**THE IDENTIFICATION, CLASSIFICATION AND EVALUATION OF WATER SOURCES LOCATED IN THE TOWN OF CHILMARK, MASSACHUSETTS**

**Introduction:**

As part of the Strategic Plan submitted to the Selectman in April of 2019, members of the Chilmark Fire Department (CFD) listed 7 Strategic Planning Topics that the department felt were key to the effective operation and growth of the Department.

While expediently addressing all 7 Strategic Planning Topics is paramount to ensuring the effective and continued operation of the CFD, there is one of the Strategic Planning Topics that will need to be considered when evaluating the efficacy of all the other issues. That Topic is, Topic # 6, Fiscal Responsibility.

To this end the members of the CFD have agreed to the following statement.

“*All operations of the department and all capital asset purchases large or small would have to pass the joint test of operational need and fiscal prudence. It is the goal of the CFD when planning new acquisitions or budgeting for new operational costs to only commence with new acquisitions or to request new operational budgets, only after it is concluded that the request is operationally needed and financially responsible”.*

Therefore, going forward it is imperative that all capital and overhead expenditures must pass the duel test of being operationally needed as well as fiscally responsible.

This paper is then designed to investigate the subject of Water Sources both in the context of operational functionality as well as with the confines of fiscal viability and responsibility.

* **Background**: As described in the Strategic Plan, for the most part, the Town of Chilmark lies in a semi-rural setting and except for a few fire hydrants located in and around Menemsha, the down is not served by hydrants. To overcome this lack of hydrants, the CFD utilizes it Tanker and portable pools as functional water sources when needed. Historically this technique has served the both the CFD and the community quite well. However, as the community continues to grow, and the residences grow larger and larger, the need to develop or construct more water sources in town has become more apparent. As mentioned in the Strategic Plan, the need for more or enhance water sources, positioned to serve, the Town was highlighted in the fall of 2018 when firefighting activities associated with large structural fire on Middle Road utilized over 90,000 gallons of water from a nearby water source. After the fire it was determined that the taking of these 90,000 gallons had almost completely drained the water source utilized for the fire.

As further described in the Strategic Plan another issue facing the CFD, associated with the utilization of existing water sources, is the fact that certain geographic areas of the town are not privy to as many or as robust water sources as other areas. As such, fire suppression activities in some locales within the Town may not be as effective as those in other areas which have a higher density of natural or man-made water supply sources. Because of this, members of the CFD, under the oversight of Town officials, have deemed it necessary to start looking into the capabilities of existing water sources as well as investigating the need for additional sources

* **Objectives:** This study has at its core, three main objectives: first to conduct an evaluation of existing water sources with the goal of prioritizing the expenditures of funds, if any, needed to enhance the performance and functionality of these sources. Secondly, this study will use the analysis of the existing sources to identify those areas of Town that might be at risk due to a lack of nearby or adequate water sources. Thirdly, based upon the findings, of these first two objectives, it is hoped that in those areas of the Town not currently adequately served by existing water sources that new potential sources can be identified or constructed all within the guise of fiscal responsibility.
* **Methodology:**
* Identification: Over the last few months members of the CFD have used firsthand as well as remote data sources such as Google Earth Pro and the USGS wetland mapping suite to identify existing and potential water sources in the Town. These water sources are identified and show on Figure 1.
* Evaluation: Once the water sources were identified they were then evaluated using the following criteria.
* **Accessibility**- Probably the most important factor related to any water source utilized for fire suppression is its accessibility. Simply put if the CFD cannot easily get its tanker near the water source its functionally is extremely diminished or non-existent. Therefore, accessibility is paramount to the functional ability of any water source.
* **Potential volume of water available**- This is an important criterion for obvious reasons, i.e. if the water source does not contain an adequate volume of water to adequately be used in fighting a large structural fire, its value is minimized. For the sake of this paper it was agreed that a minimum of 100,000 gallons would be needed for the water source to be considered an adequate water supply.
* **Geographical location**-Much like accessibility the location of the water source must be considered in its rating. If a water source has a substantial volume of water and can be easily accessed by the CFD tanker, but it is located at the end of a long narrow dirt road, its usefulness is diminished. Ideally a water source will be in the immediate proximity of a paved or improved road. In addition, water sources that are in the immediate proximity of each other are not individually as inherently valuable as a water source that is more isolated from other water sources. This decrease in value is due to supply redundancy which minimizes the value of any individual source.
* **Proximity to Areas Currently Lacking in Water Sources**-As previously mentioned it has been determined that certain areas of Chilmark currently are not well served by either natural water sources or tank supplies. Thus, the value of those water sources located near the areas that currently are not well served by local water supplies are enhanced. Thus, those water sources which are closest to areas that do not currently have identified water sources will be more valuable to the community.
* **Cost** – Where applicable the cost necessary to further enhance an existing water source or to construct a new water source was estimated and incorporated as part of the evaluation process.

