

October 29, 2015

Council on Aging / Community Center Advisory Committee
Attn: Mr. Bill Sterling
41 Cochituate Road
Wayland, MA 01778

Re: Wayland Community Center - Proposed 4.16 Acre Municipal Parcel Site Evaluation

Dear Mr. Sterling:

McClure Engineering, Inc. (McClure) is providing this letter as a summary of our findings related to our research into the feasibility assessment of siting a proposed annex to the existing building located on the proposed municipal parcel identified as Assessor's Map Parcels, 23-52S, 52L, 52K and a portion of 23-52M (the Site). The intent of this letter is to provide utility and wetland permitting information relative to the 4.16 acre subject property. This letter is not an endorsement of any proposed future use being considered by the Council on Aging/Community Center Advisory Committee (COA/CCAC).

The Site property is more specifically defined as Parcels R-20-1, Lot 4-1, Lot 8-1 and Lot 9-1B shown on the "Plan of Land Wayland, Massachusetts Showing Proposed Municipal Parcels" prepared by the Wayland Town Surveyor's office dated July 21, 2015 and recorded as Plan 616 of 2015 at the Middlesex County Registry of Deeds. These properties are all part of the larger former Raytheon facility property recently re-developed as the "Wayland Town Center" project by Twenty Wayland, LLC.

Existing conditions:

The Site existing conditions, topography, existing wetland resource area delineations and site utilities are shown on a separate plan provided by the Town of Wayland (Town) entitled "Wayland Town Center 400 Boston Post Road, Wayland, Massachusetts As-Built Plan, Phase I Grading & Drainage Plan, Drawing No. AS-2" prepared by R.J. O'Connell Associates, Inc. (O'Connell) dated February 26, 2013. Griffin Engineering, Inc. (Griffin) provides additional revisions to this plan through April 10, 2014. The following is a summary of the existing site areas:

Site area:

- Upland Area = 66,700 square feet (s.f.) ~ 1.53 +/- acres
- Riverfront Area (0' - 200') = 95,692 s.f. ~ 2.19 acres
- River (Resource Area) = 19,173 s.f. ~ 0.44 acres
- Total Site Property = 4.16 acres

Attachment A provides a "Wayland Community Center Base Plan" prepared by McClure based on a combination of the above mentioned plans for your reference. Reduced scale copies of the reference plans are also included. Full size and pdf copies of the plans will also be made available to the Town.

Existing Utilities:

The following is a summary of the available utilities either on or in close proximity to the Site along with recommendations for further study where more information is necessary:

Water:

- Existing 8" cast iron water pipe stub connected to the 12" cement line ductile iron (CLDI) water main in Andrew Avenue.
- 8" cast iron water pipe is an adequate diameter to allow for future domestic water and fire service connections to the Site.
- Currently, there is no available data regarding water pressure or fire flow measurements in the vicinity of the Site. However, there are two nearby fire hydrants on the opposite side of Andrew Avenue that could be used to obtain this information.

Recommendation:

Existing fire flow & water pressure measurements must be obtained in the vicinity of the project to confirm adequate water pressure for fire and domestic water services for the future proposed use(s).

Sanitary Sewer:

- Existing 8" diameter gravity sewer stub located at Andrew Avenue (Inv. = 120.90).
- 3,000 gallons per day (gpd) sewer design flow is allocated to the municipal pad.
Title 5 – 310 CMR Section 15.203
 - Equivalent of 40,000 s.f. office building at 75 gallons/day/1,000 s.f.; or
 - 200 seat function hall at 15 gpd/seat. Evaluation of actual project design flow for each individual building must be evaluated based on the combination of proposed uses. This may limit what can be constructed on the Site.

Recommendation:

Further discussions with Sewer Commission and Board of Health to clarify project design flow once Community Center Concept is further developed based on the proposed building use.

Other Utilities (Natural Gas, Electric, Cable, & Telephone):

- Existing natural gas service connection to existing building from gas main in Boston Post Road.
- Natural gas main is located on west side of Andrew Avenue adjacent to Site for use in future building connections.
- Existing underground electric conduit stub is located at northeast corner of property.
- Existing telephone conduit stub is located at northeast corner of property.

Attachment B provides copies of McClure correspondence with the Town Water & Sewer Departments regarding existing water and sewer service capacities.

Stormwater Management System (Drainage System):

The Site municipal parcel and its use for the siting of future Town buildings was included as part of the re-development of the former Raytheon property as the "Wayland Town Center" project. The original "Stormwater Management Study – Wayland Town Center" prepared by O'Connell revision date January 2, 2009 and its subsequent revisions incorporate several assumptions relating to the Site.

Although the current size of the "municipal parcel" is larger than the original plan, some of the basic engineering stormwater design assumptions for the overall Wayland Town Center project will still apply.

Stormwater Recharge:

- Wayland Town Center – 2009 Stormwater Study Groundwater Recharge Assumptions:
 - Existing Impervious Area = 21.8 acres (original Raytheon site)
 - Proposed Impervious Area = 22.2 acres (Wayland Town Center project)
 - Wayland Town Center Project installed three (3) separate underground stormwater infiltration areas to account for the overall increase in 0.4 acres of impervious area.
- Figure 5 – “Post Development Watershed Plan” date January 2, 2009 shows the area identified as the “Public Green (formal) and Municipal Building” 70,000 s.f. (1.6 acres) as part of the Wayland Town Center project (Watershed PW-1A).
- It appears impervious area relating to the municipal parcel is included in the original Wayland Town Center stormwater design calculations. However, the actual amount is not clear as the municipal parcel impervious area is included in the overall project total of 22.2 acres.

Recommendation:

McClure recommend calculation and comparison of final as-built impervious area for the Wayland Town Center project to confirm there is 70,000 s.f. (1.6 acres) of impervious area remaining to be constructed; consistent with the proposed 22.2 acres of impervious area noted in the study.

Attachment C provides copies of the specific pages from the 2009 O’Connell study which document the Wayland Town Center project impervious area assumptions.

Stormwater Peak Flow Control & Treatment:

Sand Filter/Detention Basin 2 is part of the adjoining Wayland Town Center project and was originally designed by O’Connell Associates, Inc. to receive runoff from approximately 12.03 acres of impervious area.

- August 31, 2009 O’Connell letter to Massachusetts Department of Environmental Protection (MassDEP) notes:
 - Stormwater system is designed to convey municipal parcel runoff to Basin No. 2
 - Basin No. 2 has been designed to attenuate peak rate of flow from the municipal parcel.
 - However, water quality treatment volume did not include the 1.4 acres of impervious area projected to be built when the Town develops the municipal parcel.
 - O’Connell recommends the Basin 2 design volume be increased to 48,800 c.f. to accommodate the 1.4 acres
- March 3, 2014 – Griffin Engineering Group , LLC “Wayland Town Center (MassDEP File No. 322-701) Proposed & As-Built Basin Volume Comparison” notes:
 - November 25, 2009 - Proposed Basin No. 2 Total Storage Volume = 39,540 c.f.
 - March 23, 2014 - As-Built Basin No. 2 Total Storage Volume = 41,512 c.f.
- The Basin No. 2 proposed design & as-built volume noted in Griffin’s March 3, 2014 letter is not consistent with the earlier information provided by O’Connell. However, the Griffin letter does show the As-Built Basin No.2 volume as larger than the November 25, 2009 proposed storage volume. It appears that a change was made to the design during the MassDEP review process for the project.

