



# Chornobyl Study

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## 1 Introduction

In April 2022, McKenzie Intelligence Services (MIS) were instructed by Greenpeace Germany to conduct an imagery analysis study of an area of the Chernobyl nuclear power plant Exclusion Zone. Following the Russian invasion of Ukraine commencing 24 February 2022, the Chernobyl area was occupied by Russian ground forces until their withdrawal on 31 March 2022. The study was conducted to determine Russian ground forces activity centred on a road junction within the Exclusion Zone and the wider area of the Exclusion Zone around the power plant. The study particularly focused on the construction of a defensive position at the road junction of interest, an assessment of military activity around the wider area and understanding the timeline of a fire that occurred in the area of interest.

## 2 Data and methodology

Satellite imagery from Maxar Technologies and Planet Labs was used in the conduct of this study. All available data from the reporting period 24 February to 31 March 2022, less cloud covered imagery, was acquired. All imagery used in this report to illustrate significant points is orientated in the natural aspect. A north arrow is included to orientate the reader. All measurements are approximate and are acquired using Geospatial Information Systems (GIS) mensuration features.

In addition to the very high resolution electro-optical imagery, low resolution multispectral imagery from the European Space Agency Sentinel constellation and very low resolution Visible Infrared Imaging Radiometer Suite (VIIRS) data from the National Aeronautics and Space Administration (NASA) was used in order to identify and illustrate any fires over the reporting period. Images used in the compilation of this report are as follows:

- High resolution imagery
  - Planet SkySat 1m resolution from 28 February 2022
  - Maxar WorldView3 50cm resolution from 28 February 2022
  - Maxar WorldView2 50cm resolution from 9 March 2022
  - Maxar WorldView1 50cm resolution from 10 March 2022
  - Maxar WorldView2 50cm resolution from 10 March 2022
  - Maxar WorldView2 50cm resolution from 11 March 2022
  - Planet SkySat 1m resolution from 14 March 2022
  - Maxar WorldView3 50cm resolution from 17 March 2022
  - Maxar GeoEye1 50cm resolution from 21 March 2022
  - Planet SkySat 1m resolution from 22 March 2022
  - Maxar WorldView1 50cm resolution from 27 March 2022
- Low resolution Multispectral (Sampled to 12.5m resolution)
  - European Space Agency Sentinel2 from 28 March 2022
  - European Space Agency Sentinel2 from 28 March 2022
- VIIRS Data

- NASA VIIRS data 375m resolution from 24 February to 31 March 2022

Once acquired the high resolution imagery was viewed using the QGIS application by our team of imagery analysts; all of which are former military intelligence analysts and are graduates of the UK MoD and NATO-recognised Imagery Analysis Course (UKIAC). The area of interest was studied in chronological order using all of the acquired imagery in order to develop a timeline of activity. Using our analysts' experience and understanding of military activity, all relevant activity was recorded and analysed to produce an assessment of activity on the ground. Finally, using the VIIRS data acquired from NASA, the date, time and geographical position of heat sources was identified to determine the timeline of the fires that occurred in the area. This data was able to plot the precise location of heat sources and was overlaid on Sentinel 2 data to illustrate a geographical timeline of the fires.

### **3 Executive Summary**

- The Russian Federation launched an invasion into Ukraine on 24 February 2022. On the first day of the invasion, Russian Forces seized and took control of the Chernobyl nuclear power plant and surrounding 30km Exclusion Zone.
- The force that occupied the power plant and wider area was fairly small, likely to be battalion strength (approx 600 personnel) suggesting that the Russians had complete confidence in their ability to secure the plant.
- Analysis of multiple sources of data, including imagery, CCTV, social media and Russian order of battle tables suggests the main force used to seize territory within the Exclusion Zone was Russian Airborne (VDV) forces. Once captured, it is likely that control of the territory within the Exclusion Zone was passed to Motor Rifle (Mechanised Infantry) elements of the 36th Combined Arms Army
- Most activity was focused on an administrative building close to the plant and an encampment in the Exclusion Zone close to the Red Forest, adjacent to a road junction. The encampment expanded over the reporting period and involved the digging of trenches, shell scrapes and more substantial revetments.
- Additional deployed positions were established within the wider area of the Exclusion Zone that involved both manual and machinery constructed revetments and trenches.
- It is likely that a sizeable force will have transited through parts of the Exclusion Zone after crossing the Belorussian border and advanced on the northern axis towards Kyiv

## 4 Area Orientation

### 4.1 Area in General

The Chornobyl nuclear power plant site is located on the western bank of the Pripyat River in northern Ukraine, approximately 14km from the border with Belarus and approximately 100km north of Kyiv (Fig.1). The site is situated within a 30km Exclusion Zone, established as a result of the accident at reactor unit 4 in April 1986.



Fig.1 - Area in General

### 4.2 Area in Detail - Road Junction

The first location of specific interest (Latitude 51.3892, Longitude 30.0480) is a road junction located 3.5km due west of the sarcophagus / confinement shelter of reactor 4 of the power plant (Fig.2). The junction is located close to the Red Forest area of the Exclusion Zone. It is of note that there are no major lines of communication leading to the power plant from the Belarus border. A single lane road approximately 5-6m in width leads from the border crossing to the power plant.

**Analyst Comment:** Open source reporting suggests that the northern part of Ukraine along the Belarus border was one of the main axes of advance towards Kyiv for the Russian ground forces. A more substantial route (P02) is located approximately 50km to the west and is likely to have been the main axis of advance for a Combined Arms Army formation that was engaged on this axis. Nevertheless, the road leading directly to the power plant is likely to have been used for the approach to the area. This road is not of sufficient size for use of a significantly sized unit or formation and the possibility of damage to the ground on either side of the road is considered to be highly likely. **Comment ends.**



Fig.2 - Road Junction Area in Detail

### 4.3 Area in Detail - Encampment

The second location of specific interest (Latitude 51.1663, Longitude 29.9645) is an encampment on the northern side of a minor road and in the vicinity of a small number of derelict buildings. The site is located approximately 26km south-southwest of the Chernobyl power plant and within the boundary of the Exclusion Zone (Fig.3). The site is not in close proximity to a major road but is accessible by a network of minor roads that link to major routes. The nearest main road that is of sufficient size to allow the movement of a large amount of traffic is the P56 route which is situated approximately 11km to the east. This route leads from

the Belarussian border and is likely to have been one of the main routes used by the invading forces as they entered Ukraine on the axis towards Kyiv.



Fig.3 - Encampment Area in Detail

## 5 Timeline of Events

### 5.1 24 February - 7 March 2022

Russia commenced its invasion of Ukraine in the early hours of 24 February 2022. Ground forces crossed into Ukraine from Crimea in the south, from Russia in the east and north east and from Belarus in the north. Hours after crossing the Belarussian border, the Chornobyl nuclear power plant and surrounding Exclusion Zone was occupied by the invading forces. No very high resolution imagery was available for this period but imagery supplied by Greenpeace of the road junction at 51.3892 30.0480 dated 28 February 22 indicated no military activity or presence (Fig.4).



