

**COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
OFFICE OF ADMINISTRATIVE APPEALS**

In the Matter of
Lynnfield Center Water District

Docket No. 2003-076
File No. 9P2-3-17-164.01
Lynnfield

INTEVENORS' POST-HEARING MEMORANDUM

I. PROCEDURAL BACKGROUND

An adjudicatory hearing was held in the above Matter of Lynnfield Center Water District (LCWD, or the District) before Administrative Magistrate James Rooney on October 12-15, 2004. Intervenors assert that that the Department failed to impose sufficiently stringent conditions on LCWD, and that the Department's modifications to the District's Water Management Act permit (modified permit) were arbitrary and capricious, an abuse of discretion, illegal or otherwise not in accordance with law. Intervenors are seeking provisions in LCWD's modified permit that require it to develop and implement a water banking program forthwith to offset new or increased water use resulting from development, redevelopment or expansion projects; for higher streamflow triggers to initiate water restrictions sooner and effective communication of those triggers; a lower seasonal cap; and leak detection every two years.

The Intervenors assert that the District's modified permit in combination with the other modified permits in the Ipswich River basin: exceeds the safe yield of the water source; fails to achieve a balance among competing water withdrawals and uses; fails to preserve the water resource itself; fails to minimize the impact of water withdrawals on,

or to protect, water quality, navigation, water-based recreation, wetland habitat and fish and wildlife; and violates anti-degradation provisions of the Massachusetts Surface Water Quality Standards.¹ See Motion to Intervene in Matter of Lynnfield Center Water District; Intervenors' Prehearing Conference Memorandum; and Prehearing Conference Report.

The safe yield issue, which was listed as an issue in all of the Ipswich modified permit appeal cases, was originally framed as "What is the safe yield of the Ipswich River?" In a Conference Report applicable to all the appeals, dated January 13, 2004, Magistrate Rooney rephrased the issue as:

Should additional conditions (or a reduction in allocation) be imposed in the modified permits, beyond those conditions imposed by the Department, to meet the requirements of the Water Management Act and its implementing regulations? See M.G.L. c 21G and 310 CMR 36.00.

- a. Was information available to the Department at the time of the permit modifications that should have led it to recalculate the safe yield? See 310 CMR 36.33(4).
- b. If so, what did the available information show about how it should be recalculated?
- c. If the available information shows that the safe yield would have been less than the safe yield originally calculated by the Department, what consequences should follow to the modified permits?
 - 1) Are the conditions imposed by the Department adequate to meet its obligations under 310 CMR 36.28(j) or must additional conditions (including some or all of those proposed by Intevenor in its appeal or its prehearing conference memorandum) be imposed or the allocations reduced?

¹ Magistrate Rooney summarized the Intervenors' other claims in the Town's Prehearing Conference Report, as "Should any additional conditions be imposed in the permit, beyond those imposed by the Department, to meet the requirements of the Water Management Act and its implementing regulations?" All of these grounds support the Intervenors' argument that a water-banking program that takes effect now is necessary.

As Magistrate Rooney recognized in his “Ruling on Issues to be Adjudicated: Safe Yield,” dated April 2, 2004:

[Intervenor’s] purpose in raising safe yield is to bolster its contention that DEP failed to include conditions adequate to limit overall water usage by the permit holders and to demonstrate a basis for imposing more stringent conditions or changing the amount allocated.

Intervenors contend that a number of more stringent conditions must be imposed where the credible evidence clearly shows (and the Department admits) that the basin is over-allocated for water withdrawals, that the Department no longer has confidence in its prior safe yield determination, the modified permit conditions will continue to result in the safe yield of the basin being exceeded, and the permit provisions fail to protect the interests of the WMA, and where significant damage to the environment will continue to occur.

II. BURDEN OF PROOF

In the Matter of Town of Freetown, Dkt. No. 91-103, Recommended Final Decision, February 14, 2001, a case involving the WMA, the Administrative Law Judge noted that “the Department has consistently placed the burden of going forward in permit appeals on the parties opposing the Department's position. See 310 CMR 1.01(13)(c)1.[6].” Under the Wetlands Regulations, the burden of going forward means “having to produce at least some credible evidence from a competent source in support of the position taken.” 310 CMR 10.03(2); *John Marshall*, Dkt. No. 85-37, Decision on Motion for Reconsideration, October 3, 1988.

The District bears the ultimate burden of proof in these proceedings. *Cf.* *Jan Companies, Inc.*, Dkt. No. 97-069, Ruling on Petitioner’s Motion Regarding Burdens of Going Forward, March 26, 1998. However, Intervenors bear the burden of going forward

on their issues, as does the District. Having met their burden of going forward and burden of proof on the safe yield issue and failure to minimize the impact of the permitted withdrawals on, or to protect, water quality, navigation, water-based recreation, wetland habitat and fish and wildlife, the burden shifted to the Department (and the District) to rebut these issues. *Douglas Abdelnour and Bonnie Abdelnour*, Dkt. No. 88-138, Final Decision, November 22, 1994 at fn 36. The standard of proof is by a preponderance of the evidence.

III. INTRODUCTION

Kerry Mackin’s testimony and supporting exhibits, as well as the Department’s direct and rebuttal testimony and exhibits, and the cross-examination testimony of Thomas Lamonte established that the USGS studies conclusively show that water withdrawals are a major cause of the reduced Ipswich River flows;² that the Ipswich River’s biological, physical and chemical integrity have been impaired by the loss of flow; that Ipswich River fisheries have been devastated by the extreme low and no-flow conditions; that the Aquatic Habitat Study by USGS-MA Division of Fish and Wildlife³ concluded that summer flows between 0.42 to 0.49 cubic feet per second per square mile (cfsm), or at least double the minimum streamflow value adopted by the Water Resources Commission (WRC) in the late 1980’s, are necessary; and that the Fisheries Restoration Task Group, comprised of fisheries experts and in which the Department participated,

² USGS in its report, *A Precipitation-Runoff Model for Analysis of the Effects of Water Withdrawals on Streamflow, Ipswich River Basin, Massachusetts*, (USGS 2000) (“Hydrological Model”), concluded that “Water withdrawals from the 155-square mile Ipswich River Basin in northeastern Massachusetts affect aquatic habitat, water quality and recreational use of the river [and that] . . . cumulative ground-water withdrawals substantially decrease low flows.” Standard Exhibit 2 at p. 1.

³ *Assessment of Habitat, Fish Communities, and Streamflow Requirements for Habitat Protection, Ipswich River, Massachusetts, 1998-99* (“Aquatic Habitat Study”) (Standard Exhibit 3).

recommended seasonal streamflows of 0.49 cfs (June-October) and higher streamflows throughout the rest of the year. The District did not present any evidence to refute these streamflow recommendations.

IV. ARGUMENT

A. The District Has a Permit and The Department May Properly Condition Its Withdrawals to Ensure That the Purposes and Requirements of the WMA Are Met.

The District raised for the first time at the hearing an issue that is essentially a legal issue, namely whether the Department can impose conditions that will effect its registered volume. This issue was not raised by the District in its appeal, neither was it raised, nor identified at the prehearing conference as a legal issue.⁴ As such it should be found to have been waived.

