



CLIENT NAME: TVA  
PROJECT NAME: Kingston - Gypsum Disposal - Peninsula Site

JOB NO.: 51032301

STANDARD  
CALCULATION  
SHEET

SUBJECT: Settlement of Final stack

CALC NO.: **FP6KIFFESCD**  
**X00030020050004**

REVISION	0	1	2	3
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DATE:	12-08-05			

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$$\therefore F = 0.31(0.5 \times 19.92 \text{ ksf}) 0.51(180')(3500')$$

$$= \underline{992,046 \text{ kips}}$$

$$\Delta p = (W - F) / a$$

$$= 20.07 \text{ ksf, use } \underline{20.0 \text{ ksf}}$$

Due to the large size of the stack footprint and relatively small thickness of the subgrade clay layer, assume

$$\Delta \sigma = 0.9 \Delta p \quad \text{(for both sublayers)}$$

$$= \underline{18.0 \text{ ksf}}$$

$$\therefore S_{\text{max}} = \frac{20' \times 12}{1 + 0.97} \left( 0.01 \times \log \frac{8.8}{1.38} + 0.3 \times \log \frac{138 + 18.0}{8.8} \right)$$

$$+ 0.01 \times \log \frac{8.8}{2.48} + 0.3 \times \log \frac{248 + 18.0}{8.8}$$

$$= 121.83 (0.008 + 0.103 + 0.006 + 0.110)$$

$$= \underline{27.66''} \Rightarrow 2.31', \text{ use } \underline{\sim 2\frac{1}{2}'}$$

### 3. RESULTS & CONCLUSION

1. The maximum settlement of the foundation subgrade under the final stack (top @ Elev. 990±) is likely to be approximately 2 1/2 feet.
2. The required clay liner/filter blanket slope,  $i_L$ , is thus equal to  $2.5'/750' + 0.005 = 0.0083$  or 0.83% at the time of installation. (Note that due to more settlement below the crest, the liner slope will ultimately flatten to roughly 0.5%).

— END —