Fig.4 - 28 February 2022

CCTV footage supplied to Greenpeace by the staff at the power plant, collected from Checkpoint Leliv on 24 February 22, shows a convoy of Russian equipment heading south through the Exclusion Zone from the direction of the power plant. The convoy consists of a pontoon bridging unit and is supported by a company plus of T-72 main battle tanks and BMP-2 armoured infantry fighting vehicles. The convoy also contained air defence assets including SA-11/17 surface to air missile system and ZSU-23-4 anti aircraft artillery. Other engineering assets were observed in the convoy including a BAT-2 armoured track layer and grader. Of note was the presence of an RKhM Kashalot (Fig.5) nuclear/biological/chemical reconnaissance vehicle. This convoy was not of substantial size but the equipment observed indicates it was on the main axis of advance for at least a Divisional sized formation or even for a Combined Arms Army (CAA). It is unknown if any further vehicles or another convoy transited through the Checkpoint either before or after the convoy captured on the CCTV

**Analyst Comment:** Open source research indicates that elements of both the Russian 36th and 41st CAA were involved in the move from Belarus on the northern axis of advance towards Kyiv. Reporting also suggests that elements of the 41st CAA took part in the offensive and capture of the Chernobyl area. The movement of a large formation such as a Division or CAA would require a substantial road to accommodate the large number of vehicles associated with this sized formation. The road leading through Checkpoint Leliv is not of suitable width to move the amount of vehicles of a significant sized formation but is suitable for smaller units. An



appreciation of the local road network from a study of the map suggests that the route P56 crossing into Ukraine from the Belarussian border approximately 12km east of Chornobyl town is a much more viable option for the amount of vehicles that would make up the main body of the invading force. Use of this route would involve the crossing of the Pripyat River at the bridge just to the east of Chornobyl village. Had this bridge been damaged or destroyed by the defending forces, it would make tactical sense to have a bridging unit nearby capable of spanning the river in order to prevent loss of momentum. The movement of the bridging unit along the smaller road on the western bank would allow for quick access to the river without being bogged down in the inevitable traffic jam that would result from the bridge's destruction. The presence of the RKhM Kashalot is significant in this area as this vehicle is associated with nuclear, chemical and biological reconnaissance. This equipment is a standard part of what is termed as the chemical defence unit of a formation but its use in this instance suggests an awareness of the environment they were deploying into. It must also be noted that intelligence reporting during this stage of the invasion indicated the potential for Russia to mount a false flag operation and accuse Ukraine of using chemical weapons. **Comment ends.**



Fig.5 - RKhM Kashalot Nuclear, Biological and Chemical Reconnaissance Vehicle

## **5.2 28 February 2022**

### **Site of Encampment**

High resolution imagery of the site of the encampment identified at 51.1663 29.9645 indicated no activity was present, nor had there appeared to have been any preparations to prepare an encampment at this time. No vehicles, either military or otherwise, were present at the site and no vehicle tracks were observed that would indicate vehicles previously present at the site.

### **Highway P56 Orane to Ivankiv**

Imagery of a large convoy of military vehicles was observed on the highway heading southwest from Orane towards Ivankiv on 28 February 2022 (Fig.6). Although this area is not within the Exclusion Zone, the direction of travel of the vehicles suggests that they would have transited through the Exclusion Zone over the previous hours or days. The convoy was made of a number of smaller packets of vehicles, most likely independent of each other as opposed to a single unit spread over a large area. At parts along the route, heavy track marks on the edge of the road were evident suggesting vehicles, most likely tracked vehicles, had been driven off the road and on the verges, possibly due to congestion on the road. Track marks were also observed in many of the fields either side of the road. At one location, it appears that an element had departed the road and had set up a deployed position with vehicles parked around the edge of the field. More detailed imagery of specific points of interest are at Figures 6a-6d.

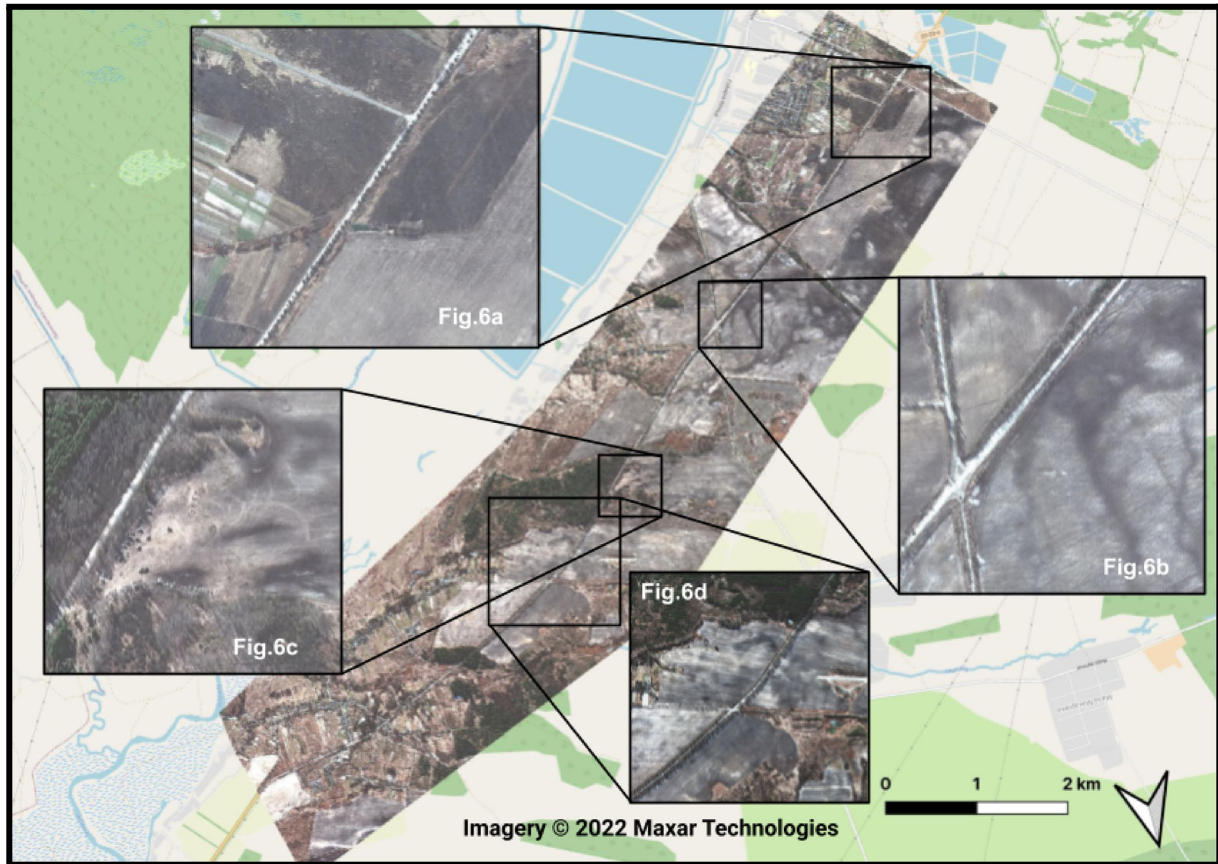


Fig.6 - Convoy and Force Elements on Orane to Ivankiv Highway



Fig.6a - Convoy Packet - Part of Convoy on Highway from Orane to Ivankiv



Fig.6b - Heavy vehicle Tracks on Highway Verge



Fig.6c - Deployed Forces Adjacent to Orane to Ivankiv Highway



Fig.6d - Convoy Packet - Part of Convoy on Highway from Orane to Ivankiv

### 5.3 9 March 2022

#### Junction of Specific Interest

A likely patrol harbour position had been set up at the road junction of interest (Fig.7). At this point in time, the location is not well established and consists of four small trenches approximately 4m in length. Spoil from the digging appears to have been placed adjacent to each trench. Three medium sized utility trucks, likely to be URAL 375, are parked in the centre of the position. No attempt to camouflage the location has been made.

