

WELL DECOMMISSIONING ON THE LUMMI INDIAN RESERVATION DURING 2014

Prepared for: Water Resources Division of the
Lummi Natural Resources Department

Project No. 130218-002-01 • December 1, 2014



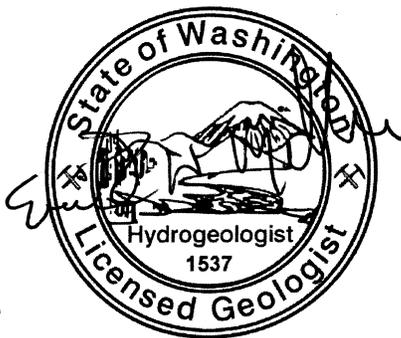
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Aspect Consulting, LLC



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12-01-14

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Introduction

This report documents well evaluation and decommissioning activities during August and September 2014 on the Lummi Indian Reservation (Reservation) in northwestern Washington State (Figure 1). Since the formation of the Lummi Water District in the 1970s, use of many domestic water supply wells has been discontinued (Salix, 2010). Proper decommissioning of inactive domestic water supply wells eliminates potential groundwater contamination pathways and protects the Reservation's groundwater system. The Lummi Natural Resources Department (LNRD) well decommissioning effort began in 2006. Twenty-eight wells have been decommissioned to date (Figure 2; Salix, 2010; Aspect, 2013), including five in 2014 (Figure 3). Aspect Consulting, LLC's (Aspect) 2014 scope of work included a site visit to candidate wells, completing well evaluation worksheets, documentation of decommissioning activities, and preparation of this report.

Well Decommissioning Methods and Results

The LNRD provided Aspect with a list of candidate wells for decommissioning or conversion to monitoring wells. After obtaining landowner permission, Aspect and LNRD conducted field assessments of nine domestic wells at eight properties in August 2014 and September 2014 (Appendix A: Well Evaluation Worksheets); two of the wells (GW447 and GW448) had already been assessed in 2013 (Aspect, 2013) but were re-visited to confirm site access and confer with the landowner. Of the nine wells assessed in consultation with LNRD, one is a candidate monitoring well (GW112), and the other eight were confirmed as appropriate candidates for decommissioning (see table below for a summary of the well assessments; see Appendix A worksheets for additional details). Five of the eight decommissioning candidate wells were inactive and therefore available for decommissioning in 2014. The remaining three of eight decommissioning candidate wells were still in-use; therefore, decommissioning of these wells can occur after the landowners connect to the Lummi Water District.

The LNRD contracted with Aquatech Well Drilling & Pumps (Aquatech) to conduct decommissioning activities by 17 LAR 04.130. Aquatech conducted site visits of each well and provided LNRD with proposed decommissioning methods. Decommissioning methods conformed to 17 LAR 04.130 except for GW447 and GW448 for which a variance was approved by LNRD (see Appendix B: September 24, 2014 Request for Variance from 17 LAR 04.130, and Appendix C: Approval of September 24, 2014 Variance Request for Well Decommissioning).

Decommissioning activities occurred on September 30, 2014 and October 1, 2014. Pre-decommissioning, during decommissioning, and post-decommissioning photographs are provided in Figures 4 through 8. Appendix D contains Aquatech's Well Decommissioning Report forms and available Well Drilling Report forms (GW066 and GW113 only).

Well ID	Well Assessment Decision (Decommission or Monitoring Well)	Decommissioning Schedule
GW066	Decommission	Decommissioned in 2014
GW074	Decommission	Pending landowner connection to Lummi Water District
GW112	Monitoring Well	(Not applicable)
GW113	Decommission	Decommissioned in 2014
GW164	Decommission	Pending landowner connection to Lummi Water District
GW189	Decommission	Pending landowner connection to Lummi Water District
GW447	Decommission	Decommissioned in 2014
GW448	Decommission	Decommissioned in 2014
GW449	Decommission	Decommissioned in 2014

GW066

GW066 was located at 2985 Lummi Shore Road. The well consisted of 6-inch diameter steel casing with approximately 2 feet (ft) of casing stick-up above ground level and a total depth of 89.75 ft below the top of casing (btoc). From these dimensions, the well casing volume below ground surface (bgs) was estimated to be 17 cubic ft or 127 gallons. The well was decommissioned on September 30, 2014. Pre-decommissioning static water level was 62.42 ft btoc. Decommissioning activities included removing a datalogger; perforating the casing from the bottom to 3 ft bgs; cutting the casing to 1.5 ft bgs; placing one 50-pound (lb) bag of bentonite at the bottom of the well; pressure grouting the casing from the bottom up with approximately 711 gallons of grout; topping the grout with half of a 50-lb bag of bentonite; and covering the decommissioned well with topsoil.

GW113

GW113 was located at 3310 Robertson Road. The well consisted of 6-inch diameter steel casing with approximately 1.8 ft of stick-up above ground level and a total depth of 81.84 ft btoc. From these dimensions, well casing volume bgs was estimated to be 16 cubic ft or 120 gallons. The well was decommissioned on October 1, 2014. Pre-decommissioning static water level was 16.82 ft btoc. Decommissioning activities included removal and disposal of the pump and pump string; perforating the well from the top of the screened interval (70 ft bgs) to 3 ft bgs; cutting of the casing to 1 ft bgs; placing one 50-lb bag of bentonite chips at the bottom of the well; pressure grouting the casing from the bottom up with approximately 342 gallons of grout; topping the grout from 7.1 ft bgs to 1 ft bgs with two 50-lb bags of bentonite chips; and covering the decommissioned well with topsoil.

