2021 5

7

500t/ km^2 a

2021 9

99.64% 99.20%

1.07 99.99% 99.16%

55.69%

2021 9

			/18628345373
	1km²		
	78000 m²		
	12		
	1 1		120899
	3050m²		60 2016 9 2017 11 2021 8

			156 0807 5343

				1500t/km²
		136.66hm²		500t/km²
		2020.50		466t/km²
		77500m² 57100m² 6510m³ 1925m 12800m² 12800m² 378m³ 1264m³ 883m 10 1980m³ 94400m² 94400m² 0.66hm² 21634m 720m³ 280m 260m		
		104600m² 6580m³ 32700m² 1900m² 770m² 4330m² 10740m² 78200m² 1900m² 4718m²		
		5012m³ 56800m² 78600m² 5580m² 6860m² 182.6m³ 36800m² 710m³ 1248m 10 12400m² 830m 8 22310m² 15600m² 280m³ 4210m² 68m³		

			95%	99.56%		43.21 hm^2		52.92 hm^2		96.48hm^2
			1.0	1.07			136.66hm^2			43.56hm^2
			99%	99.20%			2.01hm^2			500t/km^2
			95%	99.99%			41.20hm^2			466t/km^2
			99%	99.16%			41.55hm^2			76.11hm^2
			27%	55.69%			71.05 m^3			0
			(GB 50434-2018)							

..... 1
1 5
1.1 5
1.2 23
1.3 24
2 30
2.1 31
2.2 31
2.3 32
2.4 33
3 36
3.1 36
3.2 38
3.3 38
3.4 38
3.5 41
4 42
4.1 42
4.2 45
4.3 47
4.4 48
5 50

5.1 50
5.2 50
5.3 51
5.4 52
6 53
6.1 53
6.2 53
6.3 54
6.4 54
6.5 55
6.6 55
7 57
7.1 57
7.2 58
7.3 59
7.4 59
8 61
8.1 61
8.2 61
8.3 61

1

1.1

1.1.1

1.1.1.1

30km 10km

碍 217

100 08 19.6 29 21 27.6 4400m

100 19'13.64" 29

01'37.88" 3740m 30min

1.1.1.2

(KM2A) $1km^2$

5195 (ED) 1171 (MD)

(WCDA) $78000m^2$

(WFCTA) 12

(KM2A)

(WFCTA) (WCDA)

$83144.79m^2$

60

2016 8 2017 11 2021 8

120899 28048

1.1.1.3

îÌÝ1®

1.1-1

1.1-1

		1 km^2 (KM2A) 5195 (ED) 1171 (MD) 78000 m^2 (WCDA) 12 (WFCTA)
		1095m 675m 420m 883m S217 WCDA 480m 100m 150m
		23.41km 0.374km 6.5m 6.268km 4.5m 16.764km 3.5m 1.10km 0.15km 0.28km 0.67km 3.0m
		2
		1.33hm^2 1 1 1618m^2 3050m^2

1.1-2

1	MD	m^2	42000
2	ED	m^2	5195
3	WCDA	m^2	5000
4	WFCTA	t	12

2

a)

$0.38hm^2$

b)

4

( ) 1 / 1 ( ) 1

( )

c)

LHAASO

$461.6m^3/d$ + + +

碍

WCDA L

B H=5m 3m 7.5m

( ) L B H=10m 2m 3m

$500m^3$ ( ) L B H=8m 8m 4.2m

L B H=5.4m 3.9m 9.0 m

DN100 1.5m

955m

d)

146t/d 42t/d

87

( ) UPVC

WCDA

WCDA 805m 1.0 0.8m(B H)

e)

35kV 35kV 35kV 10kV

20km 35kV

35kV 10kV

$0.24hm^2$ $0.03hm^2$

$0.63hm^2$ 35kV $0.25hm^2$ 35kV

$0.24hm^2$ $0.14hm^2$

f)