**Analyst Comment:** The size and make up of the position suggests a platoon sized patrol harbour which would consist of no more than 30 individuals, although this site looks likely to have even less than that. The trenches have the appearance of fire trenches, these are narrow trenches approximately 1.5-1.8 metres in depth which provide soldiers with a degree of protection whilst still being able to engage any enemy. These types of trenches are usually dug by hand using entrenching tools. The position does not appear to be particularly tactical as there is no attempt to camouflage the position through use of cam nets or natural foliage. The orientation of the trenches is generally east to west. A trench should be dug to face any

oncoming threat. In the presence of a general threat with no specific direction, the trenches should be dug to provide arcs of observation/fire covering all compass points. The trenches observed at this location do not provide adequate cover to any threat coming from the south on the road leading to the junction which suggests either tactical naivety or complacency with regards to any perceived threat. **Comment Ends.**

**Analyst Assessment:** The location directly adjacent to the road junction suggests that the position has been deliberately chosen in order to secure or dominate the junction. **Assessment Ends.**

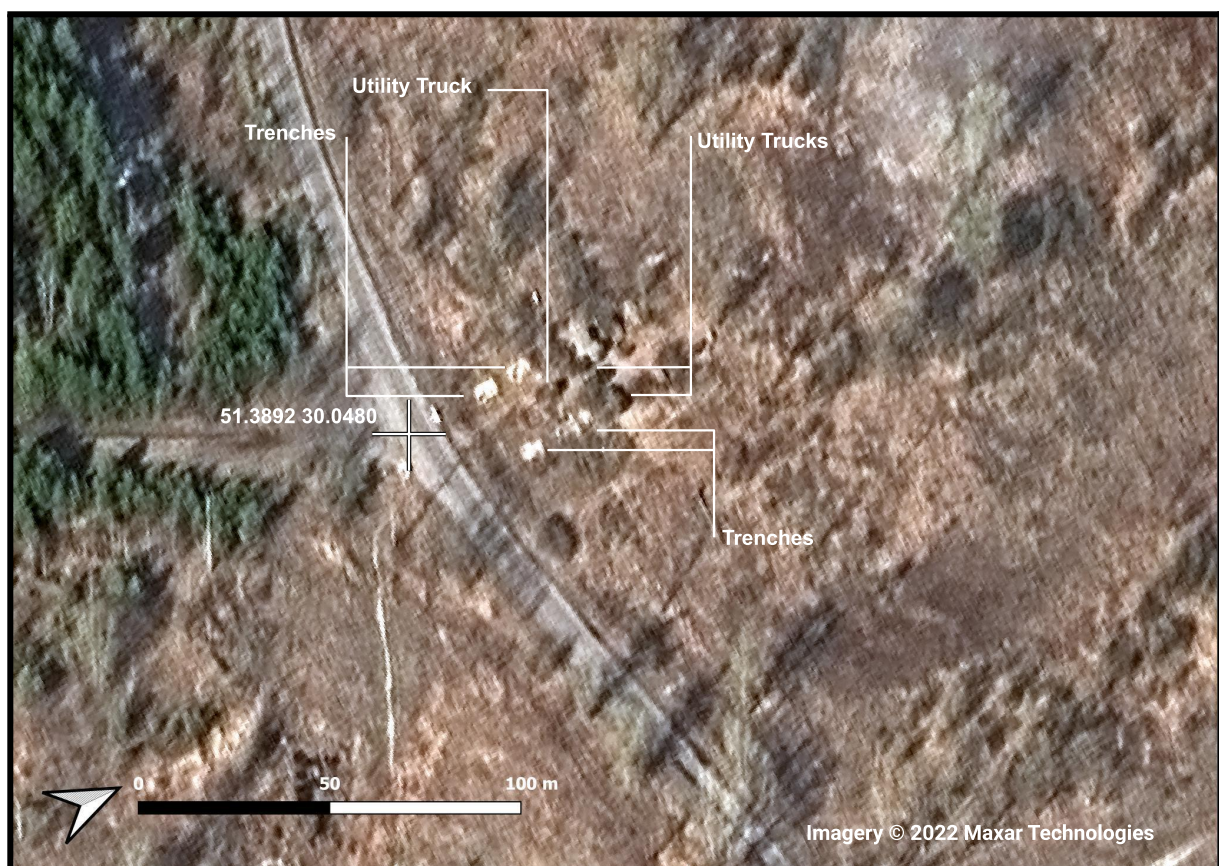


Fig.7 - Junction of Specific Interest - 9 March 2022

**Wider Area**

A number of box bodied utility trucks were observed parked in the compound of an administrative or accommodation building adjacent to the decommissioned power plant (51.38666 30.09059) (Fig.8). A makeshift chicane system has been installed on the short driveway leading to the compound gate from the road adjacent to the building.

**Analyst Comment:** The location, positioning and type of truck observed suggests this could be the command post for the unit occupying the plant and wider area. Occupying forces would



most likely look to requisition a permanent structure in which to base their command element to make use of the facilities afforded such as office space, shelter, sanitation and power if available. Any occupying force, regardless of the size would include a command element.

**Comment Ends.**



Fig.8 - Location of Likely Command Post - 9 March 2022

## 5.4 10 March 2022

### Junction of Specific Interest

No significant changes were observed within the patrol harbour area at the junction of interest (Fig.9). However, obstacles had been placed on the road to create a crude chicane system, most likely for traffic control measures. The chicane is mainly impacting the main road heading east/west but an obstacle also appears to have been placed on the road leading south away from the junction. A small defensive position appears to have been constructed on the side of the road, opposite the road leading south. It is likely that this is a small position constructed out of sandbags or something similar. Additional fire trenches were observed at the rear of the patrol harbour.

**Analyst Assessment:** The creation of a chicane and small defensive position, and the small size of the detachment that was likely to have occupied this position suggests that the role of the position was security of the approaches to the power plant or route security / route marking for forces transiting the area. Its position on this road covers one of the main approach roads to the powerplant from the west. This would indicate the forces present here would have expected any threat to have approached from the west along this route. The size of the force present does not suggest any great expectation of a significant threat however. **Assessment ends.**