GW447

GW447 was located on 3415 Lummi Shore Road. The well consisted of a 3 ft diameter concrete tile well to a total depth of 11.13 ft btoc. The top of casing (toc) was recessed approximately 2 ft bgs. From these dimensions, the well casing volume was estimated to be 79 cubic ft or 591 gallons. The well was decommissioned on September 30, 2014. Pre-

decommissioning static water level was 6.53 ft bgs. Decommissioning activities involved an approved variance from 17 LAR 04.130 (Appendix B and Appendix C) and included removal of top soil covering the well's concrete lid; removal of concrete lid; filling well casing with approximately 3.5 cubic yards or 707 gallons of concrete poured from a concrete truck; letting the concrete set over night; and covering the decommissioned well with topsoil.

GW448

GW448 was located at 3415 Lummi Shore Road. The well consisted of a 3 ft diameter concrete tile well to a total depth of 11.64 ft btoc. The toc was recessed approximately 2 ft bgs. From these dimensions, the well casing volume was estimated to be 82 cubic ft or 613 gallons. The well was decommissioned on September 30, 2014. Pre-decommissioning static water level was 5.95 ft bgs. Decommissioning activities involved an approved variance from 17 LAR 04.130 (Appendix B and Appendix C) and included removal of top soil covering the well's concrete lid; removal of concrete lid; filling well casing with approximately 3.5 cubic yards or 707 gallons of concrete poured from a concrete truck; letting the concrete set over night; and covering the decommissioned well with topsoil.

GW449

GW449 was located at 2581 Scott Road. The well consisted of 6-inch diameter steel casing with a stick-up of 0 ft and a total depth of 106.4 ft bgs. From these dimensions, the well casing volume was estimated to be 21 cubic ft or 157 gallons. The well was decommissioned October 1, 2014. Prior to decommissioning, the well was dry. Decommissioning activities included cutting the casing to 2 ft bgs; perforating the casing from bottom to 3 ft bgs; placing one 50-lb bag of bentonite chips at the bottom of the well; pressure grouting the casing with approximately 263 gallons of grout; topping the grout with three 50-lb bags of bentonite chips; and covering the decommissioned well with topsoil.

Conclusions

Five wells were decommissioned in 2014. The LNRD well decommissioning program has decommissioned a total of 28 wells since 2006. Additional domestic wells are expected to become inactive as connections to the Lummi Water District increase. Inactive wells can present physical safety and environmental concerns including becoming conduits for contaminant migration. We recommend that LNRD's decommissioning program of inactive wells continue.

References

Aspect Consulting, LLC (Aspect), 2013, Well Decommissioning on the Lummi Indian Reservation During 2013. Prepared for the Water Resources Division of the Natural Resources Department. December 31, 2013.

Salix Environmental Services (Salix), 2010, Well Decommissioning on the Lummi Indian Reservation During 2010. Prepared for the Water Resources Division of the Natural Resources Department of the Lummi Indian Business Council.

Limitations

Work for this project was performed for the Water Resources Division of the Lummi Natural Resources Department (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

FIGURES

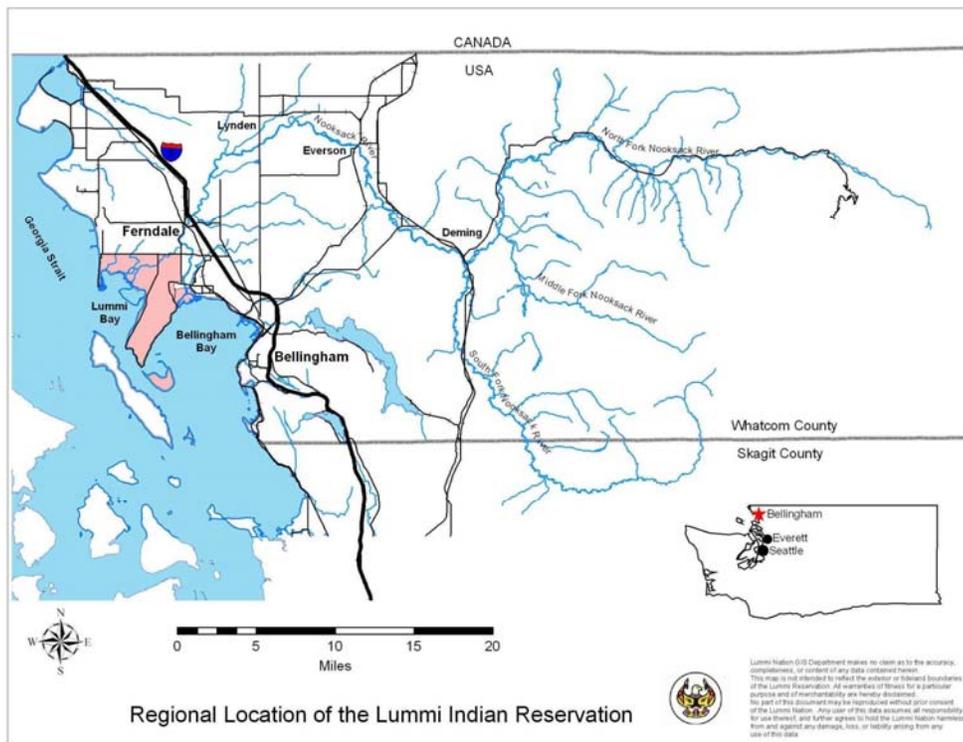


Figure 1. Location of the Lummi Indian Reservation (from Salix, 2010).

