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March 1, 2013

Ms. Wendy Wyels
Mr. Vinoo Jain
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive
Suite 200
Rancho Cordova, CA 95670

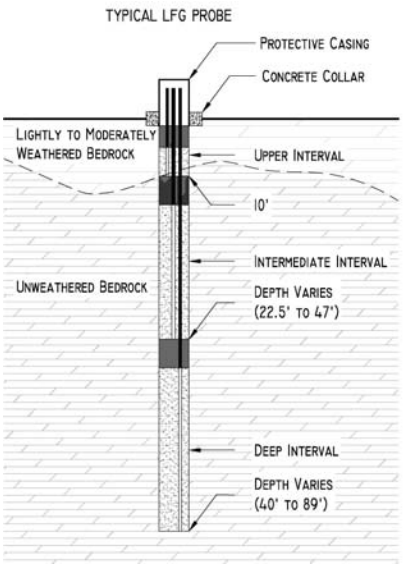
Subject: Amended Report of Waste Discharge, Big Oak Flat (Groveland) Landfill, Tuolumne County, California

Dear Ms. Wyels and Mr. Jain:

This letter was prepared on behalf of the Tuolumne County Community Resources Agency to provide comments on the Central Valley Regional Water Quality Control Board (RWQCB) Administrative Draft Waste Discharge Requirements (AD WDRs) and related documents for the Tuolumne County Groveland Landfill. The AD WDRs contain a number of findings and include several new requirements based on these findings. Our review indicates that most of the information in the AD WDRs was taken from previously submitted site documents and from the existing WDRs for the landfill. Principal comments on the AD WDRs and related AD Information Sheet and Monitoring and Reporting Program are summarized below.

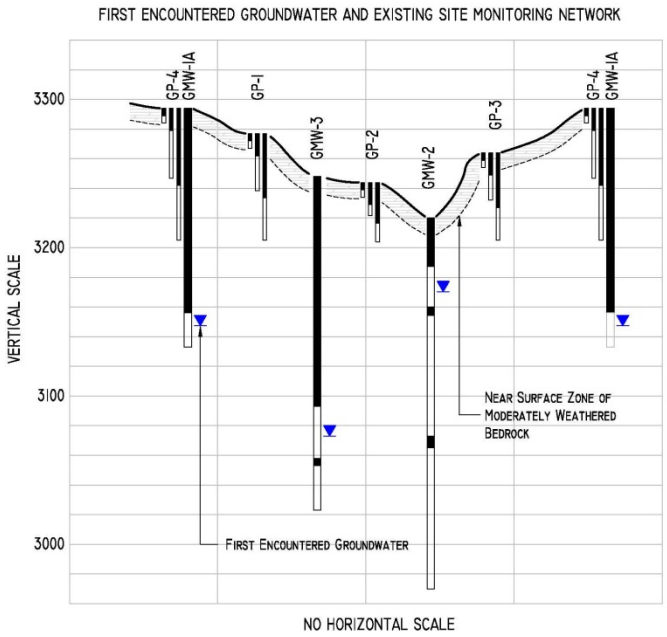
FINDING 30 - PERCHED GROUNDWATER

Finding 30 in the AD WDRs states that previous site documents indicate perched groundwater may occur at the landfill and that perched groundwater may be present at the interface between weathered and unweathered bedrock. Based on this finding, the AD WDRs state that current wells do not monitor first encountered groundwater, and as a result, the AD WDRs require that a Work Plan be prepared that addresses monitoring of this interval. The basis for the AD WDR finding regarding perched groundwater is uncertain because the "previous site documents" are not referenced.



However, the transition of weathered and unweathered bedrock <u>is currently monitored</u> at the site by four multi-interval landfill

gas (LFG) probes.[1] Although these probes are designed to monitor LFG, they also effectively monitor the presence or absence of water because the monitoring protocol includes applying a vacuum to the probe. Because of the vacuum, water would be pulled to the monitoring instrument and would be immediately apparent if it were present. To the best of our knowledge this has never occurred, which strongly indicates that perched water is not present at this site. In the event water were detected, it would be possible to collect a sample from the probe. Because the probes are constructed in much the same manner as monitoring wells, the sample would be representative.



