

Appendix 4.5: Gungahlin Town Centre PJR

Revised regulatory proposal for the ACT electricity distribution network
2019–24

November 2018

Project Justification Report

Project name	Supply to Gungahlin Town Centre
Expenditure type	Capital Expenditure
Business Group	Asset Strategy
Regulatory Period	1 July 2019 to 30 June 2024
Total Project Cost Estimate	\$2,724,000 excluding corporate overheads, excluding contingency, and excluding GST
Five year total spend 2019-24	\$2,724,000 excluding corporate overheads, excluding contingency, and excluding GST
CAPEX category	ENAA Distribution
Primary driver	Load growth in Gungahlin Town Centre
Project Number	20003951

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1. Executive Summary

This Project Justification Report addresses the growth of electricity demand in the Gungahlin Town Centre and evaluates options re how Evoenergy can meet these needs.

The maximum demand in the Gungahlin Town Centre area is forecast to increase steadily over the next ten years with the continued development of new residential suburbs at Throsby and Kenny, and commercial and residential developments in the Gungahlin Town Centre precinct. The ACT Government publication “Gungahlin Town Centre Planning refresh – Snapshot November 2018” (refer Appendix C Attachment 14) predicts that population in the Gungahlin area will grow by approximately 31,000 over the next ten years.

The forecast load growth will be supplied by existing feeders as much as possible, however these feeders cannot fully meet the forecast demand increase.

This project Justification Report proposes a new 11 kV feeder from Gold Creek Zone Substation to Valley Ave to supply the growing load demand.

The proposed new feeder will inter-tie with other 11 kV feeders from Gold Creek and Belconnen Zone Substations to provide backup security of supply in the event of a feeder outage.

Other options considered include a feeder from Belconnen Zone Substation, demand management, and a grid battery. The selected option has the highest (ie least negative) Net Present Cost, and the lowest Capital Cost of all options evaluated.

A preliminary cost estimate for the selected option of installing a new 11 kV feeder from Gold Creek Zone Substation to Valley Ave, Gungahlin is **\$2,724,000 excluding corporate overheads, contingency and GST.**

This Project Justification Report includes the assessment of risk based on probabilistic principles. The conservatively estimated value of avoided risk exceeds cost of investment. Therefore, Evoenergy considers that proposed investment is prudent and economic.

These works will be carried out during the 2019-24 Regulatory Control Period, with proposed project completion by June 2020.

2. Strategic Context and Expenditure Need

There is significant development underway and proposed for the Gungahlin Town Centre area, comprising a mixture of multi-storey commercial and residential buildings.

2.1. Existing infrastructure in the Gungahlin Town Centre area

There are several 11 kV feeders supplying the Gungahlin Town Centre area. These feeders emanate from Gold Creek Zone Substation.

The maximum load supplied by each existing feeder is shown in Table 1 for summer and winter. Yellow denotes load above 80% of the firm rating, red denotes load above firm rating. Firm rating of an 11 kV feeder is dictated by the number of inter-connections it has to other 11 kV feeders in order to provide full back-up capacity in the event of a contingency. Thus a feeder that is inter-connected to one other feeder may be loaded to 50% of its thermal capacity, and a feeder that is inter-connected to two other feeders may be loaded to 75% of its thermal capacity. 100% firm rating should not be exceeded as this places load at risk in the event of a contingency.

Table 1: Loading of feeders supplying the Gungahlin Town Centre area

Feeder Name	Zone Sub	Firm Summer Rating MVA	Thermal Summer Rating MVA	Firm Winter Rating MVA	Thermal Winter Rating MVA	2016		2017		2018	
						Summer MD	Winter MD	Summer MD	Winter MD	Summer MD	Winter MD
Anthony Rolfe	GC	5.5	7.3	6.2	8.2	6.5	7.3	7.0	6.9	5.1	6.9
Gribble	GC	5.0	6.7	5.6	7.5	4.7	3.6	4.6	4.8	4.5	4.8
Nona	GC	4.3	5.7	4.3	5.7	4.7	6.0	4.7	6.1	4.7	6.1
Riley	GC	5.5	7.3	6.2	8.2	3.0	3.7	4.0	4.5	4.5	4.5
West	GC	5.5	7.3	6.2	8.2	4.8	5.5	4.5	5.3	3.6	4.7
Hamer	GC	5.5	7.3	6.2	8.2	–	–	–	–	–	4.6
Flemington (under construction)	GC	5.5	7.3	6.2	8.2	–	–	–	–	–	–
Total	GC	36.8	48.9	40.9	54.2	25.2	27.3	26.0	28.6	23.5	32.8

2.2. Driving need for infrastructure investment

Forecast additional maximum demand in the Gungahlin Town Centre area for the next five years is indicated in Table 2. This has been based on an assessment of known developments (either at application or Preliminary Network Advice stage) proposed for the area. Some of these developments are either under construction or currently being designed.

Customer applications or enquiries for the projects listed in Table 2 are included as attachments in Appendix C.

Table 2: Proposed Developments in Gungahlin Town Centre

Proposed Development and Net Additional Diversified Load in MVA	Refer Attachment No (Appendix C)	2019	2020	2021	2022	2023	2024
Throsby Residential Estate (SLA)	1	0.5	0.5				
Kenny Residential Estate (SLA)	2			0.5	0.5	0.5	0.5
PN 20001420 Capital Metro TPS 1, Flemington Rd	3	5.5					
PN 20003574 – B1 S12. Cinema and retail development	4		1.9				
PN 20003635 – B2 S209. Infinity Apartment Building	5	1.6					
PN 20004060 – B1 S227. Eastlake Football Club commercial development	6			0.5			
PN 20004591 – B1 S246. Medical centre, commercial and residential development	7		0.5				
PN 20005080 – B4 S209. Mixed development residential 173 units, 439m ² retail, 8,395m ² car park	8		0.9				
PN 20002679 – B2 S224. Mixed development	9			0.8			
PN 20003805 – B5 S209. Mixed use development	10			1.1			
PN 20005834 – B1 S68. Mixed use development residential and commercial	11		0.3				
PN 20005840 - B1 S248 Chase residential 32 units, car park 650m ²	12		0.2				
PN 20005931 – B4 S249. Mixed development residential and commercial	13			0.3			
Additional Load (MVA)		7.6	4.3	3.2	0.5	0.5	0.5
Cumulative Additional Forecast Load (MVA)		7.6	11.9	15.1	15.6	16.1	16.6

Table 2 shows that cumulative forecast diversified additional load in the area by 2024 will be approximately 16.6 MVA.