1.3km (4084m) (

) 2m 0.5m

3

a

650m

C15 160m 4 4

4430.00m 2.5m 1.2m 1:0.5

2.45m C20 80cm 2.0m

2.5 2.0m

$2m^3/s$

100m

100m

217

1.0m 1.0m 1:1 30cm

4

a

23.406km

15m 15m

74 S21 0.374km

20km/h 6.5m 0.34hm^2

6.268km 4.5m 5.01hm^2 16.764km

3.5m 10.07hm^2

3

50t 24

20km/h 4.5m

15km/h

3.5m

b

1.10km 0.15km

0.28km 0.67km 3.5m 4.0m

0.5m

碍 1.33hm^2

3050m^2 1618m^2

4.0m 8.0m

6.0m 354m 12

D110 UPVC

260m 280m

0.5m 0.6m

4718m^2

10kV 10kV 45#

10kV 0.465km

0.015km

PE-160

10

1.1.1.4

[2017]337 137.52hm^2 136.86hm^2

0.66hm^2

136.66hm^2 133.9hm^2 2.76hm^2

1.1-3 hm^2

		69.9	69.9	
		2.03	2.66	
		4	2.47	
		15.17	15.42	
		0.66	0.66	

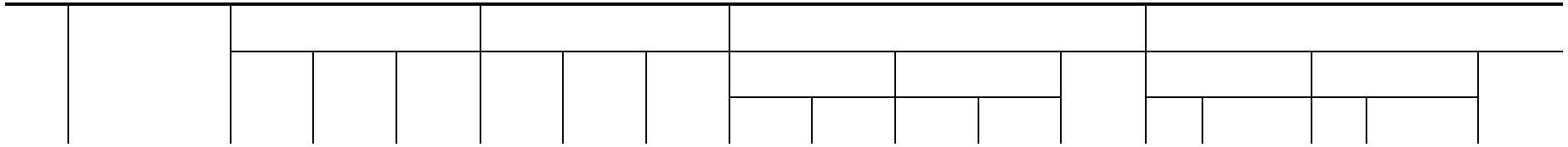
		1.06	1.06	
		43.16	43.16	
		1.54	1.33	
		137.52	136.66	

1.1.1.5

71.05 m^3 1.09 m^3

71.05 m^3 1.09 m^3

1.1-4 m^3



KM2A-ED>

			0.57	0	0.57	0.57	0	0.57		-	0	-	0	0	-	0	-	0
			14.24	0.2	14.44	11.58	0	11.58	0	-		-	0	2.58	-	0.2	-	2.78
			0	0	0	0	0	0	0	-	0	-	0	0	-	0	-	0
			0	0	0	0	0	0	0	-	0	-	0	0	-	0	-	0
			69.66	1.02	70.76	69.66	1.02	70.68	12.66	-	0.45	-	13.11	12.66	-	0.45	-	13.11
			0.3	0.07	0.37	0.3	0.07	0.37	0	-	0	-	0	0	-	0	-	0
			69.96	1.09	71.05	69.96	1.09	71.05	12.66	-	0.45	-	13.11	12.66	-	0.45	-	13.11

1.1.1.6

120899 28048

1.1.1.7

2016 8 2017 11 2016 6

50

2016 9 2017 11 2021

8 60

1.1.2

1.1.2.1

(4400m)

4400m 40m

NE

30m ~70m

-

3740m

1.1.2.2

1

a

(LHAASO) -

(51-1)

b

- -

80 9

50km 9 4.6

- 2 3 3.6

GB18306-2015 7

c

1

( )

0.5m

5cm

40

2

( )

-

I

4m I

3

( )

( )

4

/ /

/

/

/

/

90%

/

0.5m-1m

5

Ⅷ1.0m

2.3m

2.5m

>2m

7.7% 0.6m

0.74m

6

1.6m~2.0m

~

1.0 1.5m

7

2.10hm^2

MD 7143.5m^2

0.5m

2

1.1.2.3

5km

10km

657.3mm 0.1mm

120.6 50 1 48.4mm

5~10 97.7% 11~4 2.3%

1818.4mm(20cm) 5 237.7mm 5.4

18.5 -4.5 27.9

-27.6 10 1254 55.1%

2.1m/s 21.7m/s W 201.3d

12 2 0

2.3m 2.5m 22.0cm

2009~2011 652.8mm

45.1mm 5~10 95.3% 11~4

4.7% 1.2 20.9

-22.9 1~7 NNE( ) 8~12 SW( )