The lack of transient or perched groundwater is consistent with site observations that show bedrock exposed at the ground surface is dense, indurated, and exhibits no discernible primary porosity. In this type of geologic environment, perched groundwater would not be expected and groundwater would be confined to widely spaced bedrock fractures. Drilling logs from the site monitoring wells and from 36 nearby domestic and public wells show that this is the case with first encountered groundwater ranging from 17 feet below the ground surface to 475 feet below the ground surface.[2] Not one of the logs that were reviewed provides evidence of near-surface groundwater at the interface of weathered and unweathered bedrock nor does any log indicate the presence of perched groundwater. We request that this finding be revised to address the site-specific and surrounding area data and information.

[1] These probes are located approximately equidistant around the perimeter of the landfill and each probe includes three separate open intervals, with the upper interval in each probe located at or very near the transition from weathered to unweathered bedrock. The probes are monitored quarterly and also monitor the unsaturated bedrock to depths varying from 40 to 89 feet below the ground surface.

[2] The shallowest depth to groundwater at the site is 40 feet below ground surface. All of the site wells and the majority of the local wells tap moderately deep fractures (100 -300 feet) that have varying, though typically low, yields.

FINDING 31 – SPRINGS GS-1 AND GS-2

The AD WDRs indicates that spring GS-1 has not been monitored since 1990. This is not correct; GS-1 is sampled when water is present and was last sampled in December 2012. We request that this finding be revised to be factually correct.

FINDINGS 32 AND 34 – ELEVATION DESCREPACY

Findings 32 and 34 note a discrepancy between the reference elevations for the monitoring wells and the ground surface elevations shown on the site topographic map. Review of this information confirms the discrepancy and we believe it may have occurred at some time in the past when surveyed spot elevations from an unknown datum were converted during preparation of the site map. It should be noted, however, that the depth to groundwater, relative elevation changes between wells, calculated groundwater gradients, and reported flow directions in the site monitoring reports are accurate if the reference elevations for the different wells remain constant (i.e., the ground surface elevation is irrelevant to this calculation). The identified discrepancy will be resolved as part of the surveying required as part of the AD WDRs.

FINDINGS 42 AND 43 – MONITORING WELL GMW-3

With respect to monitoring well GMW-3, Finding 42 states:

> "*A sanitary seal was placed from the surface to a depth of 30 feet bgs and the casing was perforated between 60 and 100 feet bgs to allow for shallow groundwater monitoring of zones of saturation, zones of perched water, and areas of highest hydraulic conductivity per Title 27 Section 20415(b)(B)(3 thru 5).*"

We are unaware of any site reference that documents the reason for perforating the casing at this depth was "to allow for shallow groundwater monitoring of zones of saturation, zones of perched water, and areas of highest hydraulic conductivity per Title 27 Section 20415(b)(B)(3 thru 5)." In fact, the Amended Report of Waste Discharge (ROWD) that was submitted to the RWQCB in July, 2012 specifically states "*The reason for perforating the casing at this depth is not known*" (emphasis added). Moreover, the boring log for GMW-3 specifically states "no H_2O" at 60 feet below the ground surface and shows that "minor H_2O" was not encountered until 170 feet below the ground surface. As a result, there is no hydrogeologic reason to provide a screen at this depth. We request that the RWQCB provide its basis for the finding and/or to revise the finding to be factually correct.

Finding 43 states:

> "*During rehabilitation the well screen previously placed at 60 to 100 bgs depth was omitted.*"

