

## Hampstead

The Town of Hampstead developed an initial WSCMP for the Hampstead community water supply system that provided information through 2006. The CMPs for the county's other municipal water systems provided data through 2007. This occurred because the Town submitted their capacity management plan well ahead of the other jurisdictions. To ensure consistency, the County requested Hampstead to provide an updated capacity management plan using data through 2007. The information provided in this section is based on the revised WSCMP (which includes the 2007 data). Data reported in other parts of this document and in the supporting background assessments that were developed prior to receipt of the revised capacity management plan are based on the Town's initial submission.

### Water Supply

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#### ■ Source Water Assessment

The unconfined fractured rock aquifer in the Prettyboy Schist is the source of Hampstead's water supply, which is now comprised of 17 groundwater wells. All of Hampstead's wells are susceptible to contamination by nitrates, volatile organic compounds (VOCs), Synthetic Organic Compounds (SOCs), and radionuclides, but not to other inorganic compounds. Hampstead's wells were determined not to be susceptible to protozoans. Wells 19, 21, 23, and 24 are susceptible to total coliform.

The Town's inventory includes Wells 20 and 21. These two wells were used for over 20 years until the Town realized that it did not own the property where the wells are located. Both wells are high in nitrates and would require treatment or blending with lower nitrate water to meet the nitrate MCL. The Town is attempting to acquire these wells. Due to a recent change in ownership of the property where the wells are located, the Town believes there is a strong possibility the wells will be conveyed to the Town before the end of 2009.

#### ■ Water Supply Demand

The total future water demand assumes that everything within the 2003 GAB builds out according to the adopted land use plan. If this were to occur, the total future water supply demand for the Hampstead system would be 1,441,380 gpd. The numbers in the "Hampstead Future Water Supply Demand" table are based strictly on BLI calculations. They do not reflect factors unique to this municipal system that may have been considered in the capacity management plan (CMP) worksheet calculations and figures presented in the next table, "Hampstead Water Supply Capacity *Currently Available* for Existing and Future Growth."

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## Hampstead Future Water Supply Demand (Gallons per Day)

Community	Current Demand <sup>1</sup>	Planned Future Demand <sup>2</sup>		Other Potential Demand <sup>3</sup>	Total Demand
		Infill Demand	Future Demand		
Hampstead	459,680	22,500	-	959,200	1,441,380

Community	Current Demand <sup>1</sup>	Additional Demand by Land Use			Total Demand
		Residential	Commercial	Industrial	
Hampstead	459,680	441,000	43,260	497,440	1,441,380

<sup>1</sup> These data are the greatest annual average daily demand for the five-year period from 2003 through 2007.

<sup>2</sup> These data relate to areas located within the designated planned water service area. Infill demand is calculated for areas classified in the “Existing/Final Planning” service category; Future demand is calculated for the combined area classified in the “Priority” or “Future” service category.

<sup>3</sup> These data relate to areas designated in the “No Planned Water Service Area” but located within the Community Growth Area Boundary.

Source: Carroll County Department of Planning, December 2008

Calculations for future water demand used the CMP data. This demand is reflected under “Infill + Future.” However, the CMP data do not account for additional demand that would occur within the balance of the planned water service area or the area that is designated in the “No Planned Water Service Area.” To factor in this further demand, future development potential and existing development that would be served were estimated and calculated for water demand and are reported under “Other Potential Demand.”

The “Other Potential Demand” figure reflects the possible annexation of developed properties. Hampstead, like many Carroll County municipalities, is bordered by developed areas including older residential subdivisions on private wells. The requirements of Maryland annexation law make annexation of these subdivisions highly unlikely; therefore, “Other Potential Demand” may be overstated.

While presuming the buildout of the entire area within the 2003 GAB may be unrealistic, Town officials were alarmed by the gap between the capacity of the existing system as permitted by the MDE and the cumulative demand represented by the 2003 GAB.

