

SPECIAL REPORT:

**RSF Heavy Artillery in Range of Zamzam IDP
Camp as Civilians Flee**

13 December 2024

Yale SCHOOL OF PUBLIC HEALTH
Humanitarian Research Lab

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I. Key Findings

The Yale School of Public Health's Humanitarian Research Lab (HRL) confirms large-scale displacement of an unknown number of civilians from Zamzam IDP camp following repeated heavy artillery bombardment over 12 days by Rapid Support Forces (RSF). Yale HRL has identified and located four heavy artillery pieces consistent with an AH4 155 mm howitzer. Both El-Fasher and Zamzam are within the 40 km range of the weapons consistent with AH4s. Based on available data, Yale HRL assesses that these artillery pieces are likely engaged in the ongoing bombardment campaign on Zamzam, which has reportedly killed 73 people and injured 376 others as of 13 December 2024.¹ This marks the first time that these weapons have been identified in the current conflict in Sudan. According to publicly available sources reviewed by HRL, the United Arab Emirates is the only country known to have purchased the AH4 from China.²

Many civilians are still trapped in El-Fasher and Zamzam. They are subject to ongoing attacks, including those from the heavy artillery positioned within range of both locations. Some civilians are attempting to escape along remote and dangerous routes. Individuals who were able to leave Zamzam likely have extremely limited resources to complete this journey. In a region already suffering famine and near-famine conditions, the capacity of any location to support large numbers of IDPs is unknown.

Evacuation from Zamzam

Yale HRL identifies a large-scale evacuation of internally displaced persons (IDPs) from Zamzam IDP camp in satellite imagery captured on 12 December 2024. This convoy includes vehicles, carts likely pulled by donkeys, and people on foot fleeing to the southeast. This is the most significant displacement exiting the area that Yale HRL has identified through satellite imagery analysis since attacks on Zamzam started on 1 December 2024. There is observed activity consistent with displacement near Zamzam that Yale HRL is not releasing due to human security concerns.

Yale HRL has assessed significant freedom of movement restrictions between Zamzam and Tawilah, North Darfur since 1 December 2024, when Zamzam IDP camp was first attacked. These restrictions include increased checkpoint activity and roadblocks along the road between Zamzam and Tawilah.

RSF Artillery

Yale HRL identifies the presence of four heavy artillery pieces located approximately 25 km northeast of El-Fasher and 35km from Zamzam IDP camp. These artillery pieces are consistent with a Norinco AH4 with maximum operational range of 40 km. No other artillery has been observed in available satellite imagery within range capable of conducting these fire missions. These four heavy artillery pieces consistent with AH4 are first visible in satellite imagery on 11 November 2024. Three of the four artillery have maintained a continuous ongoing presence in satellite imagery between 11 November – 13 December 2024. One artillery piece is absent between 17 November – 9

December 2024, and an identical artillery piece returns to the location and is visible in satellite imagery on 10 December 2024. All four artillery pieces have pointed their gun barrels along a southwest vector when present in at least two identified positions since 17 November 2024. El-Fasher and Zamzam are within firing range of a Norinco AH4 from these positions. All four artillery pieces were located outside visibly populated areas throughout the period of observation.

These artillery pieces are assessed to be consistent with an AH4 based on dimensions, the configuration of the trails (legs), and its towing configuration and the size and density of the recoil system. Yale HRL analyzed a range of alternatives from the known inventories that have been deployed in Sudan over the past 30 years. These candidate artillery pieces include the D30 (seen in El-Fasher and in other contexts across Sudan), the M-46, and the D-74. Other artillery including the M777 and others were considered after Yale HRL dismissed the D-30, M-46, and D-74 as candidates. All other candidates were dismissed based on (a) towing configuration; (b) barrel length); (c) trail configuration; and (d) the size and density of the recoil system. The AH4 is assessed to be consistent with the artillery pieces present over the M777 based on (c) the trail configuration and (d) the size and density of the recoil system.

Table 1: Artillery Assessment Components

Components	4 Artillery near El-Fasher*	AH4 ³	D-30 ⁴	D-74 ⁵	M-46 ⁶	Other, including M-777 ⁷
<i>Barrel Length</i>	~5.8-6.0m	6.06m	4.66m	6.45m	7.15m	M-777 – 5.08m
<i>Length (combat/rest)</i>	~9.5m	~9.5m			11.73m	M-777 – 10.7m
<i>Length (Towed/Transport)</i>	~10m	~10.2m	5.4m	9.88m	11.84 m	
<i>Towing</i>	One visible being towed by Barrel	Towed by the barrel	Towed by the barrel	Towed by trails	Towed by trails	Towed by the barrel
<i>Trails (legs)</i>	X-shaped trail system (legs)	X-shaped trail system (legs)	Y-shaped with two wide trails or legs on its back	Y-shaped with two wide trails or legs on its back	Y-shaped with two wide trails	X-shaped trail system (legs)
<i>Muzzle Brake</i>	Not very pronounced	Consistent				M-777 is similar but less consistent than AH4

* This assessment is based on measurements conducted using satellite imagery analysis tools and therefore approximate.

Yale HRL’s high-confidence assessment that these weapons are consistent with an AH4 was determined and reviewed by multiple Yale HRL analysts. Yale HRL’s AH4 assessment was then reviewed and confirmed by three external experts, each with decades of experience identifying comparable weapons in satellite imagery. These outside experts independently verified Yale HRL’s weapon typing as consistent with an AH4.