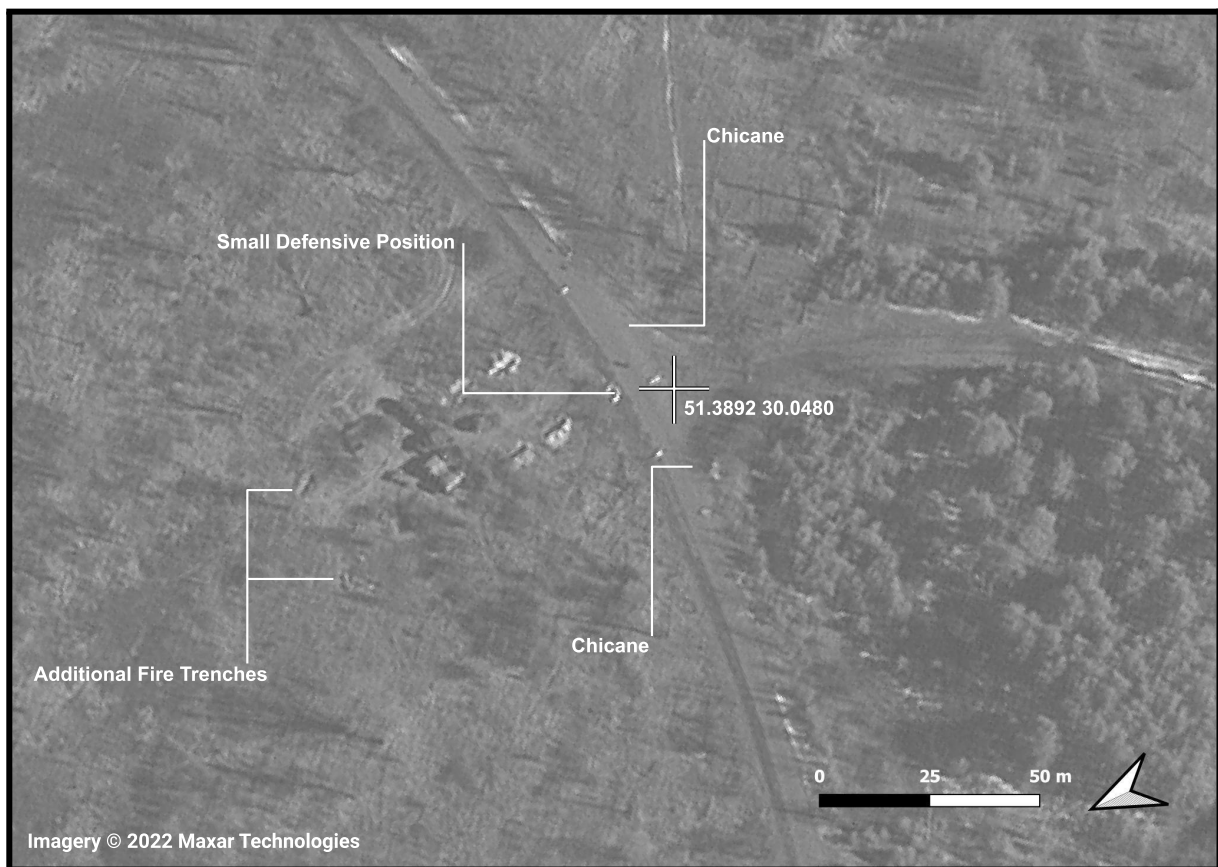


Fig.9 - Chicane System - 10 March 2022

**Wider Area**

A roadblock had been established at a major junction to the immediate west of the power plant. The roadblock was only placed on one of the four roads at the junction and blocked access to the southern side of the power plant and transmission yard. The road block did not completely block the road; a small gap approximately 1-1.5m in width remained in the centre of the road block but is unlikely to be wide enough to allow vehicles access. (Fig.10). The roadblock remained in place throughout the reporting period.

**Analyst Comment:** The position of the road block makes no logical sense as access to the transmission yard and southern side of the power plant by the road that runs just to the north of the road block. **Comment ends.**



Fig.10 - Roadblock on Road to Power Plant - 10 March 2022

### 5.5 11 March 2022

#### Junction of Specific Interest

No significant changes were observed at the patrol harbour adjacent to the junction of interest. Two utility trucks were observed within the harbour area and a third was observed on the junction (Fig.11). The chicane remained in place on the road.



Fig.11 - Junction of Specific Interest - 11 March 2022

### Wider Area

Four objects casting a shadow were observed astride a track approximately 1.2km south of the patrol harbour area (Fig.12). The objects were not observed on previous or subsequent imagery. The size and shape of the objects are commensurate with a person. The spacing, pattern and numbers suggests this is likely to be a foot patrol.

**Analyst Comment:** It is standard practice for deployed troops to conduct patrols of the wider area around their location. Patrols are conducted for security purposes (clearance and perimeter patrols) or to deliberately engage an enemy (fighting patrols). The minimum number of troops to be engaged in a patrol would be four soldiers and these would be expected to be mutually supporting and supported by other patrols nearby. Spacing of troops within the patrol is tactically important to prevent presenting a larger target; should a soldier be engaged by fire or explosive such as an IED, the other members of the patrol can react and provide covering fire or assistance if necessary without also becoming casualties. **Comment Ends.**



Fig.12 - Likely Foot Patrol - 11 March 2022

## 5.6 14 March 2022

### Site of Encampment

A large number of utility trucks (Approximately 30-40) were observed positioned in close proximity on the side of the minor road (Fig.13). An area of trees has been cleared and what appears to be two vehicles parked in the clearing. It is unlikely that the area had been cleared by hand and is likely to have required engineer support with heavy plant equipment.

**Analyst Comment:** The deployment and spacing of the vehicles is not tactical in that they are parked very close to each other and there has been no attempt to conceal their location through the use of cam nets or natural foliage. The apparent absence of armoured vehicles or fighting vehicles suggests this is not a combat or combat support unit but is likely to be a combat service support unit such as logistics or material support (maintenance) unit. **Comment Ends.**