The findings of the WRE and related technical assessments and the research provided by County Planning and GIS staff directly informed decisions related to the Town’s draft update of the *Hampstead Community Comprehensive Plan*. After careful consideration, the Town’s Planning and Zoning Commission recommended a substantive reduction in the municipal GAB. Specifically, the draft GAB strives for a sustainable “buildout” footprint for future growth which: 1) recognizes the current limitations to water system capacity including the regulatory bottleneck in groundwater appropriations; 2) maintains adequate land for groundwater recharge; 3) preserves the ability of the Town to slowly and carefully grow within the limits of public infrastructure; 4) preserves to the extent possible the option of annexing and extending municipal water service to nearby properties currently dependent on private wells in the event of unforeseen circumstances like groundwater contamination.

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## ■ Water Supply Capacity

If Hampstead were to build out according to the planned land uses adopted within the 2003 GAB, the Town would need to expand beyond its current capacity to make available another 965,950 gpd. The information in the following table is based on the December 2008 CMP worksheets.

**Hampstead Water Supply Capacity Currently Available for Existing and Future Growth  
(in Gallons per Day)**

Community	Current			Remaining Capacity	Unserved Demand		Net Avg Day Capacity Available at Buildout
	Permitted	Avg Day Capacity Limitation	Avg Day Drought Demand <sup>1</sup>		Infill + Future	No Planned Service	
Hampstead	521,400	521,400	505,650	15,750	22,500	959,200	(965,950)

<sup>1</sup> Average Day Drought Demand here includes an additional 10% for drought demand

Source: Carroll County Department of Planning, December 2008

In addition to the water demand calculated above, there is a 14.8-acre area of business zoning and 50.9-acre area of industrial zoning located south of Hampstead on the west side of MD 30. These adjoining areas are located outside, but adjacent to, the Hampstead GAB. Given its location, the possibility exists that future development of this overall site could eventually be served by the Hampstead community water supply system. Average-day water demand generated by future development of this site is estimated to be 51,080 gpd.

MDE recently approved renewed groundwater appropriation permits in the amount of 580,000 gpd (annual average). This represents an increase over the previous permit level of 521,400 gpd; however, it falls far short of the demand represented by buildout of the existing GAB. The permits also presume that Hampstead will have all 17 wells in its inventory online, including Wells 20 and 21 where the ownership issue remains unresolved.

During the past few years, Hampstead has operated its system on 12 of the 17 wells. Well 32 will be returned to service when manganese filtration equipment is installed later this year. As noted, the Town hopes to reacquire Wells 20 and 21. Another project will connect the final two wells in Hampstead's inventory to the system and potentially address the nitrate issues in Wells 20 and 21.

The Town has a fundamental unresolved difference with MDE over the capacity of the municipal water system. The initial determination by the Town working in close cooperation with the Carroll County hydrogeologist was an annual average capacity of 726,000 gpd. An independent analysis by Mr. Michael Knight of Gannett Fleming indicated a capacity of 925,000 gpd. The MDE analysis by Mr. Pat Hammond asserted a capacity of just over 561,000 gpd. With respect to the Water Capacity Management Plan for the Town of Hampstead, the Town intends to provide two plans. One will use the MDE permit number (580,000) as the capacity of the system; the other will use the Town's estimate of 726,000 gpd. These two CMPs will stand until the capacity issue is conclusively resolved, potentially through a permit application and appeal process.

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## ■ Water Supply Limitations

Locating large water production wells is challenging in the Piedmont Plateau. The yield of any given well depends on intercepting water-bearing fractures in the bedrock of the aquifer. While surface topography and features can guide water exploration efforts, locating high yield wells can be difficult.

The Town of Hampstead faces some specific limitations in developing new groundwater resources. The existing appropriation permit prevents any further water well development in the Piney Run watershed (recharge limit). There are areas in Hampstead including the Black & Decker site (PCE/TCE contamination) and the Hillcrest area (MTBE contamination) where groundwater contamination limits groundwater use. Some groundwater has high nitrate levels or other issues such as elevated iron or manganese levels.

The Town conducted extensive exploratory drilling in the Brodbeck Valley and on Carroll County's Leister Park property. This exploration did not locate any suitable water production wells. The Town's existing system of 17 production wells creates a challenge for the location of new wells. Proximate wells may have yields reduced by MDE due to speculation regarding potential interference.