The AH4 155m howitzer has a 40 km maximum range; however, it is more effective at a 25 km range.⁸ The AH4 is produced by China North Industries Group Corporation Limited (Norinco), a Chinese company and similar to the United Kingdom/United States-manufactured M777. The M777 is known to be operated by Australia, Brazil, Canada, Colombia, India, Saudi Arabia, Ukraine, and United States.⁹ The UAE is the only known entity to have publicly purchased or be operating the AH4 as of February 2019,¹⁰ and it has been reportedly used in Yemen.¹¹ Yale HRL has not identified another publicly known operator of the AH4 other than the UAE and China.¹² The United States Army's OE Data Integration Network (ODIN TRADOC) has identified that the AH4's proliferation is currently only known to include China and United Arab Emirates as of "Proliferation: China, United Arab Emirates."¹³

Attacks on Zamzam

Yale HRL corroborates reports of ongoing bombardment of Zamzam IDP Camp. Analysis of satellite imagery shows conflict-related damage from likely RSF shelling to structures in Zamzam IDP Camp between 1-5 and 9-11 December 2024. These findings corroborate reports that Zamzam has been attacked at least three times since Yale HRL's latest report on 3 December 2024.¹⁴ On 13 December 2024, the Ministry of Health in North Darfur reported that artillery shelling since 1 December had killed 73 people and injured 376 others.¹⁵ This number may be an underestimate.

Attacks on El-Fasher

Additional conflict-related damage in El-Fasher is also visible in satellite imagery. Analysis of satellite imagery between 3-5 December 2024 shows conflict-related damage to the livestock market, as well as new munition impacts and thermal scarring at the SAF 6th Division Base in El-Fasher. These findings corroborate local media reports of RSF shelling toward the livestock market and 6th Division during this time period.¹⁶ Analysis of satellite imagery between 6-8 December 2024 shows damage to the State Radio and Television Authority, corroborating reports of an RSF suicide drone attack that damaged these buildings and facility equipment on 8 December 2024.¹⁷ Yale HRL also identifies conflict-related damage to the old UNAMID compound, located on at the southern exit of the B-26 road to Zamzam IDP camp and outside the Al-Saudi hospital between 3-5 December and 5-6 December 2024, respectively.

II. Human Security Analysis

The ongoing bombardment of Zamzam IDP camp will continue to result in civilian casualties, including fatalities, and increase the level of displacement of civilians from Zamzam into the surrounding area and beyond. The displacement of civilians from Zamzam IDP camp will likely make an already highly vulnerable population that has been deprived of basic nutrition for months even more vulnerable to attack, illness, and death from lack of basic humanitarian assistance. The current situation is untenable

for civilians trapped in Zamzam, El-Fasher, and other IDP camps as well as those civilians Yale HRL is monitoring fleeing from the area. The international community must act now if civilian lives are to be protected and urgently needed humanitarian assistance is to be provisioned.

III. Methodology

Yale HRL utilizes data fusion methodologies of open source and remote sensing data analysis. Yale HRL produced this report through the cross-corroboration of open source data, including social media, local news reporting, multimedia, and other reports, and remote sensing data, including satellite imagery and thermal sensor data. Researchers analyzed open source data across social media, news reports, and other publicly available sources to identify, chrono- and geolocate, and verify incidents. Analysts assess the credibility and reliability of open source data based on a source's level of detail, past credibility, and the corroboration of other independent sources. Remote sensing and satellite imagery analysis relies on multi-temporal change detection, which involves the comparison of two or more satellite images of the same area captured at different times to detect differences in coloration, visual properties, and presence, absence, or positional change of objects across the images. Artillery assessment involves comparing and considering a range of dimensions and characteristics of various known artillery in comparison to each other.

Place names were identified using UN P-codes obtained via the United Nations Humanitarian Data Exchange (HDX) and International Organization for Migration (IOM)'s Displacement Tracking Matrix (DTM) Sudan. This baseline was then verified and informed through open source analysis by Yale HRL's analysts with relevant cultural and linguistic skills.

Limitations

There are significant limitations to the data fusion methodology. The information environment in Sudan does not have the breadth of data available in other locations and there is likely a significant reporting bias for those who provide open source reporting. The tools and techniques present significant challenges to assess activities such as extrajudicial detention, conflict-related sexual violence (CRSV), and conflict-related casualties, particularly in environments with limited data. Satellite imagery analysis is limited by available imagery over time and space. Available nadir angles of satellite imagery can produce challenges to assess structural damage, until multiple angles and ground-level photographic and video materials emerge to help inform the analysis. Image resolution level can also limit the analyst's ability to perceive the full extent of damage present.

¹ Sudan Tribune, "قتيلا و458 مصابا بالقصف المدفعي للدعم السريع على الفاشر خلال 73 ديسمبر" December 13, 2024, <https://sudantribune.net/article294603/>, archived at <https://perma.cc/2E6Z-CAW9>

² U.S. Army, "AH-4 Chinese 155mm Towed Howitzer," OE Data Integration Network, <https://odin.tradoc.army.mil/Search/All/AH4>, archived at <https://perma.cc/9UJG-VLVG>; Christopher F Foss, "UAE confirms Chinese 155 mm AH4 gun-howitzer acquisition," Janes, <https://www.janes.com/osint-insights/defence-news/uae-confirms-chinese-155-mm-ah4-gun-howitzer-acquisition>, archived at <https://perma.cc/JW7L-QMSX>; Army Recognition, "NORINCO AH4 155 mm howitzers for United Arab Emirates army," [March 1, 2019](https://armyrecognition.com/news/army-news/2019/norinco-ah4-155-mm-howitzers-for-united-arab-emirates-army), <https://armyrecognition.com/news/army-news/2019/norinco-ah4-155-mm-howitzers-for-united-arab-emirates-army>, archived at <https://perma.cc/9RVS-QE4A>

