HAFFERMAN ENGINEERING, INC.

Timbrshor Subdivision

Water Source Delineation

Annual Meeting Report

June 25, 2018

Kurtis M. Hafferman, P.E.

Abstract

Hafferman Engineering Inc. (HEI) was requested to provide a means to meet the Montana Department of Environmental Quality requirement of the Timbrshor Homeowners Association (THOA) Subdivision, Certificate of Subdivision Approval (COSA), to provide a community public water supply system. This report will provide an update to the project to meet the COSA requirements.

The MDEQ offered the THOA two options to develop a 1977 COSA compliant water supply system, a surface water diversion that would require construction of a surface water treatment facility, a storage tank and a pipeline and distribution system or a series of shared or multi-user groundwater wells.

HEI determined that the THOA could be served by a series of groundwater wells that would supply domestic drinking water. The MDEQ agreed that the 1977 COSA could be re-written to allow for individual, shared or multi-user water systems that could be served by a series of groundwater wells. The Board determined the system should be4 designed to serve the forty-seven (47) individual units.

HEI developed criteria for the well locations that considered both State and County regulation and any necessary deviations, the ability to physically construct the well in the location selected (access for a large drill rig), the location of any neighboring septic tanks, drainfields and septic effluent lines and the convenience of the location for each well to the units to be served.

The most difficult area to provide water service is the east side of the subdivisions. The MDEQ, HEI and the Board have reviewed several well location plans and are currently considering six (6) well locations that are comprised of five (5) multi-user wells serving between five (5) and nine (9) units and one (1) PWS well serving fourteen (14) units.

Timbrshor Potential Well number one (TPW-1) is intended to serve the west side of the subdivision, TPW-2 was placed in an area to serve two developed units and three future units, TPW-3 was placed to address concerns of five developed, COSA non-compliant units and two future units, TPW-4 was placed where there are no deviations required and all the connections are for future units. TPW-5 was selected as the location for a potential Public Water Supply (PWS) well that will serve fourteen (14) connections and TPW-6 was is intended to serve as a shared well that will serve two (2) future units, two (2) existing non-COSA compliant units and provide connections for five (5) COSA compliant units in the north east corner.

HEI has developed the potential assignments for each well and preliminary cost estimate with costs presented per well and the approximate costs for each unit. The bottom of the cost spreadsheet provides the estimated total project cost and average cost per forty-seven (47) units. Operation and maintenance are addressed and include annual expected costs.

It is the opinion of HEI that the fifteen potential well locations represent all the potential well locations. The revised six (6) well location drawing reflects the well locations that will, more likely than not, meet the MDEQ rules with some deviations. The revision was recently reviewed with the MDEQ and they agreed the current plan would be COSA compliant at the completion of the permitting and construction process. THOA members are requested to assist the Board and HEI in the final well site and unit connection selections.

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Appendix

Introduction

Hafferman Engineering Inc. (HEI) was requested by the Timbrshor HOA (THOA) Board of Directors (Board) to address a January 9th, 2018 memorandum from the Montana Department of Environmental Quality (MDEQ). The memorandum was in response to a request by the THOA Board to determine the means for the Timbrshor Subdivision to meet the Lake County requirement to comply with the 1977 Certificate of Subdivision Approval (COSA). The MDEQ responded that the means to comply was to meet the COSA requirements to provide a community public water supply system. A copy of the MDEQ memorandum in provided in Appendix 1. This report will provide an update to the project to meet the COSA requirements.

Procedure

In the memorandum the MDEQ defined the units within the THOA subdivision by developed units that were older than the 1977 COSA and are considered as COSA compliant, those developed after the 1977 COSA and are considered by MDEQ as Non-COSA compliant and the remaining units to be developed that are considered as Non-COSA compliant as they do not have an approved water supply system. The memorandum from the MDEQ offered the THOA two options to develop a 1977 COSA compliant water supply system.

The MDEQ stated that the 1977 COSA could remain in place if the original surface water diversion and treatment system was constructed. However, since the approved plans for the Community Public Water Supply (PWS) system had expired, new water system plans (prepared by a Professional Engineer) would need to be submitted to MDEQ for review and approval as a Community PWS system. Use of surface water would require construction of a surface water treatment facility, a storage tank and a pipeline and distribution system. The MDEQ cautioned that their records show that there is only one successful surface water Public Water Supply in Montana. The MDEQ stated that the system was constructed at a cost of more than $500,000 and requires more than $40,000 per year to maintain.

The MDEQ opinion was that a THOA could be best served by a series of Community PWS system groundwater wells. It was determined that the most straightforward system to design, permit and construct was a groundwater well system to serve domestic drinking water only. Irrigation water would be supplied by the existing surface water diversions.

To assure that a legal water rights certificates could be submitted to Department of Natural Resources and Conservation (DNRC) Water Resources Division, HEI would design groundwater well systems that pump less than 35 gpm and use less than 10 acre-feet volume per year to assure that a Notice of Completion of groundwater development could be filed with the DNRC.

Following several discussions HEI determined that the THOA could be served by a series of groundwater wells. To maintain flows less than 35 gpm and in consideration of the capacity of the local aquifer, the wells would need to be used to supply domestic drinking water only. The lawn and garden irrigation can be continued to be used from the existing surface water diversions if they have no connection to the drinking water supply. The two sources cannot mix so there can't be any valving allowing lake water into the drinking water system. Other than that, irrigation from the lake is a water right issue not a health issue. The best plan will be if the withdrawals are limited to the existing points of diversion

(pumps in the lake) and those who have diversions can develop a plan to share pipe line and distribution systems.

The MDEQ agreed that the 1977 COSA could be re-written to allow for individual, shared or multi-user water systems that could serve domestic drinking water by groundwater wells. The MDEQ rules will allow for four types of groundwater well systems, individual wells, two connection shared wells, multi-user wells with less than fifteen (15) connections and fully regulated Public Water Supply (PWS) wells for more than fifteen (15) connections

Following discussions with the Board, the Board requested HEI develop a scope of work to address the development of a series of individual, shared or multi-user water groundwater well systems to serve the forty-seven (47) individual units in the THOA subdivision.

