2018 9 28

1 1 1000
2 As
3 As
4 F
5 F
6 Ni
7 Ni
8 Pb
9 Pb
10 Cr
11 Cr

1
2
3
4
5

2018 6 26

pH

a 屈 b k a 123-cd

a h g,h,i C10 C40 28

2018 8 1

GB36600-2018

28 30

1,1- 1,2- 1,1- -1,2-

-1,2- 1,2- 1,1,1,2- 1,1,2,2-

1,1,1- 1,1,2- 1,2,3-

1,2- 1,4-

+ 2-

30

30

2018 8

1 2018 8 1

1

30

2018 9 30

2018 5

— DB44/T1415—

2014 7 7

2018 8 1

GB36600—2018

GB36600—2018 1

2018 3

GB36600—2018 1

GB36600—2018 1

2018 9 30

1.

2.

2002

3.

4.

5.

6. 1

7.

2018 9 28

1958

2006 7

2000

“ ” “ ”

“ ” “ ” “

” 2008 “

”

55 330

1000m 260m

83.957

[2012]140

[2014]66

1

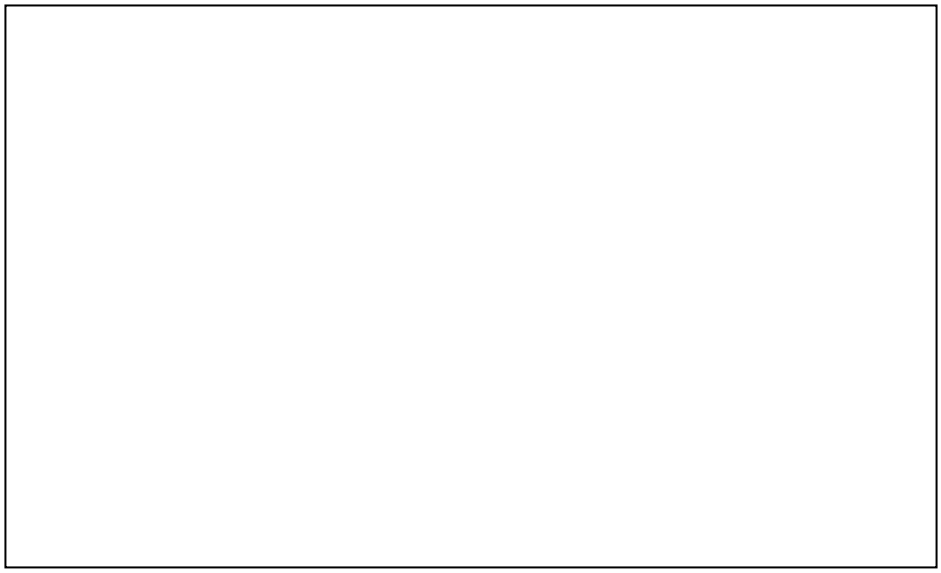
2

3

2-1

150m 300m 200 250m

83.957



1 2015 1 1

2 2018 1 1

3 2016 1 1

4 1996 4 1

2016 11 7

5 2016

42

6 2005 39

7 2008 39

8

2013 7

9 27

10 2016 31

11 [2012]140

12 2017

72

13 2017.7.1

1 HJ 25.1-2014

2 HJ 25.2-2014

3 HJ 25.3-2014

4 HJ 25.4-2014

5 HJ 494-2009

6 HJ/T 164-2004

7 GB36600-2018

8 (GB14848-2017)

9 HJ 682-2014

10 HJ/T 166-2004

11

12 JBJ89-92

13 — DB44 T 1415-2014

14 B50021

15 GBJ 145

16 GB/T50123-1999

17 2015 10

1

[2004]47

2

[2012]140

3

[2014]66

4 [2008]48

5 2014

11

HJ 25.1-2014

——

—— ——

——

2-2

w ρ_0 ρ_d Gs e Sr

Wl Wp Ip Il Kv Kv

13

Fe Mn As Cd Cr

Cr^{6+} Cu Hg Ni Pb Zn F pH 21

a 屈 b

k a 123-cd a h

g,h,i 16 C10 C40 1

2-1 2-2

2-1

					%	
1 2000			230	230	100	
		m	280	280	100	42
	As Cd Cr Cr^{6+} Cu Hg Ni Pb Zn F pH 11		219	219	100	
	a 屈 b k a 123-cd a h g,h,i 16		15	15	100	
	C10 C40 1		15	15	100	
	w ρ_0 13		6	6	100	
	pH 21		8	8	100	
	16		8	8	100	
	C10 C40 1		8	8	100	

