

Well Rehabilitation Goals

The goal of any well rehabilitation should be,

- success of treatment or a comparison of results from “Before” treatment to “After”
- the longevity of success of that treatment. A premature failure would indicate, the chemistry was not designed for the problem in the well. This could include,
 1. acids only used for slime forming bacteria/iron bacteria which are not effective.
 2. deposits such as iron or manganese and the ineffectiveness of sulfamic acid to that debris. Muriatic acids should not be used in high calcium hardness aquifer conditions as an eruption of acid may occur.
 3. the chemistry was not monitored during the process and the well may not have been fully cleaned, allowing a return of the problem
- removing the plugging without damaging the physical well with overly corrosive products or leaving corrosive products in the well for an extended period of time. Leaving products like Muriatic or hydrochloric acids in a well longer than 12 hours will take several mill thickness off the well screen. Any well should not be treated more than 4 times using corrosive acids for fear of a screen collapse.
- concerns for proper disposal of all chemistry. The two issues for disposal will be pH and hazardous chemistry. Restrictions will vary some in different areas. Check with the local sanitary sewer for criteria. Expect 7-12 well volumes of chemistry that may have to be neutralized or contained as a hazardous waste. Most facilities will require a pH between 6-9. Check with your local facility to understand requirements for pH, volumes of acidic chemistry and the presence of hazardous waste in chemistry.

Suggestions

- Keep all well records in one, easy to find location to include, 1. well construction methods, 2. diameters of all well casing used, 3. Driller’s Log with the formations encountered during drilling, 4. total depth of well, 5. open hole completion or screen used, 6. type of screen, length, and slot size, 7. if a filter pack was used and what type, 8. Original Static Water Level, 9. original pumping level, 10. original Specific Capacity of well. If you don’t have this information, contact your engineer or the drilling contractor.
- Do routine pumping tests on each well, at least once a year. Measure Static Water Level. Turn the pump on and measure Pumping Water Level in one hour of pumping. Subtract the SWL from the PWL which equals Drawdown (DD) in the well. Record the Pumping Rate in GPM or total volume pumped in that hour and divide by the time pumped for GPM rate. Divide the GPM rate by the DD which equals Specific Capacity. Monitor any changes in SC over time. It is critical to understand IF a well is declining in yield or if the decline is due to a problem in the pump. IF SC is declining by a certain percentage, the well is plugging that same percentage. IF SC is rising but GPM is declining, the pump is in need of repair.

Recommendations Prior to Well Rehabilitation

Compare the Specific Capacity (SC) of the well to previous information. If the SC has declined by over 25-30%, consideration should be given to some form of well rehabilitation. Plan for doing any well work during the off season when your requirement for water is lower and the contractor has more time to devote to the project. This reduces the emergency aspect of trying to understand the problem and successfully rehabilitating the well properly.

The SC declines generally because of plugging in the borehole or well screen. It is critical to understand what is causing this blockage to better understand how to successfully treat it.

- Do something as simple as a “Sludge analysis” from debris inside piping at the well head. IF there is debris present inside the piping, it may suggest the reason for plugging in the well. The debris may be, 1. hard (generally mineral or corrosion byproduct), 2. soft/sludgy (related to slime/iron bacteria or fungus), 3. gritty in nature (sand, decayed biological debris, or corrosion byproduct), or 4. no debris present. Debris can be found inside gasketed check valves and water meters at the well head. See “Analysis of Sludge & Debris” in our Lab Services of our web site for suggestions, examples, and costs. This determines if debris is mineral related, biological related, and if the debris dissolves with our normal “Unicid” chemistry or something unusual.
- Do “Timed” testing water samples from the well (“Casing” vs “Aquifer” Sampling). Compare, 1. counts of Heterotrophic bacteria. This will help determine if slime bacteria are contained in the well (treatable) or coming from an outside source (untreatable as a physical well problem), 2. ID of bacteria and comparison between these tests. This may determine if surface water bacteria are in the “Aquifer” sample which indicates a physical problem in the well. See “Lab Services for “Iron bacteria, Slime bacteria, & Water Chemistry” on our web site for information and pricing. Lab bottles are available at no charge and billing would be done through your well contractor. You will get a 4-5 page report, explaining and comparing the counts and IDs of bacteria. If you would like a local lab to do the testing, ask for Heterotrophic Plate Count (HPC), ID of bacteria on HPC on that “Timed” sampling. We can provide information on times for testing, the ID of bacteria from our studies, and recommendations for treatment. There is no charge for reviewing other lab results.
- A video analysis of the well is sometimes helpful after the “Timed” testing. This can confirm or eliminate if there are visible, physical problems in the well that may account for a continuous problem found in “Timed” testing. If nothing is visible, a continuing source problem may be due to grout failure on the outside of the well casing. We are available to review videos as necessary. There is no charge for this service.