**Section 671.APPENDIX E Theis Equations And Pump Test Procedures for Confined Aquifers**

If no data exists for confined unconsolidated or non-fractured bedrock aquifer constants, a pump test can be conducted to determine the lateral radius of influence as follows:

A. At least one fully penetrating piezometer is necessary.

B. The pump test should be conducted for at least 24 hours.

C. The flow equations for confined aquifers are as follows:

|  |  |
| --- | --- |
| T = | 114.6Q W(u) |
| ho-h |

|  |  |
| --- | --- |
| u = | 2693r2S |
| Tt |

|  |  |
| --- | --- |
| S = | Ttu |
| 2693r2 |

PROCEDURE

The Theis type curve is used. The type curve is used to evaluate field data for time and drawdown, which are plotted on logarithmic paper of the same scale. The following procedure can be used:

1. Overlay time drawdown data on type curve. At any match point, the values of W(u), u, and ho-h are determined (see Table B).

2. Transmissivity can be calculated using the values from the match point and the following equation:

|  |  |
| --- | --- |
| T = | 114.6Q W(u) |
| ho-h |

3. From the value established above, k can be determined as follows:

|  |  |
| --- | --- |
| k = | T |
| b |

4. From the values established above, S can be calculated as follows:

|  |  |
| --- | --- |
| S = | uTt |
| 2693r2 |