2-2

1 1:5

2 1:20

3 1:5 1:10

4 1:10

5 1:5 1:10

6 1:50

7 1:10

8

9

10 1:25

11 1:5

12

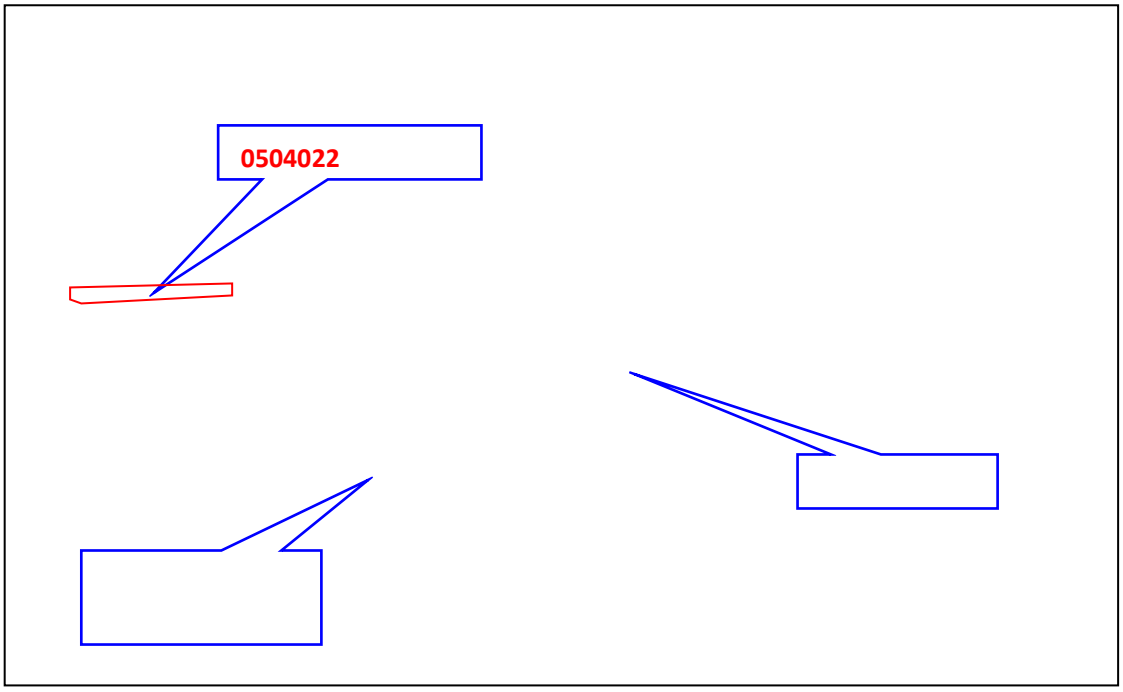
	X	Y	m
13	2521250.346	36530784.551	5.14
14	2521250.554	36530779.413	13.46
15	2521250.384	36530765.954	101.36
16	2521250.003	36530664.598	31.80
17	2521249.863	36530632.799	60.09
18	2521189.772	36530632.963	23.14
19	2521191.012	36530609.852	12.70
20	2521190.763	36530597.152	7.83
21	2521198.563	36530596.452	32.35
22	2521195.334	36530564.263	11.63
23	2521194.930	36530552.644	131.05
24	2521325.737	36530544.660	6.56
25	2521325.852	36530538.097	83.48
26	2521409.336	36530538.074	8.22
27	2521414.680	36530531.823	4.35

10+1

3

2019

3-2



5 °　7 °　　90　116㎜

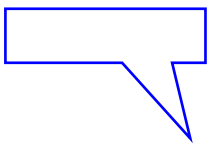
1.3km

300 380m

15 20m 63.30m $418 \times 10^8 m^3$

1:100

3-3



3-3

2014

430 430 0.8mg/kg

693mg/kg 45.03mg/kg 20mg/kg 216

66.2 3-2

60mg/kg

	3-2 mg/kg		%
	10	75	17.4
10	20	70	16.3
20	30	69	16.0
30	40	52	12.1
40	50	31	7.2
50	60	32	7.4
	60	101	23.5

3-3

					Q_4^{a1}			
					Q_4^{pa1}	0.6-9		
					Q_4g	20-30		0.20-3cm
					Q_3w^2	0-35		-
					Q_3w^1	6-12	0.5 5	0.2-2cm 3-4cm
					Q_2b^2	2-16		
					Q_2b^1	2-20	14 22.38	
					Q_1x	1-2		0.5-2cm 60-80%
					E_3b	>650		
					E_3l	>165		
					$E_{2-3}n$	130 -350		
					$E_{2-3}g$	0-221		
					$E_{2-3}f$	0-277		
					K_2l	<485		

					K_1x	<315	
					C_2pm	<583	
					C_2h	114	—
					$C_{1-2}d^2$	207 -877	
					$C_{1-2}d^1$	178	
					C_1yt	92 -310	
					D_3w	115	
					$D_{1-3}l^3$	93.3	
					$D_{1-3}l^2$	18-24	
					$D_{1-3}l^1$	<206	
					D_1y^2	<79	
					D_1y^1	158 -275	
					D_2w	10-54	
					$D_{1-2}x$	36	
					D_1n	94.94 -216	-
					D_1l	0- 185	
					h	1828	Protospongia sp.
						>499	Protospongia sp.

(3-4)

45km 5 15km 5 20 °

25 30 °

3-5

3-5

Q_3W^2

5 15m 20 25m K=8 30m/d

10 15m 100 1000m^3/d

5 8m

100 m^3/d 8 20m

0.1 1L/s

0.1L/s

1000 m^3/d

3-6

3-4

98 m	1000
350 m	1500
110 m	1145
150m	4200
200m	2700
160m	

.

