove resulting from the inconsiderate operation of large boats. However, GRDA notes that these problems have been alleviated through increased law enforcement and increased lake patrol presence in the cove.

Environmental Effects

*Visual Character and Scenic Quality* - GRDA observes that Arrowhead Marina is the oldest commercial shoreline development in Duck Creek cove. The license states that this area of the cove would be visually enhanced by Arrowhead's replacement and upgrading of the marina's existing facilities. The licensee also states that due to Arrowhead's ownership of surrounding shoreline and adjacent topography, the proposed marina expansion would not adversely impact the existing lake views of adjacent property owners (GRDA, 2002a).

Freeman says that if the proposed marina expansion is permitted, the additional 1½- to 2-story covered docks would decimate the south view of Play Haven homeowners. Freeman also says that, taken in an overall visual and scenic context, this further degradation of view is not limited to private property since it would have major long-term adverse effects on natural scenery from all sides of the creek, both from land and water.

SJC, commenting on the visual effects of the proposed dock expansion, again notes that the added facilities would protrude no farther into the cove than Arrowhead's existing docks. SJC also notes that the new docks would maintain the design style of the marina's most recently added dock, with "minimized line-of-sight structure and tall-dock construction, both designed to minimize visual interference."

Jack Lenhart, responding to the visual-impact comments of GRDA and SJC, asserts that the proposed dock expansion would be a significant intrusion into the visual beauty of the cove and contends that numerous adjacent property owners would have their lake views impacted by the proposed dock expansion. Specifically, Lenhart says that homeowners across the cove from the marina would look into a 600-foot-long, fully

covered dock. He also says that in terms of recreational uses, "lake views would be lost to a mammoth private club."

DCHA says the new dock facilities would result in a dramatic loss in scenic value, not only due to their size, but also from an architectural point of view (see information on dock size and architectural style in the previous navigational-impacts discussion). As an example of the loss of scenic value, DCHA illustrates on a map of the marina area in one of its filings that from a viewing position 50 feet north of the dock-expansion footprint and from the 750-foot contour elevation, 373 feet of shoreline would be visually obstructed on the opposite shore by the added docks (see figure 4). This map drawing also illustrates that in order to recover this segment of shoreline within the field of view, a person would need to move 356 feet further north along the shoreline's 750-foot contour.

Construction activities associated with Arrowhead's development proposal would cause a number of adverse aesthetic effects. During the construction period, the presence of earth-moving machinery and equipment would be visually objectionable. Also, the unsightly appearance of construction debris, construction staging areas, exposed soils, and partially-completed/partially-dismantled structures would temporarily degrade the visual quality of the area landscape.

After completing the proposed improvements, the appearance of the marina's boat-dock facilities and adjoining waterfront site would be permanently and substantially altered. From the perspective of many local residents and lake-area visitors, these facility and site alterations would be viewed as aesthetic enhancements or as visually acceptable modifications, due to their interest in the economic- and recreation-related values and functions they provide. From the perspective of other private and public interests, these alterations would be seen as visual obstructions or as aesthetically obtrusive additions because of their location and size and the proliferation of associated boats and yacht-club activities. From the standpoint of the overall shoreline landscape, the proposed development would be visually in character and in scale with the surroundings, but would increase the existence of visual elements (i.e., forms, colors, textures, and lines) that undesirably contrast with the landscape's natural scenery.

*Ambient Noise Levels* - SJC says the small number of additional boat slips proposed at Arrowhead Marina could result in only a negligible increase in noise from increased boat traffic. SJC asserts that the boat-traffic controls now in place in Duck Creek cove would minimize any such impact, with the remaining increase in noise, if any, being insignificant.

In response to SJC's assertions, Jack Lenhart contends that increases in boat traffic and noise attributable to the proposed boat-slip additions would not be negligible. DCHA says that while the proposed marina expansion would add to the area's noise pollution, it

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



cannot cite a specific violation of law. DCHA also says it is looking into laws used in neighboring states to address this problem.

During installation of the proposed marina facilities, machinery and equipment operation and other construction-related activities would cause noise-producing disturbances. The additional boats and yacht-club activities that would result from the marina's expansion would cause intermittent increases the area's ambient noise levels.

GRDA's Lake Rules and Regulations include the requirement that all vessels must be muffled pursuant to 63 O.S.A. § 4208. Any noise-emitting boats in violation of this requirement would be subject to compliance enforcement by the licensee's Lake Patrol.

To further assist in the control of noise at Grand Lake, GRDA should consider including other noise-specific requirements in its rules and regulations. For example, the states of Tennessee and Alabama prohibit the operation of a vessel that exceeds 86 decibels at a distance of 50 feet. Tennessee also has a muffler regulation designed to control exhaust noise and prevent muffler tampering. Most noise complaints result from violations of these muffler regulations (TVA, 2002).

Provided the Commission approves GRDA's non-project-use application, the licensee should include the following conditions adapted from license article 410 in any permit issued to Arrowhead for the proposed marina expansion. Consistent with the provisions of article 410, these permit conditions would help to ensure that the grantee would properly monitor and control noise and other aesthetically undesirable effects associated with its commercial operation.[17]

(1) The grantee's permitted use and occupancy of project lands and waters shall not endanger health, create a nuisance, or otherwise be incompatible with the project's overall purposes, including public recreation and resource protection.

(2) The grantee shall take all reasonable precautions to ensure that its permitted use and occupancy of project lands and waters shall occur in a manner that will protect the scenic, recreational, and other environmental values of the project.

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[17] License article 410 provides that the licensee: (1) has the continuing responsibility to supervise non-project uses and occupancies of project lands and waters; and (2) shall take any legal action necessary to correct violations of conditions imposed by the licensee for the protection of the project's scenic, recreational, or other environmental values.

### 5.2.8 Socioeconomic Considerations

Affected Environment

From the late 1970's through the early 1990's, Oklahoma's economy was severely depressed as a result of its dependency on and the decline of the domestic oil industry. This period of time was also a relatively low- to no-growth period for the Grand Lake area. Beginning around 1992, surrounding regions began to recover economically and the Grand Lake area experienced a significant influx of investors and private property owners (GRDA, 2002a).

The majority of the established marinas on Grand Lake at the start of this period of increased economic activity were located on Duck Creek cove. This area of the lake was poised for rapid economic growth at that time, with pre-existing platted subdivisions and developments, including golf courses and other recreational amenities. Since 1980, all Duck Creek marina owners have expanded their commercial developments to provide facilities and services to meet growth in economic demand (GRDA, 2002a).

The popularity of the Duck Creek area is partially attributable to its geographic proximity to Tulsa, the largest metropolitan area in northeast Oklahoma. Lake-access roads and interstate accessibility have contributed to this area's growth. Duck Creek is considered to be the most popular residential area on the lake primarily because of the commercial marinas and yacht clubs at this location. It has the highest concentration of residences on Grand Lake outside of incorporated city or town boundaries (GRDA,2002).

Marinas require large investments of capital. As a result, the development and expansion of these capital-intensive operations financially depend on the demand for permanent dock facilities and other recreational amenities by a substantial population of adjacent residents and nearby non-residents. Topography is also an important factor in determining where large commercial marinas can be economically developed. Duck Creek cove is an area of the lake that is relatively protected from severe lake conditions and is large enough to support a substantial amount of boat traffic (GRDA, 2002a).

Many of the letters of support forwarded to the Commission in GRDA's May 28, 2002 filing (see section 4) attest to Arrowhead's contributions to the communities of Grand Lake and Duck Creek. The following excerpts from some of these letters are representative of the socioeconomic benefits attributable to Arrowhead and its existing marina facilities and operations:

"Arrowhead is one of the largest employers on the lake and produces significant excise, sales, property, gasoline, and payroll taxes."

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



"Arrowhead annually sponsors many community events that are open to the public, including a fourth-of-July fireworks display, an antique and classic boat show, and a classic car show."

"Joe and Debbie Harwood, owners of Arrowhead Yacht Club and Marina, are respected civic and business leaders of the South Grand Lake area. Joe Harwood is an active member of the Oklahoma tourism and Recreation Commission. Debby Harwood serves the community in a leadership position as president of the South Grand Lake Chamber of Commerce."

"Arrowhead Marina has always promoted Grand Lake for tourism through their many activities such as The Duck Creek Fireworks Display, the Classic Wooden Boat Regatta, The Polar Bear Plunge, The Duck Race, and many other wholesome and fun activities throughout the summer, which draws tourists to the area and contributes to the lake-area economy."

Other letters of support say that Arrowhead Yacht Club and Marina is what makes Duck Creek real estate more valuable than real estate in undeveloped coves. The licensee says that real property values in the Duck Creek area have continued to increase dramatically in recent years and are now some of the highest on Grand Lake (GRDA, 2002a). Brady states that Duck Creek property values have increased less than comparable properties with equal access to Tulsa which are not in Duck Creek or located close to marinas. Others indicate there has been a general lessening of property values for Duck Creek homeowners, with extreme losses of property value for those owners closest to the commercial docks.

No information has been provided to support or refute any of the above property-value claims. However, it is generally understood that waterfront residential property tends to appreciate in value with: (1) open and unobstructed views of the water; (2) free access to and use of the water and adjoining shoreland for recreational activities; (3) the availability of private boat docks for personal use and enjoyment; and (4) conveniently located commercial marina facilities and other popular recreational amenities. However, proximity to commercial developments, with attendant use conflicts and aesthetic disturbances, can understandably have a depreciating effect on the value of residential property.

Brady and others also say that Duck Creek homeowners are experiencing extreme increases in property damage from boating activity in the cove. Specifically, they complain of sharp increases in damage to personal docks and to the shorelines fronting their homes from the wake-generated waves of large boats. Jack Lenhart says that numerous homeowners have left the Duck Creek area due to "noise, safety concerns, lack of recreational opportunities, and property damage."

The licensee says that increased damage to private docks and to the lake's shorelines in recent years is the result of the large influx of very large boats whose owners are often inconsiderate of others or are inadequately trained in the operation of their boats. The licensee further says that GRDA has taken a number of boat-traffic control and enforcement actions to address this problem (see section 5.2.5 for a detailed description of these actions).

Environmental Effects

*Commercial Dock Distribution* - DCHA says that by granting waivers to its Lake Rules and Regulations, GRDA has removed the market forces that would have created a more equitable distribution of marinas on Grand Lake. DCHA contends these waivers have concentrated commercial growth in Duck Creek cove. DCHA further contends that a marina, after being granted a waiver of GRDA's dock-placement provisions (see section 3.4), is able to triple its dock-rental income for little or no increase in land purchase and no new personnel or payroll.

The above "Affected Environment" section provides a brief account of the socioeconomic factors that have led to the extensive development of Duck Creek cove. While GRDA has granted waivers of its dock-placement requirements to commercial-use applicants, there is no evidence the licensee is intentionally limiting or directing growth to one area of the lake or another. Rather, the licensee, through its application review and permitting process, is responding to the site-specific conditions of individual commercial-development proposals submitted over time.

GRDA's Lake Rules and Regulations state that the intent of the licensee's dock-placement requirements is to: (1) minimize the obstruction of travel over the lands and waters of GRDA; and (2) keep to a minimum the amount of encroachment necessary on the lands and waters of GRDA. Common to these two purposes is the need to weigh and balance the extent to which the docks of a proposed marina should encroach and obstruct travel on both water and land.

Given the size and scope of many of the commercial-dock proposals submitted for GRDA's consideration, the facility-arrangement alternative with the least overall spatial needs and impacts is commonly one that confines all proposed docks to an efficiently-designed area immediately in front of the marina's back-lying lands. In regard to the proposed action in this case, Arrowhead's Marina Master Plan-Alternative VI (see figure 2) is a compact facility layout designed for the optimum use of available space for docks, slips, and interior boat circulation.

*Employment, Tax Revenues, and Tourism* - The proposed marina improvements would provide temporary construction jobs during the facility construction period, as well as additional, long-term, marina-services employment. Also, the proposed improvements

would generate additional payroll-, gasoline-, excise-, sales-, and property-tax revenues. In addition, the marina's expanded and modernized facilities and services would attract a greater number of recreation visitors to the area.

*Property Values* - The proposed marina improvements would may have an appreciating effect on residential property values in Duck Creek cove in general, due to the additional recreational amenities and services that would be available. However, the value of private properties located near the marina might be adversely affected, due to additional aesthetic disturbances and water-use conflicts.

*Residential Dockage* - The proposed marina improvements would result in a greater amount of large-boat traffic on Grand Lake. The wakes of large boats are noted as the reason for recent increases in damage to the private boat docks of lakeshore residents. The boat-traffic controls in Duck Creek cove and the monitoring and enforcement measures of GRDA's Lake Patrol would keep any additional dock damage attributable to large boat wakes to a minimum.

Article III of GRDA's Lake Rules and Regulations states that all vessel operators shall be held responsible for any damage that their wake might cause to property. The article also says that no person shall operate or give permission to operate a vessel in a wake zone at a speed which is other than reasonable and prudent, or in such a manner as to create a wake. "No wake zone" is defined in the article as an area posted with buoys or within 150 feet of any boat ramp, dock, pier, or moored vessel (GRDA, 2001a).

## 5.3 Action Alternatives

In this section, we list each of the action alternatives identified in section 3.2, followed by a description of their expected environmental benefits. We further evaluate these alternatives in section 6.2.

