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LIST OF SYMBOLS

x_m	Mean
S_i	Standard Deviation
Z_{ij}	J^{th} Value of The Standardised Variable
Q_i	Pumping Rates
k_i	Length of a Substring
Q_{\max}	Sum of Pumping Rates of All Wells
Q_{\min}	Minimum Pumping Rate
N_i	Number of Binary Digits
J^*	Penalized Objective Function Value
J	Management Objective Function
N	Total Number of Instances
p_n	Penalty
a_1	Fixed Capital Cost Per Well
a_2	Installation and Drilling Cost
a_3	Pumping and/or Treatment Costs
a_4	Mass Removal Cost Factor
a_5	Multiplier For an External User-Supplied Cost Function
y_i	Binary Variable
d_i	Depth of Well Bore Associated With Parameter
Δt_i	Duration of Pumping or Injection Associated With Parameter
M_i	Amount of Solute Mass Removed by Well
q	Flow Rate
h	Hydraulic Head

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C	Concentration
NW	Number of Pumping Wells
h_m	Limiting Head
C_m	Limiting Concentration
ρ_a	Apparent Resistivity
Ω	Ohm
R	Resistance
I	Current
a	Spacing
K	Geometric Factor
K_x	Equivalent Freshwater Hydraulic Conductivities in X- Direction
K_y	Equivalent Freshwater Hydraulic Conductivities in Y-Direction
K_z	Equivalent Freshwater Hydraulic Conductivities in Z- Direction
ρ	Fluid Density
ρ_f	Density of Freshwater
h_f	Equivalent Freshwater Head
Z	Elevation above Datum of the Centre of a Model Cell
S_f	Equivalent Freshwater Specific Storage
θ	Effective Porosity
C	Solute Concentration
$\bar{\rho}$	Density of Water Entering from a Source or Leaving through a Sink
q_s	Volumetric Flow Rate of Sources or Sinks per Unit Volume of Aquifer
t	Time
D	Hydrodynamic Dispersion Coefficients
q_s	Volumetric Flow Rate Representing Sources and Sinks

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v	Fluid Velocity
C_s	Solute Concentration of Water Entering from Sources or Sinks
R_k	Rate of Solute Production
R	Recharge from Rainfall
f	Rainfall Infiltration Factor

LIST OF ABBREVIATIONS

BIS	Bureau of Indian Standard
CGWB	Central Groundwater Board
CPHEEO	Central Public Health and Environmental Engineering Organisation
CWRDM	Centre for Water Resources and Development Management
DC	Direct Current
DEM	Digital Elevation Model
DES	Dipole Electrical Sounding
EC	Electrical Conductivity
EP	Electrical Profiling
FEMS	Frequency EM Sounding
GA	Genetic Algorithms
GIS	Geographical Information System
GALDIT	An Empirical Model for Estimating Impact of Existing Status of Saltwater Intrusion
GPS	Global Positioning System
ICMR	International Council for Medical Research
IDW	Inverse Distance Weighted
IP	Induced Polarization
IPCC	Intergovernmental Panel on Climate Change
KSREC	Kerala State Remote Sensing and Environmental Centre
MGO	Modular Groundwater Optimizer
MODFLOW	A Software for Modelling of Groundwater Flow

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MT3DMS	Three Dimensional Transport Modelling Software
NAS	National Academy of Science
NRMS.	Normalized Root Mean Square
ppm	Parts Per Million
RIS	Radio Interface Sounding
RMS	Root Mean Square
RP	Radio Wave Profiling;
RVES	Radial VES
SEAWAT	A software for simulating seawater intrusion
SGA	Simple Genetic Algorithm
S/O	Simulation / Optimisation
SP	Spontaneous Polarization
SPSS	Statistical Package for Social Sciences
SRTM	Shuttle Radar Topography Mission
SWII	Saltwater Intrusion Indicator
TDS	Total Dissolved Solids
TH,	Total Hardness
VES	Vertical Electrical Sounding
WHO	World Health Organization