Hampstead provides significant habitat for bog turtles – a threatened species. The turtles live in emerging bogs. Groundwater withdrawal is a concern in these areas due to the artesian nature of some wetland areas.

## Wastewater

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The WWTP serving the Hampstead community is owned and operated by Carroll County. The plant discharges to North Piney Branch, within the headwaters of Loch Raven Reservoir.

## ■ Wastewater Demand

The total future wastewater demand assumes that everything within the 2003 GAB builds out according to the adopted land use plan. If this were to occur, the total future wastewater demand for the Hampstead WWTP would be 1,506,340 gpd. The numbers in the "Hampstead Future Wastewater Demand" table are based strictly on BLI calculations. They do not reflect factors unique to this individual municipal system that may have been considered in the CMP worksheet calculations and figures presented in the next table, "Hampstead Wastewater Capacity *Currently Available* for Existing and Future Growth."

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## Hampstead Future Wastewater Demand (in Gallons per Day)

Community	Current Demand <sup>1</sup>	Planned Future Demand <sup>2</sup>		Other Potential Demand <sup>3</sup>	Total Demand
		Infill Demand	Future Demand		
Hampstead	628,000	65,400	236,750	576,190	1,506,340

Community	Current Demand	Additional Demand by Land Use			Total Demand
		Residential	Commercial	Industrial	
Hampstead	628,000	348,750	64,470	465,120	1,506,340

<sup>1</sup> These data represent, in general, the annual average daily demand over the three-year period 2005-2007, and include I&I.

<sup>2</sup> These data relate to areas located within the designated planned sewer service area. Infill demand is calculated for areas classified in the “Existing/Final Planning” service category; Future demand is calculated for the combined area classified in the “Priority” or “Future” service category.

<sup>3</sup> These data relate to areas designated in the “No Planned Sewer Service Area” but located within the Community Growth Area Boundary.

Source: Carroll County Department of Planning, December 2008

## ■ Wastewater Capacity

If Hampstead were to build out according to the planned land uses adopted within the 2003 GAB, the Town would need to expand beyond its current capacity to make available an additional 602,057 gpd in wastewater flows. The information in the following table is based on the December 2008 CMP worksheets.

## Hampstead Wastewater Capacity *Currently* Available for Existing and Future Growth (in Gallons per Day)

Community	Current			Existing Flows	Capacity Needed			Capacity Available at Buildout
	Permitted	I&I	Remaining Capacity		Infill	Future	No Planned Service	
Hampstead	900,000	231,000	669,000	397,000	38,856	259,011	576,190	(602,057)

Source: Carroll County Department of Planning, December 2008

In addition to the sewer demand calculated above, there is a 14.8-acre area of business zoning and 50.9-acre area of industrial zoning located south of Hampstead on the west side of MD 30. These adjoining areas are located outside, but adjacent to, the Hampstead GAB. Given its location, the possibility exists that future development of this overall site could eventually be served by the Hampstead community sewerage system. Average day wastewater demand generated by future development of this site is estimated to be 51,080 gpd.

For the Hampstead sewer system, demand beyond the BLI estimates used for residential demand also was added in the capacity management plan worksheet to account for previously allocated capacity. The demand numbers in the Wastewater Capacity table, therefore, will not exactly match the demand numbers shown in the Wastewater Demand table. In addition, because the planned water service area does not match the planned

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sewer service area, the projected wastewater demand numbers will not match the projected water demand numbers.

For the Hampstead sewer service area, allocations represent capacity set aside to accommodate development that has already paid its area connection charges. These are typically sites for which building permits have already been issued, a site plan has been approved, or a minor subdivision has been approved. The sewer capacity is “set aside” for two years after the area connections charges are paid. After two years, it is assumed the development is connected to the system.



Allocations are likely double-counting capacity demand. However, these numbers were included in the demand and capacity calculations knowing that it would provide very conservative numbers for the Hampstead sewer system but ensures the demand is accounted for.