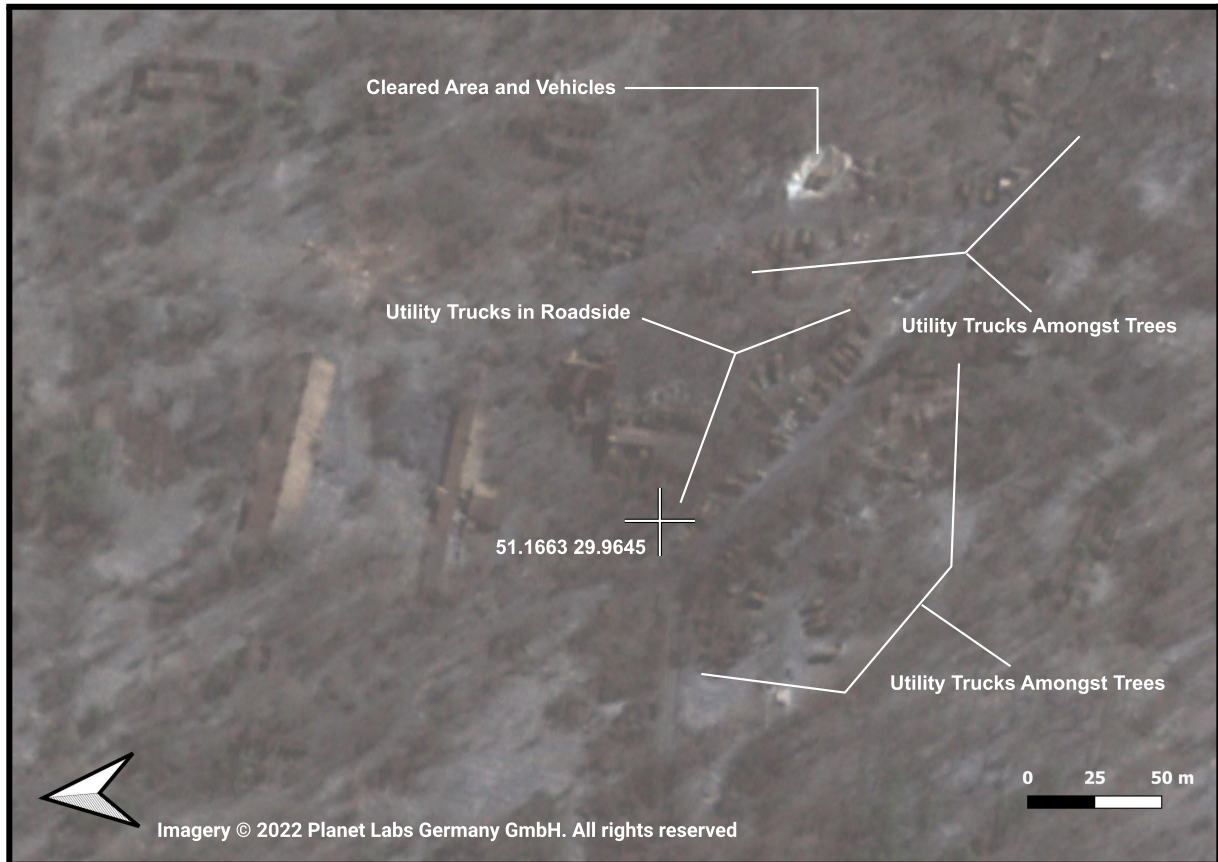


Fig.13 - Site of Encampment - 14 March 2022

## 5.7 17 March 2022

### Site of Encampment

The unit deployed at the site of the encampment remains in situ and appears to be starting to organise the site for a more permanent presence (Fig.14). Vehicles are spaced out more, in groupings and are positioned within the trees in an attempt to conceal them. Other than the previously identified clearing, there is no further digging or grading of the ground in this area. To the immediate west of the position, substantial vehicle tracks can be seen in the ground.

**Analyst Comment:** The area where the vehicle tracks can be seen was already an open space and has likely been used as an area to manoeuvre the vehicles as the site begins to be organised. Given the narrowness of the track leading to the site, the relatively dense trees and the amount of vehicles, this open area would be needed to manoeuvre the trucks. **Comment Ends.**



Fig.14 - Site of Encampment - 17 March 2022

### Stari Sokoly Village

Imagery collected on 17 March 2022 of the small village of Stari Sokoly (51.1303 29.9144), approximately 31km south southwest of the power plant and just outside the Exclusion Zone, identified a significant deployment of military vehicles and equipment (Fig.15). The site was displaying significant construction of trenches and revetments. The trenches and revetments were laid out in a defensive posture as would be expected of a deployed force in a hostile environment, with features dug outwardly facing and in all-round defence. Some of the revetments had also been constructed in the centre of the site suggesting that vehicles or equipment would be parked or stored there that needed a degree of protection, for example from small arms fire or shrapnel/blast effect. A number of derelict buildings within the site were also being utilised as a form of protection in the same way. A small number of armoured vehicles were identified occupying some of the defensive revetments around the perimeter. At the time of imaging, there appeared to be elements of an engineer bridging unit at the site. The site appears to be accessed via a small track off the main road to the immediate northeast of the site. A small trench has been dug on the opposite side of the road to this access point.

**Analyst Comment:** Analysis of the site over a period of time identified different unit types at the site. The units observed were not combat units but appeared to be in the combat support or combat service support role. Although a number of armoured vehicles were observed at the

site, these were in insufficient numbers to indicate a combat unit and were likely to be based at the site in the security role. The activity observed over the reporting period suggests the site is a logistical support hub such as ammunition/materials storage. It is possible that there may also be communications vehicles at the site which could indicate a HQ element of communications relay station. It does not appear to be a main headquarters of a significant formation. The site is not situated on one of the main routes that would be expected to be used by a large force such as the forces that headed towards Kyiv on the northern axis of advance from the Belarussian border. The site is situated between the two main routes (P02 and P56) believed to have been used by the Russian forces and is on a road that would be capable of being used by large convoys of trucks that could serve both main routes. **Comment Ends.**



Fig.15 - Stari Sokoly Village Deployed Site - 17 March 2022

## 5.8 21 March 2022

### Site of Encampment

The site is beginning to show signs of preparations for a more permanent presence (Fig.16). Areas of ground have been cleared and graded to form revetments which appear to be for the purpose of parking trucks. To the south of the minor road running through the site, an area of ground has been cleared and digging or construction appears to be ongoing. This is a substantial area of activity and may indicate the headquarters area of the unit deployed at this



site. Tonal differences amongst the trees also indicates smaller areas of ground being dug or disturbed. A number of trucks remain parked along the length of the road but on the verge and in front of the tree line.

**Analyst Comment:** The size of the unit deployed at this location, given the area covered and number of trucks present suggests greater than a company but smaller than a battalion size. As previously identified, the lack of armoured combat vehicles indicates the presence of a unit in the combat service support role. The imagery shared on social media of the site collected by an unmanned aerial vehicle indicated the presence of a large wheel and tyre. Whilst this is not conclusive, it could indicate a logistical or maintenance unit. The location of the site certainly does not provide any tactical advantage for any offensive operations. The smaller areas of disturbed ground amongst the trees is likely to be shelters or trenches dug by the troops occupying the site. The larger revetments will have required specific engineer plant equipment such as the BAT-2 armoured vehicles observed in the convoy captured by CCTV on 24 February and mentioned earlier in this report. **Comment ends.**