Results to Date

To develop a plan for the location of groundwater wells in subdivisions with waste water treatment systems, it is necessary to recognize that there are numerous administrative rules that govern what waste water treatment system components can be within a regulated 100 ft. radius of what is referred to as a groundwater well protection zone. When the well protection zones separations can't be met, the MDEQ recognizes the difficultly of the statutes and rules and has developed a committee to grant deviations. The deviations that would be necessary for the THOA well system would be deviations from drainfields, drainfield mixing zones, septic tanks and effluent lines within the well protection zone and deviations from surface water.

HEI developed criteria for the well locations that considered both State and County regulation and the necessary deviations, the ability to physically construct the well in the location selected (access for a large drill rig), the location of any neighboring septic tanks, drainfields and septic effluent lines and the convenience of the location for each well to the units to be served.

During the projects completed for the THOA in 2015, HEI developed a plot that showed the location of nine (9) potential wells to serve the THOA. Upon starting work to determine the feasibility of developing groundwater wells to meet current regulations for the THOA development, HEI investigated a maximum of fifteen (15) groundwater wells that were a combination of shared and multi-user wells. A copy of the original nine (9) well locations developed in 2015 and fifteen (15) maximum well locations is provided in Appendix 4 to this report.

On June 15, 2018 HEI met with the Helena and Kalispell MDEQ engineers to review the original and current groundwater well plan. The meeting revealed that there have been recent changes to the MDEQ administrative rules and changes to the MDEQ deviation committee. The MDEQ stated that deviations from drainfield separation less than 100 ft. are no longer granted. Current rule changes require that no well protection zones can touch a drainfield area and no deviations are granted. In addition, HEI had planned to place the pump controls and pressure tanks in underground vaults to avoid having to construct above ground structures within the common area of the THOA. MDEQ stated that deviations are no longer granted for underground vaults and all pump control structures must be above ground.

The MDEQ did offer one solution which is single family and two-unit "shared" wells are not subject to the same rigorous MDEQ review and they suggested we may have to rely on more shared wells. This alternative is viable for connections to one or a maximum of two units. Shared wells may be an option that unit owners may consider together and offer to the Board. It is important to note a well location is still governed but setbacks from septic tanks and drainfields and the ability to get a drill rig to each location. It was not possible for the Board or HEI to decide which two units would be willing to share a well and the possible separation distance issues but there may be several that could be considered.

Following the MDEQ meeting HEI refined the well locations. Changes made to the current drawing include adding the mixing zones for each drainfield to the drawings, moving all potential wells out of mixing zones and away from all drainfields and reducing the number of wells to six (6); five multi-user wells and one (1) PWS well. One of the wells intended to serve the west side of the subdivision would need to be constructed off-site on property adjacent to the subdivision. This issue of allowing the 100 ft. well protection zone to cross onto neighboring property occurs for three (3) of the wells. HEI recognizes that there will be difficulties in obtaining permissions with neighboring property owners if necessary, but at this time they must at least be considered. The revised locations are provided in Appendix 5 to this report. Also included in Appendix 5 are the property owners adjacent to the THOA subdivision that we will need to approach about well construction or well protection zone easements.

The most difficult area to provide water service is the east side of the subdivisions. We have a combination of Drainfield A, the mixing zones from Drainfield A and the proximity of the bedrock, the paved road and the existing underground utilities that serve the units that are on the northeast corner of the subdivision. During review of the well locations with the MDEQ, we had provided a location for a potential PWS well shown on the Appendix 5 drawing as Alternate PWS. At the end of our June 15 meeting it was the opinion of the MDQ that it is more likely than not that the only viable means to serve this many units was a larger PWS well. The well will need to serve as many as fourteen (14) units that are in the east half of the subdivision.

Timbrshor Potential Well number one (TPW-1) is intended to serve the one COSA non-compliant unit on the west side of the subdivision and to provide the water source for four future units that are to be developed. TPW-2 was placed in an area to serve two developed units and three future units. TPW-3 was placed to address concerns of five developed, COSA non-compliant units and two future units. TPW-4 was placed where there are no deviations required and as suggested by the MDQ would be relatively easy to permit and develop. No units on the TPW-4 are developed.

TPW-5 was selected as the location for a potential Public Water Supply (PWS) well that will serve fourteen connections. This well will require special sanitary seals at the surface, more robust pressure distribution system and higher pipeline construction standards that will increase the cost of the total development to meet PWS standards.

TPW-6 was is intended to serve as a shared well that will serve two units that are in an extremely remote location. Due to the MDEQ constraints, at this time, HEI is assuming this well will need to serve as a shared well that will serve the two (2) future units, two (2) existing non-COSA compliant units and provide connections for five (5) COSA compliant units in the north east corner. The difficulty is in bringing water lines down the face of the rock in the northeast corner. In general, HEI is considering difficult waterline connections, such as this one, will need to be made using directional boring rather

than open trench excavation. There are numerous directional boring companies that have developed in the Flathead Valley in the last five years and direction boring in rock is a viable alternative for difficult excavations that will be investigated.

HEI has developed the potential assignments for each well shown on the Appendix 5 revised well locations. The potential well assignments are provided in Appendix 6 to this report. The assignments have been sorted three (3) different ways for ease of looking up individual units; by the well, by the unit number and by the unit name.

HEI has also developed preliminary cost estimates for the development of the well, the development for the pipeline and distribution system and the pressure and control systems. The cost estimate is based on the best information on the potential well depth at the given location and the best estimate of the length of mainline and construction difficulties. Current cost developments are attempting to consider difficult development costs. Not presented in the costs but estimated in the total project costs are any MDEQ compliance requirements for the existing groundwater source at unit 317. Cost Estimates are provided in Appendix 7 to this report.