³ The Global Security, "AH4 155 mm/39 caliber Lightweight Gun-howitzer (LGH)," March 06, 2019, <https://www.globalsecurity.org/military/world/china/ah4.htm>, archived at <https://perma.cc/429K-RZ74>; Sino Defense Forum, "China's AH4 ultralight artillery is delivered for the first time, or will participate in the Middle East," August 18, 2018, <https://www.sinodefenceforum.com/t/chinese-mountain-units-soldiers.5357/page-3>, archived at <https://perma.cc/3JCD-Y94J>; @Sirius - Defence News & Analysis on Facebook, "The #Chinese AH-4 howitzer was designed for maximum mobility and air transportability," September 02, 2018, <https://www.facebook.com/siriusgroup.zarrar/posts/the-chinese-ah-4-howitzer-was-designed-for-maximum-mobility-and-air-transportabi/2062345423799324/>, archived at <https://archive.ph/wip/Q0ATJ>; U.S. Army, "AH-4 Chinese 155m Towed Howitzer," OE Data Integration Network, <https://odin.tradoc.army.mil/>, archived at <https://perma.cc/3HEE-DNWY>; iNews, "God of War's Roar: Analysis of AH-4 155mm Ultralight Howitzer," December 14, 2024, <https://inf.news/en/military/6f8bb232ed6d14a9699db151433730dd.html>, archived at <https://archive.ph/wq26E> ³ The Global Security, "AH4 155 mm/39 caliber Lightweight Gun-howitzer (LGH)," March 06, 2019, <https://www.globalsecurity.org/military/world/china/ah4.htm>, archived at <https://perma.cc/429K-RZ74>; Sino Defense Forum, "China's AH4 ultralight artillery is delivered for the first time, or will participate in the Middle East," August 18, 2018, <https://www.sinodefenceforum.com/t/chinese-mountain-units-soldiers.5357/page-3>, archived at <https://perma.cc/3JCD-Y94J>; @Sirius - Defense News & Analysis on Facebook, "The #Chinese AH-4 howitzer was designed for maximum mobility and air transportability," September 02, 2018, <https://www.facebook.com/siriusgroup.zarrar/posts/the-chinese-ah-4-howitzer-was-designed-for-maximum-mobility-and-air-transportabi/2062345423799324/>, archived at <https://archive.ph/wip/Q0ATJ>; U.S. Army, "AH-4 Chinese 155m Towed Howitzer," OE Data Integration Network, <https://odin.tradoc.army.mil/>, archived at <https://perma.cc/3HEE-DNWY>; iNews, "God of War's Roar: Analysis of AH-4 155mm Ultralight Howitzer," December 14, 2024, <https://inf.news/en/military/6f8bb232ed6d14a9699db151433730dd.html>, archived at <https://archive.ph/wq26E>

⁴ U.S. Army OE Data Integration Network (ODIN), "D-30 (M1963) Russian 122mm Towed Howitzer," <https://odin.tradoc.army.mil/WEG/Asset/b14f9899cde6b3e6045f28966886449e>, archived at <https://perma.cc/H4Z4-39WE>; Wikipedia, "122 mm howitzer 2A18 (D-30),"

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⁵ Weapons systems, “122mm D-74,” <https://weaponsystems.net/system/896-122mm%20D-74>, archived at <https://perma.cc/R3CB-6ERM>

⁶ U.S. Army OE Data Integration Network (ODIN), “M-46 (M1954) Russian 130mm Towed Howitzer,” OE Data Integration Network, <https://odin.tradoc.army.mil/WEG/Asset/f2c01186934314569154f5c5a168b4f3>; Wikipedia, “130 mm towed field gun M1954 (M-46),” December 7, 2024, [https://en.wikipedia.org/wiki/130_mm_towed_field_gun_M1954_\(M-46\)](https://en.wikipedia.org/wiki/130_mm_towed_field_gun_M1954_(M-46)), archived at <https://perma.cc/3M2M-DTGA>

⁷ Wikipedia, “M777 howitzer,” December 11, 2024, https://en.wikipedia.org/wiki/M777_howitzer, archived at <https://perma.cc/SZC5-CC8X>; ODIN, “M777 British 155mm Towed Howitzer,” https://odin.tradoc.army.mil/WEG/Asset/M777_British_155mm_Towed_Howitzer, archived at <https://perma.cc/5YQT-S5JY>

⁸ The Diplomat, “China Will Soon Field New Lightweight Gun Howitzer,” July 19, 2016, <https://thediplomat.com/2016/07/china-will-soon-field-new-lightweight-gun-howitzer/>, archived at <https://perma.cc/9UFP-C4WX>

⁹ Army Recognition, “M777,” July 28, 2024, <https://armyrecognition.com/military-products/army/artillery-vehicles-and-weapons/towed-howitzer-guns/m777-united-states-uk>, archived at <https://perma.cc/UBC3-PJVV>

¹⁰ ODIN, “Search results for “AH4”,”, <https://odin.tradoc.army.mil/Search/All/AH4>, archived at <https://perma.cc/9UJG-VLVG>; Christopher F Foss, “UAE confirms Chinese 155 mm AH4 gun-howitzer acquisition,” Janes, <https://www.janes.com/osint-insights/defence-news/uae-confirms-chinese-155-mm-ah4-gun-howitzer-acquisition>, archived at <https://perma.cc/JW7L-QMSX>