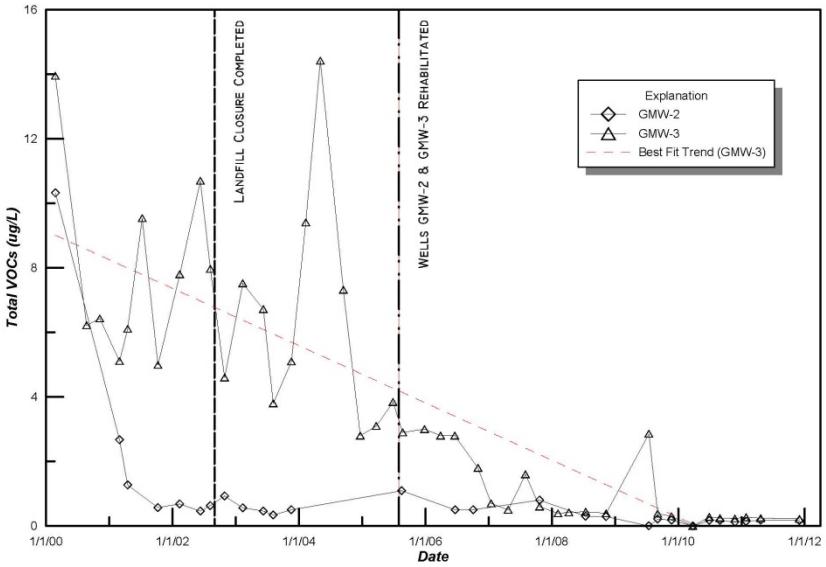
This is not correct. The well screen is still in place although a bentonite plug was placed below this zone. The presence or absence of a well screen at 60 to 100 feet below the ground surface is not significant nor would it serve any purpose because the first encountered groundwater occurs at a depth of 170 feet in this well. We request that this finding be revised to be factually correct.

FINDING 59 – WELL REHABILITATION AND VOC DETECTIONS

Finding 59 states:

> *"Following the rehabilitation of GMW-2 and GMW-3 the Discharger in its quarterly monitoring reports noticed significant improvement in groundwater quality as many VOCs previously detected in trace values were now undetectable. Furthermore, VOCs reported above the PQL were now only detected intermittently as trace values."*

This statement is factually incorrect; to the best of our knowledge no monitoring report ever indirectly or directly related the improvements in groundwater quality at the site to the rehabilitation work on wells GMW-2 and GMW-3. This is because site data show a significant improvement in groundwater quality in GMW-2 before closure of the landfill in 2003 and before rehabilitation of the wells in 2005. Moreover, as described in more detail below and shown in Figure 1, wells GMW-2 and GMW-3 monitor the same fracture zones both before and after well rehabilitation.



Therefore, the data show no correlation between groundwater quality in these wells and the well rehabilitation work and we request that this finding be revised accordingly. The AD Information Sheet that is associated with the AD WDRs should also be revised in the same manner.[3]

FINDINGS 61 THROUGH 67 – COMPLIANCE WITH TITLE 27 REQUIREMENTS

These findings indicate that the existing monitoring system does not meet CCR Title 27 requirements because: (i) unauthorized changes were made to site monitoring wells GMW-2 and GMW-3; and (ii) monitoring wells GMW-2 and GMW-3 do not comply with California Department of Water Resources (DWR) well standards. With respect to these findings, we note:

- **Changes to Monitoring Wells GMW-2 and GMW-3.** Finding 26 of the current WDRs (R5-2002-0142) for the landfill state: "*The Discharger's detection monitoring program for groundwater at this Unit does satisfy the requirements contained in Title 27*." Since the WDRs were issued in 2002, the only substantive changes at the landfill have included the completion of closure, the installation of the LFG monitoring probes, and rehabilitation work to mitigate caving in the formerly open borehole wells GMW-2 and GMW-3. The AD WDRs indicate that the monitoring program no longer meets the CCR Title 27 requirements because wells GMW-2 and GMW-3 were rehabilitated in 2005. However, as shown in Figure 1, the rehabilitated wells monitor the same water-bearing fractures that were monitored prior to the well maintenance work and site analytical data show no meaningful changes in groundwater quality were associated with the rehabilitation work. As a result, a determination that the well rehabilitation work by itself invalidates the previous WDR finding that the monitoring network complies with CCR Title 27 requirements is not supported by site information.