<u>Protect an appropriate amount of terrestrial habitat</u>

DOI recommends protecting an appropriate amount of good-quality riparian habitat to mitigate for the cumulative impacts of shoreline development at the project. DOI advises that this protected habitat should be in addition to any lands GRDA already owns because those lands are being used to mitigate for other project impacts. FWS says it is only asking for mitigation of shoreline habitats that have been lost since project relicensing and recommends that habitat values be maintained at least equal to those present when the project was relicensed (FWS, 2001a).

Place aquatic-habitat structures at the base of the marina's shoreline wall

The proposed removal of the marina's breakwalls and the recent removal of dredged material at the marina site represent sizable losses of aquatic habitat. In an area like Duck Creek cove, where fish habitat is very limited as a result of extensive shoreline development, the loss of habitat structure could have an adverse impact on fish populations. To remedy this loss, rip-rap, boulders, or other aquatic-habitat structures could be placed along the shoreline at the base of the marina's concrete wall.

Rip-rap or other types of structures would provide habitat for fish and other aquatic organisms in an area that is predominantly sediment. Benefits of these structures include cover for fish to hide from predators, rearing habitat for juvenile fish, fish spawning areas, and habitat for other aquatic organisms which provide food for fish.

Alter the proposed dock-layout plan

As shown if figure 5, Arrowhead's proposed dock expansion protrudes extensively into the waterway, adding substantially to the marina's existing dock facilities. In a segment of Duck Creek cove where boat traffic is very heavy and where the area available for boat passage is constricted, the proposed dock expansion would add to an already congested situation. The proposed expansion also would reduce the field of vision available to boaters entering the cove's navigation channel from the inlet immediately south of Arrowhead Marina. In addition, the proposed expansion would add to the aesthetically obtrusive impacts of the existing dock developments located in this area of the cove and would partially obstruct views of the surrounding landscape available to boaters and shoreline residents in the immediate vicinity of the marina.

In order to mitigate the adverse navigational and visual effects of Arrowhead's dock-expansion proposal, the exterior corners of the proposed dock layout could be beveled (angled or slanted). As shown in figure 4, these alterations to the layout plan would: (1) reduce the physical size of the dock-expansion footprint; (2) make the expanded dock configuration more functionally compatible with existing boat-traffic patterns; (3) make the expanded dock arrangement less of a visual obstruction; and (4) increase the aesthetic interest of the overall marina development by creating vistas of the marina's shoreline and waterfront facilities through openings in the perimeter of the proposed dock expansion. In addition, these dock layout modifications would reduce the number and size of boats the expanded dock facilities could handle, thereby reducing the adverse navigational, visual, and other environmental effects attributed to increased boating activity in the cove.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



Establish contingency measures for potential archaeological resource discoveries

OAS/SA advises that if construction activities at the marina expose any buried archaeological materials, OAS should be immediately contacted so that agency staff can evaluate the significance of the materials. Also, OAS/SA reminds the Commission of its responsibility under 36 CFR Part 800[18] to consult with appropriate Native American tribes that may ascribe traditional or ceremonial value to such a discovery. Since the discovery of important archaeological resources during the marina's expansion is possible, OAS/SA's recommendation is reasonable.

OAS staff have expertise in the evaluation and preservation of archaeological resources. Therefore, this agency's advice and assistance would be beneficial in determining the importance of any resources discovered and the scope of any protection measures that should be taken. Also, consultation with interested Indian tribes would be a necessary step in identifying whether these tribal groups attach any cultural or religious significance to a discovered resource and deciding how such a resource should be treated.

### 5.4 No-Action Alternative

Under the no-action alternative, there would be no change to baseline environmental conditions from the continued operation and maintenance of the marina's existing docks. However, environmental changes will occur as a result of the non-permit improvements Arrowhead intends to make to the marina.

Replacing the marina's existing fuel-storage-and-delivery system (storage tanks, supply lines, and fuel pumps) will reduce the risk of soil contamination and water pollution from possible structural and equipment failures. Developing the additional yacht-club facilities will: (1) further diminish the quantity and quality of terrestrial habitats along Grand Lake's shorelines; (2) further alter the appearance of the landscape from a natural lake environment to a more developed setting; (3) further increase ambient noise levels in Duck Creek cove; and (4) provide further socioeconomic benefits to local-area communities through additional employment, tax revenues, and tourism.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Summary of the Proposed Action's Environmental Effects

The following table summarizes the probable environmental effects of Arrowhead's proposed marina improvements, as described in detail in the "Environmental

[18] Regulations of Advisory Council on Historic Preservation.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



Analysis" section. The table uses the issues identified in the "Agency Consultation and Public Involvement" section as a checklist for the impact summary.

| IMPACT ISSUE | IMPACT RATING | | |
|---|---|---|---|
| | 1 - Minor<br>2 - Moderate<br>3 - Major | A - Adverse<br>B - Beneficial<br>NI - No Impact | S - Short Term<br>L - Long Term<br>R - Recurrent |
| Shoreline Stability and Soil Erosion | 1<br>1 | A<br>B | S[19]<br>L |
| Wildlife and Riparian Habitat | 2 | A | S/L |
| Water Quality and Lake-Bed Sedimentation | 1 | A | S/L |
| Fisheries and Littoral Habitat | 2 | A | S/L |
| Wetlands | | NI | |
| Threatened and Endangered Species | | NI | |
| Boating Use and Navigational Safety | 2 | A | L/R |
| Shoreline Access | 1 | A | L |
| Reservoir Flowage | 1 | A | L/R |
| Archaeological and Historic Properties | | NI | |
| Visual Character and Scenic Quality of the Landscape | 2<br>2 | A<br>A/B[20] | S<br>L |
| Ambient Noise Levels | 2<br>1 | A<br>A | S<br>L |
| Commercial Dock Distribution | 1 | A | L |
| Employment/Tax Revenues/Tourism | 1 | B | S/L |
| Property Values | 1-2 | B/A[21] | L |
| Residential Dockage | 1 | A | L |

## 6.2 Evaluation of Action Alternatives

In this section, we evaluate the action alternatives examined in the "Environmental Analysis" section (section 5.3). Our evaluations weigh the tradeoffs, or the cost-effectiveness, of each of the options under consideration.

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[19] Construction-related effects. Same for all "S" ratings.

[20] Depending on viewer perception.

[21] Depending on proximity to the marina.

Protect an appropriate amount of terrestrial habitat

FWS considers its habitat-protection recommendation to be reasonable since all actions such as vegetation clearing, mowing, dredging, and docks require a permit from GRDA. FWS explains that it isn't saying GRDA can't issue these permits, but that the licensee should consider the cumulative effects of its permitted actions and mitigate for the habitat that is lost (FWS, 2001a).

We agree that cost-effective measures to compensate for the incremental habitat impacts of permitted shoreline development activities is a reasonable expectation. One possible method of compensation would be for permit grantees to transfer selected shoreline land parcels to ODWC, or to a recognized conservation organization, for terrestrial resource protection. Another possible compensatory approach would be for grantees to contribute to a fund administered by GRDA for the acquisition and protection selected shoreline lands with important terrestrial-habitat characteristics and qualities.

Given that Arrowhead's additional yacht-club facilities will be constructed outside the project, the mitigation of associated habitat impacts would not be covered by GRDA's permit. However, we would expect Arrowhead to compensate for the habitat losses that result from this development through some appropriate means.

As a result of the Commission's compliance review of Arrowhead Marina's shoreline wall, GRDA is required to file an after-the-fact application for the conveyance of a parcel of project land to Arrowhead (see footnote 3). Any compensation for terrestrial habitat displaced by the marina's wall will be considered in the context of this application (FERC, 2002b).

Place aquatic-habitat structures at the base of the marina's shoreline wall

The costs of replacing the aquatic habitat removed from the marina expansion site would be very small in comparison to the costs of the proposed marina improvements. Considering the fishery benefits that would be gained, such habitat-replacement measures would be cost-effective. Therefore, as a condition for approval of GRDA's application, Arrowhead should be required to place rip-rap, boulders, or other aquatic-habitat structures along the base of the marina's shoreline wall, or at another appropriate location selected in consultation with ODWC and with GRDA's approval. These structures should be sized and designed, with ODWC's advice and assistance, to fully offset the habitat lost as a result of the marina's use of project waters.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



Make alterations to the proposed dock-layout plan

Altering the proposed dock-layout plan, as shown in figure 4, would eliminate 19 of the rental boat slips Arrowhead intends to add to the marina. These 19 slips, which would be 30 percent of the total slips added, are also the largest of the proposed slip additions: (1) three, 22x99-foot slips; (2) 14, 22x70-foot slips; and (3) two, 20x60-foot slips.

Comparing the above developmental costs to the environmental benefits that would be gained (see section 5.3), we conclude that the dock layout alterations under consideration are not warranted. Although these alterations would be effective in reducing the navigational and visual impacts of the expanded docks, these beneficial effects would not outweigh the resulting recreation-facility tradeoffs. The following are other mitigating factors considered in our evaluation of this alternative.

(1) The dock-expansion footprint, as proposed, would not require any realignment of the cove's boat-traffic lanes. However, the width of these lanes would have to be reduced for a short distance through the narrowest point of navigation to maintain the required 150-foot, idle-power zones between these lanes and the adjacent docks along each shoreline.

(2) Boater egress from the marina's expanded docks, or from the inlet located adjacent to the marina, would predominantly be in a southerly direction toward the mouth of the cove. The sight distance available to a boater at these locations would be adequate to allow safe entry to the cove's navigational channel and would not require any lane crossing for boaters headed to the main body of the lake.

(3) Commission staff observed during a recent boat tour of Duck Creek cove that the existing docks at Arrowhead Marina are set back a safe and adequate distance from the cove's navigation channel. The boat docks and slips Arrowhead proposes to add to the north end of the marina would extend further into the waterway than the marina's existing dock facilities (approximately 505 feet versus 475 feet). However, the cove widens to the north (about 1,065 feet at the northern end of the proposed dock expansion versus 1,015 feet at the exist docks), thereby offsetting the additional protrusion.

(4) Photographs taken of the marina site during staff's recent boat tour of the cove show that the marina's existing dock facilities are visually in scale with the surrounding landscape and do not excessively encroach on the landscape's viewshed. The additional docks that would be positioned around the perimeter of the dock-expansion footprint would be physically in line with the marina's existing perimeter dock and visually in character with this existing dock's design.

(5) For navigational-safety reasons, we agree with DCHA's suggestion of orienting the three large, external slips in the northeast corner of Arrowhead's proposed dock layout (see figure 2) to run parallel with the shoreline (see our response to DCHA comment 10 in Appendix A). Rotating these slips 90 degrees, as DCHA suggests, would avoid potential safety problems that could occur from boats entering and exiting these slips adjacent to the cove's navigational channel. Orienting these slips to provide water access from the side, instead of the front, of this perimeter dock would provide an added measure of safety, considering the difficulty in maneuvering boats of this length and size. Also, given that seven feet of additional space would be available under this alternative arrangement (99 feet available versus 92 feet needed for the three slips and the adjacent 18-foot walkway), these slips, and the slip's fingers, could be widened somewhat to better facilitate boater access and boat docking. Accordingly, as a condition for approval of GRDA's application, the licensee should require in its permit to Arrowhead that the expanded dock arrangement be modified as discussed above.

Establish contingency measures for potential archaeological resource discoveries

The discovery of archaeological materials during the marina's expansion could result in construction delays and additional costs to mitigate potential adverse effects on significant resources. Given the possible importance of previously unidentified resources to the area's prehistoric and historic cultural heritage and tribal traditions and customs, these developmental consequences are justified. However, in the interest of Arrowhead's development objectives, a concerted effort should be made under such circumstances to expedite any measures needed to properly take such discoveries into consideration.

Therefore, as a condition for approval of GRDA's application, the grantee should be required to immediately stop construction activities upon such a discovery and contact the licensee, OAS, and those Native American tribes/groups that may have an interest in the discovery. The grantee should allow the notified parties a reasonable amount of time to: (1) examine the discovered materials to evaluate their significance; and (2) provide the results of their evaluations to GRDA. The licensee should take any OAS or tribal comments and recommendations into consideration in deciding how to proceed.

In the event significant archaeological resources are discovered, the licensee is reminded of its responsibility under license article 409 to file for Commission approval a cultural resource management plan that describes how these resources would be protected. The grantee should be required to implement any measures prescribed by the licensee to mitigate adverse impacts to any important resource discoveries. The permit should provide for any disputes that may arise between the licensee and the grantee regarding such discoveries to be submitted to the Commission for resolution. With the above requirements and permit conditions, there would be adequate provisions to ensure that any previously unidentified archaeological resources are properly taken into account during the marina's expansion.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



The above contingency measures would not apply to the non-permit elements of Arrowhead's marina improvement program. However, the licensee should encourage the grantee to voluntarily comply with these measures for any ground-disturbing construction activities at the marina outside the project boundary.

### 6.3 Findings

Based on the information, analyses, and evaluations contained in this EA, we find that the proposed marina improvements, with our recommended environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment. We also find that Arrowhead's proposal, with our environmental recommendations, would not be inconsistent with the operation and maintenance of the project or with the project's public-recreation and resource-protection purposes.