Recommendation:

McClure recommend further review of “Wayland Town Center Project” MassDEP’s Superseding Order of Conditions MassDEP File No. 322-701 submittals to confirm final design assumptions include the 1.4 acres of impervious area for the municipal parcel.

If necessary, comparison of the overall Wayland Town Center Project As-Built impervious area within the Proposed Watershed PW-1A area could confirm the remaining impervious area to be built on the municipal parcel.

Attachment D provides copies of the August 31, 2009 O’Connell and March 23, 2014 Griffin Engineering Group, LLC letters.

Stormwater System Pipe Connection:

Existing 24” corrugated plastic pipe (CPP) storm drain is located at Lillian Drive. The design of the proposed municipal pad parking area and on-site stormwater system will need to accommodate the shallow 24” pipe invert = 122.35.

- Elevation of parking area in vicinity of existing building (floor elevation = 125.26) will impact amount of stormwater able to flow to existing 24” storm drain pipe inv.=122.35.
- Site’s stormwater design may need to consider on-site infiltration BMPs such as bioretention areas or shallow infiltration basins with forebays, and/or subsurface drywells with overflow pipe connections to the existing 24” drain pipe in Lillian Drive.
- If necessary, Site Infiltration of Portions of Existing / Proposed Roof and Impervious Areas:
 - Estimated Seasonal High Groundwater Elevation = 117-118 +/- . Additional soil testing is recommended to confirm design values prior to design.
- *Existing Deed Restriction recorded October 22, 1997, Middlesex County Registry Book 27793, Pages 141-166 “Notice of Activity and Use Limitation” requires review and approval of Raytheon’s LSP of Record prior to implementation of “installation or removal of pavement, building foundations, drainage structures, or vegetative cover.

Recommendations:

Proposed parking lot and grading design will need to take elevation of existing 24” CPP drain pipe connection into consideration.

Existing Deed Restriction will require the review of the Site’s building construction and stormwater management design by Raytheon’s LSP of Record in addition to the Town Conservation Commission and Engineering Consultant.

If on-site stormwater infiltration becomes necessary, additional on-site soil testing is recommended to confirm soil conditions.

Attachment E provides a copy of the specific information included in the 1997 Deed Restriction relating to the “installation or removal of pavement, building foundations, drainage structures, or vegetative cover.

Wetlands Permitting:

Notice of Intent and Wayland Chapter 194 Permit Applications are required for submittal, review and approval by the Wayland Conservation Commission for all proposed work due to the presence of on-site wetland resource areas and connection to the Wayland Town Center stormwater system.

The following is a summary of key wetland permitting issues based on our review of the COA/CCAC's Wayland Community Center Concept Plan Scheme A" diagram dated September 21, 2015:

- Riverfront Area (0-200 ft.) = 2.19 +/-acres (95,692 s.f.)
- Existing Building in Riverfront Area = 10,711 s.f. allowed to remain as redevelopment within previously developed Riverfront area based on informal meeting with Wayland Conservation Commission on September 24, 2015.
- 10% Riverfront Area = $(95,692 - 10,711) \times 10\% = 8,498$ s.f. additional disturbance area allowed in 100-200' Riverfront zone.
- Walking trails may be allowed in the Riverfront if proposed as a minor project meeting specific performance standards (i.e. 3 ft. width for public access, gravel surface level with grade).
- Other pedestrian access options will require further discussion with Conservation Commission and MassDEP to determine the criteria for a limited project and /or allowance within the Riverfront area.
- 100' wide area of undisturbed vegetation is to be provided from 0-100 ft.
- Proposed "Boathouse" is closer to the river than 100 ft. Permitting of this structure, if allowed, may require additional areas of wetland resource protection be provided on-site.
- Alternative Analysis – Any new alteration within the Riverfront area requires an alternative analysis be prepared for the proposed work for Conservation Commission review/approval.

MassDEP Stormwater Management Standard Compliance:

- Redevelopment – "Existing Building Footprint" must meet standards to the "maximum extent practicable".
- New Development – "All Other Proposed Site Improvements" must meet all of the standards.
- 1.4 ~1.6 acres of impervious area may already be accounted for as part of the Wayland Town Center Project.
- Peak flow control and treatment will be provided by off-site Stormwater Basin No.2.
- Additional on-site groundwater recharge may be necessary to accommodate the existing building elevation in relation to the existing 24" drain pipe stub at Lillian Drive.
- Additional on-site BMP's to meet full performance standards will include deep sump catch basins with hoods and routine parking lot sweeping.
- EPA NPDES – Construction Stormwater Permit (Disturbance >1 acre).
- Construction Period – Stormwater Pollution Prevention Plan and monitoring.
- Long term stormwater Operation and Maintenance (O&M) Plan.

Recommendations:

Additional meetings with the Conservation Commission are recommended to discuss the different potential uses of the Site property and how the project's conceptual design can comply with the regulatory aspects of the Local Wetlands By-Law and State of Massachusetts Wetlands Protection Act.

Attachment F includes a copy of the "Wayland Community Center Concept Plan – Scheme A" diagram provided by the COA / CCAC for use in our review.

National Heritage and Endangered Species Program:

A portion of the Site is mapped as both Priority Habitat of Rare Species (PH1516) & Estimated Habitat of Rare Wildlife therefore additional Permit submittals to NHESP are required to insure protection of mapped species/wildlife.

Attachment G provides a copy of the current MassGIS–NHESP mapping and a 7/1/2008 NHESP letter regarding the Wayland Town Center project.

Flood Plain:

The original Wayland Town Center project design and as-built elevations are all based on the NGVD 1929 vertical datum. During that same time period the Federal Emergency Management Agency (FEMA) Flood Plain was also based on the same datum. These flood plain lines are shown in blue on the base plan included as Attachment A.

- FEMA 100-Year Flood Elevation (NGVD 1929) = 123.0
- Town of Wayland 100-Year Flood Elevation (NGVD 1929) = 124.0
- Existing Building Floor Elevation = 125.26 (> 1 ft. above Town of Wayland 100-Year Flood).
- The Site's entire 1.53 acres of upland area and most of the area within the 100~200' Riverfront zone is outside of both 100-year flood plain elevations

The current FEMA Flood Insurance Rate mapping is based on the North American Vertical Datum (NAVD) 1988 vertical datum. The NAVD 1988 datum is lower than the NGVD 1929, therefore resulting in a different flood elevation.