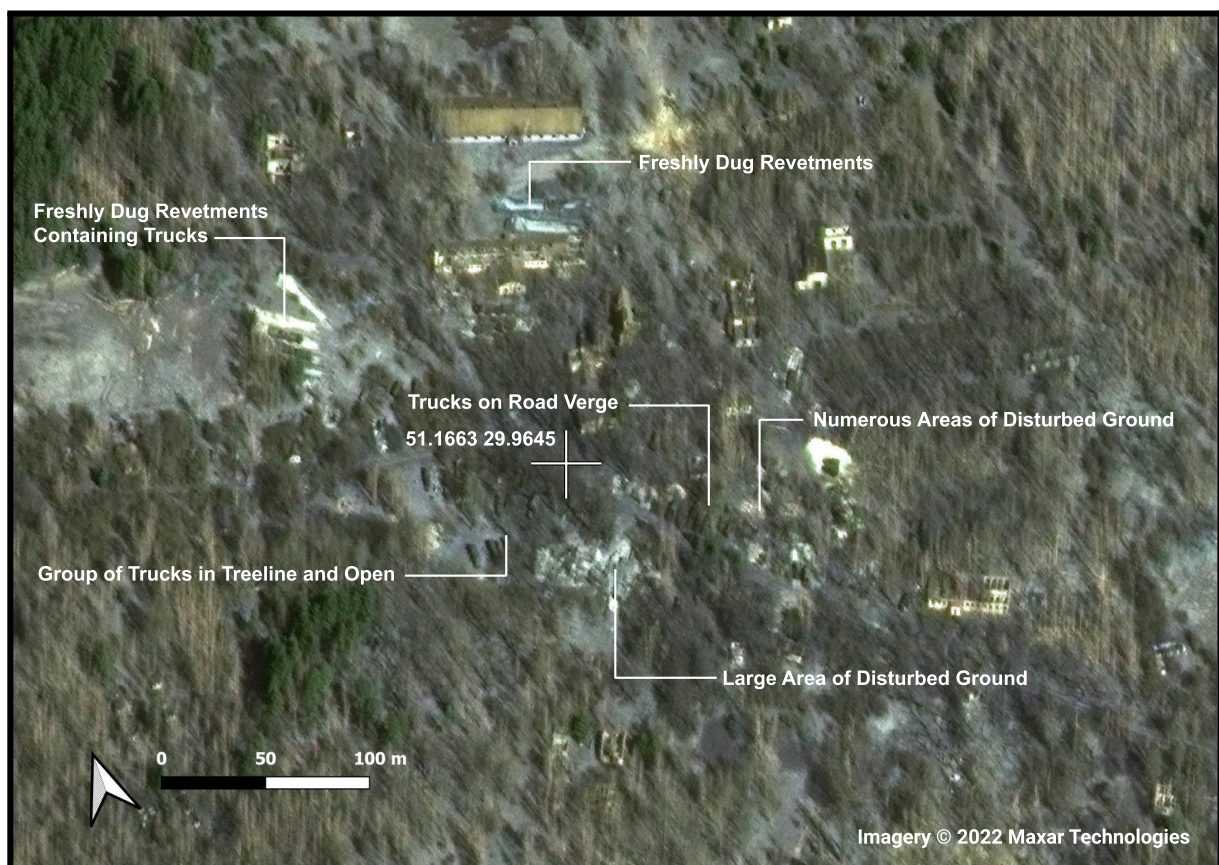


Fig.16 - Site of Encampment - 21 March 2022

## 5.9 22 March 2022

### Site of Encampment

The preparations at the encampment had progressed significantly on 22 March, only a day after the previous imagery collection (Fig.17). Further revetments had been dug around the site, both within the centre and on the extremities of the deployed area. Vehicles were also observed parked in the revetments, suggesting they were constructed for parking and protection of the vehicles. Given the assessed role of combat service support of the unit at the site, it is also possible that the revetments are makeshift vehicle maintenance bays. The vehicles that were parked in the treeline on the previous day were no longer present suggesting they had moved to the revetments. A small convoy of three trucks was observed on the road running through the site, heading in an easterly direction.

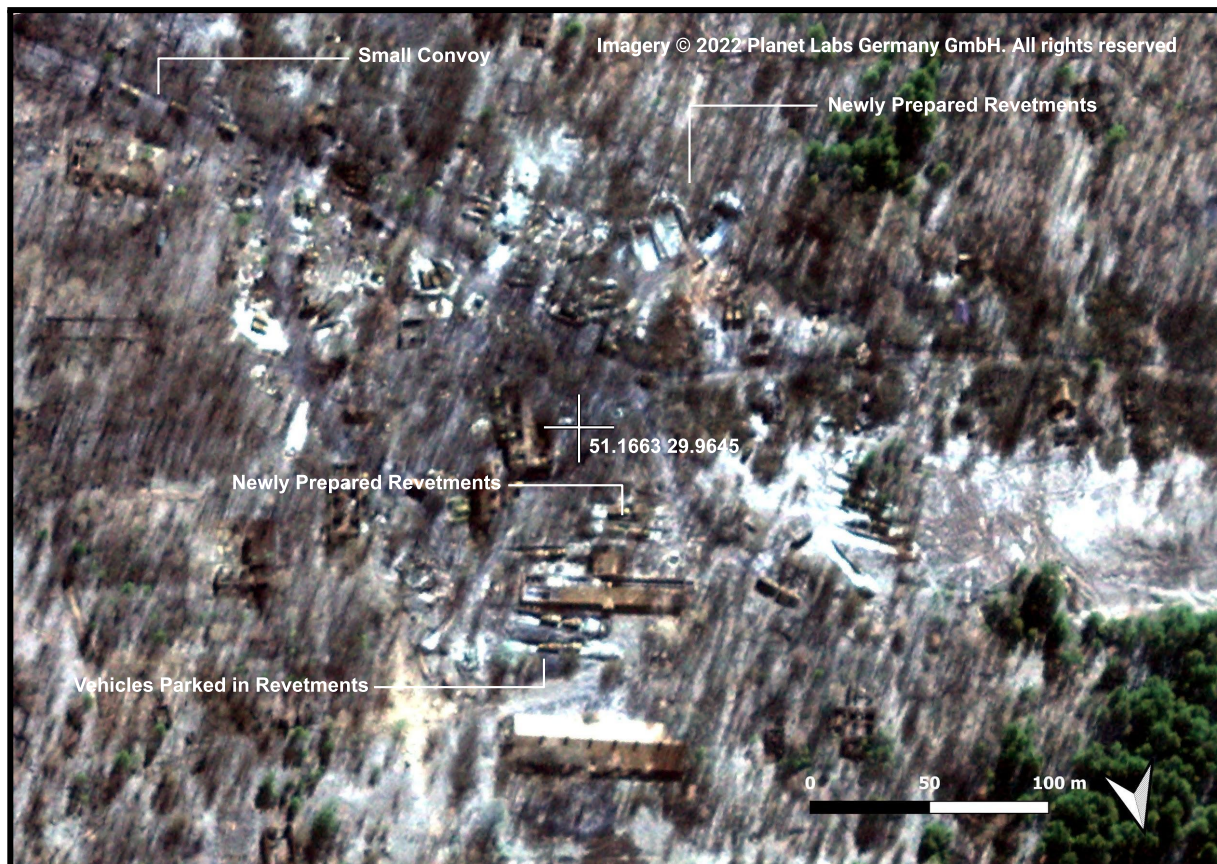


Fig.17 - Junction of Specific Interest - 25 March 2022

### 5.10 27 March 2022

#### Junction of Specific Interest

The small position adjacent to the road junction near the power plant has been developed since the previous time of imaging (Fig.18). A number of new revetments and trenches had been dug and some of the revetments were occupied by vehicles, most likely Ural-375 utility trucks. One of the trucks was parked external to the adjacent revetment. A tent had been erected in the centre of the position. Vehicle tracks were visible in the ground around the position.

**Analyst Comment:** Even though the site has been developed over the period of time between image collection, it is still considered to be a small detachment of troops, certainly no more than a platoon but likely smaller. **Comment ends.**