¹¹ Army Recognition Global Defense News, “NORINCO AH4 155 mm howitzers for United Arab Emirates army,” March 1, 2019, <https://armyrecognition.com/news/army-news/2019/norinco-ah4-155-mm-howitzers-for-united-arab-emirates-army>, archived at <https://perma.cc/9RVS-QE4A>

¹² U.S. Army, “AH-4 Chinese 155mm Towed Howitzer,” OE Data Integration Network, <https://odin.tradoc.army.mil/Search/All/AH4>, archived at <https://perma.cc/9UJG-VLVG>

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¹⁵ Sudan Tribune, "قتيلا و458 مصابا بالقصف المدفعي للدعم السريع على الفاشر خلال 73 ديسمبر" December 13, 2024, <https://sudantribune.net/article294603/>, archived at <https://perma.cc/2E6Z-CAW9>
¹⁶ Darfur24, "قتلى وجرحى في قصف مدفعي لـ"الدعم السريع" على مخيم زمزم," December 4, 2024, <https://www.darfur24.com/2024/12/04/%d9%82%d8%aa%d9%84%d9%89-%d9%88%d8%ac%d8%b1%d8%ad%d9%89-%d9%81%d9%8a-%d9%82%d8%b5%d9%81-%d9%85%d8%af%d9%81%d8%b9%d9%8a-%d9%84%d9%80%d8%a7%d9%84%d8%af%d8%b9%d9%85-%d8%a7%d9%84%d8%b3%d8%b1%d9%8a%d8%b9-3/>, archived at <https://perma.cc/LSR8-KMWP>; Darfur24, "مقتل 14 مدنيا في قصف مدفعي جديد لـ"الدعم السريع" على الفاشر," December 6, 2024, <https://www.darfur24.com/2024/12/06/%d9%85%d9%82%d8%aa%d9%84-14-%d9%85%d8%af%d9%86%d9%8a%d8%a7-%d9%81%d9%8a-%d9%82%d8%b5%d9%81-%d9%85%d8%af%d9%81%d8%b9%d9%8a-%d8%ac%d8%af%d9%8a%d8%af-%d9%84%d9%80%d8%a7%d9%84%d8%af%d8%b9%d9%85-%d8%a7/>, archived at <https://perma.cc/VS4U-T98M>; Radio Dabanga, "مقتل 7 أشخاص جراء تجدد القصف المدفعي في الفاشر," December 6, 2024, <https://www.dabangasudan.org/ar/all-news/article/%d9%85%d9%82%d8%aa%d9%84-7-%d8%a3%d8%b4%d8%ae%d8%a7%d8%b5-%d8%ac%d8%b1%d8%a7%d8%a1-%d8%aa%d8%ac%d8%af%d8%af-%d8%a7%d9%84%d9%82%d8%b5%d9%81-%d8%a7%d9%84%d9%85%d8%af%d9%81%d8%b9%d9%8a-%d9%81%d9%8a>, archived at <https://perma.cc/LPJ9-XHW9>
¹⁷ HRL_MMC_061

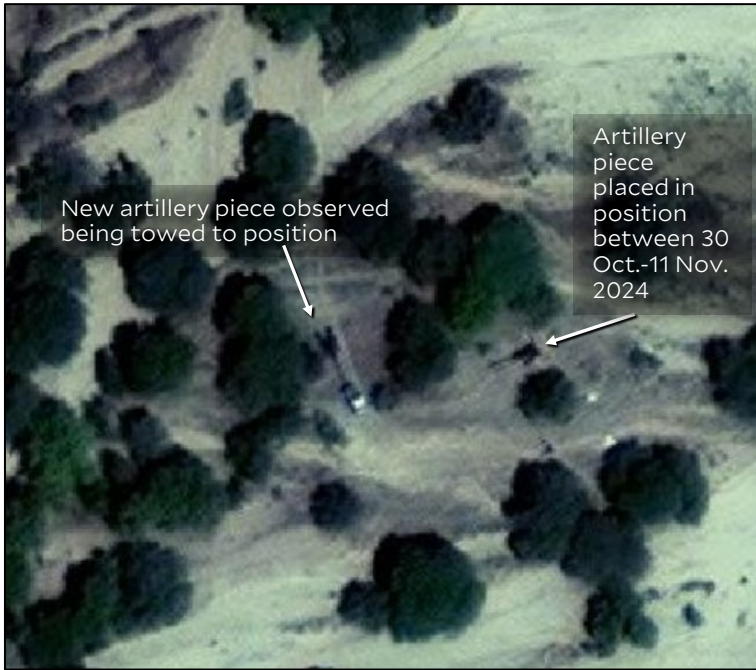
Northeast of El-Fasher

HEAVY ARTILLERY CONSISTENT WITH AH4 HOWITZERS OBSERVED BETWEEN 11-17 NOVEMBER & 10 DECEMBER 2024

Analysis of satellite imagery collected 11 November 2024 shows a heavy artillery piece consistent with an AH4 155mm howitzer northeast of El-Fasher. A similar gun being barrel-towed by a truck towards the site is observed. Analysts assessed vehicle activity at this location as early as 30 October 2024.

Imagery collected on 17 November 2024 shows both guns in position with barrels pointing toward the direction of El-Fasher. One artillery piece is absent between 17 November – 9 December 2024, and an identical artillery piece returns to the location and is visible in satellite imagery on 10 December 2024.

