EXHIBIT E
ENVIRONMENTAL REPORT
INTRODUCTION

The Indian Orchard Project consists of a dam, a canal headgate house, a power canal, two operating penstocks, a powerhouse with two generating units, and a tailrace (see Exhibit A). WMECO proposes to add a turbine to pass the minimum flow release of 247 cfs, or inflow if less, near the base of the dam (see Exhibit G, Sheet 8). The minimum flow facility will have a contingency for passing the minimum flow release when the turbine is not in operation (see Exhibit A, Section 1.2). The project is located at river mile 7.8 on the Chicopee River. The dam is approximately 4.8 miles upstream of the Chicopee Falls dam, and 1.4 miles downstream of the Putts Bridge dam.

The Chicopee River basin is the largest contributing basin of the Connecticut River, with a total drainage area of 727 square miles. The 17-mile-long Chicopee River is formed by the confluence of the Quaboag and Ware Rivers. The Swift River flows into the Ware River approximately 1 mile upstream of the Chicopee River. Approximately 186 square miles of the Swift River's drainage area are contained in the Quabbin Reservoir, which is a major municipal water supply source in Massachusetts.

Topography of the Chicopee River basin varies from the upland plains of western Massachusetts to low rolling hills near the river's confluence with the Connecticut River. The upstream portions of the Chicopee basin are rural, while the lower portions of the basin are highly developed by residences, commerce, and industry. Six hydroelectric power facilities harness the river's resources in its 17-mile course.
Terrain adjacent to the project impoundment consists of intense suburban development interspersed with industrial operations on the low hills comprising the river valley. The impoundment is surrounded by a narrow, forested buffer zone, and the power canal and powerhouse are located in the midst of an industrial complex. Downstream of the project, the southern riverbank is industrially developed, while the northern riverbank is primarily forested, with some light residential development between the river and the Massachusetts Turnpike located about 0.2 miles north.

The project operates in a pond-and-release mode to supply power. The normal impoundment fluctuation at the project is 1.0 ft, although this limit may occasionally be exceeded during annual energy audits or during system emergencies. No changes in the current operating mode are being proposed at this time.

As a result of consultation with resource agencies in the course of preparing this application, WMECO proposes to discharge a continuous and reliable minimum flow of 247 cfs or inflow, if less, into the bypassed reach upon completion of the proposed minimum flow facility.

In order to pass the recommended instantaneous minimum flow at the base of the dam, WMECO investigated several design alternatives. After conducting economic analyses, it was determined that a minimum flow generating unit should be installed. Because the dam is constructed of cut-granite, alternatives involving dam reconstruction were ruled out because of aesthetic, historic, and structural concerns.

The alternative design decided upon involves a siphon penstock in the power canal leading to a powerhouse near the base of the dam (see Exhibit G, Sheet 8). A tailrace will be excavated from the powerhouse to the existing pool at the base of the dam, thereby providing the minimum flow release at the base of the dam.

WMECO has identified and reviewed four relevant comprehensive state and regional water resource development plans regarding the Connecticut River Basin. The plans are as follows:


WMECO, in reviewing these comprehensive plans has determined that their projects, as proposed, will comply with all these plans by maintaining river water quality as flow passes the projects, by increasing recreational access to the river, and by providing increased minimum flow releases to enhance fisheries resources. WMECO also plans to consult with fish and wildlife agencies regarding fish passage facilities at the project when specific management data and schedules are developed that directly affect the project.
1.0 ENVIRONMENTAL SETTING OF THE PROJECT

1.1 Vegetative Cover

In order to assess the vegetative cover in the Chicopee River region and the Indian Orchard Project area, literature searches of pertinent documents were performed, aerial photographs and topographic maps were examined, resource agencies were contacted regarding rare and endangered species, and a field survey was conducted. The field survey covered a study area greater than the project area. A Vegetation Cover Map of the project was then prepared (see Figure E-1). A detailed report of the botanical resources in the project area is contained in Appendix B.

The Chicopee River Valley is located within the Appalachian oak forest of the Laurentian mixed forest province. Vegetative cover in this area is generally composed of tall broadleaf deciduous forest with the dominant species being white oak and northern red oak. Other components are red maple, sugar maple, yellow birch, bitternut hickory, pignut hickory, beech, tuliptree, white pine, scarlet oak, scrub oak, chinquapin oak, chestnut oak, black oak, and hemlock.

The Indian Orchard Project contains four discrete cover types as follows: Developed, Deciduous Forest, Mixed Forest, and Open Water.

Developed land covers 9.5% of the study area, and consists of industrial and commercial development. The vegetation types found in these areas vary from patches of open field to shrub upland species with some horticultural species around several of the buildings.

Deciduous Forest covers approximately 30.9% of the study area. This cover type surrounds the entire Indian Orchard impoundment, except for a small area of mixed forest, and surrounds the entire area below the project dam. This cover type is dominated by red maple and red oak. Understory species include sassafras, black cherry, gray birch, and Juneberry. Common shrubs are multiflora rose, mapleleaf viburnum, and spicebush. Common ground layer species are hayscented fern, wild lily-of-the-valley, bedstraw, violets,
cinnamon fern, and various grasses. A narrow fringe of this cover type along the shoreline of the Indian Orchard impoundment is dominated by speckled alder, silky dogwood, willow, spicebush, and mountain laurel, with various sedges and cinnamon fern in the lower layers.

Mixed Forest covers about 2.9% of the study area. This cover type is dominated by hemlock, white pine, and red oak, with red maple and gray birch in the understory. Wild lily-of-the-valley and some saplings of the above species are the only species in the ground layer.

Open Water covers 56.6% of the study area, and includes the project impoundment, tailrace, and bypass. Aquatic vegetation in both the impoundment and below the project is sparse.

1.1.1 Endangered, Threatened, and Rare Species

By letters dated June 13, 1989 and June 21, 1989 respectively, the Massachusetts Natural Heritage Program and the U.S. Fish and Wildlife Service (USFWS) reported that no known populations of endangered, threatened, or rare species occurred in the study area, and no evidence of any such species was found during the field survey.
1.2 Fish Resources

Fish habitat at the Indian Orchard Project occurs in both the impoundment and the bypassed channel areas of the project. A report on fish habitat resources in the project is contained in Appendix C. The tailrace of the Indian Orchard Project discharges to an approximately two-mile reach of the Chicopee River which is free-flowing.