Even if the Administrative Magistrate allows this issue to go forward, Intervenors assert that a registered volume is not an absolute and that conditions can properly be imposed through the District's permit that affect the registered volume. Furthermore, the District's Glen Drive wellfield is not an "existing withdrawal" and thus is not subject to registration as discussed below. The District's permit governs the Glen Drive wellfield and its four bedrock wells. This permit was issued in 1996. It authorizes the District to withdraw up to 0.83 mgd, although the District's withdrawals may not exceed 0.29 mgd on an annual average in the Ipswich basin. Intervenors respectfully assert that Stefan Taschner is flatly wrong in his claim that "all the withdrawal amounts are registered and not permitted, [and] the permit modifications may not reduce or restrict Ipswich River

⁴ See "Ruling on Legal Issues," dated March 31, 2004 (Rooney, J.), in which he discusses claims by North Reading and Hamilton only that the seasonal cap will limit their registered volumes and notes that "None of the permit holders has challenged these incidental effects on registered volume use that may be caused by any of the other conditions imposed in the permit."

Basin withdrawal.” (Taschner direct at p. 3).

Section 2 of the WMA defines an “existing withdrawal” as “the average volume of water withdrawn from a particular water source during the five years prior to January, 1986 . . .” A new withdrawal is defined as “any withdrawal that is not an existing withdrawal.” G.L. c. 21G, § 2. Pursuant to § 7, no person may make a new withdrawal (above the threshold volume) without obtaining a permit. The WMA regulations at 310 CMR 36.17 specify that a new withdrawal in excess of the 100,000 gpd threshold volume⁵ from a water source must obtain a permit for the withdrawal from the Department. The Glen Drive wellfield was constructed in the mid-1990’s and permitted in 1996. Thus, it is clear under the plain language of the statute and the implementing regulations that the District’s withdrawal from the Glen Drive wellfield is not pursuant to a registration because the withdrawal did not exist prior to 1986 and therefore could not be registered. Instead, the withdrawal is being made pursuant to a permit and the Department may condition this withdrawal.⁶

1. The Seasonal Cap Provision is Related to the Department’s Goals and Is Not Arbitrary and Capricious.

There is no question that the Department has broad authority to impose permit conditions to ensure that the purposes of the WMA are being met. The regulations at 310 CMR 36.28 require permits to be conditioned on “at least” the enumerated criteria, which

⁵ Contrary to Taschner’s claim (direct testimony at p. 3), there is no statutory right of entitlement to a “reserve” of an additional 100,000 gpd. Indeed, LeVangie testified on cross that the 100,000 gpd “is not intended to be for general operating.” (Please note that the adjudicatory hearing was not transcribed. All references to testimony at the hearing herein are based on detailed notes taken at the hearing).

⁶ While the Administrative Magistrate does not have to reach the issue in this appeal, Intervenor believe that the Department has the authority to condition registrations under the plain language of 310 CMR 36.08(1). Section 36.08 (1) provides: “the registrant shall comply at all times with *any requirements and conditions imposed by the Department.*” (Emphasis added). *See also*, 310 CMR 36.08(4).

includes water conservation measures and “implementation of conditions that minimize the impact of the withdrawal on factors listed in 310 CMR 36.26.” Section 36.26 in turn requires the Department to consider, among other things, reasonable conservation practices and measures, and reasonable protection of public drinking water supplies, water quality, groundwater recharge areas, navigation, water-based recreation, wetland habitat and fish and wildlife. The Department is also required to evaluate the anticipated time of year when withdrawals will occur, and may specify the “maximum allowable withdrawal volume expressed in terms of average daily withdrawal per year or *per some shorter period of time as applicable*” and the “maximum allowable peak withdrawal.” 310 CMR 36.26(1)(c), 36.27(2)(b) and (d) (emphasis added).

The District argues that the seasonal cap effectively reduces its annual registered volume,⁷ although it admits that the Department has not changed its registered volume. The real question is, however, whether the Department has the authority to impose conditions in the permit that apply to the entire authorized withdrawal, registered and permitted, or stated another way, that affect the registered volume. Intervenors believe the answer is clearly in the affirmative.

It is not possible to impose conditions on the Glen Drive wellfield that do not apply to the registered withdrawal point. If this were the case, the statutory and regulatory scheme would be rendered unworkable because one set of rules would apply to a portion of a withdrawal and another set (or no rules) to the other. It would be impossible, for instance, to implement streamflow-triggered restrictions on use, or to impose a residential per capita day performance standard, or indeed, any water

⁷ As discussed *supra*, The District’s registered volume applies only to “Station 2,” the Main Street wells, in the Ipswich basin.

conservation measures on only the permitted volume. Such an illogical result should not be found lightly. “If a sensible construction is available we shall not construe a statute to make a nullity of pertinent provisions or to produce absurd results.” *Flemings v. Contributory Retirement Appeal Board*, 431 Mass. 375, 375-76 (2000), citing *Manning v. Boston Redevelopment Authority*, 400 Mass. 444, 453 (1987) and other cases.

The Department has always considered conditions imposed in the permit to apply to the entire authorized withdrawal volume, not just the volume over the registered volume. Substantial deference is due to the agency’s interpretation of its own regulations. The Department has the authority to impose permit conditions that also have a seasonal effect on the amount of water the District can withdraw on a daily average pursuant to its registration. While the seasonal cap affects the registered volume for five months of the year, this does not invalidate the condition.⁸ This comports with the Administrative Magistrate’s “Ruling on Legal Issues” in which he states that “otherwise appropriate conditions are not barred simply because they might impact registered volume use . . .” and his conclusion at p. 16 that

While the summer cap cuts into North Reading’s and Hamilton’s potential use of registered volumes during five months of the year, it does not bar them from withdrawing their total annual registered volumes. Because the communities retain at least a theoretical right to withdraw their registered volumes, and because DEP has stated a permit-related purpose for imposing a summer cap, DEP has not impermissibly rewritten the registration statements.

Here, the “permit-related purpose” of the summer cap as articulated by the

⁸ The Administrative Magistrate in his “Ruling on Legal Issues” rejected arguments by Hamilton and North Reading that the Department lacks authority to limit their registered withdrawals as part of the permitting process: “when DEP imposes permit conditions, it is in fact imposing those conditions on all the water use by permit holders because there is no way to do otherwise. Magistrate Rooney also noted in his ruling that while Topsfield’s modified permit “will in practice make it highly unlikely that the town will be able to withdraw its total authorized volume during the course of a year[, t]hat does not make it legally invalid. . .”

Department in its cover letter to the District's modified permit is to reduce the difference between summer and winter water use. LeVangie also testified that the Department's intent in imposing a seasonal cap is to limit consumptive use in the high demand/ high stress summer period. (LeVangie cross). While Burnham testified that the District used to take more water in the summer from the Ipswich basin, it now spreads out the amount of water it pumps from the Ipswich basin throughout the year (Burnham direct at p. 24-26); however, Intervenors note that in 2003 the District pumped five times as much water from the Glen Drive wells in the summer months as it did in the winter. (O'Keefe cross and exhibit A to her direct).

David Peeling of SEA, hired by the District for the purposes of this administrative hearing only, went to great lengths to attempt to explain the leap in summer water use as unrelated to outdoor water use. But as he admitted on cross, his analysis contains many assumptions -- *i.e.*, assumptions about college students and if and when they were away from home, that the town's population was more active than most and accordingly used more indoor water, and that 20% of the elderly population leaves in the winter. Peeling agreed on cross that he did not have data to back up his assumptions, nor did he factor in families going away in the summer on vacation. He also did not attempt to quantify the amount of non-essential seasonal outdoor water use that is in fact being used. Peeling agreed that exhibit A to his direct testimony, a residential demand comparison of LCWD and Danvers for 2002, is a bell curve graphically showing that water use peaks in the summer months. Lynnfield primarily has single family homes with large lots and lawns;

many of these homes have in ground sprinkler systems. (Peeling cross).⁹

Significantly, Burnham and Taschner's confirmed on cross that with even-odd day watering there are spikes in water use on the even days, or about a 100,000-150,000 gpd increase, when outdoor watering is permitted.¹⁰ Particularly telling is the fact that while the daily pumping records would be valuable in quantifying outdoor use according to Peeling and would show these spikes, neither the District nor Peeling provided this data as an exhibit.