According to MDE’s methodology for estimating I&I on the CMP worksheets, I&I flows averaged about .230 mgd, which is about a third of the total average plant influent. I&I flows take away capacity that

might otherwise be available to wastewater demand.

The Hampstead WWTP NPDES permit is currently being operated under a consent judgment agreement, pending resolution of issues related to an effluent temperature limit.

### ■ Limitations Based on Design Capacity

The 0.9-mgd design capacity of the Hampstead WWTP is only slightly lower than the 0.93 mgd wastewater demand that was projected for buildout of the infill+future scenario (the entire planned service area). However, the plant would need to be expanded to approximately 1.5 mgd in order to meet the projected buildout wastewater demand for the entire growth area.

### ■ Limitations Based on Local Water Quality

Like other POTWs in Carroll County, the Hampstead WWTP is fully capable of meeting technology-based limits for conventional pollutants and water quality-based limits for constituents such as ammonia. The plant is successfully meeting a 0.3 mg/L total phosphorus limit required by the Loch Raven Reservoir phosphorus TMDL. However, during summer months this facility is not capable of meeting a very stringent effluent temperature limit, expressed as the higher of 20° C or the upstream ambient stream temperature. Installation and operation of chillers to reduce the effluent temperature would be very costly, energy-intensive, and may complicate environmental management. The County has performed studies that demonstrate that current effluent temperature is protective of the

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aquatic life in the receiving stream and that Piney Run supports a balanced indigenous aquatic population. However, because the plant's NPDES permit cannot be finalized until the temperature issue is resolved, it represents a pending controlling wastewater limitation.

The Hampstead WWTP discharges into Piney Run approximately 8 river miles upstream of its confluence with a Tier II segment of Western Run in Baltimore County. Given the high levels of treatment and long distance to the segment, the Tier II designation is not expected to represent a controlling limitation on the Hampstead WWTP discharge.

## ■ Limitations Based on Bay Nutrient Caps

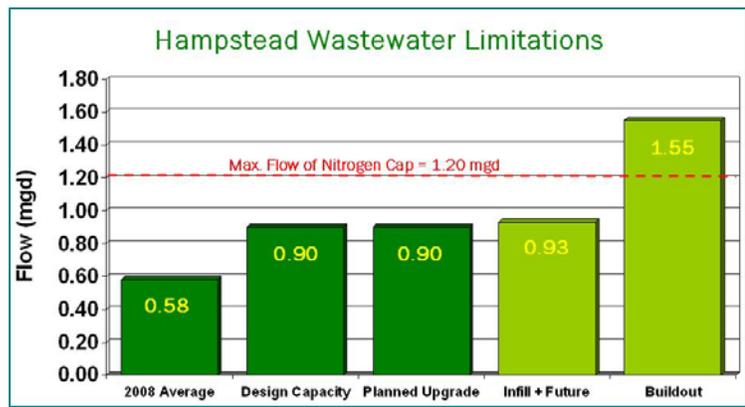
Regarding plant expansion, no ENR upgrade is planned pending resolution of the temperature issue. However, the Hampstead WWTP has been added to the list of facilities eligible for Bay Restoration Funds. If the Hampstead WWTP does eventually upgrade to achieve 3.0 mg/L total nitrogen, it could discharge up to 1.2 mgd without exceeding the nitrogen cap. This would allow accommodation of planned service area ("infill+future") flows, but not the full 1.5-mgd wastewater demand projected at full buildout within the GAB. Discharges above 1.2 mgd would require the County to obtain nutrient offsets/credits or to pursue no-discharge options such as land application or effluent recycle/reuse.

## ■ Limitations Based on 2005 Reservoir Watershed Management Agreement (WMA)

Point source management provisions pertaining to the Hampstead WWTP are currently tied to limitations set through the plant's NPDES permit and existing MDE programs, including limiting phosphorus effluent concentrations to below 0.3 mg/l and capping total phosphorus loads using the TMDL programs. The WMA by itself is not a limiting factor on the operation of the Hampstead WWTP. Hampstead is not currently a signatory to this Agreement. This is with the understanding that the WWTP is owned and operated by the County.