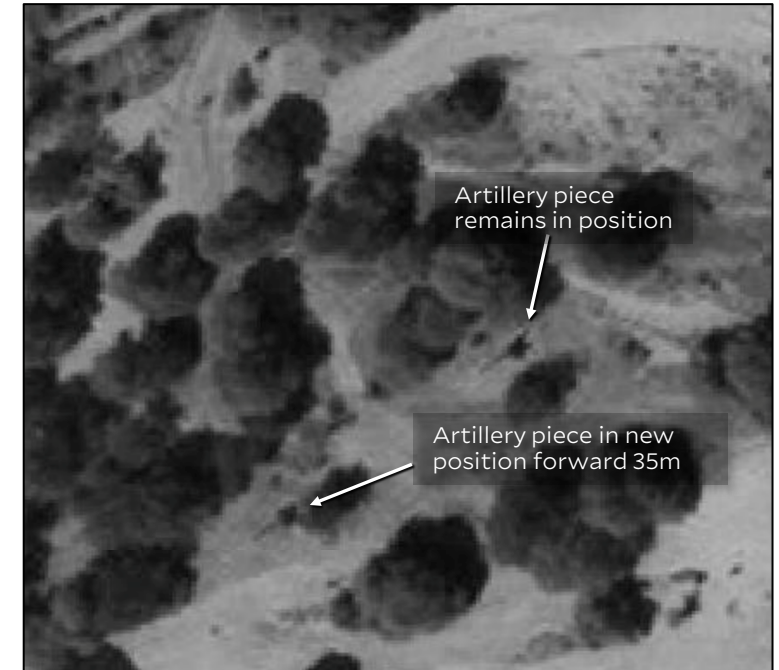
On 10 December 2024, imagery shows that one artillery unit has been repositioned forward approximately 35 meters, while the other artillery remains in the same position.



11 November 2024 © 2024 Maxar, USG Plus



17 November 2024 © 2024 Maxar, USG Plus



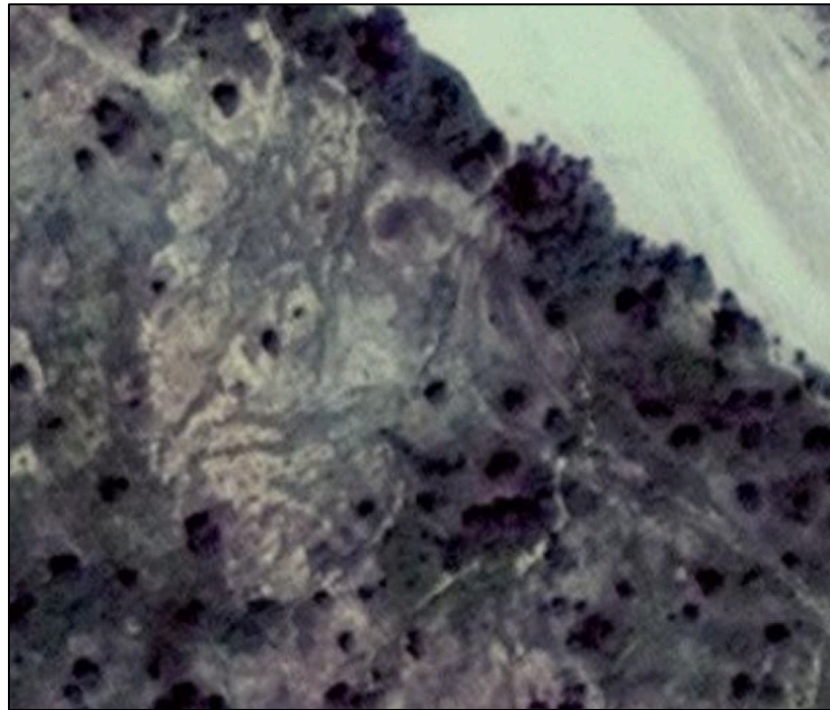
10 December 2024 © 2024 Maxar, USG Plus

Northeast of El-Fasher

HEAVY ARTILLERY CONSISTENT WITH AH4 HOWITZERS PRESENT THROUGHOUT 11 NOVEMBER-13 DECEMBER 2024

Analysis of satellite imagery collected between 22 September and 11 November 2024 shows the new presence of two heavy artillery pieces consistent with AH4 155mm howitzers. The guns appear aimed directly at El-Fasher.

The artillery pieces remain present in satellite imagery analysis throughout the 11 November – 13 December 2024. As of 13 December 2024, the artillery pieces are still in position at this location. The 10 December image is presented due to the quality of the image.



22 September 2024 © 2024 Maxar, USG Plus



11 November 2024 © 2024 Maxar, USG Plus



10 December 2024 © 2024 Maxar

Image enhanced with MGP Pro HD image enhancement

Evacuation out of Zamzam

LARGESCALE EVACUATION VISIBLE
ON 12 DECEMBER 2024

Imagery collected over Zamzam on 12 December 2024 shows a combination of approximately 100 vehicles and pack animals consistent with camels and donkeys traveling southeast from Zamzam IDP camp.



Zamzam IDP Camp

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN
01-05 DECEMBER 2024

Analysis of satellite imagery collected between 01 and 05 December 2024 of Zamzam IDP Camp shows the damage from likely shelling to structures within the camp.



01 December 2024 © 2024 Maxar, USG-Plus



05 December 2024 © 2024 Maxar, USG-Plus

Zamzam IDP Camp

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN
01-05 DECEMBER 2024

Analysis of satellite imagery collected between 01 and 05 December 2024 of Zamzam IDP Camp shows the damage from likely shelling to structures within the camp.