The existing feeders (as listed in Table 1) will be configured and spare capacity utilised to supply these additional loads as much as possible.

The geographical locations of the new loads listed in Table 2 do not match the geographical locations of existing feeders. Evoenergy has thus concluded that one additional feeder is required to supply the forecast load growth in the Valley Ave area of Gungahlin. There is no existing feeder to this area.

The proposed residential developments in Gungahlin Town Centre are primarily multi-storey apartment buildings. To date these have tended to be all-electric and built without solar PV or battery energy storage facilities. Although the buildings themselves and installed appliances (reverse cycle heat pumps, LED lighting etc) are energy efficient, an after diversity maximum demand (ADMD) figure of 2.5 kVA per unit has been assumed. This allows for current energy efficiency measures and will allow for the expected uptake of electric vehicle charging facilities and instantaneous hot-water heating systems in the future. A concerted effort is proposed by Evoenergy as part of its Demand Side Management initiative, to work with developers and their designers at an early stage, to consider alternative energy sources such as gas and solar PV, and to increase energy efficiency by installing building management systems, centralised gas hot-water heating systems, and gas-powered evaporative cooling systems etc.

3. Objectives

3.1. Corporate, asset management and key project objectives

The corporate, asset management and related key project objectives are shown in Table 3 below.

Table 3: Corporate, asset management and key project objectives

Corporate objectives	Asset management objectives	Key project objectives
Responsible	<ul style="list-style-type: none"> Achieve zero deaths or injuries to employees or the public. Maintain a good reputation within the community. Minimise environmental impacts, for example bushfire mitigation. Meet all requirements of regulatory authorities, such as the AER as outlined in the NER, and the ACT Utilities (Technical Regulations) Act 2014. 	The selected option must ensure environment and safety standards will be met.
Reliable	<ul style="list-style-type: none"> Tailor maintenance and renewal programs for each asset class based on real time modelling of asset health and risk. Meet network SAIDI and SAIFI KPIs. Record failure modes of the most common asset failures in the network. Successfully deliver the asset class Program of Work (PoW) to ensure that the protection operates correctly to disconnect faulty sections in accordance with the NER. 	<p>Options evaluations to consider the value of customer reliability (VCR).</p> <p>In accordance with regulated requirements, the selected option must ensure access to an electricity supply.</p>
Sustainable	<ul style="list-style-type: none"> Enhance asset condition and risk modelling to optimise and implement maintenance and renewal programs tailored to the assets' needs. Make prudent commercial investment decisions to manage assets at the lowest lifecycle cost. Integrate primary assets with protection and automation systems in accordance with current and future best practice industry standards Deliver the asset class PoW within budget. 	<p>Options evaluations to consider the cost effectiveness of the solution.</p> <p>In accordance with regulated requirements, the selected option must be the most prudent and efficient.</p> <p>Non-network options will be evaluated on equal merit with network solutions.</p>
People	<ul style="list-style-type: none"> Proactively seek continual improvement in asset management capability and competencies of maintenance personnel. 	A post implementation review to incorporate learnings through the asset management system.

The project objectives are consistent with Evoenergy's regulatory requirements described below.

3.2. Regulatory Compliance

3.2.1. National Electricity Law and National Electricity Rules

Evoenergy is subject to the National Electricity Law (NEL) and the National Electricity Regulations (NER) which regulate the National Electricity Market (NEM). Evoenergy operates in the NEM as both a Transmission Network Service Provider (TNSP) and a Distribution Network Service Provider (DNSP).

The National Electricity Objective (NEO), as stated in the NEL is to:

“...promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

- a) price, quality, safety, reliability and security of supply of electricity; and*
- b) the reliability, safety and security of the national electricity system.”*

This objective requires Registered NEM participants to balance the costs and risks associated with electricity supply.

The planning and development process for distribution and transmission networks is carried out in accordance with the National Electricity Rules (NER) Chapter 5 Part B Network Planning and Expansion.

The primary objective of planning is to ensure that customers are able to receive a sufficient and reliable supply of electricity now and into the future.

3.2.2. Capital Expenditure Objectives and Criteria

The NER provides further guidance in terms of allowable capital expenditure via the capital expenditure objectives and criteria for standard control services. These capital expenditure objectives, specified in clause 6.5.6(a) and 6.5.7(a) of the NER describe the outcomes or outputs to be achieved by the expenditure. The objectives include: *Meet or manage the expected demand for standard control services*

- 1) Comply with all applicable regulatory obligations or requirements associated with the provision of standard control services*
- 2) To the extent that there is no applicable regulatory obligation or requirement in relation to the quality, reliability or security of supply of standard control services; or the reliability or security of the distribution system through the supply of standard control services, to the relevant extent:*
 - a. Maintain the quality, reliability and security of supply of standard control services*
 - b. Maintain the reliability and security of the distribution system through the supply of standard control services*
- 3) Maintain the safety of the distribution system through the supply of standard control services.*

The expenditure criteria, set out in Section 6.5.6(c) and Section 6.5.7(c) of the NER, further outline requirements for the way in which expenditure must be set to achieve the objectives above. These include:

- 1) The efficient costs of achieving the expenditure objectives*
- 2) The costs that a prudent operator would require to achieve the expenditure objectives; and*
- 3) A realistic expectation of the demand forecast and cost inputs required to achieve the expenditure objectives.*

The above criteria therefore imply that the capital expenditure, determined in line with the expenditure objectives, must be met via prudent and efficient expenditure, is to be achieved at least cost.

