GROUND WATER PROSPECTS MAP

(PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS)

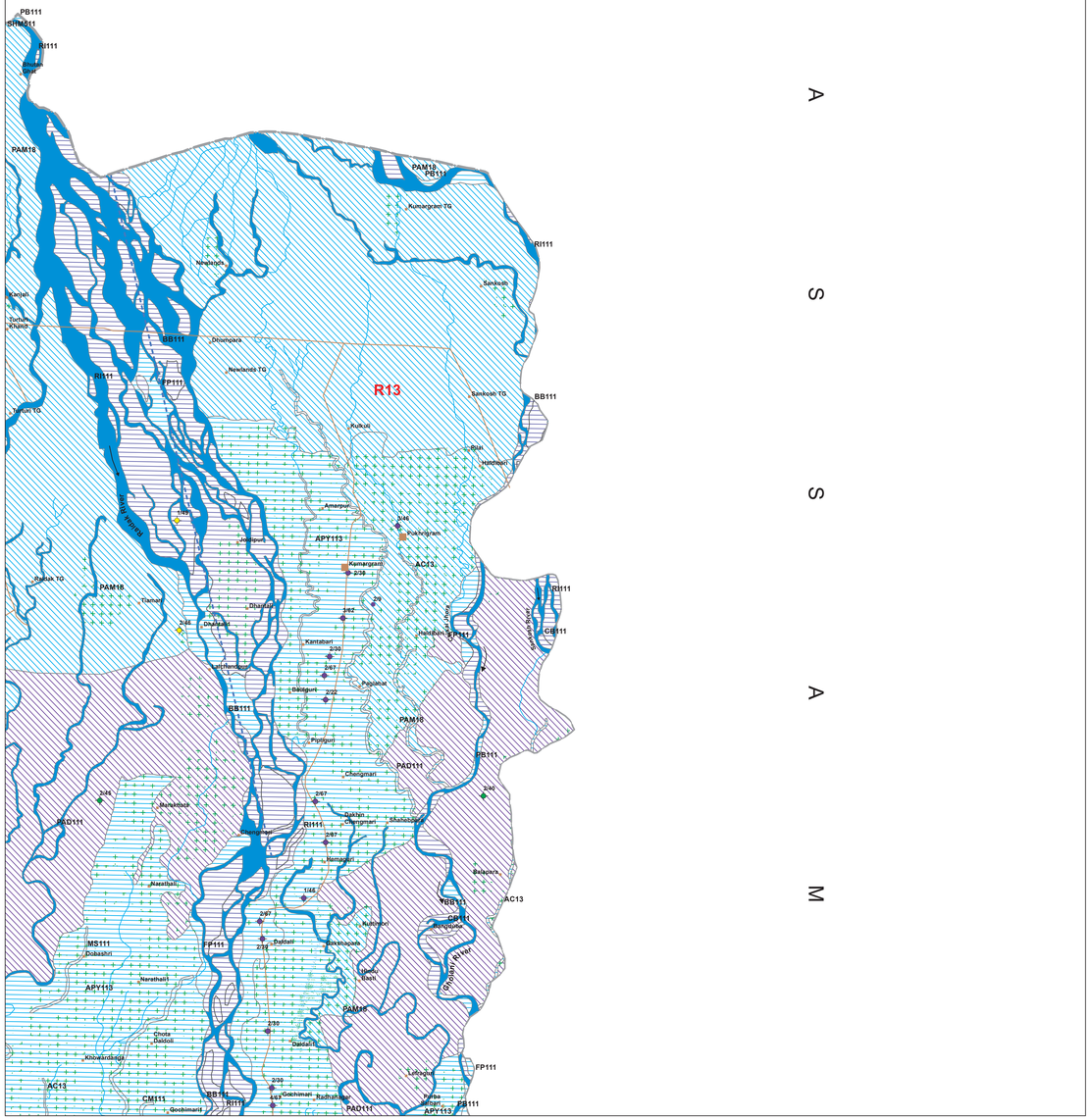
Kilometers

0 1 2 3 4 5

SCALE - 1 : 50,000

MAP SHEET NO. 78F/14

JALPAIGURI & KOCH BIHAR DISTRICTS, WEST BENGAL



A S S A M

DATA USED : IRS - P6 LISS III FCC dated February 2009,March 2009 & Nov 2011, GROUND TRUTH & WELL OBSERVATION during February-March 2011, Published GSI & SOI maps.

