KAZ Minerals PLC

Tailings management

June 2019

Introduction

KAZ Minerals tailings facilities

Facility	Type	First operation	Expected closure date	Status
Bozshakol	Downstream	2016	2058	Active
Aktogay	Downstream	2017	2045	Active
Bozymchak	Dry stack	2014	2032	Active
East Region				
Orlovsky	Upstream	1989	2026	Active
Nikolayevsky	Upstream	1980	2020[1]	Active
Belousovsky	Upstream	1949	Under review	Active

1. Artemyevsky mine transitioning in 2020 to in-pit tailings disposal in the Nikolayevsky open pit.

The safe and effective management of tailings waste is a high priority for KAZ Minerals. The Group currently has six tailings storage facilities, five of which are in Kazakhstan in locations which are not mountainous and have low levels of precipitation. At Bozymchak, in Kyrgyzstan, due to its location in mountainous terrain, the Group employs a 'dry stack' tailings facility.

Strict operating procedures are in place for the maintenance and monitoring of tailings storage facilities, including regular inspections and testing of nearby ground water. The Group periodically arranges for inspections by independent external experts, with all active tailings storage facilities inspected during 2018. There are no significant deficiencies identified in the stability of the Group's tailings storage facilities.

KAZ Minerals is required to comply with the regulations of the Government of Kazakhstan and the Government of Kyrgyzstan, as applicable, in relation to the design, construction, maintenance and closure of tailings storage facilities. State authorities regularly inspect the Group's tailings facilities to ensure compliance with regulations. Ongoing work programmes, supported by appropriate external consultants, are in place to develop the tailings dams in line with future production plans and to address any issues identified.

At Bozshakol and Aktogay, a central thickened discharge method is used, which is most appropriate for the flat terrain and conditions at these sites. In the East Region, upstream tailings storage facilities are located at Orlovsky (Zhezkent), Nikolayevsky and Belousovsky. At Bozymchak in Kyrgyzstan, the 'dry stack' tailings facility filters material before storage to reduce moisture content to approximately 14%, before waste is deposited in plastic lined cells by mechanical means. The Group does not have any inactive dams.

In 2019, following a decision last year, the Group has enhanced its internal resources through the recruitment of additional international tailings expertise both centrally and, with a focus on tailings construction management, at site. Emergency response plans are in place at our sites, however opportunities to strengthen these further have been identified and the Group is working with local authorities to do so. In addition to the Group's internal operating procedures and regular reviews by independent tailings experts, design institutes and state inspectors, a comprehensive external review has been scheduled across all facilities. The last such comprehensive external review was conducted in 2016.

This report has been produced in support of the tailings disclosure request issued by the Church of England Pensions Board and the Council on Ethics of Swedish National Pension Funds issued in April 2019, on behalf of 96 investors in the mining sector.

The information presented in this document is true to the best of our knowledge, based on our governance, technical and review systems.

Andrew Southam

Chief Executive Officer, KAZ Minerals PLC

Bozshakol

1. "Tailings Dam" Name/identifier	Bozshakol
2. Location	N 51° 50' 51.87" E 74° 17' 29.01"
3. Ownership	100% owned and operated by KAZ Minerals
4. Status	Active
5. Date of initial operation	2016
6. Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7. Raising method	Downstream
8. Current Maximum Height	12m
9. Current Tailings Storage Impoundment Volume	83 Mm^3
10. Planned Tailings Storage Impoundment Volume in 5 years' time.	180 Mm^3
11.Most recent Independent Expert Review	December 2018
12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	Yes
13. What is your hazard categorisation of this facility, based on the consequence of failure?	High consequence: Proximity to production facilities
14. What guideline do you follow for the classification system?	ANCOLD
15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	No
16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Both
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	Yes 2018
18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	a) Yes b) No
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	Requirement for climate change impact analysis to be assessed.
20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	

Aktogay

1. "Tailings Dam" Name/identifier	Aktogay
2. Location	N 46° 56' 50.62" E 79° 56' 12.04"
3. Ownership	100% owned and operated by KAZ Minerals
4. Status	Active
5. Date of initial operation	2017
6. Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7. Raising method	Downstream
8. Current Maximum Height	23m
9. Current Tailings Storage Impoundment Volume	22 Mm^3
10. Planned Tailings Storage Impoundment Volume in 5 years' time.	147 Mm^3
11.Most recent Independent Expert Review	February 2019
12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	Yes
13. What is your hazard categorisation of this facility, based on the consequence of failure?	Low consequence
14. What guideline do you follow for the classification system?	ANCOLD
15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	Settlement in natural ground beneath internal bunds was addressed by constructing support buttresses in 2019.
16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Both
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	No
18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	a) No b) No
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	Requirement for climate change impact analysis to be assessed.
20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	

Bozymchak

1. "Tailings Dam" Name/identifier	Bozymchak
2. Location	N 41° 15' 33.65" E 71° 5' 12.78"
3. Ownership	100% owned and operated by KAZ Minerals
4. Status	Active
5. Date of initial operation	2015
6. Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7. Raising method	Other: Dry stacking
8. Current Maximum Height	35m
9. Current Tailings Storage Impoundment Volume	2 Mm^3
10. Planned Tailings Storage Impoundment Volume in 5 years' time.	4 Mm^3
11.Most recent Independent Expert Review	May 2019
12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	Yes
13. What is your hazard categorisation of this facility, based on the consequence of failure?	Hazard categorisation 2
14. What guideline do you follow for the classification system?	International Building Code (IBC) 3.04-01-2005
15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	No
16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Both
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	Yes 2011
18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	a) Yes b) Yes
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	Yes
20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	

Orlovsky (Zhezkent)

1. "Tailings Dam" Name/identifier	Orlovsky (Zhezkent)
2. Location	N 50°55'59,76'' E 81°17'28,89''
3. Ownership	100% owned and operated by KAZ Minerals
4. Status	Active
5. Date of initial operation	1989
6. Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7. Raising method	Upstream
8. Current Maximum Height	14m
9. Current Tailings Storage Impoundment Volume	11 Mm^3
10. Planned Tailings Storage Impoundment Volume in 5 years' time.	17 Mm^3
11.Most recent Independent Expert Review	May 2019
12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	Yes
13. What is your hazard categorisation of this facility, based on the consequence of failure?	Insignificant
14. What guideline do you follow for the classification system?	Kazakhstan safe operations rules for tailings/slurry storage facilities at hazardous production sites, 2014
15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	No. (Records reviewed for 10 years.)
16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Both
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	No
18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	a) No b) No Closure plan is at approval stage, final approval expected in June 2019
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	Requirement for climate change impact analysis to be assessed.
20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	

Nikolayevsky

1. "Tailings Dam" Name/identifier	Nikolayevsky
2. Location	N 50° 34' 58.10" E 81° 54' 13.98"
3. Ownership	100% owned and operated by KAZ Minerals
4. Status	Active
5. Date of initial operation	1980
6. Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7. Raising method	Upstream
8. Current Maximum Height	45m
9. Current Tailings Storage Impoundment Volume	32 Mm^3
10. Planned Tailings Storage Impoundment Volume in 5 years' time.	35 Mm^3
11.Most recent Independent Expert Review	May 2019
12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	Yes
13. What is your hazard categorisation of this facility, based on the consequence of failure?	Significant: Proximity to production facilities and permanent community
14. What guideline do you follow for the classification system?	Kazakhstan safe operations rules for tailings/slurry storage facilities at hazardous production sites, 2014
15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	Additional buttressing recommended in 2015 was carried out and certified. (Records reviewed for 10 years.)
16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Both
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	No
18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	a) No b) No Closure plan is at approval stage, final approval expected in June 2019
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	Requirement for climate change impact analysis to be assessed.
20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	The Nikolayevsky facility stores tailings from the Nikolayevsky concentrator, which processes ore from the Artemyevsky mine.

Belousovsky

1. "Tailings Dam" Name/identifier	Belousovsky
2. Location	N 50° 7' 48.62'' E 81° 17' 28.89''
3. Ownership	100% owned and operated by KAZ Minerals
4. Status	Active
5. Date of initial operation	1949
6. Is the Dam currently operated or closed as per currently approved design?	Operated as per currently approved design
7. Raising method	Upstream
8. Current Maximum Height	60m
9. Current Tailings Storage Impoundment Volume	18 Mm^3
10. Planned Tailings Storage Impoundment Volume in 5 years' time.	21 Mm^3
11.Most recent Independent Expert Review	May 2019
12. Do you have full and complete relevant engineering records including design, construction, operation, maintenance and/or closure.	Yes
13. What is your hazard categorisation of this facility, based on the consequence of failure?	Significant: Proximity to production facilities and permanent community
14. What guideline do you follow for the classification system?	Kazakhstan safe operations rules for tailings/slurry storage facilities at hazardous production sites, 2014
15. Has this facility, at any point in its history, failed to be confirmed or certified as stable, or experienced notable stability concerns, as identified by an independent engineer (even if later certified as stable by the same or a different firm).	No. (Records reviewed for 10 years.)
16. Do you have internal/in house engineering specialist oversight of this facility? Or do you have external engineering support for this purpose?	Both
17. Has a formal analysis of the downstream impact on communities, ecosystems and critical infrastructure in the event of catastrophic failure been undertaken and to reflect final conditions? If so, when did this assessment take place?	Yes 2018
18. Is there a) a closure plan in place for this dam, and b) does it include long term monitoring?	a) No b) No Closure plan is at approval stage, final approval expected in June 2019
19. Have you, or do you plan to assess your tailings facilities against the impact of more regular extreme weather events as a result of climate change, e.g. over the next two years?	Requirement for climate change impact analysis to be assessed.
20. Any other relevant information and supporting documentation. Please state if you have omitted any other exposure to tailings facilities through any joint ventures you may have.	The Belousovsky facility stores tailings from the Belousovsky concentrator, which processes ore from the Irtyshsky mine.