With staff's modifications, Arrowhead's marina-improvement proposal would:

(1) help meet the public's demand for additional and upgraded marina facilities and services on Grand Lake in a safe and efficient manner;

(2) offset the loss of aquatic habitat and the reduced recruitment of fish[22] resulting from removal of the marina's breakwaters and recent dredging and wall-construction work at the marina;

(3) ensure that any archeological resources discovered during the marina's expansion are properly taken into account; and

(4) provide greater socioeconomic benefits to the communities of Grand Lake and Duck Creek in terms of employment, tax revenues, and tourism promotion.

In our judgement, the positive aspects of the staff-modified proposal outweigh its negative environmental consequences. Also, in our judgement, the net benefits of the modified proposal outweigh the alternative of taking no action. Based on these conclusions, we recommend that the licensee's application be approved along with our action-alternative recommendations.

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[22] Recruitment can be defined as the addition of members to an aggregate population. In a fishery, recruitment is the number of additional fish that become available at a particular stage in their life history (Everhart et al, 1975).

## 6.4 Other Assessment Results

Requests for Moratoriums on Permitting and Granting of Waivers

Creekmore and Jack Lenhart request the Commission to place a moratorium on any further permitting of commercial docks and slips on Grand Lake until GRDA provides: (1) an updated recreation management plan addressing the lake's carrying capacity; and (2) a Comprehensive Shoreline Management Plan (CSMP) for the project. DCHA requests that no further waivers of GRDA's Lake Rules and Regulations be granted for commercial uses until the Commission has approved a CSMP for the project.

*Carrying Capacity* - By applying documented carrying-capacity standards, various capacity factors, and an established methodology and formula for determining optimum carrying capacity, Dr. Lowell Caneday has calculated a carrying capacity of 6,015 boats of mixed types for Grand Lake, or approximately 0.13 boats per acre of usable water at the lake (Caneday, 1997).[23] Based on this calculated figure, Dr. Caneday states that the number of boats surveyed in concentrated boating areas on August 31, 1996 (Labor Day) and July 4, 1997 were below and above the lake's calculated carrying capacity, respectively. Dr. Caneday further states that this figure indicates the lake is near capacity in terms of the number of watercraft presently accessing the lake. However, he cautions against using this calculated carrying-capacity figure alone without consideration of the desired "quality" of recreational boating experiences at the lake or the desired "quality" of the lake environment (see footnote 23).

Referring to the above carrying-capacity information, FWS states that current boating use on Grand Lake can be reasonably assumed to be as great or greater than in 1997. FWS also states that boat docks and slips have significantly increased since 1997 and that watercraft (such as jet skis), which access the lake from boat ramps, have probably increased as well. Further, FWS indicates that these increases in the use and occupancy of the lake, and the lake's shorelines, have accelerated the rate at which fish and wildlife resources, aesthetic values, recreation, and public safety will reach critical carrying-capacity thresholds (FWS, 2000 and 2001a).

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[23] Dr. Caneday, Professor and Associate Dean, Oklahoma State University (OSU), was the principal investigator for and author of a recreation management plan for Grand Lake. This plan, which was prepared for GRDA by OSU and is appended to the project's approved recreation plan, recommends that the lake's recreational carrying capacity not be based simply on the quantity, or a specific number, of boats, but rather on an established set of management goals, objectives, and actions for achieving preferred environmental conditions and recreational experiences at the lake.

Ruddy Herrmann, commenting as "an interested and concerned citizen, taxpayer, homeowner, and boater," says the boat-carrying capacity of Duck Creek cove "specifically needs to be rigorously and objectively examined." Herman also says that any recommendations from such a study need to be reviewed and implemented responsibly (Herman, 2002).

GRDA's Recreation Plan (RP) for the project provides for continued monitoring of recreation use and shoreline development at Grand Lake. In approving the RP, the Commission has required the licensee to file periodic monitoring reports containing: (1) data on the current levels of recreation use and shoreline development at the project; (2) an evaluation of the need to make any changes to current management practices related to recreation use and shoreline development; and (3) documentation of agency consultation in conducting its management assessment. The agencies the licensee is required to consult include: (1) FWS; (2) the National Park Service (NPS); (3) ODWC; and (4) the Oklahoma Tourism and Recreation Department (OTRD). The first of these reports was required to be filed by April 1, 2003. GRDA filed the report on July 1, 2003 describing the changes to recreational facilities at the project and the work of the Lake Patrol in enforcing regulations on the Lake.

The RP states that if recreational use of the project were to exceed its documented carrying capacity, GRDA could: (1) implement seasonal rules for targeted recreation activities; (2) increase the number of seasonal patrolmen to enforce existing and future use restrictions; and (3) place restrictions on special events.

Exhibit J of the RP describes the goals, objectives, and actions GRDA has adopted to achieve preferred environmental conditions and preferred recreational experiences at Grand Lake (see footnote 23). Considering that the licensee and the consulted agencies may have differing points of view on future management direction for the lake, any proposed changes in management practice should not be implemented until the Commission notifies the licensee that its monitoring report assessment, which is expected in the near future, has been accepted.

In the DEA for this application, Commission staff recommended that after acting on Arrowhead's proposed marina expansion, the Commission should defer final action on any other non-project-use proposals involving Duck Creek cove until after it reviews GRDA's first monitoring report. After further consideration of the above monitoring and reporting requirements, and comments on the DEA, Commission staff now concludes that such a moratorium is not warranted. To the extent that limitations on commercial marinas or other shoreline development within the project are warranted, they are most appropriately imposed within the context of an amendment to the project recreation plan, or a Commission-approved CSMP (see discussion below), which would be enforceable license conditions. In the interim, any filed non-project-use applications will continue to

be reviewed to determine whether, and under what specific conditions, such proposals should be approved.

In making the above finding, we emphasize that the levels of recreational use and shoreline development described in this EA indicate that the resources of Grand Lake's Duck Creek arm are approaching carrying-capacity limits for boating-related facilities and activities. Given this situation, Commission staff will intensively scrutinize any future non-project proposals involving this cove with respect to their effects on preferred environmental conditions and preferred recreational experiences.

*Comprehensive Shoreline Management Plan* - GRDA states that in the past it has served as the monitoring and coordinating agency for implementing and enforcing all applicable rules and regulations concerning shoreline activity on Grand Lake. The licensee further states that it is logical for it to continue serving in this capacity as required under the terms of its project license (GRDA, 2002b).

As licensee for the Pensacola Project, GRDA is responsible for managing the shoreline lands and waters within the project boundary. As noted in the Commission's order approving the project RP, the licensee has expressed a willingness to work with the Grand Lake Advisory Commission (GLAC) and other Grand Lake stakeholders to develop a CSMP for the project (FERC, 1998a).[24]

Pursuant to the Commission's order approving the project's RP, GRDA has filed a series of reports on preparing a CSMP for the project.[25] With GRDA's consent, a committee of the GLAC had been taking the lead in developing this plan. On March 6, 2002, Commission staff met with GLAC's chairman to exchange ideas and information on the best way to develop the plan. To date, little progress has been made on the plan.[26] The licensee states in its July 1, 2003 filing of the Report on the Recreation Plan

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[24] GLAC is an independent commission established by the Oklahoma state legislature to advise GRDA on lake-related issues. The commission has 19 members who are appointed by various state agencies, local chambers of commerce, and area lake associations. The commission is charged with providing a forum for interested persons to address environmental, recreational, and economic-development concerns and to obtain input from lake enthusiasts, property owners, and business persons.

[25] GRDA has filed progress/status reports on the development of a project CLMP on March 22, 1999; October 25, 1999; June 22, 2000; and January 25, 2002.

[26] GLAC to which the licensee delegated the task of developing the CSMP has been disbanded under a newly-signed statute. This statute also requires replacing the existing GRDA board with a new board in September, 2003.

Implementation and Progress Report on Development of Shoreline Management Plan Since 1997 that licensee states that it "hopes" to develop a shoreline management plan for the Markham Ferry Project (FERC Project No. 2183) by the end of August 2004, in conjunction with the relicensing of the project. GRDA "hopes to follow a similar path" and complete a plan for the Pensacola Project in the same time frame, but cautions that "due to the number of stakeholders, diversity of interests, and possible interaction with the state government, this schedule may be altered."

As discussed in a guidebook recently published by the Commission's Office of Energy Projects (OEP), a CSMP can serve as an important tool in providing for the proper use, conservation, and development of reservoir shorelines managed by a project licensee. Copies of this OEP guidebook, entitled *Guidance for Shoreline Management Planning at Hydropower Projects*, have been given to GRDA and GLAC for their information and use. Also, the licensee and the advisory commission have been offered OEP-staff assistance in preparing the CSMP.

The issues addressed in this EA show that shoreline-development pressures and land- and water-use conflicts are increasing at the project. Also, the information and analyses presented in this EA show that the shoreline resources within Duck Creek cove have become fragmented and degraded to a considerable extent. In addition, the agency and public comments considered in this EA show that the conservation of shoreline resources is becoming an increasingly important concern to those who have an interest in Grand Lake. These indicators point with a greater degree urgency to the need for a CSMP.

A CSMP for the project will require a substantial and uncertain amount of time to develop. Consequently, we consider it unreasonable to place a moratorium on further non-project-use applications until this plan is completed. However, considering the above facts, the Commission should reserve judgement as to whether a more aggressive shoreline management approach is needed for the project. The licensee's initial recreation/shoreline monitoring report, which is expected to include a program summary and schedule for preparing the project CSMP, should serve as the basis for the Commission's further consideration of this issue.

With regard to whether the Commission should temporarily suspend GRDA's ability to waive its rules and regulations pending Commission approval of a CSMP, we find that such a question involves considerations of legal rights and Commission policy which are beyond the scope of this environmental assessment. However, it would be beneficial if GRDA would fully explain the reasons for any such waivers in its non-project-use applications submitted to the Commission.

The CSMP would help address cumulative impact concerns. DOI comments that cumulative impacts on fish and wildlife habitat continue to intensify at the project and

that it has seen no effort to quantify these impacts or the areas of habitat that remain. FWS says that the cumulative loss of shoreline habitat is of great concern since it has not seen a decline in shoreline development applications for the project in at least a year (FWS, 2001b). Jack Lenhart comments that the Commission should require some type of cumulative effects study and that these study results should be part of a project CSMP (Lenhart, 2001).

As evidenced by section 5 of this EA, the Commission considers the cumulative environmental effects of proposed developmental actions in the context of individual non-project-use proceedings. The Commission's order approving the project RP states that the project is expected to experience increased shoreline development in the future and this continuing development may have long-term cumulative effects on the reservoir, its shoreline resources, and the surrounding communities. This order also states that Commission staff have strongly encouraged the development of a CSMP to address existing and future shoreline activities at the project, including their effects on environmental resources, local residents, businesses, and other interests associated with Grand Lake (FERC, 1998a). As discussed in the above OEP guidebook and as stressed in OEP staff's discussions with GLAC, it is important to base the project CSMP on complete and accurate resource inventories and other shoreline-related information.

Herrmann, commenting broadly about shoreline-related issues and competing resource interests at Grand Lake, says it is important to achieve an appropriate balance among all major stakeholders in any comprehensive planning activity. Herrmann also remarks that instead of various stakeholders being pitted against one another, they must recognize their common interests and work together to maintain the lake's long-term viability (Herrmann, 2002). We agree. Consistent with these comments and the Commission's order approving the project RP, we expect GRDA and GLAC to consult with federal and state agencies, local communities, and the general public as part of their CSMP development process. This includes COE, FWS, NPS, ODWC, OTRD, and local-community associations such as DCHA.

FWS comments that GRDA's boat-dock permitting program does not have any limits on the spacing or density of docks and provides no incentives for group docks or other measures that would reduce potential impacts (FWS, 2001b). ODWC says it understands that GRDA currently has no shoreline management guidelines and recommends that the licensee develop criteria that limits shoreline development at some given density (ODWC, 2002b). The project CSMP should address these issues.

Shoreline Wall Investigation

As noted previously in this EA, the Commission has determined that GRDA did not comply with certain non-project-use and project-land-rights provisions of the project license in its permitting of Arrowhead's wall and in conveying a related parcel of project

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



land to Arrowhead (FERC, 2002b). As a result, the Commission has required GRDA to take certain compliance actions, consistent with its responsibilities as project licensee (see footnote 3). This includes: (1) reporting to the Commission the extent to which it has required, or will require, Arrowhead to obtain the licensee's approval for the specific compensatory measures taken on project lands to meet COE's permit and consent conditions (see footnote 5); and (2) filing an after-the-fact application for GRDA's land conveyance to Arrowhead.

Among other items, GRDA is to include in the above application descriptions of the environmental effects of using of the conveyed land for Arrowhead's shoreline wall and any measures that are proposed to mitigate the wall's adverse effects. The licensee has been advised to refer to the environmental analyses in this EA in preparing this part of the application.

Based on our "Affected Environment" descriptions in section 5 of this EA, the existing two-tiered wall at Arrowhead Marina has resulted in: (1) moderate, long-term, adverse effects on terrestrial and aquatic resources and reservoir flowage; and (2) moderate, long-term changes in the appearance of the shoreline. Based on our "Environmental Effects" discussions in section 5, the incremental terrestrial, aquatic, and flowage impacts of the proposed third tier of the wall would be minor, adverse, and long term. The proposed landscaping between the wall's tiers (see figure 3) would help soften the stark appearance of the wall's vertical concrete surfaces.

