

Accelerated gate two queries process

Strategic solution(s)	Water Recycling
Query number	SWR005
Date sent to company	16/12/2021
Response due by	20/12/2021

Query

1. Confirm when final effluent samples have been taken from [REDACTED] WWTW.

The input data for the Gate 2 report included seven sampling events for the [REDACTED] final effluent, each event including one grab sample and one 24-hour composite sample. Samples were collected on the following dates:

- 11/10/2021
- 19/10/2021
- 20/10/2021
- 22/10/2021
- 25/10/2021
- 27/10/2021
- 29/10/2021

Sampling of the [REDACTED] final effluent is ongoing and sixteen further sampling events have been completed since the data inputs for the Gate 2 report were finalised. Samples were collected on the following dates:

- 01/11/2021
- 03/11/2021
- 05/11/2021
- 08/11/2021
- 09/11/2021
- 10/11/2021
- 12/11/2021
- 16/11/2021

- 17/11/2021
- 19/11/2021
- 22/11/2021
- 24/11/2021
- 26/11/2021
- 13/12/2021
- 14/12/2021
- 15/12/2021

Note also that a five-year routine compliance sampling dataset, spanning 2016 to 2021, for the [REDACTED] final effluent was used to sense check the baseline established in the WFLH sampling data, with appropriate modifications made to the envelope using this data where discrepancies were identified.

2. Final outcomes from Gate 1 required evidence showing that the character and variability of the final effluent from [REDACTED] and [REDACTED] was similar. The data table in S 2.2.1 does not suggest the data is equivalent. In addition information provided previously suggested 5 of the samples were taken in October 2021, please confirm how this has been deemed as sufficient to confirm any variability in the effluent.

The sampling exercise for [REDACTED] WTW under the WFLH programme started in October 2021 and is still underway to provide a larger dataset against which the [REDACTED] final effluent data can be compared. Southern Water acknowledges differences in the final effluent data for the two sites in Annex 2 and Annex 3 of the Gate 2 submission and provides explanation for the discrepancies associated with key design parameters, total nitrogen (particularly nitrate) and total dissolved solids (predominantly chloride), for the water recycling treatment process. The WRP design at Gate 2 accounts for these differences and, more generally, the similarities in the final effluent profiles indicate that WRP performance should be reliably informed by the pilot testing at [REDACTED]. Note also that a five-year routine compliance sampling dataset, spanning 2016 to 2021, for the [REDACTED] final effluent was used to sense check the baseline established in the WFLH sampling data, with appropriate modifications made to the envelope using this data where discrepancies were identified.

The design presented for the WRP at Gate 2 was developed by Southern Water in collaboration with subject matter experts from [REDACTED], with independent reviews also completed by experts from [REDACTED] and [REDACTED].

A demonstration facility is in the process of being considered for [REDACTED] with an intended treated water output of up to 1 Ml/d, yielding scalable data and providing an opportunity for parallel testing of different suppliers' product offerings.

3. Provide monitoring data and parameters being analysed for the inlet and outlet water for the pilot plant and explain why, as you have stated in your submission (Pg22 technical annex), this information is not scalable.

The pilot plant data is not directly scalable to the Gate 2 concept design due to large magnitude in size difference between the two facilities. The pilot plant delivers a permeate flow of 2.6 m³/h, whilst the full scale plant will be required to produce a maximum of 625 m³/h under B4 and 3,125 m³/h under B5, this throughput being approximately 240 and 1,200 times greater than the pilot facility.

Table 1 summarises the sample points within the pilot plant compound which are included in the routine sampling programme for monitoring the performance of the pilot process.

Table 1. [REDACTED] pilot plant sample points.

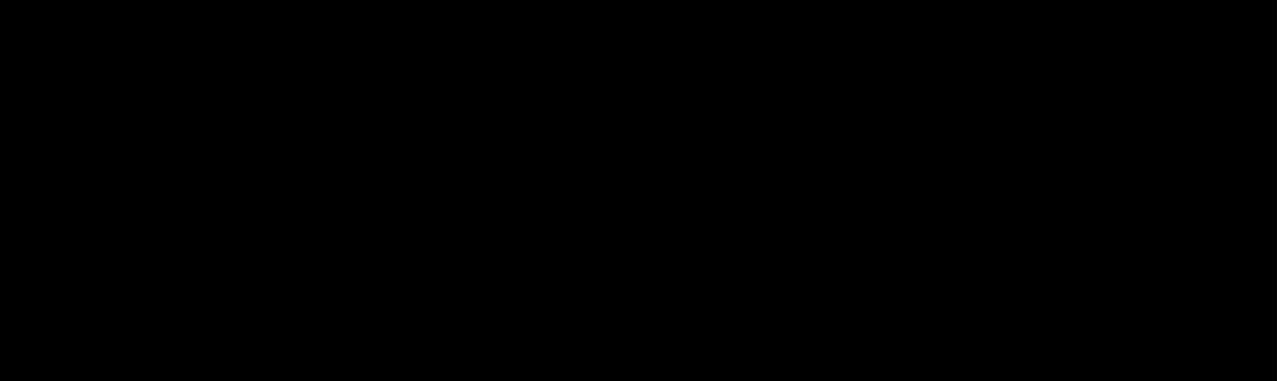
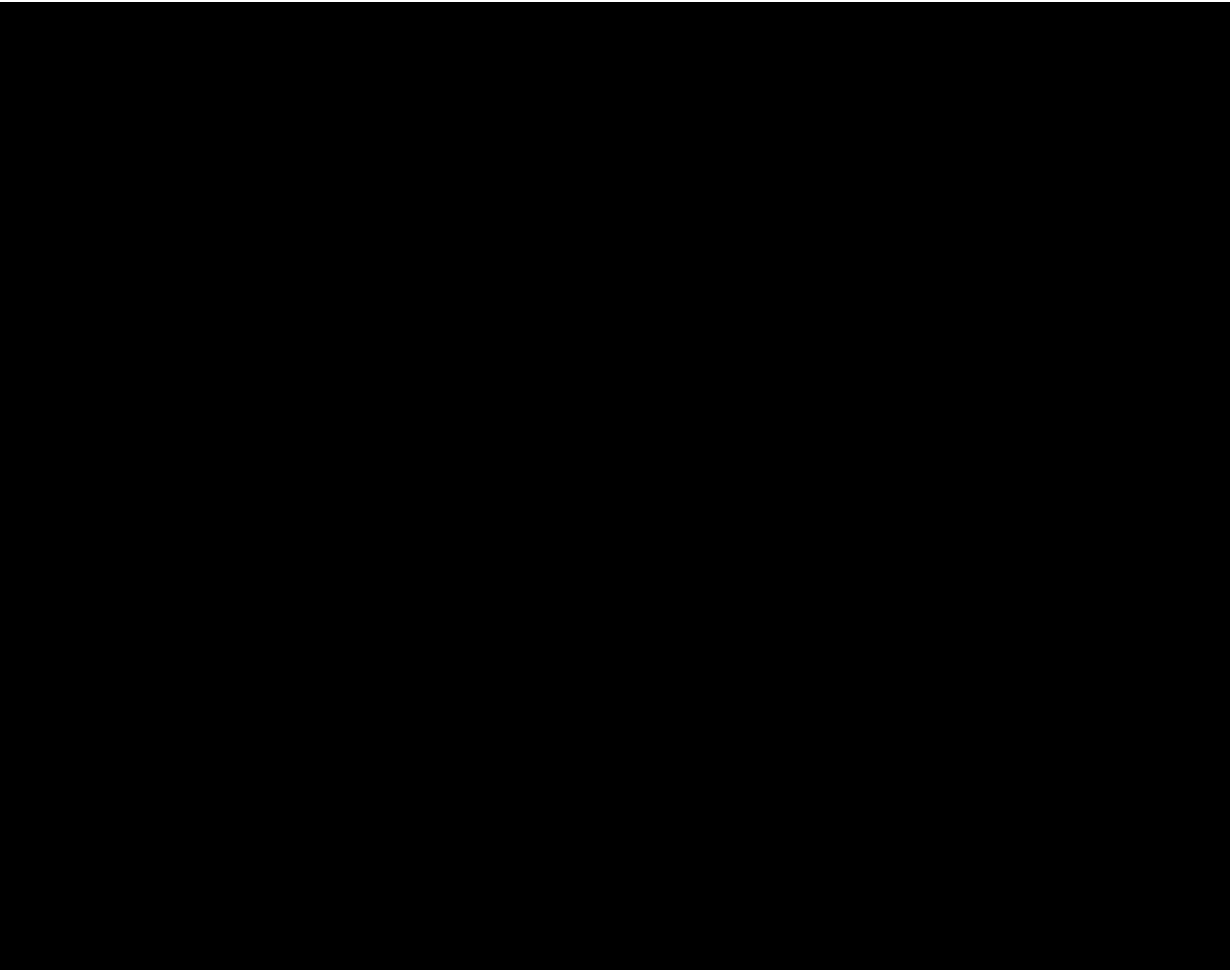
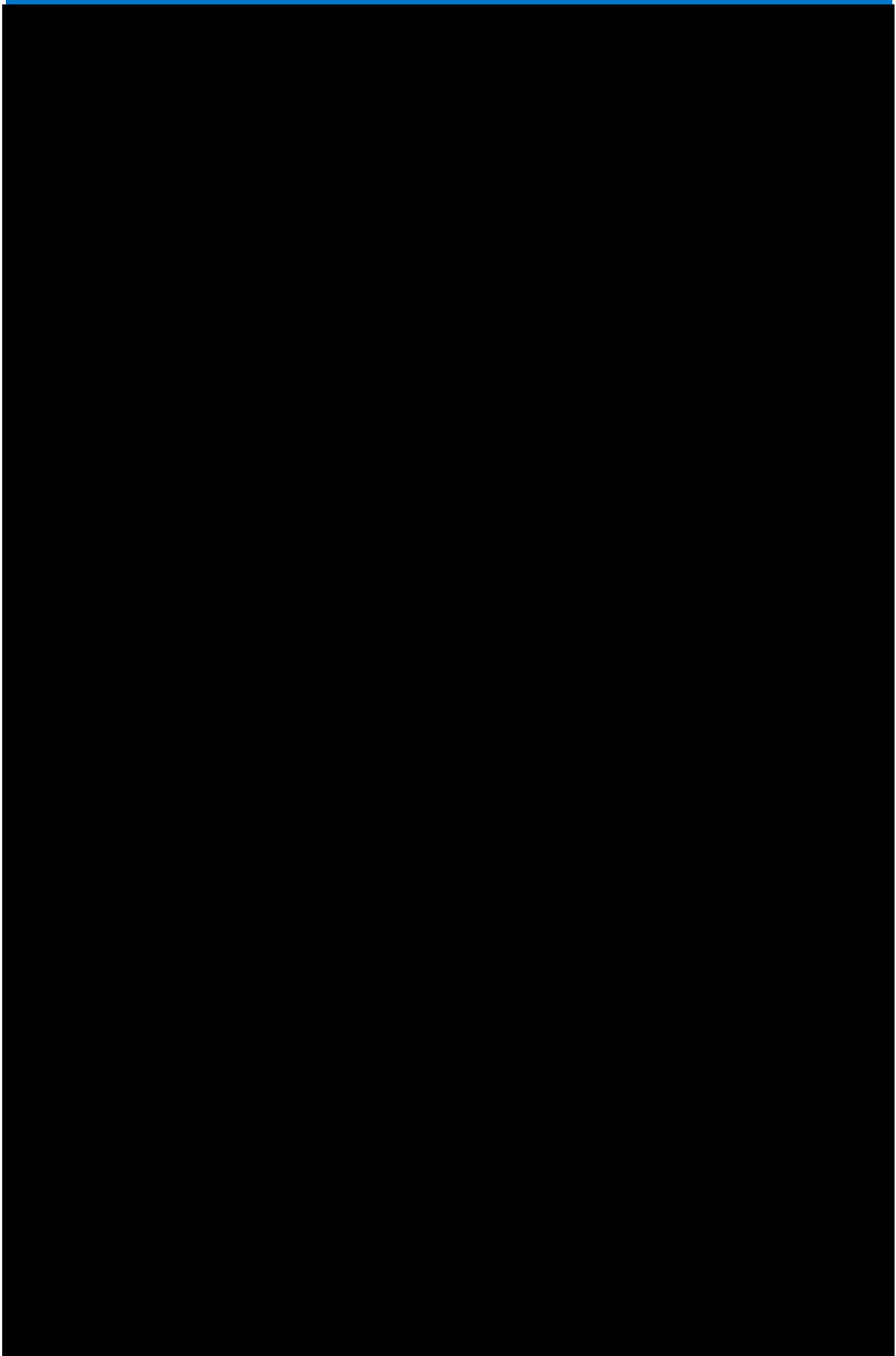
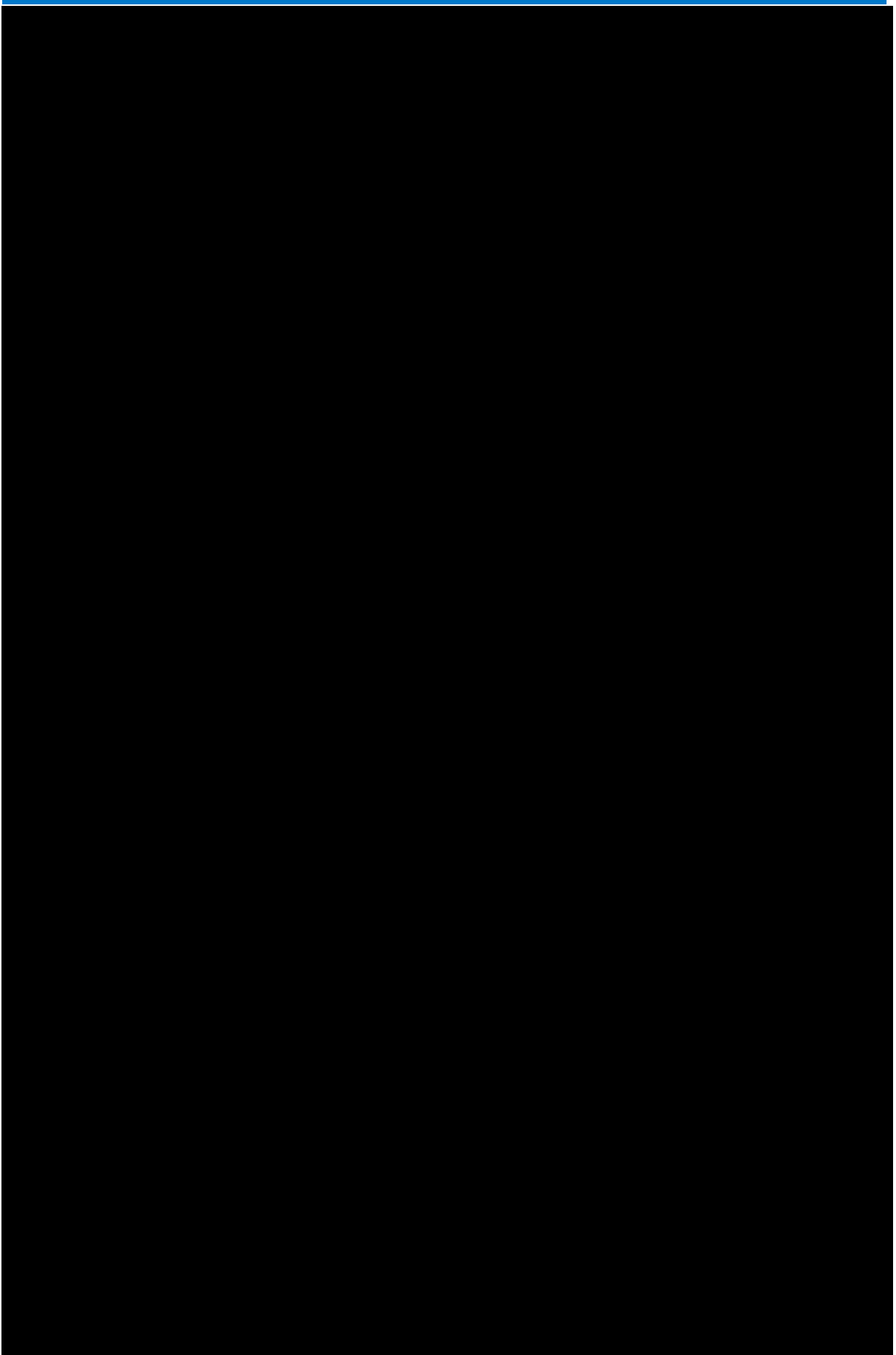
A large black rectangular redaction box covering the content of Table 1.

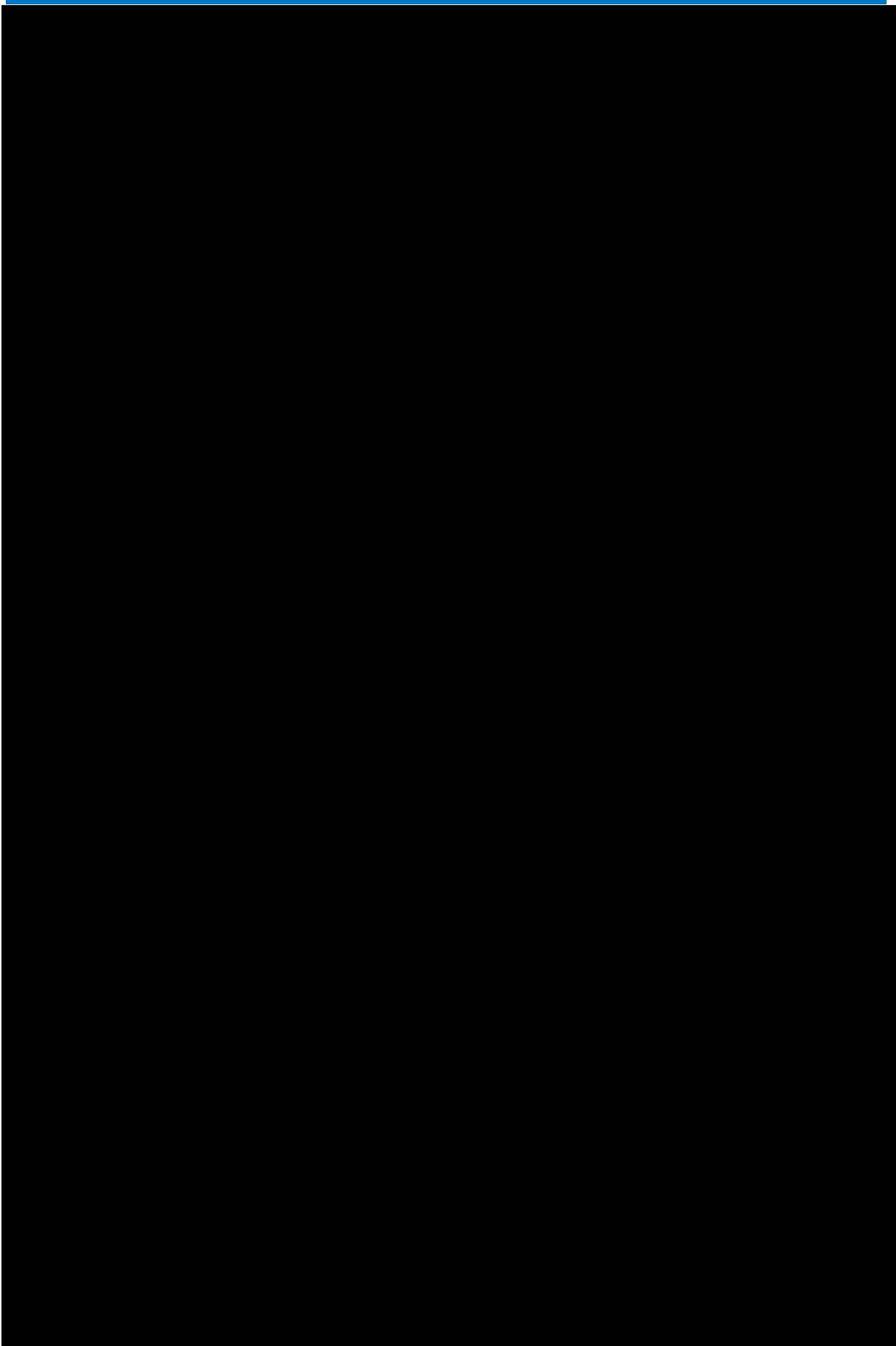
Table 2 presents the sample count for each of the parameters measured for the pilot plant inlet (BREAK TANK INLET) and outlet (UVAOP EFFLUENT).