Both Lamonte and O'Keefe testified that the Department believes that outdoor watering is an issue in Lynnfield. O'Keefe explained that exhibit E to her direct testimony, which is a chart of LCWD pumping history prepared by Taschner, shows that summer water use in the District's service area is increasing. In fact, Lynnfield is tied for the highest summer to winter water use ratio in the basin. (O'Keefe cross; Lamonte direct exhibit C). See also, Wagner direct testimony at p. 7 and exhibit 28, which is a table comparing the District's maximum and minimum water use month for each of the years 1991-2003.¹¹ In recent years, the maximum month use has been approximately twice the minimum month and in 1999 it was triple the minimum water use month. (Wagner direct at p. 7 and exhibit 28).

⁹ Peeling also disagreed with Taschner's direct testimony statement that all water withdrawn goes back into the aquifer. Only 10% of the homes serviced by the District are in the Ipswich basin so this water is not returned to the Ipswich basin and Peeling agreed that water used for lawn watering is also lost to the basin.

¹⁰ Taschner agreed on cross by the Department that lawn watering could be less frequent than alternate days.

¹¹ Wagner also testified that according to estimates by the American Water Works Association (AWWA) approximately 20% to 50% of all residential water use is for landscaping. (Wagner direct at p. 7 and exhibit 27).

In sum, the seasonal cap is tied to the Department's goal of reducing summer water use when stress is high. The Department properly prescribed a cap limiting withdrawals in the five-month period. As discussed *infra*, however, Intervenors believe that to be effective the cap must be set lower and then gradually reduced over time to allow customers to gradually adjust to it.

2. The District Has Not Instituted Most of the Enhanced Water Conservation Measures.

Under the modified permit if the District fails to comply with the residential per capita water use, or the seasonal water use performance standards, the District is required to develop and implement an Enhanced Water Conservation Plan (Enhanced Plan). LCWD claims that it has already implemented all of those measures and there is nothing more it can do in terms of an Enhanced Plan, or to make a water bank viable.¹²

However, on cross Taschner admitted that LCWD has not implemented many of these measures. The District has not adopted a bylaw limiting lawn size; a program for providing water saving devices at cost;¹³ a program to encourage use of rain barrels through rebate or at cost offering; or a bylaw requiring at least six inches of loam.¹⁴ Asked if public recreational fields and parks are irrigated in accordance with the WRC's 2002 Guide to Lawn and Landscape Conservation, Taschner stated that the schools have their own irrigation wells. The District's water rate structure, while an increasing block rate structure, is also quite low and according to Peeling, not "a particularly effective rate

¹² See Prehearing Conference Report at p. 2.

¹³ About 18 years ago MWRA provided some low flow devices to Lynnfield residents. However, installation was not provided and the District had no data on the number of devices that were actually installed. Taschner admitted that the devices that were installed could wear out in 18 years and Burnham testified on cross that toilet dams are no longer recommended.

¹⁴ Peeling testified that the District's water conservation education/outreach efforts have been limited.

structure” for encouraging water conservation.¹⁵ Taschner on questioning by Administrative Magistrate Rooney agreed that the District could do more conservation.

3. The District’s Withdrawals Impact Wills Brook and the River and Streamflow Triggers are a Necessary and Proper Condition.

The District agrees that the Ipswich basin is stressed; however, it is not just during drought and near drought periods that “stream flow is severely decreased or non-existent,” as Taschner seems to imply. (Taschner direct at p. 5). The upper third to one-half of the river dried up in the summers of 1995, 1997, 1999 and 2002. In 2002, a year in which only a state Drought Advisory was in effect, record-breaking low flows were recorded at the USGS South Middleton gage in September. (Mackin direct at p. 3 and exhibit 25).¹⁶ Mackin testified on direct at p. 3-4, and Lamonte agreed on cross, that flows have deteriorated over the past decade, based on the seven consecutive day low flow over a ten-year period (or 7Q10) in the period 1993-2002 and other information. The 7Q10 was reduced by an order of magnitude from 4.1 cfs with no withdrawals and 1991 land use, to 0.54 cfs with average 1989-93 water withdrawals and 1991 land use at the South Middleton gage, or about 1/8th of what it would be without water withdrawals. (Standard Exhibit 2 at p. 1, 69; Lamonte cross).

The basis of the District’s claim that streamflow triggers should be removed from its modified permit is that “the implied assertion that bedrock well water affects the Ipswich River streamflow is not supported by technical data provided to the

¹⁵ Customers pay a \$250 a year tax to the District, which most are not even aware of since it is included on their Town tax bill. (Peeling testified that to be an effective conservation measure, persons have to be aware of the charge) In addition, District customers pay \$60.00 for the first 60,000 gallons and then \$1.60 per 1,000 gallons up to 120,000 gallons. About 1800 homes are at the \$60.00 minimum level, according to Taschner.

¹⁶ Burnham is incorrect when he states that when dirt bikes were riding on the dry riverbed in 2002 it was a 100-year drought. (Burnham direct at p. 39).

Department.”¹⁷ The District has failed to meet its burden of proof on this issue. The District did not present any credible evidence that its withdrawals do not impact the Ipswich River, let alone Wills Brook. In fact all of the evidence was to the contrary.

Peeling testified at the hearing that while he had not read the USGS bedrock well study (Mackin direct exhibit 19), he knew that bedrock wells can act very similar to groundwater wells when there is good “vertical connectivity” between the bedrock fracture and the surface layers. When there is connectivity the wells will create a cone of depression that draws down the water table and surface waters for which groundwater provides baseflow. Mr. Peeling’s direct testimony indicated that there is indeed vertical connectivity between the ground surface and the deep bedrock fissure from which the wells draw. (Peeling direct at paragraph 17).

The Department’s witnesses testified that there was vertical connectivity between the bedrock fractures and the overburden and that pumping of the Glen Drive wells impacts Wills Brook, which is a tributary that flows into the river a short distance upstream of the South Middleton USGS gage, and the river. (O’Keefe direct and cross; Lamonte cross).¹⁸ According to O’Keefe, the six-foot drawdown in the overburden reported during pumping extended to Wills Brook. Peeling agreed on cross that

¹⁷ The District’s prehearing conference memorandum relies on its letter of appeal for the “issues to be adjudicated,” stating “as of this date, all the issues raised by Lynnfield’s letter of Appeal must be addressed.” The Administrative Magistrate in the Prehearing Conference Report at p. 2 notes that the District’s principal objection to the modified permit is that the Glen Drive wellfield, the only wells covered by the permit, draws from bedrock sources that the District does not believe serve as a water source for the Ipswich River.