The action alternatives recommended in this EA would effectively mitigate the wall's detrimental effects on aquatic and terrestrial habitats and associated fish and wildlife populations. The conditions contained in COE's after-the-fact permit and consent to construction will effectively compensate for the wall's adverse effects on flowage.

## 7.0 LITERATURE AND CORRESPONDENCE CITED

Caneday, Lowell, Ph.D. 1997. Letter to GRDA summarizing available information on the carrying capacity of lakes in terms of numbers of watercraft. Oklahoma State University. September 23, 1997.

COE (Corps of Engineers, Tulsa District). 2002. Letter from Robert L. Suthard, Jr., Colonel, U.S. Army District Engineer, to Joe Harwood, Arrowhead Yacht Club, in reference to the construction of retaining walls at Arrowhead Marina. Tulsa, Oklahoma. March 8, 2002.

DOI (United States Department of the Interior). 2002. Letter from Glenn B. Sekavec, Regional Environmental Officer, responding to the Commission's Notice of Application

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



for Non-Project Use of Project Lands and Waters at the Pensacola Project (FERC No. 1494-224). March 1, 2002.

Everhart et al (Everhart, W. Harry; Eipper, Alfred W.; and Youngs, William D.). 1975. Principles of Fishery Science. Cornell University Press, Ithaca, New York.

FERC (Federal Energy Regulatory Commission). 1992. Order Issuing New License and Environmental Assessment. Pensacola Project, FERC No. 1494-002 (59 FERC ¶ 63,231 at p. 63,231). April 29, 1992 (Order); November 19, 1991(EA).

FERC. 1996. Order Amending License and Environmental Assessment. Pensacola Project, FERC No. 1494-123 (77 FERC ¶ 61,251). December 3, 1996.

FERC. 1997. Order Modifying and Approving Non-Project Use of Project Lands and Final Environmental Assessment of Proposed Excavation for Boat Access. Pensacola Project, FERC No. 1494-094 (80 FERC ¶ 62,113). August 6, 1997.

FERC. 1998a. Order Modifying and Approving Long-Term Recreation Plan. Pensacola Project, FERC No. 1494-148 (84 FERC ¶ 62,144). August 14, 1998.

FERC. 1998b. Order Approving Non-Project Use of Project Property and Final Environmental Assessment of Application For Non-Project Use of Project Lands and Waters. Pensacola Project, FERC No. 1494-140 (85 FERC ¶ 61,171). November 2, 1998.

FERC. 2002a. Order Approving Non-Project Use of Project Lands and Waters and Environmental Assessment of Application for Non-Project Use of Project Lands. Pensacola Project, FERC No. 1494-218 (99 FERC ¶ 62,088). May 1, 2002.

FERC. 2002b. Letter to Bob Sullivan, GRDA, regarding the Commission's compliance review of various non-project uses of project lands, including Arrowhead Marina's shoreline wall. Pensacola Project, FERC No. 1494-240. December 19, 2002.

FWS (U.S. Fish and Wildlife Service). 2000. Letter from Jerry J. Brabander, Field Supervisor, to GRDA commenting on GRDA's notices of applications 00-26 through 00-53 for shoreline development proposals at the Pensacola Project (FERC No. 1494). December 18, 2000.

FWS. 2001a. Letter from Jerry J. Brabander, Field Supervisor, to the Commission responding to GRDA's April 11, 2001 reply to the Commission's February 16, 2001 request for additional information on various applications for non-project use of project lands and waters at the Pensacola Project (FERC Nos. 1494-222, -223, -224, and -225). May 24, 2001.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



FWS. 2001b. Letter from Geoffrey Jackell, Acting Regional Director, commenting on the Commission's Environmental Assessment for Non-Project Use of Project Lands and Waters at the Pensacola Project (FERC No. 1494-209). August 28, 2001.

GRDA (Grand River Dam Authority). 1997-1998. Recreation Management Plan, and supplemental information on the plan, for the Pensacola Project (FERC No. 1494). Filed October 3, 1997 and January 28, 1998. Note: This is the same plan the Commission has identified as the project's Long-Term Recreation Plan (see FERC. 1998a, above) .

GRDA. 2001a. Rules and Regulations Governing the Use of Shorelands and Waters of the Grand River Dam Authority (GRDA's Lake Rules and Regulations). January 17, 2001. Note: An earlier version of GRDA's Lake Rules and Regulations was included as Appendix B in GRDA's Recreation Management Plan for the Pensacola Project (see GRDA. 1997 -1998, above). In that earlier version, GRDA reserved the right to make changes to these rules and regulations (see Article XIV of that document). The Commission approved the above recreation plan in a 1998 order (see FERC. 1998a, above).

GRDA. 2001b. Letter from Mary Von Drehle, Assistant General Council, to the Federal Energy Regulatory Commission, in reference to U.S. Fish and Wildlife Service comments, by letter dated December 18, 2000, on permit applications 00-26 through 00-53. April 11, 2001.

GRDA. 2001c. Application for non-project use of project lands and waters. Pensacola Project (FERC No. 1494-232). June 14, 2001.

GRDA. 2002a. Additional information on the application for non-project use of project lands and waters. Pensacola Project (FERC No. 1494-232). March 29, 2002.

GRDA. 2002b. Letter from Mary E. Von Drehle, Assistant General Counsel, to U.S. Senator Don Nickles in response to a May 14, 2002 letter to Senator Nickles and Senator James Inhofe from Leonard A. Dalquest regarding the permitting of shoreline activities at the Pensacola Project (FERC No. 1494). May 31, 2002.

GRDA. 2002c. Letter from Mary E. Von Drehle, Assistant General Counsel, to the Commission filing an executed copy of COE's after-the fact permit for Arrowhead Marina's shoreline wall. Pensacola Project (FERC No. 1494-232). September 17, 2002.

GRDA. 2003. Letter from Mary E. Von Drehle, Assistant General Counsel, to the Commission filing a copy of COE's consent to easement structures for Arrowhead Marina's shoreline wall. Pensacola Project (FERC No. 1494-232). January 13, 2003.

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



Harwood, Joe. 2000. Letter from Joe Harwood to Arrowhead Investment & Development Company clients regarding various marina issues. Ketchum, Oklahoma. March 10, 2000.

Hermann, Ruddy. 2002. Letter to FERC, GRDA, COE, FWS, and DOI regarding a variety of issues at Grand Lake of the Cherokees in northeast Oklahoma. Tulsa, Oklahoma. Filed April 8, 2002.

Lenhart, Jack R. 2001. Letter to the Commission in support of an August 28, 2001 letter to the Commission from FWS regarding its concerns about the cumulative impacts of shoreline use and development activities at the Pensacola Project (FERC No. 1494). Tulsa, Oklahoma. September 24, 2001.

OAS (Oklahoma Academy of Sciences). 1989. Proceedings of the Oklahoma Academy of Science, Vol. 69: pages 33-37.

ODWC (Oklahoma Department of Wildlife Conservation). 2002a. Website at http://www.wildlifedepartment.com/listing.htm.

ODWC. 2002b. Letter from Jim Burroughs, Northeast Region Fisheries Biologist, to FERC regarding requests for comments GRDA shoreline development applications 02/01 and 02/02. Oklahoma City, Oklahoma. February 8, 2002.

TVA (Tennessee Valley Authority). 2002. *TVA River Neighbors*, a newsletter published three times a year for people who live near to and use the Tennessee River and its tributaries and reservoirs. Knoxville, Tennessee. August 2002. Page 7.

## 8.0 LIST OF PREPARERS

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## APPENDIX A

**Responses to Comments on Draft Environmental Assessment**
**Application for Non-Project Use of Project Lands and Waters**
**Pensacola Project – Oklahoma**
**FERC No. 1494-232**