3.2.3. Regulatory Investment Test

Section 5.16 of the NER describes the Regulatory Investment Test for Transmission (RIT-T) and Section 5.17 describes the Regulatory Investment Test for Distribution (RIT-D). These tests must be carried out for any proposed investment where the augmentation or replacement cost of the most expensive credible option exceeds \$5 million.

The regulatory investment tests provide the opportunity for external parties to submit alternative proposals to the Network Service Provider, who is obliged to consider any credible proposal objectively.

The most expensive credible option does not exceed \$5 million so this project will not be subject to the RIT-D.

3.2.4. Utilities Act 2000 (ACT)

Evoenergy has an obligation to comply with the Utilities Act 2000 (ACT) which imposes specific technical, safety and reliability obligations via the Management of Electricity Network Assets Code and the Electricity Distribution Supply Standards Code.

The *Electricity Distribution (Supply Standards) Code* issued by the ACT Independent Competition and Regulatory Commission (ICRC) sets out certain performance standards for the distribution network in the ACT. A Distribution Network Service Provider (DNSP) is required to “take all reasonable steps to ensure that its Electricity Network will have sufficient capacity to make an agreed level of supply available”. The processes defined in these criteria serve to limit network augmentation expenditure to instances where the increase in demand is clear and above the secure or firm capacity.

This local jurisdictional code specifies reliability standards that Evoenergy must endeavour to meet when planning, operating and maintaining the distribution network. It also specifies power quality parameters that must be met including limits on voltage flicker, voltage dips, switching transients, earth potential rise voltage unbalance, harmonics and direct current content.

The Management of Electricity Network Assets Code requires electricity distributors to protect integrity and reliability of the electricity network and to ensure the safe management of the electricity network without injury to any person or damage to property and the environment.

3.2.5. Evoenergy’s Distribution Network Augmentation Standards

Evoenergy’s distribution network augmentation standards are set to ensure compliance with the relevant regulatory instruments as described above. System planning studies are undertaken to assess the adequacy of the distribution network to meet current and forecast demands whilst meeting the quality of supply criteria stipulated in the NER. The key performance criteria that are addressed are: thermal overloading, voltage performance, supply security and supply reliability. Studies are conducted using Evoenergy’s medium growth, 50% PoE demand forecast, plus known customer-initiated point load requests and applications (copies of these point load connection applications are attached in Appendix C).

As a **first step**, Evoenergy applies deterministic planning criteria to identify where existing or emerging constraints exist on the network. The deterministic approach can lead to uneconomic outcomes. For that reason further analysis is performed to confirm whether the investment proposal is justified economically.

Therefore, as a **second step**, Evoenergy applies probabilistic assessment of risk to determine whether network investment is justified. The value of avoided risk is estimated using probabilistic methodology.

Thus, benefit is expressed as avoided risk. The risk may include other components, but typically unserved energy is the dominant risk component for augmentation projects. If avoided risk exceeds the cost of the proposed augmentation, the investment is considered economic. The assessment of risk is based on the probability of a credible contingency event occurring sufficiently frequently, and with such consequences as to justify Evoenergy to take prudent action to mitigate against it. The probability of a credible contingency event occurring at a time when load exceeds firm capacity, is used to calculate unserved energy.

The value of unserved energy compared with the cost of the investment, determines the prudence of the augmentation.

The value of Unserved Energy identified in this PJR (refer Appendix B2) is high due to the fact that forecast

demand exceeds the thermal capacity of the existing network.

To meet the forecast demand under the Do Nothing option (ie connecting all new loads to existing feeders only), would require operating some feeders above their thermal ratings. Operating an 11 kV distribution feeder at or above its thermal rating is extremely risky as overheating can lead to conductor annealing and failure, or cause failure of jumpers, clamps, connectors, conductor joints, or other hardware. On overhead lines the conductors may sag below their statutory ground clearance (resulting from a combination of ambient and conductor temperature).

In addition, non-network solutions and demand side management solutions are considered when evaluating project options. To inform Evoenergy's position, as part of this assessment, Evoenergy models various load forecast outcomes using Monte Carlo methodology to select the preferred option. This modelling allows Evoenergy to consider whether a demand side solution is a viable option and should be explored further.

This proposed new feeder to the Gungahlin Town Centre has been selected as the preferred option taking into account the available capacity (Table 1), forecast load (Table 2) and the corresponding reduction of risk. It is considered to be a prudent investment, because the avoided risk is higher than the cost of investment. Furthermore, at the time of investment the risk value exceeds the annualized cost of investment.

3.2.6. Cost compliance

Cost compliance is achieved by proactively pursuing the philosophy of compliance with the National Electricity Objective by fully exploring and evaluating all options technically and commercially so as to seek approval for a solution that provides sound grounds for an efficient investment while meeting the long term interests of consumers.

The investment value has been determined using 2016-17 market prices. The methodology and estimated costs used for this project are developed through the application of industry knowledge and Good Engineering Operating Practices based on historical similar projects. This approach complies with paragraphs 6 & 7 of the National Electricity Law (NEL).

It is noted that the National Electricity Law, Rules, Objectives, Criteria, and the ACT Distribution Code, do not require an assessment of unserved energy to be included in the cost evaluation of major augmentation projects.

4. Options Assessment

Evoenergy has considered five options (plus a do nothing option) to provide additional capacity and security of supply to Gungahlin Town Centre as listed in Table 4.