## ■ Summary of Wastewater Limitations

Until the temperature issue is resolved, the current design capacity of 0.9 mgd will remain the controlling limitation. Longer-term, the Bay-related nitrogen loading cap represents a 1.2-mgd limit to surface water discharges.



## System-Specific Strategies: Hampstead

### ■ System-Specific Action Items Already in Place: Current Protections, Practices, and Policies

#### ✓ Super Pump House (SPH)

This \$1.8 million capital project will allow the connection of the remaining wells in the Town's inventory – Triple Green Court and Stansbury. The project will also allow the blending of the high nitrate water from Wells 20 and 21 (providing the Town acquires the wells). The Town also may connect Wells 11 and 12 to the SPH, thus avoiding a rebuild of the aging Melvin Miller Pump House (near the tennis courts). The SPH will add one modest capacity well from the 6-acre site (testing pending). This well will presumably add some measure of capacity to the existing 580,000 gpd permits. The precise amount will depend on the MDE determination of yield. The SPH also will include generator backup to operate wells in the event of an extended power outage.

The groundwater appropriation permit issued by MDE presupposes the Town will have all 17 wells in service. To put every well in service, the Town must construct the SPH.

#### ✓ Water Reuse

The Town has engaged in discussions with MDE, BTR Capital Group (owners of the “Black & Decker” property), and the developer of the Houck/Leister property regarding reuse of post-VOC treatment water. The former Black & Decker plant is currently under an administrative consent order that requires the company to mitigate VOC contamination in the vicinity of the BTR plant. The “ring-well” configuration withdraws groundwater, removes the contamination and discharges it into the Patapsco watershed. The Town believes the post-treatment water would be appropriate for a “third-line” system serving the large industrial area. The treated water could be used to meet process and sanitary needs rather than simply being discharged. This system would greatly reduce demand for treated, potable water.

### ■ Additional Recommended Strategies

*Note: Numbers for each objective correspond to the relevant objective in the countywide strategies section of this plan. Objectives included below are those that apply specifically and uniquely to this system. Strategies that apply to the County and all of the municipal systems are included in the Countywide Strategies section of this plan.*

#### 1. **Protect and sustain existing water supplies serving existing development [Town]**

##### System-Specific Action Items Already in Place:

- ✓ Adopted a Groundwater Conservation Zoning District (July 2008), which replaces the General Industrial Zoning District and allows a mix of environmentally-sensitive commercial and industrial uses while limiting water use

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- ✓ Continue to provide development plans to County to review and offer comments to Town regarding Water Resource Protection

## System-Specific “To Do” Action Items:

### Short-term

- Amend the *Hampstead Community Comprehensive Plan* to reduce the size of the Hampstead GAB to more closely reflect a balance between future water demand and potential water supply capacity
  - Land use designation and GAB changes proposed in the draft Hampstead comprehensive plan could reduce unserved demand from 981,700 gpd to about 503,612 mgd, thereby reducing the projected capacity deficit to 303,386 gpd
- Apply the Groundwater Conservation Zoning District in appropriate locations as identified in the *Hampstead Community Comprehensive Plan*
- Amend the Municipal Growth Element of the *Hampstead Community Comprehensive Plan* and associated annexation areas, as needed, to reflect the changes recommended in this plan
- Update the WSCMP worksheets developed as background data for this plan document to reflect the most current information, then complete and submit a full WSCMP to MDE for review
- Work to reach a clear, well-defined, and scientifically-sound understanding with MDE on how capacity is calculated in a groundwater system
- Continue to engage in and support hydrogeologic research in the Piedmont Plateau

## 2. *Identify and develop, as needed, new water supplies adequate to support planned future growth without over-allocating available sources [Town]*

## System-Specific “To Do” Action Items:

### Short-term Strategy/ies

- Pursue agreement with BTR for, and implementation of, post-treatment reuse of water from the former Black & Decker plant to meet process and sanitary needs of the large industrial area in that vicinity
- Optimize system operations
- Work cooperatively with MDE to develop a more reasonable approach to appropriating groundwater, calculating well yields, and giving credit for recharge
- Acquire existing high capacity wells when possible