1958

55 2018

3-2 3-7

3-2 3-3

3-4 3-5

3-6 3-7

1958

1968 1982

1983

2004

2007

2010

2001

2006

2014

YJH

WC 2003

2006

2003

2007

2010

2004

2014

2014

2014

2010

2000 5

2002 2017

3-7

3-7

3-7 2010 2018 6

3-5

3-5

			t/a
1		Al Mg Si Cu Mn Ni Zn Sn Pb Ti	3.5
2			5
3			11
4			42
5			3
6			0.1
7			0.4
8			1
9		H_2SO_4	65
10		HF	0.8
11			143
12			1.78
13			1.60

1

5 10

CNC

3-8　3-9

3-8

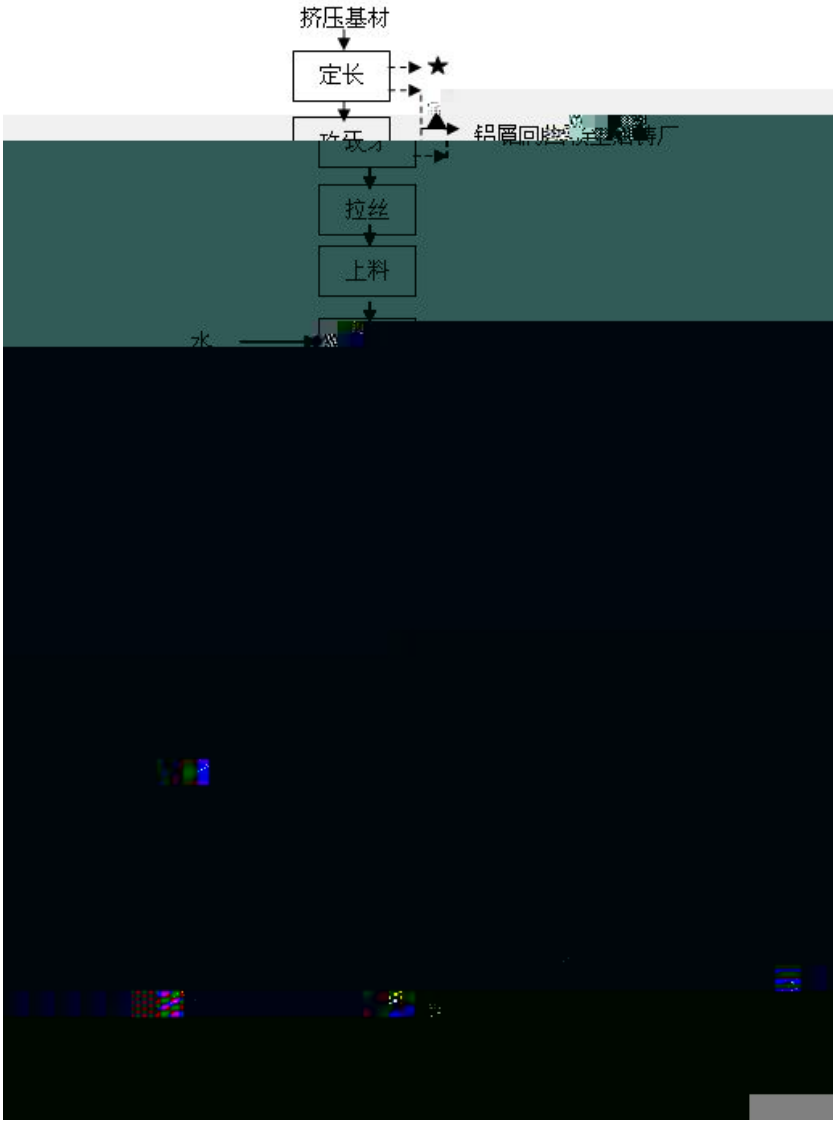
3-9

30t/d

4t/d

5

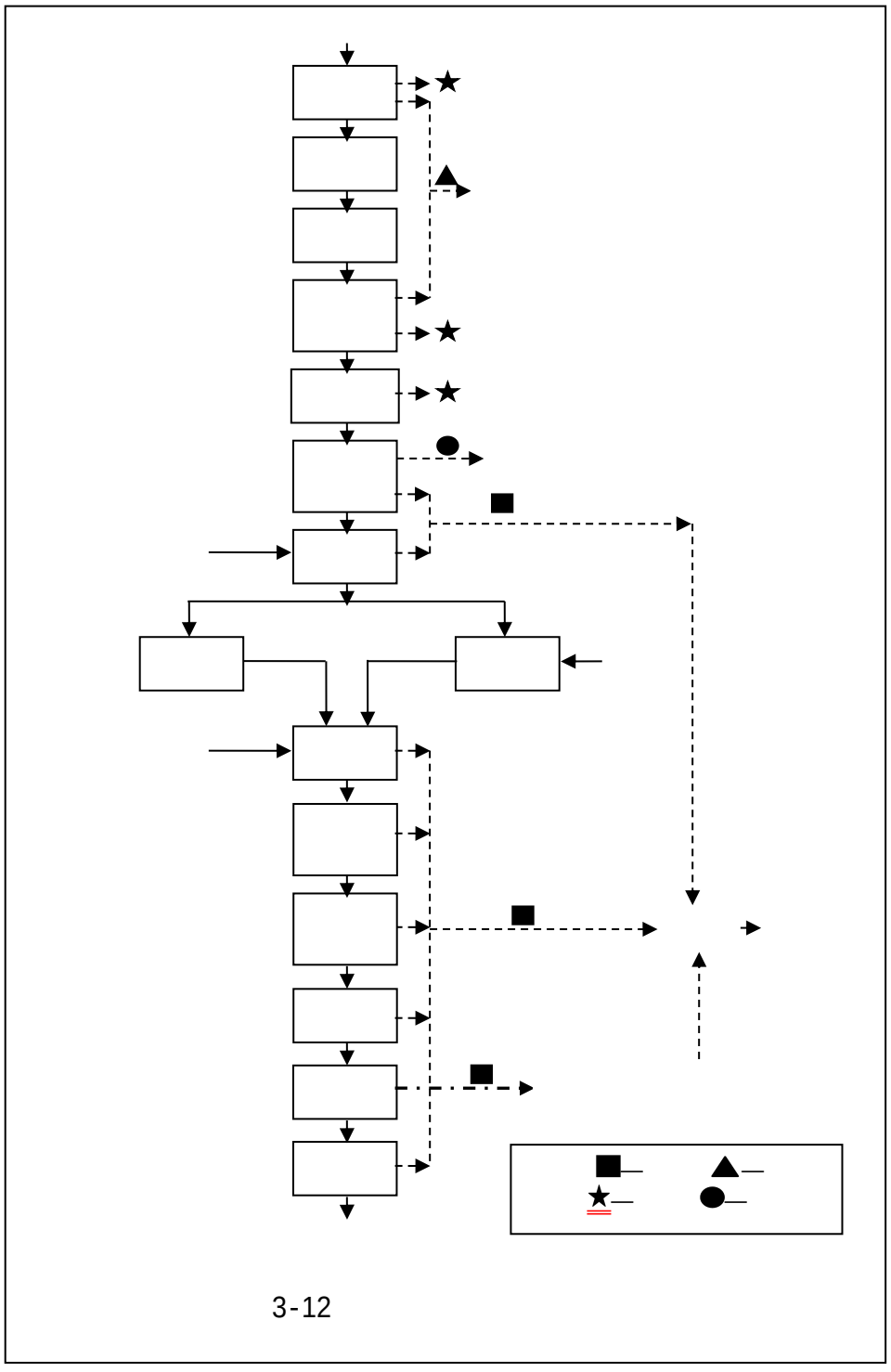
3-10



3-10

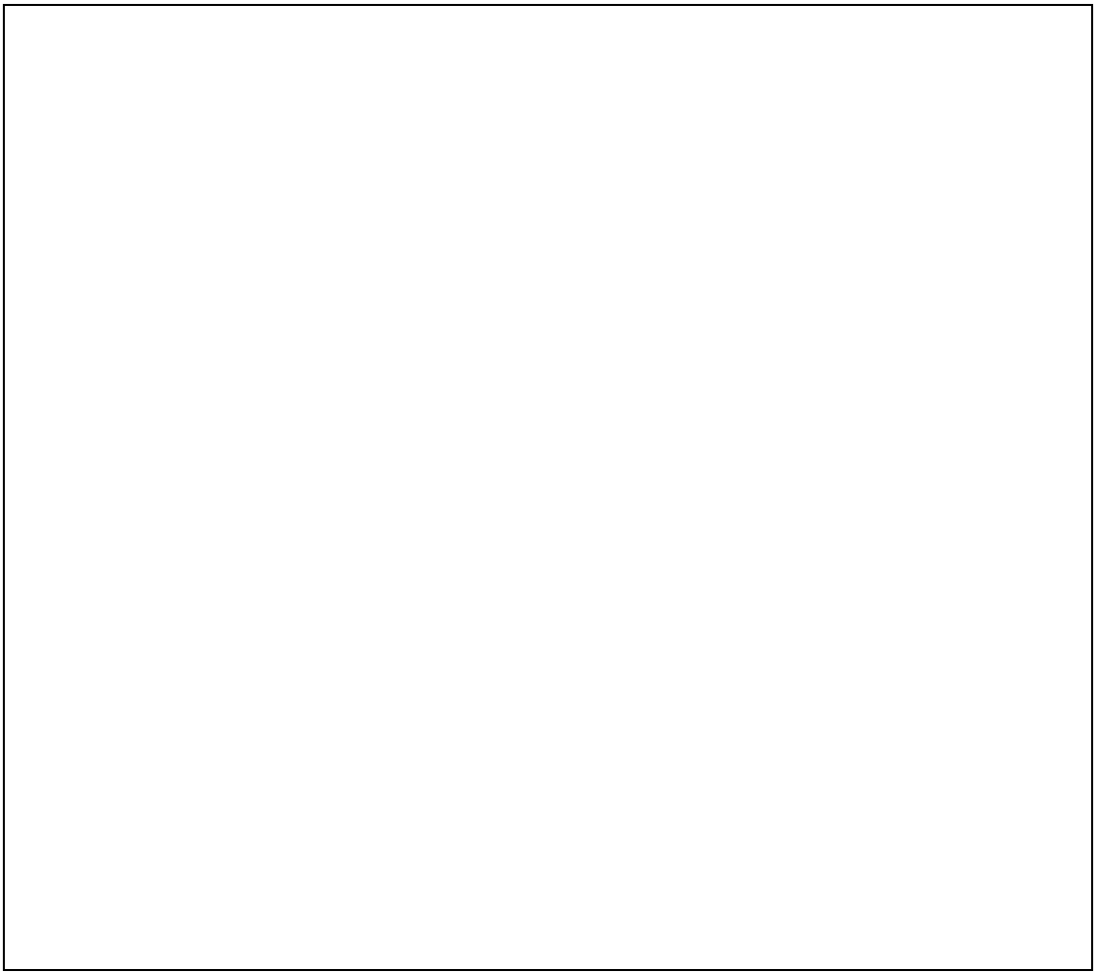
200

3-12



3-12

3-13



3-13

3

3-14　　3-16

Ni

GB8978-1996

GB8978-1996

6

2016 2016

26.67% 20.0 30% 15.0

43.33% 115.0 pH

1958

55

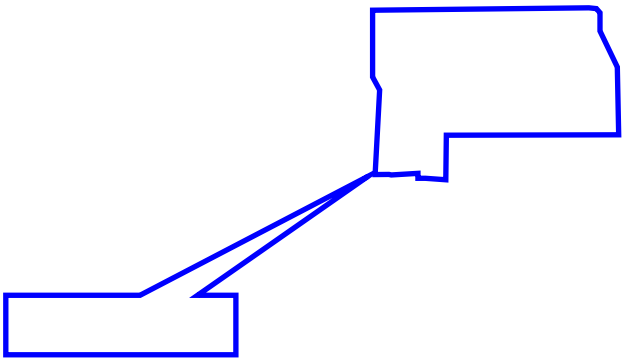
3-6

3-6

1				
2				
3				
4				
5		/	/	/
6		/	/	/
7		/	/	/

2011-2020

3-17



3.4

2018 6

3-7 50

50

3-7

				%
1			15	
2			6	40.0
			9	60.0
3		30	2	13.3
		30 40	3	20.0
		40 50	3	20.0
		50 60	4	26.7
		60	3	20.0
4			3	20.0
			7	46.7
			3	20.0
			2	13.3
5			6	40.0
			9	60.0

40%

1

2

HJ/T 25.1-2014 6.2.2

:

1600m²(40m × 40m)

HJ/T 25.1-2014

1958

55

40m × 40m 4-1

ZK08411

ZK09614

HJ/T 25.1-2014 6.1.3.2

0.5 2.0m

5

4-2 0.5 1.0m 0.20

0.50m 0.20m 1.00 1.15m 2.00 2.15m 3.00

3.15m 4.00 4.15m 1kg

42 254 219

15 15 6 24 8

8 8

4-1 4-2

				m		
	ZK07201	X:2521412 Y:36530444		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07205	X:2521372 Y:36530444		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07209	X:2521332 Y:36530444		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07213	X:2521292 Y:36530444		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07217	X:2521252 Y:36530444		0-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07221	X:2521212 Y:36530444		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07601	X:2521412 Y:36530484		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07605	X:2521372 Y:36530484		0.20-0.50		