- FEMA 100-Year Flood Elevation (NAVD 1988) = 121.0
- **Note:** The NAVD 1988 datum is lower than NGVD 1929, however, the flood plain line is depicted in the same general location as shown on the As-Built Plans.
- It will be necessary to adjust the elevation topography shown on the Base Plan to the NAVD 1988 datum in order to perform a direct comparison.

The location of the 100-year flood plain will most likely only impact the proposed Boathouse element of your current concept diagram. All other proposed future work is recommended to be located outside of 100-year flood elevation.

- Proposed Boathouse is within both FEMA and Town of Wayland 100-Year Flood Zones and must meet flood plain building construction design standards.
- Army Corps of Engineers Permit requirements for work within flood plain will apply including compensatory flood storage for any filling within the flood zone (including foundation piers).

Recommendations:

Prior to design of the project, the base plan survey elevations and flood plain will need to be adjusted to NAVD 1988 datum to be consistent with current standards.

Further evaluation of the flood plain design standards should be considered if any of the proposed work will be located in the 100-year flood plain (i.e. proposed boathouse).

Attachment H provides a copy of the current FEMA Flood Insurance Rate Map, Middlesex County Massachusetts, Panel 526 of 656, Map Number 25017C0526F, Map Revised July 7, 2014.

Summary of Recommendations:

- 1) Existing fire flow and water pressure measurements must be obtained in the vicinity of the project to confirm adequate water pressure for fire and domestic water services for the future proposed use(s).
- 2) Further discussions with Sewer Commission and Board of Health to clarify Project Sanitary Sewage Design Flow once Community Center Concept is further developed based on the proposed building use(s).
- 3) Calculation and comparison of final as-built impervious area for the Wayland Town Center project to confirm there is 70,000 s.f. (1.6 acres) of impervious area remaining to be constructed, consistent with the Proposed 22.2 acres of impervious area noted in the original study.
- 4) McClure recommend further review of "Wayland Town Center Project" MassDEP's Superseding Order of Conditions MassDEP File No. 322-701 submittal to confirm final design assumptions include the 1.4 acres of impervious area for the municipal parcel.
- 5) If necessary, comparison of the overall Wayland Town Center Project as-built impervious area within the proposed watershed PW-1A area could confirm the remaining impervious area to be built on the municipal parcel.
- 6) If necessary, further evaluation of on-site stormwater drainage options will be necessary dependent on the findings of recommendations 3 and 4.
- 7) Proposed parking lot and grading design will need to take elevation of existing 24" CPP drain pipe connection into consideration.
- 8) Existing deed restriction will require the review of the proposed construction activities and stormwater management design by Raytheon's LSP of Record in addition to the Town Conservation Commission and Engineering Consultant.
- 9) If on-site stormwater infiltration becomes necessary, additional on-site soil testing is recommended to confirm soil conditions.
- 10) Additional meetings with the Conservation Commission are recommended to discuss the different potential uses of the Site property and how the project's conceptual design can comply with the regulatory aspects of the Local Wetlands By-Law and State of Massachusetts Wetlands Protection Act.
- 11) Also recommend contacting National Heritage and Endangered Species Program (NHESP) to review Wayland Community Center Concept Plan - Scheme A diagram and participate in the pre-application discussions regarding future Site development.
- 12) Update Site base plan topography & 100-Year Flood elevations to NAVD 1988 to be consistent with current regulations and FEMA Flood Plain Elevation information.

Sincerely,



David Faist, P.E.

Enclosures:

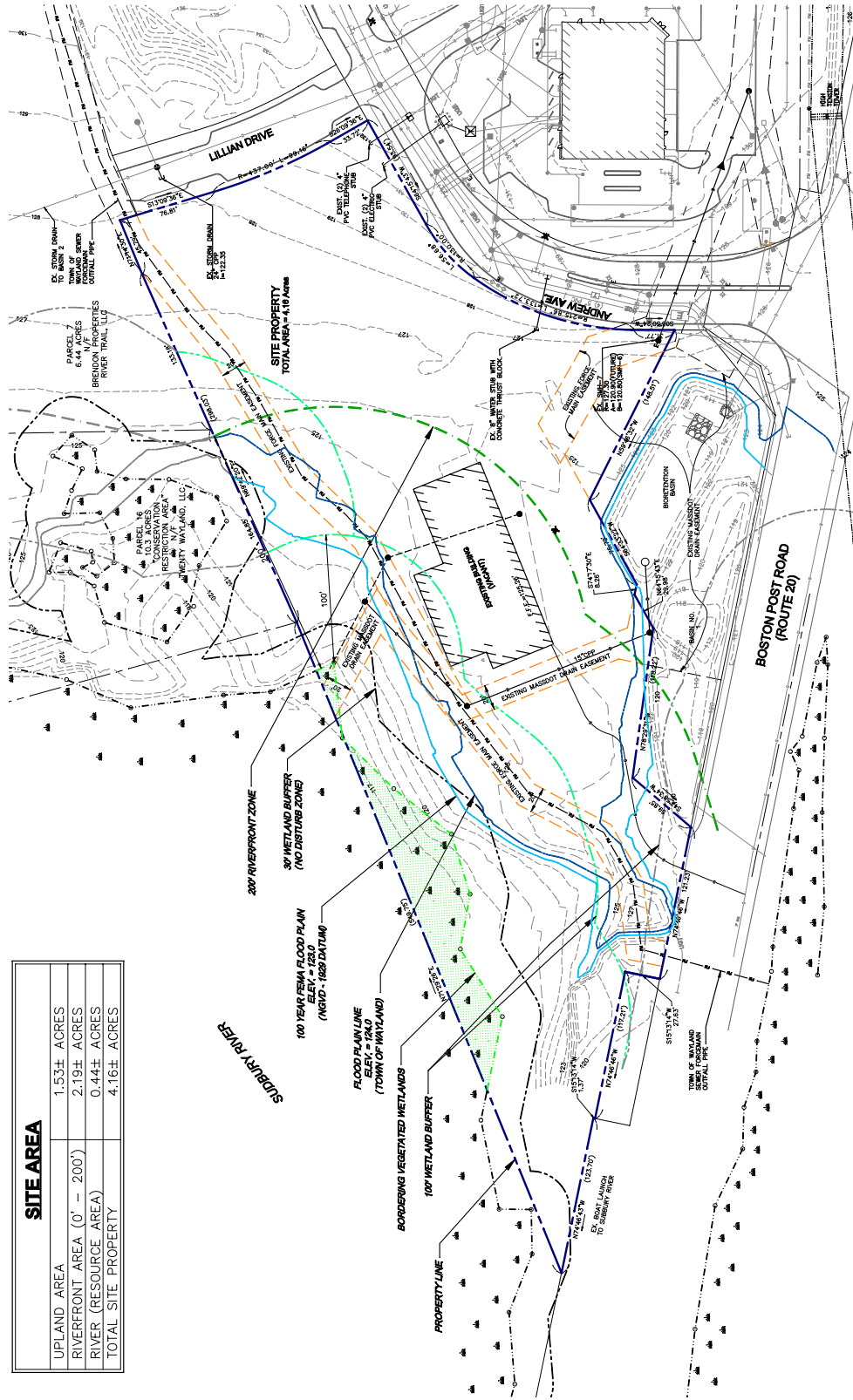
cc: Ben Gould, CMG Environmental, 67 Hall Road, Sturbridge, MA 01566