01 December 2024 © 2024 Maxar, USG-Plus



05 December 2024 © 2024 Maxar, USG-Plus

Zamzam IDP Camp

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN 09-11 DECEMBER 2024

Analysis of satellite imagery collected between 09 and 11 December 2024 of Zamzam IDP Camp shows the damage from likely shelling to structures within the camp.



09 December 2024 © 2024 Maxar, USG-Plus



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Zamzam IDP Camp

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN
09-11 DECEMBER 2024

Analysis of satellite imagery collected between 09 and 11 December 2024 of Zamzam IDP Camp shows the damage from likely shelling to structures within the camp.



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Zamzam IDP Camp

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN
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Zamzam IDP Camp

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN
09-11 DECEMBER 2024

Analysis of satellite imagery collected between 09 and 11 December 2024 of Zamzam IDP Camp shows the damage from likely shelling to structures within the camp.



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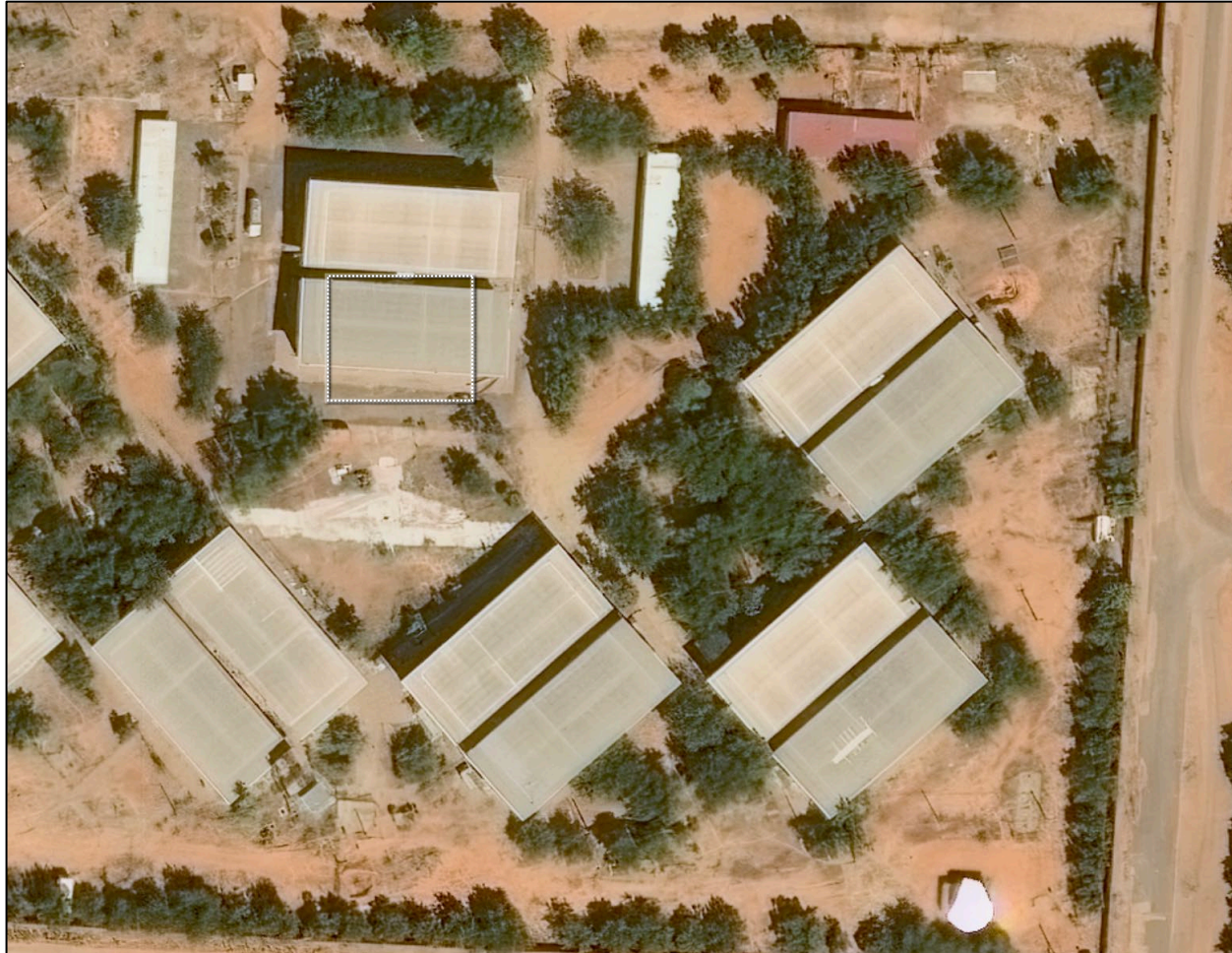


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Former UNAMID Compound, El-Fasher

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN
03-05 DECEMBER 2024

Analysis of satellite imagery collected between 03 and 05 December 2024 shows damage to a build in the former UNAMID compound in western El-Fasher.