| **U.S. Fish and Wildlife Service** | |
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| COMMENTS | RESPONSES |
| 1. FWS agrees with the analysis of effects on terrestrial and aquatic resources in the DEA and supports the recommended mitigation of impacts to fisheries habitat. The DEA doesn't specify any mitigation for impacts to terrestrial resources. | The FEA states that: (1) we would expect Arrowhead to appropriately compensate for terrestrial habit losses resulting from related shoreline development outside the project; and (2) any terrestrial impact mitigation for Arrowhead's shoreline wall will be considered in the context of GRDA's related after-the-fact conveyance application (see page 46). The licensee's CSMP for the project should further address these issues by identifying shoreline segments with important terrestrial and aquatic resources where development would be prohibited or appropriately restricted (see page 52 for CSMP discussion). These shoreline segments could then support the compensatory measures described on page 46 by serving as targets for the acquisition and management of adjacent shoreline parcels for resource protection and conservation. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **U.S. Fish and Wildlife Service** | |
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| 2. The cumulative loss of public access to shorelines from docks and other waterfront facilities should be considered and mitigation for these losses should include the licensee's acquisition or leasing of other shoreline areas that would be accessible to the public. | The licensee proposed, in its approved recreation plan for the project, to continue consulting with state and local agencies on the need for additional public-access sites on licensee-owned properties around Grand Lake. We expect the licensee to address this issue in its recreation/shoreline monitoring reports, which the Commission required in its order approving the project recreation plan (see discussion of reporting requirements on page 51). The licensee's CSMP for the project also should address this issue by: (1) identifying shoreline areas reserved for public recreation; (2) designating shoreline segments that would remain natural, undeveloped, and reasonably free of public-access encumbrances and restrictions; and (3) defining rules for the shared use of shorelines that are open to both public and private access (see page 52 for CSMP discussion). |
| 3. GRDA has made virtually no progress in preparing a CSMP for the project. Deadlines should be established for completion of this plan. | GRDA's first recreation/shoreline monitoring report is expected to contain a program outline and schedule for preparing a project CSMP (see page 52 of DEA and page 53 of FEA). This report, and the licensee's CSMP program/schedule, will serve as the basis for the Commission's further consideration of this issue. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **U.S. Fish and Wildlife Service** | |
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| 4. FWS has concerns related to the potential long-term impacts associated with the partially-constructed shoreline wall at Arrowhead Marina. Adjoining private property owners should be educated about the adverse effects these structures have on the environment, When warranted, penalties should be imposed for unauthorized structures and measures should be required for impact mitigation to deter similar actions. | The Commission has completed its investigation of the shoreline wall at Arrowhead (see pages 55 and 56 for results and required compliance measures). No penalties have been imposed for GRDA's permitting of this wall without the Commission's prior approval. However, this license violation has been entered in the Commission's compliance records for the project and will be considered in any future compliance proceedings. The licensee should consider including an educational element in its project CSMP (see page 52 for CSMP discussion), with the objective of informing interested stakeholders about the impacts of various shoreline activities and the measures that can be taken to help protect and enhance the project's shoreline resources. One of the action items GRDA has adopted to achieve preferred environmental conditions and preferred recreational experiences at Grand Lake is an educational effort designed to assist area residents and visitors in understanding the effect of their behaviors on water quality and recreation (see discussion of GRDA-adopted goals, objectives, and actions on page 52). A CSMP educational element would be consistent with this action item. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **U.S. Fish and Wildlife Service** | |
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| 5. Although the DEA addresses the cumulative impacts of shoreline development, FWS remains concerned about the lack of shoreline monitoring and the mitigation of development-related effects. Neither FERC nor GRDA have made any assessment of how much shoreline has actually been impacted or the extent that "less disturbed shoreline areas" remain. This information is crucial to efforts to protect habitat values. We recommend that cumulative impacts be monitored and that appropriate amounts of shoreline habitat be protected and enhanced to mitigate for unavoidable adverse effects. When wetlands are impacted, appropriate amounts of wetland habitat should be restored, created, or protected. | As stated in the DEA, the Commission considers the cumulative environmental impacts of proposed developmental actions in the context of individual non-project-use proceedings. As documented in this FEA, we analyze the incremental effects of a proposed action along with the effects of other past, present, and reasonable-foreseeable future actions and then evaluate measures to mitigate those effects. In making these analyses and evaluations, we take into account the comments of agencies with special interests and expertise in the resources affected. In order for this proposal-by-proposal approach to be successful, we expect the consulted agencies to provide site- and resource-specific information to support their recommendations. As noted in the Agency Consultation section of this EA, FWS has previously expressed the same general concerns stated here about cumulative effects, but has not provided any specific comments related to Arrowhead's proposal. We share FWS's general concerns about cumulative effects and consider the licensee's monitoring/reporting requirements, and its CSMP efforts (see our responses to FWS comments 1-4), to be the appropriate contexts for addressing these broad concerns on a project-wide basis. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Donald Read** | |
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| COMMENTS | RESPONSES |
| 1. The EA's scope only should have covered Arrowhead's partially-constructed wall. | The EA primarily addresses the environmental issues associated with Arrowhead's dock-expansion proposal. The Commission conducted a separate but related compliance review of Arrowhead's shoreline wall (see results of wall investigation on pages 55 and 56). |
| 2. Three mistakes were made when FERC visited Grand Lake in connection with its review of Arrowhead's wall and other pending cases: (a) the public were not allowed to accompany FERC's representative as its notice of the visit had indicated; (b) FERC should have obtained a suitable meeting place instead of holding two separate onsite meetings – one outside for agency representatives and the public and the other inside for members of Arrowhead's yacht club; and (c) no one from the complaining parties accompanied FERC's representative in a boat tour of Duck Creek cove, only GRDA personnel and Joe Harwood, the owner of Arrowhead Marina. (See pages 14 and 15 of DEA.) | Due to security and liability concerns expressed by the owner of Arrowhead Marina, access to the marina site was limited to two onsite meeting locations. Staff presented the same information at both meetings and opportunities for comments and questions were provided during both informational sessions. Only general and procedural matters were discussed during these meetings. No one was advantaged or disadvantaged, with respect to obtaining or providing information, as a result of holding two separate meetings. After the meetings, staff toured the marina site alone. However, all interested persons were able to accompany staff during a subsequent tour of the cove by land. During a later tour of the cove by water, only GRDA personnel were in the boat with staff. Other interested individuals accompanied staff during the water tour in separate boats. GRDA representatives and staff refrained from discussing the merits of any case under Commission review during the boat tour. |
| 3. There was no need for an EA. All that was needed was for FERC to examine Arrowhead's violation of COE's permitting requirements for the marina's shoreline wall. | As noted in our response to Read comment 1, this EA is for Arrowhead's dock-expansion proposal. Our review of Arrowhead's shoreline wall was conducted as a separate but related case (see wall investigation on pages 55 and 56). |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Donald Read** | |
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| 4. Section 3.0 of the EA has nothing to do with the complaints of the public. The EA should not have been developed in this fashion. | This EA, including descriptions of the proposed action and alternatives (section 3.0), follows the standard format and content for environmental review documents. Mr. Read misunderstands the purpose of this EA. The complaints the Commission has received regarding Arrowhead's shoreline wall have been addressed in another proceeding (see responses to Read comments 1 and 3). |
| 5. Read provides remarks about certain responses (and the lack of responses) to the Commission's notice of GRDA's Arrowhead application (see page 11 of DEA). Specifically, he: (a) questions the timing and factual content of some of these filings, and the filer's motives; (b) offers an explanation for the limited number of agency comment letters; and (c) characterizes the comments in one of these filings as pointing to violations of the licensee's lake rules. | Comments noted. |
| 6. On page 15 of the DEA it is stated that at the two onsite meetings at Arrowhead Marina, three aids to two U.S. Senators and a U.S. Congressman were present. Not so. Those three individuals were ushered inside by a marina person so the public could not inform them. | Mr. Read incorrectly interprets what is stated on page 15 of the DEA. The actual statement reads: "Approximately 110 individuals participated in the two informational sessions, including: ... (3) staff from the offices of U.S. Senators Don Nickles and Jim Inhofe and Congressman Brad Carson ... ." This statement is intended to give a summary of the session participants, collectively, and is not intended to mean that all the participants attended both sessions. (See response to Read comment 2.) |
| 7. Why consider Arrowhead's fuel-tank and waste-treatment improvements? (See section 5.2.) | These improvements are considered, along with Arrowhead's proposed action, in our analysis of cumulative impacts (see footnote 12). |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Donald Read** | |
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| 8. Read makes comments similar to those received in previous filings regarding the impacts of large boats on shoreline erosion and the displacement of wildlife habitat by shoreline development (see section 5.2.1). | Comments noted and considered. |
| 9. Read provides general comments about the permitting of walls and dredging at the project and the effects of these structures and activities on terrestrial resources (see section 5.2.1). | Comments noted and considered. |
| 10. Read provides general information and personal observations about the lake's existing aquatic resource conditions and some of the major contributing sources of water pollution at the lake. He agrees with the DEA's wetlands analysis. (See sections 5.2.2 and 5.2.3). | Comments noted and considered. |
| 11. Read provides information about the presence of bald eagles in the project area, supported by his personal observations (see section 5.2.4). | Comments noted and considered. |
| 12. Read expresses personal opinions and viewpoints related to the DEA's analysis of effects on recreation and other land and water uses (section 5.2.5). Regarding boating use and navigational safety, he complains about the lack of enforcement of GRDA's lake rules. Regarding shoreline access, he disagrees with the DEA's conclusion that the third tier of the wall at Arrowhead would have no effect on public access to project shorelands. Regarding reservoir flowage, he expresses his concern that Arrowhead's wall is the type of encroachment that will be repeated at other shoreline sites, if permitted to remain. Also, he notes that an additional COE permit will be needed for filling behind the wall. | Comments noted and considered. With respect to the effect of Arrowhead's wall on public access, the DEA concludes that the shorelands fronting the marina are generally unsuitable and undesirable for public recreation due to safety and security concerns. These access conditions existed prior to construction of the first two tiers of the wall, given that the marina was previously permitted to use and occupy this shoreline area for commercial facilities and operations. Construction of the wall's third tier would not change these pre-existing conditions. (See related responses to Read comments 1, 3, and 4.) |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Donald Read** | |
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| 13. Read criticizes the use of staff's onsite observations as the basis for conclusions given in the cultural resources section of the DEA (section 5.2.6). | The agency-consultation and cultural-resource sections of the EA have been revised to include the SHPO's June 19, 2001 consultation letter. The conclusions given in the EA's cultural resources section are based on the results of SA and SHPO consultation. Statements related to staff observations of the marina site are intended to confirm these conclusions. |
| 14. Read expresses personal opinions and viewpoints concerning the DEA's analysis of effects on landscape aesthetics (section 5.2.7). His comments focus primarily on the appearance of the shoreline wall and boating-related noise. He again complains that GRDA's lake patrol is inadequate to enforce the licensee's existing lake rules. | Comments noted and considered. |
| 15. Read expresses personal opinions and viewpoints regarding the DEA's analysis of socioeconomic effects (section 5.2.8). He generally contends that the analysis gives too much attention to the beneficial aspects of marina developments, in terms of employment, tax revenues, tourism, and property values, and neglects the developmental benefits of home and residential property owners. | Comments noted and considered. The EA presents an objective analysis of both the beneficial and adverse socioeconomic effects of the proposed marina improvements. This includes a balanced consideration of competing public and private property interests. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Donald Read** | |
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| 16. Read expresses personal opinions and viewpoints regarding the DEA's consideration of action alternatives (section 5.3). Specifically, he contends that: (1) placing aquatic habitat structures "at the base of Arrowhead's shoreline wall" gives tacit approval to the wall; (2) no one could force Arrowhead to adopt the "very good idea" of making alterations to the proposed dock layout plan; and (3) the contingency measures for archaeological-resource discoveries would not work without a field archaeologist being present. | The aquatic-habitat alternative is to mitigate for lost habitat resulting from removal of the marina's breakwaters and recent dredging and wall-construction work at the marina. The EA states that the recommended habitat structures could be placed at the base of the wall or at another selected site. Decisions regarding the disposition of the wall have been made independent of this mitigative measure (see shoreline wall investigation on pages 55 and 56). As stated in footnote 4, Arrowhead's proposed dock improvements can only be permitted if the Commission approves GRDA's application. We would expect the permit grantee to take necessary and appropriate steps to effectively implement our recommended archaeological-contingency measures. |
| 17. Read expresses personal opinions and viewpoints regarding the DEA's conclusions and recommendations section (6.0). He characterizes this section's summary table of environmental effects as "just a piece of paper to defend the marina owner." He contends that the statement that "all project shorelines are owned by GRDA," as found on page 45 of the DEA, is incorrect. Regarding this section's findings, he states "it is apparent that the illegalities [of Arrowhead's shoreline wall] are being pre-approved by the use of an EA, the wrong vehicle." | Comments noted and considered. The environmental-effects table, which summarizes the results of our impact analyses, is used as the basis for the findings in section 6.3 of this EA. The statement that all project shorelines are owned by GRDA has been deleted from our evaluation of FWS's habitat-protection recommendation (page 46 of FEA). As stated on page 2, this FEA will be used to support the Commission's decisions on GRDA's non-project-use application for Arrowhead's dock-expansion proposal. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Donald Read** | |
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| 18. Read expresses personal opinions and viewpoints concerning the DEA's section on other assessment results (section 6.4). Regarding the moratorium issue, he asserts that enough data on carrying capacity is already available to take action on the requested commercial-permitting moratorium, instead of waiting for the licensee's first monitoring report. He further asserts that the stated purpose of a comprehensive shoreline management plan is the reason why a moratorium on commercial permitting should be in effect until such a plan is in place: to provide a tool for the proper use, conservation, and development of reservoir shorelines managed by a project licensee (see page 51 of DEA). Regarding our investigation of Arrowhead's shoreline wall, he asserts that the Commission should be investigating whether the marina owner had obtained the necessary permits from COE and the Delaware County Floodplain Administrator, not a permit from GRDA. | Comments noted and considered. The DEA recommended a moratorium on non-project-use applications that was limited to Duck Creek cove and to the time period needed for the Commission to complete its review of GRDA's first monitoring report (see page 51 for a description of the licensee's monitoring and reporting requirements) . However, after further consideration, we conclude that Commission decisions on such applications should continue to be based on the merits of each proposal, rather than on a moratorium of arbitrary geographic scope and indefinite duration (see page 52 of FEA). Conclusions as to whether a more aggressive management approach is needed at the project will depend on the results of the Commission's review of GRDA's monitoring reports and other deliberations. Regarding Arrowhead's shoreline wall, the focus of our investigation was the licensee's compliance with the terms and conditions of its project license. As licensee, GRDA is responsible supervising and controlling the non-project uses and occupancies of project lands and waters for which it grants permission. These responsibilities are separate and independent from the permitting requirements and actions of other regulatory authorities. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Oklahoma Department of Wildlife Conservation** | |
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| COMMENTS | RESPONSES |
| 1. ODWC supports most of the Commission's recommendations in the DEA; however, it would like to see more consideration given to the mitigation of impacts to terrestrial habitat, the loss of public shoreline access, and the coverage of public waters with private docks. Construction of the shoreline wall at Arrowhead, and the subsequent backfilling behind the wall, has allowed for the conversion of public lands to private property and will lead to additional habitat loss unless adequate mitigation is required. ODWC disagrees with the "no impact" rating given to the issue of shoreline access in the DEA's summary table of environmental effects (section 6.1), and suggests that this rating should be moderate, adverse, and long term. | Regarding ODWC's comments concerning terrestrial habitat, public access, and Arrowhead's shoreline wall, see responses to FWS comments 1, 2, and 4 and Read comment 12. Recognizing that the shoreline segment currently occupied by the wall may have been marginally accessible to the public before the wall was constructed, the impact rating for shoreline access in the FEA's summary table has been changed to minor, adverse, and long term. As stated on page 1 of the FEA, the purpose of the proposed docks is to accommodate the demand of the boating public. Also, as indicated on page 5, most of the proposed boat slips would be available for public rental. The Commission's review of commercial dock applications involves the weighing of tradeoffs in the public interest. These tradeoffs include benefits in the form of additional and improved docking facilities to meet public demand and costs in the form of uses and occupancies of project lands and waters. On balance, the public benefits of approved recreational-development applications are considered to outweigh their environmental costs. |
| 2. ODWC agrees that the continuing displacement of public access to project lands and waters by dock installations is an issue that could be addressed by a CSMP for Grand Lake. Such a plan should be completed and implemented as soon as possible by establishing strict deadlines for preparing the plan in a timely manner. | See responses to FWS comments 2 and 3. |

| **Oklahoma Department of Wildlife Conservation** | |
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| 3. OWDC is encouraged by the effort to address cumulative impacts in the DEA and suggests that detailed guidelines and requirements be set to implement the action alternatives recommended in the DEA. | Comments noted and considered. |

| **Cheryl Lenhart** | |
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| COMMENTS | RESPONSES |
| 1. Lenhart makes several comments that are similar to those already attributed to her and others in the environmental analysis sections of the EA. | Comments noted and considered. |
| 2. Arrowhead's shoreline wall is not shown in the DEA. A survey, rather than Arrowhead's drawings, is needed to accurately show how the proposed docks protrude into Duck Creek. It is impossible to see the true impact that this giant mass of docks will have, or how it will affect the residents in the immediate vicinity of the marina. The pictures of the Arrowhead expansion in the DEA do not depict the roofs on the docks and show no similarity to what they are really going to look like. | The shoreline wall is shown in figure 3 of the EA. Figure 5 of the EA shows the general setting of Arrowhead's proposed improvements and the proposed dock-expansion footprint in relation to the marina's surroundings. Also, as noted in the EA, Commission staff toured Duck Creek cove and took photographs of the marina from various locations during a recent project visit. These site observations were considered in our analysis of the aesthetic and other environmental effects of Arrowhead's proposal. On page 5 of the EA, we note that the proposed perimeter-dock facilities would have the same design features as the marina's most recently constructed dock, including sheet-metal roofing. The facility layout drawing in GRDA's application indicates that Arrowhead's courtesy- and service-dock slips would not be covered. (See related response to DCHA comment 7.) |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Cheryl Lenhart** | |
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| 3. If the proposed dock expansion is allowed, will the homeowner on the opposite shore be permitted to use his 125-foot allowance? | Boat-traffic congestion and navigational safety would continue to be important factors to consider in deciding whether, and under what conditions, to permit additional docks in this area. As noted in our analysis of effects on boating and navigation, further boat-traffic restrictions might be required if any additional docks were permitted in this area in the future. Also, this analysis notes that it might be necessary impose restrictions on any additional docks in this area, due to increased traffic and safety concerns. |
| 4. The public access to the lake that is located immediately north of the marina has been closed with a cable and lock. The public can no longer put their boats into the water at this location. | According to GRDA, this previous boat-access point has been closed for a number of years due to hazardous road-gradient conditions. Also, the licensee has confirmed that this previous access site is not one of the public boat launches referenced in the project recreation plan . References to this facility as being an active boat-launch site have been deleted from the EA. |

