GROUND WATER PROSPECTS MAP (PREPARED FROM SATELLITE IMAGE INTERPRETATION WITH LIMITED FIELD CHECKS) SCALE - 1: 50,000 Kanksa Agricultural Farm NRSC (ISRO), DEPT. OF SPACE, GOVT. OF INDIA Designed & Developed by Hydrogeology Division, NRSC, ISRO DATA USED: IRS - P6 LISS III FCC dated February 2006, GROUND TRUTH & WELL OBSERVATION during April-May, 2009 & Jan-Feb, 2010, Published Geological maps & Literatures.

L E G E N D

MAP UNIT	GEOLOGICAL SEQUENCE ROCK TYPE	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						RECHARGE STRUCTURES	REMARKS
(HYDROGEOMORPHIC UNIT) REPRESENTED IN THE MAP WITH ALPHANUMERIC CODE (COLOUR INDICATES YIELD RANGE AND HATCHING INDICATE DEPTH RANGE)	(REPRESENTED IN THE MAP WITH NUMERIC CODE)				AQUIFER MATERIAL LS = LOOSE SEDIMENTS PR = PERMEABLE ROCK FIR = FISSURED ROCK FR = FRACTURED ROCK WR /= WEATHERED ROCK / WM WEATHERED MATERIAL IR = IMPERVIOUS ROCK IM = IMPERVIOUS MATERIAL	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)	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 MEASUR	(PROBLEMS / LIMITATIONS)
PB111	ay Deposits	Point Bar (PB)	1	Very Good	LS	RW TW	5-10 m	300-400 LPM	Very High	Р	7%	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
CB111	(Present Day) (Present Day) (Present Day) (Present Day) (111)	Channel Bar (CB)	5 - 6	Excellant	LS	RW TW	5-10 m	400-500 LPM	Very High	Р	42%	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
FP111	Hugli Format	Flood Plain (FP)	5 - 22 104	Very Good	LS	RW TW	<30 m	400-800 LPM	Very High	Р	93%	Not Required	Groundwater prospects very high with high recharge potential. Recharge structures not required.
APY113	Alluvium (Sand and Silt) (Sand and Silt) (113)	Alluvial Plain Younge (APY)	7.01 - 7.05 HP - 2	Very Good	LS	DW TW	10 - 12 m 20 - 30 m	125 - 150 m ³ /day 250 - 300 LPM	Very High	Р	50%	Not Required	Aquifer is formed of Sandy part of alluviu Recharge structures not required as good recharge conditions prevail
APO13	Alluvium (Sand with silt Early Hopozole and clay) (13)	Alluvial Plain Older (APO)	No wells observed	Good	LS	DW TW	10 - 20 m 30 - 50 m	80 - 100 m ³ /day 175 - 200 LPM	High	Р	25%	Not Required	Aquifer is formed of Sandy part of alluviu Recharge structures not required as goo recharge conditions prevail
VFS211	tocene) Laterite	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	50 - 60 m	75 - 100 LPM	Moderate	Р	10%	DT Moderate	Recharge structures will increase the sustainability of groundwater
LP211	(Ferricrete-hard crus lateritic nodules and lithomarge clay) (211)		4.59 - 8.44 DW - 18 HP - 15	Limited	WM+FR	DW TW / BW	15 - 20 m 50 - 60 m	25 - 50 m ³ /day 50 - 100 LPM	Moderate	Р	20%	RW / DT High	Areas of exposed lithomarge clay. Fraction zones form the aquifer, recharge structure will enhance groundwater development
DLU211	Lalgarh (Middle	Dissected Lateritic Upland (DLU) Hard crust and Lateritic nodules	4.27 - 6.79 DW - 3 HP - 1	Nil to moderate	WM+IR (Impervious materia	TW / BW	80 - 100 m	30 - 50 LPM	Low	Р	Nil	Not Required	Essentially run-off zone where hard capping present. Areas of nodular laterites are rechard zones with deep water table conditions. Prima forest areas with sparse settlements. Not suit for large scale development of groundwater