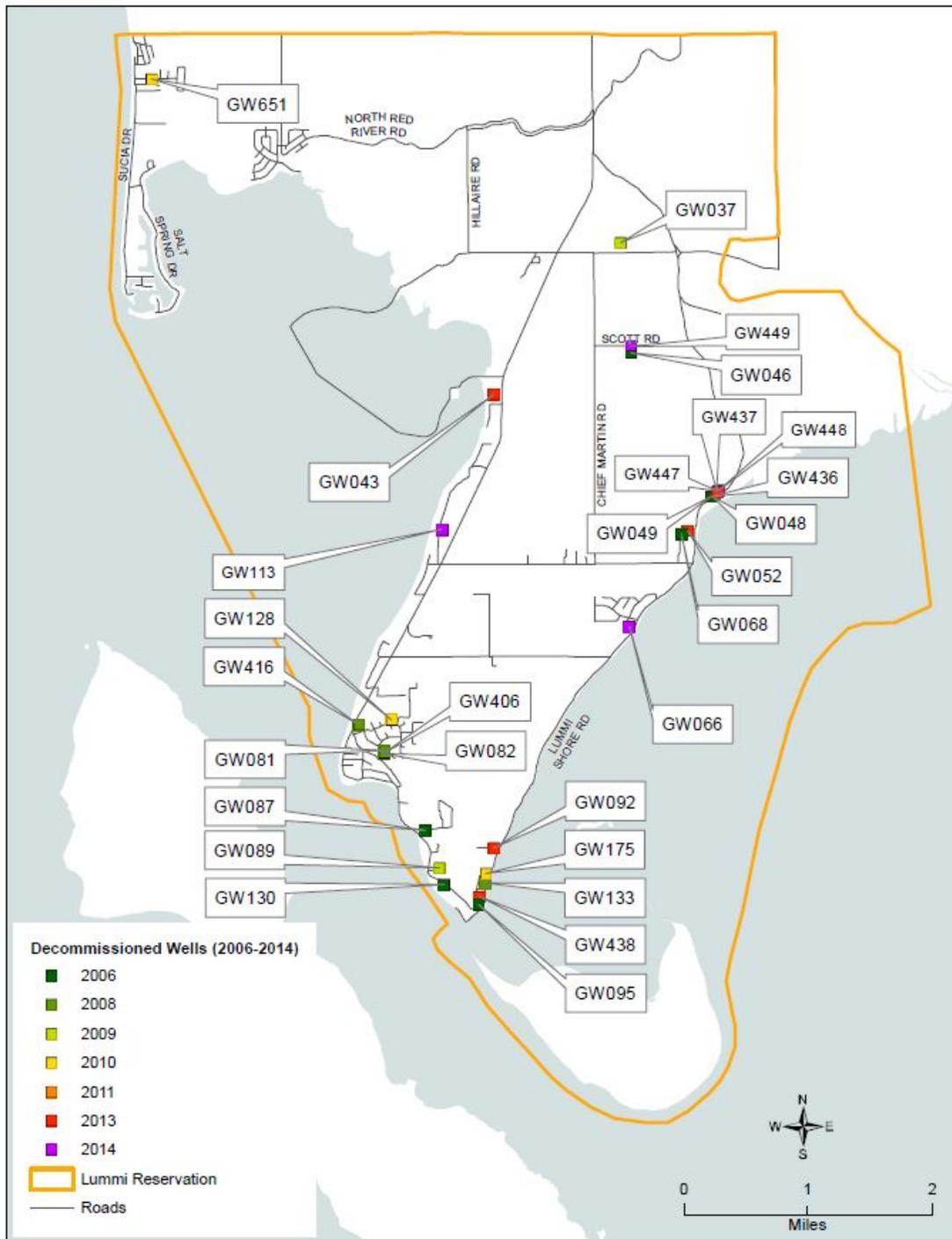


Figure 2. Location of all wells decommissioned on Lummi Indian Reservation since 2006.