ATTACHMENT A

- WAYLAND COMMUNIITY CENTER BASE PLAN
- 2015 PLAN OF LAND, WAYLAND, MA, SHOWING PROPOSED MUNICIPAL PARCELS
- 2014 AS-BUILT PLAN, WAYLAND TOWN CENTER



SITE AREA	
UPLAND AREA	1.53± ACRES
RIVERFRONT AREA (0' - 200')	2.19± ACRES
RIVER (RESOURCE AREA)	0.44± ACRES
TOTAL SITE PROPERTY	4.16± ACRES



WAYLAND COMMUNITY CENTER
BASE PLAN

HOR. SCALE IN FEET: 1"=40'
0 40 80 120

McCLURE
ENGINEERING, INC.

5 Masonic Home Road
Chaffin, MA 01507
Tel: (508) 245-2005
Fax: (508) 245-4857
Email: dfa@mcclureengineers.com

ATTACHMENT B

- SEWER AND WATER CAPACITY
- TOWN CORRESPONDENCE

David Faist

From: fred knight <fred.knightway@gmail.com>
Sent: Wednesday, October 07, 2015 5:11 PM
To: Sarkisian, Sarkis
Cc: David Faist; Capasso, Jane
Subject: Re: Wayland Municipal Pad - Sewer Flow

David,

A Title V design flow of 3,000 gallons/day (gpd) was allocated to the Municipal Pad in agreements starting in 2006. Since then, the KGI owners relinquished their hold on that design flow and "gave" it to the town in order to avoid paying the betterment. The Town made an equivalent payment in lieu of betterment for the 3000 gpd.

Currently the 3,000 gpd remains earmarked for the Municipal pad. Treated as an office building under Title V, this 3,000 gpd would allow up to a 40,000 sqft building, which is the largest that is contemplated for this area. Currently somewhere between 22,000 and 30,000 sqft of space is being considered for a Community Center at this location. An article at Spring's Annual Town Meeting failed to garner the funds to take the next design steps for this site. A similar article is under consideration at this fall's (2015) Special Town Meeting. Ultimately, if 40,000 sqft of building area is constructed, all 3,000 gpd will be needed. Otherwise, some of this design flow could be used by the Town for other purposes, provided the WWMDC agrees, as for the Library. The connected wastewater for this building will flow by gravity to the main of the wastewater system as it passes from Rte 20 to the collection pump at well station #3, where there is a pump to pump it to the wastewater Treatment Facility (WWTF).

I know nothing about water testing.

I hope this helps. Much more can be written (and has been).

Cheers,
Fred

--
Fred Knight, fred@knightway.org, 508 358 0834

On Wed, Oct 7, 2015 at 1:21 PM, Sarkisian, Sarkis <ssarkisian@wayland.ma.us> wrote:

Fred,

Can you please help David with WW ? thanks

From: David Faist [<mailto:dfaist@mcclureengineers.com>]
Sent: Wednesday, October 07, 2015 1:12 PM
To: Sarkisian, Sarkis
Subject: Wayland Municipal Pad - Sewer Flow

Hi Sarkis,

We're working on gathering all the utility information we can on the Municipal Pad and was wondering if you had the following information or could point me to the right person.

- 1) Sewer Connection – Do you know if there is an estimate / allotment for the amount of sewer flow allowed for the municipal pad site ?
- 2) Water Line – was there any fire flow testing of any of the nearby fire hydrants for the new water main in the vicinity of the pad site ?

I already have all of the utility locations from Alf and any other information you think might be helpful is appreciated.

Thank you.

David

David T. Faist, PE

e-mail: dfaist@mcclureengineers.com

cell: [\(508\) 864-6802](tel:(508)864-6802)

McCLURE
ENGINEERING, INC

5 Masonic Home Road

Charlton, MA 01507

David Faist

From: Millette, Don <dmillette@wayland.ma.us>
Sent: Tuesday, October 13, 2015 12:57 PM
To: David Faist
Cc: Sarkisian, Sarkis
Subject: RE: Municipal Pad Water Service
Attachments: image001.jpg

Follow Up Flag: Follow up
Flag Status: Flagged

Good Afternoon David,

I could find the as-builts after reading your email. My foreman may have them filed away somewhere. He is out of the office today, I will ask him tomorrow morning and I will get back to you.

Don Millette
Water Superintendent
Wayland DPW Water Division

office 508-358-3699
cell 508-975-5762

From: David Faist [dfaist@mcclureengineers.com]
Sent: Tuesday, October 13, 2015 12:31 PM
To: Millette, Don
Cc: Sarkisian, Sarkis
Subject: RE: Municipal Pad Water Service

Hi Don,

Do you have any information for the existing 8" Water Stub to the Proposed Municipal Parcel at the Wayland Town Center project.
(see attached highlighted plan)

I'm looking for Existing Fire Flow / water pressure if you have available ?

Please let me know if you have or if I need to contact Tata & Howard.

Thank you.

David

David T. Faist, PE
e-mail: dfaist@mcclureengineers.com<mailto:dfaist@mcclureengineers.com>
cell: (508) 864-6802

[cid:image001.jpg@01D105B3.20DC7A20]<<http://www.mcclureengineers.com/>>
5 Masonic Home Road
Charlton, MA 01507

From: Sarkisian, Sarkis [mailto:ssarkisian@wayland.ma.us]
Sent: Tuesday, October 13, 2015 11:53 AM
To: David Faist <dfaist@mcclureengineers.com>
Cc: Millette, Don <dmillette@wayland.ma.us>
Subject: RE: Municipal Pad Water Service

The Water Supt. Don Millette who is cc'd in this email. Our Water consultant is Tata & Howard who recently did testing for the River's Edge property.

From: David Faist [mailto:dfaist@mcclureengineers.com]
Sent: Tuesday, October 13, 2015 11:13 AM
To: Sarkisian, Sarkis
Subject: Municipal Pad Water Service

Hi Sarkis,

Fred was able to get me the sewer information.

Who do I need to contact at the Town to get information regarding the existing 8" Water Stub to the Site and the Existing Fire Flow / water pressure ?

Thank you.