¹⁸ The bedrock wells are located 1200 feet from Wills Brook (referred to as Willis Brook by Mr. Peeling). As Peeling states in his direct testimony at paragraph 17 and on cross, the ten-day pump test for the Glen Drive wells showed drawdown effects as far as 1,500 feet away from the wells: groundwater levels in the aquifer feeding Wills Brook were reduced by 9 inches, which would result in reduced flows in Wills Brook, which in turn flows into the Ipswich River. Also according to Peeling, the cone of depression caused by pumping the wells, which reverses or retards the flow of groundwater some distance away from the wells, would reach Wills Brook.

reductions in flows in Wills Brook affect the river.¹⁹ Lamonte testified that Reach 17 in the USGS hydrologic model is Wills Brook, and that according to USGS this reach is “particularly impacted from groundwater withdrawals.” (Lamonte cross; Standard Exhibit 2 at p. 18). The USGS report states that in Reaches 1 and 17, headwater reaches with multiple pumped wells, “water withdrawals commonly exceed streamflow in these reaches by 50 percent or more periods of several days or more during the late summer.” (Standard Exhibit 2 at p. 39). Table 9 of the USGS report shows the deficit between actual water withdrawals and the withdrawal satisfied by streamflow in the model at Reach 17. (Standard Exhibit 2 at p. 41). “This is pretty dramatic evidence that pumping withdrawals from [the District’s] wells are impacting Wills Brook.” (Lamonte cross).

While Peeling did not look at the cumulative impacts of pumping in Wills brook subbasin, LCWD’s withdrawals comprise the majority of the withdrawals in the subbasin. Characterizing his estimate as “better than back of the envelope,” Peeling estimated that the potential response in Wills Brook streamflow for changes in current Glen Drive pumping “is most likely longer than 10 days.” (Peeling direct at paragraph 17). Peeling testified at paragraph 20 that under a pumping scenario the response time to the river is more difficult to quantify, but is most likely on the order of weeks rather than days. From this he concludes that there is a questionable technical basis for implementing mandatory restrictions based on streamflow levels in the river.²⁰ (*Id.*).

¹⁹ He also testified that the unnamed tributary (or branch) of Wills Brook could be affected by the pumping of the District’s Main Street well and also by the Glen Drive wells if it is groundwater fed.

²⁰ Peelings testimony was premised on the faulty assumption that the Department was seeking immediate benefit to river from the streamflow triggers and from reducing withdrawals from the Glen Drive wells through mandatory water conservation measures. (Peeling direct at paragraph 20). However, LeVangie testified that the goal is to help mitigate the stress and that reduced pumping will increase baseflow to Wills Brook and the river. The 5-month period was chosen because it has the highest water demand.

However, on cross Peeling agreed that mandatory restrictions imposed in July would benefit Wills Brook during the summer. He also agreed that the mandatory restrictions could benefit the brook and the river in the fall.

O'Keefe, LeVangie and Lamonte each testified on cross that reductions in summer use will benefit Wills Brook and the river in the summer and fall. Low flows also occur at other times of the year. (Mackin direct testimony at p. 22; LeVangie cross; Peeling cross). Reduced pumping will increase baseflow to Wills Brook and the Ipswich River. (LeVangie cross; Standard Exhibit 2). The USGS hydrological model indicates that reducing groundwater pumping will result in improved baseflow.

Mackin testified that she performed a sub-basin inflow-outflow analysis for Wills Brook according to the methodology in the WRC's *Stressed Basins Report* (Standard Exhibit 5), to evaluate the level of stress on Wills Brook due to the net loss of water. Based on the WRC methodology, the net loss of water in the Wills Brook sub-basin exceeds the August median streamflow and the sub-basin is in fact "highly stressed." (Mackin direct at p. 20-21 and exhibit 29).²¹ This is particularly important because Wills Brook is a tributary where populations of brook trout have been documented and it has also been home to other fluvial fishes --brown trout and white sucker, which also require flowing water. (*Id.*). Lamonte agreed on cross that the Wills Brook sub-basin is considerably stressed.

Both LeVangie and Lamonte testified at the hearing that the Department is not just concerned with the river's mainstem, but also with the health of the tributaries. Peeling also agreed that the Department is seeking to manage the basin as a hydrological unit and that the tributaries are an important part of the hydrological unit.

²¹ The caption to exhibit 29 may be erroneously labeled "Idlewild Brook" instead of "Wills Brook."

B. The Modified Permit Conditions Do Not Go Far Enough and Fail to Protect the Interests of the WMA and the Regulations.

1. The Safe Yield of the Ipswich Basin has Been Exceeded.

In his “Ruling on Motion to Strike” Administrative Magistrate Rooney explained that Intervenor could present evidence on safe yield to bolster their contention that the Ipswich basin is over-allocated and that therefore more stringent conditions should be imposed on the permit holders. See also, January 13, 2004 Conference Report and April 2, 2004 “Ruling on Issues to be Adjudicated: Safe Yield.” While the Administrative Magistrate opines that safe yield is not “nearly as relevant as it might otherwise be[.]” because the District’s allocation is based on registered volume alone, as discussed *supra* at p. 5-6, the District has a permit authorizing its withdrawal of up to 0.83 mgd from the Glen Drive wells; and the Glen Drive withdrawals are not subject to registration.

The proscription that withdrawals not exceed the safe yield of the basin applies to permits as 310 CMR 36.28(j) makes clear: “All permits shall be conditioned on at least the following: . . . (j) that the withdrawal in combination with other registered and permitted withdrawals shall not exceed the safe yield of the water source[.]”²² This requirement that water withdrawals not exceed the safe yield of the water source is not discretionary and it sets a finite limit on the amount of water that can be withdrawn from a water source, while protecting the interests set forth in the WMA.²³ Notably, there is no exception: the Department may not authorize water withdrawals in excess of the safe yield. See, G.L. c. 21G, § 11; 310 CMR 36.30(2)(a). Intervenor asserts that the

²² LeVangie in his direct testimony relies on criteria in 310 CMR 36.28(1) as a basis for other conditions imposed by the Department in the modified permits. (LeVangie direct and rebuttal testimony at p. 5).

²³ See G.L. c. 21G, §§ 3, 7.

authorized withdrawal of up to 0.83 mgd from the Glen Drive wellfield in combination with other basin withdrawals exceeds the safe yield of the water source. Significantly, the District pumped five times as much water from the Glen Drive wells in the summer months -- when the river and Wills Brook are most stressed -- as it did in the winter in 2003. (O'Keefe cross and exhibit A to her direct).

The sole prefiled direct testimony presented by the Department on the issue of safe yield was from LeVangie, who stated that the Department did not re-evaluate safe yield during the five-year review because no new reference streamflow was developed and approved by the WRC and the permit did not authorize an increase above the registered volume. (LeVangie direct and rebuttal testimony, p. 8). Neither he nor any other witness refuted the Elizabeth Dorsey's statement as counsel for the Department that the Department has "no confidence" in its previous safe yield determination of an additional 3.5 mgd to allocate in the Ipswich basin. (Mackin direct testimony at p. 9 and Exhibit 10).²⁴

Safe yield is the amount of water that can be withdrawn while still protecting ecological integrity -- wetlands, fish and wildlife -- and conversely, the quantitative amount of water that has to remain in the river, according to LeVangie at the hearing.²⁵ It is the limit on the amount of water that the Department has the authority to allocate. Safe yield plays an important role in the WMA permitting scheme. "The Regulations are

²⁴ O'Keefe testified that she was present at the Wenham prehearing conference and had "a general recollection" of Dorsey's statement.

²⁵ Section 2 of the WMA defines "safe yield" as "the maximum dependable withdrawals that can be made continuously from a water source, including ground or surface water, during a period of years in which the probable driest period or periods of greatest water deficiency is likely to occur, provided, however, that such dependability is relative and is a function of storage and drought probability." The regulations at 310 CMR 36.03 define safe yield as "the maximum annually averaged daily water use consumptive loss rate that can be sustained from a water source with an acceptable degree of risk."

replete with references to DEP's obligation to ensure that withdrawals from the water source do not exceed the safe yield of the water source." "Ruling on Issues to be Adjudicated: Safe Yield," April 2, 2004. LeVangie agreed with the characterization of safe yield as the "bottom line" on the amount of withdrawals cumulatively that can be taken out of a water source. (LeVangie cross; Mackin direct testimony at p. 7).