Classification: Based upon the detailed evaluation, all existing water sources will be scored as to their viability and value and rank ordered.

**ANALYSIS**

As a result of the CFD’s initial investigation, 11 existing water sources were identified for further evaluation, using the criteria cited above. These existing water sources are identified as follows:

1. Tiasquam River crossing Middle Road.
2. Middle line Tank.
3. Turtle Cove Pond.
4. Chilmark Chocolate Pond.
5. U.S. Coast Guard Dry Hydrant.
6. 490 State Road-Keith Farm
7. 462 North Road.
8. North Tabor Farm.
9. Harlock Pond.
10. Tiasquam River – Town line South Road.
11. Hariph’s Creek.

A detailed evaluation of each of these cited sources is as follows. For evaluation purposes each criterion will be assigned a score between 1 and 10 with 10 being the most advantageous score.

**Tiasquam River Crossing Middle Road**

Location: This water source is located on Middle Road at 41\*22’14.70” N – 70\*42’20.10 W, having an elevation of 97 feet. The site is located on a main Town artery and is in the relative geographic center of Town. Its only drawback is that it is not located near in proximity of those areas not currently served by an existing water source.

Location Score – **9**

Accessibility: This water source is located on a paved road and is readily accessible by fire apparatus

Accessibility Score – **10**

Water Volume: Based upon observations, measurements, it is estimated that the Tiasquam River at this location flows at over 500 gpm. thus, being able to provide more than enough water for a structural fire.

Water Volume Score – **10**

Proximity to those areas currently lacking viable water sources: While not immediately proximate to those areas not currently served by existing water sources the Tiasquam Middle Road Crossing is located in a centralize location and could be a good secondary asset to be used in firefighting operations occurring in its immediate proximity and in more remotely located areas.

Proximity Score – **5**

Cost: Other than some minor seasonal weed control, development and utilization of this water source will entail minimal expense.

Cost Score – **10**

**Total Score – Tiasquam Middle Road Crossing - - 44**

**Middle Line Tank**

Location: The Middle Line tank is located off Middle Line Road, approximately ½ mile from the nearest paved road. While the location of the tank serves the nearby residents well, its remoteness and the fact that it can only be accessed via a one lane dirt road greatly diminishes the value of the tank to serve as a water source for other areas of the Town. Middle line Tank is found at an elevation of 168 feet at 41\*22’19,32” N – 70\*43’19.39” W.

Location Score – **4**

Accessibility: Access to the Tank itself is very good in that CFD apparatus have little trouble connecting to the tank and commencing firefighting operations. However, as previously discussed, because tank is in a remote location and can only be reached by a one lane dirt road, the usefulness of the tank as related to Town-wide firefighting operations is greatly compromised.

Accessibility Score – **3**

Water Volume: The Middle Line tank contains 20,000 gallons of water which is enough water to supply the CFD, with approximately 1 hour of water during normal firefighting operations. While 20,000 gallons is generally not enough water to adequately address the water needs associated with a large structural fire, it is more than adequate to address initial attack requirements and will give the CFD enough time to set up multiple-tanker shuttle operations to the location.