| **Cheryl B. Creekmore** | |
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| COMMENTS | RESPONSES |
| 1. Creekmore makes several comments that are similar to those already attributed to her and others in the environmental analysis sections of the EA. | Comments noted and considered. |
| 2. You will be setting a precedent for anyone else desiring to "add" to their property without buying any land, if the proposed expansion is permitted. I am requesting that you not approve GRDA's application. | See response to ODWC comment 1. In our judgement, the positive aspects of Arrowhead's staff-modified proposal outweigh its negative environmental consequences (see Findings on page 49). |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Cheryl B. Creekmore** | |
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| 3. Creekmore comments about the apparent disparity in how GRDA's dock-placement rules are applied to homeowners and marina owners. She cites Arrowhead's dock-expansion proposal as an example of how these rules are continuing to be ignored for commercial developments. | While GRDA did not expressly waive its dock-placement standards in the commercial-use application for Arrowhead, the facility layout drawing in this application reflects the fact that these standards were not applied to Arrowhead's dock-expansion proposal. The Commission considered such waivers to be implicit in this drawing and has based its independent review of GRDA's application on the merits of Arrowhead's proposal. Section 3.4 of this EA considers an alternative to Arrowhead's proposal that applies the above standards to the proposed dock expansion. This alternative has been eliminated from further analysis due to greater development costs, unacceptable levels of environmental impact, and excessive conflicts and encroachments with respect to other shoreline uses and occupancies. As stated on page 54 of the FEA, the question of whether GRDA can or should continue its practice of granting such waivers involves considerations of legal rights and capacity and Commission policy which are beyond the scope of this environmental assessment. However, it would be beneficial for GRDA to fully explain the reasons for any such waivers in its non-project-use applications to the Commission. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Annette O. Willis** | |
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| COMMENTS | RESPONSES |
| 1. In order to enjoy and protect the beauty of Duck Creek cove, and to promote the cove's recreational safety and functionality, let it remain in its present state. | This EA considers the no-action alternative, which would essentially maintain the status quo with respect to Arrowhead's docks (see sections 3.3 and 5.4). In our judgement, the net benefits of Arrowhead's dock-expansion proposal, as modified by staff's recommended measures, outweigh the alternative of taking no action (see Findings on page 49). |
| 2. GRDA admits that all seven marinas on Duck Creek cove are at full capacity. That definitely means that the cove has already been maximized to the limit. | GRDA says that all existing marinas on the lake, including those recently constructed, are operating at maximum capacity (see Purpose and Need for Action on page 1). This means that the docking facilities are at fully capacity, not the cove. However, we agree that certain areas of the lake, including Duck Creek cove, may be approaching carrying-capacity limits for boating-related facilities and activities (see Carrying Capacity on pages 50 and 51). |
| 3. The addition of boulders or riprap at the base of the marina's wall will put fish at risk from the trapped oil and gas spills from the docks. | We recommend in the EA that riprap, boulders, or other aquatic-habitat structures be placed along the base of the wall or at another appropriate location selected in consultation with OWDC and with GRDA's approval. We agree that the potential risks to the fishery should be considered along with potential the benefits in selecting a suitable site for these habitat structures. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Annette O. Willis** | |
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| 4. The proposed dock improvements not only take up double the waterway area, but also add 64 slips in an already congested cove. This improvement will generate more noise, pollution, and safety concerns, which gives it a negative picture. Allowing the proposed docks to protrude more than halfway into the cove is inconsiderate, given that there is only 25 feet left for dock additions on the opposite shore rather than the 125 feet allowed. | These adverse impacts have already been analyzed and evaluated in the EA. As noted in the environmental analysis section, only about 25 feet of open water remains available between Arrowhead's existing dock and the opposite shore after subtracting the cove's boat-traffic lanes and GRDA's idle-power-zone requirements. The analysis section also notes that GRDA would have to impose further boat-traffic restrictions for a short distance through the narrowest point between the proposed dock-expansion footprint and the opposite shore, where a residential dock already exists. As indicated in our response to Lenhart comment 3, boating congestion and navigational safety would continue to be important considerations in the permitting of any additional docks in this area in the future. |
| 5. Willis makes several other comments that are similar to statements already considered in the analysis section of the EA regarding boat-traffic congestion and traffic controls in Duck Creek cove, the visual and other environmental impacts of Arrowhead's shoreline wall, and the aesthetic and other environmental effects of Arrowheads proposed dock expansion. | Comments noted and considered. |
| 6. What does one do when the cove is filled to capacity because of the density of boats and homes? You stop giving permits and don't cause a choking effect. The environmental problems must be solved rather than added to. Let there be balance because we are all environmental enthusiasts, recreational users, and stakeholders who are interested in good overall recreational planning. | See responses to Read comment 18 and Brady comment 2. As noted on page 54 in our comprehensive shoreline management plan discussion, we agree that it is important to achieve an appropriate balance among all major stakeholders in any comprehensive planning activity. Instead of various stakeholders being pitted against one another, they must recognize their common interests and work together to maintain the lake's long-term viability. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Janette O. Layne** | |
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| COMMENTS | RESPONSES |
| 1. Layne expresses personal opinions and viewpoints regarding the legality of Arrowhead's shoreline wall and dock-expansion proposal. | Comments noted and considered. |
| 2. Layne expresses personal opinions and viewpoints regarding the demand for and distribution of commercial docks, the trend toward larger docks and slips, and the socioeconomic consequences of expanded marina developments. | Comments noted and considered. |
| 3. The facility layout drawings included in the DEA show no dimensions, roof heights, cove widths, adjacent property lines, opposite shorelines, dock dimensions, slip sizes, etc. How can determinations on the need and legality of the proposed dock expansion be made without this information. | See response to Lenhart comment 2. The proposed layout drawing of the Arrowhead's docks, and staff's dock-layout alternative (EA figures 2 and 4, respectively), are both dimensioned. Both of these drawings also show the size of the slips and fingers. As stated on page 31 of the DEA, the eve heights of the roofs covering the existing and proposed perimeter docks range from 24 to 32 feet above the water's surface. Also, the layout drawing in the application is labeled to show which docks would be covered (i.e., the perimeter docks). The width of the cove at Arrowhead Marina is described and analyzed in relation to the existing and proposed docks on pages 16, 28, and 32 of the DEA. |
| 4. Layne expresses personal opinions and viewpoints about the effects that the seven commercial marinas in Duck Creek cove have on recreational use of the cove. She says the licensee has established no-wake zones the entire length of the cove. | Comments noted and considered. As noted on page 27 of the DEA, GRDA has implemented a number of boat-traffic-control measures in the cove, including traffic lanes and no-wake zones. However, no-wake zones have only been established in the most constricted/congested areas, not the cove's entire length. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Janette O. Layne** | |
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| 5. Layne questions whether there is an adequate labor force for the employment benefits attributed to Arrowhead's proposal to be realized. | We consider the additional employment benefits of Arrowhead's proposal to be a reasonable expectation, given the size of the local-community labor force. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Judith A. Read** | |
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| COMMENTS | RESPONSES |
| 1. Read provides details about the procedural steps required to obtain permits and approvals from the Federal Emergency Management Agency and the Delaware County Floodplain Board for the construction of shoreline walls at the project. She suggests that the information that results from this process would be helpful in our review proceedings. | Comments noted and considered. |

| **Sierra Club** | |
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| COMMENTS | RESPONSES |
| 1. The club expresses its concerns about the cumulative environmental impacts of commercial and residential development at Grand Lake and GRDA's alleged failure to monitor and mitigate the cumulative effects of shoreline developments like Arrowhead's proposal. | Comments noted and considered. See responses to FWS comments 2 and 5. |
| 2. The club requests the Commission to: (a) impose a moratorium on future non-project development requests until a shoreline management plan is developed; (b) require GRDA to implement a review and monitoring system to assure future compliance with the shoreline management plan; and (c) require GRDA to implement specific practices aimed at mitigating shoreline erosion and loss of wildlife habitat and wetlands. | See responses to FWS comments 1 and 5 and Read comment 18. |