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05 December 2024 © 2024 Maxar, USG-Plus

Old Zamzam Camp/UNAMID, El-Fasher

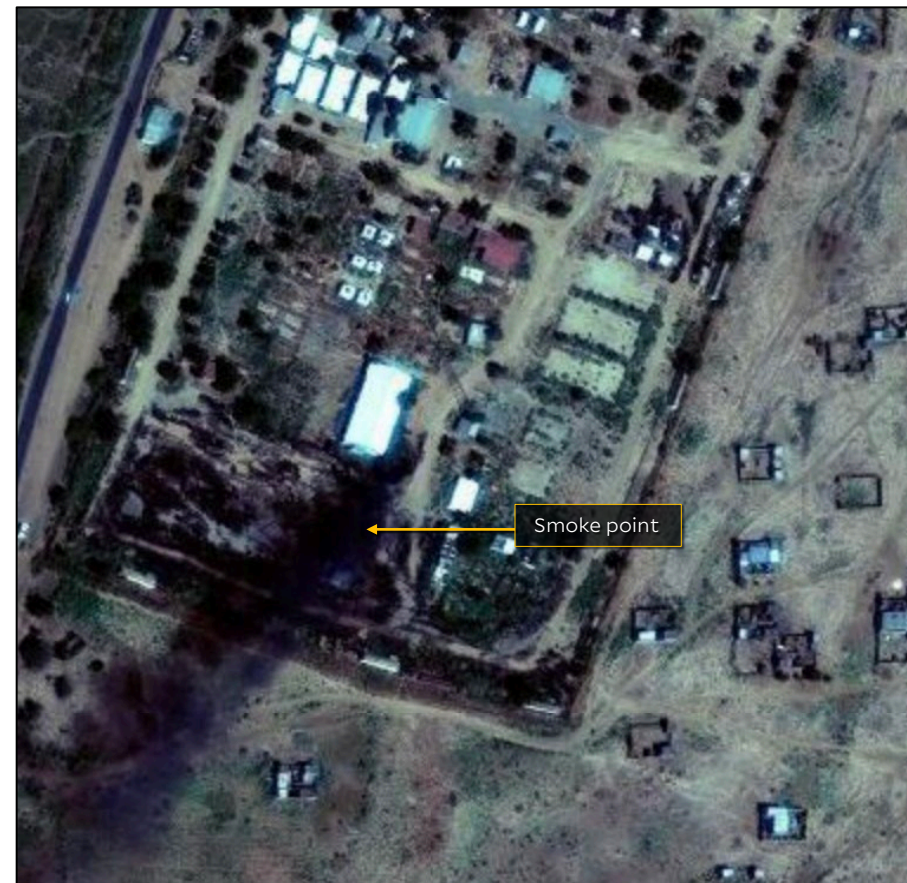
SMOKE OBSERVED BETWEEN 09-11 DECEMBER 2024



09 December 2024 © 2024 Maxar, USG-Plus

Analysis of satellite imagery collected between 09 and 11 December 2024 of El-Fasher shows smoke due to likely munitions impact emanating from the (Old Zamzam Camp/UNAMID Compound).

This location is at the base of the B26 toward Zamzam and a critical checkpoint and area of control for SAF/Joint Forces.



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Grand Mosque, El-Fasher

SMOKE OBSERVED BETWEEN 06-08 DECEMBER 2024

Analysis of satellite imagery collected between 06 and 08 December 2024 of El-Fasher shows smoke due to likely munition impact emanating from a building in the Grand Mosque.



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08 December 2024 © 2024 Maxar, USG-Plus

State Radio and Television Authority, El-Fasher

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN
06-08 DECEMBER 2024

Analysis of satellite imagery collected between 06 and 08 December 2024 shows damage to buildings at the State Radio and Television Authority.

Open sources reported on 08 December 2024, suicide drones had damaged the buildings and facility equipment, destroying the radio's main switching station.



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Central El-Fasher

IMPACT AND SMOKE PLUME OBSERVED BETWEEN 10-11 DECEMBER 2024

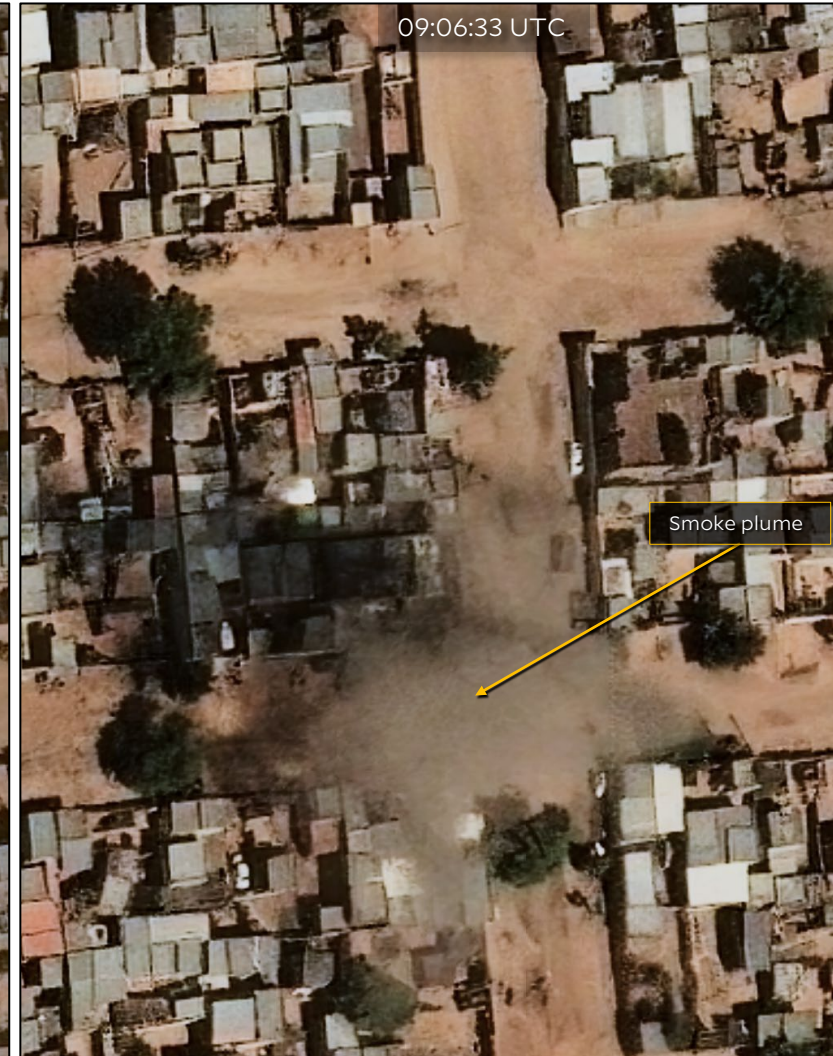
Analysis of two satellite images collected on 11 December 2024 of El-Fasher shows explosive smoke from a munitions impact and a smoke plume due occurring in an approximately 23 second time window at 09:06 UTC in central El-Fasher.