Water Volume Score – **6**

Proximity to those areas currently lacking viable water sources: The Middle Line Tank is relatively isolated from the rest of town by both a geographic and accessibility perspective. Therefore, its value to those areas of town that currently lack viable water sources is almost zero.

Proximity Score – **1**

Cost: This tank has already been constructed and is operating effectively therefore other than the costs associated with routine maintenance the costs associate with the operation of this tank is minimal.

Cost Score – **10**

**Total Score Middle Line Tank - - 24**

**Turtle Cove Pond**

Location: Turtle Cove Pond is located about 1/8 mile off North Road at 41\*22’01.55” N – 70\*44’22.18 W. The elevation of the pond is 144 feet. This location allows the pond to function as a significant water source for the North-Central portions of the Town. It is not located within a mile of any other existing water sources thus enhancing its value. The only minor drawback associated with Turtle Cove Pond is CFD apparatus can only be reached by traveling a short distance down a one-lane dirt road, thus somewhat decreasing firefighting efficiency.

Location Score – **9**

Accessibility: While getting to the location of the Turtle Cove Pond is minimally compromised by its location on a dirt road, access to the water in the pond can be made via two distinct locations on the pond’s parameter. This duel access allows for greater flexibility in shuttle operations and may even allow the pond to be used by two tankers at the same time. This greatly enhances the ponds value in firefighting operations.

Accessibility Score- **9**

Water Volume: The Turtle Cove Pond contains well over 100,000 gallons of water and, as such, serves as a significant resource to be utilized in firefighting operations.

Water Volume Score – **10**

Proximity to those areas currently lacking viable water sources: For the most part the north-central portions of Chilmark are not well served by other existing water sources. For this reason, the location of Turtle Cove Pond allows it to be a valuable firefighting resource for this area of town. With minor physical upgrades to the shoreline areas of the pond, it will be one of the most important firefighting resources in town.

Proximity Score – **10**

Cost: In order to utilize the full potential of Turtle Cove Pond some expenditures will have to be made associated with clearing some of the vegetative growth that surrounds the two potential pond parameter access points, and with fortifying the small access roads near the pond.

Cost Score - **8**

**Total Score Turtle Cove Pond - - 46**

**Chilmark Chocolate Pond**

Location: Chilmark Chocolate Pond is located on the northwestern side of State road between the Chilmark Police Station and the site if the former Chilmark Chocolate Store. Its geographic coordinates are 41\*20’28.29” N 70\*44’46.27” W and it sits at an elevation of 59 feet. The location of the pond allows it to serve as an important water source for both the western and southcentral parts of Chilmark.

Location Score – **10**

Accessibility: Perhaps one the most accessible of all Town water sources in that it sits immediately beside a major paved road as well as having an existing dry hydrant at the location. This roadside location allows for rapid transition of tanker shuttles and offers two methods for tanker filling, i.e. via existing dry as well as the utilization of a strainer.

Accessibility Score – **10**

Water Volume: While not being able to produce the same amount of water as some of the other natural existing water sources in town, the Chilmark Chocolate Pond has proven that is can supply enough water to adequately address the water needs associated with a large structural fire as historically the Chilmark Chocolate Pond supplied over 90,000 gallons of water used in the Middle Road fire of 2018.

Water Volume Score – **9**

Proximity to those areas of Town currently lacking viable water sources: The Chilmark Chocolate Pond is centrally located between the southwestern and southcentral areas of Chilmark. While it’s location may not be proximate to some locations within these two areas, it location along a major paved road and the ease of which fire apparatus can access the water in the pond make it a very valuable resource for firefighting in these two areas of town.

Proximity Score – **9**

There are very few costs associated with future operation of the Chilmark Chocolate Pond. The costs associated with using this water source is extremely small and will most likely just be associated with minor maintenance such as weed cutting.