### Short-term Water Supply Solutions (Specific Projects):

- Complete exploratory drilling for new wells and construction of the Super Pump House

### Long-term Water Supply Options

*Note: These are options that will be considered for long-term supply. However, inclusion here does not imply that there is a definite plan to move forward with an option. Exploring additional sources, even for those systems that currently project enough capacity to meet demand, is included in order to be prepared for policy changes or other changes that would result in the need for additional available water capacity.*

- Groundwater Wells: Drill and develop 20 groundwater wells (based on the average MDE appropriation of existing Hampstead wells) to meet projected additional demand requirements of approximately 528,000 gpd

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- Obtain (annex, purchase, or designate as planned WSA) control over sufficient acreage in the appropriate watershed(s) to meet the MDE-required amount of recharge
- Begin MDE water appropriation permitting process
- Acquire ownership or easement of well site(s)
- Drill and develop well site(s)
- Conduct pumping test(s) and source water quality analyses
- Finalize MDE water appropriation permit process
- Install permanent wellhead(s) and fencing and construct treatment/transmission infrastructure necessary to connect wells to the WSA distribution system
- Union Mills Reservoir: Safe yield 3.76 mgd with normal pool elevation of 610 ft.; planned reservoir; to serve as regional source of supply for Westminster, Hampstead, Taneytown, and Manchester Service Areas
- Prettyboy Reservoir: Based on Baltimore City's plans to develop 120 mgd treatment plant for its Susquehanna River intake and the resulting increased system reliability, purchase excess capacity from Prettyboy Reservoir. Conceptual plans for a 3.0 mgd intake and 7.5-mile long, 16-inch raw water pipeline from Prettyboy Reservoir to a new 3.0 mgd WTP in Hampstead. Also requires a high service pump station located at the intake site.
- York Water Company: Interconnection with York Water Company (in Pennsylvania) to provide approximately 0.90 mgd of finished water to Manchester and Hampstead. Requires a purchase agreement among all parties. Would require need and participation of Manchester. May not be necessary under normal operating conditions, but would provide ability to move water during extraordinary conditions, such as extreme drought.

#### 4. *Promote water conservation measures and manage demand for potable water to ensure adequate supplies are available for planned development [Town]*

##### System-Specific Action Items Already in Place:

- ✓ Public Education: Water quality and quantity awareness at festivals, newsletters, e-newsletters, materials at town hall
- ✓ Water Loss Management: Give out dye tablets and give credits for fixing leaks
- ✓ Low-Flow Devices: Give out free or reduced cost low-flow devices
- ✓ Water Use Rate Schedule: Progressive water rate schedule
- ✓ Billing Cycle: Quarterly billing cycle
- ✓ High water use notification: Provide a written notice to users where water use is 20 percent higher than the seasonal average for the property
- ✓ Maintain system integrity: Difference between water pumped and water billed in Hampstead runs between 3 and 5 percent
- ✓ Outdoor water use: Limit discretionary outdoor water use
- ✓ Drought restrictions: Maintain the ability to limit use during drought period

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### 5. Sustain existing wastewater treatment capacity [County]

#### System-Specific Action Items Already in Place:

- ✓ Currently conducting an I&I study that should identify where reductions in I&I could result in regaining capacity, reducing the 231,000 gpd estimate based on the difference in flows from 2003 to 2002

#### System-Specific “To Do” Action Items:

- Support the Town in amending the Hampstead Community Comprehensive Plan to reduce the size of the Hampstead GAB to more closely reflect a balance between future demand and potential wastewater capacity
- Identify potential industrial/manufacturing users for which water reuse in operations may be pursued
- Identify potential areas for spray irrigation to gain additional wastewater capacity at the WWTP
  - For an increase of 650,000 gpd, and an expected 0.78 mgd reuse flow, an estimated 454 acres of land would be required to reuse 50 percent of the buildout flow
- Update the WWCMP worksheets developed as background data for this plan document to reflect the most current information, then complete and submit a full WWCMP to MDE for review