10 December 2024 © 2024 Maxar, USG Plus



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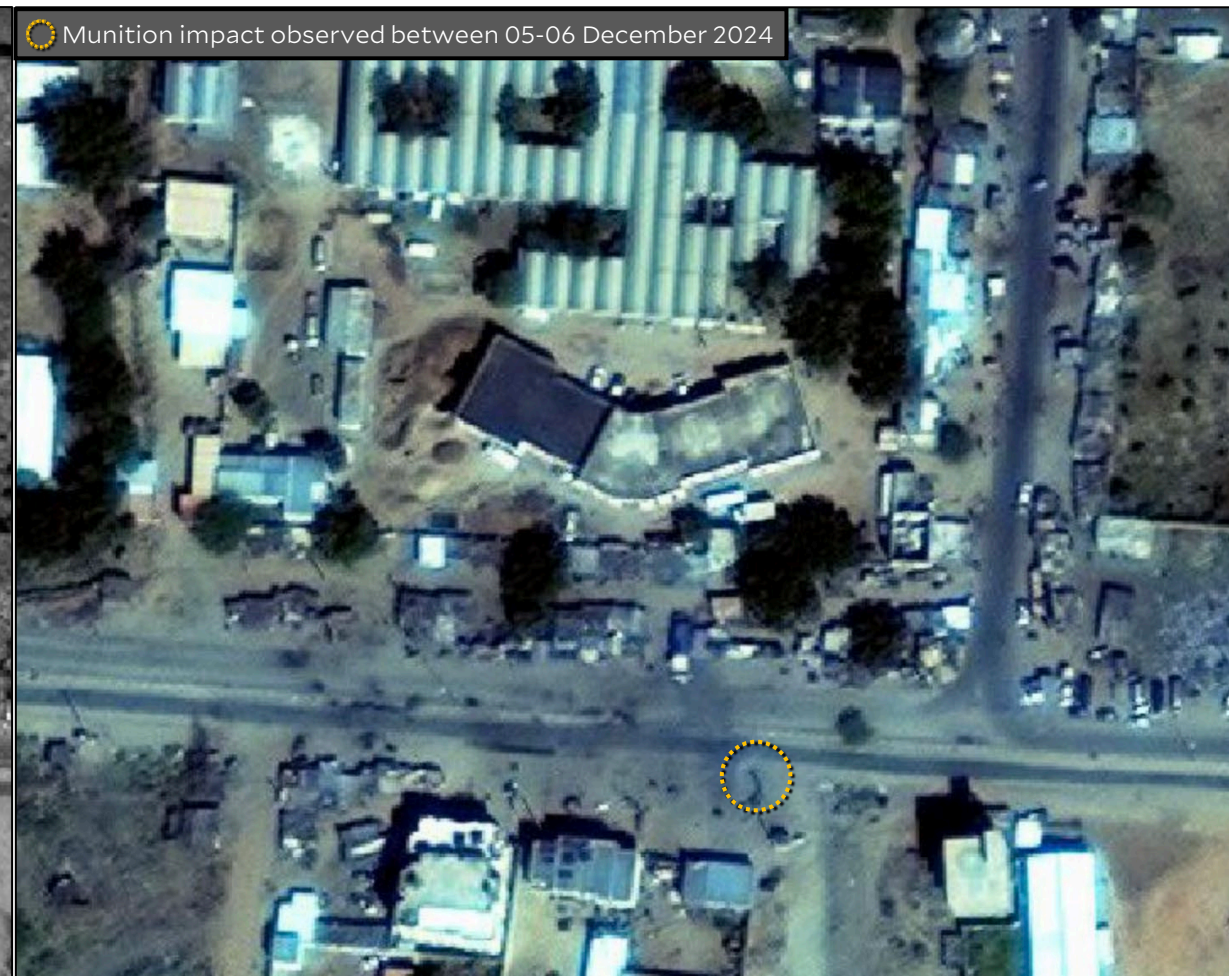
Al-Saudi Hospital, El-Fasher

MUNITION IMPACT OBSERVED
BETWEEN 05-06 DECEMBER 2024

Analysis of satellite imagery collected between 05 and 06 December 2024 of El-Fasher shows a munition impact crater outside the entrance of the Al-Saudi Hospital.



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Livestock Market, El-Fasher

CONFLICT-RELATED DAMAGE OBSERVED BETWEEN
03-05 DECEMBER 2024

Analysis of satellite imagery collected between 03 and 05 December 2024 shows damage due to likely shelling to the livestock market in central El-Fasher.



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Humanitarian Research Lab

<https://medicine.yale.edu/lab/khoshnood/>