Designed & Developed by Hydrogeology Division, NRSC, ISRO

L E G E N D

MAP UNIT (HYDROGEOMORPHIC UNIT) REPRESENTED IN THE MAP WITH ALPHANUMERIC CODE (COLOUR INDICATES YIELD RANGE AND HATCHING INDICATE DEPTH RANGE)	GEOLOGICAL SEQUENCE / ROCK TYPE (REPRESENTED IN THE MAP WITH NUMERIC CODE)	GEOMORPHIC UNIT / LANDFORM (REPRESENTED IN THE MAP WITH ALPHABETIC CODE)	DEPTH TO WATER LEVEL PRE / POST- MONSOON (AVERAGE IN METERS) / NO. OF WELLS OBSERVED	RECHARGE CONDITIONS BASED ON AVAILABILITY OF WATER (RAINFALL & OTHER SOURCES)	GROUND WATER PROSPECTS: AQUIFER MATERIAL (LS = LOOSE SEDIMENTS; CK = CONSOLIDATED ROCK; FR = FISSURED ROCK; FR = FRACTURED ROCK; WR = WEATHERED ROCK / WM = WEATHERED MATERIAL; IR = IMPERVIOUS ROCK)	TYPE OF WELLS SUITABLE (DW = DUG WELL; RW = RING WELL; BW = BORE WELL; TW = TUBE WELL; DBW = DUG CUM BORE WELL / DTW = DUG CUM-TUBE WELL)	DEPTH RANGE OF WELLS (SUGGESTED) MIN - MAX (IN METERS)	YIELD RANGE OF WELLS (EXPECTED) (in LPM or m^3 / day)	HOMOGENEITY IN THE UNIT & SUCCESS RATE OF WELLS (PROBABILITY) VERY HIGH HIGH MODERATE LOW	QUALITY OF WATER POTABLE (P) NON - POTABLE (NP) (INDICATE REASONS IF NON POTABLE)	GROUND WATER IRRIGATED AREA (APPROX. RANGE IN PERCENTAGE)	RECHARGE STRUCTURES SUITABLE & PRIORITY PT = PERCOLATION TANK; CD = CHECK DAM; NB = NALA BUND; RW = RECHARGE WELL; DT = DESILTING OF TANK; RP = RECHARGE PIT; SD = SUBSURFACE DYKE; RS = RECHARGE SHAFT; ST = STORAGE TANK; SCM = SOIL CONSERVATION MEASURES	REMARKS (PROBLEMS / LIMITATIONS)
CB111	Shaugaon Formation / Present Day Deposits (Present Day) — Alluvium (Sand Dominant) (111)	Channel Bar (CB)	No Well Observed	Excellent	LS	TW	5- 10 m	400-500 LPM	Very High	P	Nil	Not Required	Highly productive shallow aquifer with good recharge from the river base flow.
BB111		Braid Bar (BB)	No Well Observed	Excellent	LS	TW	5-10 m	400-500 LPM	Very High	P	Nil	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
PB111		Point Bar (PB)	No Well Observed	Very Good	LS	TW	5-10 m	300-400 LPM	Very High	P	Nil	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
RI111		River Island (RI)	1 / 1 / 1	Very Good	LS	TW	5-10 m	400-500 LPM	High	P	10	Not Required	Highly productive aquifer in shallow depth.Good recharge
CM111		Cut-off Meander (CM)	No Well Observed	Very Good	LS	RW TW	10-20 m	300-400 LPM	Very High	P	Nil	Not Required	Highly productive shallow aquifers with good recharge.
MS111		Meander Scar (MS)	No Well Observed	Very Good	LS	RW TW	10-15 m	200- 250 LPM	High	P	Nil	Not Required	Highly productive shallow aquifers with good recharge.
FP111		Flood Plain (FP)	2 / 2 / 2	Very Good	LS	TW	<30 m	250-350 LPM	Very High	P	45	Not Required	Receives good recharge and forms shallow aquifer.Overall quality of the water is potable.
PAD111		Piedmont Alluvium Deep (PAD)	2 / 1 / 2	Good	LS	TW	60-80 m	400-500 LPM	Moderate	P	25	Not Required	Good ground water prospect at greater depth as the principal aquifer occurs below PAM.
APY113	Malda/Jalpaiguri Formation (Early - Late Holocene)	Alluvium (Sand and Silt) (113)	Alluvial Plain Younger (APY)	2 / 2 / 11	Good	LS	TW	25-30 m	200-250 LPM	High	P	75	Not Required	Highly productive aquifer at shallow depth with good recharge.
AC13		Alluvium (Sand,Silt & Clay) (13)	Abandoned Channel (AC)	No Well Observed	Excellent to Very Good	LS	RW TW	10-15 m	250-300 LPM	Very High	P	Nil	Not Required	Highly productive shallow aquifers with good recharge from base flow.
PAM18	Samsing Fm (Late Pleistocene)	Alluvium (Gravel Dominant) (18)	Piedmont Alluvium Moderate (PAM)	3 / 2 / 3	Good	LS	RW TW	40 - 60m	300-400 LPM	Moderate	P	35	Not Required	Good ground water prospect at modarate depth along piedmont slope.
SHM511	Siwalik (Pliocene-Eocene)	Sandstone & Conglomerate (511)	Structural Hill Moderately Dissected (SHM)	Essentially run-off zone. Drinking water sources primarily from springs and river/stream water. Limited prospects along Intermontane Valleys.										