The costs are presented per well and provide the approximate costs for each unit. The bottom of the cost spreadsheet provides the estimated total project cost and average cost per forty-seven (47) units. HEI has also provided an estimate of the anticipated annual operation and maintenance costs for each well. Not included are long term pump replacement costs as these are difficult to estimate until exact systems are designed. In general, it can be anticipated to consider pump replacement on a minimum of 10-year and maximum of 25-year cycles. Replacement times and future-cost analysis will be included in final design and will be included in final operation and maintenance manuals.

HEI has revised the current well location drawing to reflect the maximum number of locations that will more likely than not meet the MDEQ rules. The revision was recently reviewed with the MDEQ and they provided the following comments.

1. Well Sites TPW1, TPW 4, TPW5 appear to have clear well protection control zones. Therefore, these could be approved by standard review for public, multi-user or individual use. Easements for access to the offsite well, TPW1, will be required.
2. All three wells with offsite well protection control zones must record well protection zones easements and or deed restrictions for the 100-ft radius, which will require signature by the neighboring parcels that have 100-ft radius overlap. I am very supportive of pursuing these well locations.
3. Well Sites TPW2, TPW3, TPW5 and the existing McCarthy well will require deviation requests for wastewater sealed components (sewer pipes and septic tanks) within 100 feet of the well, if these are to be used for multi-user or public wells. If they are to be used for individual or shared use, then sealed wastewater components within 50 feet of the well require a deviation.
4. Good grouting protocol will be important in convincing the deviation committee on the proximity to wastewater components.
    a. These are not easy deviations to get, but DEQ is aware of the challenge at this site.
    b. The one potential condition that is sometimes applied with similar PWS well requests is the requirement to chlorinate the well(s). It will depend how the committee feels about the overall proposal.

5. ARM 17.36.333 requires multiple, multi-user wells to be connected. However, a waiver can be pursued if this is physically or economically impractical. I support this waiver, as this is a very challenging site with difficult bedrock trenching and varying elevations, but we will need to process the request.

It is important to note that there may be issues with adjoining property owners that cannot be resolved. In particular, TPW-6 presents numerous challenges. If we can't get the required permission or access, it will require that the PWS well, TPW-5, be expanded to a full PWS well. Expansion to full PWS standard will require two wells in the same location that are manifolded together, a larger structure constructed to house pressure tanks and pressure distribution and a complicated and difficult construction of a pressure distributing line.

Other wells that cross property lines include TPW-1 and TPW-4. If permission or access are not possible on these wells it will likely require expansion of TPW-2 into a ten (10) unit multi-user well and TPW-2 to a thirteen unit multi-user well.

The desired maximum number of units on one well is nine (9) for both the practical side of water supply and well design and water rights permitting. Larger demand such as TWP-5 may require that water storage tanks are considered.

Conclusions and Recommendations

It is the conclusion of HEI that the data developed to date provides all the potential well locations that can convincingly be located within the Timbrshor subdivision. The initial plan included nine (9) wells, that was increased to fifteen (15) and eventually reduced to six (6) feasible well locations.

The revised six (6) well location drawing reflects the well locations that will, more likely than not, meet the MDEQ rules with some deviations. The revision was recently reviewed with the MDEQ and they agreed the current plan would more likely than not be COSA compliant at the completion of the permitting and construction process.

It is recommended that the THOA members use this occasion to assist the Board and HEI in the final well site and unit connection selections.

There are many steps that remain to be taken. The most important will be the locations of the wells. From there, well construction and state approval of the well locations will need to be completed all before well development and potential capacity or storage can be addressed.

It's always difficult in these initial stages of planning to try and make sure that all the steps are taken. Nonetheless HEI has long held the opinion that on these kinds of jobs you can only visualize the product. The product is a series of groundwater wells developed with sufficient capacity and the waterlines and distribution systems constructed to individual homes within the Timbrshor subdivision. All connected to a clean, safe water supply system. In the end of all the Subdivision compliant missed steps have been taken care of and the future is normal.

APPENDIX 1

January 9, 2018 MDEQ Memorandum

DEQ
Montana Department
of Environmental Quality

Memo

TO: Jim Cole, Timbrshor Association President (electronic only)

CC: Kurt Hafferman, PE, Hafferman Engineering (electronic only)

Diana Luke, Lake County Sanitarian (electronic only)

FROM: Emily Gillespie, PE

DATE: January 9, 2018

SUBJECT: **Timbrshor Association (Borchers at Finley Point)**
Water System Compliance

As we previously discussed, I extend my gratitude to the Timbrshor Association for your completion of the wastewater improvements on site.

Additionally, Tim Cole recently inquired about compliance for the water systems onsite. The intent of this memo is to outline the units which are currently in compliance with the original approval and those that are not. For the ones out of compliance, I have listed a few options for coming into compliance.

Units currently in compliance (17): Units 203, 204, 205, 210, 211, 306, 307, 308, 309, 311, 312, 314, 315, 316, 401, 402 and the lodge were outlined as having individual water systems that predated the 24-77-K902 Borchers at Finley Point Water Certificate of Subdivision Approval (dated July 22, 1977). Hence, these lots may remain served by individual water systems.

Units currently out of compliance (38 original, 30 current units): Units 201, 202*, 206, 209, 216, 217**, 219, 301, 302, 305, 317***, 318, 319, 320, 403/404, 406, 408, 409, 410, 411, 412, 413, 414, 416, 417, 418/419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430 were approved to be connected to a Community water supply system. All of these units, whether built or non-built, must seek an approvable solution to their water supply. Individual surface water intakes are not allowed by current DEQ Subdivision laws.

*Shaded units are no longer approved for construction per the "Restriction on Development Lots" agreed to by the Lake County Commissioners on April 16, 2015.

**Unit 217 currently has sanitary restrictions placed on it.

***Unit 317 was inadvertently left off 1977 Water COSA, but shows up in the 1977 Wastewater COSA

Options for compliance:

(1) The 1977 COSA pertaining to water could remain in place. However, since the approved plans for the Community Public Water Supply (PWS) system have expired, new water system plans (prepared by a Professional Engineer) would need to be submitted to DEQ for review and approval as a Community PWS system. This Community PWS system could be served by either groundwater wells or surface water, with appropriate treatment. By not changing the 1977 COSA, the PWS system plans do not require water rights verification. Therefore, compliance with water rights could be delayed until the Salish Kootenai Compact has been resolved.

    a. It is also possible that a Community PWS system designed to supply domestic water only could be served by two (or more) groundwater wells that pump less than 35 gpm and use less than 10 acre-feet volume per year. In that case, simple Notice of Completion water rights certificates could be submitted to DRNC Water Resources Division.

