

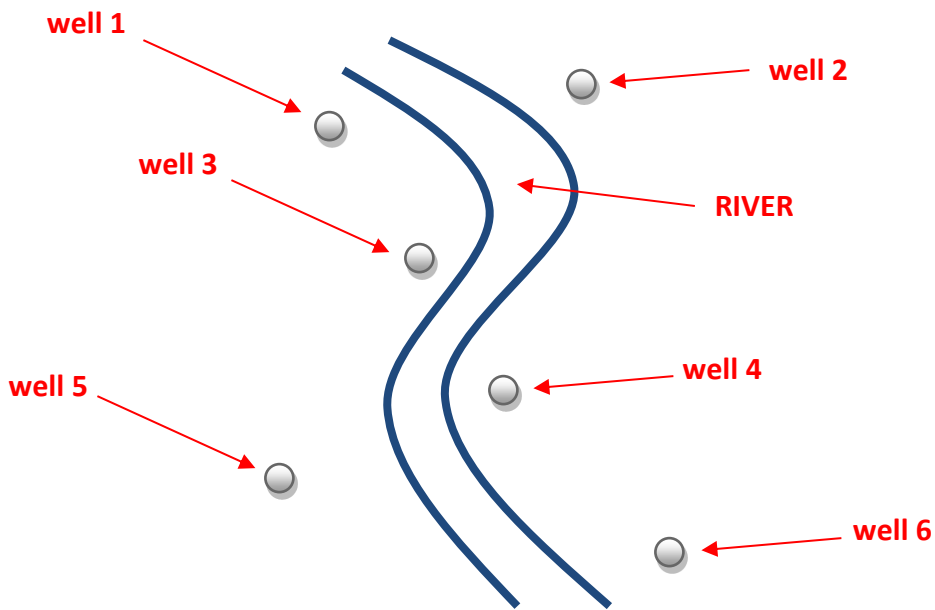
Soil Contamination Worksheet **Example Answers**

1. Record your calibration data in the table below.

Table 1: Soil Contamination Calibration		
Material	Number of Dye Drops	Percentage of Reflection
clean sand	0	80
contaminated sand	2	52
contaminated sand	4	48
contaminated sand	6	44
contaminated sand	8	40
contaminated sand	10	36

Example data

2. Below, sketch the location of the simulation river and wells. Label the wells by number.



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Example data

3. Record your experimental data in the table below.

Table 2: Soil Contamination Experiment			
Well #	Percentage of Reflection	Visual Observation	Number of Drops
Well 1	76	Clean sand	0
Well 2	52	Slightly contaminated, light red	2
Well 3	42	Contaminated, red	7
Well 4	33	Contaminated, very red	10 or more
Well 5	45	Contaminated, red	6
Well 6	60	Clean sand	maybe 1 or 0

4. Do your visual observations match the number of drops you calculated? Explain.

Example answer: Yes, my visual observations match the number of drops for the most part. The only concern is in well 6. I think that my visual observation was not as accurate as the color sensor. Therefore, I would conclude that there was 1 drop of dye that I could not see.

5. What are possible sources of error?

Example answer: One possible source of error is inconsistent lighting conditions. A second source of error could be not using the color sensor correctly, that is, pointing it at the screen and not at the sand. Lastly, if my calibration was incorrect, that would be a major source of error.

6. How might you improve this experiment for next time?

Example answer: I think using more cups with different amounts of dye would be helpful. For example, we could calibrate for 1, 3, 5, 7 and 9 drops of dye. Also, perhaps we can make a measure of ambient light conditions and then use a correction if ambient light conditions change throughout the course of the experiment.