On cross, Lamonte testified that based on Neil Fennessey's computations for the Department using the safe yield methodology in 310 CMR 36.31(2) (the only variable in which is the streamflow value), that any streamflow value greater than 0.25 cubic feet per second per square mile (cfs/m) results in a determination of zero water to allocate in the Ipswich basin. (Lamonte cross; Mackin direct testimony at p. 10-12 and exhibit 12). The Department has no guidance or protocol for determining safe yield and no other method for determining safe yield. (Lamonte cross). However, the Department no longer uses the methodology in 310 CMR 36.31(2) and it stopped doing safe yield determinations, according to LeVangie.²⁶

The Department admits that the Ipswich River's capacity to supply water resources has been exceeded, that is "one of the most hydrologically stressed basins in Massachusetts" and that it has experienced "unsustainable patterns with significant low-flow problems." (Lamonte direct and rebuttal testimony, Exhibit A at p. 1 and cross; Intervenors' exhibit 17). "[W]e have reached, and exceed, the capacity of the river to supply the water resources on which the region depends for economic stability and

²⁶ While LeVangie testified that the Department is sticking with its original safe yield determination in the Ipswich basin, he admitted that "safe yield and minimum streamflow were stopped because of legitimate concerns." According to him, the Department now receives and weighs public comments -- "a process not safe yield necessarily," -- rather than "coming out with a number." LeVangie agreed that the Department was free to use the USGS studies and experience with actual conditions in determining safe yield.

growth. Until recently we did not have the data and analysis that could tell us by how much the River is oversubscribed . . .” (Lamonte direct exhibit A).

LeVangie and Lamonte used the words “oversubscribed” and “over allocated” to describe the Ipswich River basin.²⁷ Lamonte explained that “overallocated,” which refers to the water withdrawal portion of the man-made impacts, means that the withdrawals exceed the carrying capacity of the basin. He agreed that safe yield has been exceeded. (Lamonte cross). Existing uses, fishing, swimming, and boating, have been impaired, and at times eliminated, in the Ipswich basin. (Mackin direct testimony at p. 4, 13-15, 18; Wagner direct testimony at p. 1-3; direct testimony of Lamonte, Exhibit A at p. 1; LeVangie cross). As Lamonte testified, the Ipswich “hasn’t been sustainable for a long time for habitat.” (Lamonte cross).

It is also true that flows have declined by an order of magnitude from what they would be without withdrawals, and that low flows are getting worse. (Mackin direct at p. 3-4; Lamonte cross; Standard Exhibit 2 at p. 1, 69). Total basin use in 2001 was 27.94 mgd, or almost 4.0 mgd *lower* than the 31.66 mgd total authorized withdrawals in the basin. (Lamonte direct testimony exhibit A at p. 3; Lamonte cross). Even so, under current conditions, portions of the Ipswich River dry up about every other year and the whole river regularly experiences severe low flows. (Mackin direct testimony at p. 3, 17). While withdrawals in 2002, a year for which there was a drought advisory only, were below the authorized volumes, the upper part of the river dried up and dirt-biking replaced canoeing. (Lamonte cross; Mackin direct at p. 15; Wagner direct at p. 3 and

²⁷ The basin is over-allocated in regard to water withdrawals and the water cycle. (LeVangie cross).

exhibits 3 and 25). Lamonte agreed that if permit holders withdraw their total authorized volumes, streamflow conditions will worsen.²⁸ (Lamonte cross).

Despite the central role of safe yield in the WMA permit process and the fact that the Department would likely change safe yield during the five-year review process because it provides an opportunity to take a basin-wide look at the WMA permits, the Department acknowledged that it did not redetermine safe yield in this five-year review, but instead relied on water conservation measures to achieve improvements in streamflow.²⁹ It did not start with a safe yield number, or a quantity of water that needed to remain in the river as its goal in the permit modifications. (Levangie cross). Nor did it identify an overall quantitative goal for reductions in water use from the allocations that needed to be achieved under the modified permits. (Levangie cross; Lamonte cross). Rather, it took a trial and error approach, while continuing to authorize total withdrawals that exceed the Ipswich basin's capacity. It also did not, as Lamonte admitted on cross, know how much improvement in flow there would be from the modified conditions.³⁰ Rather, the overall goal according to LeVangie was to have a streamflow of 0.42 cfsm more often, although he admitted that the Department does not have an overall way to assess the adequacy of its modified permit conditions. (Levangie cross).

²⁸ The District also withdraws well into the 100,000 gpd above threshold volume. If each permit holder withdrew an additional 100,000 gpd on top of their authorized volumes, or another 1 mgd, conditions would be even worse. (Lamonte cross).

²⁹ LeVangie testified on cross that the Department had not used either 310 CMR 36.31(1) or (2) to determine a new safe yield in the Ipswich, although he agreed that the Department was likely to review safe yield when doing five-year reviews and that the Department has the authority to redetermine safe yield in the five-year review.

³⁰ The Department does not have a definitive number for the gain in water savings from the modified permit conditions. (Lamonte cross). Lamonte testified that some measures interact and have a shared effect, for instance the seasonal cap and the 65-gallon per capita day performance standard, and savings from mandatory outside watering restrictions are difficult to quantify. (Lamonte direct testimony, exhibit D; Lamonte cross).

The Department's witnesses admitted on cross that the seasonal cap will fall far short of making up the seasonal water deficit in the basin identified in the *Ipswich River Watershed Management Plan*, Standard Exhibit 12.³¹ The Management Plan, funded by EOEPA, estimates the water deficit for the entire Ipswich River watershed as 14.4 mgd for the summer months (July-September) and it establishes a goal of 5.4 mgd in summer water conservation savings for the entire watershed.³² According to Lamonte, the Department was not trying to make up the water deficit in the basin through its permit conditions. (Lamonte cross). While the conservation measures are certainly a good idea and indeed required under 310 CMR 36.28, they cannot substitute for the Department's obligation to ensure that withdrawals cumulatively do not exceed safe yield.

A wealth of information was available to the Department at the time it conducted the five-year review of the Ipswich basin WMA permits that made it clear that the withdrawals authorized by the Department exceeded the safe yield of the basin. These included: the recent USGS studies establishing that water withdrawals cause unnaturally low flows that result in lost and degraded habitat; the USGS recommended seasonal streamflow for aquatic habitat, which is double the old DEM minimum streamflow value

³¹ Lamonte agreed that in 2002, the seasonal cap provision would have saved basin-wide 0.53 mgd, and in 1999, 3.43 mgd) and O'Keefe testified that this is substantially below the necessary savings identified in the Management Plan. (Lamonte direct testimony, exhibit D at p. 4 and cross; O'Keefe cross). LeVangie also testified that the Department does not expect the modified permit provisions to solve the water deficit in the Ipswich basin. (LeVangie cross).

³² While Lamonte testified without explication that the Department does not "necessarily agree" with the 14.4 summer deficit figure, or with all the assumptions in the Management Plan, he could not specify a different basin water deficit. (Lamonte cross).

for the Ipswich;³³ actual experience with the results of the water withdrawals -- massive fish kills, streambank exposure, segmentation at riffles, and dry riverbed conditions; extreme low flows, including in the tributaries; water quality impairment, such as low dissolved oxygen, streamflow gage data, fish community data and a Target Fish Assessment that showed a paucity of flow-dependent species in the current fish community. All of this information proved that the basin is over-allocated for water withdrawals and that the safe yield of the basin has been exceeded. Importantly, the information that the Department had in hand at the time of the five-year review should have led it to recalculate the safe yield of the basin and to condition the permits accordingly.