(2) The 1977 COSA could be re-written to allow for individual, shared or multi-user water systems that could be served by groundwater wells that pump less than 35 gpm and 10 acre-feet volume per year. In this scenario, simple Notice of Completion water rights certificates could be submitted to DRNC Water Resources Division for each well.

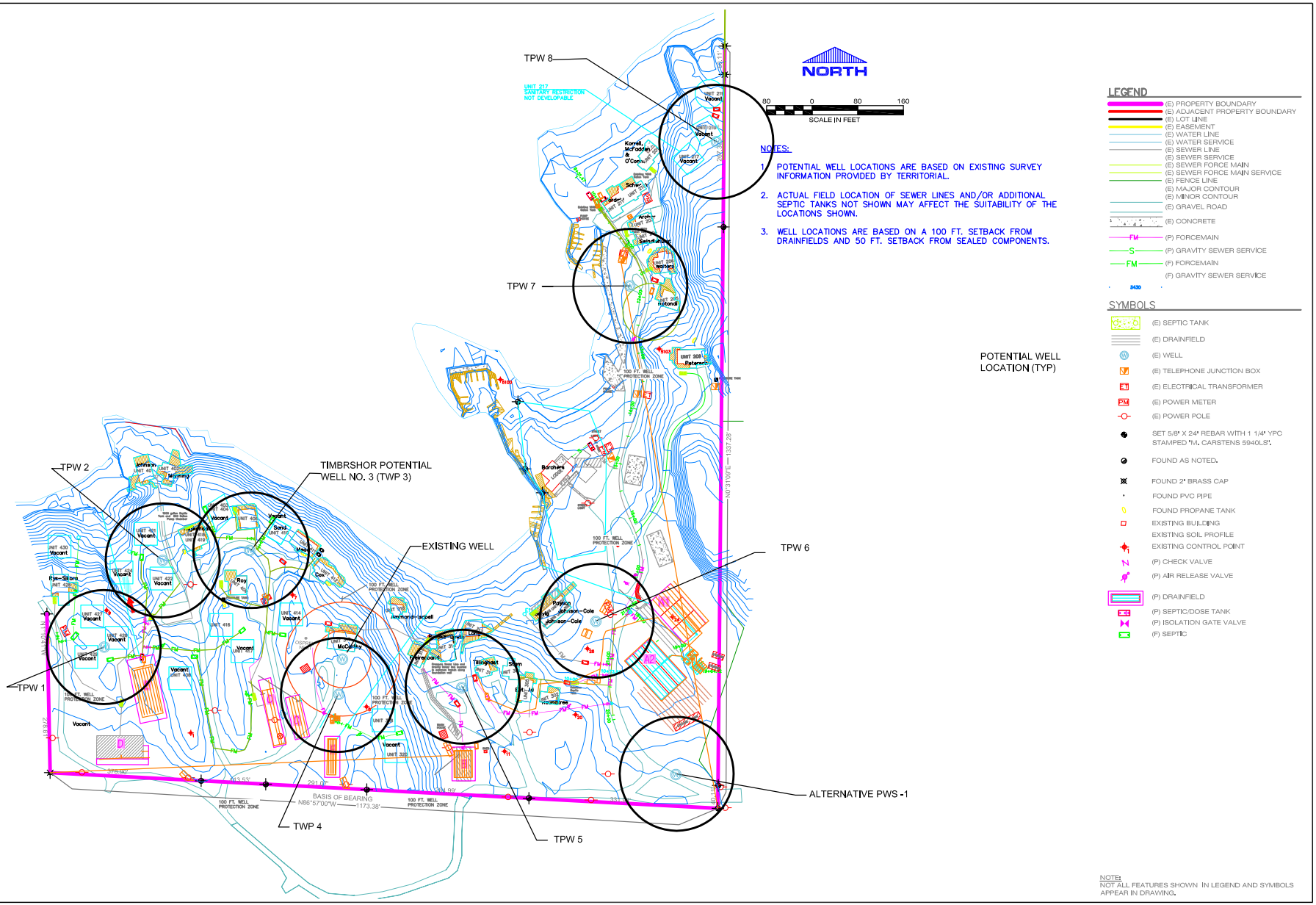
(3) The 1977 COSA could be re-written to allow for individual or shared cisterns to be filled by a water hauler (or potentially hauled by individual unit owners). No water rights are involved with this scenario.

If you have any questions, please contact me at 406-755-8979 or egillespie@mt.gov.

APPENDIX 2

Original Nine Well Locations Map

Fifteen Maximum Well Locations Map



NOTES:

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2. ACTUAL FIELD LOCATION OF SEWER LINES AND/OR ADDITIONAL SEPTIC TANKS NOT SHOWN MAY AFFECT THE SUITABILITY OF THE LOCATIONS SHOWN.
3. WELL LOCATIONS ARE BASED ON A 100 FT. SETBACK FROM DRAINFIELDS AND 50 FT. SETBACK FROM SEALED COMPONENTS.