Dave

ATTACHMENT C

- GROUNDWATER RECHARGE AND BASIN 2
- STORMWATER MANAGEMENT STUDY

Stormwater Management Study

**Wayland Town Center
Wayland, MA**

**Applicant:
Twenty Wayland, LLC
260 Boston Post Road, Suite 9
Wayland, MA 02109**

**Prepared by:
R.J. O'Connell & Associates, Inc.
80 Montvale Avenue
Stoneham, MA 02180**

**Date: July 31, 2008
Revised: January 2, 2009**



Brian Dundon

1-2-09

7.0 Groundwater Recharge

Groundwater recharge for the proposed development will be provided in accordance with the MA DEP Stormwater Management Standards. These standards require that the annual recharge from the post-development site shall approximate the annual recharge from pre-development site conditions based on soil types. For hydrologic group A soil types, the volume that is required to be recharged is equal to 0.60 inches multiplied by the increase in impervious area. The proposed development is located within hydrologic group A soils, therefore the volume required to be recharged is as follows:

Existing impervious area: ±21.8 acres

Proposed impervious area: ±22.2 acres

Increase in impervious area: ±0.4 acres

$$V = 0.4 \text{ acres} \times 0.60 \text{ inches} \times \frac{43,560 \text{ s.f.}}{1 \text{ acre}} \times \frac{1 \text{ ft.}}{12 \text{ inches}} = 871 \text{ cubic ft.}$$

The stormwater management system will provide groundwater recharge through the use of underground infiltration basins. The static method was used to calculate recharge volumes for the infiltration basins by determining the volume of water stored in each basin that is located below the system outlet. The recharge volumes calculations provided in each infiltration basin is included in Appendix I and summarized in the table below:

INFILTRATION BASIN	PROVIDED RECHARGE VOLUME
INFILTRATION BASIN 1	2,721 Cubic Feet
INFILTRATION BASIN 2	729 Cubic Feet
INFILTRATION BASIN 3	1,828 Cubic Feet

As shown above, the proposed development provides a total recharge volume of 5,278 cubic ft. which exceeds the 871 cubic feet required by DEP Stormwater Management Standards.

72-hour Drawdown Analysis:

As per the Massachusetts Stormwater Handbook, the recharge volume should infiltrate within 72 hours. The drawdown analysis for the static method is performed by selecting a Rawls infiltration rate (provided by the Handbook) for the existing site soils in the areas where recharge is proposed. Test pits performed in the area of the infiltration basins were used to determine groundwater levels and soil types. The soil testing indicates that the ESHWT in the area of Basin #3 is elevation 123, which is 4.5 feet below the bottom of the proposed infiltration basin, and the ESHWT in the area of Basin #1 and #2 was not encountered down to elevation 119, which is seven feet below the bottom of the infiltration basin (refer to Appendix G for soil test results).

Based on the information from the borings and monitoring wells, the bottom of the infiltration basins are more than 2 ft. above the groundwater levels, and the underlying soils consist primarily of loamy sand. Upon review of the Rawls table, an infiltration rate of 2.41 inches per hour based on the underlying soil

9.0 Summary

The stormwater collection and management system for the proposed development will provide mitigation of post-development stormwater runoff conditions utilizing a combination of detention basins and Low Impact Development techniques and "Best Management Practices" to reduce pollutant loadings within the stormwater prior to discharging it off site.

As shown in the following summary, the proposed stormwater management system has been designed to match or reduce post development peak discharges to less than the existing rates for all modeled storms.

Analysis Point 1 - Existing 36" CMP Summary Existing vs. Proposed Peak Discharge Rates		
Storm Event:	Existing Flow (CFS)	Proposed Flow (CFS)
1-inch	3.3	<0.0
2-year	31.6	4.3
10-year	52.9	35.6
100-year	91.2	63.9

Analysis Point 2 - Existing Culvert (Behind Daycare Building) & Boston Post Road Summary Existing vs. Proposed Peak Discharge Rates		
Storm Event:	Existing Flow (CFS)	Proposed Flow (CFS)
1-inch	<1.0	0
2-year	10.4	1.4
10-year	18.1	3.8
100-year	32.3	9.3

Analysis Point 3 - Wetlands West of Site (Sudbury River) Summary Existing vs. Proposed Peak Discharge Rates		
Storm Event:	Existing Flow (CFS)	Proposed Flow (CFS)
1-inch	4.1	<0.0
2-year	41.6	6.2
10-year	71.2	34.8
100-year	129.0	102.1

Analysis Point 5 - Wetlands North of Site (Adjacent to Wayland Meadows) Summary Existing vs. Proposed Peak Discharge Rates		
Storm Event:	Existing Flow (CFS)	Proposed Flow (CFS)
1-inch	0	0
2-year	<1.0	<1.0
10-year	1.0	1.0
100-year	5.5	2.0

Analysis Point 6 - Wetlands South of Site Summary Existing vs. Proposed Peak Discharge Rates		
Storm Event:	Existing Flow (CFS)	Proposed Flow (CFS)
1-inch	0	0
2-year	1.1	0
10-year	3.9	<1.0
100-year	10.4	2.7

Project
Location:
Check One

By: PMA Date 01/02/09

Checked: _____ Date: _____

PROPOSED WATERSHED 1A (PW-1A)

1. Runoff curve number (CN)

Soil Name and Hydrologic Group (appendix A)	Cover Description (cover type, treatment, and hydrologic conditions percent impervious unconnected/connected impervious area ratio)	CN			Area		Product of CN x Area
		Table 2-2	Figure 2-3	Figure 2-4			
					X	acres	
						mi ²	
					%		
A	Grass - good	39			8.51		331.89
A	Impervious (pavement, roof)	98			12.03		1178.94
							0.00
							0.00
							0.00
							0.00
							0.00
							0.00
							0.00
							0.00
Totals =					20.54		1510.83

Use only one CN source per line.

Use only one CN source per line.

Totals =

20.54

1510.83

CN (weighted) =

$$\frac{\text{total product}}{\text{total area}}$$

73.5555

Use CN=

74

2. Runoff

		Storm #1	Storm #2	Storm #3
Frequency	yr.	2	10	100
Rainfall, P (24 hour)	in.	3.10	4.50	7.00
Runoff, Q	in.	0.97	1.97	4.04

(Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)

SEDIMENT FOREBAY CALCULATIONS

RETENTION BASIN #2 FOREBAY VOLUME = 6,100 CF

Size Required = 0.1" OF RUNOFF / IMPERVIOUS ACRE

$$(0.1"/12) \times (12.03 \times 43,560) = 4,367 \text{ CF}$$

FOREBAY VOLUME PROVIDED (6,100 CF) EXCEEDS
VOLUME REQUIRED (4,367 CF)

RETENTION BASIN #3 FOREBAY VOLUME = 2,150 CF

SIZE REQUIRED = 0.1" OF RUNOFF / IMPERVIOUS ACRE

$$(0.1"/12) \times (5.34 \times 43,560) = 1,938 \text{ CF}$$

FOREBAY VOLUME PROVIDED (2,150 CF) EXCEEDS VOLUME REQUIRED (1,938 CF)

WATER QUALITY VOLUME (WQV) CALCULATIONS (FIRST 1" OF RUNOFF)

REQUIRED WQV @ DETENTION BASIN #2:

$$1"/12 \times (12.03 \text{ Acres of Impervious}) (43,560) = 43,670 \text{ CF}$$