- **DWR Water Well Standards.** Prior to rehabilitation, wells GMW-2 and GMW-3 were open boreholes that captured groundwater from two (GMW-3) and three (GMW-2) subsurface fractures. In our opinion, this type of monitoring system is appropriate for the site because: (i) a water table aquifer does not exist at the site; (ii) the fracture zones that are monitored are not separate aquifers, aquitards, or aquicludes [rather, they represent water-bearing void space within a surrounding matrix of intact rock with apparent

[3]The AD Information Sheet also states that the Discharger changed the well screen locations as part of the rehabilitation work. This also is not correct. Well screens were not present within the water-bearing zone in either well prior to rehabilitation. Following rehabilitation, well screens were placed opposite the water-bearing fractures. However, it is important to understand that the screened intervals monitor the same open borehole intervals that were monitored before the rehabilitation work.

negligible primary porosity]; and (iii) the fractures that are monitored occur within the uppermost water-bearing geologic unit and each fracture in each well occurs within the same geologic unit and rock type. The DWR Water Well Standards allow exemptions due to site-specific conditions and we therefore presume that the RWQCB relied on the aforementioned site-specific conditions and this exemption in making its earlier determination that the monitoring network met CCR Title 27 requirements. Because the wells capture groundwater from the same water-bearing fractures as was captured prior to rehabilitation, the RWQCB findings implication that the wells no longer meet CCR Title 27 requirements or DWR requirements due to the rehabilitation work is not supported by the site data.

We request that Findings 61 through 67 be revised to be factually correct and to specifically address the differences that lead to a finding of compliance with CCR Title 27 requirements in the current WDRs to a finding of non-compliance in the AD WDRs.

PROVISION 8 – GROUNDWATER AND SURFACE WATER MONITORING WORK PLAN

With respect to the Groundwater and Surface Water Monitoring Network Work Plan (Work Plan) required under this Provision, we note:

- **Provision 8a.1**. If necessary based on RWQCB response to the preceding comments, the Work Plan will describe how wells GMW-2 and GMW-3 will be modified to only capture groundwater from the uppermost water-bearing fracture in each well.

- **Provision 8a.2**. As described previously, there is no evidence that first encountered groundwater occurs 10 to 15 feet below the ground surface at the transition of unweathered to weathered bedrock. However, the site monitoring system currently includes LFG probes that monitor this interval around the entire perimeter of the landfill and these probes can be used to conclusively identify the presence or absence of groundwater. Accordingly, we suggest that the Work Plan address how these probes will be used as groundwater monitoring points to collect samples for analysis in the event groundwater is detected.

- **Provision 8a.3**. The Work Plan will include an evaluation of well GMW-2 with respect to point of compliance and the potential for storm water influence on groundwater quality. In the event the results of this evaluation indicate the potential for storm water

influence, the Work Plan will include an assessment of mitigation measures such as lining the detention pond as alternatives to moving the monitoring well.

- **Provision 8a.4**. The Work Plan will identify all springs that discharge within one mile of the facility based on review of available records, site reconnaissance/mapping, and review of remote sensing imagery. If any springs are identified that potentially could be affected by the landfill, the Work Plan will contain a proposal for their subsequent monitoring. The springs will be located on the site map addressed under Provision 8e.

- **Provisions 8a.5.** The Work Plan will evaluate the effectiveness of surface water monitoring points LJC-1 and LJC-2. Alternative monitoring points will be proposed if it is determined that their locations do not comply with CCR Title 27.

- **Provision 8e**. The site topographic survey required under this provision will reconcile the topographic map and monitoring well reference point discrepancies and will clearly identify the datum of the map. Any springs identified as part of the spring survey will be shown on the map. The map will be prepared and stamped by a California Licensed land surveyor.

