APPENDIX F

CONSENT AGREEMENT

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT
LANSING

JENNIFER M. GRANHOLM
GOVERNOR

REBECCA A. HUMPHRIES
DIRECTOR

August 11, 2010

CERTIFIED MAIL

Ms. Sue F McCormick, Public Service Area Administrator
City of Ann Arbor
100 North 5th Avenue
Ann Arbor, Michigan 48107

Dear Ms. McCormick:

SUBJECT: Consent Agreement
Argo Dam, Dam ID 559, City of Ann Arbor

Enclosed please find two executed copies of the Consent Agreement between the City of Ann Arbor and the Land and Water Management Division of the Michigan Department of Natural Resources and Environment.

If you have any questions regarding this matter, please contact me.

Sincerely,

Byron Lane, P.E., Chief
Hydrologic Studies and Dam Safety Unit
Land and Water Management Division
517-241-9862

Enclosure

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENT

City of Ann Arbor

Argo Dam, Section 20, T02S, R06E, Ann Arbor Township, Washtenaw County

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CONSENT AGREEMENT

The City of Ann Arbor (Ann Arbor) and the Land and Water Management Division (LWMD), Michigan Department of Natural Resources and Environment (DNRE), in consideration of their mutual interest in increasing the safety of the Argo Dam, located in the City of Ann Arbor, Washtenaw County, Michigan (hereinafter "the dam"), have agreed to this Consent Agreement. This Consent Agreement identifies the necessary actions to be taken by Ann Arbor, and supersedes the Dam Safety Order issued to Ann Arbor on August 6, 2009. This agreement also serves to resolve the pending contested case initiated by Ann Arbor regarding the August 6, 2009 Order.

IT IS HEREBY AGREED AS FOLLOWS:

Background

1) The Argo Dam is currently rated by DNRE as a "high hazard potential dam" per the provisions of Part 315 (Dam Safety) of the Natural Resources and Environmental Protection Act, MCL 324.31501 *et seq*. Section 31503 (11) defines a high hazard potential dam as follows: "High hazard potential dam" means a dam located in an area where a failure may cause serious damage to inhabited homes, agricultural buildings, campgrounds, recreational facilities, industrial or commercial buildings, public utilities, main highways, or class I carrier railroads, or where environmental degradation would be significant, or where danger to individuals exists with the potential for loss of life.

2) Section 31518(7) states, "If, based on the findings and recommendations of the inspection report and an inspection by the department, the department finds that a condition exists which endangers a dam, it shall order the owner to take actions that the department considers necessary to alleviate the danger."

3) On August 6, 2009, the LWMD of the Department of Environmental Quality (DEQ) issued a Dam Safety Order to Ann Arbor requiring the City to correct certain deficiencies of the toe drains of the headrace embankment and to remove the extensive growth of trees and brush from the headrace embankment. The LWMD takes the position there are certain deficiencies of the toe drains of the headrace embankment, and the City takes the position that the deficiencies are not all deficiencies or that they are not as severe as characterized by the MDNRE, but the parties resolve their concerns and differences by this agreement.

4) The City filed a petition for a contested case hearing regarding the Order. That matter has been held in abeyance while the LWMD and the City engaged in settlement negotiations regarding the Order.

5) On November 2, 2009, the City installed a stop log blocking flow to the Argo Dam headrace.

6) The City has provided additional information to the LWMD, including, but not limited to, a report entitled *Geotechnical Evaluation Report for the Argo Dam Headrace Embankment*, dated December 16, 2009 prepared by Soil and Materials Engineers, Inc; a *Vegetation Management Plan-Headrace Embankment Argo Dam*, dated April 30, 2010; and *Triggers for response actions for the Argo Headrace Embankment,* dated April 30, 2010.

7) Pursuant to Executive Order 2009-45, all of the functions and authorities of the DEQ LWMD were transferred to the DNRE, Effective January 17, 2010.

8) The City and the LWMD have now agreed upon a series of measures and a schedule regarding the dam, that are specified below.

Vegetation Management

9) Ann Arbor shall remove the trees and brush from the headrace embankment in accordance with the schedule contained in *Vegetation Management Plan – Headrace Embankment Argo Dam,* dated April 30, 2010.