Table 4: Options considered for provision of additional capacity and security to Gungahlin Town Centre

Option	Option type	Description	Evaluation
0	Network	Do nothing	Not selected as does not meet minimum requirements
1	Network	Construct new 11 kV cable feeder from Gold Creek Zone Substation to Valley Ave via Mirrabai Drive	Selected as higher NPC
2	Network	Construct new 11 kV cable feeder from Belconnen Zone Substation to Valley Ave	Not selected due to lower NPC
3	Non-network	Demand side management	Not selected as does not meet minimum requirements and lower NPC
4	Mixed	Delayed preferred network option using grid battery	Not selected as cost of delay exceeded benefits
5	Non-network	Grid battery only	Not selected due to lower NPC

4.1. Options Description

4.1.1. Do Nothing Option

The ‘Do Nothing’ option requires connecting all new loads to existing feeders in the Gungahlin Town Centre area. This would require operating most feeders above their firm rating and operating some feeders up to their thermal limits.

The ‘Do Nothing’ option would result in insufficient network capacity in the area as some feeders would be forced to operate beyond their thermal rating (and would consequently be tripped by over-current protection), and thus would result in Evoenergy breaching its obligations to provide a reliable and secure power supply. This option is not a prudent or acceptable solution as all new loads could not be supplied and would place considerable load at risk in the event of a feeder contingency.

The value of energy at risk under the Do Nothing option is high based on the probability of a contingency event occurring at the same time as demand exceeds firm capacity (refer Appendix B2).

4.1.2. Option 1: Construct new 11 kV feeder from Gold Creek Zone Substation to Gungahlin Town Centre

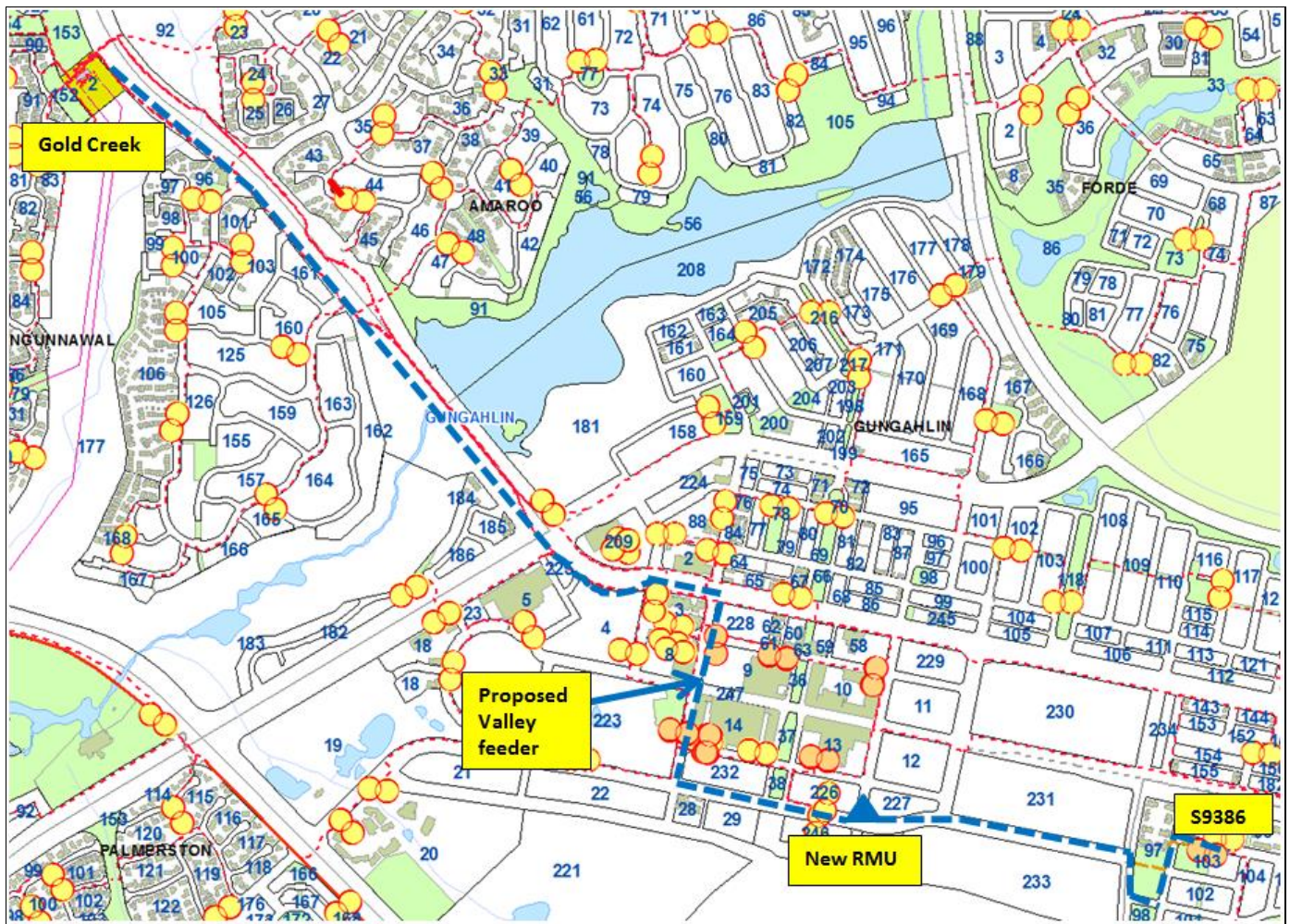
Option 1 considers the installation of a new 11 kV cable feeder from Gold Creek Zone Substation to Valley Ave, Gungahlin to meet the growing load demand. The new feeder would provide up to 5.5 MVA firm capacity (summer).

Gold Creek Zone Substation is the nearest zone substation to the Gungahlin Town Centre. There is spare capacity available at Gold Creek to meet this demand and there is a spare feeder circuit breaker available. The new feeder would be known as **Valley feeder**.

The proposed 11 kV 3c/400mm² AL XLPE cable would be run via a new 3-way switching station to be installed at the intersection of Hinder St and The Valley Ave to existing distribution substation S9386. A cable would be installed from this new switching station to distribution substation S11048 to provide a link between the new feeder and Gribble

feeder. Route length is approximately 5.3 km. The route length of the link from the new RMU to S11048 is approximately 160m. Figure 1 illustrates the proposed cable route.

Figure 1: Proposed 11 kV cable feeder route from Gold Creek Zone Substation to Valley Ave, Gungahlin



A preliminary estimated cost for Option 1, the installation of a new feeder from Gold Creek Zone Substation to Gungahlin Town Centre is **\$2,724,000 excluding corporate overheads, contingency and GST**. Refer to cost estimates, cash flows and NPC comparison in Appendices A and B.

Option 1 is selected due to its higher (i.e. least negative) net present cost (NPC).

4.1.3. Option 2: Construct new 11 kV cable feeder from Belconnen Zone Substation to Valley Ave, Gungahlin

Option 2 considers the installation of a new feeder from Belconnen Zone Substation to Valley Ave, Gungahlin to meet the growing load demand. The new feeder would provide up to 5.5 MVA firm capacity (summer).

Belconnen Zone Substation is not the closest zone substation to Gungahlin Town Centre. The route length of a new 11 kV feeder from Belconnen Zone Substation to Valley Ave, Gungahlin is approx 12.3 km.

A preliminary cost estimate for Option 2, the installation of a new feeder from Belconnen Zone Substation to Gungahlin Town Centre, is **\$5,096,000 excluding corporate overheads, contingency and GST**. Refer to cost estimates and NPC comparison in Appendices A and B.

Option 2 is not selected due to its lower NPC.

4.1.4. Option 3: Demand Management

Option 3 considers non-network initiatives including:

- Incentives to realise the potential of latent demand management within the customer base.
- Incentives to encourage the uptake of additional demand management within the customer base.

These options are discussed further within the Demand Management Paper.

To defer the new feeder to Gungahlin Town Centre to the next regulatory control period (ie beyond 2024), it is estimated that non-network solutions would need to provide a maximum demand of approximately 3.6 MVA within the next two years.

Latent demand management within the existing customer base was investigated, with a maximum estimated capacity of 1.62 MVA. This does not meet the minimum capacity required of 3.6 MVA by July 2020 to enable the new feeder to be deferred.

These non-network options are summarised in Table 5.

Table 5: Summary of latent demand management

Non-network Option	DM	Gungahlin Town Centre East 11 kV feeders						Total
		A Rolfe	Gribble	Nona	Riley	West	Hamer	
Customer – owned embedded generation	MVA	0.30	0.20	0.20	0.10	0.20	0.20	1.20
Customer – owned energy storage	MVA	0.05	0.02	0.04	0.02	0.05	0.02	0.20
Load curtailment	MVA	0.05	0.04	0.04	0.02	0.05	0.02	0.22
Totals	MVA	0.40	0.26	0.28	0.14	0.30	0.24	1.62

In summary, a maximum demand reduction of 1.62 MVA could be achieved if all the above non-network options were implemented. This is not sufficient to defer the new feeder.

Third party non-network proposals will be requested in Evoenergy's 2018 Annual Planning Report and via Evoenergy's website demand management portal and may identify additional opportunities.

Where there is insufficient latent demand management within the customer base, there is further opportunity to incentivise customers to adopt additional technologies to reduce demand. This includes opportunities to permanently reduce demand (such as energy efficiency technology or power factor correction) as well as opportunities to adopt technology to enable participation in demand response markets (such as embedded generation, battery storage, building management systems). For the purposes of the evaluation, it is assumed that no more than 30% of demand growth can be offset using additional demand management.

For the Gungahlin Town Centre it was determined that more than 40% of demand growth would need to be offset by demand management to enable the project to be deferred, implying that new demand management is unlikely to defer investment.

4.1.5. Option 4: Grid battery to defer Option 1

This option utilises a grid battery to enable Option 1 to be deferred. This option has the advantage of deferring the investment until greater certainty in future demand is known. However, given the relatively high certainty of future demand for this project and the relatively high cost of the grid battery, this option was assessed as higher cost than the network Option 1 with a preliminary cost estimate **\$3,317,077 excluding corporate overheads, contingency and GST**. Refer to cost estimates and NPC comparison in Appendices A and B.

4.1.6. Option 5: Grid battery only

This option utilises a grid battery only. A grid battery, although more expensive than a traditional network solution on a per MVA basis, has advantages over a traditional network solution. A grid battery is modular and also able to be

redeployed, meaning it can represent a more economic option in an environment of demand uncertainty or where demand is expected to increase for a short period and then decline.

In the case of the Gungahlin Town Centre however, the grid battery was not economic due to the relative certainty of demand with a preliminary cost estimate of **\$5,706,960 excluding corporate overheads, contingency and GST**. Refer to cost estimates, cash flows and NPV comparison in Appendices A and B.

4.1.7. Options Analysis

Table 6 lists the forecast new loads (as per Table 2) and states which feeder Evoenergy proposes to connect and supply each load from. This includes the proposed new Valley feeder.

It should be noted that it is not feasible to utilise all available spare capacity of existing feeders due to their geographic location, inter-connectivity and proximity to new loads. These forecast loads make allowance for predicted penetration of rooftop solar PV and battery storage systems.

Table 6 maps out how the new loads are allocated to the existing and proposed Valley feeder. Note that no new loads are allocated to Nona feeder, which is already at capacity and there are no possibilities for switching loads out of this feeder.

Table 6: Forecast Loads and Proposed Feeder Supplies

Gungahlin Town Centre Forecast Load Growth							
Proposed Development and Net Additional Diversified Load in MVA	2019	2020	2021	2022	2023	2024	Total
Throsby Residential Estate (SLA)	0.5	0.5					1.0
Proposed feeder to supply above load	Hamer						
Kenny Residential Estate (SLA)			0.5	0.5	0.5	0.5	2.0
Proposed feeder to supply above load	Anthony Rolfe after load transfer to new Valley feeder						
PN 20001420 Capital Metro TPS 1, Flemington Rd	5.5						5.5
Proposed feeder to supply above load	Flemington (under construction)						
PN 20003574 – B1 S12. Cinema and retail development		1.9					1.9
Proposed feeder to supply above load	New Valley feeder						
PN 20003635 – B2 S209. Infinity Apartment Building	1.6						1.6
Proposed feeder to supply above load	West						
PN 20004060 – B1 S227. Eastlake Football Club commercial development			0.5				0.5
Proposed feeder to supply above load	Hamer						
PN 20004591 – B1 S246. Medical centre, commercial and residential development		0.5					0.5
Proposed feeder to supply above load	Hamer						
PN 20005080 – B4 S209. Mixed development residential 173 units, 439m ² retail, 8,395m ² car park		0.9					0.9
Proposed feeder to supply above load	Hamer						
PN 20002679 – B2 S224. Mixed development			0.8				0.8
Proposed feeder to supply above load	West						
PN 20003805 – B5 S209. Mixed use development			1.1				1.1
Proposed feeder to supply above load	Gribble						
PN 20005834 – B1 S68. Mixed use development residential and commercial		0.3					0.3
Proposed feeder to supply above load	Anthony Rolfe after load transfer to new Valley feeder						
PN 20005840 - B1 S248 Chase residential 32 units, car park 650m ²		0.2					0.2
Proposed feeder to supply above load	Anthony Rolfe after load transfer to new Valley feeder						
PN 20005931 – B4 S249. Mixed development residential and commercial			0.3				0.3
Proposed feeder to supply above load	Gribble						
Forecast Additional Load pa (MVA)	7.6	4.3	3.2	0.5	0.5	0.5	
Cumulative Forecast Additional Load (MVA)	7.6	11.9	15.1	15.6	16.1	16.6	

Table 7 lists the existing and proposed feeders to the Gungahlin Town Centre area with their existing maximum demand and forecast maximum demand at 2024.

Table 7: Gungahlin Town Centre area feeders load forecasts (including proposed new Valley feeder)

Feeder	Zone Substation	Firm rating MVA (summer)	Thermal rating MVA (summer)	Existing max demand MVA (summer)	Forecast max demand MVA (summer 2024)
Anthony Rolfe	Gold Creek	5.5	7.3	5.1	5.1
Gribble	Gold Creek	5.0	6.7	4.5	5.9
Nona	Gold Creek	4.3	5.7	4.8	4.3
Riley	Gold Creek	5.5	7.3	4.5	4.5
West	Gold Creek	5.5	7.3	3.6	6.0
Hamer	Gold Creek	5.5	7.3	4.1	6.0
Flemington (under construction)	Gold Creek	5.5	7.3	–	5.5
Valley (2020)	Gold Creek	5.5	7.3	–	5.8

Yellow denotes feeder loaded above its firm rating. Orange denotes proposed new feeder.

Loading of feeders to their thermal rating would risk large amounts of unserved energy in the event of a contingency.

Should the proposed Valley feeder not be installed, loads on the existing feeders under the Do Nothing option would be as shown in Table 8.

Table 8: Gungahlin Town Centre area feeders load forecasts (*without* proposed new Valley feeder)

Feeder	Zone Substation	Firm rating MVA (summer)	Thermal rating MVA (summer)	Existing max demand MVA (summer)	Forecast max demand MVA (summer 2024)
Anthony Rolfe	Gold Creek	5.5	7.3	5.1	7.1
Gribble	Gold Creek	5.0	6.7	4.5	5.8
Nona	Gold Creek	4.3	5.7	4.7	4.7
Riley	Gold Creek	5.5	7.3	4.5	7.5
West	Gold Creek	5.5	7.3	3.6	6.7
Hamer	Gold Creek	5.5	7.3	4.1	5.6
Flemington (under construction)	Gold Creek	5.5	7.3	–	5.5

Yellow denotes feeder loaded above its firm rating. Red denotes feeder loaded above its thermal rating.

Loading of feeders above their thermal rating would risk large amounts of unserved energy in the event of a contingency.

4.1.8. Summary of Options Analysis

A summary of the options considered is presented in Table 8.

Table 8: Summary of Options Analysis

Option	Description	Total Capital Cost 2019-2039	Capital Cost 2019-24	20 year Net Present Cost	Outcome
0	Do nothing	\$0	\$0	\$0	Not selected as does not meet need
1	Construct new 11 kV cable feeder from Gold Creek Zone Substation to Valley Ave	\$2,724,000	\$2,724,000	-\$2,844,996	Selected due to higher NPC
2	Construct new 11 kV cable feeder from Belconnen Zone Substation to Valley Ave	\$5,096,000	\$5,096,000	-\$4,102,235	Not selected due to lower NPC
3	Demand side management	N/A	N/A	N/A	Not selected as does not meet need
4	Delayed preferred network option using grid battery	\$3,317,077	\$3,317,077	-\$3,451,160	Not selected as deferral not economic
5	Grid battery only	\$5,706,965	\$1,669,685	-\$6,145,116	Not selected due to lower NPC

4.2. Recommendation

The selected option is Option 1, the installation of a new 11 kV cable feeder from Gold Creek Zone Substation to Valley Ave to meet the growing load demand in the Gungahlin Town Centre. Cable to be 11 kV 3c/400mm² AL XLPE.

Financial analysis shows Option 1 to be the best option due to its higher (ie least negative) NPC. It also has the lowest capital cost. Refer to cost estimates, cash flows and NPC comparison in Appendices A and B. It can be implemented in time to meet the project needs as identified and will add to Evoenergy’s regulated asset base. The major assets will have an economic life of 50 years.

The new feeder will provide capacity and security of supply to the new developments proposed for the Gungahlin Town Centre area.

The project will be carried out with completion by June 2020.

The preliminary cost estimate of the selected option is **\$2,724,000 excluding overheads, contingency and GST**.

The proposed 11 kV feeder will provide ties to existing feeders from Gold Creek and Belconnen zone substations, and thus provide some backup supply capability and load transfer capability in the future.

Appendix A – Cost Estimates

A.1 Cost Estimate – Option 1: 11 kV Feeder from Gold Creek Zone Substation to Gungahlin Town Centre

One new feeder from Gold Creek Zone Substation to Valley Ave, Gungahlin Town Centre, 5.3 km.					
Preliminary Estimate ± 30% Accuracy					
Description	Notes	Unit	\$/Unit	Quantity	Cost
Trenching and drilling					\$2,103,500
Clearing of route where required	Allowance	m2	\$10		\$0
Directional drilling - Mirrabai Drive	Refer quote for Hamer Fedder project 20004647	ea	\$1,200,000	1	\$1,200,000
Directional drilling - remainder of route	Assume no rock	m	\$350	2100	\$735,000
Open trenching and backfilling	Assume excavation with no rock. Backfill with bedding sand and native soil.	m	\$250	200	\$50,000
Cable jointing and haulage pits	Assume every 500m	ea	\$3,000	14	\$42,000
Traffic management	Allowance	m	\$5	5300	\$26,500
Reinstatement incl revegetation as required	Allowance	m3	\$100	500	\$50,000
Cabling works					\$453,500
11 kV 3c/400mm2 Al XLPE cable		m	\$55	5300	\$291,500
11 kV 3c/300mm2 Al XLPE cable		m	\$45		\$0
11 kV 3c/185mm2 AL XLPE cable		m	\$30		\$0
Throughjoints	Assume every 500m	ea	\$1,000	12	\$12,000
Terminations		ea	\$1,500	2	\$3,000
Conduit and marker tape	Trenching sections only	m	\$15	200	\$3,000
Cable installation labour and plant		m	\$20	6000	\$120,000
Cable jointing labour and plant		ea	\$1,500	14	\$21,000
HV Cables and connections Test & Commissioning	Allowance	ea	\$3,000	1	\$3,000
Zone Substation Connection					\$16,500
11 kV feeder CB spare at Gold Creek		ea	\$100,000		\$0
11 kV Test & Commissioning	per CB	lot	\$2,000	1	\$2,000
P&C equipment and cabling	per feeder panel	ea	\$5,000	1	\$5,000
P&C Test & Commission	Allowance	ea	\$2,500	1	\$2,500
DC Cabling	per switchgear panel/bay	ea	\$5,000	1	\$5,000
DC Test & Commission	Allowance	ea	\$2,000	1	\$2,000
SCADA					\$30,500
SCADA connections		ea	\$1,000	2	\$2,000
Fibre optic cable		m	\$5	5300	\$26,500
SCADA Test & Commission	Allowance	ea	\$2,000	1	\$2,000
Indirect Costs					\$120,000
Development Application	Allowance	ea	\$10,000	1	\$10,000
Contractor's Preliminaries, site establishment and disestablishment	Allowance	ea	\$10,000	1	\$10,000
Project management and administration	Allowance	ea	\$100,000	1	\$100,000
Project Sub Total without overheads					\$2,724,000
Overheads					
Overall average overhead rate	Allowance	27%			\$735,480
Project Sub Total with overheads					\$3,459,480

A.2 Cost Estimate – Option 2: 11 kV Feeder from Belconnen Zone Substation to Gungahlin Town Centre

One new feeder from Belconnen Zone Substation to Valley Ave, Gungahlin Town Centre, 12.3 km.					
Preliminary Estimate ± 30% Accuracy					
Description	Notes	Unit	\$/Unit	Quantity	Cost
Trenching and drilling					\$3,781,500
Clearing of route where required	Allowance	m2	\$10	5000	\$50,000
Directional drilling	Assume no rock	m	\$350	4300	\$1,505,000
Open trenching and backfilling	Assume excavation with no rock. Backfill with bedding sand and native soil.	m	\$250	8000	\$2,000,000
Cable jointing and haulage pits	Assume every 500m	ea	\$3,000	30	\$90,000
Traffic management	Allowance	m	\$5	12300	\$61,500
Reinstatement incl revegetation as required	Allowance	m3	\$100	750	\$75,000
Cabling works					\$1,122,500
11 kV 3c/400mm2 Al XLPE cable		m	\$55	12300	\$676,500
11 kV 3c/300mm2 Al XLPE cable		m	\$45		\$0
11 kV 3c/185mm2 AL XLPE cable		m	\$30		\$0
Throughjoints	Assume every 500m	ea	\$1,000	24	\$24,000
Terminations		ea	\$2,500	2	\$5,000
Conduit and marker tape	Trenching sections only	m	\$15	8000	\$120,000
Cable installation labour and plant		m	\$20	12300	\$246,000
Cable jointing labour and plant		ea	\$1,500	32	\$48,000
HV Cables and connections Test & Commissioning	Allowance	ea	\$3,000	1	\$3,000
Zone Substation Connection					\$6,500
11 kV feeder CB double up at Belconnen		ea	\$100,000		\$0
11 kV Test & Commissioning	per CB	lot	\$2,000	1	\$2,000
P&C equipment and cabling	per feeder panel	ea	\$5,000		\$0
P&C Test & Commission	Allowance	ea	\$2,500	1	\$2,500
DC Cabling	per switchgear panel/bay	ea	\$5,000		\$0
DC Test & Commission	Allowance	ea	\$2,000	1	\$2,000
SCADA					\$65,500
SCADA connections		ea	\$1,000	2	\$2,000
Fibre optic cable		m	\$5	12300	\$61,500
SCADA Test & Commission	Allowance	ea	\$2,000	1	\$2,000
Indirect Costs					\$120,000
Development Application	Allowance	ea	\$10,000	1	\$10,000
Contractor's Preliminaries, site establishment and disestablishment	Allowance	ea	\$10,000	1	\$10,000
Project management and administration	Allowance	ea	\$100,000	1	\$100,000
Project Sub Total without overheads					\$5,096,000
Overheads					
Overall average overhead rate	Allowance	27%			\$1,375,920
Project Sub Total with overheads					\$6,471,920