				1.00-1.15		

				m		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07609	X:2521332 Y:36530484		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07613	X:2521292 Y:36530484		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07617	X:2521252 Y:36530484		0-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK07621	X:2521212 Y:36530484		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK08001	X:2521412 Y:36530524		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK08005	X:2521372 Y:36530524		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK08009	X:2521332 Y:36530524		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK08013	X:2521292 Y:36530524		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK08017	X:2521252 Y:36530524		0-0.50		
				1.00-1.15		

		m
		2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		1.00-1.15
ZK08401	X:2521412 Y:36530564	2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		1.00-1.15
ZK08405	X:2521372 Y:36530564	2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		1.00-1.15
ZK08409	X:2521332 Y:36530564	2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		1.00-1.15
ZK08411	X:2521300 Y:36530564	2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		1.00-1.15
ZK08413	X:2521292 Y:36530564	2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		1.00-1.15
ZK08417	X:2521252 Y:36530564	2.00-2.15
		3.00-3.15
		4.00-4.15
		0.20-0.50
		1.00-1.15
ZK08801	X:2521412 Y:36530604	2.00-2.15
		3.00-3.15
		4.00-4.15

				m		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK08813	X:2521292 Y:36530604		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK08817	X:2521252 Y:36530604		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09201	X:2521412 Y:36530644		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09205	X:2521372 Y:36530644		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09209	X:2521332 Y:36530644		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09213	X:2521292 Y:36530644		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09217	X:2521252 Y:36530644		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09601	X:2521412 Y:36530684		0.70-0.85		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09605	X:2521372 Y:36530684		0.20-0.50		
				1.00-1.15		

				m		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09609	X:2521332 Y:36530684		0.20-0.50		
				0.85-1.00		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09613	X:2521292 Y:36530684		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09614	X:2521285 Y:36530684		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK09617	X:2521252 Y:36530684		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK10009	X:2521332 Y:36530724		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK10013	X:2521292 Y:36530724		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		
	ZK10017	X:2521252 Y:36530724		0.20-0.50		
				1.00-1.15		
				2.00-2.15		
				3.00-3.15		
				4.00-4.15		

7 15m

1.0m 7 1

1 1 1

1 8

1000ml 9 10m 1.0m

4 Õ ü

3 CMA

CNAS

1

2

3

XRF

5-1

XRF

X X

5-1 XRF 5-2 XRF

4 48 h

GB50021-2001

Φ130mm 7m

Φ75mm PVC 5 m

5 0.2 0.50m

5-1

5-1

5-3 5-4 pH

pH

± 10%

50 24

pH

5-3 5-4

1m

DNAPL LNAPL

DNAPL LNAPL

4 48h

1 RTK

2

GPS

“S”

ZK09614 S09614

“SD” ZK09614

SD09614 “SSC”

ZK09614 SSC09614

1 HJ/T166-2004

(HJ/T164-2004

2

4

pH 5-1

pH 5-2

1	As	-	GB/T 22105.2-2008
2	Hg		GB/T 22105.1-2008
3	Cr Ni Cu Zn		GB/T 14506.30-2010
4	pH		LY/T 1239-1999
5	Cd Pb		GB/T 14506.30-2010
6	Cr^{6+}		GB/T 15555.4-1995
7	F		GB/T 14506.30-2010
8		-	2017 1625
9			2017 1625

1	As		GB/T 5750-2006
2	Hg		GB/T 5750-2006
3	Cr		GB/T 5750-2006
4	pH		GB/T 5750-2006
5	Cd Pb		GB/T 5750-2006
6	Fe F Cr^{6+}		GB/T 5750-2006
7	Ni		GB/T 5750-2006
8	Zn Cu Mn		GB/T 5750-2006
9			GB/T 5750-2006
10		108	GB/T 5750-2006
11			GB/T 5750-2006
12			

3 B P(

20 20 20

208 11

7 1

1

2

3

EPA 20 1

5

11 HJ/T

166-2004 13-2 11

		mg/kg
T07205-5 T07205-6 4.00-4.15m	Cr^{6+}	
	As	3.17
	Cd	0.02
	Cr	34.7
	Cu	10.5
	F	319
	Hg	0.021
	Ni	11.2
	Pb	11.8
	Zn	18.3
T07209-5 T07209-6 4.00-4.15m	Cr^{6+}	
	As	3.37
	Cd	0.025
	Cr	58.6
	Cu	13
	F	452
	Hg	0.024
	Ni	14.3
	Pb	14.5
	Zn	23.3
T08413-2 T08413-3 2.00-2.15m	Cr^{6+}	
	As	8.03
	Cd	0.033
	Cr	82.2
	Cu	21.5
	F	381
	Hg	0.0479
	Ni	11.7
	Pb	13.5
	Zn	30.2

[redacted]

[redacted]

		mg/kg	mg/kg	%	%
	Pb	13.6	13.6	0.0	±10
	Zn	29.2	27.4	3.2	±10
T08809-5 T08809-6 4.00-4.15m	Cr^{6+}			/	/
	As	11.5	10.7	3.6	±10
	Cd	0.032	0.029	4.9	±30
	Cr	51.4	51.2	0.2	±10
	Cu	19	17.1	5.3	±10
	F	288	332	7.1	±5
	Hg	0.042	0.034	10.5	±30
	Ni	12.8	12.1	2.8	±10
	Pb	11.5	11.1	1.8	±10
	Zn	30.4	28.6	3.1	±10
T08817-5 T08817-6 4.00-4.15m	Cr^{6+}			/	/
	As	13	11.5	6.1	±10
	Cd	0.037	0.03	10.4	±30
	Cr	81.6	77.9	2.3	±10
	Cu	23.6	21	5.8	±10
	F	333	380	6.6	±5
	Hg	0.0528	0.0748	17.2	±30
	Ni	23.3	25.1	3.7	±10
	Pb	15.2	14.8	1.3	±10
	Zn	33.1	33.3	0.3	±10
T09209-5 T09209-6 4.00-4.15m	Cr^{6+}			/	/
	As	4.98	4.55	4.5	±20
	Cd	0.026	0.028	3.7	±30
	Cr	61.7	54.6	6.1	±10
	Cu	12.5	11.6	3.7	±10
	F	525	473	5.2	±5
	Hg	0.027	0.024	5.9	±30
	Ni	16.3	15.5	2.5	±10
	Pb	16	15.4	1.9	±10
	Zn	23.7	23	1.5	±10
T09217-5 T09217-6 4.00-4.15m	Cr^{6+}			/	/
	As	7.89	8.12	1.4	±20
	Cd	0.033	0.036	4.3	±30
	Cr	59.6	59.9	0.3	±10
	Cu	12.3	12.1	0.8	±10
	F	220	218	0.5	±5
	Hg	0.0731	0.0761	2.0	±30
	Ni	17	18.1	3.1	±10

		mg/kg	mg/kg	%	%
	Pb	9.3	9.2	0.5	±20
	Zn	27.4	27.4	0.0	±10
T09605-5 T09605-6 4.00-4.15m	Cr^{6+}			/	/
	As	6.15	4.69	13.5	±20
	Cd	0.033	0.026	11.9	±30
	Cr	60.7	54.5	5.4	±10
	Cu	12.7	13.2	1.9	±10
	F	424	424	0.0	±5
	Hg	0.0166	0.0163	0.9	±30
	Ni	13.2	13.8	2.2	±10
	Pb	14.2	14	0.7	±10
	Zn	22.5	21.9	1.4	±10
T10009-5 T10009-6 4.00-4.15m	Cr^{6+}			/	/
	As	10	10	0.0	
	Cd	0.028	0.024	7.7	±30
	Cr	87	87.2	0.1	±10
	Cu	12.6	12.7	0.4	±10
	F	459	407	6.0	±5
	Hg	0.167	0.183	4.6	±25
	Ni	17.9	17.1	2.3	±10
	Pb	14.8	15	0.7	±10
	Zn	29.9	29.2	1.2	±10
T10017-2 T10017-3 2.00-2.15m	Cr^{6+}			/	/
	As	15.5	15.8	1.0	±10
	Cd	0.037	0.033	5.7	±30
	Cr	102	103	0.5	±5
	Cu	40.9	39.9	1.2	±10
	F	389	404	1.9	±5
	Hg	0.0865	0.092	3.1	±30
	Ni	19.2	19	0.5	±10
	Pb	18	17.9	0.3	±10
	Zn	44.8	44.2	0.7	±10

5-5

42

3

0.10 0.30m 0.10 0.20m

0.20 0.30m

2

0.20 3.90m

ZK09217 3.90m ZK08813

2.00m

W

$Q_3W^{\frac{1}{}}$

3

1.50 4.80m

ZK09201 ZK09617 4.80m

ZK09601 4.30m

2

,

0.90 6.60m ZK07209

6.60m ZK08411 5.50m

1

1.00 1.50m ZK09614

1.50m ZK07201 1.40m

1

0.2 4.0cm

55% 45%

0.70 10.00m ZK08809 10.00m

ZK08411 9.00m

n

350m

2 3

6 3 1 2

6 w ρ_0 ρ_d Gs e

Sr Wl Wp Ip Il Kv

Kv 6-1

0 15m 7m

10^{-6} 10^{-7}cm/s 10^{-7}cm/s

10^{-7} 10^{-8}cm/s

6-1

( )			w	ρ0	ρd	Gs	e	Sr	Wl	Wp	Ip	Il	Kv	Kv	2~0.5	0.5~0.25	0.25~0.075	0.075~0.05	0.05~0.01	0.01~0.005	<0.005	<0.002
--	m	GB50007—2011	%	g/cm^3		--	--				--	--	cm/s		%							
ZK08805	2.40		23.5	2.03	1.64	2.70	0.643	99	34.1	20.5	13.6	0.22	4.01E-08	6.21E-08	0.0	1.8	34.1	5.2	11.5	7.7	39.7	31.8
TG1	2.60																					

2

Q_4^{ml} Q_3w^1

15m

$E_{2-3}n$

350m

42

7m 8m 90m

25m

100m^3/d

$E_{2-3}n$

0.36L/s

3-4

7 8m

1

30m³/h 3-4 D8 1000m

42 280m 254

219 15 15 6

24 8 8 8

As Cd Cr Cr^{6+} Cu Hg Ni Pb Zn F

pH 11

a 屈 b k a

123-cd a h g,h,i 16

C10 C40 1 w

ρ_0 ρ_d Gs e Sr Wl Wp

Ip Il Kv Kv 13

Fe Mn As Cd Cr

Cr^{6+} Cu Hg Ni Pb Zn F pH 21

a 屈 b

k a 123-cd a h

g,h,i 16 C10 C40 1

GB36600-2018

GB36600-2018

GB36600-2018 A.1

60mg/kg — DB44 T 1415-2014

— DB44 T 1415-2014

GB36600-2018

6-2

	mg/kg	mg/kg	mg/kg	mg/kg
As	60	120	--	--
Cd	20	47	--	--
Cr	/	/	350	--
Cr^{6+}	3	30	/	--
Cu	2000	8000	--	--
Hg	8	33	--	--
Ni	150	600	--	--
Pb	400	/	--	--
Zn	/	/	500	--

	mg/kg	mg/kg	mg/kg	mg/kg
F	/	/	1000	--
pH	/	/	/	/
	25	255	/	--
	/	/	/	367
	/	/	/	679
	/	/	/	644
	/	/	/	381
	/	/	/	5037
	/	/	/	508
	/	/	/	381
a	5.5	55	/	--
屈	490	4900	/	--
b	5.5	55	/	--
k	55	550	/	--
a	0.55	5.5	/	--
123-cd	5.5	55	/	--
a h	0.55	5.5	/	--
g,h,i	/	/	/	381
C10 C40	826	5000	/	/

“ / ” “ -- ”

(GB14848-2017)

pH 6-3

	≤ 150	≤ 300	≤ 450	≤ 650	650
	≤ 300	≤ 500	≤ 1000	≤ 2000	2000
	≤ 0.02	≤ 0.10	≤ 0.50	≤ 1.50	1.50
	≤ 2.0	≤ 5.0	≤ 20.0	≤ 30.0	30.0
	≤ 0.01	≤ 0.10	≤ 1.00	≤ 4.80	4.80
	≤ 0.001	≤ 0.001	≤ 0.002	≤ 0.01	0.01
	≤ 0.001	≤ 0.01	≤ 0.05	≤ 0.1	0.1
	≤ 1.0	≤ 2.0	≤ 3.0	≤ 5.0	5.0
Fe	≤ 0.1	≤ 0.2	≤ 0.3	≤ 2.0	2.0
Mn	≤ 0.05	≤ 0.05	≤ 0.1	≤ 1.5	1.5
As	≤ 0.001	≤ 0.001	≤ 0.01	≤ 0.05	0.05

Cd	≤0.0001	≤0.001	≤0.005	≤0.01	0.01
Cr^{6+}	≤0.005	≤0.01	≤0.05	≤0.10	0.10
Cu	≤0.01	≤0.05	≤1.00	≤1.50	1.50
Hg	≤0.0001	≤0.0001	≤0.001	≤0.002	0.002
Ni	≤0.002	≤0.002	≤0.02	≤0.10	0.10
Pb	≤0.005	≤0.005	≤0.01	≤0.10	0.10
Zn	≤0.05	≤0.5	≤1.00	≤5.00	5.00
F^-	≤1.0	≤1.0	≤1.0	≤2.0	2.0
pH	6.5≤pH≤8.5			5.5≤pH 6.5 8.5 pH≤9.0	pH 5.5 pH 9.0
	≤1	≤10	≤100	≤600	600
	≤1	≤360	≤1800	≤3600	3600
	≤1	≤50	≤240	≤480	480
b	≤0.1	≤0.4	≤4.0	≤8.0	8.0
a	≤0.002	≤0.002	≤0.01	≤0.5	0.5