Cost Score – **10**

**Total Score Chilmark Chocolate Pond - - 48**

**U.S. Coast Guard Dry Hydrant**

Location: The U.S. Coast Guard Dry Hydrant is located at the Coast Guard Station in Menemsha. The geographic coordinates of the dry hydrant are 41\*21’01.81” N – 70\*45’50.93 W and it is sited at an elevation of 17 feet. The location near the Menemsha area allows the dry hydrant to be a good asset for fighting fires near Menemsha and in Menemsha Harbor.

Location Score - **7**

Accessibility: The Coast Guard Dry Hydrant is very accessible via paved roads allowing for fire apparatus to easily access the water in the associate tank. This ease of access should allow for rapid filling of tankers.

Accessibility Score- **10**

Water Volume: The tank associated with the dry hydrant only holds 10,000 gallons which is enough water to supply structural fire operations for approximately 30 minutes. While this amount of water is enough to address the initial attack, on a typical structural fire, it will have to augmented by water from another water source to effectively address a large structural fire.

Water Volume Score – **4**

Proximity to those areas of town currently lacking viable water sources: The Coast Guard Dry Hydrant is located on the eastern shore of Menemsha Pond and as such, it is located quite far from those other areas of town that currently do not have existing water sources. As a result, the Coast Guard tank has very little value associated with providing water to any area of town except the immediate area in and around Menemsha.

Proximity Score – **1**

Cost: As this dry hydrant is located on U.S. Government property and is owned and maintained by the U.S. Government, the town of Chilmark should typically incur no costs associated with its operation and maintenance.

Cost Score – **10**

**Total Score U.S. Coast Guard Dry Hydrant - - 32**

**490 South Road – Keith Farm**

Location: This water source is located near, and approximately across the street from the Chilmark Community Center, at the following geographic coordinates; 41\*20’69” N – 70\*44’17.47 W. The elevation at this location is 37 feet. This water source consists of two small ponds each having its own standpipe. The first pond is located approximately 50 feet north of South road and the second is located approximately 500 feet north of South road. The location of these ponds in the south-central part of Chilmark makes them a good potential water source to be used in firefighting operations in this part of town.

Location Score – **10**

Accessibility: Both ponds are in proximity of a paved road, i.e. South Road, and can be easily accessed by fire apparatus. Both ponds have existing standpipes which will further enhance the ability of CFD apparatus to efficiently withdraw water.

Accessibility Score – **8**

Water Volume: Combined the two ponds contain over 450,000 gallons of water which make them far more than adequate for a water source. By itself the pond located immediately north and proximal to South Road contains a minimum of 250,000 gallons which should be more than adequate to address even the largest structural fire.

Water Volume Score – **10**

Proximity to those areas of town currently lacking viable water sources: The water source at 490 South Road is the closest existing water source that can be used to supply water to the southcentral part of Chilmark. The southcentral part of Chilmark is currently is not served by any existing natural or artificially developed water source, so for this reason the relative proximity of this water source to this area cannot be understated.

Proximity Score – **10**

Cost: As both ponds both have existing standpipes any costs associate with the 490 South Road site should be limited to costs associated with normal maintenance and should be minimal.

Cost Score - - **9**

**Total Score – 490 South Road – Keith Farm - - 47**

**462 North Road**

Location: Located near the intersection of Menemsha Crossroad and North road at 462 North Road, and has the following geographic coordinates: 41\*21’11.77” N – 70\*45’23.26” W. The site has an elevation of 95 feet. This site has some potential in that it lies near a paved roadway, i.e. North Road, but as it is in an area that is already served by two existing water sources, i.e. U.S. Coast Guard standpipe and Turtle Cove pond, the location of this water source does not by itself do much to greatly enhance the firefighting capabilities of the CFD.

Location Score – **3**

Accessibility: Currently this water source is not accessible to CFD apparatus in that it is located approximately 150 south of North Road and is not served by a standpipe connection. At present there is also no way to get CFD apparatus close enough to the pond to withdraw any water. However because the pond relatively close to a paved roadway it’s there is some potential for future ease of accessibility.

Accessibility Score - - **0**

Water Volume: The pond at 462 North Road is quite large and holds well over100,000 gallons of water and as such, could be an asset once developed.