PROVIDED WQV @ DETENTION BASIN #2 = 2 yr. STORM EVENT.

$$\text{VOLUME OF RUNOFF @ 12.35 (hrs)} = 45,056 \text{ CF}$$

$$\text{STAGE STORAGE ELEVATION @ 12.35 hrs} = \text{ELEVATION 120.98}$$

SET 1ST ORIFICE @ 121.00

REQUIRED WQV @ DETENTION BASIN #3:

$$1"/12 \times (5.34 \text{ Acres of Impervious}) (43,560) = 19,384 \text{ CF}$$

PROVIDED WQV @ DETENTION BASIN #3: 2 yr. STORM EVENT

$$\text{VOLUME OF RUNOFF @ 12.45 hrs} = 19,435 \text{ CF}$$

$$\text{STAGE STORAGE ELEVATION @ 12.45 hrs} = \text{ELEVATION 128.17}$$

SET 1ST ORIFICE @ 128.25

REQUIRED WQV @ DETENTION BASIN #4:

$$1"/12 \times (0.47 \text{ Acres Impervious}) (43,560) = 1,706 \text{ CF}$$

$$\text{PROVIDED WQV BELOW WEIR @ 130.20'} = 2,200 \text{ CF}$$

SEE ATTACHED HYDROGRAPHS FOR BASIN 2 & 3 WQV

SEE ATTACHED STAGE/STORAGE GRAPH FOR BASIN 4 WQV

ATTACHMENT D

- AUGUST 31, 2009 R.J. O'CONNELL LETTER TO MASSDEP RE: BASIN NO. 2 AND MUNICIPAL PARCEL
- MARCH 3, 2014 GRIFFIN ENGINEERING "PROPOSED AND AS-BUILT BASIN VOLUME COMPARISON" LETTER

RJO'CONNELL & ASSOCIATES, INC.
CIVIL ENGINEERS & LAND PLANNERS

80 Montvale Ave., Suite 201 Stoneham, MA 02180
phone 781-279-0180 fax 781-279-0173

August 31, 2009

Mr. Michael Abell
Wetlands and Waterways Program
Department of Environmental Protection
Northeast Regional Office
205B Lowell ST
Wilmington, MA 01887

RECEIVED
SEP 02 2009
WAYLAND CONSERVATION COMMISSION

Regarding: Wayland Town Center
DEP File No 322-0701
Wayland, MA
06032.18

Dear Mr. Abell:

With respect to the plans now before you in connection with the above-referenced appeal, this letter is to advise you of a minor modification to the design of Basin No 2. The stormwater collection system is designed to convey stormwater from the Town of Wayland's future municipal parcel ("Municipal Parcel") situated near the Rt. 20 entrance to Basin No. 2.

The stormwater collection system is designed per local requirements to convey the Municipal Parcel runoff to Basin No. 2. Basin No. 2 has been designed to attenuate the peak rate of flow from the Municipal Parcel. The Stormwater Management Report, revised through January 2, 09 provides the supporting calculations. However the water quality treatment volume did not include the 1.4 acres of impervious area projected to be built when the Town of Wayland develops the Municipal Parcel.

The 1.4 acres of increased impervious surface area translates to an additional 4,900 cubic feet (cf) of treatment volume required for Basin No 2 in order to treat the "first flush". Therefore the total project water quality volume will increase from 43,670 cf to **48,600 cf**. The increased water quality volume will be accommodated with a minor modification to Basin No. 2. The 8-inch diameter low flow orifices will be changed to 4-inch diameter openings and the invert elevations will be adjusted from 121.0 to 121.50.

This minor change has no further impact on the Project or other issues advanced by Twenty Wayland and RJOC in support of the appeal. RJOC respectfully requests the minor design modification to the outlet control structure from Basin No 2 be incorporated into the final notice of intent design plans that will accompany the superseding order of conditions. RJOC apologizes for any inconvenience this may have caused. Should there be any questions and/or comments regarding the above please do not hesitate to contact me at 781-279-0180 x103.

Sincerely,

RJO'CONNELL & ASSOCIATES

Brian Dundon

Brian Dundon, PE
Vice President



cc: Frank Dougherty
Brian Levey, Esq.
Brian Monahan, Wayland Conservation Commission



March 3, 2014

Mr. David Faist, P.E.
CMG Environmental, Inc.
67 Hall Road
Sturbridge, MA 01566

By Email

**Subject: Wayland Town Center (DEP File No. 322-701)
Proposed & As-Built Basin Volume Comparison**

Dear Mr. Faist:

Please find attached Proposed and As-Built Basin Comparison Tables for Basins 1 through 4 and the Bio-retention Basin at the subject project. The tables compare the constructed volumes and elevations with the proposed conditions as permitted by the Town of Wayland Conservation Commission. The tables indicate that the constructed volumes in all the basins are greater than the proposed volumes.

We calculated basin volumes based on topographic AutoCAD files developed by RJ O'Connell Engineering and Associates, Inc.

We trust the above is satisfactory. Please do not hesitate to contact me should you have any questions or comments or require additional information.

Very truly yours,
GRIFFIN ENGINEERING GROUP, LLC

A handwritten signature in black ink, appearing to read "Robert H. Griffin".

Robert H. Griffin, P.E.



Griffin Engineering Group, LLC
 100 Cummings Center, Suite 224G
 P.O. Box 7061
 Beverly, MA 01915
 Phone: 978-927-5111; Fax: 978-927-5103

PROPOSED AND AS-BUILT BASIN COMPARISON

BASIN #2

AREA & VOLUME COMPARISON ⁽¹⁾

PROPOSED CONDITIONS		AS-BUILT CONDITIONS	
ELEVATION, FT	AREA, SF	ELEVATION, FT	AREA, SF
119.5	8,089	119.5	8,670
120	8,892	120	9,511
121	10,704	121	11,293
122	12,624	122	13,159
123	15,052	123	15,518
TOTAL STORAGE	39,540	TOTAL STORAGE	41,512
$\frac{(8,089 + 8,892 + 10,704 + 12,624 + 15,052) \times 2}{2} = 39,540$		$\frac{(8,670 + 9,511 + 11,293 + 13,159 + 15,518) \times 2}{2} = 41,512$	

ELEVATION COMPARISON

	ELEVATIONS, FT	
	PROPOSED	AS-BUILT
BOTTOM OF FOREBAY	119.5	119.4± ⁽²⁾
BOTTOM OF POND	119.5	119.5± ⁽²⁾
STONE CHECK DAM	122.8	122.8±
EMERG. SPILLWAY	123.5	123.4±
TOP OF POND	124.0	124.0±

Notes:

- (1) Stopped Volume Calculations at approximately spillway elevation; average end-area method used to calculate volumes.
- (2) Areas per cad file. Proposed conditions designed by R.J. O'Connell & Associates. As-Built conditions surveyed by R.J. O'Connell & Associates.
- (3) Proposed conditions based on Sheets 3A & 3B dated 11/25/08 and Sheets 3C & 3D dated 1/9/09.
- (4) Bottom as-built elevations are an average of the spot grades and shall be considered approximate.