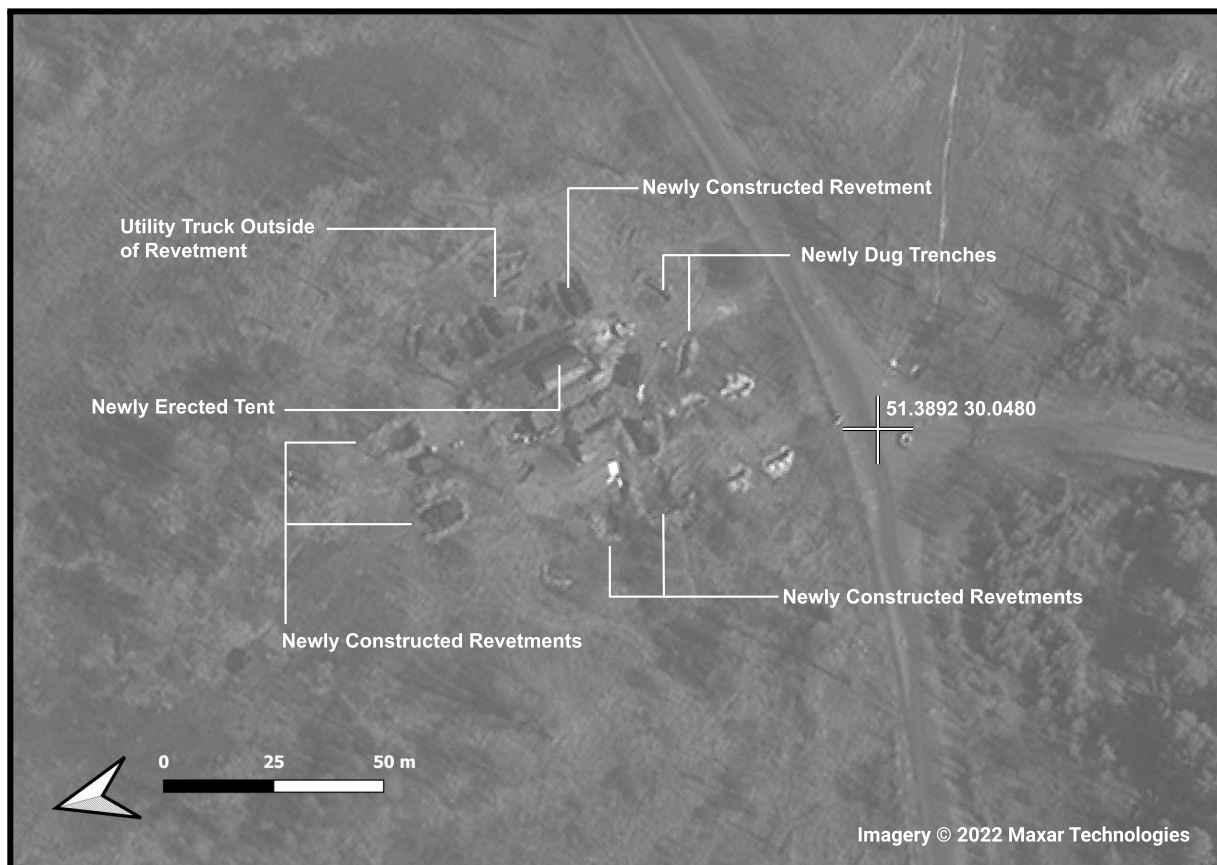


Fig.18 - Junction of Specific Interest - 27 March 2022

### 5.11 28 March 2022

Lower resolution multispectral imagery from the Sentinel 2 constellation indicated the presence of a fire within the forest block where the patrol harbour area was situated. This area was also analysed using the NASA Visible Infrared Imaging Radiometer Suite, a very low resolution sensor (375m) that collects in the infrared band and identifies heat sources.

The Sentinel 2 sensor collects in 13 bands of the electromagnetic spectrum including 3 visible bands (Red, Green & Blue) and a number of wavelengths within the infrared band. Composite images taking data from different bands can produce various composite images including true colour, false colour infrared and shortwave infrared. Using these different band combinations can create various effects such as eliminating smoke and identifying fire and burnt vegetation. The image collected on 28 March was collected at 0856 UTC, 1156 local time. The image at Fig.19 is displayed using the False Colour (Urban) band combination (2 x shortwave infrared bands 12 & 11 and the visible red band 4). This combination eliminates much of the smoke and also displays fire in very bright colours. The image shows two separate instances of fire; a small fire adjacent to the road and approximately 330m west of the patrol harbour, and a second larger fire stretching across the width of the forest block approximately 690m west of the patrol harbour.

VIIRS data collected at 1100 UTC, 1400 local time identified heat sources across the entire area of the forest block with the exception of the area immediately to the west of the patrol harbour. The heat sources are displayed on the image at Fig.19 as 37m pixels, illustrating that heat sources were within that 375m<sup>2</sup> area.

**Analyst Assessment:** Conducting a timeline analysis of the fire identified on the multispectral imagery and the VIIRS data, the fire appears to have been started in the area immediately to the west of the patrol harbour in the morning of 28 March. The fire either spread to the west or another fire was started a little further on at around the same time. As the day progressed and into the early afternoon, the fire was burning across the entire area of the forest block, both east and west of the patrol harbour. The assessed original source of the fire appeared to have either been extinguished or had burnt itself out. The initial fires identified at 0856 UTC were to the west of the patrol harbour whereas the VIIRS data from 1100 UTC recorded heat sources to the east. Whilst it cannot be confirmed, it does not appear that this was a fire that went out of control but is likely to have been started deliberately. Russian forces withdrew from the Chernobyl plant at the end of March 2022 and were fully withdrawn as of 1 April 2022. This reinforces the assessment that the fires were started deliberately although there is no tactical reason for this to happen. **Assessment Ends.**