VFS512	Sandstone (Supra Panchet)	Valley Fill Shallow (VFS)	No wells observed	Good	LS Underlain by WM+FR	TW / BW	30 - 50 m	150 - 175 LPM	Moderate	Р	Nil	RP / DT Moderate	Groundwater prospects good.Recharge structures will increase groundwater development
BPS512	(Mahadeva Formation (512)	Buried Pediplain Shallow (BPS)	4.77 - 6.23 DW - 4	Moderate	WM+FR	DW TW / BW	5 - 10 m 40 - 60 m	15 - 25 m³/day 75 - 100 LPM	Low	Р	Negligible	RP / DT High	Weathered and Fractured Standstone for the aquifer.Better prospects along fracture zones
BPM55	Shale with Sandstone Bands	Buried Pediment Medium (BPM)	6.00 HP - 1	Moderate	WM+FR	DW TW / BW	15 - 20 m 40 - 50 m	10 - 15 m ³ /day 100 - 125 LPM	Moderate	Р	Nill	Not Required	Recharge structures not required since there are no settlements in the unit
BPS55	(Panchet Formation)	Buried Pediplain Shallow (BPS)	4.52 - 7.94 DW - 9 HP - 1	Limited	WM+FR	DW TW/ BW	15 - 20 m 40 - 60 m	5 - 10 m /day 50 - 100 LPM	Low	Р	10%	Not Required	Aquifer conditions modified by coal minimactivities. Groundwater development may not be sustainable in the long run. Areas piped water supply
VFS531	Sandstone & Shale with Coal	Valley Fill Shallow (VFS)	No wells observed	Good	LS Underlain by WM+FR	TW / BW	20 - 25 m	75 - 100 LPM	Moderate	Р	10%	Not Required	Aquifer conditions modified by coal minir activities. Groundwater development may be sustainable in the long run. Areas of p water supply
BPS531	(Raniganj Formation) (531)	Buried Pediplain Shallow (BPS)	4.77 - 8.95 DW - 5 HP - 1	Moderate	WM+FR	DW TW / BW	5 - 10 m 20 - 30 m	10 - 15 m ³ /day 30 - 50 LPM	Low	Р	Negligible	Not Required	Aquifer conditions modified by coal minir activities. Groundwater development may be sustainable in the long run. Areas of p water supply
BPS54	Sandy Shale (Barren Measure) (54)	Buried Pediplain Shallow (BPS)	3.45 - 3.79 DW - 2	Limited	WM+FR	DW TW / BW	5 - 10 m 40 - 60 m	< 5 m ³ /day 30 - 50 LPM	Low	Р	20%	RW / DT Moderate	Recharge structures will increase scope groundwater development
VF\$832	Complex 400 mill.yrs)	Valley Fill Shallow (VFS)	No wells observed	Moderate	LS Underlain by WM+FR	TW / BW	30 - 50 m	150 - 175 LPM	Moderate	Р	10%	CD Moderate	Prospects inferred as no wells observed Recharge condition is moderate with moderate groundwater prospects
BPM832	Granitoid Gneiss (83) (83)	Buried Pediplain Moderate (BPM)	No wells observed	Limited	WM+FR	DW TW / BW	5 - 10 m 40 - 50 m	15 - 25 m ³ /day 150 - 175 LPM	Moderate	Р	50%	RP Moderate	Recharge structures will improve ground water prospects
BPS832	Chhotanaç (Lower Prot	Buried Pediplain Shallow (BPS)	No wells observed	Limited	WM+FR	DW TW / BW	5 - 10 m 40 - 60 m	10 - 15 m ³ /day	Low	Р	30%	RP High	Recharge structures will improve sustainability of groundwater sources

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 /Q Q P 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 be identified based on follow-up ground hydrogeological/geophysical surveys.