Indeed, the Commissioner of the Department assured counsel for the Ipswich River Watershed Association five months prior to issuing the modified permits that “We will use the information and studies that have recently been developed in re-determining

³³ The Department’s original safe yield determination pursuant to the methodology at 310 CMR 36.31(2) used the WRC’s reference streamflow value of 0.22 (or 0.217) cfs, which was taken from the Ipswich River Basin Plan prepared by the Department of Environmental Management (DEM) and Vicki Gartland in particular some 15 years ago, to conclude that an additional 3.29 mgd was available for allocation. (Mackin direct testimony at p. 7-8, 11-12; Lamonte cross; Standard Exhibit 1). This “minimum streamflow” was the threshold below which it was believed that any further reduction would have an adverse environmental impact. (LeVangie cross; Standard Exhibit 1 at p. 33 and Executive Summary). Basin planning was discontinued shortly after it began because of concerns about the approach and the basin planning regulations were repealed in 1996. (Mackin direct at p. 7-9 and exhibits 8 and 9; Lamonte cross; LeVangie cross). The concept of a minimum streamflow is obsolete today and Gartland now agrees that the 0.22 cfs value is inadequate and that a streamflow of 0.42 cfs is needed to provide reasonable habitat protection. (LeVangie cross; see also, Lamonte cross). The Department expected that the WRC and DEM would support the new streamflow value. (Lamonte direct exhibit B; Lamonte cross).

LeVangie and Lamonte agreed at the hearing that no studies support the old DEM minimum streamflow value in the Ipswich. (LeVangie cross; Lamonte cross). A streamflow two times higher than the DEM minimum streamflow value is based on the best available science for habitat protection in the Ipswich River. (Lamonte cross; LeVangie cross; Standard Exhibit 3 and 9). None of the four methodologies utilized by USGS and MA DFW in their habitat assessment work or the Fisheries Task Group, of which the Department was a member, supports the DEM minimum streamflow.

the safe yield of the Ipswich River Basin and to ensure that the purposes of the Water Management Act, including protection of the water resource itself, are being met.”

(Mackin direct at p. 16 and exhibit 17).

While 310 CMR 36.33(4) specifies that the Department “will review . . . any available safe yield information,” it is not free to ignore highly relevant information regarding this pivotal issue or to issue modified permits that exceed the safe yield. The Department’s claim that its did not re-evaluate basin safe yield because the WRC had not changed the reference streamflow, cannot withstand scrutiny for several reasons. First, nothing prevents the Department from using an accurate streamflow number(s) in place of the WRC reference streamflow in the 310 CMR 36.31(2) methodology. The regulations at 36.31(2) specify how, in “water sources deemed appropriate by the Department,” it is to determine the safe yield of a water source. It is abundantly clear from the evidence presented that the 0.22 cfs WRC reference streamflow value is not scientifically valid and will not prevent “an adverse environmental impact on the water resources of the basin,” as originally believed.

The Department is certainly free to use a streamflow value in its safe yield determination that new science establishes is more credible. In fact, 310 CMR 36.31(1)(e) specifies that in any determination of safe yield the Department may consider “any additional applicable information.”³⁴ The Department has the authority, and Intervenor contend, the obligation, to use a more accurate streamflow value when it has clear evidence that the WRC reference streamflow value is not scientifically supportable.

³⁴ The Department considered the USGS studies essential to its re-determination of safe yield when it unequivocally committed to re-determining the safe yield of the Ipswich basin . (Mackin direct exhibit 17).

Second, even if the Department determines that it is “not appropriate” to use the methodology in 36.31(2) because the reference streamflow value has not been changed by the WRC, this does not obviate the Department’s responsibility under 36.28(1)(j) and 36.33(4). Subsection (1) of 310 CMR 36.31 specifies the criteria that the Department may consider at a minimum in its determination of safe yield. Reading 36.31 (1) and (2) together makes it clear that subsection (1) is the default provision on safe yield in situations where the Department finds the use of subsection (2) inappropriate.

Lastly, the Department’s failure to come to grips with and to implement the “pivotal concept” of safe yield for more than a decade cannot be excused by the WRC ’s failure to change the reference streamflow.³⁵ Lamontes testimony on cross makes it clear that the Department has no other method for determining safe yield other than the methodology in 310 CMR 36. 31(2).

The empirical data on actual streamflow conditions and environmental impacts, fish surveys, and scientific studies establishing the impacts of water withdrawals on streamflow, assessing aquatic habitat conditions, and recommending seasonal streamflow values are all “additional applicable information” under 310 CMR 36.31(1)(e) and “available safe yield information” under 310 CMR 36.33(4). The Department was not free to ignore this additional safe yield information.

It is not necessary to calculate the precise safe yield to find that the combined permitted volumes, 3.61 mgd in total, now allocated in the modified permits exceed the

³⁵ No inference should be drawn that the WRC stands behind the DEM minimum streamflow value for the Ipswich basin. In fact all indications are that the WRC, which originally had the issue of the Ipswich River basin reference streamflow on its meeting agenda for May, 2003, would support the 0.42 streamflow threshold. (Kerry Mackin rebuttal testimony at 2-3 and exhibit B; see also, Lamonte direct testimony, exhibit B at p. 2).

safe yield of the basin. The totality of the evidence presented shows that even if all provisions of the modified permits are complied with in full, a sizeable deficit will remain. Additionally, community growth and new development will erode the savings gained by the water conservation measures. The modified permits explicitly authorize water withdrawals greater than those occurring today and in recent years -- volumes that already cause significant environmental damage.

2. Stronger Conditions Are Necessary to Comply with the WMA and Its Regulations.

The USGS studies, target fish assessment, experience with actual conditions, stressed basin analysis, and water quality and gage data all establish the impact of the basin withdrawals on the interests protected by the WMA. The Department is charged with establishing “a mechanism for managing ground and surface water as a single hydrological system, and ensuring where necessary, “an appropriate balance among competing water withdrawals and uses, *as well as preservation of the water resource itself.*” (emphasis added). G.L. c. 21G, § 3; 310 CMR 36.02. Permits must be conditioned to minimize the impact of water withdrawals on, and reasonably protect, water quality, navigation, water-based recreation, wetland habitat and fish and wildlife. 310 CMR 36.28(f); 36.26(1)(i). See also, G.L. c. 21G, § 7. The fact that the safe yield of the basin is exceeded is strong evidence relevant to the Intervenor’s claims that a balance has not been achieved, the resource itself is not being preserved and that impacts to water quality, navigation, water-based recreation, wetland habitat and fish and wildlife are not being minimized.

In the past the scales have tipped very far to favor the water supply side of the equation. The conditions in the District’s modified permit and those of the other water

suppliers will not achieve the required balance between water withdrawals and environmental, economic and recreational uses, nor will they preserve the water resource itself or reasonably protect/minimize the impacts on the enumerated interests. To meet the requirements of the law, it is not sufficient to simply improve conditions by some unknown amount; it is necessary to achieve the required balance among competing uses, preserve the water resource itself, reasonably protect instream uses, as well as not exceed the safe yield.