LEGEND

- (E) PROPERTY BOUNDARY
- (E) ADJACENT PROPERTY BOUNDARY
- (E) LOT LINE
- (E) EASEMENT
- (E) WATER LINE
- (E) WATER SERVICE
- (E) SEWER LINE
- (E) SEWER SERVICE
- (E) SEWER FORCE MAIN
- (E) SEWER FORCE MAIN SERVICE
- (E) FENCE LINE
- (E) MAJOR CONTOUR
- (E) MINOR CONTOUR
- (E) GRAVEL ROAD
- (E) CONCRETE
- FM (P) FORCEMAIN
- S (P) GRAVITY SEWER SERVICE
- FM (F) FORCEMAIN
- (F) GRAVITY SEWER SERVICE

SYMBOLS

- (E) SEPTIC TANK
- (E) DRAINFIELD
- W (E) WELL
- (E) TELEPHONE JUNCTION BOX
- E.T. (E) ELECTRICAL TRANSFORMER
- P.M. (E) POWER METER
- (E) POWER POLE
- SET 5/8" X 24" REBAR WITH 1 1/4" YPC STAMPED "M. CARSTENS 5940LS".
- FOUND AS NOTED.
- FOUND 2" BRASS CAP
- FOUND PVC PIPE
- FOUND PROPANE TANK
- EXISTING BUILDING
- EXISTING SOIL PROFILE
- EXISTING CONTROL POINT
- (P) CHECK VALVE
- (P) AIR RELEASE VALVE
- (P) DRAINFIELD
- (P) SEPTIC/DOSE TANK
- (P) ISOLATION GATE VALVE
- (F) SEPTIC

NOTE:
NOT ALL FEATURES SHOWN IN LEGEND AND SYMBOLS APPEAR IN DRAWING.

BY	DESCRIPTION	DATE
	REVISIONS	

DRAWN BY: NJF | APPROVED BY: KMH

TIMBRSHOR WASTEWATER TREATMENT SYSTEM IMPROVEMENTS

FOR

TIMBRSHOR HOMEOWNERS ASSOCIATION

SECTION 1, T.23N, R.19W., P.M., M. LAKE COUNTY, MONTANA

HAFFERMAN ENGINEERING, INC.
35 SOUTH MAIN, SUITE B
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ONLINE: http://www.hilmayer.com

DRAWING TITLE:
POTENTIAL WELL LOCATIONS

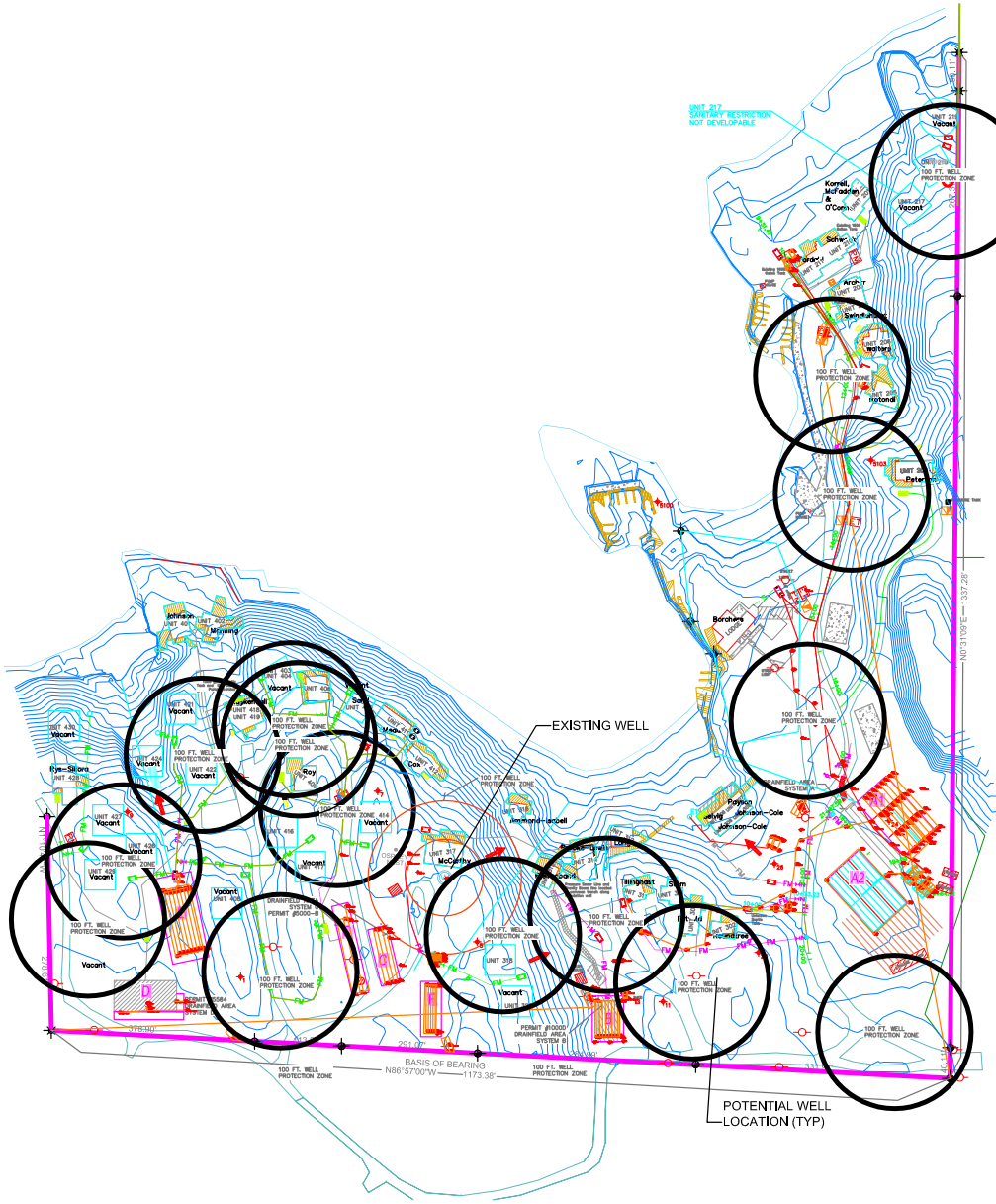
SCALE: AS SHOWN

DATE: APRIL 2014

PROJECT NO: T.58.1

DRAWING NUMBER:
1 OF 1

T-58-01-MSTR AB KMH 6_12_2018 PWL.DWG



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DRAWN BY: NJF | APPROVED BY: KMH