GROUND WATER PROSPECTS INFORMATION	HYDROLOGICAL INFORMATION	STRUCTURAL INFORMATION	BASE MAP INFORMATION	LOCATION INFORMATION		
YIELD COLOUR DEPTH RANGE OF WELLS	DESCRIPTION SYMBOL	DIPS BEDDING SCHISTOSITY/ FOLIATION	SYMBOL DESCRIPTION	STATE INDEX DISTRICT INDEX		
RANGE CODE SHALLOW MODERATE DEEP OF WELLS SO METERS 30 METERS > 80 METERS	CANAL / TANK IRRIGATED AREA	GENTLE (<15)	NH - 2 NATIONAL HIGHWAY			
	GROUND WATER IRRIGATED AREA	MODERATE (15 - 45)	SH - 9 STATE LUCUIMAY			
> 800 LPM VIOLET	RIVER / STREAM (with sand)	STEEP (45 - 80) SUB - VERTICAL	STATE HIGHWAY	A A		
	WATER BODY / SPRING	TO VERTICAL (> 80)	METALLED ROAD			
400 - 800 LPM INDIGO	CANAL RAIN GUAGE STATION (With average annual rainfall in mm)	ANTICLINE / ANTIFORM ←←	OTHER ROAD	INDIA		
200 - 400 LPM BLUE	RECHARGE STRUCTURES SUGGESTED	SYNCLINE / SYNFORM ←	RAILWAY	WEST		
100 - 200 LPM GREEN	PERCOLATION TANK NALA BUND DESILTING OF TANK SUBSURFACE DYKE SUBSURFACE DYKE RECHARGE SHAFT RECHARGE SHAFT	TREND LINE	CITY / VILLAGE	BENGAL A-BIRBHUM B-BARDDHAMAN C-PURULIYA D-BANKURA E-PASCHIM MEDINIPUR		
50 - 100 LPM YELLOW	SOIL CONSERVATION MEASURES WELLS OBSERVED DURING FIELD VISIT YIELD RANGE BORE / YIELD RANGE DUG WELL / RING WELL IN LPM TUBE WELL IN m ³ / day RING WELL	LITHOLOGY / GEOMORPHIC UNIT BOUNDARY	HABITATIONS : NON - COVERED (NC) PARTIALLY COVERED (PC)	BLOCK INDEX MAPSHEET INDEX		
30 - 50 LPM ORANGE	> 800 LPM	### FAULT F F F F F F F F F F F F F F F F F F F	BOUNDARY:	BLOCK INDEX MAPSHEET INDEX		
20 - 30 LPM BROWN	200 - 400 LPM	THRUST T T T T T T T T T T T T T T T T T T	DISTRICT	A19 A18		
	30 - 50 LPM	FRACTURE / LINEAMENT	ВLОСК	73M/2 73M/6 73M/10		
10 - 20 LPM PINK	20 - 30 LPM + 15/70 10 - 15 m ³ / day 8/15	SHEAR ZONE (Confirmed / Inferred) S S/S S/S S	OTHER INFORMATION	B07		
Prospects limited to valley portions only	10 - 20 LPM	DYKE (Confirmed / Inferred) OUADTZ DEEE (Confirmed / Inferred)	Rainfall: 1348mm	A17 ILLAMBAZAR B05 ONDAL A18 DUBRAJPUR B06 PNADABESWAR		
(Hills, Plateaus etc.)	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	QUARTZ REEF (Gommined/microca)		A19 KHAYRASOL B07 FARIDPUR-DURGAPUR B08 KANSKA B09 AUSGRAM - II		
Run-off zone/ Barrier for G.W. movement (Inselberg / Ridge / Dyke etc.)	DUG - CUM- BORE WELL ARTESIAN WELL ARTESIAN WELL DUG - CUM- BORE WELL HAND PUMP WELL OBSERVATION WELL OF	PEGMATITIE VEIN (Confirmed / Inferred) Lithologic contacts are inferred at places & Geomorphic boundaries	(Source IMD)	D08 BARJORA		
PREPARED BY	G.W DEPT. / C.G.W.B. TECHNICAL GUIDANCE & QUALITY CHECK	PARTICIPATING ORGANIZATIONS	METHODOLOGY & DROJECT EXECUTION	SPONSORED BY		
GEOINFORMATICS & REMOTE SENSING CELL I.B. STATE COUNCIL OF SCIENCE AND TECHNOLOGY	इसरो isro	SURVEY OF INDIA	METHODOLOGY & PROJECT EXECUTION	RAJIV GANDHI NATIONAL DRINKING WATER MISSION (PHASE III B)		
DEPARTMENT OF SCIENCE AND TECHNOLOGY	NATIONAL REMOTE SENSING CENTRE	GEOLOGICAL SURVEY OF INDIA	NATIONAL REMOTE SENSING CENTRE	DEPARTMENT OF DRINKING WATER SUPPLY (DDWS)		
GOVERNMENT OF WEST BENGAL 4TH FLOOR, BIKASH BHAVAN SALT LAKE, KOLKATA 700 091	INDIAN SPACE RESEARCH ORGANISATION (ISRO) DEPT. OF SPACE, GOVT. OF INDIA BALANAGAR, HYDERABAD - 500 625	PHED, GOVT. OF WEST BENGAL STATE WATER INVESTIGATION DIRECTORATE, GOWB P.S.MAPS (LAND RECORD), GOVT OF WEST BENGAL	INDIAN SPACE RESEARCH ORGANISATION (ISRO) DEPT. OF SPACE, GOVT. OF INDIA BALANAGAR, HYDERABAD - 500 625	MINISTRY OF RURAL DEVELOPMENT GOVERNMENT OF INDIA NEW DELHI		