**Wayland Town Center
Operations and Maintenance Plan**

DEP ON SITE PERMIT
FILE # 322-0701
Con Com Condition # 6

For:

Twenty Wayland, LLC
Wayland Town Center
400 Boston Post Road
Wayland, MA 01778

Owner:

Twenty Wayland, LLC
c/o KGI Properties, LLC
10 Memorial Blvd.
Providence, RI 02903
Phone: (617) 548-8416
Email: fdougherty@kgiproperties.com

Prepared By:

R.J. O'Connell & Associates
80 Montvale Avenue, Suite 201
Stoneham, MA 02180
Phone: 781-279-0180
Email: brian.dundon@rjoconnell.com

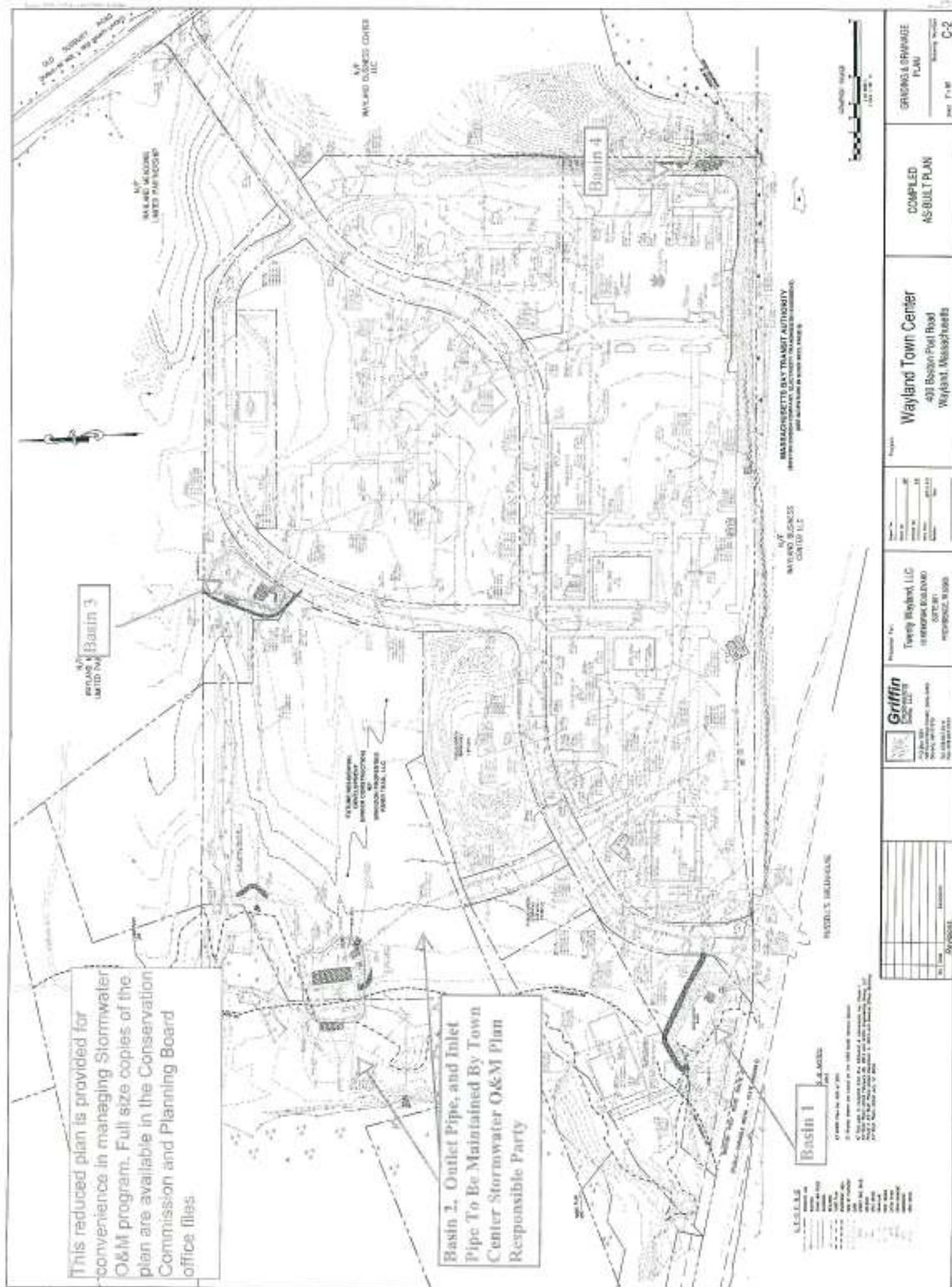
Date:

January 2, 2009
updated May 25, 2011

RECEIVED

SEP 13 2011

WAYLAND TOWN CENTER



ATTACHMENT E
1997 DEED RESTRICTION

1997 Deed Restriction

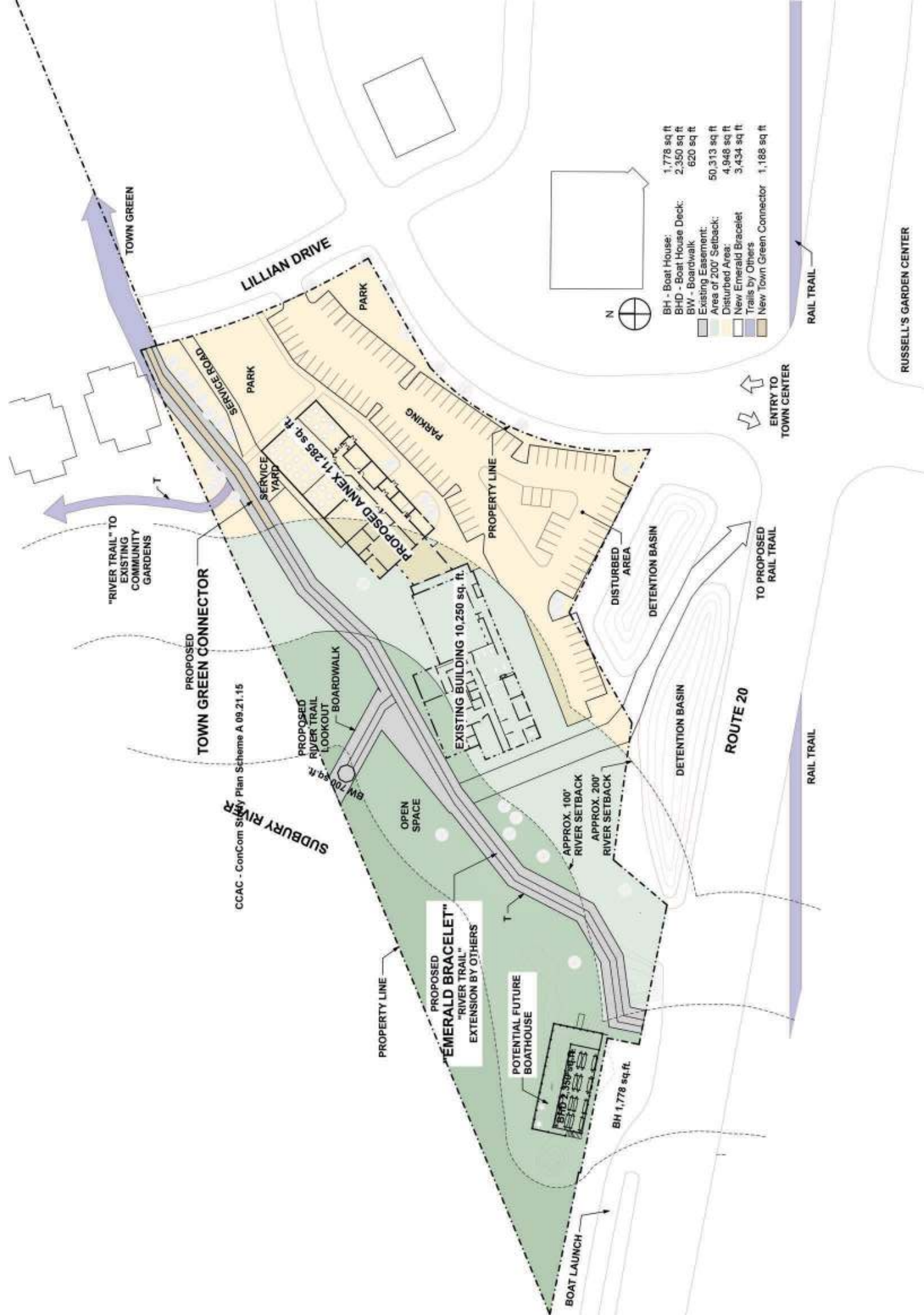
- Recorded 10/22/97 in Middlesex County South District Registry of Deeds Book 27793, Pages 141-166 by Wayland Meadows Limited Partnership (Property owner at time)
- Titled "Notice of Activity and Use Limitation" but not a standard DEP AUL

3. Obligations and Conditions Set Forth in the AUL Opinion. If applicable, obligations and/or conditions to be undertaken and/or maintained at the Portion of the Property to maintain a condition of No Significant Risk as set forth in the AUL Opinion shall include the following:

- (i) Certification in the form of documentation bearing the original signature, date and Seal of the LSP must be obtained by the Owner prior to implementation of the following activities and uses:
 - a) expansion or relocation of existing buildings laterally or vertically;
 - b) use of the Portion of the Property for residential, childcare, daycare, recreational, agricultural, horticultural, or gardening activities, or for unrestricted public access;
 - c) subsurface activities including: excavation, new construction below grade, reconstruction of existing buildings below grade, or maintenance of subsurface utilities; and
 - d) land development or construction involving changes in surface conditions (i.e., topography, surface cover, etc.) including installation or removal of pavement, building foundations, drainage structures or vegetative cover.

ATTACHMENT F

WAYLAND COMMUNITY CENTER CONCEPT PLAN



ATTACHMENT G

- NHESP MAPPING
- July 1, 2008 NHESP LETTER RE: WAYLAND TOWN CENTER





MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

July 1, 2008

Wayland Conservation Commission
Town Building
41 Cochituate Rd
Wayland MA 01778

RECEIVED

JUL 03 2008

WAYLAND CONSERVATION COMMISSION

RE: Applicant: Frank Dougherty, Twenty Wayland, LLC
 Project Location: 400 - 440 Boston Post Road
 Project Description: Construction of a mixed-use development
 DEP Wetlands File No.: 322-0701
 NHESP Tracking No.: 06-20298

To Whom It May Concern:

The applicant listed above has submitted a Notice of Intent with site plans (dated 6/2/2008) to the Natural Heritage & Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries & Wildlife, in compliance with the rare wildlife species section of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.58(4)(b) & 10.59).

MA WETLANDS PROTECTION ACT (WPA)

Based on a review of the information that was provided and the information that is currently contained in our database, the NHESP has determined that this project, as currently proposed, **will not adversely affect** the actual Resource Area Habitat of state-protected rare wildlife species. Therefore, it is our opinion that this project appears to meet the state-listed species performance standard for the issuance of an Order of Conditions.

Please note that this determination addresses only the matter of rare wildlife habitat and does not pertain to other wildlife habitat issues that may be pertinent to the proposed project.

MA ENDANGERED SPECIES ACT (MESA)

To date, the NHESP has not received a complete filing pursuant to the MESA. The proponent has elected to engage in informal consultation with the NHESP to address state-listed species concerns associated with this project. Based on a preliminary review of the information provided and contained in our database, the NHESP anticipates being able to issue a determination that this project will not result in a prohibited "take" of state-listed species. However, please note that the NHESP will not make a final determination until we receive a complete MESA filing.

If you have any questions regarding this letter please contact Rebecca Skowron, Endangered Species Review Biologist, at (508) 389-6343 or at rebecca.skowron@state.ma.us.

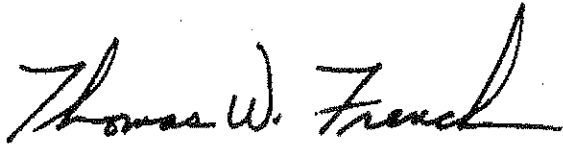
www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7891

An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

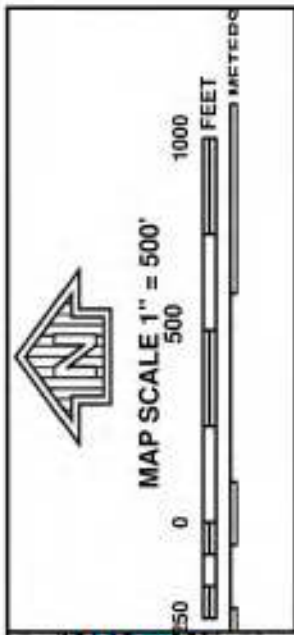
Sincerely,

A handwritten signature in black ink that reads "Thomas W. French". The signature is fluid and cursive, with the first letters of each name being capitalized and prominent.

Thomas W. French, Ph.D.
Assistant Director

cc: Frank Dougherty, Twenty Wayland, LLC
Andrew Magee, Epsilon Associates, Inc.
DEP Northeast Office, Wetlands Section

ATTACHMENT H
FEMA FLOOD MAPPING
JULY 7, 2014



NFP

PANEL 0526F

FIRM

FLOOD INSURANCE RATE MAP

MIDDLESEX COUNTY,

MASSACHUSETTS

(ALL JURISDICTIONS)

PANEL 526 OF 656

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTINUED

COMMUNITY

WATERLUT, TOWN OF

NUMBER

526000

PANEL

526000

SCALE

1" = 500'

Notice to User: The Map Number shown below should be used when placing map orders. The Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER

25017C0526F

MAP REVISED

JULY 7, 2014

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov