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Supplement 2 - debris-rich ice logging 2024/2025

674 Dark procedure

675 The processes during the resurfacing of the drill can happen in two ways:

- 676 1) If the core barrel is expected to be empty, then one person goes down in the inclined trench,
677 and looks into the barrel as soon as it reaches the top of the borehole lid. If it contains a core,
678 then a plug is put in. If there is no core, nothing out of the ordinary drill routine is done.
679 2) If a core is expected in the drill, then a 2m black trash bag, in the shape of a tube (also
680 referred to as “The Wurst”), is lowered around the borehole lid. The drill is pulled up into
681 the trash bag, and a rope system closes the bottom of the bag. The tower is brought to
682 horizontal. Under the cover a plug is inserted into the drill head, covering the core from
683 light. Paper covers are added. The core barrel is extracted from the drill’s outer tubes and
684 the upper part is then covered too. The core barrel is then carried down into the dark trench.

685 The extraction of the core is done using a broom or bamboo stick in red light. Extraction is easy
686 with the 2 m-core barrel. The 4m barrel is quite challenging, but also works, if the core is removed
687 in increments.

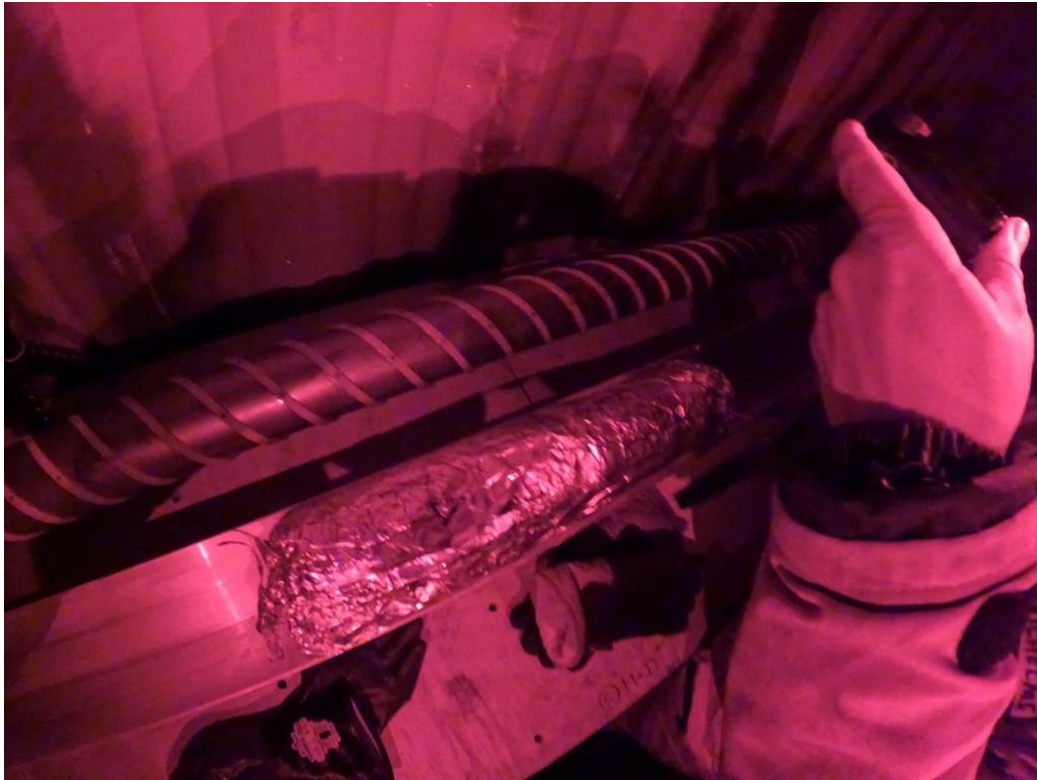
688 The core is logged with a wooden 1 m stick, to 1cm precision, and, if needed, cut with a hand saw.

689 Packing procedure

690 The packing procedure follows these steps, from the inside (closest to the core) to the outside:

- 691 - Transparent and labeled ice core bag
692 - Tin foil
693 - Black garbage bag
694 - light-tight modified ice core box

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696

697 *Figure S2_1: ice core packed in tin foil*

699 January 5, 2025

700 Drillers run #886

701 Drilled a bit more than 3 m. Then trouble at bottom. Cores handled as basal material, so full dark
702 mode and logged in the red light.

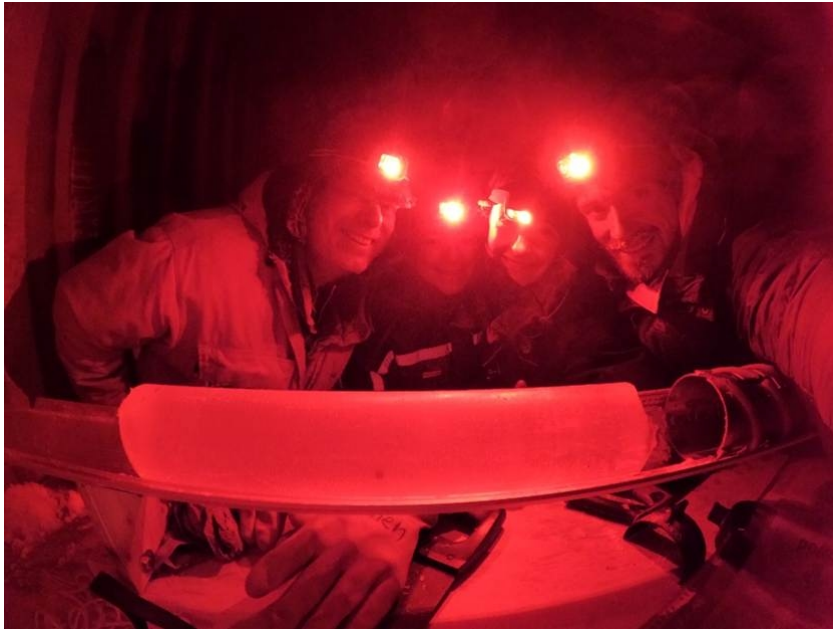
703 Half of bag 2793 left from the run before. (update Jan 9th, cut and repacked as B-cuts)

704 Bag 2794, full bag, no basal material. (update Jan 9th, cut and repacked as B-cuts)

705 Bag 2795, full bag, no basal material. (update Jan 9th, cut and repacked as B-cuts)

706 Bag 2796, 47cm, first basal material. Small rocks, size around 1-3 mm. Labelled as bag 2796-A.

707 Loggers depth: 2795.47m



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709 *Figure S2_2: First basal material – bag 2796-A (top to the left of image)*

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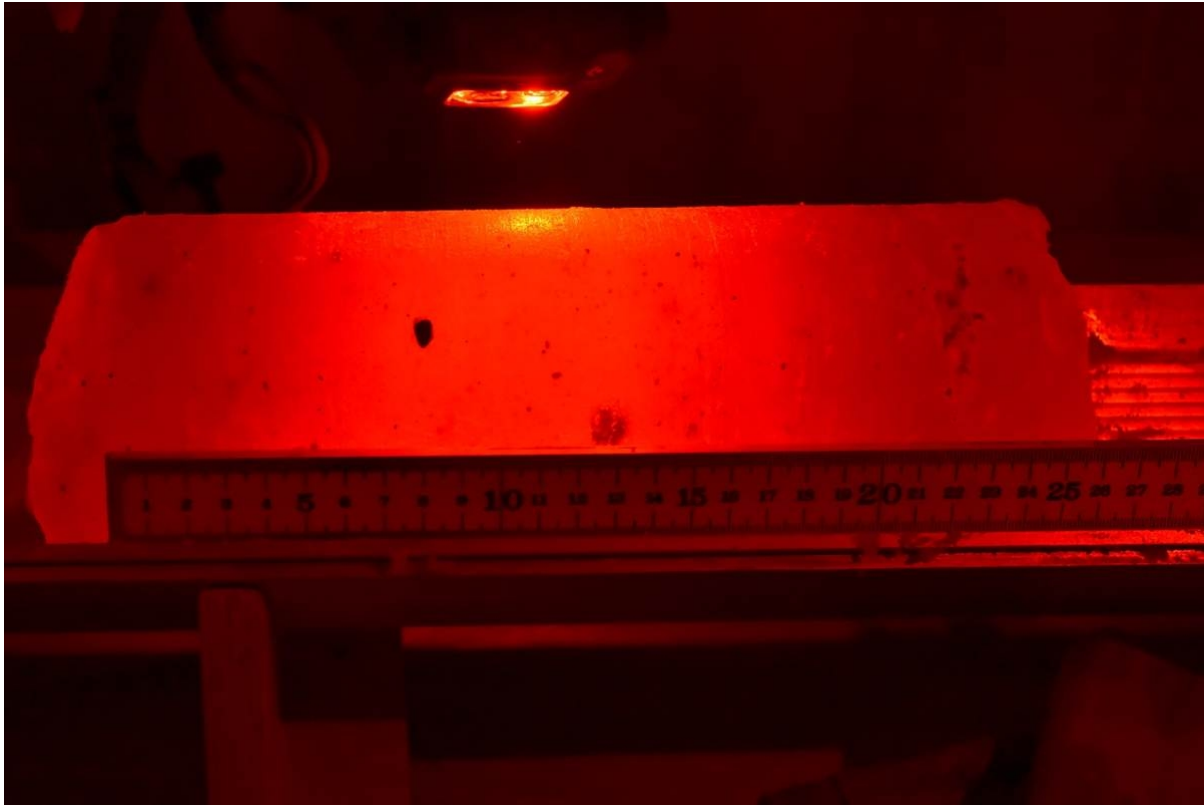
712 January 6, 2025

713 Drilled 26 cm of core (bag 2796-B). Not matched to the previous core. No loggers mark added, no
714 orientation line (updated on Jan 14th). Packed, and stored.

715 Drillers run #889 (approx. 8 pm)

716 Loggers Depth: 2795,73m

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719 *Figure S2_3: bag 2796-B, 26 cm length*

720

721 January 7, 2025

722 At 8:50: Logged 7 cm (bag 2796-C), drillers run #890 (from evening before)

723 At 11:30: logged 6 cm (bag 2796-D), drillers run #891

724 At 15:38: logged 13 cm (bag 2796-E), drillers run #892

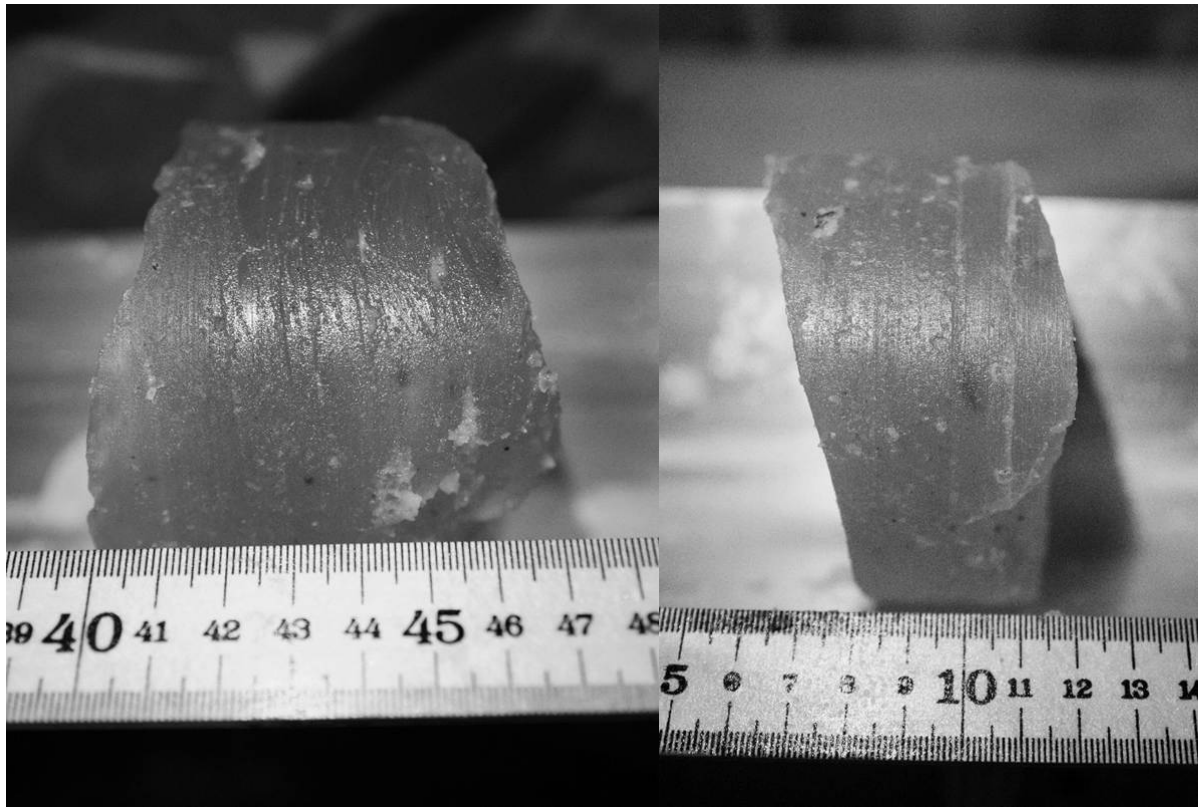
725 All above: Not matched to previous core. No logger mark, and no orientation line (updated on Jan
726 14th). Packed, and stored. Bag 2796 Added up to 99 cm.

727 **Update: Jan 14th**, repacking of bag 2796:

728 Orientation preserved and marked, 5 pieces, total length 101 cm (not 99, as marked before)

729 Breaks at 49 cm, 65-66 cm, 82 cm, and 87 cm.

730 All cores with basal material in box BE0068.



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732

733 *Figure S2_4: bag 2796-C, -D, and -E*

734 Next run: drilled approx. 2.2m of core in the evening (run #894). Core catchers didn't catch. Empty
735 core barrel on surface.

736 Next run down, drilled a bit more, core came up. Left hanging in the hole until morning, as loggers
737 were already sleeping.

738

739 January 8, 2025

740 **Core #1 of day (drillers run #894 (drilled), #895 brought up core)**

741 Core barrel brought to red light cave, no exposure to sun-light.

742 Length measured of core: 208cm, but bottom 11,5 cm was forgotten in core barrel while extracting
743 core. Noticed in the drill tent when the core barrel was prepared for the next run. Therefore, this
744 core was exposed to light (bag 2799-B).

745 First bag 2797, length 101 cm. Not cut at the top.

746 Bag 2798, length 100 cm. Cut on both sides. Orientation is not marked at the top but can be
747 matched, due to a break while cutting with a hand saw.

748 Bag 2799, length 7.5 cm. Packed and stored. Will later be bag 2799-A.

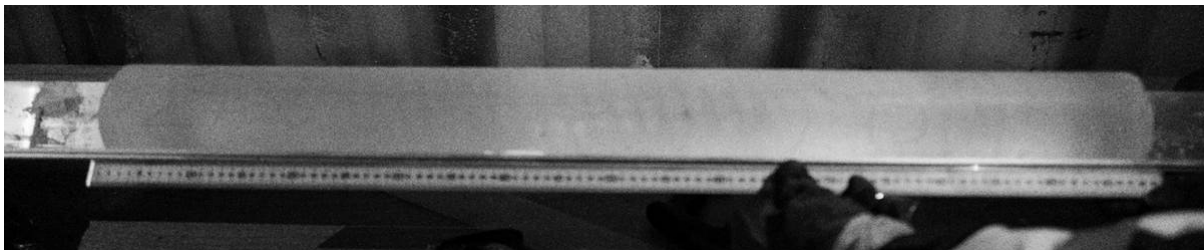
749 *Visible inclusions are present in the upper 30cm of core (bag 2797). Then very clear ice, very few*
750 *inclusions. Sandy layer in bag 2799-B, but above, very clean ice.*

751 Loggers depth: 2798.075m



752

753 *Figure S2_5: bag 2797 - length 101cm, top to the right of the picture.*



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755 *Figure S2_6: bag 2798 - length 100cm, top to the right of the picture.*

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757

758 **Core #2 of day (drillers run #896 (drilled), #897 brought up core)**

759 Drilled approx. 1 to 1.5m. Core catchers did not catch (#896). Next run brought core up with new

760 core catchers mounted (#897). Length: a bit less than a meter. Core stuck out of the core barrel.

761 During the process of pushing it back in, the end was exposed to light (i.e. bottom of bag 2799-D).

762 Bag 2799-A unpacked and matched. 7,5 cm length (ice from previous run)

763 Bag 2799-B was not packed, due to exposure to sunlight in the drill tent. Breaks matched. 11,5 cm

764 length. (ice from previous run)

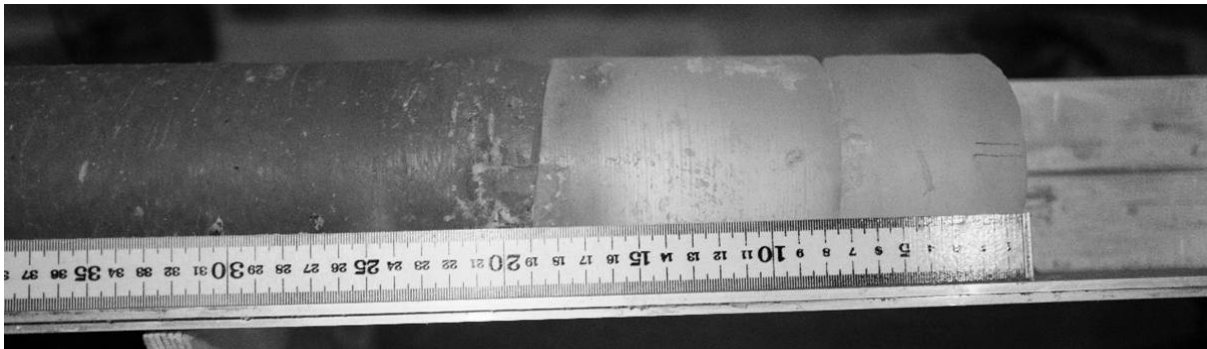
765 The rest of the core was broken, therefore split into Bag 2799-C and -D. 27 and 58 cm length,

766 respectively. Bag 2799-D contains 4 cm of Bag 2800. Not cut.

767 *Visible inclusions increase over depth within bag 2799. Many in the bottom, very dark ice. Large*

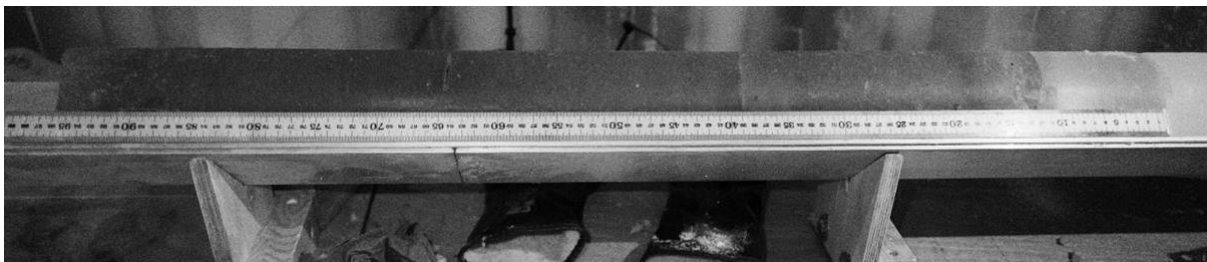
768 *stone (3x1cm) around 46cm in bag 2799.*

769 Loggers Depth: 2799.04m.



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771 *Figure S2_7: bag 2799-A, B, partly C*



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773 *Figure S2_8: bag 2799-B (partly), C and D. Ruler starts at approx 10cm of core.*



774

775 *Figure S2_9: large rock at bottom of bag 2799-C (top to the right).*

776

777 January 10, 2025

778 79 cm of core brought up. One core catcher mark at the very bottom.