42d 3~5 35cm

186d

1.1.2.4

104km 3614km^2 51.5m^3/s

3000m

121km

111km

碍 碍

(6204m)

碍

- 4420m 7.5km^2

碍

14.9km

43.3km^2 0.278~0.376m^3/s

2km

14.1km 31.8km^2 0.545m^3/s (0.287~0.385m^3/s)

碍 200m 碍

75.2km^2 S217 1.295m^3/s

2000 m^3

4 5~11

12 ~ 4

49.4m^3/s 15.6 m^3

4 6~9 5 10

11 4

(5~11) 72.3m^3/s 85.8%

(12~ 4) 16.9m^3/s 14.2% 1~3

15.0m^3/s 7.5% 2

3 (2) 2.4%

220m

40km 575.97km^2

5.54m^3/s 812m(3708m 4520m) 5.54m^3/s

5km

5m^3/s

0.5m^3/s

1.1.2.5

4800m 4200m~4800m

3600m~4200m 3500m~4300m 2700m~3500m

2200m~3000m 1900m~2200m

4400m

3740m

1.1.2.6

(1920m~2000m)

(2000m~2900m) (2900m~3900m)

(3900m~4400m) (4400m~4700m) (

4700m~5000m)

4400m

30%

3700m

1.1.3

1.1.3.1

1

[2013]188 [

] [2017]482

GB50434-2008

2

-4-1wh

(SL190-2007)

4

2021 9

1.3

1.3.1

2021 5

1.3.2

1

2021 5

2

3

氨

1.3-1

1.3-1

1			
2			
3			
4			

1.3.3

1 3

2

1

3 1

1.3.4

GPS

1.3-2

1	50m		1
2			1
3	2m		8

4			5
5			1
1	GPS		1
2			1
3			1
4			1
5			1
6			1
7			1
8			1
9			1
10			1
11			10
12			30
13	Mavic 2		1

尾	尾

1.3-1

1.3.5

[2020]1883 ,

,

1

GPS

1~4m^2

2

GIS GIS

GIS

1.3.6

2021 5

2021 9

2

2015 139

[2018]887

[2020]161 [2015]139 [2020]1883

2.1

$136.66hm^2$

2.1-1

2.1-1

2.3

2.3.1

2.3.2

2.3.3

2.3-1

2.3-1

				3
				2
				2
				2
				1

2.4-1

				3	
				1	
2017.11-2021.5					
				1	
				2	
				1	
				1	

				1	
				1	
2021.5-2021.8				3	
				2	3 3
					3 3
					3 3
				1 10	3 3

3

3.1

3.1.1

1 137.52hm^2

3.1-1

3.1-1 hm^2

		69.90	0	69.90
		2.03	0	2.03
		4.0	0	4.0
		15.83	0	15.83
		1.06	0	1.06
		43.16	0	43.16
		135.98	0	135.98
		1.54	0	1.54
		137.52	0	137.52

2

136.66hm^2 3.1-2

3.1-2 hm^2

		69.90	69.90
		2.66	2.66
		2.47	2.47
		16.08	16.08
		1.06	1.06
		43.16	43.16
		135.33	135.

3.1-3 合 hm^2

		69.9	69.9	69.9		
		2.03	2.66	2.66	0.63	0.63hm^2
		4	2.47	0.37	-1.53	1.53hm^2
		15.83	16.08	15.42	0.25	0.25hm^2
		1.06	1.06	0		
		43.16	43.16	44.22		

