***TESTING THE WATERS***

Your Name: Natalie Nolta

Lab Group Members: Deena Reese

Directions: Working as a group, you must test 24 wells (three at a time) to determine how far the mercury contamination has spread in the aquifer below Silver oaks. You will use this information to create an underground map of the contamination plume.

Procedure: Place 5 drops of the well water you have chosen into a cup on the SEPUP tray. Add 1 drop of Universal Indicator. Using the chart on page A-114, record the color, concentration range and code for each well you have tested. Use the data table below to record all of our information.

*Well Selection Table:*

|  |  |
| --- | --- |
| **Well Number** | **Reason for choosing well (Be Specific)** |
| 40 | It is right next to the power plant and Fenton River |
| 9 | It is right next to the gold mine |
| 2 | It is in between the old warehouses and the town landfill |

*Well Testing Results:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Well Number** | **SEPUP Cup Number** | **Color** | **Concentration Range** | **Code** |
| 40 | **1** | Orange | Less than 0.1ppb | 1 |
| 2 | **2** | Orange | Less than 0.1ppb | 1 |
| 9 | **3** | Yellow  | 0.11ppb-.80ppb | 2 |

*Well Selection Table:*

|  |  |
| --- | --- |
| **Well Number** | **Reason for choosing well (Be Specific)** |
| 30 | Next to the middle school |
| 37 | Next to the abandoned industrial buildings |
| 4 | Next to acme chemicals |

*Well Testing Results:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Well Number** | **SEPUP Cup Number** | **Color** | **Concentration Range** | **Code** |
| 30 | **1** | Yellow | 0.11ppb-0.8ppb | 2 |
| 37 | **2** | Yellow | 0.11ppb-0.8ppb | 2 |
| 4  | **3** | Orange | Less than 0.1ppb | 1 |

*Well Selection Table:*

|  |  |
| --- | --- |
| **Well Number** | **Reason for choosing well (Be Specific)** |
| 24 | Next to the industrial buildings |
| 22 | In the middle of the city |
| 15 | In the middle of the city |

*Well Testing Results:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Well Number** | **SEPUP Cup Number** | **Color** | **Concentration Range** | **Code** |
| 24 | **1** | Yellow | 0.11ppb-0.8ppb | 2 |
| 22 | **2** | Yellow | 0.11ppb-0.8ppb | 2 |
| 15 | **3** | Blue-green | 4.1ppb-32ppb | 4 |

*Well Selection Table:*

|  |  |
| --- | --- |
| **Well Number** | **Reason for choosing well (Be Specific)** |
| 19 | It’s at the high school |
| 33 | It’s in the Oak Wells Terrace Homes |
| 23 | It’s in the industrial buildings |

*Well Testing Results:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Well Number** | **SEPUP Cup Number** | **Color** | **Concentration Range** | **Code** |
| 19 | **1** | Green | 0.81ppb-4ppb | 3 |
| 33 | **2** | Orange | Less than 0.1ppb | 1 |
| 23 | **3** | Blue-green | 4.1ppb-32ppb | 4 |

*Well Selection Table:*

|  |  |
| --- | --- |
| **Well Number** | **Reason for choosing well (Be Specific)** |
| 13 | Near the other wells that are blue-green |
| 25 | Near the other wells that are blue-green |
| 16 | Near the other wells that are blue-green |

*Well Testing Results:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Well Number** | **SEPUP Cup Number** | **Color** | **Concentration Range** | **Code** |
| 13 | **1** | Blue-green | 4.1ppb-32ppb | 4 |
| 25 | **2** | Green | 0.81ppb-4ppb | 3 |
| 16 | **3** | Green | 0.81ppb-4ppb | 3 |

*Well Selection Table:*

|  |  |
| --- | --- |
| **Well Number** | **Reason for choosing well (Be Specific)** |
| 26 | In the future homes/near the industrial buildings |
| 27 | In the future homes/near the industrial buildings |
| 28 | In the future homes/near the industrial buildings |

*Well Testing Results:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Well Number** | **SEPUP Cup Number** | **Color** | **Concentration Range** | **Code** |
| 26 | **1** | Orange | Less than 0.1ppb | 1 |
| 27 | **2** | Green | 0.81ppb-4ppb | 3 |
| 28 | **3** | Orange | Less than 0.1ppb | 1 |

*Well Selection Table:*

|  |  |
| --- | --- |
| **Well Number** | **Reason for choosing well (Be Specific)** |
| 11 | Dairy farms |
| 12 | Near the industrial buildings and the other contaminated wells |
| 8 | Near the water district |

*Well Testing Results:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Well Number** | **SEPUP Cup Number** | **Color** | **Concentration Range** | **Code** |
| 11 | **1** | Orange | Less than 0.1ppb | 1 |
| 12 | **2** | Blue | More than 32ppb | 5 |
| 8 | **3** | Orange | Less than 0.1ppb | 1 |

*Well Selection Table:*

|  |  |
| --- | --- |
| **Well Number** | **Reason for choosing well (Be Specific)** |
| 5 | Golden Oaks Estates  |
| 6 | Golden Oaks Estates |
| 7 | Golden Oaks Estates |

*Well Testing Results:*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Well Number** | **SEPUP Cup Number** | **Color** | **Concentration Range** | **Code** |
| 5 | **1** | Green | 0.81ppb-4ppb | 3 |
| 6 | **2** | Orange | Less than 0.1ppb | 1 |
| 7 | **3** | Blue-green | 4.1ppb-32ppb | 4 |

Analysis Questions:

1. Describe what you determined is the source of contamination. Where did it begin and where is it spreading? The Industrial Buildings is the source of the mercury contamination. It began in well 12 and spread to wells 15, 19, 23, 13, 25, 16, 27, 5, and 7 (those are the ones that turned green or blue-green out of my tested wells). It spread all the way from Shadow Oaks Homes to the Silver Oaks High School.
2. Is there a direction of contamination flow? What is the direction? Is there something that is causing this contamination flow? The contamination flow is north east. The elevation in the southwest of Silver Oaks is around 3,750 ft. and the elevation in the northeast of Silver Oaks is only around 800 ft. This is a contamination plume. It’s being spread by groundwater.
3. Complete the plume map. I will give you a copy of Silver oaks.