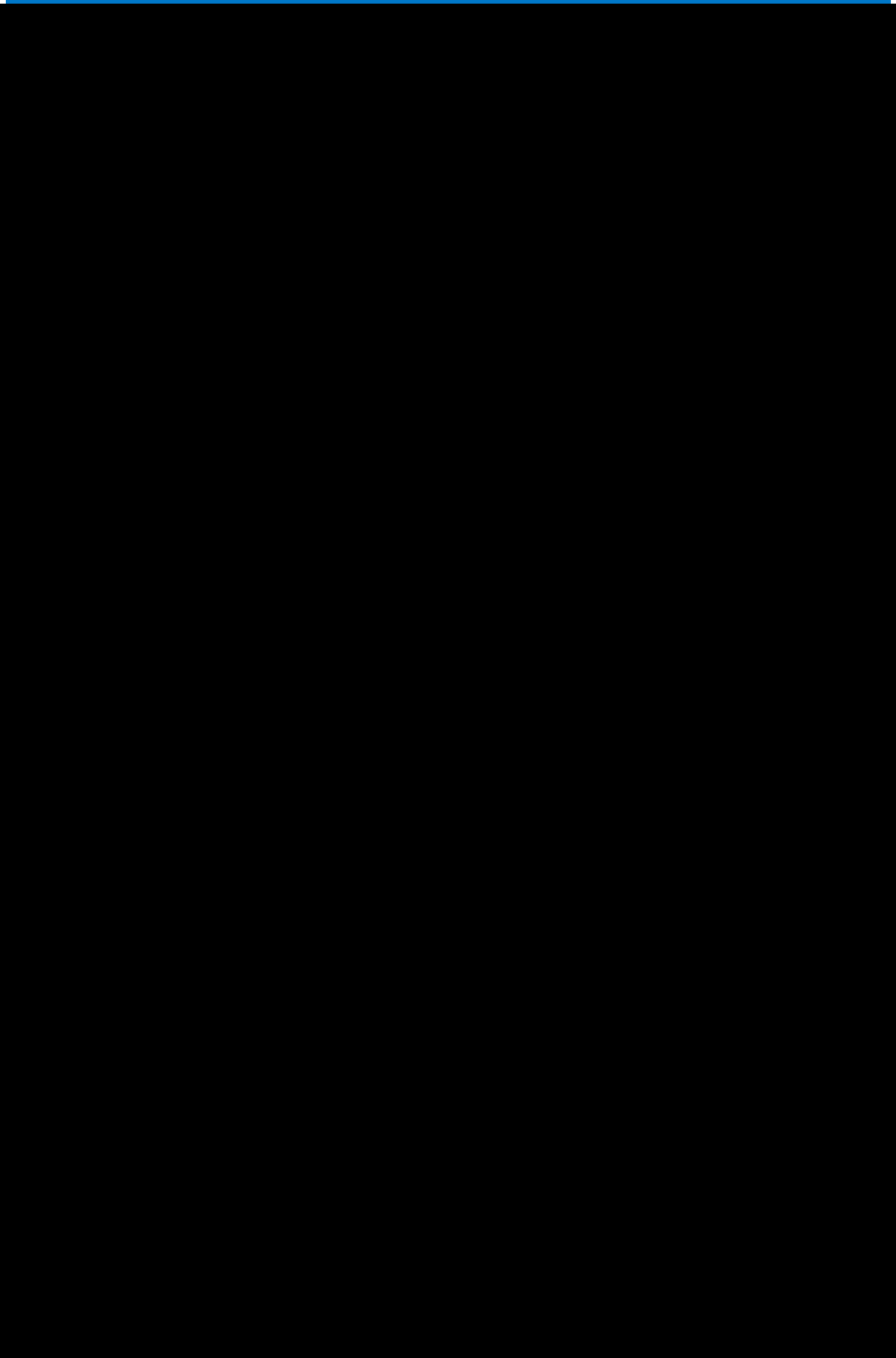
Table 2. Parameters and Sample Count measured at the pilot plant inlet and outlet.