779 Including the "+4 cm" from run before, now bag 2800 and 83cm

780 Loggers depth: 2799.83m.

781 *Description: 0-20cm from top (of drilled core section), basal material content low. 5 cm from top,*
782 *large pieces of 3x2 cm. 20cm to bottom (i.e. bag plus 24cm to 83cm), foggy texture and gradual*
783 *increase of particles. Particles around 1mm to 1-2cm in diameter. Somewhat layered structure.*
784 *Some particles appear roundish.*

785 Packed in box BE0068.

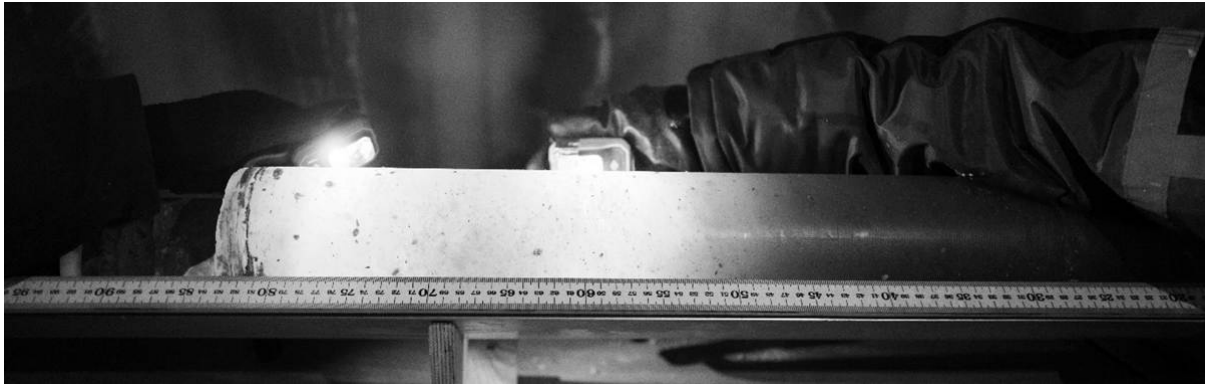
786 **Update March 5, 2025:**

787 Loggers depth: 2799.83m plus 2cm is **2799.85 m depth.**

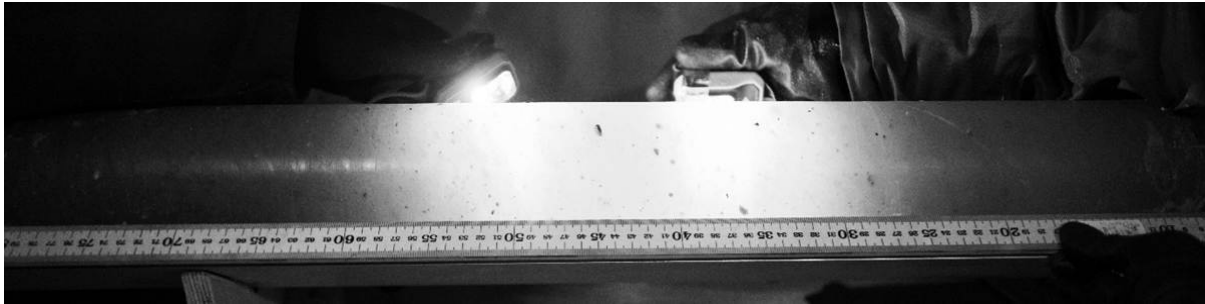
788 The plus 2 cm from bag 2796 were not added before.

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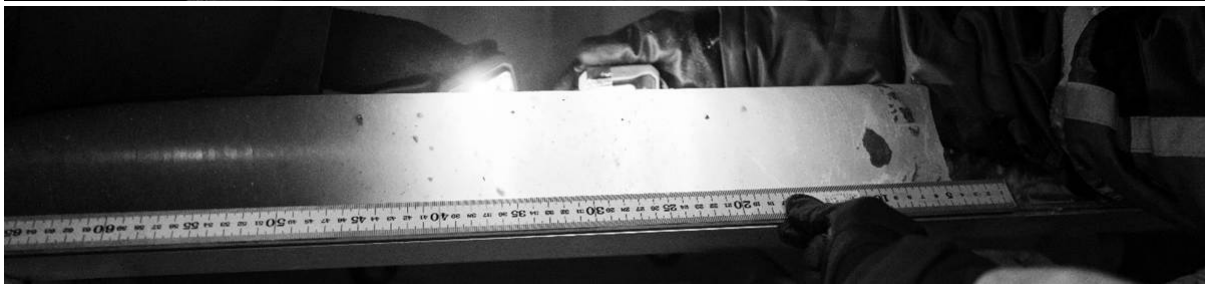
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793 *Figure S2_10: Bag 2800 (4 to 83cm) illuminated at different positions.*

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