Water Volume Score - - **10**

Proximity to those areas of town currently lacking a viable water source: Much like the U.S. Coast Guard standpipe site the pond at 462 North Road is quite distant from those areas of Chilmark that currently lack a viable water source and, as such, has limited value associated with firefighting activities in those areas.

Proximity Score – **1 i**

Cost: The cost to develop this water source could be quite substantial in that the effective development of this water source will entail either the installation of a minimum of 150 feet of underground piping and associated standpipe or the installation of an access road running from the south side of North Road to the north side of the pond.

Cost Score – **0**

**Total Score 462 North Road - - 14**

**North Tabor Farm Road Pond**

Location: The North Tabor Farm Road Pond is located on the south side of Tabor Farm road approximately 1,700 feet from North Road, This location will help serve the firefighting needs of the north-central portion of Chilmark but, its siting some 1700 feet away from a paved road does reduce the positive aspects of its geographical location. North Tabor Farm Road Pond has an elevation of 147 feet, and is found at the geographic coordinates of 41\*21’11.71” – 70\*45’23.26” W.

Location Score – **7**

Accessibility: The North Tabor Farm Road Pond is located on the south side, and approximately 60 feet from, North Tabor Farm Road. North Tabor Farm road is a one lane unimproved road which will limit the speed with which CFD apparatus can travel, thus diminishing the quality of access somewhat. Physical access to the Pond by apparatus is good assuming the ground is soft.

Accessibility Score – **6**

Water Volume: It is estimated that, at a minimum the pond contains at least 75,000 gallons of water thus making it suitable candidate for addressing all but the largest structural fires. The pond is refilled by an on-site well, but it is doubtful that this well will be able to provide the sustained volume of water needed, i.e. 300 gpm, to be much of a factor during firefighting operations.

Water Volume Score – **8**

Proximity to those areas of town currently lacking a viable water source: The North Tabor Farm Road Pond is in the north central part of Chilmark, an area that is currently lacking a viable water source. While access is somewhat restricted due to its distance from North Road, its location should allow the pond to be a viable water source for use in the area.

Proximity Score – **9**

Cost: Other than the need for some reinforcing of the immediate access to the pond and some limited costs associated with brush cutting, costs associate with the development of this water source are minimal

Cost Score – **8**

**Total Score for North Tabor Farm Road Pond - - 38**

**Harlock Pond**

Location: Harlock Pond is located on the western and southern side of Harlock Road and is found at an elevation of 110 ft. Harlock Pond is located approximately ½ mile north of North Road, in the far northeastern corner of Chilmark. While the Pond’s viability as a usable community-wide water source is limited somewhat due to its remote location its value as a water source for use in the immediate surrounding area is very high.

Location Score – **9**

Accessibility: Accessibility to the pond is restricted due to its distance from the nearest paved road. In addition, currently there is no designated area of the pond set aside for CFD apparatus access. However, based upon a site survey it appears that there exist several locations on the northern and western sides of the pond that could be developed into good access points with minimal expense.

Accessibility Score – **5**

Water Volume: Harlock Pond is very large having a surface area of over 30 acers. As such it rates very high in the Water Volume category.

Water Volume Score – **10**

Proximity to those areas of Town currently lacking a viable water source: Harlock Pond is located in the northeastern corner of one of the areas of town that currently is not benefit of any natural or man-made water source, therefore its score in this category is very high.

Proximity Score – **10**

Cost: There will be some above average costs associated with the development of Harlock Pond as a water source, however these costs will probably be limited to the development of some apparatus access points on the north or western side of the pond. If the installation of dry sump is required to effectively facilitate drafting the cost will go up appreciably.

Cost Score- **6**

**Total Score Harlock Pond - - 40**

**Tiasquam River- Town Line South Road**

Location: The water for this source comes from the Tiasquam River crossing of South road located immediately on the border between West Tisbury and Chilmark. The geographic coordinates for this location are 41\*22’38.74N – 70\*40’38.12” W, and the site sits at an elevation of 11 feet. As this site is located on South Road its value as a water source is high. The location of the site has a further advantage in that it can be used to supply necessary firefighting water for both the southeaster reaches of Chilmark as well as the southwestern reaches of West Tisbury.

