REQUESTS FOR ADDITIONAL INFORMATION REGARDING HONEYWELL'S RIP RAP DURABILITY EVALUATION: CYPRESS QUARRY (RIP RAP REPORT), May 2012

The Rip Rap Report is a supplement to the "License Amendment Request Report, U.S. NRC License Number SUB-526, Closure of Surface Impoundment Retention Ponds B, C, D, and E, Honeywell Metropolis Works" (LARR), which serves as the Decommissioning Plan for Honeywell's amendment request.

The information requested in the following requests for additional information (RAIs) on the Rip Rap Report is needed for the U.S. Nuclear Regulatory Commission's (NRC's) staff to determine compliance with the dose requirement for unrestricted use in 10 CFR 20 Subpart E, and to assess the applicant's design of engineered barriers for erosion control with respect to the guidance specified in NUREG-1757 and in NUREG-1623.

Variability of Rock Units Important to Producing the Required Rock Size

RAI 1

On page 1, the Rip Rap Report states that a 12-inch D_{50} rock is needed. Table 5-4 in Volume 2 of the LARR indicates the need for rip rap with a D_{50} range from 11 to 18 inches or more—depending on the response to RAI 3 for Volume 2 of the LARR on the D_{50} analysis. On page 3, fifteen significant bedding planes are noted; but the thickness of rock units between these bedding planes was not given, and the variability of the units between the major bedding planes was not described. The presence of bedding planes can limit the size of the rip rap material, and these features could be planes of weakness, which can cause rip rap to weaken and reduce the size of the rock material. Provide the general thickness and describe the homogeneity of the units between the major bedding planes. If smaller bedding planes exist within these units, provide the general thickness of units between the smaller bedding planes. Based on this information, evaluate whether rip rap can be produced with a D_{50} of up to 18 inches that is free of bedding planes or stylolites that could cause future degradation of the rip rap and reduction of the rip rap size. Also discuss if certain units in the upper and lower benches would be preferable and therefore targeted for production of the larger-sized rip rap.

RAI 2

The presence of stylolites and clay seams can limit rock size since these features can be more susceptible to weathering. Stylolites are shown in the slabbed samples of UB-1 and UB-2 shown in Photos 10 and 11 of Appendix B of the Rip Rap Report. The petrographic analysis of the UB-1 sample also noted numerous clay seams. Describe these features in the upper bench, if they are representative of the upper bench, and if they could limit the size of the rock produced.

Representativeness of Samples

RAI 3

The discussion on page 2 explained that 7 representative samples for durability tests were selected from the 15 samples collected from the three benches in the quarry, but no explanation was given for how the 7 samples for durability tests were selected—and if they are representative. Provide a discussion of how the 7 samples were selected. Were the 7 samples the same types of limestone as the 15 samples (as classified by Dunham, for example, mudstone or packstone)?

RAI 4

On page 5, it was noted that an U.S. Army Corps of Engineer's (Corps) report identified zones of argillaceous limestone in the quarry and that samples were tested. No further information from this report was provided. Understanding the distribution of argillaceous material is important since its presence can increase the susceptibility of the rock to weathering and can cause a reduction in the rip rap size. Provide a summary from the Corp's report regarding the argillaceous limestone, including location within the quarry sequence or benches, if known, and any laboratory test results for this zone. Furthermore, did Honeywell sample this zone? If so, what are the test results and scores? Can these zones be easily identified and avoided?

RAI 5

On page 6, it is noted that samples were collected from each quarry bench; but it is not clear if these samples are for each limestone type/lithofacies (e.g., Dunham's classification used in the petrographic analyses in Appendix B) identified in each bench. Are the samples representative of each limestone type expected to be used? On page 7, it was noted that the 7 samples selected for durability testing were selected on the basis of variation in each bench; but it is not clear what variation was considered and if these samples represent each limestone type expected to be used. Provide a clarification that addresses these questions.

Quality Assurance Procedures for Rock Production

RAI 6

Text on pages 2 and 7 of the Rip Rap Report correctly indicates the need for quality assurance procedures to avoid production of unacceptable rock or rock with adverse features. Provide a commitment to prepare these procedures and submit them to NRC for approval before production of the rock. Production procedures should also include the potential for identifying and removing concentrations of stylolites.

RAI 7

The discussion on page 4 indicates that about 10 feet (ft) of the Aux Vases Formation (Aux Vases) is exposed at the quarry and overlies the St. Genevieve Formation (St. Genevieve) that is proposed for use as rip rap for the Honeywell project. The description indicates that the contact between these two formations is gradational and that the Aux Vases Formation consists mainly of sandstone, shale, and limestone. The description of the Geologic Setting also

indicates that the upper St. Genevieve can have interbeds of sandstone and shale similar to those in the Aux Vases. The presence of such interbeds can affect the weathering susceptibility, size and durability of the rock. Therefore, discuss if these interbeds in the St. Genevieve were observed at the quarry and if these potentially unacceptable rock types—either in the St. Genevieve and the overlying Aux Vase—are easily identifiable. On page 11, the procedure discussion only mentions that the overburden and Aux Vases sandstone will be completely stripped or removed before mining the upper bench. While this is appropriate, the procedures to be developed will need to also describe how to identify unacceptable rock from either the Aux Vases or upper units of the St. Genevieve, how they would be removed, and how produced rock will be checked to ensure that unacceptable rock has been avoided.

Natural Analogues

RAI 8

Pages 10 and 11 discuss natural analogues that show long-term durability of similar rock at another location. The discussion notes that the St. Genevieve is similar in "composition" to the Kelley's Island limestone in Ohio, and had a similar depositional history. It is not clear what "composition" means. Does composition include specific limestone types classified by Dunham for example (e.g., are they both mudstones?). This information is needed to further verify the similarity of the two rock formations and therefore the credibility of the analogue comparison.

RAI 9

The discussion of the Kelley's Island analogue on pages 10 and 11 describes large glacial grooves (15 ft deep and 35 ft wide) and striations. Elaborate on the description of striations and polished surfaces at Kelley's Island based on the literature, including extent of striations, depth of these scratches and extent of glacially polished surfaces that have been preserved. Preservation of such fine markings over a 10,000-year period is more significant than the very large, deep grooves also present. This striation information is needed to better understand the preservation of very fine markings on the limestone at the Kelley's Island location that qualitatively demonstrates the long-term durability of similar limestones from the St. Genevieve Formation.

Oversizing Considerations

RAI 10

On page 9, the lower rock durability score of 75 for sample LB-5 was discussed and that oversizing the rock would require an increase of about 5 percent in the D_{50}. Provide a discussion of the potential reason for the low score that was strongly influenced by a very low absorption test result. Discuss if simple oversizing will mitigate the cause of the lower score. Also, discuss if this sample is considered representative of the lower bench. Consider if the test result could represent a feature in the lower bench that should be avoided. This information is needed to assess whether oversizing can compensate for a lower rock durability score. In situations where rock contains such features as high porosity zones and shale interbeds, oversizing might not ensure that adequate rock size will be maintained over the long term.