

LAND USE

100 Attachment 4

Township of Holland

Appendix D

Pump Test Procedure

[Amended 12-30-1981 by Ord. No. 81-23]

Parameter	Criteria																
Techniques of measuring water levels	Pumping well: by electric probe or air line. Observation well: by tape or by electric probe, all measurements made to nearest tenth of a foot.																
Techniques of measuring flow rates	By orifice, weir or flow meter for pumping rates, measurements made to within 2% of the actual rate.																
	<table><thead><tr><th>Time (minutes)</th><th>Depth Readings</th></tr></thead><tbody><tr><td>0 to 10</td><td>Every 1 minute</td></tr><tr><td>10 to 20</td><td>Every 2 minutes</td></tr><tr><td>20 to 50</td><td>Every 5 minutes</td></tr><tr><td>50 to 100</td><td>Every 10 minutes</td></tr><tr><td>100 to 200</td><td>Every 20 minutes</td></tr><tr><td>200 to 100</td><td>Every 100 minutes</td></tr><tr><td>1,000 to 5,000</td><td>Every 500 minutes</td></tr></tbody></table>	Time (minutes)	Depth Readings	0 to 10	Every 1 minute	10 to 20	Every 2 minutes	20 to 50	Every 5 minutes	50 to 100	Every 10 minutes	100 to 200	Every 20 minutes	200 to 100	Every 100 minutes	1,000 to 5,000	Every 500 minutes
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Pump flow rate	Every 5 to 10 minutes until stabilized																
Recommended plots	s (arithmetic) versus t (log) s (arithmetic) versus t_2 (log) s (log) versus r/t (log) Q (arithmetic) versus t/r^2w (log)																

HOLLAND CODE

Parameter	Criteria
Required results	T: pumping well only (developed from recovery water levels): pumping well and observation well (developed from drawdown and recovery water levels). S: pumping well and observation well (developed from drawdown and recovery water levels). C: pumping well (developed from drawdown).

NOTE: Groundwater quality: from chemical samples taken during pumping.

(General Reference: Lohman, S.W., 1972, Ground-Water Hydraulics, United States Geological Survey Professional Paper 708, 70 pages).

KEY:

Q = Discharge from the pumping well.

s = Drawdown (static water level subtracted from the level in the well during the test)

s_w = Drawdown in the pumping well.

r = Radial distance from the pumping well.

r_w = Radius of the pumping well.

t = Time.

T = Coefficient of transmissivity.

S = Coefficient of storativity.

C = Specific capacity of the pumping well.

NOTES:

All units must be consistent.