Location Score – **10**

Accessibility: This site is easily accessible in that it is located on a paved road which serves as a main artery in the south side of town. In addition, if necessary, the site can be accessed from either side of the bridge crossing the Tiasquam River thus greatly increasing the operational flexibility afforded to tanker shuttle operations.

Accessibility Score – **10**

Water Volume: The Tiasquam River at its crossing points on Middle Road and here at its crossing point on South Road offers almost unlimited supply of water in that it is estimated that for most of the times of the year its flow rate is far greater than 500 gallons per minute.

Water Volume Score – **10**

Proximity to those areas of Town currently lacking a viable water source: The southeastern section of Chilmark does not currently benefit from having any centrally located water source. However, the site of the Tiasquam River South Road crossing sits at the eastern boundary of this area and therefore can adequately serve as a water source for the eastern portion of the area. In addition, because the water source is located on a major paved road the effective geographic operational radius that this source can serve is probably ½ mile thus greatly increasing its locational value.

Proximity Score - **10**

Cost: There will be some costs associated with the final development of this site in that there will be the initial need to cut back some growth along the bank of the river, near the bridge, to insure ease of access. In addition, periodic brush clearing, or trimming will be required.

Cost Score - **8**

**Total Score Town line South Road - Tiasquam River - - 48**

**Hariph’s Creek**

Location: Hariph’s Creek is located on State Rd on the western side of town. The location of Hariph’s Creek currently makes it the western most water source in town. Because of its location and because Hariph’s Creek is crossed by State Road which is paved and two lanes wide, Hariph’s Creek is very critical in supplying water for fires both east and west of this location.

Location Score – **10**

Accessibility: Due to its location on State Road, Hariph’s Creek is very accessible in that it can be accessed from either side of the bridge crossing the creek. In addition to the bridge access, water in the area can be accessed via a boat launch that is found directly on the northwestern side of the creek crossing. The boat launch also offers a convenient turn around point for CFD apparatus if needed.

Accessibility Score – **10**

Water Volume: There is an unlimited supply of saltwater available at this location.

Water Volume Score – **10**

Proximity to those areas of Town currently lacking a viable water source: Currently there are no viable water sources located in the area of Chilmark west of Hariph’s Creek. Thus, this water source is a very valuable resource for this area. The value of this water source to areas proximal to Hariph’s Creek is enhanced due to its location on a paved road which should allow for quicker than average tanker shuttle times if needed.

Proximity Score – **10**

Cost: There should be very little, if any costs associated with the utilization of this water source as the site will not need any perioding brush cutting or future access stabilization to be viable.

Cost Score – **10**

**Total Score Hariph’s Creek - - 50**

**COMPOSITE WATER SOURCE RATING SCORES**

1. Hariph’s Creek - - - 50
2. Tiasquam River -Town Line South Road- - - 48
3. Chilmark Chocolate Pond - - - 48
4. 49 State Road – Keith Farm - - - 47
5. Turtle Cove Pond - - - 46
6. Tiasquam River – Middle Road - - - 44
7. Harlock Pond - - - 40
8. North Tabor Farm Road – Pond - - - 38
9. U.S. Coast Guard Dry Hydrant - - - 32
10. Middle Line Tank - - - 24
11. 462 North Road - - -14

**ASSESSMENT AND RECOMMENDATIONS**

**ASSESSMENT:**

The review of the analysis and evaluation of the data gathered in the initial part of this study has allowed members of the CFD to develop recommendations for the future disposition of water sources that are both operationally relevant and cost effective. How the Department arrived at its recommendations is discussed as follows:

After existing water sources were identified by field observations the locations of these sources were plotted using Google Earth. These locations are showing in Figure 1.