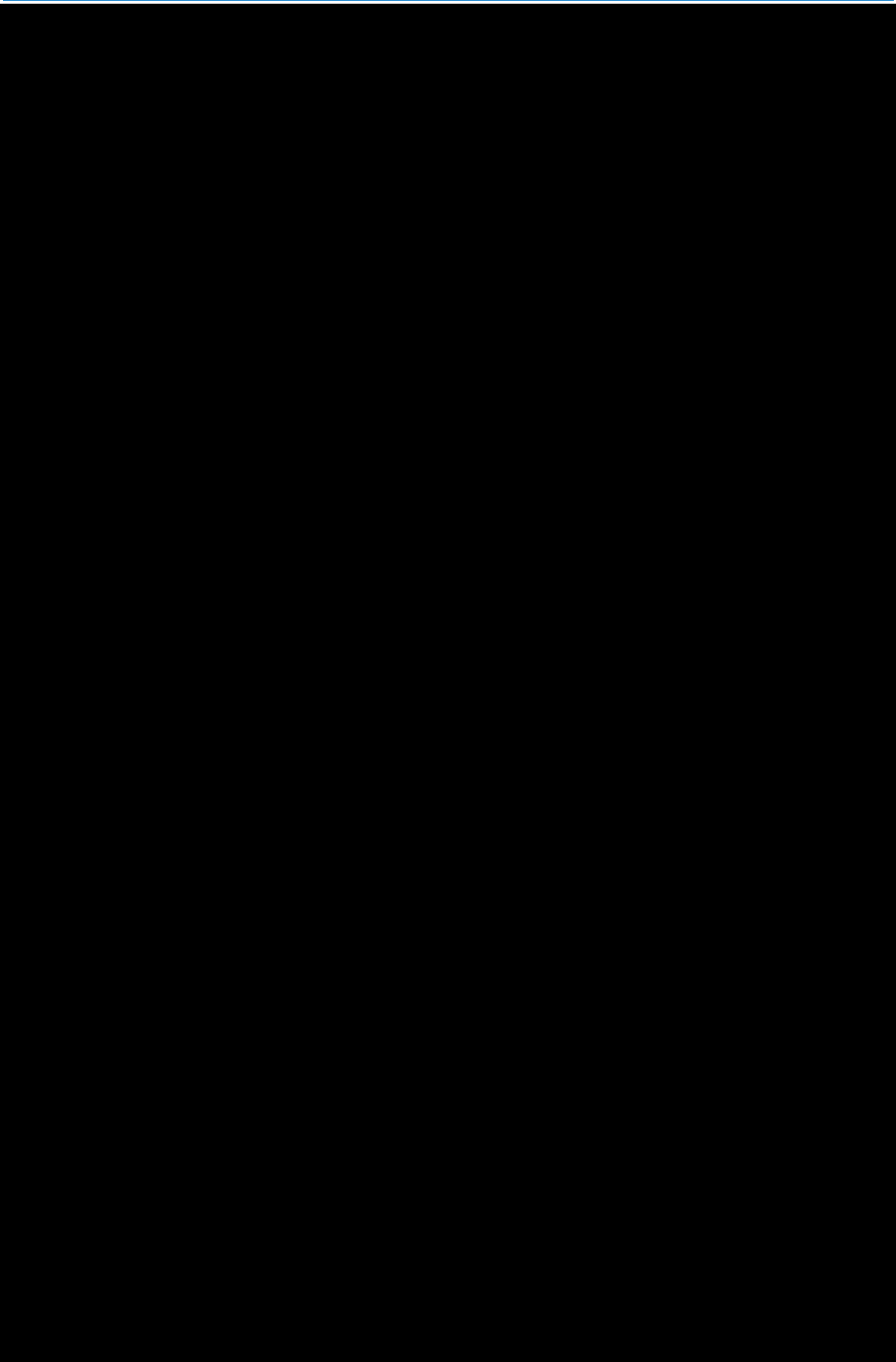
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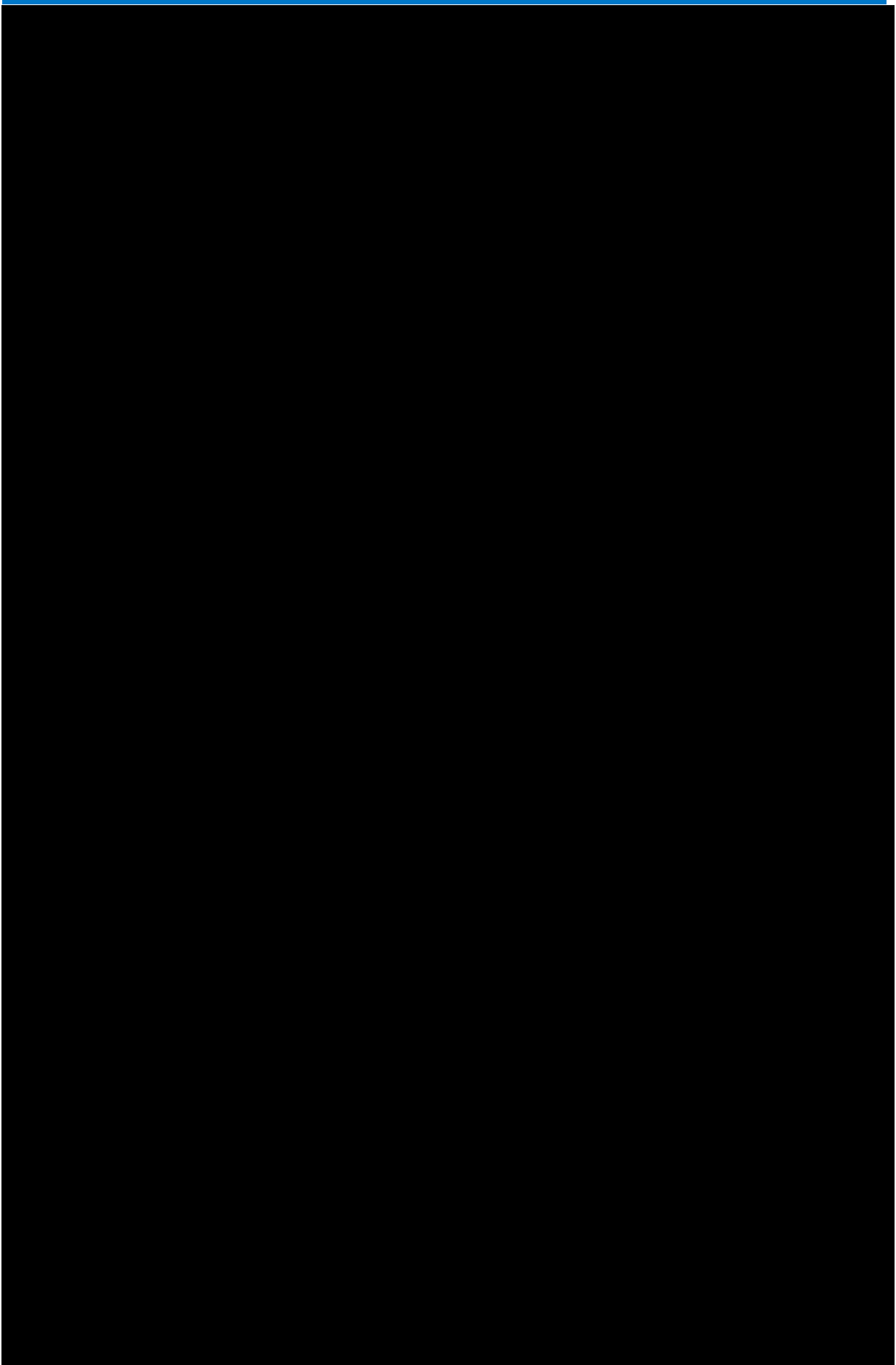