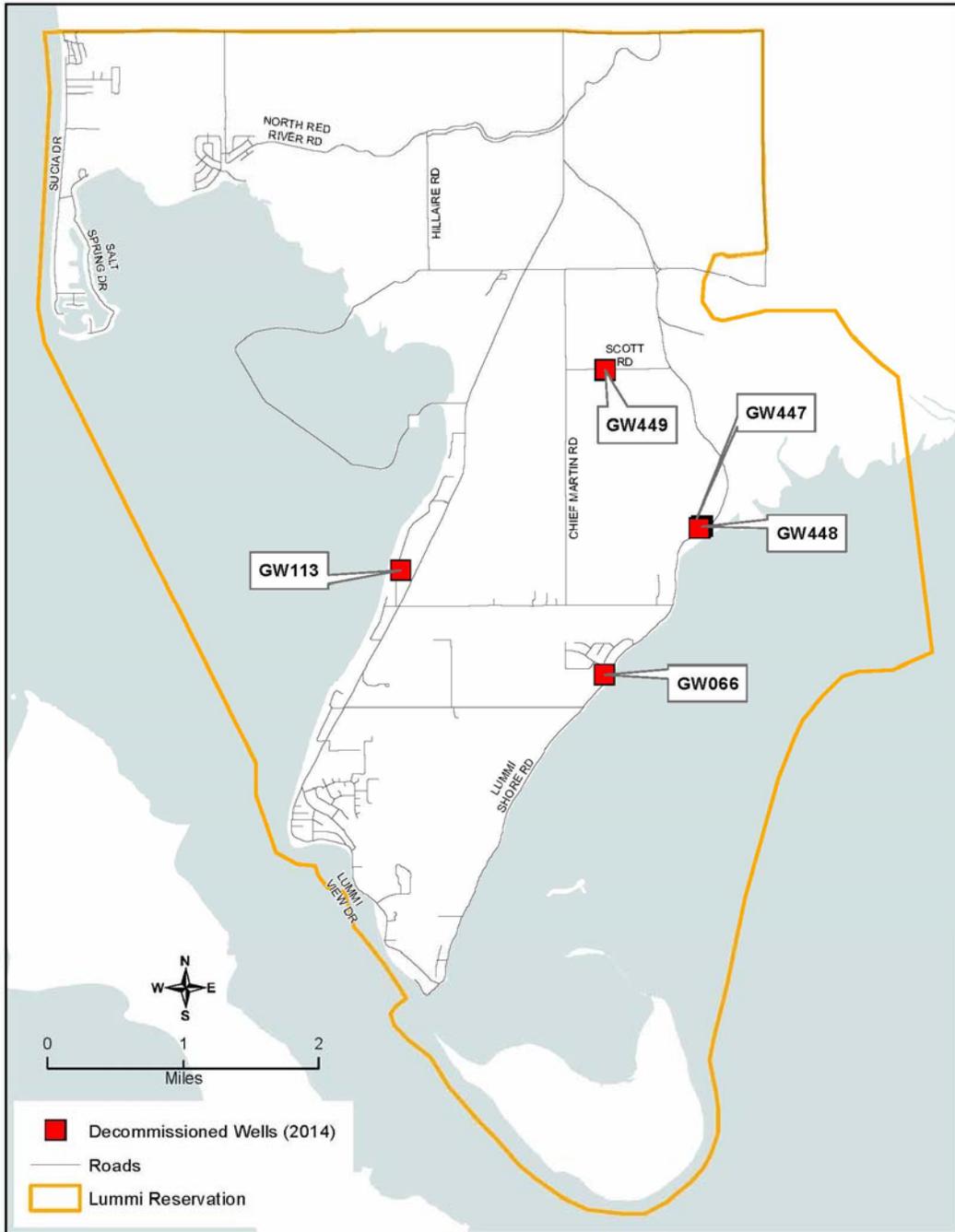


Figure 3. Location of wells decommissioned on Lummi Indian Reservation in 2014.



(a)



(b)



(c)

Figure 4. GW066 (a) pre-decommissioning, (b) during decommissioning, and (c) post-decommissioning (before decommissioned well covered with topsoil).



(b)

(a)



(c)

Figure 5. GW113 (a) pre-decommissioning, (b) during decommissioning, and (c) post-decommissioning.



(a)



(b)



(c)

Figure 6. GW447 (a) pre-decommissioning, (b) during decommissioning, and (c) post-decommissioning.



(a)



(b)



(c)

Figure 7. GW448 (a) pre-decommissioning, (b) during decommissioning, and (c) post-decommissioning.



(a)



(b)



(c)

Figure 8. GW449 (a) pre-decommissioning, (b) during decommissioning, and (c) post-decommissioning.

APPENDIX A

Well Evaluation Worksheets

WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: *GW066, Pierre, 2985 Lummi Shore Road*
 Person performing determination and date: *Jared Bean, September 22, 2014*

Criteria Description	Sub-category/ Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Not good Corroded monument; rotten floorboards around monument; well house in poor condition</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>No</i>
2. Is the well <u>unlikely</u> to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>No Adjacent to private and shared driveways; in active storage area</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>No</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>No (See above)</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>No</i>
4. Is the well <u>unlikely</u> to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>Unlikely</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>Yes Access port for water level measurements</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> • Well dimensions known? • Water level, production known? • Well construction details known? • Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>Yes, But surface seal dimensions unclear</i>	Sufficient information in well log = Yes Otherwise = No	<i>No</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> • The aquifer is not tapped by other wells. • Are wells that tap the aquifer proximate or distant? • There is access to other wells that tap the aquifer. • Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>No</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>No</i>

Check the appropriate result:

decommission well, candidate for use as monitoring well, or further information is required.

Assessment Completed by: *Victor Johnson*

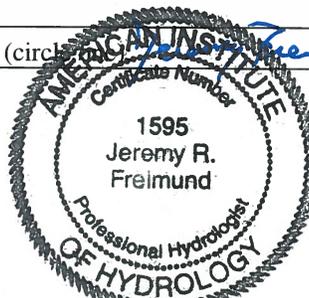
Date: *September 15, 2014*

Assessment Reviewed by: *Jared Bean, Erick Miller*

Date: *September 22, 2014*

Concurrence by Water Resources Manager, Yes No (circle)

Date: *9/26/2014*



WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: *GW074, Kathy Charles, 3349 Southgate Road*
 Person performing determination and date: *Jared Bean, August 25, 2014*

Criteria Description	Sub-category/ Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Unknown Above-ground monument appears to be in good condition</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>Yes</i>
2. Is the well <u>unlikely</u> to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>Unclear, but unlikely Located near road and driveway</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>Yes</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>No Located near road and driveway</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>No</i>
4. Is the well <u>unlikely</u> to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>Yes</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>Yes</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> Well dimensions known? Water level, production known? Well construction details known? Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>Yes Driller log available, but surface seal depth unknown</i>	Sufficient information in well log = Yes Otherwise = No	<i>No</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> The aquifer is not tapped by other wells. Are wells that tap the aquifer proximate or distant? There is access to other wells that tap the aquifer. Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>No</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>No</i>

Check the appropriate result:

decommission well, candidate for use as monitoring well, or further information is required.

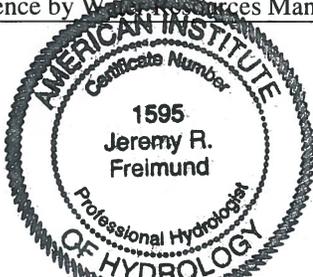
Assessment Completed by: *Jared Bean, Erick Miller*

Date: *August 28, 2014*

Concurrence by Water Resources Manager, Yes No (circle one):

Jeremy Freimund

Date: *9/26/2014*



WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: *GW112, Rob/Cindy/Sally Jefferson, 3232 Robertson Road*
 Person performing determination and date: *Jared Bean, August 25, 2014*

Criteria Description	Sub-category/ Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Unknown Above-ground monument appears to be in good condition</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>Yes</i>
2. Is the well <u>unlikely</u> to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>Yes But located near driveway and house</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>Yes</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>Yes But located near driveway and house</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>Yes</i>
4. Is the well <u>unlikely</u> to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>Yes Located near house gutter drain, but surface seal installed to 18 ft below ground surface</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>Yes</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> Well dimensions known? Water level, production known? Well construction details known? Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>Yes Driller log available</i>	Sufficient information in well log = Yes Otherwise = No	<i>Yes</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> The aquifer is not tapped by other wells. Are wells that tap the aquifer proximate or distant? There is access to other wells that tap the aquifer. Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>Yes</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>Yes</i>

Check the appropriate result:

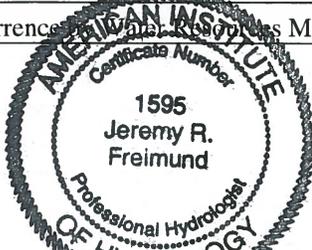
decommission well, candidate for use as monitoring well, or further information is required.