	1.54	1.33	1.33
	137.52	136.66	133.90

3.2

3.3

71.05 ÍÎPDA6 1.09 m^3

3.4-1 A m^3 en-AUS-US

KM2Am

			0.57	0	0.57	0.57	0	0.57		-	0	-	0	0	-	0	-	0
			14.24	0.2	14.44	11.58	0	11.58	0	-		-	0	2.58	-	0.2	-	2.78
			0	0	0	0	0	0	0	-	0	-	0	0	-	0	-	0
			0	0	0	0	0	0	0	-	0	-	0	0	-	0	-	0
			69.66	1.02	70.76	69.66	1.02	70.68	12.66	-	0.45	-	13.11	12.66	-	0.45	-	13.11
			0.3	0.07	0.37	0.3	0.07	0.37	0	-	0	-	0	0	-	0	-	0
			69.96	1.09	71.05	69.96	1.09	71.05	12.66	-	0.45	-	13.11	12.66	-	0.45	-	13.11

3.5

4

4.1

4.1.1

2

4.1.1.1

23.34hm^2

77500m^2 MD WCDA MD

57100m^2 3 ~6

MD

45.61hm^2

10.85hm^2 0.1m~0.3m

600m^3/hm^2 6510m^3

4.1.1.2

WCDA 805m

1.0m 0.8m

390m 160m

110m 660m

0.3m 0.15m C20

3

1.28hm^2 12800m^2

MD

12800m^2 3 ~6 MD

0.74hm^2 0.63hm^2

0.1m~0.3m

600m^3/hm^2 378m^3

MD

4.1.1.3

883m 1.5m M10

S217

3.59hm^2 0.08hm^2

3.51hm^2 0.1m~0.3m

0.2m 600m^3/hm^2

2106m^3

4.1.1.4

6544m

0.5m×0.4m 15090m 0.3m×0.3m

1000m 1

3m 1.5m 1.5m( ) 6

25

8.97hm^2 8.97hm^2

MD

3

~6 MD 0.47hm^2

0.47hm^2

4.03hm^2 3.30hm^2

0.1m~0.3m

600m^3/hm^2 1980m^3

0.66hm^2

4.1.1.5

650m

0.3m 0.3m 2.0m 1.0m 1.0m( ) 4

1.54hm^2 720m^3

4.1.2

2016 9 2021 8

4.1.3

4.1-5

4.1-5

			m^2	77500	77500	0	
			m^2	57100	57100	0	
			m^3	6510	6510	0	
			m	1465	1925	460	
				3	0	-3	
			m^2	12800	12800	0	
			m^2	12800	12800	0	
			m^3	378	378	0	
			m^3	2106	1263.6	-842.4	
			m	1250	883	-367	
				25	10	-15	

			m^2	94400	94400	0	
			m^2	94400	94400	0	
			m^3	1980	1980	0	
			hm^2	0.66	0.66	0	
			m	21634	21634	0	
			m^3	720	720	0	
			m	650	280	-370	
			m	0	260	260	
				4	0	-4	

4.2

4.2.1

4.2.1.1

MD 13.73hm^2

10.46hm^2

MD 32700m^2 0.2m

6580m^3 1：1

15g/m^2

4.2.1.2

1800m^2 800m^2 100m^2

700m^2 1：1

15g/m^2

4.2.1.3

1.79hm^2 0.2m 3580m^3

1。1 150kg/hm^2

4.2.1.4

7.35hm^2

1。1 15g/m^2 1900m^2

4700m^2 1900m^2

4.2.1.5

110m^2 60m^2 720m^3

4.2.2

2016 9 2021 8

			m^2	17900	10740	-7160	
			m^2	73500	73500	0	
			m^2	4700	4700	0	
			m^2	1900	1900	0	
			m^2	110	0	-110	
			m^2	5410	4718	692	

4.3

4.3.1

4.3-1

			m^3	4098.5	5012	913.5	
			m^2	60000	56800	-3200	
			m^2	75000	78600	3600	
			m^2	5000	5580	580	
			m^2	10000	6860	-3140	
			m^3	262.5	182.6	-79.9	
			m^2	40000	36800	-3200	
			m^3	750	710	-40	
			m	1510	1248	-262	
				3	10	7	
			m^2	11000	12400	1400	
			m	800	830	30	
				5	8	3	
			m^2	20000	22310	2310	
			m^2	13000	15600	2600	
			m^3	240	280	40	

		m^2	5000	4210	-790	
		m^3	50	68	18	

4.3.2

4.4

136.66hm^2

2021 9 43.56hm^2

43.21hm^2 99.20%

466t/km^2 a 1.07

71.05 m^3 71.05

m^3 99.56%

5

5.1

1

2

2016 9 ~2021 8 60

136.66

hm^2

3

136.66hm^2

5.2

136.66hm^2 136.66hm^2

1500t/ km^2

5.2-1 合

		(hm^2)	t/km^2 a	t/km^2 a
		69.9	463	500
		2.66	481	500
		2.47	376	500
		16.08	528	500
		1.06	517	500
		43.16	457	500
		1.33	300	500
		136.66	466.00	500