5 6-4 6-5

6-4

			%	mg/kg	mg/kg	mg/kg		mg/kg		
As	219	219	100	1.22	252	60	2	120	1	GB36600-2018
Cd	219	219	100	0.02	1.6	20	0	47	0	GB36600-2018
Cr	219	219	100	27.8	437	350	1	/	0	
Cr^{6+}	219	219	100			3	0	30	0	GB36600-2018
Cu	219	219	100	7.85	224	2000	0	8000	0	GB36600-2018
Hg	219	219	100	0.01	0.195	8	0	33	0	GB36600-2019
Ni	219	219	100	6.5	591	150	2	600	0	GB36600-2020
Pb	219	219	100	7.5	481	400	1	800	0	GB36600-2021
Zn	219	219	100	12.4	169	4915	0	/	0	
F	219	219	100	127	1630	1000	1	/	0	
pH	219	219	100	3.03	10.63	/	/	/	0	/
	15	14	93.3	0.0012	0.0391	25	0	255	0	GB36600-2018
	15	13	86.7	0.0004	0.0086	367	0	/	0	
	15	8	53.3	0.0006	0.0169	679	0	/	0	
	15	15	100.0	0.0004	0.0088	644	0	/	0	
	15	15	100.0	0.0046	0.1711	381	0	/	0	
	15	15	100.0	0.0002	0.0491	5037	0	/	0	
	15	15	100.0	0.0005	0.3805	508	0	/	0	
	15	15	100.0	0.0005	0.3542	381	0	/	0	
a	15	14	93.3	0.0005	0.2338	5.5	0	55	0	GB36600-2018
屈	15	14	93.3	0.0010	0.2433	490	0	4900	0	GB36600-2018
b	15	14	93.3	0.0009	0.2517	5.5	0	55	0	GB36600-2018
k	15	14	93.3	0.0007	0.1626	55	0	550	0	GB36600-2018
a	15	14	93.3	0.0002	0.2093	0.55	0	5.5	0	GB36600-2018
123-cd	15	14	93.3	0.0007	0.0827	5.5	0	55	0	GB36600-2018
a h	15	14	93.3	0.0002	0.0359	0.55	0	5.5	0	GB36600-2018
g,h,i	15	14	93.3	0.0011	0.0932	381	0	/	0	
C10 C40	15	15	100.0	8	333.1	820	0	5000	0	GB36600-2018

6-5

					%						
	23.0	96.1	8	8	100	≤150	≤300	≤450	≤650	650	0
	69	503	8	8	100	≤300	≤500	≤1000	≤2000	2000	0
(N)	0.06	42.02	8	8	100	≤0.02	≤0.10	≤0.50	≤1.50	1.50	6
(N)	0.82	28.25	8	8	100	≤2.0	≤5.0	≤20.0	≤30.0	30.0	2
(N)	0.005	0.252	8	8	100	≤0.01	≤0.10	≤1.00	≤4.80	4.80	0
			8	0	/	≤0.001	≤0.001	≤0.002	≤0.01	0.01	0

1.

As Cd Cr Cr^{6+} Cu Hg Ni Pb Zn

F 10

a 屈 b k a

123-cd a h g,h,i 16

C10 C40 1

5

GB36600-2018 —

DB44 T 1415-2014

252mg/kg

120 mg/kg

6-6 6-1 6-2

6-6

		mg/kg	mg/kg	mg/kg		m
T08409-1		252	60	120	ZK08409	0.20-0.50
T08417-2		64.8	60	120	ZK08417	1.00-1.15
T07609-1		1630	1000	/	ZK07609	0.20-0.50
T07617-1		591	150	600	ZK07617	0-0.50
T07617-1		437	350	/	ZK07617	0-0.50
T08009-1		234	150	600	ZK08009	0.15-0.50
T07213-1		481	400	800	ZK07213	0.15-0.50

6-6 7

ZK07213 ZK7609 ZK07617 ZK08009 ZK08409 ZK08417

252mg/kg ZK08409 0.20 0.50m

1630mg/kg ZK07609 0.20 0.50m 591mg/kg

ZK07617 0 0.50m 437mg/kg ZK07617

0 0.50m 481mg/kg ZK07213 0.15

0.50m 5 0.70m

0 0.70m 6 1.00 1.60m

1

6-7

6-7

m		%	m
0-0.50	6	85.7	0-0.70
1.00-1.15	1	14.3	1.00-1.60

6-7 0 0.70m

85.7% 1.00 1.60m

5

2 11

42 6

14.3%

0 0.70m 1.00 1.60m

5

GB36600-2018 — DB44

T 1415-2014

252mg/kg 120

mg/kg

HJ/T 25.1-2014 4.2.2.3

2.

Fe Mn As Cd Cr Cr^{6+}

Cu Hg Ni Pb Zn F pH 21

a b

k a 123-cd a h g,h,i

pH

7

(GB14848-2017)

Fe Mn Fe

Mn

pH pH 1988

pH 4.75 5.49 8

pH 4.93 5.90 pH

7 0.02 0.14

mg/kg 0.02 mg/kg

ZK08009

0.20-0.50m 234mg/kg, 150mg/kg 1 4m

48.6 70.7 mg/kg

6

10.4 47.9mg/kg

1

2 5

252mg/kg ZK08409 1630mg/kg

ZK07609 591mg/kg ZK07617

481mg/kg ZK07213 252mg/kg

120 mg/kg

3 0 0.70m

1.00 1.60m 5

0.70m

4 pH 7

pH pH

5 GB36600-2018

5.3.3

HJ 25.1-2014

HJ 25.2-2014