Assessment Completed by: *Jared Bean, Erick Miller*

Date: *August 28, 2014*

Concurrence of the Resource Manager Yes No (circle one):

Jeremy Freimund Date: *9/26/2014*



WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: *GW113, Johnny Felix, 3310 Robertson Road*
 Person performing determination and date: *Jared Bean, August 25, 2014*

Criteria Description	Sub-category/ Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Unknown Above-ground monument appears to be in good condition</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>Yes</i>
2. Is the well unlikely to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>Unclear, but unlikely; Located in yard – yard acts as active fishing equipment storage and transportation hub</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>Yes</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>Yes But nearby boat storage area</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>Yes</i>
4. Is the well unlikely to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>Yes But located close to home and roof drains</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>Yes Well log TD = 78 ft Measured TD = 67 Therefore, screen silted</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> • Well dimensions known? • Water level, production known? • Well construction details known? • Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>Yes Driller log available</i>	Sufficient information in well log = Yes Otherwise = No	<i>Yes</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> • The aquifer is not tapped by other wells. • Are wells that tap the aquifer proximate or distant? • There is access to other wells that tap the aquifer. • Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>No</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>No</i>

Check the appropriate result:

decommission well, candidate for use as monitoring well, or further information is required.

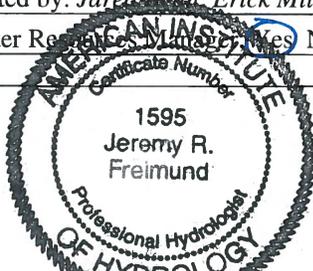
Assessment Completed by: *Jared Bean, Erick Miller*

Date: *August 28, 2014*

Concurrence by Water Resources Institute (Yes No (circle one):

Jeremy R. Freimund

Date: *9/26/2014*



WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: *GW164, Bewley, North of 2359 Lummi Shore Road*

Person performing determination and date: *Jared Bean, September 22, 2014*

Criteria Description	Sub-category/ Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Unknown Above-ground monument appears to be in good condition</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>Yes</i>
2. Is the well <u>unlikely</u> to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>Unlikely No septic; house is on municipal sewer; well located about 1 ft from the house</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>Yes</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>No Located next to house in side yard; potential for contamination from yard activities</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>No</i>
4. Is the well <u>unlikely</u> to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>Unlikely</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>No Access issues: gated driveway, well behind house, no well log</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>No</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> Well dimensions known? Water level, production known? Well construction details known? Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>No log TD = 113 ft bTOC DTW = 5.06 ft bTOC on 9/15/14 Monument = 6" steel casing</i>	Sufficient information in well log = Yes Otherwise = No	<i>No</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> The aquifer is not tapped by other wells. Are wells that tap the aquifer proximate or distant? There is access to other wells that tap the aquifer. Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>No</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>No</i>

Check the appropriate result:

decommission well, candidate for use as monitoring well, or further information is required.

Assessment Completed by: *Victor Johnson*

Date: *September 15, 2014*

Assessment Reviewed by: *Jared Bean, Erick Miller*

Date: *September 22, 2014*

Concurrent Reviewer: *Water Resources Manager* Yes No (circle one): *Jeremy Freimund*

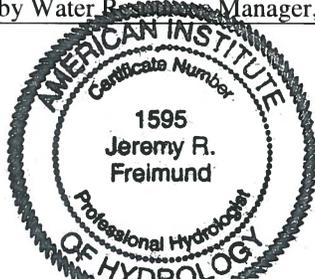
Date: *9/26/2014*



WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: <i>GW189, Marie Egawa, 2519 Lummi Shore Road</i>				
Person performing determination and date: <i>Jared Bean, August 25, 2014</i>				
Criteria Description	Sub-category/ Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Unknown Above-ground monument appears to be in good condition</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>Yes</i>
2. Is the well <u>unlikely</u> to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>Unclear, but unlikely Located in yard by propane tank</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>Yes</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>Yes But driveway and propane tank nearby; septic drainfield location unknown</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>Yes</i>
4. Is the well <u>unlikely</u> to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>Yes</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>Yes</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>Yes</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> Well dimensions known? Water level, production known? Well construction details known? Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>Yes Driller log available</i>	Sufficient information in well log = Yes Otherwise = No	<i>Yes</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> The aquifer is not tapped by other wells. Are wells that tap the aquifer proximate or distant? There is access to other wells that tap the aquifer. Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>No</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>No</i>
Check the appropriate result: <input checked="" type="checkbox"/> decommission well, <input type="checkbox"/> candidate for use as monitoring well, or <input type="checkbox"/> further information is required.				
Assessment Completed by: <i>Jared Bean, Erick Miller</i>			Date: <i>August 28, 2014</i>	
Concurrence by Water Resources Manager (Yes No (circle one): <i>Yes</i>) <i>Jeremy Freimund</i>			Date: <i>9/26/2014</i>	



WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: *GW447, Michael Johnson, 3415 Lummi Shore Road*

Person performing determination and date: *Jared Bean, November 15, 2013*

Criteria Description	Sub-category/Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Not good Buried with soil in a local depression</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>No</i>
2. Is the well <u>unlikely</u> to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>No (See above)</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>No</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>No Next to barn and driveway</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>No</i>
4. Is the well <u>unlikely</u> to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>No In surface depression and well cover is likely not sealed</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>No</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>No</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>No</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> Well dimensions known? Water level, production known? Well construction details known? Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>No log Approximate dimensions known</i>	Sufficient information in well log = Yes Otherwise = No	<i>No</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> The aquifer is not tapped by other wells. Are wells that tap the aquifer proximate or distant? There is access to other wells that tap the aquifer. Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>No</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>No</i>

Check the appropriate result:

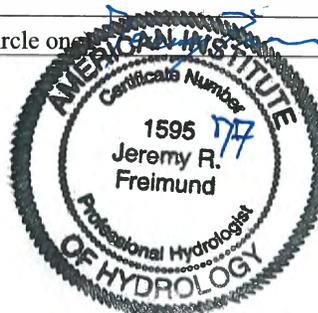
decommission well, candidate for use as monitoring well, or further information is required.