| **Duck Creek Homeowners Association**<br>(three filings) |
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20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association**<br>(three filings) | |
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| COMMENTS | RESPONSES |
| 1. DCHA provides a series of statements which its says are facts that may not have been available to the preparers of the DEA and that may have an influence on some of the Commission's conclusions in this case. These statements pertain to what DCHA asserts are: (a) errors in GRDA's application; (b) clarification of rights to access and use the project's shorelines; and (c) corrections to statements in the DEA made by the licensee and the Commission. | We have reviewed DCHA's statements and find that they contain no information on the facts in this case that was not already available and discernable through our examination of the public record for this project and our observations during a recent project visit. We respond to other comments made by DCHA concerning the licensee's application, shoreline-related rights, and the DEA in a sequential manner following our response to this comment. |
| 2. DCHA lists several items which it contends are deficiencies in GRDA's application pursuant to the requirements under Appendix B of the project's recreation plan. Appendix B to this plan is the Rules and Regulations Governing the Use of Shorelands and Waters of GRDA (GRDA's Lake Rules and Regulations). | Some of the items in DCHA's list pertain to the requirements in GRDA's Lake Rules and Regulations for obtaining a commercial-use permit from the licensee. While a permit applicant – not GRDA – is subject to these requirements, an application from the licensee must be sufficient for the Commission to make an informed decision on the merits of a proposed non-project use. We reviewed GRDA's application for adequacy and obtained additional information that was needed to complete our assessment of Arrowhead's proposal. |
| 3. DCHA asserts that absent specific waivers of the dock-placement provisions in GRDA's Lake Rules and Regulations, a private landowner's right to encroach into the project is limited to these provisions. DCHA further asserts that no citizen, private developer, or otherwise should expect free transfer of highly valuable public property to totally private use without consideration of the rights embodied, limited, and protected in these rules and regulations. | While the project license requires the licensee to allow the public free access, to a reasonable extent, to project lands and waters for recreational and navigational use, private access to and use of project shoreline areas by adjacent property owners is a privilege – not a right – that the licensee has the discretion to grant or deny, with appropriate conditions, subject to Commission review and approval [e.g., see Alcoa Power Generating, Inc., 93 FERC ¶ 61,152 at p.61,48 (2000) and South Carolina Electric and Gas Co., 95 FERC ¶ 61,351 at footnote 13 (2001)] . |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association**<br>(three filings) | |
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| 4. DCHA contends that contrary to GRDA's claim that all existing marinas on the lake are operating at maximum capacity, the marinas are not currently full (DEA, Section 2.0). Weekly newspaper adds for available slips and vacancies observed at Thunder Bay and Harbors View Marinas during an October 2002 survey are cited as examples that excess capacity presently exists. | While the licensee did not qualify its statement about the current supply-and-demand situation for commercial docks, we understand there may be a marginal amount of dock capacity available at any given time due to seasonal use patterns, cyclical turnover rates, and other market conditions. Given these variables, we consider GRDA's statement regarding additional docking needs to be valid. |
| 5. Septic systems and treatment facilities are outside the project boundary and jurisdiction (DEA, Section 3.1). | See response to Read comment 7. |
| 6. Multiple permit violations and omissions are pending action on Arrowhead's wall (DEA, Section 3.1). | See response to Read comment 1. |
| 7. Neither of the drawings in figure 3 of the DEA bear any resemblance to the intended docks. | The caption to figure 3, and our reference to this figure on page 5, indicate that the drawings in this figure are intended to show marina's yacht-club improvements, not Arrowhead's dock-expansion proposal. We have included a note in the EA indicating that the drawings in this figure do not accurately depict Arrowhead's expanded dock facilities, as proposed. (See response to Lenhart comment 2). |
| 8. DCHA contends that the DEA contains misleading statements by GRDA regarding procedural requirements in its application and states that there is no solace in the fact that GRDA's Lake Rules and Regulations provide for the removal of non-complying facilities (DEA, Section 3.1). | Comments noted. See response to DCHA comment 2. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association**<br>(three filings) | |
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| 9. DCHA objects to GRDA's statement that it had waived the dock-placement provisions of its Rules and Regulations "many years ago" for Arrowhead Marina (DEA, Section 3.1). DCHA contends that GRDA's failure to properly waive these provisions for Arrowhead's current proposal deprived the public of critical information at the time public comments were taken and voids the application submitted to the Commission. | GRDA states in its application that Arrowhead's dock-expansion proposal "involves the granting of a commercial dock permit as contemplated by Article IV of GRDA's Lake Rules and Regulations." While GRDA did not expressly waive the dock-placement requirements of Article IV in the subject application, the dock layout drawing included in the application reflects the fact Arrowhead's proposed facilities were not held to these standards. We considered such waivers to be implicit in this drawing, which contains no GRDA-imposed changes with respect to dock location, dock length, slip orientation, or slip size (see page 7 of EA). Our notices of the application, of the Commission staff's related visit to the project, and of the DEA for the application have provided adequate opportunities for the public to be informed about Arrowhead's proposal, for public involvement in the Commission's review process, and for public input on relevant issues. We have based our independent assessment of the application on the merits of the proposal, with careful consideration given to all competing interests and concerns. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association**<br>(three filings) | |
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| 10. DCHA presents two additional dock-layout alternatives for consideration: a closed-perimeter layout and an open-bay layout. Both layouts limit the protrusion of the docks to 1/3 of the cove, as measured from elevation 750 feet (PD), in order to reduce the loss of navigable water. Both layouts also eliminate the external slips along the southern-most dock of Arrowhead's layout in order to reduce navigational-safety hazards, recreational-use conflicts, and adverse aesthetic effects. | We have evaluated DCHA's layout alternatives and conclude that their respective environmental benefits do not outweigh the recreational-facility tradeoffs that would result. The closed-perimeter layout eliminates 61 slips, or 95 percent of the total net slips Arrowhead proposes to add, including 28 of the 73 slips in Arrowhead's proposal that are 40 feet or longer. Also, this alternative substantially reduces and constricts the open spaces, or areas of access, between the layout's perimeter and interior docks, significantly affecting the safe ingress/egress of boats. The open-bay layout eliminates 35 slips, or more than 50 percent of Arrowhead's proposed net additions, including 48 (two-thirds) of the 40-foot-or-longer slips in Arrowhead's proposal. Also, this layout creates multiple openings, or points of access, to the layout's perimeter and interior docks, adding significant navigational-safety concerns and exposing the docks, slip fingers, and moored boats to wake and wave damage. In our judgment, there is adequate space between the southern-most dock and the opposite shoreline to compatibly accommodate this dock's external slips, as proposed in Arrowhead's layout (see figure 5). However, we have revised the EA to reflect our agreement with DCHA's suggestion of reorienting the three large, external slips in the northeast corner of Arrowhead's layout for safety reasons (see page 48 of EA). |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association**<br>(three filings) | |
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| 11. DCHA says that if commercial applicants were required to adhere to GRDA's dock-placement rules, free-market forces would cause other facility site alternatives to become more economically attractive and viable. This, in turn, would result in less concentration of commercial development and greater dispersion of environmental impacts. DCHA notes that the reasons given for eliminating the alternative considered in Section 3.4 of the DEA are also the factors that set shoreline property values and that allow free-market forces to regulate shoreline development and use. Regarding each of these reasons, or factors, DCHA further notes that: (a) near-shore dredging is a requirement related to natural site conditions, which impact the development feasibility and valuation of a site; (b) additional on-shore development to secure and provide access to the docks would occur on private, non-project land outside the Commission's jurisdiction; (c) greater construction and maintenance costs is a debatable issue that is outside the Commission's jurisdiction; (d) unacceptable impacts on natural and scenic resource values is a viable consideration, but DCHA contends that Arrowhead's proposal would be more disruptive to natural and scenic resources; and (e) excessive conflict and encroachment is only a relevant factor if the use or occupancy is in violation of standing law or established rules and regulations. | Section 3.4 of the EA analyzes the economic and environmental consequences of applying GRDA's dock rules to Arrowhead's proposal. While these rules are appropriate for smaller developments, this analysis shows that their application to larger commercial facilities is not conducive to achieving GRDA's stated intent of minimizing travel obstructions and encroachments on both project lands and project waters (see page 41 under *Commercial Dock Distribution*). Also, this analysis is indicative of the reasons why GRDA normally waives these rules for such proposals (see page 7), regardless of their shoreline location. As indicated in our responses to other comments related to facility siting issues (e.g., see B.A.S.S. Federation comment 8), comprehensive controls are needed to properly balance the competing economic and environmental factors involved in managing the use, conservation, and development of the project's shorelines. Regarding the specific factors considered in our Section-3.4 analysis, we agree with DCHA's comments on dredging, but disagree with its views on development costs and impacts. Also, we consider additional on-shore development needs and excessive conflict and encroachment to be relevant factors, regardless of where such development occurs and whether such conflicts and encroachments are formal violations. (Also see related response to Creekmore comment 3.) |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association**<br>(three filings) | |
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| 12. GRDA's non-project-use application didn't include Arrowhead's wall. Therefore, ODWC and other agencies had no jurisdiction on which to comment. The application's inaccuracies and omissions are the primary reason for the lack of public or official response. GRDA didn't have Arrowhead's wall in their file for viewing at the time it placed notices of Arrowhead's permit application in local newspapers. The public had insufficient information on which to comment. In addition, GRDA's notice of Arrowhead's proposal wasn't carried in the Tulsa World, the predominant newspaper for the majority of users affected. The above comments also apply to the Commission's notice of GRDA's application. | See response to DCHA comment 9. The Commission's site-visit and Draft-EA notices were placed in the Tulsa World newspaper. These notices and the Commission's notice of application also were place in other local-area newspapers. |
| 13. The Congressional officers who have written in support of Arrowhead's proposal might write differently today. No additional Congressional letters have been posted to the FERC FERRIS site since DCHA's presentations on this proposal in their offices. | Comment noted. |
| 14. Late intervention must be granted [to Mike Brady, DCHA president] for the reasons stated. | Late intervention has been granted (see page 14). |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association** (three filings) | |
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| 15. With the contour changes resulting from Arrowhead's shoreline wall, which is footed at approximately elevation 739 feet, the width of the cove at elevation 750 feet is narrowed at the marina site by approximately 66 feet (750'-739' = 11' x 6' horizontal/1' vertical = 66' horizontal change). End result: less public recreational and navigational water. | As indicated on page 30, we estimate that the vertical face of the first tier of Arrowhead's shoreline wall is located approximately were contour elevation 744 feet previously existed before the wall was constructed. Based on this estimate, we calculate that the 750-foot contour elevation has been moved about 36 feet, not 66, toward the water as a result of Arrowhead's shoreline wall (750'-744' = 6' x 6' horizontal/1'vertical = 36 feet. We have revised the EA to reflect this change. Although this change reduces the overall width of the cove (see revision on page 17), as well as the measured distances that Arrowhead's existing and proposed docks protrude into the waterway (see revisions on pages 29 and 47), it does not reduce the amount of open water available for public recreation and navigation, as DCHA contends. This is because the actual location of the docks in relation to the opposite shoreline has not changed; the only change is to the near-shore point of measurement. |
| 16. DCHA provides comments similar to those already considered in the EA regarding the effects of development activities and wave action on shoreline erosion. | Comments noted. |
| 17. Without Commission review of Arrowhead's stormwater management plan, this plan should be given no weight in the Commission's deliberations. | Our evaluation of Arrowhead's proposal appropriately takes into consideration the beneficial effects of its stormwater management plan on shoreline stability, soil erosion, water quality, and lake-bed sedimentation. |
| 18. It is inaccurate to state that the proposed dock improvements will not result in more loss of habitat. | This statement is made in the context of our analysis of effects on wildlife and riparian habitat from the proposed docks. Since the docks, themselves, would not cause any disturbance to, or displacement of, terrestrial resources, we consider this statement to be accurate. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association** (three filings) | |
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| 19. What is considered "immediate" in the Commission's statement that no wetlands occur in the immediate vicinity of Arrowhead Marina? National Wetland Inventory maps show wetlands within one mile of this location. | Within one-quarter mile of the marina site. |
| 20. DCHA provides the results of its own survey conducted last year of private boat slips located north of Arrowhead Marina South. | Survey results noted. |
| 21. DCHA provides comments on the cause-and-effect relationship between boat-traffic congestion and accident/fatality rates. | Comments noted. |
| 22. By the Commission's own calculations, only 25 feet remain for private dock development on the far shore opposite the proposed docks. GRDA's Lake Rules entitle this far-shore owner 125 feet for dock placement without a waiver. If he were to apply for the full 125-foot protrusion to which he is entitled, it could not be granted because of Arrowhead's expansion. | See responses to Lenhart comment 3, Willis comment 4, and DCHA comment 3. Without a waiver, GRDA's dock-placement rule limits docks and other floating structures, including attachments, to a <u>total maximum length</u> of 125 feet or one-third of distance from shoreline to shoreline, whichever is less (underline added for emphasis). Accordingly, a private dock less than 125 feet long, including attachments, would be consistent with this rule. |
| 23. Referring to the effects of Arrowhead's wall on public access, DCHA states that the public's right to access the shoreline should not be claimed or removed without due process and consideration to the state. DCHA contends that the Commission is incorrect in its finding that this wall has not appreciably affected public access to project shorelands. | See responses to FWS comment 2, Read comment 12, and ODWC comment 1. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association**<br>(three filings) | |
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| 24. Referring to the DEA's statement that COE manages flowage-easement lands around Grand Lake for flood control, DCHA says these COE easements go as high as elevation 759 feet. DCHA claims that the volumes of lost impound given in the DEA from Arrowhead's wall are incorrect and should be recalculated because the COE's easement at the marina goes to elevation 757 feet, not 755. | Comments noted regarding the extent of COE's flowage easements. Our calculations of lost flood-pool storage capacity are correctly based on the storage volumes actually displaced by the wall's three tiers, and the associated backfill amounts behind these tiers, not the extent of COE's flowage-easement lands occupied by the wall and backfill. |
| 25. Considering all the uncontested facts in this case, the licensee and the Commission seem to be admitting that Duck Creek cove is over carrying capacity; unsafe; and compromised navigationally, scenically, and in the types of uses allowed. So what's another 65 large yachts in a cove so overdone already. | As stated on page52, the levels of recreational use and shoreline development described in this EA indicate that the resources of Grand Lake's Duck Creek arm are approaching carrying-capacity limits for boating-related facilities and activities. Given this situation, the Commission will intensively scrutinize any future non-project proposals involving this cove with respect to their effects on preferred environmental conditions and preferred recreational experiences. |
| 26. DCHA provides its opinions and viewpoints on the comments of SJC (attorney for Arrowhead), and of Jack Lenhart, regarding the effects of Arrowhead's proposal on boating use and navigational safety. | Comments noted. |
| 27. DCHA contends that the DEA's calculation of the space occupied by Arrowhead's dock-expansion footprint is incomplete because it doesn't include the walkways. | Our calculations compare the areas occupied by Arrowhead's existing and proposed docks. Neither of these calculations include the walkways to these docks because the area occupied by the walkways is common to both footprints. |
| 28. DCHA comments on the DEA's analysis of factors that contribute to the visual obstruction of covered boat slips. | Comments noted and considered. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association** (three filings) | |
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| 29. DCHA discusses the navigational-safety concerns associated with Arrowhead's proposal to install three, 99-foot-long slips in the northeast corner of its dock layout. | See response to DCHA comment 10. |
| 30. Can the EA's recommendation that GRDA consider including other noise-specific provisions in its rules and regulations be made a requirement. Ambient and incident noise-level testing by trained technicians with a Class 1 noise-level meter that meets ANSI 51.4-1983, IEC 651-1979, AND IEC 804-1985 should be required. Noise-level criteria should be less than 75 dba at 50 feet and at one-half maximum engine RPM. Tests should be performed prior to slip rental and a sticker provided upon satisfactory passage. | Decisions on requiring boaters on Grand Lake to comply with additional noise-control measures are left to the licensee. However, we expect GRDA to give serious consideration to implementing such measures, including the specific recommendations included in DCHA's comments. |
| 31. In reference to a comment in the DEA attributed to Brady and others regarding Duck Creek property values, DCHA says that Brady has never stated that property values have gone down. According to DCHA, Brady has stated that Duck Creek property values have increased less than comparable properties with equal access to Tulsa which are not in Duck Creek or located close to marinas. | Comment noted. In an August 30, 2001 letter to the Commission, filed September 7, 2001, Mr. Brady states, in reference to the loss of scenic beauty resulting from the "non-compliant permitting" of docks in Duck Creek cove, that there has been a "general lessening of property values for all Duck Creek homeowners ... ." However, we have revised the FEA to reflect DCHA's comments regarding statements attributable to Brady. |
| 32. DCHA understands the moratorium recommended in the DEA to mean right now and not after the permitting of Arrowhead's or Thunder Bay's proposed docks. The requests for moratoriums are the result of observations and conditions which exist currently. | See response to Read comment 18. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Duck Creek Homeowners Association**<br>(three filings) | |
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| 33.DCHA provides comments on the character and makeup of the Grand Lake Advisory Commission, which it contends is "hopelessly compromised with conflicts of interest" in regard to carrying out its mission of advising GRDA on lake-related issues; providing a forum for interested persons to address environmental, recreational, and economic-development concerns; and obtaining input from lake enthusiasts, property owners, and business persons. | Comments noted and considered. |
| 34. DCHA says the procedure and legality of Arrowhead's shoreline wall is still in question. DCHA provides information and opinions on GRDA's permitting of the wall and what it contends was a "land swap" with Arrowhead to accommodate the wall. | As stated on page 56, the Commission has completed its investigation of Arrowhead's shoreline wall. As a result of this compliance review, we have required GRDA to file an after-the-fact application for the subject lands conveyed to Arrowhead. |
| 35. DCHA provides its opinions and viewpoints on a number of other issues addressed in the DEA, including several suggested changes to the impact-rating table. | Comments noted and considered. The impact ratings given in the FEA are based on our consideration of both the intensity and context (i.e., significance) of the effects that would be caused by Arrowhead's proposal with respect to each of the resource issues analyzed. None of DCHA's suggested changes to these ratings are considered warranted. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Janie Brady** | |
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| COMMENTS | RESPONSES |
| 1. Brady expresses personal opinions and viewpoints about Arrowhead's dock-expansion proposal as it relates to GRDA's lake rules and regulation. She contends that commercial marinas should be held to the same dock-placement standards that are applied to residential dock applicants. | See response to Creekmore comment 3. |
| 2. Brady provides general comments similar to those already considered in the environmental-analysis section of the DEA. She contends that Duck Creek cove cannot support any more boats of the size that would be accommodated by Arrowhead's dock-expansion proposal. | Comments noted and considered. See responses to Willis comment 2 and DCHA comments 25 and 35. We recognize that each dock and boat that is added to the cove contributes to the cove's overall recreational and environmental load. We also recognize that as docking facilities and boating activities in the cove reach carrying-capacity thresholds, each incremental addition elicits a greater amount of concern in terms of its effect on maintaining preferred recreational experiences and preferred environmental conditions (see carrying-capacity discussion on pages 50-52). The impact-ratings table on page 45 reflects the weight, or significance, given to Arrowhead's proposal from the standpoint of each issue addressed in the EA. |