Reconstruction or Repair

10) Ann Arbor shall select and execute one of two options or a combination thereof: (i) repair the toe drain system and/or (ii) reconstruct the embankment, according to the following terms and schedule:

    a) Ann Arbor shall issue a Request for Proposal no later than October 1, 2010 for the repair of the toe drains and/or for the reconstruction of the embankment.

    b) Ann Arbor shall apply for the necessary permits for the selected option no later than February 1, 2011.

    c) Construction of the selected option shall commence on or before June 1, 2011, contingent upon receipt of the required DNRE permits by May 15, 2011.

    d) Construction of the selected option shall be completed by November 15, 2011.

Stop Log

11) The stop log currently blocking the flow to the Argo Dam headrace may be removed upon signing of this agreement by both parties. The refilling of the headrace shall not exceed six (6) inches of elevation in a 24-hour period.

12) The flow from the impoundment to the headrace shall be completely shut off again via the re-installation of the stop log on or before October 15, 2010.

13) The headrace stop log may be removed again after May 1, 2011.

14) Ann Arbor shall implement the measures detailed in the document *Triggers for Response Actions for the Argo Headrace Embankment* dated April 29, 2010. For the term of this agreement, Ann Arbor shall replace the stop-log within 2 hours if any of the triggers described occur.

15) If Ann Arbor does not commence or complete construction by the dates specified in items 10 c. and 10 d. above, the flow to the headrace from the impoundment shall be completely shut off via the re-installation of the stop log. The flow shall not be restored until Ann Arbor has completed a repair or construction program approved by the DNRE.

Inspections and Monitoring

16) Ann Arbor shall have the headrace embankment inspected at least quarterly by a Licensed Professional Engineer familiar with dam safety engineering.

17) At any time when the stop-log is not in place, Ann Arbor shall make a monthly visual inspection of the head race embankment and shall check and record all piezometer levels.

18) For the term of this Agreement, Ann Arbor shall monitor the water level in Argo Pond on at least a daily basis.

Quarterly Report

19) Ann Arbor shall make a quarterly report to the DNRE. The report, which may be submitted electronically, will be due on the 15th of the month following the end of the quarter. The first regular quarterly report shall be due July 15, 2010. Quarterly reports shall include the following items:

    a) A report on the progress toward each of the milestones, and a statement that the conditions observed are in compliance with the terms of this agreement. If any conditions observed are not in compliance with the terms of this agreement, Ann Arbor shall give a detailed report as to any item not in compliance.

    b) A summary of the data gathered during the required inspections.

20) Ann Arbor will maintain all data pertinent to the provision of this agreement for DNRE inspection upon request, including but not limited to piezometer readings, pond levels, inspection notes, and work records.

21) The terms of this agreement shall be deemed satisfied upon satisfactory completion of the construction activities described herein as permitted by the DNRE and completion of the work items detailed in *Vegetation Management Plan – Headrace Embankment Argo Dam* dated April 30, 2010.

22) This Consent Agreement shall be binding upon the parties and their successors and may be enforced as an order pursuant to MCL 324.31524(4).

23) This Consent Agreement shall not create any private rights or causes of action in any third party.

24) This Consent Agreement supersedes and replaces the Dam Safety Order issued August 6, 2009.

25) This Consent Agreement shall resolve the contested case proceeding filed by Ann Arbor regarding the Dam Safety Order issued August 6, 2009.

26) The undersigned certify that they are fully authorized by the party they represent to enter this Consent Agreement and legally bind that party to this Agreement.

Elizabeth M Browne Dated: May 6, 2010
Elizabeth M. Browne, Division Chief
Land and Water Management Division
Michigan Department of Natural Resources and Environment

Approved as to form:

Robert P. Reichel Date: May 6, 2010
Robert P. Reichel
Assistant Attorney General
Environment, Natural Resources and
Agriculture Division
Department of Attorney General

City of Ann Arbor

John Hieftje Date: 5/4, 2010
John Hieftje, Mayor

Jacqueline Beaudry Date: 5/4, 2010
Jacqueline Beaudry, City Clerk

Approved as to substance

Roger W. Fraser Date: 5/4, 2010
Roger W. Fraser, City Administrator
City of Ann Arbor

Sue F. McCormick, Public Service Area Administrator, City of Ann Arbor

Date: 5/4, 2010

Approved as to form and content

for Stephen K. Postema, City Attorney
City of Ann Arbor

Date: 4 May, 2010

Vegetation Management Plan- Headrace Embankment Argo Dam
April 30, 2010

Background

The Argo Dam headrace embankment is a 1500 foot long earthen embankment that provides the millrace and canoe portage around Argo Dam. At the crest of the embankment is a foot path and growing on the sides of embankment are vegetated areas consisting of woody shrubs and trees. According to the Michigan Department of Natural Resources and Environment (MDNRE), the extensive root systems of woody plants compromise the stability of the earthen embankment. The woody vegetation also impedes visual inspection of the toe drains and embankment. For these reasons, MDNRE requires that earthen embankments be free of woody vegetation.