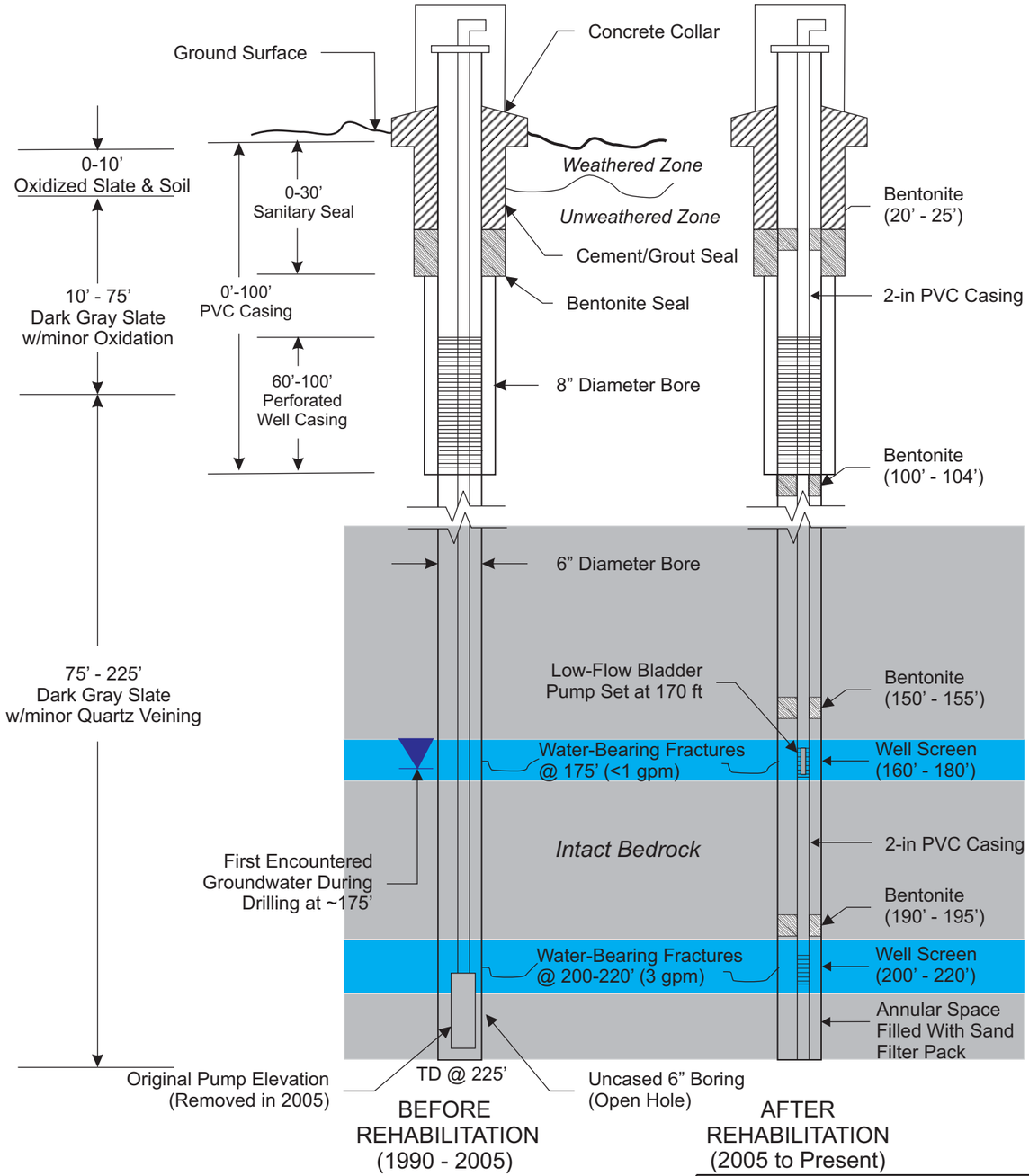
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. Please contact Dan Hambrick at the Tuolumne County Community Resources Agency (209-533-5577) or the undersigned (415-699-8073) at your earliest convenience if you have any questions or need additional information.

Very truly yours,
RMC Geoscience, Inc.