F____F/ ____ / — — -

These are fault / fracture zones, which generally act as conduits for movement of ground water in hard rocks. Along these zones, the yields are significantly higher and wells are likely to be sustainable for longer duration. However, the inferred fractures need to be confirmed by detailed ground surveys.

D____D /Q____Q / P____P
D— —D /Q— —Q / P____P

These are dykes, quartz reefs and pegmatite veins, which generally act as barriers for ground water movement.

N.B.-The depth range and yield range of wells may vary within the unit because of certain inhomogeneities. Fractures/Lineaments which are clearly observed / inferred from the satellite image are indicated on the map. There could be some obscured fractures which also influence the ground water prospects. Locations of the recharge structures shown in the map are tentative. This map is useful for narrowing down the target zones,and exact location on the ground for wells and recharge structures should be identified based on follow-up ground hydrogeological/geophysical surveys.

GROUND WATER PROSPECTS INFORMATION

YIELD RANGE OF WELLS	COLOUR CODE	DEPTH RANGE OF WELLS: SHALLOW (<30 METERS)	MODERATE (30 - 60 METERS)	DEEP (>60 METERS)
> 800 LPM	VIOLET			
400 - 800 LPM	INDIGO			
200 - 400 LPM	BLUE			
100 - 200 LPM	GREEN			
50 - 100 LPM	YELLOW			
30 - 50 LPM	ORANGE			
20 - 30 LPM	BROWN			
10 - 20 LPM	PINK			
Prospects limited to valley portions only (Hills, Plateaus etc.)	RED			
Run-off zone/ Barren for G.W. movement		(Inselberg / Ridge / Dyke etc.)		

HYDROLOGICAL INFORMATION

DESCRIPTION	SYMBOL
CANAL / TANK IRRIGATED AREA	
GROUND WATER IRRIGATED AREA	
RIVER / STREAM (with sand)	
WATER BODY / SPRING	
CANAL	
RAIN GUAGE STATION (With average annual rainfall in mm)	800

RECHARGE STRUCTURES SUGGESTED

PERCOLATION TANK		CHECK DAM	
NALA BUND		RECHARGE WELL	
DESILTING OF TANK		RECHARGE PIT	
SUBSURFACE DYKE		RECHARGE SHAFT	
SOIL CONSERVATION MEASURES		STORAGE TANK	