This document contains the proposed vegetation management plan for the headrace embankment. MDNRE has indicated that there is no need for removal of vegetation in the swale at the toe of the embankment or along the river's edge. As such, this plan will only address vegetation management on the earthen embankment. The phasing of the work took into consideration: the impacts that vegetation removal can have on the stability of the embankment; the opportunity for tree removals to be coordinated with construction of the selected alternative to address the repair of the toe drains in 2011, which could involve substantial reconstruction of the millrace and embankment; and the need to communicate and educate the residents about the vegetation removal.

Vegetation & Vegetation Management on the Headrace Embankment

Current vegetation on the Argo Headrace Embankment includes:

- Shrubs and brush, and
- Trees

1. Shrubs and Brush

The woody shrubs and brush on the embankment consists of primarily non-native shrubs, including Honeysuckle (*Lonicera sp.*) and Buckthorn (*Rhamus sp.*). Due to their early bud break and prolific fruiting, these species quickly establish and colonize disturbed areas. A comprehensive inventory of the shrubs has not been undertaken but it is estimated that there are several hundred shrubs along the embankment.

Shrubs and Brush Management

Immediate Concerns

There is a population of Purple Turtlehead (*Chelone obliqua*) a state listed endangered plant species at the east end (closest to concrete dam structure) of the embankment on the east side. Due to its status as an endangered species, no woody vegetation removal will occur within 10 feet of the turtlehead population during the growing season. Care will be taken to ensure that cut shrubs do not fall onto the plants. When the turtlehead is dormant, the remaining vegetation will be removed by hand. No mechanical equipment is planned to be used in the area of the turtlehead; however, if it is determined that mechanized equipment is needed the City will apply for a threatened and endangered species permit through MDNRE prior to equipment being used.

Short Term *Timeframe: March 2010 – June 30, 2010*

As of March 25, 2010, the City began removing the woody shrubs along the headrace embankment. Crews from the City's Public Services Area are removing the shrubs by hand

using saws and pruners. The stumps are being treated with the herbicide to keep them from re-sprouting-- Pathfinder II (active ingredient: *triclopyr)* when the plants are dormant and Triclopyr salt formulation during the growing season. The herbicide is being painted on the stumps with a foam applicator. The crews have started on the east end (farthest from concrete dam structure) of the embankment and will move west, working on both sides of the embankment. No herbicide will be used within the 10 foot buffer surrounding the Purple turtlehead, unless MDNRE determines that it is safe to be used in this area.

Mid - Long Term *Timeframe: Begin Summer 2010*
The vegetation on the headrace embankment will be monitored for sprouting 2-3 times per year by the City's Public Services or Community Services staff. Any woody shrubs/brush discovered during inspection will be removed.

2. Trees
There are 311 trees on the earthen embankment, swale at the toe of the embankment and along the river, according to a tree inventory completed by the city in 2007 (see attached). The trees range in size from 1" to 38" in diameter at breast height (DBH). The predominant species of trees on the embankment include Mulberry (*Morus alba),* Black Willow (*Salix nigra)*, Elm (*Ulmus sp.),* Cottonwood (*Populus deltoides),* Green Ash (*Fraxinus pennsylvanica),* Tree of Heaven (*Ailanthus altissima)* and Boxelder (*Acer negundo).*

Of the 311 trees, 196 trees are located off the embankment, either in the swale at the base of the embankment or in the ridge that runs along the river. The majority of trees in the swale at the toe of the embankment are dead ash trees. Of the trees off the embankment, 24 are considered landmark trees according to city ordinance. Of these landmark trees, 7 of them (all Cottonwood trees) have canopies that extend over the embankment.

The 7 landmark trees that are off the embankment and have canopy that extends over it should not pose a risk to the embankment. These trees are growing along the river on a ridge that is 3-4 feet above the swale at the toe of the embankment. The roots of the 7 trees terminate in the shallow soil of the swale where oxygen and nutrients are readily available. Because the root system of these landmark trees does not extend into the embankment, these seven trees will not be removed. A map which identifies these 7 trees is attached.