Richard A. Mitchell, PG, CEG
Principal Engineering Geologist

cc: Mr. Dan Hambrick/Tuolumne County
Ms. Rachelle Williams/Tuolumne County

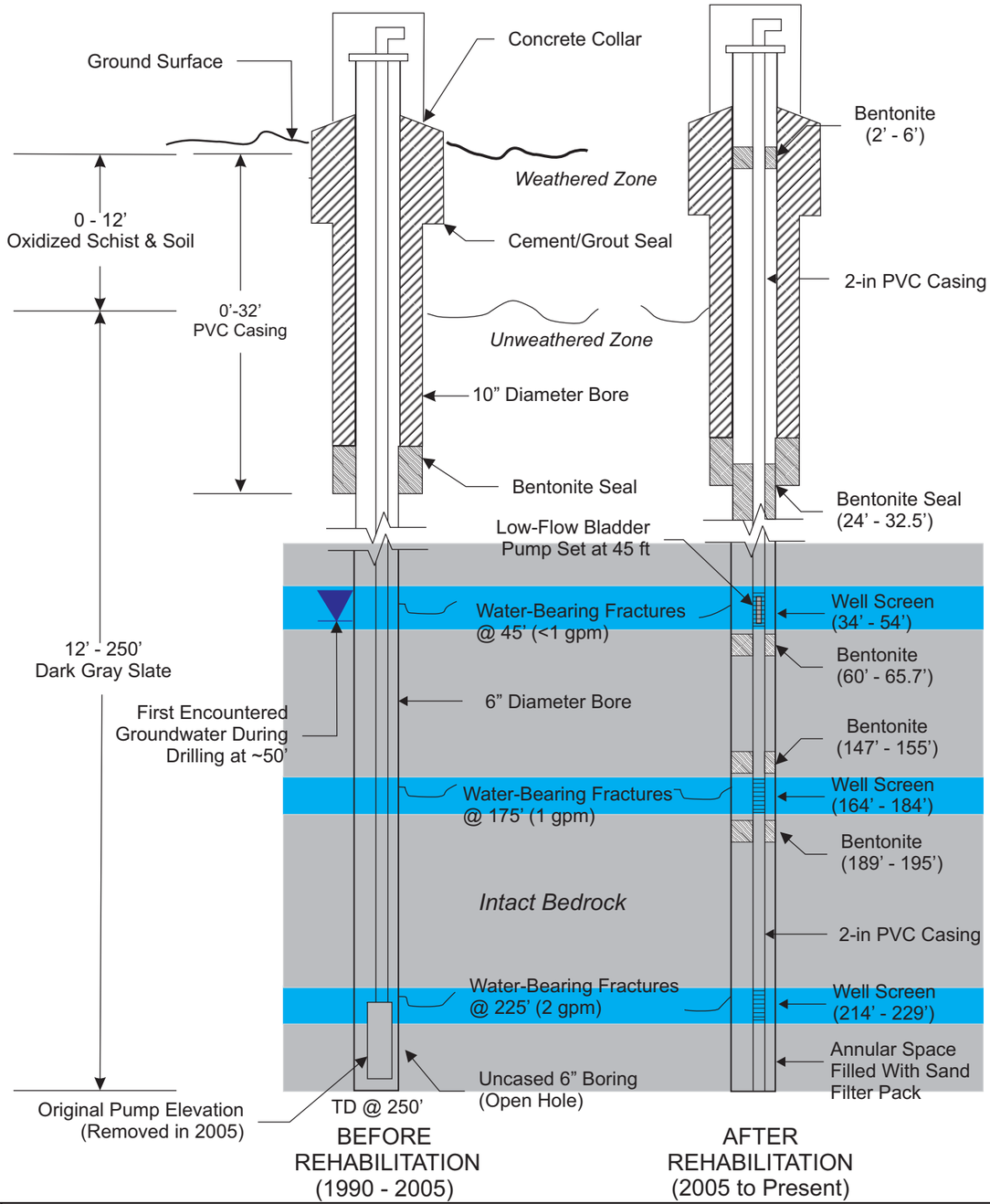
GMW-3 (NTS)



BEFORE REHABILITATION (1990 - 2005)

AFTER REHABILITATION (2005 to Present)

GMW-2 (NTS)



BEFORE REHABILITATION (1990 - 2005)

AFTER REHABILITATION (2005 to Present)

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Amended Report of Waste Discharge
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GMW-3 AND GMW-2 BORING AND WELL COMPLETION INFORMATION

February 2013 | FIGURE 1