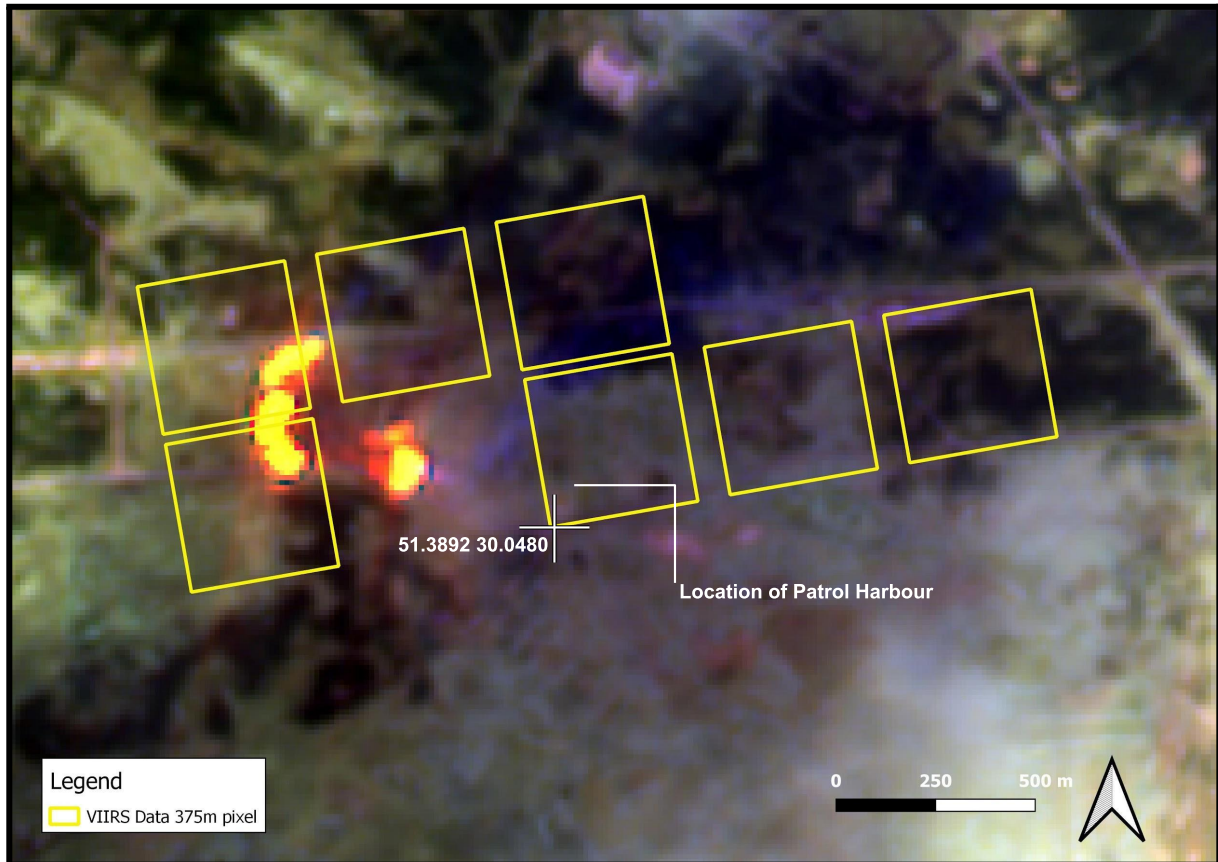


Fig.19 - Timeline of Fire Event - 28 March 2022

## 5.12 Change Detection Study 2021-2022

A change detection study using multispectral imagery from the Sentinel 2 sensor was conducted of the wider Exclusion Zone area using imagery from the same period of time (March/April) of 2021 and 2022. The aim of this study was to identify any significant changes to the ground which may indicate disturbance or digging of the ground. The study would also determine changes to the infrared return of vegetation in the zone, again indicating changes or disturbance to the vegetation. The results of the change detection did not reveal any significant changes to the ground that would suggest extensive digging. A number of areas that had been subject to fire were identified however. Many of these areas were located within the Exclusion Zone as illustrated at Fig.20.

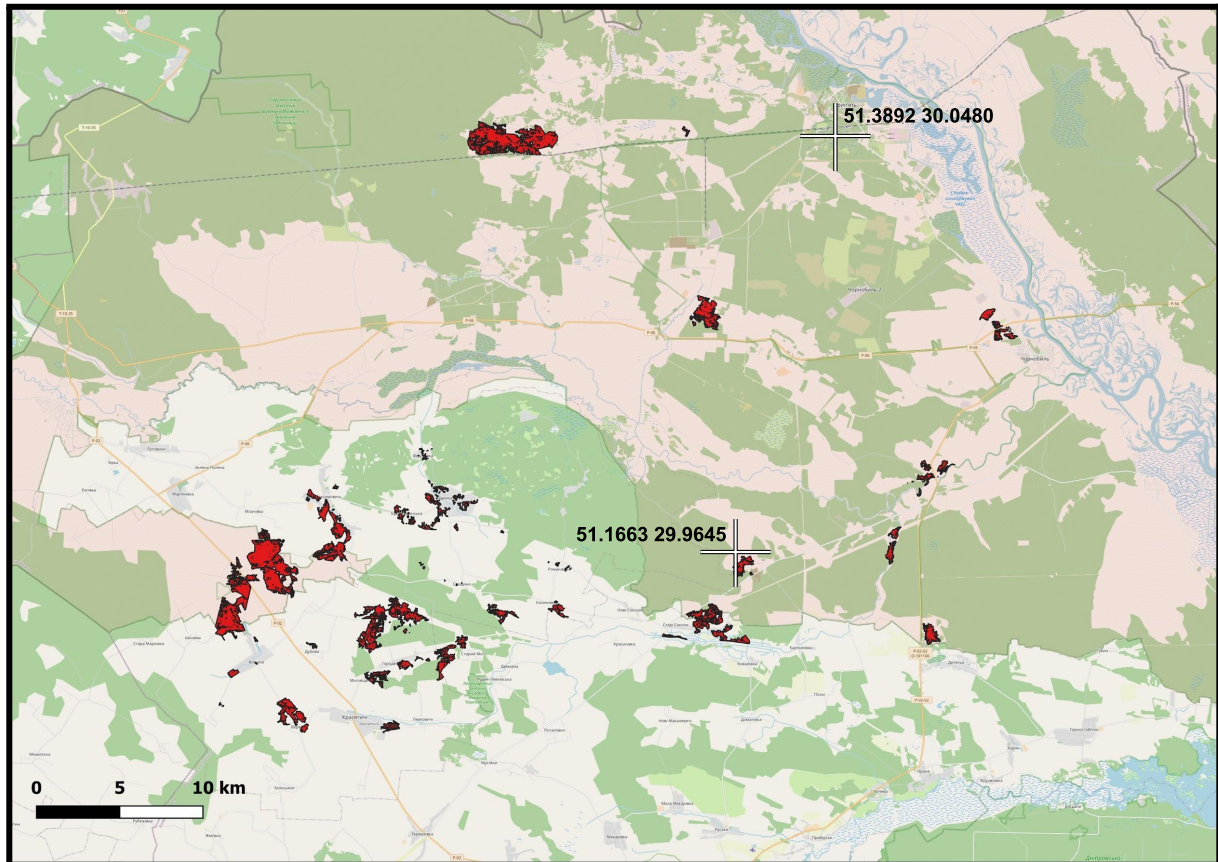


Fig.20 - Areas of Burnt Ground Between March 2021 - March 2022

## 6 Overall Assessment

Throughout the entire reporting period, there has been no evidence of a sizable garrison either at the Chernobyl power plant or the wider area incorporating the Exclusion Zone. It is estimated that the area was occupied by no more than a battalion sized unit, approximately 600 troops. There has been no evidence of a sustained and overwhelming security presence throughout the area, either in the form of patrols using armoured vehicles or static security posts.

Of the different deployed areas analysed in the conduct of this study, it is apparent that the deployed troops closer to the power plant are likely to have been conducting area / route security duties. The force observed at the power plant and immediate area was not equipped with heavy armour suggesting that they were not to be employed in any offensive capacity nor were they expecting to engage a sizeable or heavily equipped force. It can be expected that the force that occupied the power plant would have been aware of the size and make up of the security presence at the plant prior to the invasion and would have tailored the force accordingly. Furthermore, the power plant site is not on a logical main route for the advancing Russian forces crossing the Belorussian border on the main axis of advance towards Kyiv. Given the close proximity to the Belorussian border, and the expectation that the axis towards Kyiv would have been secured early on in the invasion, a sizable security force to garrison the

area was most likely considered unnecessary. This further reinforces the likelihood that the troops occupying the plant were not first echelon frontline forces.

The deployment of Russian forces at the southern extremity of the Exclusion Zone is a larger force and is also not equipped with heavy armour; equipment that would be expected to be present in an offensive frontline unit. The location of this deployment, straddling a minor road but not immediately close to a main route also suggests that this is not a unit that is on a fast moving offensive axis. The sizable groundwork that was observed at this location, grading and digging of large revetments, substantial construction of trenches and shelters etc suggests that the force expected to be at that location for a protracted period of time. The footage collected by an unmanned aerial vehicle (UAV) reinforces this assessment. The construction observed included covered trenches and shelters dug into the ground. At one area, a large excavation was observed with long wooden poles laid across the top. This appears to be a partially constructed protective shelter for troops to use in the event of bombardment or air strike. It also appears that small observation posts had been constructed on top of the large earth revetments. This would provide an elevated view of the area for a perimeter security force for the deployed location. The construction of these facilities indicates a tactically aware force had occupied the site. The activity observed on imagery and after the unit had vacated the site confirms it was not a frontline offensive unit such as infantry or armour. It is more likely that this force was in the combat service support role. The activity observed suggests a second line material support area for logistics, repair and maintenance support to the forces further forward.



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