Note: If any landmark tree(s) is removed, mitigation tree planting must occur that is equal to 50% of the diameter at breast height of the tree(s) that has been removed. The mitigation tree planting can occur on any city property.

Tree Management:
Immediate Concerns
There is a population of Purple Turtlehead (*Chelone obliqua*) a state listed endangered plant species at the east end (closest to concrete dam structure) of the embankment on the east side. Due to its status as an endangered species, no woody vegetation removal will occur within 10 feet of the turtlehead population during the growing season. Care will be taken to ensure that cut trees do not fall onto the plants. When the turtlehead is dormant, the remaining vegetation will be removed by hand. No mechanical equipment is planned to be used in the area of the turtlehead; however, if it is determined that mechanized equipment is needed the City will apply for a threatened and endangered species permit through MDNRE prior to equipment being used.

Short Term *Timeframe: May 2010-September 30, 2010*

In the short term the trees on the embankment and in the swale that are listed in the survey as in poor condition or dead will be removed. These trees pose a hazard to people and the stability of the embankment. Tree removal will be completed by the City's Public Services Area staff or contractors. All logs and tops from the removed trees will be taken off the embankment and hauled away. The stumps will be cut flush with the ground and painted with herbicide to prevent re-sprouting. No re-vegetation will occur. No herbicide will be used within the 10 foot buffer surrounding the Purple turtlehead, unless MDNRE determines that it is safe to be used in this area.

The weight/size of machinery, equipment and vehicles can have an impact on the stability of the earthen embankment and therefore are not feasible for use during the removal of the trees on the embankment. All tree cutting (including log and brush removal) will need to be done by hand. Vehicles/machinery can be staged off the earthen embankment and used to pull logs (winch) from the embankment, if necessary. To be consistent with the shrub removal, tree removal will begin on the east end of the embankment and move west, removing trees on both sides of the embankment. In areas that are too wet in the spring, tree removal will occur in late summer/early fall.

Long Term *Timeframe: Begin Summer 2011*

The city is weighing several options for construction work on the headrace embankment, including repairing the toe drains or reconfiguring the millrace and headrace embankment. The decision on these options will be made in late 2010/early 2011.

Removal of remaining trees on the embankment and in the swale at the toe of the embankment will be done by December 31, 2011 unless approval for some to remain is given in writing by the MDNRE.

Beginning in the summer of 2010 the vegetation on the headrace embankment will be monitored for sprouting 2-3 times per year by Public Services or Community Services staff. Any woody vegetation discovered during inspection will be removed.

Stump Removal and Revegetation

As mentioned above that the City is initiating the process to evaluate options for construction work on the headrace embankment. The long-term plan for stump removal and re-vegetation will be developed and submitted for approval following the construction that will occur on the headrace embankment.

Argo Survey Tree Tag Database

TAG	SIZE	TYPE	CONDITION
1708	16" & 11"	Mulberry	Inv.
1709	8" & 4" & 10"	Blac Willow	
1710	11"	Elm-Rock	
1711	38"	Cottonwood	LM
1712	26"	Cottonwood	LM
1713	8"	Mulberry	Inv.
1714	6" & 5"	Hawthorne	Poor
1715	9"	Tree of Heaven	Inv.
1716	8"	Ash	Dead
1717	13"	Elm-Rock	
1718	17"	Red Maple	
1719	14"	Cottonwood	
1720	11"	Sugar Maple	
1721	19"	Black Willow	Poor
1722	20"	Black Willow	
1723	18"	Black Willow	
1724	10"	Elm-Rock	
1725	14"	Black Willow	
1726	9"	Basswood	
1727	24"	Black Willow	LM
1728	8" & 9"	Mulberry	Inv.
1729	30" & 28"	Black Willow	Very Poor
1730	10"	Mulberry	Inv.
1731	30" & 35"	Black Willow	Very Poor
1732	11"	Mulberry	Inv.
1733	9"	Elm-Rock	
1734	23"	Black Willow	
1735	15"	Black Willow	Poor - Top is gone
1736	21"	Black Willow	
1737	15"	Black Willow	
1738	31"	Cottonwood	LM
1739	23"	Black Willow	Poor-top is gone
1740	24"	Cottonwood	LM
1741	7"	Mulberry	Inv.
1742	12"	Tree of Heaven	Inv.
1743	31"	Cottonwood	LM
1744	7"	Mulberry	Inv.
1745	7"	Mulberry	Inv.
1746	7"	Elm-Rock	
1747	17"	Cottonwood	
1748	22"	Cottonwood	
1749	13" & 18"	Mulberry	Inv.
1750	24"	Cottonwood	LM
1751	8"	Mulberry	Inv.
1752	27"	Cottonwood	LM
1753	31"	Cottonwood	LM
1754	12"	Black Willow	Poor
1755	19"	Black Willow	