Based upon a review of these locations we were able to determine those areas of Town that, from a geographic perspective, currently do not benefit from any natural or man-made water sources. As one can see from looking at Figure 1, these areas include: 1. A good part of the northcentral part of town found north of North Road and trending west to east from approximately Brickyard Road to Cape Higgins Road. 2. The Southcentral area of town running on both the north and south sides of South Road from approximately Ocean View to approximately Sheep Hill Road. 3. It was also determined that water sources were also lacking in the southern reaches of town along Quansoo road as well as for all the Squibnocket area.

Once those areas of Town currently lacking water sources were determined, it was then possible to further refine the needs assessment by assigning an “Operational Radius”, to each of the identified locations. An “Operational Radius” is the maximum distance, from a water source, that the amount of water needed to adequately fight a fire, i.e. 300 gpm, can be transported, within the allotted time frame, by one tanker. The CFD is aware that in most instances where tanker shuttles are needed for firefighting that more than one tanker will likely be involved in operations. However, for this analysis it was decided to conduct an evaluation based upon a worst-case scenario, i.e. the availability of only one tanker, was most appropriate and relevant.

Figure 2 shows existing Town water sources with their assigned operational radii. It was determined for the most part, if a water source was located on an unimproved road or had poor access that the most likely operational radius would be ¼ mile. Conversely if the water source was located on an improved paved road that it was probable that the operational radius could be extended to ½ mile.

Coupling these operational radii with the scoring analysis allowed the CFD to gain a much better perspective of the usefulness and viability of existing water sources as well as an insight as to how to most efficiently address the needs of those areas of town currently not adequately served by existing water sources,

A review of Figure 2 along with the source scores presented in the previous section has allowed the CFD to come up with the following observations:

1. 4 of the 5 highest scoring water sources, i.e. Hariph’s Creek, Chilmark Chocolate Pond, Keith Farm and Town Line-Tiasquam River are found in the southern part of Town. While the southcentral part of town is still not the home to indigent water sources the presence of these “highly valued” water sources makes this lack of indigent water sources less critical. In addition, from a cost-benefit perspective, little cost will be associated with the maximization of the functional utility of any of these 4 water sources.
2. Further analysis of Figure 2 reveals that the northern part of town especially the northeast quadrant is currently not well served by water sources in that the only two existing sources that can potentially services this area are located at Turtle Cove Pond and Harlick’s Pond.
3. Some of the areas north and south of Middle Road are somewhat lacking in proximal water sources however for the most part these areas can be adequately served by accessing water from the Tiasquam River – Middle Road Crossing or from the Chilmark Chocolate Pond. In addition, water from Turtle Cove Pond can be used to serve this area via Tabor House Road.
4. Both Squibnocket and the southern portion of Quansoo are currently not well served by existing water sources. The Quansoo area is isolated because it is necessary to potentially travel several miles along a very narrow dirt road to bring water to this area. Squibnocket while relatively close to the Hariph’s Creek water source cannot currently be adequately served by water from Hariph’s Creek due to the fact that the narrowness of the causeway, leading to the area, coupled with the extremely sharp turn located at the immediate western end of the causeway, makes tanker operations dangerous and extremely inefficient.

**RECOMMENDATIONS:**

In keeping with the previously state objectives of the Chilmark Fire Department’s Strategic Plan, members of the CFD have come up with the following recommendations designed to maximize the functionality of existing and proposed water sources located in Town.

The following recommendations therefore have been made not only from an operational point of view but also after careful consideration of the cost- benefit of each recommendation. The following recommendations are made in their order of importance.