Assessment Completed by: *Erick Miller/Jared Bean*

Date: *November 20, 2013*

Concurrence by Water Resources Manager, Yes No (circle one)

Date: *11/26/13*



WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: *GW448, Michael Johnson, 3415 Lummi Shore Road*

Person performing determination and date: *Jared Bean, November 15, 2013*

Criteria Description	Sub-category/Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Not good Buried with soil in a local depression</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>No</i>
2. Is the well <u>unlikely</u> to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>No (See above)</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>No</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>No Next to driveway</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>No</i>
4. Is the well <u>unlikely</u> to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>No In surface depression and well cover is likely not sealed</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>No</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>No</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>No</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> Well dimensions known? Water level, production known? Well construction details known? Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>No log Approximate dimensions known</i>	Sufficient information in well log = Yes Otherwise = No	<i>No</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> The aquifer is not tapped by other wells. Are wells that tap the aquifer proximate or distant? There is access to other wells that tap the aquifer. Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>No</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>No</i>

Check the appropriate result:

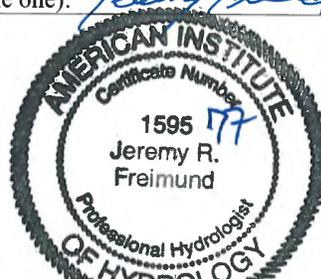
decommission well, candidate for use as monitoring well, or further information is required.

Assessment Completed by: *Erick Miller/Jared Bean*

Date: *November 20, 2013*

Concurrence by Water Resources Manager Yes No (circle one): *Jeremy Freimund*

Date: *11/26/13*



WORKSHEET FOR DETERMINING IF ABANDONED WATER WELLS SHOULD BE MONITORING WELLS OR DECOMMISSIONED

Criteria to determine if abandoned wells should be decommissioned or become candidates for use as a monitoring well. If the answer for questions 1 through 7 is "yes" then the well is a candidate for use as a monitoring well.

Well number, owner, and street address: *GW449, Lucy Spencer, 2581 Scott Road*
 Person performing determination and date: *Jared Bean, August 25, 2014*

Criteria Description	Sub-category/ Explanation	Actual Well Information	Evaluation	Answer (Yes or No)
1. Is the well in good condition?	Good, not good, or unknown. In rare situations, unknown condition may not preclude use as a monitoring depending upon location of the well and if sufficient information can be gathered about its condition.	<i>Unknown Monument sheared near ground surface; no cap; property owner was unaware of well's existence</i>	Good condition = Yes If unknown but important location and sufficient information gathered about condition = Yes Otherwise = No	<i>No</i>
2. Is the well <u>unlikely</u> to be a source of ground water contamination now or in the foreseeable future?	For example, is the well located at the bottom of a local depression?	<i>No Located near driveway, road, and ditch; monument sheared near ground surface; no cap</i>	Unlikely to be a source of contamination = Yes Otherwise = No	<i>No</i>
3. Is the well located a sufficient distance from current and foreseeable sources of contamination?	Case-specific. In general, are sources of contamination located or likely to be proximate to the well (e.g., septic tank, gas station).	<i>No Near driveway, road, and ditch</i>	Sources of current and foreseeable contamination unlikely to be proximate to the well = Yes Otherwise = No	<i>No</i>
4. Is the well <u>unlikely</u> to be influenced by factors which diminish the utility of the well to serve as a monitoring well?	For example, is the well shallow and close to home with a foundation drain?	<i>No Near ditch</i>	Unlikely that well influenced by factors that diminish use as a monitoring well = Yes Otherwise = No	<i>No</i>
5. Is the well suitable for use as a monitoring well?	For example, is the well conducive to water level measurements or obtaining water quality measurements? Both water level and quality are not necessary, depending upon the location of the well.	<i>No No well log, no water level or quality monitoring record</i>	Suitable for use as a monitoring well = Yes Otherwise = No	<i>No</i>
6. Is there a Well Log for the well?	<ul style="list-style-type: none"> Well dimensions known? Water level, production known? Well construction details known? Stratigraphy recorded and reliable? Not all information is necessary, depending upon location and need for monitoring well.	<i>No driller log</i>	Sufficient information in well log = Yes Otherwise = No	<i>No</i>
7. Does the well tap an aquifer where additional information would be useful?	For example: <ul style="list-style-type: none"> The aquifer is not tapped by other wells. Are wells that tap the aquifer proximate or distant? There is access to other wells that tap the aquifer. Are aquifer characteristics or uses sufficiently variable or unique to warrant an additional monitoring well? 	<i>No</i>	Additional aquifer information at well location useful = Yes Otherwise = No	<i>No</i>

Check the appropriate result:

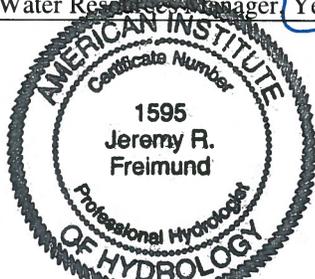
decommission well, candidate for use as monitoring well, or further information is required.