1756	7"	Mulberry	Inv.
1757	20"	Black Willow	
1758	7"	Ash	Dead
1759	8"	Mulberry	Inv.
1760	8"	Mulberry	Inv.
1761	19"	Cottonwood	
1762	25"	Cottonwood	LM
1763	22"	Black Willow	
1764	18"	Black Willow	
1765	10"	Mulberry	Inv.
1766	18"	Black Willow	Poor
1767	8"	Tree of Heaven	Inv.
1768	9"	Mulberry	Inv.
1769	23"	Cottonwood	
1770	8"	Tree of Heaven	Inv.
1771	36"	Cottonwood	
1772	10"	Mulberry	Inv.
1773	11"	Tree of Heaven	Inv.
1774	27"	Cottonwood	LM
1775	9"	Elm-Rock	
1776	25"	Cottonwood	LM
1777	10"	Mulberry	Inv.
1778	11"	Mulberry	Inv.
1779	30"	Cottonwood	LM
1780	7"	Mulberry	Inv.
1781	11"	Cottonwood	
1782	21"	Cottonwood	
1783	12"	Black Willow	
1784	20"	Black Willow	Poor-top is gone
1785	10" & 10"	Mulberry	Inv.
1786	9"	Mulberry	Inv.
1787	17"	Cottonwood	
1788	8"	Mulberry	Inv.
1789	11"	Mulberry	inv. - bent over
1790	34"	Cottonwood	LM
1791	15"	Mulberry	Inv.
1792	9"	Mulberry	Inv.
1793	12"	Tree of Heaven	Inv.
1794	24"	Cottonwood	LM
1795	22"	Cottonwood	
1796	14"	Elm-Rock	
1797	8"	Mulberry	Inv.
1798	8"	Mulberry	Inv.
1799	13"	Ash	Dead
1800	20"	Black Willow	Leaning
1801	19"	Black Willow	
1802	26"	Cottonwood	LM
1803	29"	Cottonwood	LM
1804	8"	Tree of Heaven	Inv.
1805	10"	Tree of Heaven	Inv.
1806	13"	Mulberry	Poor - Inv.
1807	15"	Black Willow	