1. Improve the immediate access point(s) to Turtle Cove Pond. The rational for this is as follows: Looking at Figure 2 it is easy to see the importance of Turtle Cove Pond in that it is the water source closest to the northcentral portion of town, As previously stated that area of town does not currently contain a nearby and viable water source. As such, it is felt that with a minimum expenditure of funds allocated to improving the immediate access point to the pond, that the viability of this water source can be greatly enhanced. Based upon field reconnaissance, it is felt that by just upgrading the immediate access to the pond through some brush cutting and by potentially improving the substrate near the pond to support the weight of our Tanker that this pond has the potential to greatly enhance the water supply capabilities serving the northcentral part of town
2. Improve the immediate access point to Harlock Pond. Harlock Pond and Turtle Cove Pond serve as bookends to that northern portion of Town that could use enhanced water supply. While not scoring as high on the operational functionality scale as the top five water sources Harlock Pond still is a potentially valuable water source due to its proximity to the northern area of Town that is currently deficient in adequate water sources. It is felt that from both an operational and cost-benefit perspective that a minimal expenditure of funds associated with improving the immediate access to the pond will significantly increase its firefighting value. Like Turtle Cove Pond, field reconnaissance revealed that the immediate accessibility of Harlock pond can be greatly enhanced by the removal of some large rocks as well as the potential buttressing of the substrate to support the weight of the Tanker.
3. Undertake brush cutting at Tiasquam River – Town line South Road water source. The water source at this location is highly rated being one of the best in Chilmark. However, its value can be inexpensively enhanced by trimming some of the bushes found where South Road crosses over the stream bed.
4. Develop a new water source at Thumb Cove Road. Figure 3 adds to the information shown on Figure 2 by incorporating 3 new recommended waters sources. The first of these is located on the terminus of Thumb Cove road. By looking at Figure 3 it is easy to see that a water source at this location will significantly increase the CFD’s ability to address fires located in the southcentral part of Town. This new water source is located approximately 1/8 mile south of South Road and offers an unlimited supply of water. In addition to serving as a potentially valuable resource potentially benefitting those southcentral areas of town bordering South Road, the proximity of Thumb Cove Road to Meeting House Road greatly enhances the CFD’s ability to service those areas transected by Meeting House. In addition, from a cost-benefit perspective there is almost no cost associate with the development of this water source except for the potential reinforcing of the immediate access point to the water to support the weight of the Tanker.
5. Installation of water tank in the Squibnocket area. As previously stated, Squibnocket while being relatively close to Hariph’s creek cannot be adequately served by water from the creek due to limitations associated with using the Tanker on the causeway. Therefore, one of the only options available to enhance the fire protection of the area is to install a underground tank somewhere in the area. While from purely operational perspective tanks are generally inferior water sources, due to limited water volumes, in this case the installation of a tank is probably the only realistic option and thus is the most cost-beneficial solution. The CFD is currently investigating some potential naturally occurring water sources in the area, which might offer a more cost efficient option than a tank, but until the operational capabilities of these options are determined and verified, the installation of a underground tank is the preferred option.
6. Installation of a water tank in the southern portion of Quansoo. The other area of Town that could potentially benefit from the installation of a water tank is the southern reaches of Quansoo road. Currently, while the Tiasquam River-Town Line South Road water source is relatively nearby, access to the southern reaches of Quansoo road by fire apparatus is significant compromised not only due to the unimproved nature of the road but also due to the fact that dense vegetation has been allow to grow along the immediate shoulder of the road. These two facts make the operation of a tanker shuttle extremely inefficient and potentially damaging to fire apparatus. As such, the only existing solution would be to install a tank somewhere along Quansoo road perhaps in the area of the intersection known as 4 Corners. While a tank located at this location would potentially enhance the firefighting capabilities in the area, the cost-benefit of the installation would be greatly diminished without the removal of vegetation which currently greatly impacts the ability of fire apparatus to access the area.

**CONCLUSION**

 As part of its effort to continually upgrade its fire fighting ability, the CFD commenced a study designed to identify and evaluate existing and potentially new water sources in the Town of Chilmark.

The goal of this effort was to make recommendations pertaining to the enhancement of water sources in town that would improve the firefighting capabilities of the Department.

Additionally, in conducting this study, the CFD applied a cost-benefit analysis to all the developed recommendations with the goal that all recommendations yielded the greatest benefit for the least amount of cost.

The results of the study produced 6 individual recommendations which if implemented will significantly increase the firefighting capabilities of the CFD at a minimum of cost.