Although no species distribution data exist for the Indian Orchard impoundment, information is available from the Massachusetts Division of Fisheries and Wildlife (MDFW) describing the Red Bridge Project impoundment. This impoundment is also located on the Chicopee River, approximately 7.4 river miles upstream of the Indian Orchard impoundment. A 1982 MDFW report indicates that the Red Bridge impoundment "for all practical purposes is warmwater (fish) habitat." In the case of the Indian Orchard impoundment, this observation is also true, and is supported by impoundment mapping (see Appendix C) and water quality sampling (see Section 1.4.1) conducted during July, 1989. The impoundment was found to backwater a serpentine river reach upstream as far the Putts Bridge Project. The shoreline is vegetated primarily with hardwood forest and riparian species (see Section 1.1), which provide cover for warmwater fish species such as largemouth bass, sunfish, and chain pickerel.

According to a June 23, 1981 survey of the Red Bridge impoundment conducted by the MDFW, the following fish species were observed, in declining order of abundance: yellow perch, white perch, pumpkinseed, white sucker, bluegill, golden shiner, fallfish, largemouth bass, yellow bullhead, chain pickerel, black crappie, and brown bullhead. These are species that would likewise be expected to be established in the Indian Orchard impoundment. Since the 1981 survey, the MDFW has also introduced tiger muskie and northern pike to the Red Bridge impoundment. Reports from anglers indicate that some of the pike and muskies have escaped the impoundment and have been harvested elsewhere in the watershed; it is therefore possible that these species now exist in the Indian Orchard impoundment. A 1989 publication of the MDFW entitled "Best Bets for Bass" lists the Chicopee River as a largemouth bass
fishery. The 1973 MDFW Performance Report characterized this reach of the Chicopee entering the project as a good warmwater fishery, containing silt, rubble and gravel substrate, and brown water color.

Although streams such as the Swift, Quaboag, and Ware Rivers, located well upstream of the project in the headwater tributaries of the basin, are stocked seasonally with trout, there is no evidence of a coldwater fishery in the project area, and summer water temperatures (see Section 1.4.1) appear to exceed the upper thermal limits for coldwater fish.

The riverine bypassed channel of the Indian Orchard Project consists of two types of habitat: several channels, typically 40-ft wide with exposed ledge substrate, split by small wooded islands extending from the downstream edge of a pool located at the base of the project spillway, downstream a distance of approximately 500 ft, and several relatively deep pools (depths of at least 4 to 6 ft at leakage and at 240 cfs) located above and below these channels in the remainder of the reach (see Appendix C).

There are no existing anadromous fish runs involving the project waters. American shad presently ascend the Chicopee River only to the base of the Dwight dam, which is approximately 6.6 river miles downstream. "The Chicopee River is not a component of the Connecticut River Anadromous Fish Restoration Program because of limited habitat for Atlantic salmon and American shad" (USFWS letter, April 20, 1989).

1.2.1 Endangered, Threatened, and Rare Species

The shortnose sturgeon, the only federally listed endangered fish species in New England, is not known to exist in or near the project waters. There are no state-listed rare or endangered fish species, or species of special consideration that are known to occur in or near the project waters (MDFW, personal communication).
1.3 Wildlife Resources

Wildlife resources in the Indian Orchard Project area were determined from literature searches of pertinent documents, consultation with resource agencies, and from a field survey conducted to locate indications of wildlife. The field survey included an area (study area) larger than the project area. Wildlife resources within the study area include reptiles, birds and mammals. No amphibians were observed in the study area. For a detailed description of the wildlife resources in the project area, see Appendix B.

The only reptile observed in the study area was the painted turtle. The habitat available for reptiles is limited by the relatively narrow strip of deciduous forest along the impoundment. However, other common reptile species whose range includes central Massachusetts could occur in the project.

Habitat for waterfowl, wading birds, and shore birds is limited due to steep rocky banks in most areas. The only waterfowl observed in the study area were a double-crested cormorant and a pair of mallards. The major habitat for birds in the study area is the narrow strip of deciduous forest. A total of 49 bird species was observed during the field survey, including species such as the northern flicker, great crested flycatcher, blue jay, American crow, wood thrush, warbling vireo, and song sparrow.

Habitat for mammals is also limited by the narrow strip of deciduous forest, and by the steep rocky shoreline. The only mammal species observed in the study area were Eastern chipmunks and muskrats. Gray squirrels were observed nearby, and are expected to venture into the forest on occasion.

1.3.1 Endangered, Threatened, and Rare Species

By letters dated June 13, 1989 and June 21, 1989 respectively, the Massachusetts Natural Heritage Program and the USFWS reported that no known populations of endangered, threatened, or rare species occurred in the study area, and no evidence of any such species was found during the field survey.
1.4 Water Quality and Quantity

1.4.1 Existing Water Quality

Existing water quality at the Indian Orchard Project is classified by the Massachusetts Department of Environmental Quality Engineering (MDEQE) as Class B, warmwater fishery. To meet this classification, the water must have a minimum dissolved oxygen (D.O.) of 5.0 mg/l. Temperature must be less than 83°F, pH must be between 6.5 and 8.0 standard units, and fecal coliform bacteria counts must not be more than 200 per 100 ml sample. Other general regulations govern levels of oil and grease, radioactive substances, color, odor, foam, turbidity, floating or suspended solids, nutrients, and aesthetics (314 CMR 4.03 (1988)).

According to the State of Massachusetts 1988 Section 305(b) report, the river is generally meeting these water quality standards. The only impediment to full support of the standards is from fecal coliform bacteria caused by surface runoff after storm events.

Water quality has improved since 1980, apparently as a result of completion of a secondary wastewater treatment plant in Palmer, and the elimination of individual discharges in both Palmer and Monson. High-strength industrial wastes, previously discharging to the Chicopee, are now discharged to the Connecticut River via the Springfield Regional Wastewater Treatment Facility at Bondi Island (West Springfield, MA).

The existing water quality data have been studied, and current data have been collected. A water quality report detailing the data and the collection methods is contained in Appendix D.
Existing data consist of several water quality data reports published by MDEQE. The most recent were published in 1980 and 1985. Only these two recent reports were considered to have current data. Earlier reports contained data before some wastewater treatment plants were operational. The 1985 sampling did not sample below the Miller Street Bridge in Wilbraham. The 1980 report contained data from several sample locations in the Chicopee basin. Sampling stations were located below the Putts Bridge Project, and below the Indian Orchard dam at the West Street Bridge.

D.O., temperature, long-term and 5-day BOD, nitrogen and phosphorus, suspended and total solids, pH, alkalinity, chloride, and hardness were measured in 1980. D.O. was sampled every few hours to determine a diurnal fluctuation. Algae (as Chlorophyll "a") and bacteria were also reported. Two periods of data were collected: July 14-17 and August 18-21, 1980. The results of MDEQE investigations indicated water quality to be generally acceptable and generally meeting the river’s B classification.

D.O. ranged from 6.4 mg/l to 9.1 mg/l. The average daily D.O. measured in the two sample periods, however, was generally in the upper 80% to mid-90% saturation range. A slight diurnal fluctuation in D.O. was noted at the stations near Indian Orchard.

Since most of these data were collected during critical summer, warm weather conditions, river water temperatures were in the low to mid-70°F range. BOD$_5$ values ranged from 1.5 to 3.6 mg/l, but were usually about 2.5 mg/l. No changes in BOD were caused as the water passed between the stations.

Total and suspended solids tended to be about the same at either station, and averaged about 45 mg/l in July. In August, however, total solids at the above project station were 68 mg/l, compared to 55 mg/l at the lower station. Turbidity and bacteria values were also slightly lower below the impoundment.
Nitrogen (total Kjeldahl, Ammonia, and Nitrate) and phosphorus all showed no distinct pattern of change when passing from above the impoundment to below the dam. Hardness and pH data displayed this same lack of pattern. Chlorophyll "a" was measured only at the MDEQE station above the project on July 15 and August 19. The measured values were 13.6 and 5.0 mg/m$^3$.

All data measured by MDEQE near the Indian Orchard site, with the exception of bacteria levels, met or exceeded the Class B water quality criteria.

Little water quality data (since the 1980 data described above) exist. Therefore, it was necessary to conduct sampling at the project. This additional sampling provided current data to update and verify changes since the 1980 data were collected.

D.O. and temperature at the Indian Orchard Project were sampled from July 24 to 27, 1989. Sampling of the impoundment was accomplished using a Hydrolab upstream of the gatehouse to record D.O., temperature, and conductivity. D.O. data recorded by the Hydrolab unit are shown graphically in Figure E-2, and are attached in Appendix D. Average D.O. was 8.4 mg/l at an average temperature of 24.1°C. Based on this, average saturation would be 99.9%.

During the sampling period, the temperatures ranged from 22.5°C to 26.4°C, and averaged 24.1°C. Conductivity was constant at 0.11 mmhos/cm.

Sampling downstream of the impoundment consisted of discrete samples taken manually with a portable D.O./temperature meter from the side of the bypassed reach and from the road bridge below the tailrace. During the sampling period, all flow was passing over the dam. Measured D.O. values averaged 7.8 mg/l and 8.8 mg/l at the side of the bypass and from the bridge over the bypass, respectively. Temperatures ranged from 23.5°C to 25°C, and averaged 24°C. Data from this manual sampling are also included in Appendix D.
All data collected during the July, 1989 sampling far exceed the requirements of the Class B water quality standards.

1.4.2 Existing Water Quantity

Average annual flow at the Indian Orchard Project is approximately 914 cfs. At USGS Gage No. 01177000, located 0.6 miles downstream, the maximum recorded flow was 45,200 cfs on September 21, 1938, the minimum flow was 16 cfs, recorded on several dates during 1929-31, and the average flow is 914 cfs. Further description of the flow regime is presented in Exhibit A, Section 5.0.

1.5 Land and Water Uses

1.5.1 Land Uses

The area immediately surrounding the Indian Orchard Project is predominantly suburban, with some industrial use in the vicinity. Photographs of the project area can be found in Appendix G.

The dominant land use immediately around the impoundment is suburban and industrial, although there is a buffer strip of trees encircling the impoundment. The power canal passes through an industrial complex that contains the project powerhouse. The rest of the area surrounding the forested buffer strip is dominated by densely populated suburban and commercial uses.

1.5.2 Water Uses

The primary uses of the waters of the Chicopee River are for hydroelectric generation, receiving waters for industrial and municipal discharges, and limited recreation. In the 17 miles between the river's confluence with the Connecticut River and its headwaters at the confluence of
the Ware and Quaboag Rivers, there are six hydroelectric generating facilities. Numerous discharge points exist below the Indian Orchard Project, as the river flows through the populated areas of Chicopee and Springfield, Massachusetts. Recreational use of the Chicopee River is described in Section 1.6.

1.6 Recreational Uses

The Indian Orchard Project is located in an urban and industrial area. Recreational activities at the project include fishing, boating, and walking.

There are no existing formal recreational facilities at the project, but some fishing and walking occur. Nearby residents and factory workers use a network of footpaths during evenings or lunch breaks to reach fishing locations.

Some fishermen use small boats put in at an informal boat launch located on the southerly shore of the impoundment.

1.6.1 Map of Existing Recreational Resources

Attached as Figure E-3 is a map showing the existing recreational sites at the Indian Orchard Project.

1.6.2 National Wild and Scenic Rivers and Wilderness Designations

No portions of the project area or areas affected by the project have been identified or included in the National Wild and Scenic Rivers in the Nationwide Rivers Inventory.

There are no areas along the project that have been identified under provisions of the Wilderness Act.
1.7 Historical and Archaeological Resources

The Indian Orchard dam, constructed of brownstone blocks, and canal were erected in 1846 as a speculative venture intended to attract manufacturers to locate nearby and purchase waterpower. The first occupant built a brick mill in 1854, but went bankrupt in the Panic of 1857, after which the Indian Orchard Mills Company, a textile firm, purchased the property and improvements. This firm added several new mills over the next 30 years before it, too, succumbed to bankruptcy.

The next owner, Indian Orchard Company, produced yarn on the site, and rented substantial space to a diverse array of industrial tenants. The complex achieved its present extent under this ownership. As part of its rental activities, Indian Orchard Company upgraded the waterpower system, adding the present 1896 powerhouse (brick-pier construction, one-story high, gable roof, segmental-arched window openings, round-arched triple attic windows in the pedimented gable-ends), and rebuilding the canal. The firm built the present headgate house in 1915 (brick-pier construction with concrete foundation, gable roof, segmental-arched window openings).

Many of the powerhouse windows have been filled with brick or plywood, and the operating equipment has been periodically renewed and upgraded.

Two horizontal waterwheels were installed in 1897, and a third wheel was installed in 1898. The waterwheels were belt-connected to AC and DC generators. A fourth waterwheel and generator were installed in 1904. In 1917-1918, the belt-driven generators were replaced with direct-connected generators. Units No. 3 and No. 4 were replaced in 1928 with vertical turbine/generator units. The United Electric Light Company, a predecessor of WMECO, acquired the project in 1941. In 1963, Units No. 3 and No. 4 were converted to semi-automatic control, and the station began unmanned operations. Units No. 1 and No. 2 were retired in 1970.
An archaeological survey of the site area consisted of a brief background survey, to determine if any previously reported prehistoric sites are known in the area, and a walkover survey and visual examination of the impact area. While no prehistoric sites are reported within or immediately adjacent to the project area, several have been recorded along the Chicopee River, including the Bircham Bend Site near Interchange 6 of I-90, and the Indian Crossing Site at the confluence of the Chicopee and Connecticut Rivers.

A visual examination of the project area indicated that the project area had been extensively disturbed by construction activities associated with the prior construction and operation of the Indian Orchard facility. Although the impact area has no potential for yielding intact prehistoric sites, the surrounding area is considered to have a high potential for yielding intact prehistoric archaeological sites, based on the topography of the area and its proximity to the Chicopee River.

1.7.1 National Register Sites

There are no structures or sites in the immediate project vicinity that are currently listed or known to be eligible for listing in the National Register of Historic Places. There are presently a number of registered sites in Hampden and Hampshire Counties. None of these sites are in the vicinity of the Indian Orchard Project, nor will any sites be affected by the project.

The Indian Orchard Project, together with the surrounding industrial complex, may be eligible for listing in the National Register. Appendix F contains the appropriate historical site survey forms of the Massachusetts Historical Commission. These forms more fully describe the historical features and potential significance of the Indian Orchard Project.
1.8 Scenic and Aesthetic Resources

The Chicopee River Valley is located in western Massachusetts. The headwaters to the Chicopee River are located in the rural upland plains to the east, while the downstream portion of the river flows into the highly developed and densely populated Connecticut River Valley. The downstream portion of the river was heavily industrialized during the late 19th and 20th centuries, as shown by the predominance of power canals that are directed through industrial complexes. As such, the undeveloped scenic and aesthetic resources of the river basin are concentrated toward the east. The urban and industrial nature of the Chicopee River in the vicinity of the City of Chicopee (near the confluence with the Connecticut River) provides diverse urban scenic resources.

The City of Indian Orchard, Massachusetts provides a diverse cityscape dominated by large industrial complexes constructed during the mid to late 1800's. Much of the industrial architecture of the area exhibits the masonry construction (particularly brownstone) popular during that era. The commercial development near the project consists mainly of small independent businesses along a main street. Residential development near the center of town includes mill housing, while large houses with sculptured lawns and ornamental trees are the dominant scenic resource on the outskirts of town. The residential development and the small parks and city places interspersed throughout the city area complement the intense industrial development of the city center to provide the diverse scenic resources of the area.

The Indian Orchard Project is located on the Chicopee River at the City of Indian Orchard, Massachusetts. The project area itself is relatively suburban, with residential, commercial and industrial development dominating the area around the impoundment. There is a lightly forested strip of land around much of the project, including the tailrace.

Photographs of the project area are presented in Appendix G.
2.0 PROJECT IMPACTS, AGENCY RECOMMENDATIONS, AND MEASURES PROPOSED BY THE APPLICANT

In compliance with §4.38(b)(1) of the Federal Energy Regulatory Commission’s regulations, WMECO provided agencies with a document entitled Combined Initial Consultation Document on February 21, 1989. A copy of this document and all agency responses to it are included in Appendix A. On September 21, 1989, draft copies of this application were distributed to agencies, in compliance with §4.38(b)(2) of the Commission’s regulations. Copies of agency comments to the draft application are contained in Appendix A.

The following section discusses (for each resource category discussed in the sub-sections of Section 1.0 of this Exhibit) the anticipated impacts associated with the operation of the Indian Orchard Project, the specific agency recommendations for studies or other measures that were received in response to the Initial Stage Consultation document, and WMECO’s proposals in response to agency recommendations.

2.1 Vegetative Cover

2.1.1 Continuing and Incremental Impacts

The impoundment of the Indian Orchard Project will continue to experience a maximum daily fluctuation of 1.0 ft, except during periods of high flows. No adverse impacts to the botanical resources of the Indian Orchard Project are expected to occur as a result of the continued operation of the project or as a result of the proposed modifications to the project.

2.1.2 Recommendations by Agencies

No recommendations by resource agencies were made during Initial Stage Consultation, or during Second Stage Consultation, regarding the botanical resources of the project.
2.1.3 Measures Proposed by Applicant

Since no adverse impacts to botanical resources are expected to result from the project, no measures regarding these resources are proposed.

2.2 Fish Resources

Based on recommendations by resource agencies concerning the Indian Orchard Project (see Section 2.2.2), WMECO evaluated the continuing and incremental impacts of instream flows, peak flow releases, and impoundment fluctuations on fish resources, and the impact of project operation on water quality as it relates to fishery management. WMECO submitted study plans for evaluating these potential impacts to USFWS, MDFW, and MDEQ on June 5, 1989 (see Appendix A). The USFWS and MDFW approved the study plans in letters dated June 16 and June 14, 1989, respectively (see Appendix A). Whenever possible, resource agency personnel involved with review responsibilities participated in site visits and study activities.

2.2.1 Continuing and Incremental Impacts

At the recommendation of the USFWS and MDFW, continuous minimum flow releases into the bypassed reach and below the project were considered by WMECO for protection of aquatic habitat; both agencies deemed the historic practice of diverting the river (up to the maximum turbine capacity) through the powerhouse, and stopping all flows during ponding, as having a negative effect on fishery potential. The potential impact of varying instream flows on fish resources in the bypass and below the project was evaluated using methods that were consistent with methods established by the USFWS Aquatic Base Flow (ABF) policy. WMECO estimated an ABF flow at the Indian Orchard Project, based on historic flow records, that would be sufficient to protect aquatic habitat and prevent adverse impacts (see Appendix C). The ABF flow at the project is 247 cfs.
The potential impact of upramping on fish resources was evaluated by determining whether riverine reaches downstream of the project would be adversely affected by sudden changes in flow as the turbines are cycled on and off. Details concerning the methods and results of the ramping studies are contained in Appendix C. The potential upramping impacts at the Indian Orchard Project are concentrated at the hydraulic controls located downstream of the project tailrace. These hydraulic controls are subject to wider variations in velocity than the intervening pool sections, which have standing water that can help attenuate increased flows. The riverine reach below the project is characterized by two habitat types: pools and riffles upstream, and wide, slow moving shallow runs containing dense mats of rooted aquatic vegetation downstream (see Appendix C).

Typical habitat in the 1.1 mile long upstream reach is favored by smallmouth bass, while other species of concern tend to inhabit slower moving impoundment habitat. Juvenile smallmouth bass congregate toward the low velocity areas near shore. Water stage increases caused by upramping would provide significant additional velocity refuges as additional streamside rootwads, trees, and other velocity refuges are submerged. Adequate instream velocity refuges exist to protect adult fish due to the substrate of this riverine reach. The substrate consists of cobble, rock and boulder, with occasional patches of gravel (see Appendix C).

During normal operation the powerhouse units will be activated individually over a period of approximately ten minutes each. This will result in a flow increase from 247 cfs (the minimum flow release) to 1772 cfs (the hydraulic capacity of the powerhouse combined with the minimum flow) over an approximately twenty minute period. Based on these considerations and the abundance of protective cover, no significant impacts are expected.
The downstream reach is characterized by a more level slope, low velocities, and very dense aquatic vegetation. This type of habitat is more robust, or more able to absorb flow increases associated with upramping (see Appendix C). Additionally, this reach is located over a mile downstream of the tailrace. This distance will tend to attenuate the peak flows, reducing the velocity and stage increases that reach the project. Therefore, adverse upramping impacts to this riverine reach are not expected to be significant.

The potential impacts of impoundment fluctuations were evaluated by first performing a survey of the project to locate potential fish spawning habitat in the littoral zone. The level of impact was evaluated based on the amount of potential spawning habitat that might be exposed during normal operation of the project. There is no impact at the Indian Orchard Project because no significant spawning habitat is exposed by the daily 1.0 ft impoundment fluctuations (see Appendix E).

The potential effects of project operation on water quality as it relates to fishery management was evaluated in conjunction with other water quality studies at the project. Water quality parameters upstream and downstream of the project were measured to determine the impact of the project on water quality. Operation of the project did not have a significant adverse impact on water quality (see Appendix D). In fact, the proposed modification of the project is expected to enhance water quality in the bypassed reach by providing additional flow, increasing dissolved oxygen, and decreasing temperature fluctuations in the bypassed reach (see Section 2.4.1, and Appendix D).

2.2.2 Recommendations by Agencies

The USFWS and MDFW both responded to WMECO's Initial Stage Consultation document with letters dated April 20, 1989 (see Appendix A). Both agencies recommended that WMECO evaluate the
potential impacts of instream flows, peak flow releases, and impoundment fluctuations on fish resources, and the impact of project operation on water quality as it relates to fishery management. Additionally, they recommended that WMECO should plan to provide fish passage facilities when such facilities are needed at the project. The MDFW also requested information concerning flow velocities at the trashracks. A number of other federal, state, and local resource agencies also recommended increasing minimum flows below the dam, to enhance fishery resources, and evaluating the need for constructing fish passage facilities.

During the Second Stage of Consultation, USFWS, MDFW and many other agencies supported the minimum flow release proposed by WMECO to support fisheries resources. Additional comments requested daily variation of the flow releases, and documentation of those releases. The Connecticut River Watershed Council further recommended that WMECO "examine operations to determine if fish are entrapped or killed." As described below, trashrack velocities were estimated for the project and it was determined that fish were not likely to become entrapped. Also, the minimum flow release should improve fisheries resources below the project dam.

2.2.3 Measures Proposed by the Applicant

Based on the ABF that is sufficient to protect aquatic habitat at the project (247 cfs), WMECO proposes to continuously provide the lesser of the ABF or inflow to the project at the base of the dam and downstream of the project. The flow will be discharged through a minimum flow turbine upon completion of the proposed facility (see Exhibit G, Sheet 8).

The Chicopee River is not currently scheduled for the restoration of Atlantic Salmon, American Shad, or other anadromous fish species because of limited available habitat for these species (see USFWS and MDFW letters dated April 20, 1989 in Appendix A).
WMECO proposes to consult with appropriate resource agencies regarding fish passage facilities at such time as specific management data and schedules are developed which directly affect the project.

WMECO proposes no measures concerning peak flows, because no impacts regarding upramping are expected.

WMECO proposes no measures regarding impoundment fluctuations at the project, because no significant impacts result from the project's daily pond fluctuation of 1.0 ft.

WMECO proposes no additional measures regarding water quality, because no significant adverse impacts are expected to result from project operation (see Section 2.4.1).

Flow velocities at the trashracks vary according to unit flow (625 cfs and 900 cfs). The intakes to the two units are separated by a concrete pier; therefore, flow velocities are relatively independent. The estimated maximum velocities at the trashracks are approximately 3.25 ft/sec at Unit 3 (625 cfs), and 1.88 ft/sec at Unit 4 (900 cfs). WMECO proposes no measures regarding this information, since these flow estimations indicate moderate velocities that would frequently be encountered under normal river conditions.

Minimum flow releases at the project will vary during seasonal high flows when the combined hydraulic capacity of the powerplant and the minimum flow facility are exceeded. WMECO will file a plan to monitor the minimum flow release with the USFWS within six months of receiving an exemption for the project. Additionally, records of the minimum flow releases will be filed by WMECO with the USFWS and MDFW in a manner specified during further consultation with these agencies. WMECO also plans to notify MDFW within 30 days of the start-up of the proposed minimum flow facility.
2.3 Wildlife Resources

2.3.1 Continuing and Incremental Impacts

No adverse impacts to the wildlife resources of the Indian Orchard Project are expected to occur as a result of the continued operation of the project or as a result of the proposed modifications to the project (see Appendix B). The impacts of pond fluctuations on wildlife resources were evaluated in response to agency recommendations. Pond fluctuations were found to have insignificant adverse impact on wildlife because water level fluctuations at the project expose only narrow bands of shoreline, and no areas containing critical habitat (see Appendix E).

2.3.2 Recommendations by Agencies

The USFWS on April 20, 1989, and the MDFW on April 20, 1989, recommended that WMECO evaluate the impacts of pond fluctuations on the fish and wildlife resources of the project. Both agencies reviewed study plans that were developed to address the potential impacts and that were submitted on June 5, 1989. The study plans were approved by USFWS on June 16, 1989, and by MDFW on June 14, 1989. A discussion of the impacts to fish is contained in Section 2.2. As discussed above there are no adverse impacts to wildlife.

No additional comments regarding wildlife resources were received during the Second Stage of Consultation.

2.3.3 Measures Proposed by Applicant

WMECO proposes no measures regarding wildlife resources, since no significant adverse impacts to these resources are expected to result from the project.
2.4 Water Quality and Quantity

2.4.1 Continuing and Incremental Impacts

2.4.1.1 Impact of Continued Operation

During the sampling period, D.O. measured at the gatehouse averaged 8.37 mg/l. Average temperature was 24.1°C. Downstream measurements averaged 7.92 mg/l D.O. and 24.2°C temperature. This slight difference in D.O. levels indicates that the continued operation of the project in the current operating mode would likely have no significant impact on water quality.

No change in water quantity is expected as a result of continued project operation.

2.4.1.2 Incremental Impacts

The only new development proposed at the Indian Orchard Project is installation of a minimum flow turbine to provide a continuous minimum flow of 247 cfs into the bypassed section of the river. Flow through the turbine will be drawn from the top of the canal, and since water quality in the impoundment exceeds minimum standards, this 247 cfs flow is expected to meet water quality standards in the bypass.

The bypassed reach is a series of shallow pools and riffles that currently receive only leakage from the spillway. The proposed minimum flow will increase flow through these pools, decreasing detention time and increasing natural aeration in that section of river.

Water passing through a turbine is not aerated when going through the turbine. Once through the proposed minimum flow turbine and into the bypass, however, shallow flow over rocks and boulders
as the water flows downstream would change oxygen levels. Super-
saturated water from the impoundment would lose oxygen, and
oxygen-deficient waters would gain oxygen, bringing D.O. levels
closer to their natural saturation levels. This will slightly
reduce the magnitude of any diurnal fluctuations in the bypass and
downstream reaches. At Indian Orchard, this change will not,
however, significantly affect D.O., which was measured within 10 to
15% of saturation at most times (see additional discussion in Section
1.4.1).

Temperature fluctuations will probably increase slightly in the
bypassed reach because of increased contact with ambient air
temperature, and resulting water temperatures will be slightly
closer to ambient air temperature than they are now. In the power
canal and penstock, there is less opportunity for this contact with
the atmosphere. This will not, however, significantly affect
overall river temperatures.

There should be no significant changes in other water quality
constituents as a result of maintaining a minimum flow in the
bypass.

Based on monitoring and study of water quality concerns, it is
not expected that the Class B, warmwater fishery water quality
standards will be violated by continued project operation. The
bacteria levels, cited by MDEQE as being the cause for only partial
support of the standards, are not affected by the project. No
significant adverse impact to water quality will result from the
proposed changes to the project.

The only change in water quantity will be the increase of
247 cfs flow into the bypassed reach.
2.4.2 Agency Recommendations

Federal, state, and local resource agencies have recommended a minimum flow in the bypass that will maintain water quality sufficient to protect fish and other aquatic biota. For the Indian Orchard Project, this was calculated to be 247 cfs. This flow was viewed by agencies during a site visit August 2, 1989, and was approved in letters from USFWS and MDFW dated August 8 and August 10, 1989, respectively.

Nutrient sampling was requested in an April 20, 1989 letter from the USFWS. However, preliminary review of the 1980 MDEQ data showed that ample data already exist. Therefore, USFWS agreed that nutrient sampling would not be necessary, because there had been no significant change in nutrient loading to the river that would cause a significant change from the existing 1980 data (see Appendix A). Nutrient levels showed no consistent change passing from above to below the project.

During the Second Stage of Consultation, the Connecticut River Watershed Council (October 25, 1989) recommended an "analysis of erosion due to the unloading of sediment in the impoundments behind the series of dams, coupled with pulses of water released to the river." The project does not have a large hydraulic capacity, and flows released from the project are normally confined to the well defined river channel. The natural high seasonal flows that would be expected to exceed the well defined river channel and cause significant erosion can not be controlled by WMSCO. River flows exceed the hydraulic capacity of the power plant approximately 8% of the time.

The Water Supply Citizens Advisory Committee on October 25, 1989, commented that "it may be that the ponding of polluted runoff or CSO's contributes to the coliform problem, and that larger minimum releases would help the situation." Actually, the ponding of polluted runoff does not exacerbate the coliform problem, and larger minimum releases would not help the situation. Coliform bacteria originate from point and
non-point pollutant sources, which is not caused by the project. Once the bacteria enters the water column they must live out their life cycle. Changing operation of the project or increasing minimum flow releases would have no effect on the concentrations of these bacteria.

2.4.3 Measures Proposed by the Applicant

WMECO proposes no water quality measures beyond discharge of an instantaneous minimum flow release below the dam (upon completion of the minimum flow facility), since operation of the existing project and the proposed modification of the project are expected to have no adverse impact on water quality.

2.5 Land and Water Uses

2.5.1 Continuing and Incremental Impacts

The existing land and water uses described in Section 1.5 will not be adversely affected by the proposed project.

2.5.2 Recommendations by Agencies

With the exception of recreational uses (see Section 2.6), no specific recommendations regarding land or water uses were made by any consulting agencies during the Initial Stage of Consultation.

During the Second Stage of Consultation, many agencies requested that WMECO participate in the purchase of additional land in the vicinity of their projects in order to provide a buffer zone to protect the river corridor.

2.5.3 Measures Proposed by the Applicant

Since no adverse impacts to land or water uses are expected to result from the project, WMECO proposes no specific measures concerning these uses at this time.
As noted in Exhibit G, WMECO owns flowage rights to all lands necessary to operate their projects, and, where possible, is utilizing their additional lands to enhance recreational facilities (see Section 2.6). In response to second stage recommendations that WMECO protect the river corridor, WMECO proposes to include all new facilities, as well as all lands that The Company owns in fee or for which WMECO owns flowage rights, within the project boundary. As shown by the correspondence contained in Appendix A, WMECO is also consulting further to assist governmental agencies in obtaining conservation easements for land parcels that are not part of the project.

2.6 Recreational Uses

2.6.1 Continuing and Incremental Impacts

The continued operation of the Indian Orchard Project will have no adverse effect on recreation. The proposed operation of the project is expected to enhance recreation at the project, because a minimum flow will be released into the bypass, which will increase fish habitat below the dam, and should improve the existing fishery and aesthetics. Additionally, the measures proposed by WMECO (see Section 2.6.3) will also enhance recreational opportunities at the project.

2.6.2 Recommendations by Agencies

The USFWS on April 20, 1989, and the MDFW on April 20, 1989, suggested that WMECO evaluate the adequacy of existing recreational access given the project's proximity to an urban area. The USFWS also suggested that additional recreational opportunities may be required, based on the outcome of instream flow and reservoir studies. The Massachusetts Riverways Programs (MRP) responded on May 12, 1989 and June 23, 1989 with general comments regarding resource protection, recreational access, and aesthetics. MRP also commented that they support more specific recommendations made by other resource agencies. A number of resource agencies requested WMECO to consider boat portage routes around the dams on the Chicopee River.
During Second Stage Consultation many commenters supported WMEO's proposals to enhance recreation. The Connecticut River Watershed Council recommended that a "low impact recreation area could be maintained at Indian Orchard." This recommendation is consistent with the recreational facilities already proposed by WMEO for the project.

2.6.3 Measures Proposed by Applicant

In order to improve the recreational resources of the project, WMEO plans to improve an existing informal small boat access area (described in Section 1.6) for use by car-top boats, and by constructing and maintaining a foot path along the southerly shore leading to a small picnic area near Indian Leap (see Figure E-4). WMEO also proposes to install a boat barrier upstream of the project dam to improve boating safety, and to provide all the necessary safety information and signs at the project.

As shown in Figure E-3 in Section 1.6, the improvement to the informal small boat access area will include construction of a parking area for five cars. A two-level wooden dock will be constructed at the water's edge. The dock will be constructed of rock-filled timber cribbing. The dock will facilitate the loading and tie-up of small boats and canoes. Further consultation with the City of Springfield and others will be undertaken regarding the proximity of the proposed parking area to a nearby storm drain outfall and an abandoned railroad right-of-way which parallels the public road.

A half-mile foot path will be constructed along the impoundment's south shore, between the small boat access parking area and a scenic overlook to the east. An existing informal access path to the overlook extends from Indian Leap Street. This path, which is approximately 50 yards long, is expected to continue providing additional access to the scenic area. The new path along the impoundment will be cleared of vegetation, roots, etc., and a trail tread of wood chips will be provided. At the overlook, WMEO will furnish and place 3 picnic tables (concrete base with wood seats and top) firmly anchored to the rock to
resist vandalism. The overlook provides a scenic view of the impoundment, the river, and the bluff area, which is locally known as "Indian Leap." WMECO will provide a signboard to explain the history and lore of the Indian Leap area, from which the power station and local neighborhood take their names.

As discussed in Section 2.6.1, the increased minimum flow release in the bypass will improve the existing fishery and aesthetics. As noted in Section 1.6, many foot paths lead to the bypass, and also to the impoundment. These paths are not impacted by the change in flows or reservoir levels. Therefore, no further measures are proposed by WMECO as a result of the outcome of instream flow and reservoir studies.

2.7 Historical and Archaeological Resources

2.7.1 Continuing and Incremental Impacts

The proposed addition of a minimum flow facility at the canal spillway will have an insignificant structural impact. The location of the tailrace of the new powerhouse was specifically chosen to avoid potential undermining of the Indian Orchard dam by minimum flow discharges. There would be minor visual impacts from the siphon penstock and powerhouse; however, the site is not readily visible from any public rights-of-way, and the proposed facility is consistent with the historical waterpower purpose of the project.

Based on a site survey by the project archaeologist, there are no indications that the proposed construction activities will have an impact on any archaeological resources that may be present in the project area.

2.7.2 Recommendations by Agencies

During the Initial Stage of Consultation, WMECO provided the Massachusetts Historical Commission (MHC) (acting as the Massachusetts State Historic Preservation Officer) with a description of the project, noting its operation and history. The MHC responded that WMECO's proposal to license the project without any changes would not affect significant cultural, historical, or archaeological resources.
During Phase II studies, and in response to recommendations of fishery agencies, WMECO gave consideration to the installation of a small turbine at the dam to discharge a continuous minimum flow into the bypassed segment of the river. WMECO immediately contacted the MHC by telephone to discuss the need for studies to address potential impacts resulting from installation of a new turbine. MHC staff requested that WMECO conduct a survey of the project sufficient to permit an assessment of its eligibility for inclusion in the National Register; based on the project's eligibility, an assessment of the impacts of the proposed turbine on historical and archaeological resources would be needed, together with mitigative proposals, if necessary, to minimize or eliminate impacts.

During the Second Stage of Consultation, the MHC (October 24, 1989) requested the opportunity to review and comment on preliminary plans for the facilities to determine what effects the proposed undertakings may have on significant historical and architectural characteristics of the generating stations. The MHC also indicated that a site visit would assist their review and determination of effect.

2.7.3 Survey and Salvage Measures Proposed by the Applicant

A survey of the project sufficient to permit an assessment of its eligibility for inclusion in the National Register of Historic Places was conducted. The results of the survey are contained in Appendix F. WMECO proposes to consult with the MHC regarding appropriate mitigation steps that may be undertaken. WMECO expects to consult with MHC and the Advisory Council on Historic Preservation regarding design details for the proposed facility to avoid adverse impacts on the characteristics of the Indian Orchard Project that may make it eligible for inclusion in the National Register. Additionally, WMECO will consult with the MHC to institute measures during construction activities so that previously unidentified resources are adequately protected.

The contributing structures that make the project meet the criteria for National Register eligibility (i.e., the hydroelectric station, dam, canal, and associated structures) will not be adversely impacted by the proposed construction as a result of WMECO's proposal to consult with the
SHPO on final design details. Therefore, as discussed in WMEO's
response letter to the SHPO, WMEO has encouraged a site visit by the
SHPO, and has requested the SHPO to find that the proposed activities
have no adverse effect on the eligibility of the structures (see
Appendix A).

2.8 Scenic and Aesthetic Resources

2.8.1 Continuing and Incremental Impacts

In the industrial setting prevalent around the project, the
development proposed at the project will have no adverse impact on the
scenic and aesthetic resources of the area.

2.8.2 Recommendations by Agencies

During Initial Stage Consultation, federal, state, and local
resource agencies recommended increased flow discharges into the bypassed
reach to enhance aesthetic resources of the project.

No further recommendations regarding scenic and aesthetic resources
were made during the Second Stage of Consultation.

2.8.3 Measures Proposed by the Applicant

WMEO proposes to provide a continuous minimum flow release
of 248 cfs or inflow, if less, into the bypassed reach. WMEO proposes
no additional measures regarding the scenic and aesthetic resources of
the proposed project, since no major changes to project structures are
being proposed.
3.0 AGENCY CONSULTATION

3.1 Initial Stage Consultation

On February 21, 1989, WMECO provided 37 agencies with the Combined Initial Consultation Document. A copy of this document is attached in Appendix A (Agency Consultation). Comments and recommendations from reviewing agencies were requested within 30 days. Eleven agencies responded (see Appendix A), some with specific recommendations regarding studies, surveys, and materials to be included in the draft application. Those recommendations have been addressed in Section 2.0 of this Exhibit.

The following agencies received the Initial Stage Consultation Document:

- National Marine Fisheries Service
- National Park Service, Division of Environmental Compliance
- National Park Service, Mid-Atlantic Region
- National Park Service, North Atlantic Region
- U.S. Army Corps of Engineers
- U.S. Department of Interior (DOI)
- U.S. DOI, Environmental Project Review
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service (FWS)
- U.S. FWS Connecticut River Atlantic Salmon Commission
- U.S. FWS Endangered Species Specialist
- U.S. FWS New England Region
- U.S. FWS Regional Director
- MA Cooperative Fisheries Research Unit
- MA Environmental Protection Agency Unit
- MA Department of Community Affairs
- MA Department of Environmental Management
- MA Department of Environmental Quality Engineering (DEQE)
- MA DEQE Regional Environmental Engineer
- MA Department of Public Utilities
- MA Division of Fisheries and Wildlife (DFW)
MA DFW Natural Heritage Program  
MA DFW Program Coordinator  
MA Division of Marine Fisheries  
MA Energy Facilities Siting Council  
MA Executive Office of Environmental Affairs  
MA Historical Commission  
City of Chicopee, MA, Mayor  
City of Chicopee, MA, Conservation Commission  
City of Chicopee, MA, Office of Community Development  
City of Chicopee, MA, Watershed Council  
City of Springfield, MA, Mayor  
Connecticut River Watershed Council  
Pioneer Valley Planning Commission  
Town of Belchertown, MA, Board of Selectmen  
Town of Ludlow, MA, Board of Selectmen  
Town of Palmer, MA, Board of Selectmen  
Town of Wilbraham, MA, Board of Selectmen

### 3.1.1 Agency Meetings

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<thead>
<tr>
<th>Date</th>
<th>Agencies</th>
<th>Location</th>
<th>Topic</th>
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<td>March 29, 1989</td>
<td>USFWS, MDFW</td>
<td>At Project</td>
<td>Preliminary site visit</td>
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<td>May 12, 1989</td>
<td>USEWS, MDFW</td>
<td>Westboro, MA</td>
<td>Discuss study plans</td>
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<td>June 20, 1989</td>
<td>City of Chicopee Office of Community Development, MA Riverways Program, Chicopee River Watershed Council</td>
<td>Chicopee</td>
<td>River Flows Wildlife Protection</td>
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<td>June 29, 1989</td>
<td>MDFW</td>
<td>At Project</td>
<td>Participation in Fisheries Studies</td>
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<td>Late July, 1989</td>
<td>City of Chicopee Office of Community Development</td>
<td>Chicopee</td>
<td>Chicopee Enhancement Plan</td>
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<td>August 2, 1989</td>
<td>USFWS, MDFW</td>
<td>At Project</td>
<td>View ABF</td>
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<td>August 23, 1989</td>
<td>MA Dept. of Fisheries, Ludlow Wildlife and Environmental Law Enforcement, and interested citizens</td>
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<td>Maintenance of Public Facilities</td>
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<td>August 30, 1989</td>
<td>USFWS, MDFW</td>
<td>Concord, NH</td>
<td>Review study results</td>
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### 3.2 Second Stage of Consultation

On September 21, 1989, WMECO circulated a draft Application for Exemption from Licensing to 38 resource agencies. The draft application provided descriptions of resources and results of studies performed by WMECO to address resource issues raised during the Initial Stage of Consultation, as well as WMECO proposals for addressing resource issues. Comments from agencies were requested within 30 days. Seven agencies responded (see Appendix A). WMECO responded to all commenters to specifically address resource and other issues raised (see Appendix A), and resource issues have been addressed in this application.

The following agencies received the draft Application for Exemption from Licensing:

- National Marine Fisheries Service
- National Park Service, Division of Environmental Compliance
- National Park Service, Mid-Atlantic Region
- National Park Service, North Atlantic Region
- U.S. Army Corps of Engineers
- U.S. Department of Interior (DOI)
- U.S. DOI, Environmental Project Review
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service (FWS)
U.S. FWS Endangered Species Specialist
U.S. FWS New England Region
U.S. FWS Regional Director
U.S. FWS Connecticut River Coordinator
MA Cooperative Fisheries Research Unit
MA Environmental Protection Agency Unit
MA Department of Community Affairs
MA Department of Environmental Management (DEM)
MA DEM Division of Forests and Parks
MA Department of Public Utilities
MA Division of Fisheries and Wildlife (DFW)
MA Metropolitan District Commission
MA Waterways Regulation Program
MA Department of Environmental Protection (DEP)
MA DEP Division of Water Pollution Control
MA DFW Field Headquarters
MA Dept. of Fisheries, Wildlife, and Environmental Law Enforcement
MA DFW Natural Heritage Program
MA Division of Marine Fisheries
MA Energy Facilities Siting Council
MA Executive Office of Environmental Affairs
MA Historical Commission
City of Springfield, MA, Mayor
City of Springfield, MA, Conservation Commission
City of Springfield, MA, Department of Public Works
Connecticut River Watershed Council
Chicopee River Watershed Council
Pioneer Valley Planning Commission
Town of Ludlow, MA, Board of Selectmen
Town of Ludlow, MA, Conservation Commission