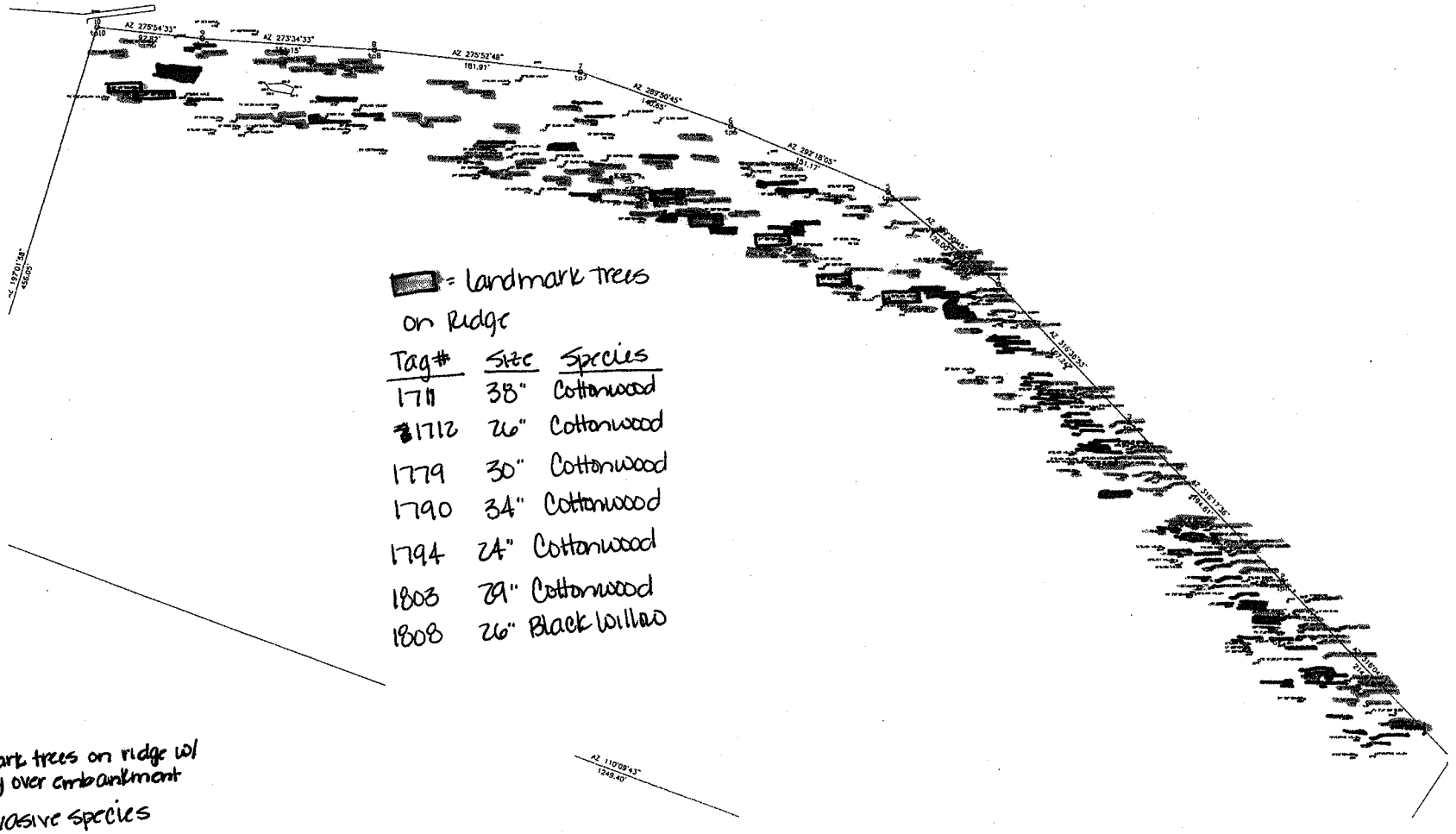
1808	26"	Black Willow	LM
1809	20"	Black Willow	
1810	22"	Black Willow	
1811	13"	Mulberry	Inv.
1812	30"	Black Willow	LM
1813	N/A	Lost this tag	
1814	10"	Mulberry	LM
1815	27"	Black Willow	LM
1816	11"	Mulberry	Inv.
1817	20"+20"	Ash	Dead
1818	10"	Ash	Dead
1819	14"	Ash	Dead
1820	16"	Ash	Dead
1821	11"	Black Cherry	
1822	14"	Ash	Dead
1823	22"	Black Willow	
1824	9"	Mulberry	Inv,
1825	11"	Ash	Dead
1826	11"	Ash	Dead
1827	11"	Ash	Dead
1828	11"	Ash	Dead
1829	11"	Ash	Dead
1830	9"	Ash	Dead
1831	16"	Black Willow	
1832	21"	Black Willow	
1833	20"	Black Willow	
1834	20"	Black Willow	
1835	9"	Tree of Heaven	Inv.
1836	9"	Elm-Rock	
1837	14"	Ash	Dead
1838	20"	Ash	Dead
1839	8"	Ash	Dead
1840	7"	Ash	Dead
1841	8"	Mulberry	Inv.
1842	9"	Tree of Heaven	Inv.-Dead
1843	7"	Mulberry	Inv.
1844	9"	Ash	Dead
1845	12"	Mulberry	Inv.
1846	18"	Ash	Dead
1847	15"	Ash	Dead
1848	13"	Mulberry	Inv.
1849	16"	Black Willow	Leaning in River - tag on root
1850	7"	Mulberry	Inv.
1851	18"	Black Willow	
1852	18"	Black Willow	
1853	11"	Ash	Dead
1854	13"	Ash	Dead
1855	15"	Ash	Dead
1856	15"	Ash	Dead
1857	9"	Mulberry	Inv.
1858	16"	Ash	Dead
1859	8" + 6"	Mulberry	Inv.