TIMBRSHOR WASTEWATER TREATMENT SYSTEM IMPROVEMENTS

FOR

TIMBRSHOR HOMEOWNERS ASSOCIATION

SECTION 1, T.23N., R.19W., P.M., M. LAKE COUNTY, MONTANA

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DRAWING TITLE:
POTENTIAL WELL LOCATIONS

SCALE: AS SHOWN

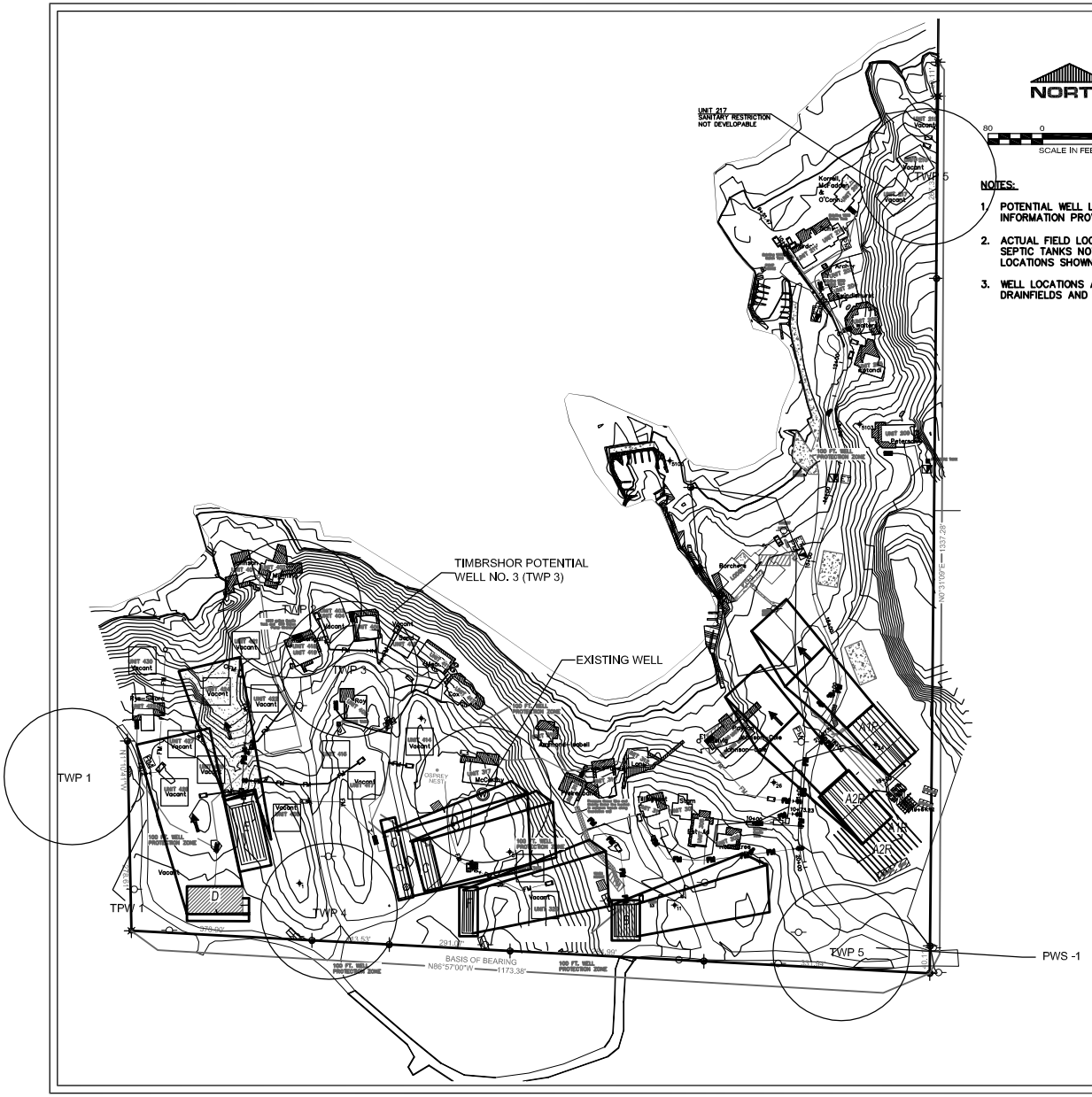
DATE: APRIL 2014 | PROJECT NO: T.58.1

DRAWING NUMBER:
1 OF 1

T-58-01-MSTR AB KMH 6_12_2015 PW.DWG

APPENDIX 3

June 23, 2018 Revised Well Locations



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FOR

TIMBRSHOR HOMEOWNERS ASSOCIATION

SECTION 7, T.23N., R.19W., P.M., M, LAKE COUNTY, MONTANA

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EMAIL: info@hilltmyer.com
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DRAWING TITLE:
POTENTIAL WELL LOCATIONS

SCALE: AS SHOWN

DATE: APRIL 2014 | PROJECT NO: T.58.1

DRAWING NUMBER:
1 OF 1

T-58-01-MSTR AS KMH 4_22_2014 PWL WITH MIXING ZONES DEL.DWG

APPENDIX 4

Well Assignments

HAFFERMAN ENGINEERING, INC.

Project: Timbrshor
Project #: T.58.1
File: S:/…/Water Rights/DEQ 2018
Assignment Hafferman

