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4. Experimental Results

The tracer consisted of a solution 0.2 % NaCl. Conversion from resistances to concentration was achieved by calibrating each probe in situ by performing one dimensional test at different initial tracer concentration with in range 0 - 0.2% NaCl.

Concentration-Resistance Calibration curves were found for each probe. The temperature range of the experiment (8 - 9 degree Celsius). The soil sample was used river sand with the porosity 0.38, permeability 0.079444 cm/sec. Tests were run at several seepage velocity (0.0026 cm/sec, 0.0039 cm/sec, 0.0052 cm/sec, 0.0065 cm/sec, 0.0078 cm/sec) and breakthrough curves for each probe were obtained. Longitudinal dispersion coefficients for various seepage velocity were determined and the results were shown in Table.1, Transversal dispersion coefficients were also determined by substituting the steady state concentration at lateral direction of probe and the results were shown in Table.2.

Table.1. Longitudinal Dispersion Coefficient

Velocity (cm/sec)	DL (cm ² /sec)	(x, y) cm
0.0026	0.014029	(0,15)
0.0026	0.021761	(0,25)
0.0026	0.032879	(0,45)
0.0039	0.020792	(0,15)
0.0039	0.021888	(0,25)
0.0039	0.032151	(0,45)
0.0052	0.021387	(0,15)
0.0052	0.022399	(0,25)
0.0052	0.043434	(0,45)
0.0065	0.027239	(0,15)
0.0065	0.038431	(0,25)
0.0065	0.046162	(0,45)
0.0078	0.034906	(0,15)
0.0078	0.039513	(0,25)
0.0078	0.045171	(0,45)

Table.2. Transversal Dispersion Coefficient

Velocity (cm/sec)	DT (cm ² /sec)	(x, y) cm
0.0026	0.000758	(10,15)
0.0026	0.000776	(10,25)
0.0039	0.0015024	(10,15)
0.0039	0.0017104	(10,25)
0.0052	0.0028299	(10,15)
0.0052	0.0034936	(10,25)
0.0065	0.0059442	(10,15)
0.0065	0.0080246	(10,25)
0.0078	0.0131011	(10,15)
0.0078	0.0188461	(10,25)

5. Inversion Tomography Result

Apparent resistivity data from the experimental result for velocity 0.0026 cm/sec was generated by inversion tomography finite element method. 2) Pole-Pole electrode configuration was used for calculating apparent resistivity each block number. In this research for pole-pole array all the combination of 22 electrodes position was used to collect data. The finite element mesh for computation in this research can be shown on Fig.2. The result of calculation by inversion tomography for position X = 0.0 cm and y = 15 cm shown in Fig.3 and Fig.4.

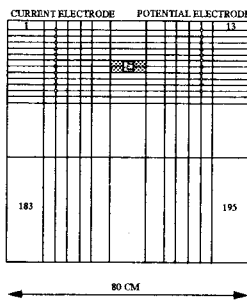


Fig.2 Finite Element Mesh

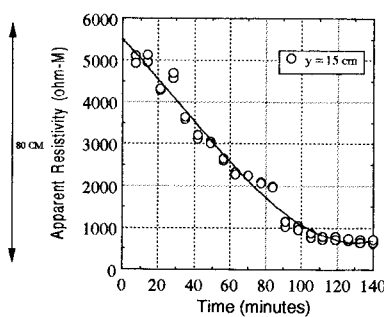


Fig.3 Relationship Between Apparent Resistivity and Time

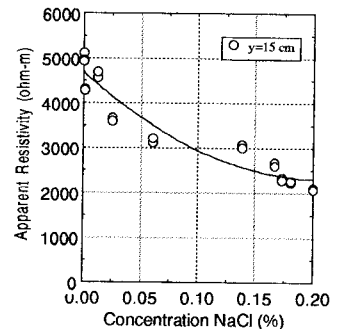


Fig.4 Relationship Between Concentration and Apparent Resistivity.

6. References

- 1) J.C Bruch et.al, Two dimensional Dispersion, Sanitary Engineering Division, ASCE SA6.
- 2) Yutaka Sasaki, Automatic Interpretation of Resistivity Sounding Data Over Two Dimensional Structure, Geophysical Exploration, Vol. 35. No.5, 1981.