1860	10"	Mulberry	Inv.
1861	18"	Black Willow	
1862	20"	Cottonwood	
1863	14"	Ash	Dead
1864	10"	Mulberry	Inv.
1865	13"	Ash	Dead
1866	15"	Ash	Dead
1867	12"	Ash	Dead
1868	8"	Ash	Dead
1869	15"	Ash	Dead
1870	14"	Mulberry	Inv.
1871	7"+12"	Ash	Dead
1872	10"	Sugar Maple	
1873	16"+11"	Ash	Dead
1874	18"	Ash	Dead
1875	10"	Ash	Dead
1876	16"	Sugar Maple	LM
1877	17"	Cottonwood	
1878	19"	Cottonwood	
1879	24"+20"+16"	Cottonwood	LM
1880	9"	Elm-Rock	Dead
1881	18"	Ash	Dead
1882	15"	Ash	dead - top down
1883	11"	Elm-Rock	
1884	18"	Ash	Dead
1885	7"	Ash	Dead
1886	7"	Mulberry	Inv.-Dead
1887	24"	Cottonwood	LM
1888	15"	Ash	Dead
1889	13"	Ash	Dead
1890	10"	weeping willow	
1891	21"	Cottonwood	
1892	11"	Ash	Dead
1893	19"	weeping willow	
1894	7"+12"	Ash	Dead
1895	15"	Sugar Maple	
1896	9"+5"	box Elder	
1897	10"	box Elder	
1898	7"	Mulberry	Inv.
1899	11"	Tree of Heaven	Inv.
1900	12"	Mulberry	Inv.
1901	14"	Tree of Heaven	Inv.
1902	8"	Mulberry	Inv.
1903	12"	Tree of Heaven	Inv.
1904	12"+7"	Tree of Heaven	Inv.
1905	23"	black Locust	Inv.
1906	11"	Elm-Rock	
1907	7"	Tree of Heaven	Inv.
1908	8"	Elm-Rock	
1909	7"	Tree of Heaven	Inv.
1910	9"	Mulberry	Inv.
1911	12"	Ash	Dead

1912	26"	black Locust	Inv.
1913	9"	Ash	Dead
1914	9"	Elm-Rock	
1915	12"	Tree of Heaven	Inv.
1916	10"	Tree of Heaven	Top Broken
1917	14"	black Locust	Inv.
1918	8"	black Locust	Inv.
1919	7"	Black Cherry	
1920	10"	Tree of Heaven	Inv.
1921	8"+7"	Mulberry	Inv.
1922	7"	Elm-Rock	
1923	21"	black Locust	Inv.
1924	12"	Mulberry	Inv.
1925	8"	Tree of Heaven	Inv.
1926	9"	Black Cherry	
1927	10"	Tree of Heaven	Inv.
1928	8"	Tree of Heaven	Inv.
1929	11"	Tree of Heaven	Inv.
1930	17"	Tree of Heaven	Inv.
1931	12"	Tree of Heaven	Inv.
1932	14"+8"	Tree of Heaven	Inv.
1933	8"+4"	Mulberry	Inv.
1934	8"	Tree of Heaven	Inv.
1935	7"	Elm-Rock	
1936	10"+6"	Elm-Rock	
1937	19"	Black Cherry	LM
1938	7"	Tree of Heaven	Inv.
1939	7"	Elm-Rock	
1940	8"	Mulberry	Inv.
1941	11"	Tree of Heaven	Inv.
1942		Lost this tag	
1943	12"	Tree of Heaven	Inv.
1944	9"	Tree of Heaven	Inv.
1945	10"	Tree of Heaven	Inv.
1946	13"	Mulberry	Inv.
1947	8"	Mulberry	Inv.-poor
1948	8"	Tree of Heaven	Inv.
1949	8"	Black Cherry	
1950	12"	Sugar Maple	
1951	10"	Tree of Heaven	Inv.
1952	11"	Sugar Maple	
1953	11"	Tree of Heaven	Inv.
1954	8"	Tree of Heaven	Inv.
1955	10"	Elm	
1956	16"+4"	Tree of Heaven	Inv.
1957	7"	Black Cherry	
1958	7"	Sugar Maple	
1959	17"	Tree of Heaven	Inv.
1960	12"	Mulberry	Inv.
1961	9"	Tree of Heaven	Inv.
1962	14"	Mulberry	Inv.
1963	15"	Mulberry	Inv.

1964	14"	Mulberry	Inv.
1965	17"	Mulberry	Inv.
1966	12"	Black Cherry	
1967	14"	Ash	Dead-leaning
1968	13"	Black Cherry	
1969	12"+19"	Ash	Dead
1970	17"	Sugar Maple	LM
1971	17"+13"	Ash	Dead
1972	5"+12"	Mulberry	Inv.
1973	9"	Mulberry	Inv.
1974	19"	Mulberry	Inv.
1975	13"	Mulberry	Inv.
1976	14"	black walnut	
1977	11"	Black Cherry	
1978	12"	Mulberry	Inv.
1979	26"	Ash	Dead
1980	14"	Ash	Dead
1981	10"	Mulberry	Inv.Poor
1982	12"	black walnut	
1983	17"	black walnut	
1984	23"	Mulberry	Inv.
1985	10"+8"	Mulberry	Inv.
1986	16"	Mulberry	Inv.
1987	10"	Tree of Heaven	Inv.
1988	11"	Mulberry	Inv.
1989	12"	Tree of Heaven	Inv.
1990	9"+10"	Tree of Heaven	Inv.
1991	12"	Tree of Heaven	Inv.
1992	10"	Tree of Heaven	Inv.
1993	9"	Mulberry	Inv.
1994	9"+14"	Ash	Dead
1995	14"	Ash	Dead
1996	20"	Ash	Dead
1997	10"	Tree of Heaven	
1998	8"	Mulberry	
1999	9"	Mulberry	
2000	13"	Ash	Dead
2001	17"	Ash	Dead
2002	10"	Black Cherry	
2003	9"	Tree of Heaven	
2004	9"	Mulberry	
2005	8"	Mulberry	
2006	8"	Tree of Heaven	Dead
2007	7"+11"	Tree of Heaven	Dead
2008	8"	Mulberry	
2009	10"	Tree of Heaven	
2010	9"	Tree of Heaven	
2011	9"	Tree of Heaven	
2012	10"	Tree of Heaven	
2013	8"	Tree of Heaven	
2014	14"	Ash	Dead
2015	10"	Ash	Dead

2016	12"	Ash	Dead
2017	16"	Ash	Dead
2018	13"	Mulberry	



= landmark trees on Ridge

Tag #	Size	Species
1711	38"	Cottonwood
1712	26"	Cottonwood
1779	30"	Cottonwood
1790	34"	Cottonwood
1794	24"	Cottonwood
1803	29"	Cottonwood
1808	26"	Black Willow

= landmark trees on ridge w/ Canopy over embankment

= Invasive species

= Dead/poor Condition

= Landmark Trees

4/30/10

Triggers for Response Actions for Argo Headrace Embankment
April 29, 2010

MDNRE has requested the City develop triggers that indicate potentially hazardous conditions or imminent failure of the Argo Headrace Embankment which will lead to isolation of the headrace embankment from the Argo Pond. These triggers are:

1. Low pond level alarm in the control room at the Water Treatment Plant
2. Piezometric readings
3. Visual signs

The City's response for each of these triggers is described below. The City staff performing visual inspections and responding to alarms are trained in dam safety, surveillance and monitoring, and the Emergency Action Plan for Argo dam.

1. Low pond level alarm.

We continuously monitor Argo pond in real time. The pond level monitor is in the dam control room at Argo. Argo pond is maintained at 773.50ft. Pond elevations of 773.80 ft and 773.20 ft will generate high and low pond alarms in the control room at the Water Treatment Plant which is staffed 24 hours, 7 days a week. A staff member will be dispatched to the dam site when high/low pond level alarm is received in the control room. The staff member visiting the dam will investigate the cause of the low pond alarm including performing visual inspection of the embankment. If the visual inspection of the embankment shows failure of the embankment such as water seeping oozing out or the embankment is breached or other signs listed below under visual signs, headrace will be isolated from the pond by installing the stop-log.

2. Piezometric readings.

Piezometers are read monthly. Following threshold/action levels are established for piezometers:

Piezometer	Action level
B1	771.0
B2	767.50
B4	762.50
B5	764.50
B6	763.0
B7	763.50
B8	763.0
B9	761.2

If any of the monthly piezometric readings reaches its corresponding action level in the table above, the frequency of piezometer readings will be increased to weekly readings. If eight consecutive weekly

readings show a rising trend above the action level, then the headrace will be isolated from the pond by installing the stop-log.

3. Visual signs

During visual inspections, if any of the following conditions are observed at the Headrace Embankment, the headrace Embankment will be isolated from the pond by using the stop-log:

- seepage of water on downstream slope,
- boiling near the toe of the embankment,
- bulging of embankment slope