The Department acknowledges that instream uses have been seriously impaired by the low flows. (Lamonte direct testimony exhibit A at p. 1; cover letter to the District's modified permit). Fishing, canoeing, kayaking, swimming, public water supply, habitat for fish, other aquatic life and wildlife, and warm water fishery are all existing uses in the Ipswich River -- uses that have been impaired or eliminated by the loss of flow in the river and its tributaries. The antidegradation provisions of the Massachusetts Water Quality Standards at 314 CMR 4.04(1) require that "[i]n all cases existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected."

The modified permit, conditions and provisions will continue to cause, alone and in combination with the other withdrawals authorized in the basin, the elimination or serious impairment of existing uses in the Ipswich River basin in violation of 314 CMR 4.04(1). Intervenors assert that like the evidence that safe yield has been exceeded, this is convincing evidence that the water resource itself is not being preserved, that a balance has not been achieved among competing uses, and that "reasonable protection" of water

quality, water-based recreation, wetland habitat and fisheries and wildlife has not been accomplished.³⁶

The evidence established that the Department did not have a reduction target or goal for necessary water savings when it modified the permits. Rather, it adopted certain conservation measures intended to bring overall use down. However, the Department cannot say with certainty, with the exception of the seasonal cap, or the 65 gallons per capita day performance standard, what these measures, which interact, will accomplish. The evidence showed that the prescribed water conservation measures will not meet the watershed-wide goal of 5.4 mgd in water conservation savings identified in the Management Plan to help make up the 14.4 mgd July-September seasonal deficit. Its wait-and-see/trial and error approach neither accomplishes, nor comports with, the Department's obligations under the regulatory scheme to ensure that safe yield is not exceeded, to preserve the water resource itself, to achieve a balance and to protect/minimize the impacts on the interests enumerated in 310 CMR 36.26(1)(i). See 310 CMR 36.28(1)(f); G.L. c. 21G, § 7.

- a. The Permit Should Be Revised to Make the Water Bank Program Effective Now.

The District is butting up against its allocation limits and is currently operating in the “red area” of an additional combined (both basins) 200,000 gpd³⁷ above threshold

³⁶ LeVangie testified that the Department can consider the MA surface water quality standards (WQS) in its permitting decisions and that compliance with WQSs is “reasonable protection of water quality.” (LeVangie cross).

³⁷ It is far from clear to the Intervenor that the District may use more than 100,000 gpd above its combined Ipswich and North Coastal registered volumes, as opposed to the 200,000 gpd that the District asserts it is entitled to use.

volume of its allocation, according to Burnham.³⁸ LeVangie characterized the District as “living close to the edge” of its authorized volume. (LeVangie cross). Taschner, Burnham and Peeling all testified that the District will trigger the water bank requirement in the modified permit. Currently, the modified permit states that if the District exceeds its authorized volume on an average annual daily basis in the Ipswich basin by any amount in calendar year 2004,³⁹ it must by March 1st of the following year submit to the Department for its review and approval a plan and schedule for implementing a water bank, which it shall then implement as approved by the Department. In view of the growth and pending projects (including teardowns and expansions) that Burnham describes in his testimony, Intervenors believe that the District should be embracing water banking now and that under these circumstances, the Department’s failure to require an water bank program now in the modified permit is arbitrary and capricious and an abuse of discretion.

The Department’s witnesses all testified that instituting a water-banking program would be highly beneficial for the District. And in fact the District in its response to the Department’s order to complete (OTC) stated that it would apply for an additional allocation or consider a water bank. (OTC Response Item 11). LeVangie testified that a banking program is a practical solution to the shortage facing the District because there is a finite amount of water that can be allocated in the Ipswich basin.⁴⁰ If water banking is

³⁸ On cross by the Department counsel, Burnham testified that this means there is a problem, either high lawn watering or leaks. He also characterized it as “over-usage of water.”

³⁹ It is unclear at what point the water bank would become operative due to the appeal, and also whether the water bank would remain in effect if water usage were reduced below the authorized volume in subsequent years.

⁴⁰ Indeed, it was the recommendation of the WMA Program that communities immediately consider implementation of a water bank (Lamonte direct exhibit B).

successful in reducing demand, this will benefit the river. (Lamonte cross). O'Keefe explained on cross that water banking can be effective in communities like Lynnfield that are primarily residential and LCWD could find water savings in a variety of ways, including recharging stormwater in the Ipswich basin and retrofitting older homes with low flow devices. To be most effective, water banking should be in place before the new development occurs. (O'Keefe cross).

Water banking in Weymouth has been successful and has enabled the Town to stay below its registered volume.⁴¹ (O'Keefe cross; LeVangie cross; Mackin direct at p. 18 and exhibit 18). Asked by LCWD's counsel how the Department could tell if water banking was working, O'Keefe responded that the community would grow but the demand would not increase.

Water banking would help ensure that conditions in the Ipswich do not get worse -- something the Department is concerned with. (O'Keefe cross). Withdrawals are 3-4 million gallons lower than currently authorized, yet Ipswich River flows are drastically reduced or eliminated, as occurred in 2002, 1999, 1997 and 1995. (Mackin direct testimony). This is because the allocations are set too high and cumulatively exceed the safe yield of the basin. Over time, these permits will not even maintain the *status quo* for the river, since development and growth will continually push water use in each community toward its full authorized volume, notwithstanding the other permit conditions.

⁴¹ Weymouth has moved toward a fee-based program, which applies broadly to new development, including chapter 40B developments, expansions that result in a change of use of building space or add bedrooms, and new industrial/commercial processes. This approach has proven successful in providing resources to reduce water demand without adverse impacts on economic development. (Mackin direct exhibit 18). However, the development and funding of the water bank is left to the District's discretion,

Having opted not to reduce the allocations, the only other option to ensure that the safe yield of the basin is not exceeded, and that impacts to water quality, navigation, water-based recreation, wetland habitat and fish and wildlife are minimized and that these interests are reasonably protected, is to impose a water bank to offset use going forward. A 2:1 ratio is also an effective way to mitigate existing use. A water-banking program can offset new or increased demand and accommodate growth while ensuring sustainability of the water resource. This is squarely within the interests and purview of Department's authority under the WMA as the Administrative Magistrate found in his Ruling on Legal Issues. There are several ways in which a water-banking program can be structured, and the District is given the flexibility to develop a program suited to its individual situation.

Intervenors propose that the following language be added to the District's modified permit under Special Condition 1:

The District shall on or before March 1, 2005 submit to the Department for its review and approval a plan and schedule for immediately implementing a water bank. The District shall implement the water bank forthwith.

At a minimum, this water bank shall provide for conserving at least two gallons of water for every gallon of water demand added to the system as a result of new development, redevelopment or expansion.

- b. Voluntary Restrictions Should Be In Place All Summer, the Streamflow Trigger for Mandatory Restrictions Should be Set Higher, and Effective Communication of Restrictions Required.

Intervenors assert that a higher streamflow trigger should be set for mandatory restrictions; that the trigger for voluntary restrictions should be replaced by a seasonal (May-September) voluntary restriction; and that effective communication of mandatory restrictions should be required in the permit. Recognizing the delay between reducing

groundwater pumping and recovery of streamflow, the Fisheries Task Group recommended that management actions be “taken earlier, at higher streamflows than the recommended fisheries thresholds, to prevent flows from going below the recommendations and damaging the resource.” (Standard Exhibit 9 at p. 8, 10). The Ipswich River Coalition, comprised of environmental and land trust groups, urged the Department to adopt a “stepped up approach” requiring restricted uses well before the 0.42 cfs threshold is reached: “Given that water conservation program implementation results in less need to pump, restrictions should be implemented well in advance of streamflow actually reaching the 0.42 cfs threshold and certainly by 0.67 cfs.” (Mackin rebuttal testimony and exhibit C, Memorandum at p. 2).