WELLS OBSERVED DURING PRE & POST MONSOON PERIOD

YIELD RANGE IN LPM	BORE / TUBE WELL	YIELD RANGE IN m^3 / day	DUG WELL / RING WELL
> 800 LPM	16/70	> 400 m^3 / day	8/15
400 - 800 LPM	16/70	200 - 400 m^3 / day	8/15
200 - 400 LPM	15/70	100 - 200 m^3 / day	8/15
100 - 200 LPM	15/70	50 - 100 m^3 / day	8/15
50 - 100 LPM	15/70	25 - 50 m^3 / day	8/15
30 - 50 LPM	15/70	15 - 25 m^3 / day	8/15
20 - 30 LPM	15/70	10 - 15 m^3 / day	8/15
10 - 20 LPM	15/70	5 - 10 m^3 / day	8/15
< 10 LPM	15/70	< 5 m^3 / day	8/15

Colour inside well symbol indicates yield range. The figures on the top right hand side of well indicate the depth to water level and depth of well in meters

DUG / CUM- BORE WELL — HAND PUMP WELL
ARTESIAN WELL — OBSERVATION WELL OF G.W DEPT. / C.G.W.B.

STRUCTURAL INFORMATION

DIPS	BEDDING	SCHISTOSITY / FOLIATION
GENTLE (< 15)		
MODERATE (15 - 45)		
STEEP (45 - 80)		
SUB - VERTICAL TO VERTICAL (> 80)		

ANTICLINE / ANTIFORM

SYNCLINE / SYNFORM

TREND LINE

ESCARPMENT

LITHOLOGY / GEOMORPHIC UNIT BOUNDARY

	MINOR	MAJOR
FAULT	F F	F F
THRUST	T T	T T
FRACTURE / LINEAMENT		
FRACTURE / LINEAMENT (Inferred)		
SHEAR ZONE (Confirmed / Inferred)	S S	S S
DYKE (Confirmed / Inferred)	D D	D D
QUARTZ REEF (Confirmed / Inferred)	Q Q	Q Q
PEGMATITE VEIN (Confirmed / Inferred)	P P	P P

Lithologic contacts are inferred at places & Geomorphic boundaries are gradational

BASE MAP INFORMATION

SYMBOL	DESCRIPTION
NH- 34	NATIONAL HIGHWAY
SH -12	STATE HIGHWAY
	METALLED ROAD
	OTHER ROAD
	RAILWAY
	CITY / VILLAGE
	HABITATIONS : NON - COVERED (NC) PARTIALLY COVERED (PC)

BOUNDARY :
INTERNATIONAL
STATE
DISTRICT
BLOCK

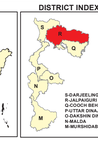
OTHER INFORMATION

Rainfall : 3102 mm
Nearest Rain gauge Station : Jalpaiguri (Source IMD)

LOCATION INFORMATION

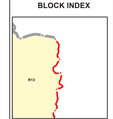
STATE INDEX

DISTRICT INDEX



D-DARJEELING
J-JALPAIGURI
C-COOCH BEHAR
P-UTTAR DINAJPUR
Q-DAKSHIN DINAJPUR
M-MALDA
M-MURSHIDABAD

BLOCK INDEX



MAPSHEET INDEX

78F9	78F13	78J1
78F10	78F14	78J2
78F11	78F15	78J3

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GEOINFORMATICS & REMOTE SENSING CELL
W.B. STATE COUNCIL OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
GOVERNMENT OF WEST BENGAL
4TH FLOOR, BIKASH BHAVAN
SALT LAKE, KOLKATA 700 091

TECHNICAL GUIDANCE & QUALITY CHECK
NATIONAL REMOTE SENSING CENTRE
INDIAN SPACE RESEARCH ORGANISATION (ISRO)
DEPT. OF SPACE, GOVT. OF INDIA
BALANAGAR, HYDERABAD - 500 625

PARTICIPATING ORGANIZATIONS
PHED, GOVT. OF WEST BENGAL
GEOINFORMATICS & REMOTE SENSING CELL
W.B. STATE COUNCIL OF SCIENCE AND TECHNOLOGY,GOWB
STATE WATER INVESTIGATION DIRECTORATE, GOWB

METHODOLOGY & PROJECT EXECUTION
NATIONAL REMOTE SENSING CENTRE
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