Revision Date 6/23/2018

DEQ Key
COSA Compliant=COM
Not COSA Compliant=NCOM

Timbrshor Potential Well Assignments

Well Name/ Assignment June 23, 2018	Unit#	Owner	Status D=developed ND = not developed	DEQ Water Supply Status
TPW-1	426	Borchers-Bill	NOT DEVELOPED	NCOM
TPW-1	427	Maxwell	NOT DEVELOPED	NCOM
TPW-1	428	Rys-Sikora	DEVELOPED	NCOM
TPW-1	429	Manning	NOT DEVELOPED	NCOM
TPW-1	430	Rys-Sikora	NOT DEVELOPED	NCOM
TPW-2	401	Johnson **	DEVELOPED	COM
TPW-2	402	Manning**	DEVELOPED	COM
TPW-2	421	Johnson	NOT DEVELOPED	NCOM
TPW-2	422	Johnson	NOT DEVELOPED	NCOM
TPW-2	424	Johnson	NOT DEVELOPED	NCOM
TWP-3	406	Armstrong	DEVELOPED	NCOM
TWP-3	409	Roy	DEVELOPED	NCOM
TWP-3	410	Sand	NOT DEVELOPED	NCOM
TWP-3	411	Mead	DEVELOPED	NCOM
TWP-3	412	Cox	DEVELOPED	NCOM
TWP-3	403/404	Cobb	NOT DEVELOPED	NCOM
TWP-3	418/419	Cobb	DEVELOPED	NCOM
TPW-4	318	McCarthy	NOT DEVELOPED	NCOM
TPW-4	320	McCarthy	NOT DEVELOPED	NCOM
TPW-4	408	Carraway	NOT DEVELOPED	NCOM
TPW-4	414	McCarthy	NOT DEVELOPED	NCOM
TPW-4	416	Manning	NOT DEVELOPED	NCOM
TPW-4	417	Manning	NOT DEVELOPED	NCOM
TPW-5	209	Peterson	DEVELOPED	NCOM
TPW-5	301	Karpstein	DEVELOPED	NCOM
TPW-5	302	Rountree	DEVELOPED	NCOM
TPW-5	305	Estvold	DEVELOPED	NCOM
TPW-5	306	Selvig (4-plex)	DEVELOPED	COM
TPW-5	307	Payson (4-plex)	DEVELOPED	COM
TPW-5	308	Cole (4-plex)	DEVELOPED	COM
TPW-5	309	Cole (4-plex)	DEVELOPED	COM
TPW-5	311	Tillinghast	DEVELOPED	COM
TPW-5	312	Novinski	DEVELOPED	COM
TPW-5	314	Brooke-Lewis	DEVELOPED	COM
TPW-5	315	Freireaband	DEVELOPED	COM
TPW-5	316	Ammonns-Isbell	DEVELOPED	COM
TPW-5	Lodge	Rose	DEVELOPED	COM
TPW-6	201	Rose	DEVELOPED	NCOM
TPW-6	203	Acher	DEVELOPED	COM
TPW-6	204	Swindlehurst	DEVELOPED	COM
TPW-6	205	Rotondi, D	DEVELOPED	COM
TPW-6	206	Walters	DEVELOPED	NCOM
TPW-6	210	Schwank	DEVELOPED	COM
TPW-6	211	Fordahl	DEVELOPED	COM
TPW-6	216	Rotondi, M	NOT DEVELOPED	NCOM
TPW-6	219	Borchers-Michione	NOT DEVELOPED	NCOM
McCarthy	317	McCarthy	DEVELOPED	NCOM

HAFFERMAN ENGINEERING, INC.

Project: Timbrshor
Project #: T.58.1
File: S:/…/Water Rights/DEQ 2018
Assignment Hafferman

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DEQ Key
COSA Compliant=COM
Not COSA Compliant=NCOM

Timbrshor Potential Well Assignments

Well Name/ Assignment June 23, 2018	Unit#	Owner	Status D=developed ND = not developed	DEQ Water Supply Status
TPW-6	201	Rose	DEVELOPED	NCOM
TPW-6	203	Acher	DEVELOPED	COM
TPW-6	204	Swindlehurst	DEVELOPED	COM
TPW-6	205	Rotondi, D	DEVELOPED	COM
TPW-6	206	Walters	DEVELOPED	NCOM
TPW-5	209	Peterson	DEVELOPED	NCOM
TPW-6	210	Schwank	DEVELOPED	COM
TPW-6	211	Fordahl	DEVELOPED	COM
TPW-6	216	Rotondi, M	NOT DEVELOPED	NCOM
TPW-6	219	Borchers-Michione	NOT DEVELOPED	NCOM
TPW-5	301	Karpstein	DEVELOPED	NCOM
TPW-5	302	Rountree	DEVELOPED	NCOM
TPW-5	305	Estvold	DEVELOPED	NCOM
TPW-5	306	Selvig (4-plex)	DEVELOPED	COM
TPW-5	307	Payson (4-plex)	DEVELOPED	COM
TPW-5	308	Cole (4-plex)	DEVELOPED	COM
TPW-5	309	Cole (4-plex)	DEVELOPED	COM
TPW-5	311	Tillinghast	DEVELOPED	COM
TPW-5	312	Novinski	DEVELOPED	COM
TPW-5	314	Brooke-Lewis	DEVELOPED	COM
TPW-5	315	Freireaband	DEVELOPED	COM
TPW-5	316	Ammonns-Isbell	DEVELOPED	COM
McCarthy	317	McCarthy	DEVELOPED	NCOM
TPW-4	318	McCarthy	NOT DEVELOPED	NCOM
TPW-4	320	McCarthy	NOT DEVELOPED	NCOM
TPW-2	401	Johnson **	DEVELOPED	COM
TPW-2	402	Manning**	DEVELOPED	COM
TWP-3	406	Armstrong	DEVELOPED	NCOM
TPW-4	408	Carraway	NOT DEVELOPED	NCOM
TWP-3	409	Roy	DEVELOPED	NCOM
TWP-3	410	Sand	NOT DEVELOPED	NCOM
TWP-3	411	Mead	DEVELOPED	NCOM
TWP-3	412	Cox	DEVELOPED	NCOM
TPW-4	414	McCarthy	NOT DEVELOPED	NCOM
TPW-4	416	Manning	NOT DEVELOPED	NCOM
TPW-4	417	Manning	NOT DEVELOPED	NCOM
TPW-2	421	Johnson	NOT DEVELOPED	NCOM
TPW-2	422	Johnson	NOT DEVELOPED	NCOM
TPW-2	424	Johnson	NOT DEVELOPED	NCOM
TPW-1	426	Borchers-Bill	NOT DEVELOPED	NCOM
TPW-1	427	Maxwell	NOT DEVELOPED	NCOM
TPW-1	428	Rys-Sikora	DEVELOPED	NCOM
TPW-1	429	Manning	NOT DEVELOPED	NCOM
TPW-1	430	Rys-Sikora	NOT DEVELOPED	NCOM
TWP-3	403/404	Cobb	NOT DEVELOPED	NCOM
TWP-3	418/419	Cobb	DEVELOPED	NCOM
TPW-5	Lodge	Rose	DEVELOPED	COM

HAFFERMAN ENGINEERING, INC.