Waiting until the 0.42 cfs threshold is reached before requiring mandatory restrictions will likely result in unnaturally low-flows throughout the river. As Wagner testified the Ipswich is a small river system and flows can drop very quickly in hot, dry weather and can spike up very quickly in response to summer storms. Wagner explained,

in putting in flow triggers where actions are required, the triggers should be set to allow adequate response time before flows actually reach the levels that we want to maintain because otherwise the river will certainly drop well below those levels before the actions can have a beneficial effect.

(Wagner direct testimony at p. 7).

Based on USGS streamflow data from 1999-2002, the voluntary and mandatory triggers are often reached within a few days of each other. (Mackin direct testimony at p. 21). For the streamflow trigger to be an effective tool, mandatory restrictions need to take effect when streamflow falls to 0.67 cfs. (Mackin direct testimony at p. 22). This 0.67 cfs streamflow provides “good” summer habitat condition based on the Tennant Method, as opposed to the “fair” Tennant habitat condition reflected in the 0.49-0.42

cfs figure (Tennant, 1976).⁴² (Mackin rebuttal testimony exhibit C, Memorandum at p. 2 fn. 3). Because there is lag time between reduced pumping and streamflow recovery, the streamflow threshold should be set higher, which would result in mandatory restrictions taking effect well in advance of flows reaching and going below 0.42 cfs.⁴³ The Department failed to provide an appropriately conservative protective approach that takes account of lag time in both notification as well as the effects of well pumping in establishing the 0.42 cfs streamflow trigger for mandatory restrictions.

Burnham testified on direct at p. 31 that it can take two weeks to get a notice published in the local newspaper getting people notified of a restriction. The river would typically have dropped to a mere fraction of the streamflow trigger during this delay and critical habitats lost in the interim. (Mackin direct at p. 22).

Following the letter of this provision, the District is only required to post legal notice in the newspaper of the restrictions once streamflow falls below the trigger. Language requiring in addition to the legal notice, effective communication of the restriction should be added to Special Condition 6.

Because the streamflow thresholds for voluntary and mandatory restrictions are set so close together, at the time the public is receiving notification that voluntary restrictions are in effect, the streamflow trigger for mandatory restrictions frequently will

⁴² The Tennant Method is one of the methodologies used by USGS and MA DFW in the Aquatic Habitat Study for comparison in determining flow requirements in the Ipswich River for the protection of aquatic habitat.

⁴³ Lag time between pumping a well and its impacts on streamflow exist for all wells, and are an important reason why restrictions should be implemented before flows fall to damaging levels. However, it is not practical to try to tie the onset of restrictions to individual well lag time. All wells have different lag times and basing restrictions on this would be a permitting and enforcement nightmare. The only practical way to incorporate lag time into the regulatory scheme is to impose restrictions well in advance of reaching critical streamflow levels.

have been reached. (Mackin testimony at p. 21-22). These triggers coupled with the public notice provision will result in public confusion, making it difficult to achieve timely compliance.

The on-again off-again aspect to the voluntary and mandatory triggers will also make enforcement difficult. In this highly stressed basin the District's own witness, David Peeling, agrees that water conservation and voluntary restrictions should be a way of life in the summertime. The permit should be revised to require that voluntary restrictions automatically be in effect May1-September 30 and that the District provide effective notification (in addition to legal notice) when the restrictions become mandatory.

For all of the reasons discussed above, the Intervenors propose the following revision to Special Condition 6 of the District's permit:

Beginning on May 1, 2005, the District shall implement voluntary water restrictions from May 1 to September 30 of each year. The District shall implement mandatory water restrictions whenever streamflow falls below 0.67 cfsm for 3 consecutive days as measured at the USGS stream gauge noted.

[Note: the 0.56 cfsm voluntary restriction portion of the chart would be eliminated and the <0.42 cfsm and corresponding cfs flow volume would be changed to <0.67 cfsm and 83.75 cfs, respectively].

c. The District's Seasonal Cap Should be Lower.

Imposition of a summer cap, which is directed at outdoor consumptive use, contributes to overall water savings in the Ipswich River basin, and Intervenors agree that is an important component of the District's modified permit. However, overall, the summer cap will not result in a great deal of water savings basin- wide. The basin-wide savings would only be .53 mgd based on 2002 usage and 3.43 mgd based on 1999 usage.

(Lamonte direct testimony exhibit D). This is far short of the 5.4 mgd summer water conservation goal. (Standard Exhibit 12 at p. iii, 6-2; O'Keefe cross). The Regional Water Conservation Plan, establishes a minimum 20% reduction target in summertime water use basin-wide from 1999 use levels (Standard Exhibit 13 at p. 15).

The Department's approach will not achieve the level of seasonal water savings that are necessary. Basing the seasonal reduction ratio on the year in which water use was highest and requiring a percentage reduction of this lowers the bar for required reductions, sets an unequal standard, and in effect rewards communities with the highest seasonal use in each category. As Mackin testified,

By computing the summer to winter withdrawal ratio of 1.96 based on the Water District's highest seasonal use in 1999, it is only required to reduce its ratio to 1.48, or an average of 0.75 mgd over the period May 1st thru September 30. Basing the Water District's cap on 1999 -- a year that the Water District exceeded its authorized volume -- in effect rewards it for violating its pumping limits and creates a situation where its reduction goal is no higher than those communities that are only slightly above the summer to winter ratio of 1.4 used by the Department. (Mackin direct at p. 24).

The District should be held to a summer to winter ratio of 1.2 and given a reasonable amount of time to achieve the ratio.

d. Leak Detection Should be Required Every Two Years in the District's Permit.

Under the modified permit, the District is required to do a leak detection survey every three years unless its unaccounted for water (UAW) exceeds 10%, or increases by 5% or more. Previously, the Department was requiring the District and most of the other basin WMA permit holders to perform a leak detection survey every two years.

Burnham testified on cross that using the SCADA system, the District has no problem surveying one-half of its system every year for leaks. He agreed that full leak

detection every two years is a good idea and that “without a doubt” it is cost-effective. Leak detection every two years is the industry standard recommended by the American Waterworks Association, and also in the Massachusetts Water Conservation Standards and the Regional Water Conservation Plan, which was ratified by the Ipswich River Management Council. (Mackin direct testimony at p. 25 and Standard Exhibit 13).

The requirement that if UAW increases by 5% or more over the percentage reported in the District’s Annual Statistical Report for the prior calendar year, then it is required to perform a leak detection survey of its entire distribution system, cannot substitute for biennial leak detection. Under the Department’s provision, UAW could fall just below 10% for three years, and leaks could persist for up to another year without repair, potentially representing significant volumes of water. This is a step backwards, and Special Condition 9 of the modified permit should be revised to require a full leak detection survey at least every two years. In such a stressed basin, it is important to ensure that existing standards are not weakened. The 5% increase condition should be imposed in addition to biennial leak detection, not in lieu of it.

V. CONCLUSION

For all of the reasons discussed above, the District’s modified permit should be changed to include immediate development and implementation of a water bank program; voluntary outdoor water restrictions throughout the summer regardless of streamflow, a higher streamflow trigger for mandatory restrictions, more effective

communication of the trigger, a lower seasonal cap, and leak detection every two years.

Respectfully submitted,

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Dated: December 27, 2004

CERTIFICATE OF SERVICE

I, Margaret Van Deusen, attorney for the Intervenors hereby certify that on December 27, 2004, copies of the foregoing Intervenors Post-Hearing Memorandum and Motion to Exceed the Page Limit was served by mailing first class postage-prepaid to:

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