443t

2099t

5.2-2 合

			t/km^2 a	t/km^2 a	hm^2	a	t	t	t
			1017	1500	69.9	5	3554	5243	1688
			872	1500	2.66	5	116	200	84
			1014	1500	2.47	3	75	111	36
			1172	1500	16.08	3	565	724	158
			954	1500	1.06	5	51	80	29
			457	1500	43.16	0	0	0	0
			1021	1500	1.33	3	41	60	19
			463	1063	69.9	0	0	0	0
			481	837	2.66	0	0	0	0
			376	743	2.47	2	19	37	18
			528	685	16.08	2	170	220	50
			517	725	1.06	0	0	0	0
			457	457	43.16	5	986	986	0
			300	912	1.33	2	8	24	16
					136.66	5	5585	7684	2099

5.3

6

6.1

96.48hm^2

96.13hm^2 99.64%

95%

6.1-1 合 hm^2

									%
		69.9	69.9	40.4	0.35	28.87	29.22	69.62	99.60
		2.66	2.66	1.78	0.6	0.27	0.87	2.65	99.62
		2.47	2.47	1.32	0.07	1.07	1.14	2.46	99.60
		16.08	16.08	8.61	0.95	6.5	7.45	16.06	99.88
		1.06	1.06			1.06	1.06	1.06	100.00
		43.16	2.98			2.96	2.96	2.96	99.33
		1.33	1.33	0.81	0.04	0.47	0.51	1.32	99.25
		136.66	96.48	52.92	2.01	41.2	43.21	96.13	99.64

43.56hm^2 43.21hm^2 99.20%

96%

6.2-1

								%
		69.9	40.4	29.5	0.35	28.87	29.22	99.05
		2.66	1.78	0.88	0.6	0.27	0.87	98.86
		2.47	1.32	1.15	0.07	1.07	1.14	99.13
		16.08	8.61	7.47	0.95	6.5	7.45	99.73

		1.06	0	1.06	0	1.06	1.06	100.00
		2.98	0	2.98	0	2.96	2.96	99.33
		1.33	0.81	0.52	0.04	0.47	0.51	98.08
		96.48	52.92	43.56	2.01	41.2	43.21	99.20

6.3

466t/km^2 a

1.07 1.0

6.3-1

		(hm^2)	t/km^2.a	t/km^2.a	
		69.9	463	500	1.08
		2.66	481	500	1.04
		2.47	376	500	1.33
		15.83	528	500	0.95
		1.06	517	500	0.97
		43.16	457	500	1.09
		1.33	300	500	1.67
		136.66	466.14	500	1.07

6.4

71.05 m^3

71.05 m^3 99.99% 95%

6.4-1

		m^3	m^3	%
		56.78	56.78	99.99
		1.66	1.66	99.99
		0.66	0.66	99.99

6.5

41.55hm^2 41.2hm^2 99.16%

99%

6.5-1 合 hm^2

					%
		69.9	29.15	28.87	99.04
		2.66	0.28	0.27	96.43

7

7.1

(GB50433-2018)

(GB50434-2018)

GB50433-2008

99.64% 99.20% 1.07 99.99%

99.16% 55.69%

43.16hm^2

136.66hm^2

52.92hm ² 43.21hm ² 43.16hm ²

2.01hm ² 41.20hm ²

99.64% 99.20% 1.07 99.99%

99.16% 55.69%

7.2 任

(1)

(2)

3

4

8

8.1

1

2

3

4

8.2

1

2

8.3

1

2