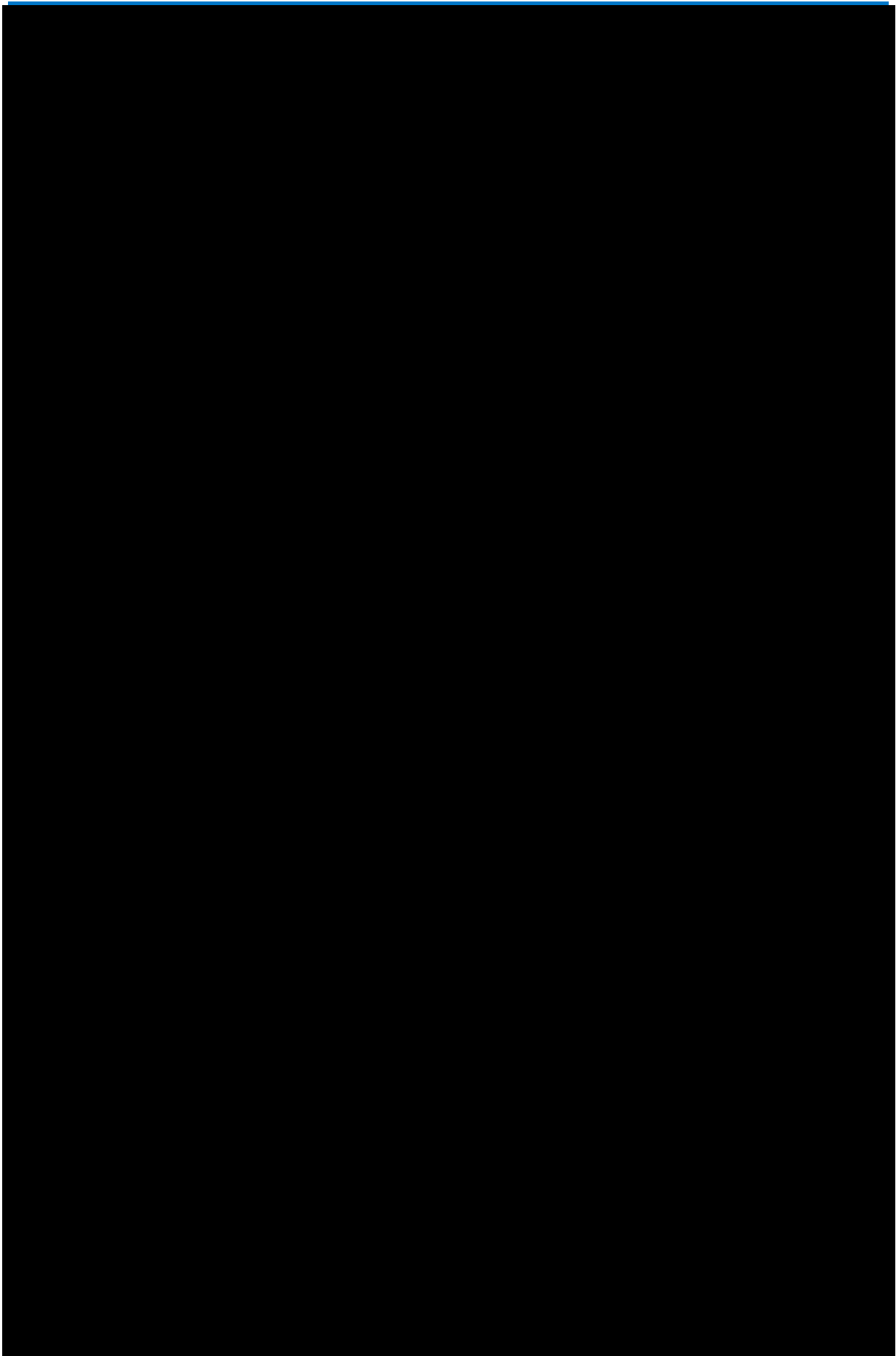


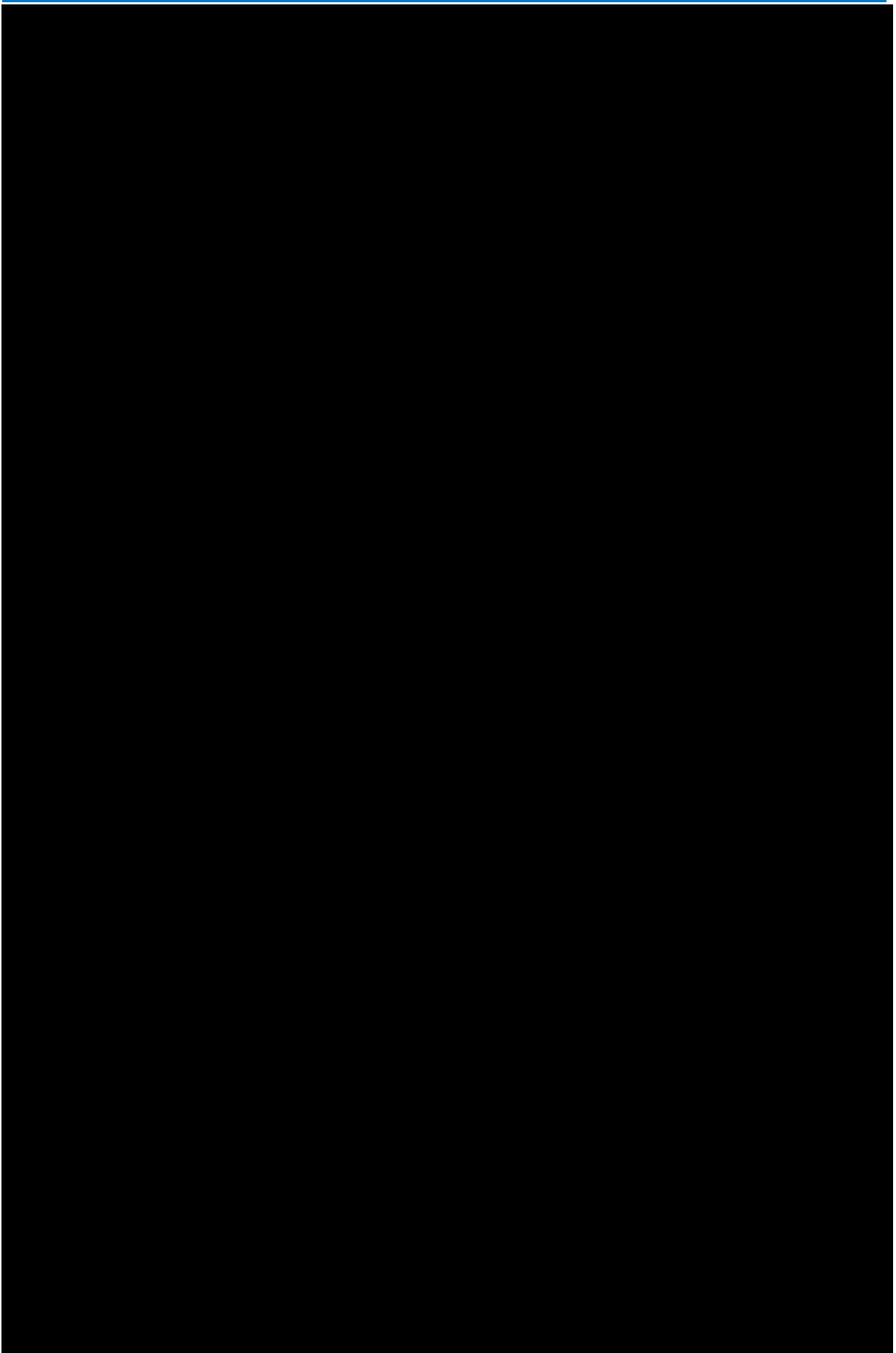


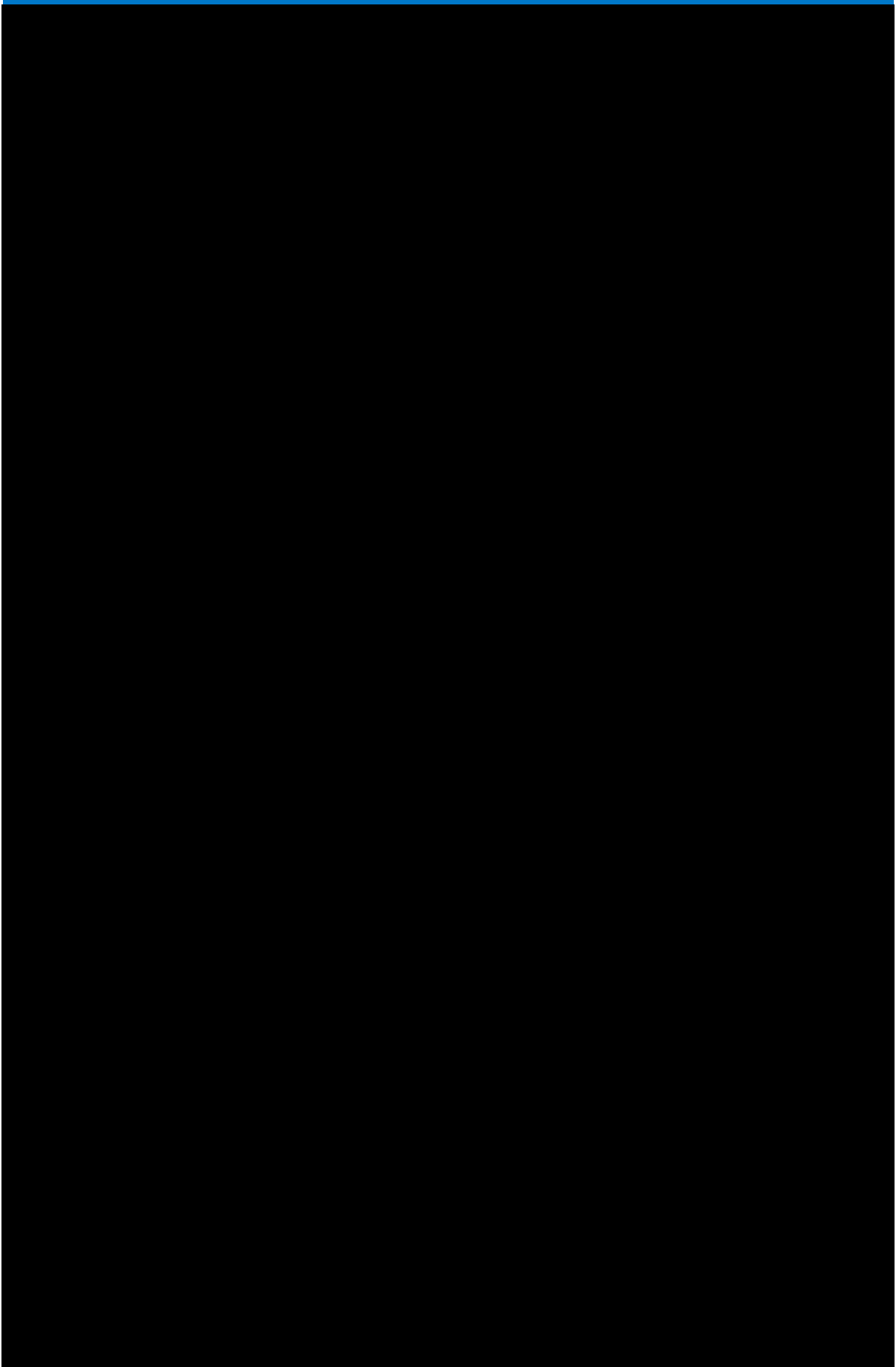


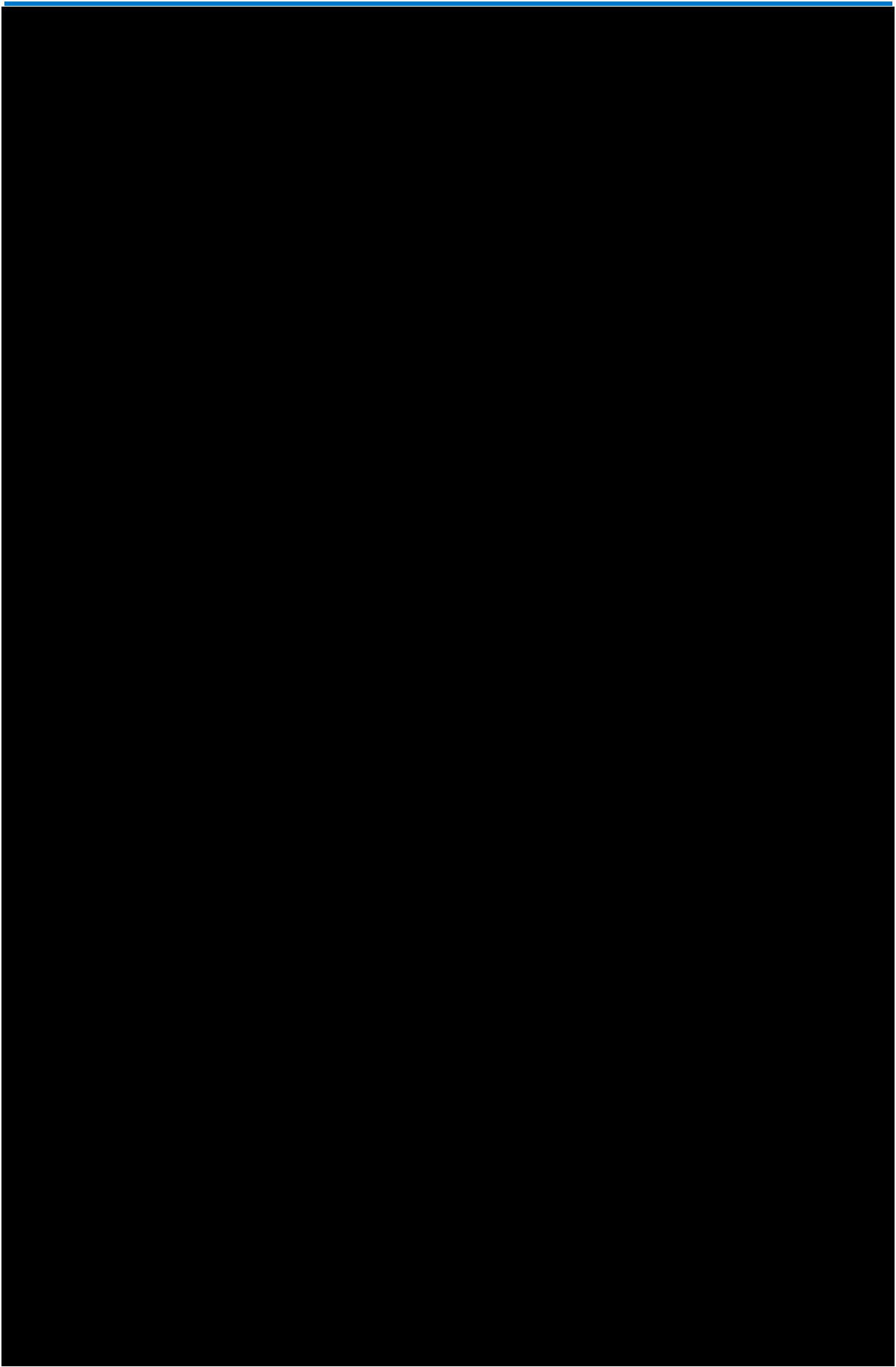


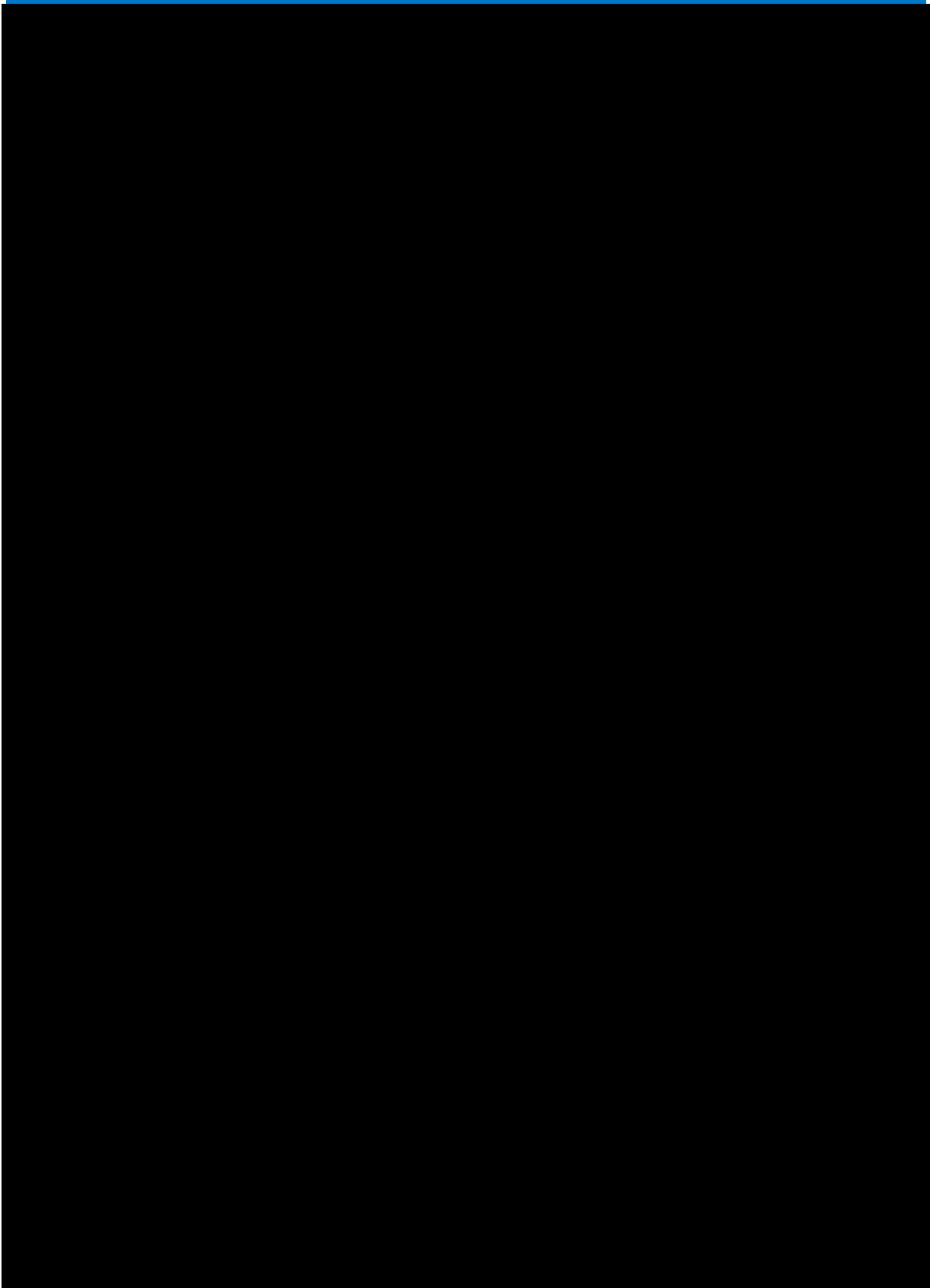












4. Have any failsafes been considered at the WRP to prevent out of spec effluent entering the WRP and causing issues with overloading of the process.

As per section 2.2.5.2 of Annex 2 and section 2.2.3.1 and 2.2.3.2 of Annex 3 of the submission, the Water Recycling Plant will employ a Critical Control Points approach to manage out of spec water. If an individual process of monitor fails, the facility will have the provision to divert off spec water.

This will be employed across the full process train, as per the Process Flow Diagram shown in figure 6 on page 24, starting with the inlet break tank at the front end of the process.

5. Provide further information as to why, on Page 7 Para 3, the Regulation 31 approval process, which is managed by the DWI, would not be able to give the approval to a suitable manufacturers application within the S.20 agreement timeframe of 2027.

The page and paragraph referenced don't match this query. There are four references to reg 31 in the documents.

Section 2.2.9 regarding the proposed pre-treatment at [REDACTED] and refers to PWNT being the only supplier of reg 31 ceramic membranes and is not related to the SRO.

The other three references are in Appendix A regarding option B3. At no point does the document say, "the Regulation 31 approval process, which is managed by the DWI, would not be able to give the approval to a suitable manufacturers application within the S.20 agreement timeframe of 2027". What it does opinion is that the lack of approved membranes "further compounds the uncertainty around approvals required for direct water recycling, including the amount of time that is needed to get a Regulation 31 membrane for the timely delivery and operation of direct water recycling as an SRO for Hampshire, and the information and evidence required to support it.". Please could you provide the exact reference and document name if you feel we have not fully addressed the question above.

Solution owner response

We have addressed each of the points raised in the above query, with blue responses beneath each point.

Date of response to RAPID

20/12/2021

**Strategic solution contact /
responsible person**

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]