Project: Timbrshor
Project #: T.58.1
File: S:/…/Water Rights/DEQ 2018
Assignment Hafferman

Revision Date 6/23/2018

DEQ Key
COSA Compliant=COM
Not COSA Compliant=NCOM

Timbrshor Potential Well Assignments

Well Name/ Assignment June 23, 2018	Unit#	Owner	Status D=developed ND = not developed	DEQ Water Supply Status
TPW-6	203	Acher	DEVELOPED	COM
TPW-5	316	Ammonns-Isbell	DEVELOPED	COM
TWP-3	406	Armstrong	DEVELOPED	NCOM
TPW-1	426	Borchers-Bill	NOT DEVELOPED	NCOM
TPW-6	219	Borchers-Michione	NOT DEVELOPED	NCOM
TPW-5	314	Brooke-Lewis	DEVELOPED	COM
TPW-4	408	Carraway	NOT DEVELOPED	NCOM
TWP-3	403/404	Cobb	NOT DEVELOPED	NCOM
TWP-3	418/419	Cobb	DEVELOPED	NCOM
TPW-5	308	Cole (4-plex)	DEVELOPED	COM
TPW-5	309	Cole (4-plex)	DEVELOPED	COM
TWP-3	412	Cox	DEVELOPED	NCOM
TPW-5	305	Estvold	DEVELOPED	NCOM
TPW-6	211	Fordahl	DEVELOPED	COM
TPW-5	315	Freireaband	DEVELOPED	COM
TPW-2	421	Johnson	NOT DEVELOPED	NCOM
TPW-2	422	Johnson	NOT DEVELOPED	NCOM
TPW-2	424	Johnson	NOT DEVELOPED	NCOM
TPW-2	401	Johnson **	DEVELOPED	COM
TPW-5	301	Karpstein	DEVELOPED	NCOM
TPW-4	416	Manning	NOT DEVELOPED	NCOM
TPW-4	417	Manning	NOT DEVELOPED	NCOM
TPW-1	429	Manning	NOT DEVELOPED	NCOM
TPW-2	402	Manning**	DEVELOPED	COM
TPW-1	427	Maxwell	NOT DEVELOPED	NCOM
McCarthy	317	McCarthy	DEVELOPED	NCOM
TPW-4	318	McCarthy	NOT DEVELOPED	NCOM
TPW-4	320	McCarthy	NOT DEVELOPED	NCOM
TPW-4	414	McCarthy	NOT DEVELOPED	NCOM
TWP-3	411	Mead	DEVELOPED	NCOM
TPW-5	312	Novinski	DEVELOPED	COM
TPW-5	307	Payson (4-plex)	DEVELOPED	COM
TPW-5	209	Peterson	DEVELOPED	NCOM
TPW-6	201	Rose	DEVELOPED	NCOM
TPW-5	Lodge	Rose	DEVELOPED	COM
TPW-6	205	Rotondi, D	DEVELOPED	COM
TPW-6	216	Rotondi, M	NOT DEVELOPED	NCOM
TPW-5	302	Rountree	DEVELOPED	NCOM
TWP-3	409	Roy	DEVELOPED	NCOM
TPW-1	428	Rys-Sikora	DEVELOPED	NCOM
TPW-1	430	Rys-Sikora	NOT DEVELOPED	NCOM
TWP-3	410	Sand	NOT DEVELOPED	NCOM
TPW-6	210	Schwank	DEVELOPED	COM
TPW-5	306	Selvig (4-plex)	DEVELOPED	COM
TPW-6	204	Swindlehurst	DEVELOPED	COM
TPW-5	311	Tillinghast	DEVELOPED	COM
TPW-6	206	Walters	DEVELOPED	NCOM

APPENDIX 5

June 23, 2018 Cost Estimates

HAFFERMAN ENGINEERING, INC.

Date: 6/23/2017

Timbrshor HOA File: T.58.02 Revised:

Well Development Costs

Well No	Well Type	No. of Units	Cost Per Well	Projected Distribution System Cost	Total Cost Per Well	Cost Per User
TPW1	Multi-user	5	$ 25,200.00	$ 24,340.00	$ 49,540.00	$ 9,908.00
TWP2	Multi-user	5	$ 22,680.00	$ 23,800.00	$ 46,480.00	$ 9,296.00
TWP3	Multi-user	7	$ 23,940.00	$ 31,320.00	$ 55,260.00	$ 7,894.29
TWP4	Multi-user	6	$ 25,200.00	$ 34,500.00	$ 59,700.00	$ 9,950.00
TWP5	PWS	14	$ 35,000.00	$ 65,800.00	$ 100,800.00	$ 7,200.00
TWP6	Multi-user	9	$ 21,735.00	$ 56,300.00	$ 78,035.00	$ 8,670.56
				Total Projects Water System Cost/Average Cost Per 47 Users	*$ 389,815.00*	*$ 8,293.94*

Projected Annual Operation Costs

Well No	Well Type	No. of Units	Operation Cost Per Year *	Annual Cost Per User
TPW1	Multi-user	5	$ 2,280.00	$ 456.00
TWP2	Multi-user	5	$ 2,280.00	$ 456.00
TWP3	Multi-user	7	$ 2,280.00	$ 325.71
TWP4	Multi-user	6	$ 2,280.00	$ 380.00
TWP5 **	PWS	14	$ 4,600.00	$ 328.57
TWP6	Multi-user	9	$ 2,280.00	$ 253.33
		Average Cost Per User Per Year		$ 366.60

* Operation Costs include electrical costs, routine maintenance and a reserve fund for pump replacement

** TWP-1 May require a system operator paid approximatley $300 per month