Assessment Completed by: *Jared Bean, Erick Miller*

Date: *August 28, 2014*

Concurrence by Water Resource Manager (Yes No (circle one):

Jeremy Freimund Date: *9/26/2014*



APPENDIX B

**September 24, 2014 Request for
Variance from 17 LAR 04.130**



MEMORANDUM

Project No.: 130218

September 24, 2014

To: Jeremy Freimund, P.H.
Water Resources Manager
Lummi Natural Resources Department

From: Jared Bean, Staff Hydrogeologist
Aspect Consulting, LLC

Re: **Request for Variance from 17 LAR04.130**

The memorandum requests variances from 17 LAR 04.130 for decommissioning of two wells on the Lummi Peninsula. Aquatech (Representative: Ron Walden, 360-742-6005, 2675 Butler Creek Rd, Sedro-Woolley, WA 98284) intends to decommission these wells during the week of September 29, 2014. This memorandum documents the procedures provided to us by Aquatech for variance approval.

GW447 and GW448 (Johnson) 3415 Lummi Shore Road

Aquatech requests a variance from 17 LAR 04.130(e) which calls for clean chlorinated pea gravel to be installed in dug wells to two feet above static water level.

Aquatech proposes the following methods for effective decommissioning: remove concrete lid, fill the well from bottom to top of concrete tiles (approximately 2 ft below ground surface) with concrete, and cover the concrete filled well with topsoil. Aquatech argues that filling the entire well with concrete will provide a better seal than placing chlorinated pea gravel at the bottom of the well.

Limitations

Work for this project was performed for the Lummi Natural Resources Department Water Resources Manager (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

P:\Lummi NRW1\Lummi On-Call Contract\Well Decommissioning\2014\2014 Well Decommissioning Variance Request Memo.docx



APPENDIX C

**Approval of September 24, 2014
Variance Request for Well
Decommissioning**



September 26, 2014

Mr. Jared Bean, Staff Hydrogeologist
Aspect Consulting, LLC
350 Madison Avenue North
Bainbridge Island, WA 98110

SUBJECT: Approval of September 24, 2014 Variance Request for Well Decommissioning

Dear Jared,

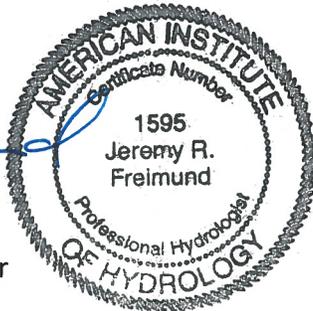
I am in receipt of your written request for a variance from the minimum well decommissioning standards identified in 17 LAR 04.130. This variance request is authorized by 17 LAR 04.010(d) and your request provides the required information.

The purpose of this letter is to notify you that your request for a variance from 17 LAR 04.130 is **APPROVED** for the two wells identified in you memorandum (GW447 and GW448).

Please do not hesitate to contact me (360-312-2314) if you need any further information or clarification.

Sincerely,

Jeremy Freimund, P.H.
Water Resources Manager



Cc Leroy Deardorff, LIBC Environmental Program Director
 Erick Miller, Senior Associate Hydrogeologist

APPENDIX D

Aquatech's Well Decommissioning Reports

Well 65. U.S. Geological Survey Luwal test well 1.
 Drilled by Hayes, 1971. Casing: 6-inch to 87 ft.
 Screen: .020-inch slot, 87-92 ft; .010-inch slot,
 92-97 ft. Well depth, 97 ft.

Silt, clayey, with sand and pebbles	12	12
Clay, silty, with layers of silt	8	20
Silt, clayey, with sand and pebbles	16	36
Sand and pebbles, with silt and clay	2	38
Gravel	1	39
Gravel and clay	4	43
Sand and gravel, with clay and silt	4	47
Silt, clayey	13	60
Sand, silty	3	63
Sand, fine	8	71
Silt and fine sand, with clay	11	82
Clay	9	91
Sand, fine and medium, with granules	0	91
Silt and fine sand, with coarse sand	0	103
Sand, medium and coarse, with pebbles	4	107
Sand, fine and medium, with pebbles	2	109
Clay at 109 ft	--	109

Well 66. Laramie Water District No. 7. Drilled by Hayes,
 1964. Cased to 81 ft. Screen: .010-inch slot, 81-86 ft.

Loam, sandy, tan	3	3
Clay, brown	14	17
Clay, gray	19	36
Till, sandy, gray	27	63
Sand, silty, black	4	67
Sand and gravel, silty, brown	5	72
Sand, fine, brown (clean)	10	82

Well 71. Vina Bell. Dug by Ward Sharp, 1964.
 Casing: 36-inch to 32 ft.

Loam, sandy	2	2
Clay, gray	10	20
Hardpan	8	28
Clay, blue	4	32

Well 72. Verne Johnson. Dug 1946.
 Casing: 30-inch to 34 ft. Well depth, 30 ft.

Topsoil	1	1
Clay, hard, with gravel (hardpan)	24	25
Sand, black (water)	7	32
(Clay, hard, with gravel)?	10	42

Well 73. Georgia Manor Water Association. Drilled by
 Dean Kingsmore, 1959. Casing: 8-inch to 169 ft;
 perforated 164-169 ft.

Gravel	12	12
Clay, blue	12	24
Sand (dry)	52	76
Gravel	49	125
Sand, fine (water)	44	169

Well 74. Vernon Pratt. Drilled by Livermore, 1971.
 Casing: 6-inch to 133 ft. Screen: .025-inch slot,
 133-138 ft.

Topsoil	2	2
Loam, sandy	3	5
Sand and fine gravel	17	22
Sand and gravel	50	80
Sand, fine	50	130
Sand, coarse, and a little fine gravel	7	137
Sand, fine	1	138

Well 75. Leonard Salisbury. Drilled by Livermore, 1969.
 Casing: 6-inch to 135 ft. Screen: 135-140 ft.