| **Rudy Herrmann** | |
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| COMMENTS | RESPONSES |
| 1. The DEA raises some very troubling concerns about the cumulative environmental impacts resulting from years of over-development at Grand Lake. Furthermore, DOI remains concerned about the rapid pace of shoreline development at Grand Lake and the absence of a comprehensive shoreline management plan. | Comments noted. See responses to FWS comments 3 and 5, Willis comment 2, and Brady comment 2. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Rudy Herrmann** | |
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| 2. I strongly suggest that a moratorium be placed on all pending and future non-project-use requests along Duck Creek (and perhaps elsewhere at Grand Lake) until at least the following occurs: (a) GRDA develops the required CSMP; (b) GRDA fulfills its responsibilities under the project's recreation plan; and (c) GRDA is required to put in place a broad-based Lake Advisory Council that adequately represents the diverse stakeholders at Grand Lake in the development and ongoing monitoring of the project's CSMP and recreation plan. | See responses to Read comment 18. As indicated on pages 54 and 55 in our comprehensive shoreline management plan discussion, we expect GRDA and GLAC to consult with federal and state agencies, local communities, and the general public in their CSMP development process. This includes COE, FWS, NPS, ODWC, OTRD, and local-community associations such as DCHA. |
| 3. I think it would be a mistake to approve GRDA's application for Arrowhead's dock-expansion proposal. Such approval would merely communicate that "business as usual" prevails. | See responses to Creekmore comment 2 and Willis comment 1. |

| **Lisa Luce** | |
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| COMMENTS | RESPONSES |
| 1. Luce expresses personal opinions and viewpoints about Arrowhead's proposal in relation to GRDA's lake rules and regulations. | See response to Creekmore comment 3. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Oklahoma State B.A.S.S. Federation** | |
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| COMMENTS | RESPONSES |
| 1. While we are pleased that this specific application has risen in public visibility to the point of warranting an EA, we feel that not nearly enough EAs are performed on Grand Lake, and we would hope to encourage a policy of performing an EA on any commercial expansion of over 50 slips or any expansion with a combined new total footage of 1,500 lineal feet of rental. | We determine the need for an EA on a case-by-case basis after considering the scope, scale, and setting of a proposed non-project use and the specific issues raised in the proceeding. |
| 2. Grand Lake has historically been a favored recreational fishing destination for our members and the fishing public. However, the last 15 years has seen a marked increase in the number and size of commercial boat docks, which is changing the recreational character and practicality of the lake for weekend uses. Nowhere is this trend more pronounced than on the Duck Creek arm of the lake. The effects of this trend are increases in boat-related noise and wave action and a shrinking of navigational lanes. The increasing number of high-performance, multi-engine craft are creating exceptional safety problems. | These comments are consistent with the information and analyses presented in the EA. |
| 3. The concrete walls already constructed at Arrowhead will have a continued negative effect on fishing opportunities. Speed controls, like those implemented in Duck Creek cove, significantly diminish the desirability and accessibility of these areas for fishing. | Comments noted and considered. |
| 4. We strongly take issue with the analysis in the DEA regarding shoreline access. Arrowhead's wall has resulted in a total of over 740 feet of complete blockage of public access to the shoreline and its original natural grade and habitat. Blockage of public access to public property should not be condoned or permitted. | See responses to Read comment 12 and ODWC comment 1. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Oklahoma State B.A.S.S. Federation** | |
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| 5. We are in favor of any and all habitat mitigation and feel that it should have long preceded this application as an absolute requirement for commercial developers. We would prefer decisions on the extent of mitigation and monitoring for effectiveness be left to fish and wildlife agencies and we would encourage more active agency involvement and consultation on these matters. In addition, the Federation and other similar organizations should be consulted in the future. | The Commission determines whether mitigative measures are warranted, and the types of measures to be taken, based on the nature and extent of an impact. Mitigative measures are selected and sized to address the resource-specific effects that are expected to actually occur. On-site is preferred to off-site mitigation and such mitigation is required only to the extent necessary to respond to impacts from actions that occur within a project boundary. The Commission expects permit grantees to mitigate impacts from connected actions that occur outside a project. Project licensees and applicants are required to consult with resource agencies and are expected to appropriately involve other entities with special interests and expertise in the preparation and implementation of impact-mitigation plans. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Oklahoma State B.A.S.S. Federation** | |
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| 6. At least three major marina expansions have taken place in Duck Creek cove since the completion of the carrying-capacity study performed by Oklahoma State University in 1996. New carrying-capacity studies should be repeated and analyzed extensively before any new commercial docks are permitted in this area. | The information and analyses presented in this EA provide a sufficient basis on which to determine whether, and under what conditions, to approve GRDA's application for Arrowhead's dock-expansion proposal. However, as stated on page 52, the levels of recreational use and shoreline development described in this EA indicate that the resources of Grand Lake's Duck Creek arm are approaching carrying-capacity limits for boating-related facilities and activities. Given this situation, the Commission will give greater scrutiny to any future non-project proposals involving this cove with respect to their effects on preferred environmental conditions and preferred recreational experiences. Also on page 52, we state that GRDA is expected to consider the carrying-capacity concerns expressed in this EA in complying with its periodic monitoring and reporting requirements, with Duck Creek cove being one of the primary focus areas of the required monitoring. Decisions as to whether a more aggressive management approach is needed at the project will depend on the Commission's review of GRDA's monitoring reports and other deliberations. See related response to Read comment 18. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Oklahoma State B.A.S.S. Federation** | |
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| 7. It is our belief that the burden of expense for these EAs, and for impact-mitigation measures, should be more directly shouldered by those making application. Lack of funds should never be presented as an excuse for non-enforcement of regulations or the lack of professional studies and assessments. | In regard to non-project-use applications that do not require prior Commission approval, decisions are delegated to the licensee concerning study, assessment, and impact-mitigation needs. For applications in which a licensee must request Commission authorization to grant a permit or to convey certain project land and water interests for a proposed non-project use, the licensee is requested to provide any additional information that may be needed to complete the application review process. However, we consider it appropriate for the licensee to forward these requests to the applicant, which may include providing the results of studies and assessments related to the specific non-project use being proposed. When the Commission determines that mitigative measures are needed to address the impacts that would result from a proposed non-project use, it requires the licensee to ensure that such measures are implemented by the applicant, either through permit conditions or conveyance covenants. Decisions are left to licensees on whether to provide any financial assistance to permit applicants in preparing their applications and to permit grantees in complying with the conditions of their permits. Article 410 of the license for the Pensacola Project provides, among other things, that the licensee may establish a program for issuing permits, including requiring permit applicants to pay a reasonable fee to cover the licensee's costs of administering the permit program. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

| **Oklahoma State B.A.S.S. Federation** | |
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| 8. We see no evidence in the EA that the Commission explored the practicality of recommending that applications for new facilities be relocated out of the coves and onto the main lake. This alternative would have several significant benefits from the standpoints of safety and ease of navigation, recreational use, relief from excessive boat densities and boat-wave erosion, and the elimination of dock protrusions in excess of GRDA's dock-placement provisions. | As stated on page 2 of this EA, the Commission's review process is for the purpose of determining whether, and under what conditions, GRDA's non-project-use application should be approved. Although other dock locations would have certain recreational and environmental benefits, the examination of other sites for these facilities is not a reasonable alternative for Commission consideration. The action alternatives recommended in this EA would mitigate certain adverse impacts of Arrowhead's dock-expansion proposal. With these modifications, Arrowhead's proposal is judged to outweigh the no-action alternative, which constitutes denial of the application. Although the modified proposal would still result in several adverse effects, the positive aspects of the proposal are judged to outweigh these negative environmental consequences.<br>As indicated in our response to FWS comment 5, we consider GRDA's preparation of a CSMP for the project to be the best forum for addressing broad-based issues on a project-wide basis, such as identifying potential locations for new facilities. In this regard, a project CSMP could serve as an effective site-screening tool by applying appropriate site-selection criteria to the project's lands and waters in order to classify shoreline segments, and areas, around the lake that are capable of supporting, and are environmentally suitable for, various types of development. |

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Grand River Dam Authority Project No. 1494-232

(Issued October 23, 2003)

MASSEY, Commissioner, dissenting:

A common thread of deep concern permeates the record in this proceeding. Members of the public, long-time residents of Duck Creek cove, recreational and environmental groups, and the U.S. Fish and Wildlife Service are greatly concerned that this popular cove is being transformed from a multi-purpose, recreational cove into primarily a navigational channel for increasingly large and powerful watercraft, at the expense of public safety, public access, water quality and shoreline habitat. The undisciplined permitting of individual, private, commercial marina operations, without the benefit of a comprehensive management approach, is severely limiting the public's access to the waterways and shorelines of Duck Creek cove, as well as other bays and coves in Grand Lake. [1]

Arrowhead proposes to replace its existing dock facility with 11 docks, providing boat slips for 175 watercraft. One hundred eleven of these slips are designed for vessels of 40 feet or longer, including 19 slips for 70-foot vessels and three slips for vessels of 99 feet in length. The water surface area to be occupied by the dock expansion is approximately 390,000 square feet, or nearly twice the area occupied by the current facility.[2] Arrowhead's proposed expansion would protrude extensively into a narrow portion of the cove, squeezing the passage between the dock expansion footprint and the opposite shore to 500 feet. In addition, a private boat dock is located on the opposite shore at this point, leaving less water than needed to accommodate the existing boat-

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[1] In addition to applying for authorization from the Commission for Arrowhead to expand its Arrowhead Marina, Grand River Dam Authority (GRDA) issued a permit to Arrowhead for the construction of a related 580 foot seawall on an easement owned by the Army Corps of Engineers, in apparent violation of § 301 of the Clean Water Act and GRDA's License Article 410. In addition, GRDA exchanged property within the project boundary with Arrowhead, for the purpose of facilitating Arrowhead's private club and marina expansion, without Commission approval, in apparent violation of GRDA's License Article 5. (December 19, 2002, FERC compliance letter to GRDA; and Department of the Army, Tulsa District, Corps of Engineers' letter dated March 8, 2002, to Arrowhead Yacht Club).

[2] Final Environment Assessment, Application for Non-Project Use of Project Lands and Waters, Pensacola Project, FERC No. 1494-232, at 32 (2003).

20031023-3048 Issued by FERC OSEC 10/23/2003 in Docket#: P-1494-232



traffic lanes.[3] This proposed expansion, where passage is already constricted, would also reduce the field of vision available to boaters entering the cove's navigation channel from the inlet immediately south of Arrowhead Marina.[4]

According to a survey conducted by the Licensee in conjunction with the preparation of the Project's recreation plan, navigational safety is at the forefront of concerns expressed by residents of Grand Lake, primarily as a result of the greater number of larger boats. As the size of the boats has increased geometrically, safety concerns have risen sharply. Duck Creek cove is one of the most intensively developed areas of the reservoir and has the highest density of commercial docks. During the fall of 1995, the Licensee conducted an open forum seeking input from property owners and members of the general public, in response to strong safety concerns as well as boating accidents occurring in Duck Creek cove.[5] According to comments received by the Commission from one resident, there are already over 1,000 commercial slips available within a two-mile stretch of the cove, the majority of which are designed for boats 35 feet in length or greater.[6]

The many comments received in response to the Commission's Draft EA provide ample evidence that the approval of Arrowhead's marina expansion will decrease recreational opportunity for members of the public, as well as for the residents of Duck Creek cove. Private commercial development can be compatible with public recreation. However, I find that the expansive development proposed in this application is in direct conflict with the Commission's general policy that the public be given the maximum practicable access to project lands and waters.[7] And second, I would vote for this proposal only if it were modified to adequately address the legitimate safety concerns that have been raised.

For these two reasons, I respectfully dissent.

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William L. Massey
Commissioner

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[3] Staff EA at pg 33.

[4] Staff EA at pg 43.

[5] Recreation Management Plan, Grand Lake O' the Cherokees (1997).

[6] Staff EA at pg 27.

[7] West Penn Power Company, 81 FERC § 61,362 (1997).