Topsoil	2	2
Sand and gravel	95	97
Sand and gravel (water)	43	140

61

C line 1974

DECOMMISSIONED
 09/30/2014
 GW066

16
 38 N/O/E - 25 J02

WELL LOG

Well Ident 66	Owner PIERRE ENEAS	Location 30N/01E-25J02
-------------------------	-----------------------	---------------------------

Drill. Method			Drill. Dates			
X	527845.909	Y	399554.167	Z	63.06	Meas. Pt. Elev.

All measurements are in feet.				Use	U	Scales (1: xxy)	
Water Level (ft MSL)	-6.94	Level-Date		Active	N	Vertical	Horizontal

Depth [feet]	Hole	Annulus	Casing	Screen	Lithology	Elev. [feet]
0					Loam, Sandy, tan	60
3						57
5					Brown clay	55
10						50
15						45
17						43
20					Gray clay	40
25						35
30						30
36						25
40						20
45	6		6			15
50					Till, sandy, gray	10
55						5
60						0
63						-3
65					Sandy, silty, black	-5
70						-10
71						-11
75					Sand and gravel, silty, brown	-15
76						-16
80						-20
81					Fine Sand, brown (cleaner 81-86 ft)	-21
85	86		86	86		-25

DECOMMISSIONED
 GW066
 09/30/2014

113 38N/OIE-23P01

The Original and First Copy with Department of Ecology

WATER WELL REPORT

Second Copy - Owner's Copy PB-91-0685
Third Copy - Driller's Copy

STATE OF WASHINGTON
For Indian Health Service - Portland

Water Right Permit No. _____

(1) OWNER: Name Virgil Williams Address 4900 Fremont, Bellingham, WA.

LOCATION OF WELL: County Whatcom NW 1/4 NW 26 T. 38 N. R. 1 W.M.

(2a) STREET ADDRESS OF WELL (or nearest address): Robertson Rd.

(3) PROPOSED USE: Domestic Industrial Municipal
 Irrigation Test Well Other
 DeWater

(10) WELL LOG or ABANDONMENT PROCEDURE DESCRIPTION

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of information.

(4) TYPE OF WORK: Owner's number of well (if more than one) _____
Abandoned New well Method: Dug Bored
Deepened Cable Driven
Reconditioned Rotary Jetted

MATERIAL	FROM	TO
Top Soil/Brown Clay	0	12
Blue Clay	12	65
Water, Coarse Sand	69	78

(5) DIMENSIONS: Diameter of well 6" inches.
Drilled 78' feet. Depth of completed well 78' ft.

Sieve Test:
#40 Slot - 20% material
#30 Slot - 5% of material
#20 Slot - 40% of material
#15 Slot - 20% of material
#12 Slot - 10% of material
#10 Slot - 5% of material

(6) CONSTRUCTION DETAILS: 2" stick up
Casing installed: 6" diam. from 0 ft. to 78 ft.
Welded diam. from _____ ft. to _____ ft.
Liner installed diam. from _____ ft. to _____ ft.
Threaded diam. from _____ ft. to _____ ft.

5' #20 screen installed, 2' extension on bottom, 5' on top

Perforations: Yes No
Type of perforator used _____
SIZE of perforations _____ in. by _____ in.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

Screens: Yes No
Manufacturer's Name Johnson
Type Johnson Steel - 5' extension on top
Diam. 5 1/2" Slot size #20 from 71 ft. to 76 ft.
Diam. Bottom extension from 76 ft. to 78 ft.

Gravel packed: Yes No Size of gravel _____
Gravel placed from _____ ft. to _____ ft.

Surface seal: Yes No To what depth? 30 ft.
Material used in seal Bentinite
Did any strata contain unusable water? Yes No
Type of water? _____ Depth of strata _____
Method of sealing strata off _____

(7) PUMP: Manufacturer's Name Jacuzzi
Type Submersible

(8) WATER LEVELS: Land surface elevation above mean sea level _____ ft.
Static level 16' ft. below top of well Date 4-3-91
Artesian pressure _____ lbs. per sq. inch Date _____
Artesian water is controlled by _____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? Yes No If yes, by whom? DPW/Illy
Yield: 20 gal./min. with 25' ft. drawdown after 2 hrs.

Work started 4-3-91 19. Completed 4-3-91 19.

WELL CONSTRUCTOR CERTIFICATION:

I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME DAHLMAN PUMP & WELL DRILLING, INC.
(PERSON, FIRM, OR CORPORATION) (TYPE OR PRINT)

Address Box 422, Burlington, WA. 98233

(Signed) [Signature] License No. 0623
(WELL DRILLER)

Contractor's Registration No. DAHLMWP123LC Date 4-4-91 19

(USE ADDITIONAL SHEETS IF NECESSARY)

DECOMMISSIONED
GW113
10/07/2014

field
25 ft = 0.59 gpm/ft
available drawdown = 62 ft
78 ft - 16 ft = 62 ft
0.59 gpm/ft = 62 ft = 49.6 gpm

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level
1 Min	35'	4 Min	21' 6"	8 Min	16'
2 Min	28'	5 Min	20'		
3 Min	24'	6 Min	18' 6"		
7-91	Date of test	7 Min	16'		

Best test 17 gal./min. with 40' ft. drawdown after 1 1/2 hrs.
Air test 17 gal./min. with stem set at _____ ft. for 1 1/2 hrs.
Artesian flow _____ g.p.m. Date _____
Temperature of water _____ Was a chemical analysis made? Yes No

WELL LOG

Well Ident

113

Owner

WILLIAMS VIRGIL

Location

39N/01E-23P01

Drill. Method

Drill. Dates

X

525518.803

Y

400814.710

Z

18.00

Meas. Pt. Elev.

All measurements are in feet.

Use

H

Scales (1:xxx)

Water Level (ft MSL)

2.00

Level-Date

Active

Y

Vertical

Horizontal