Appendix B – Financial Analysis

B.1 Capital Expenditure Cash Flow for Each Option

Financial Year	Option 1	Option 2	Option 3	Option 4	Option 5
2019-20	\$2,724,000	\$5,096,000	N/A	\$593,077	\$593,077
2020-21				\$2,724,000	\$269,152
2021-22					\$269,152
2022-23					\$269,152
2023-24					\$269,152
2024-25					\$269,152
2025-26					\$269,152
2026-27					\$269,152
2027-28					\$269,152
2028-29					\$269,152
2029-30					\$269,152
2030-31					\$269,152
2031-32					\$269,152
2032-33					\$269,152
2033-34					\$269,152
2034-35					\$269,152
2035-36					\$269,152
2036-37					\$269,152
2037-38					\$269,152
2038-39					\$269,152
Total Cost (20 years)	\$2,724,000	\$5,096,000	N/A	\$3,317,077	\$5,706,965
2019-24 Regulatory Control Period Cost	\$2,724,000	\$5,096,000	N/A	\$3,317,077	\$1,669,685

B.2 NPC Analysis

The Net Present Cost (NPC) was calculated using a Monte-Carlo simulation model. The simulation randomly selects a peak demand growth rate for each year that is within ± 10% of the forecasted spot loads expected in the Gungahlin Town Centre. The use of a Monte-Carlo simulation results in selection of the best option that is robust to uncertain peak demand growth forecasts.

Investment within the simulation is dynamic – investment decisions change based on the randomly selected growth rates from previous years. Investment occurs automatically when the firm rating is breached so the value of energy at risk is always zero. In options where multiple investments are available the cheapest is selected.

Summary Financial Analysis Results for Supply to Gungahlin Town Centre

The summary below shows the average values for the selected characteristics after 50 simulations.

Options:

One – One new 11 kV feeder from Gold Creek Zone Substation to Gungahlin Town Centre.

Two – One new 11 kV feeder from Belconnen Zone Substation to Gungahlin Town Centre.

Four – Defer Option 1 with grid battery.

Five – Grid battery only.

Results (Average over 50 simulations):

Option:	One	Two	Four	Five
NPC (2019-2024)	-\$2,602,773	-\$3,752,971	-\$3,208,937	-\$2,482,028
NPC (2019-2039)	-\$2,844,996	-\$4,102,235	-\$3,451,160	-\$6,145,116
Network Option total Capital Cost	\$2,724,000	\$5,096,000	\$2,724,000	-
Option Capital Cost (2019-2024)	\$2,724,000	\$5,096,000	\$3,317,077	\$1,669,685
Option Capital Cost (2019-2039)	\$2,724,000	\$5,096,000	\$3,317,077	\$5,706,965

Unserviced Energy:

The following table estimates the volume of unserved energy (USE) in kWh under the Do Nothing scenario.

Feeder	USE Exceeding	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24
Anthony Rolfe	Firm	1	1	3	7	13	22
	Thermal	0	0	1,326	2,826	7,097	21,529
Gribble	Firm	0	0	1	1	1	1
	Thermal	0	0	0	0	0	0
Nona	Firm	16	16	16	16	16	16
	Thermal	0	0	0	0	0	0
Riley	Firm	0	15	15	15	15	15
	Thermal	0	12,982	12,982	12,982	12,982	12,982
West	Firm	1	1	17	17	17	17
	Thermal	0	0	17,930	17,930	17,930	17,930
Hamer	Firm	0	1	1	1	1	1
	Thermal	0	2,000	2,000	2,000	2,000	2,000
Flemington	Firm	0	0	0	0	0	0
	Thermal	0	0	0	0	0	0
	Total USE	19	15,018	34,291	35,794	40,072	54,512
	Value of USE	\$507	\$404,437	\$923,492	\$963,982	\$1,079,172	\$1,468,071

Notes:

The amount of load and duration above the firm rating of each existing feeder has been calculated using the actual historical load profile curve for each feeder plus the expected load profile curves of forecast new loads. New loads have been allocated to existing feeders where possible in the most optimal manner to utilise available spare capacity and minimise unserved energy. It is not always possible to utilise available spare capacity because the geographical location of some new loads do not match the geographical location of existing feeders and it is not cost effective to extend such feeders.

Unserved energy = (load above feeder firm rating x probability of an outage occurring at the time of such exceedance x outage duration) + all load above feeder thermal rating (ie when the load exceeds the thermal rating of the feeder, all such energy is assumed to be unserved).

Value of Unserved Energy assumes:

- Value of Customer Reliability = \$26.93/kWh. This is the figure published by AEMO in 2014 for Residential Customers. This is a conservative figure to use as approximately 60% of load in the Gungahlin Town Centre area is supplied to Business Customers – AEMO’s published VCR for this category of customer is \$44.72/kWh.
- CPI = 2% pa.
- Probability of feeder outage = 6% (= 3% probability of zone transformer failure + 3% probability of feeder failure).
- Probability of feeder outage in any given hour = 6% / (24 x 365).
- Outage duration = 8 hours. This is a conservative figure as feeder cable faults can often take longer than 8 hours to locate and repair.
- Value of unserved energy = Volume of unserved energy x VCR.
- All energy above the thermal rating is not served. This is equivalent to assuming a 100% outage probability for energy above this level.

At the time of investment the value of unserved energy exceeds the annualised cost of this proposed augmentation, so the proposed new feeder to the Gungahlin Town centre is considered to be economically justified.

In addition to the value of unserved energy, there are litigation, reputational and other financial risks to be added to the overall risk cost as follows:

Litigation costs = \$100,000 / event

Reputational risk cost = external consultations and communications costs = \$10,000 / event.

Financial risk cost = internal investigation costs = \$10,000 / event.

Total risk cost = Reliability risk cost + Litigation + Reputational risk cost + Financial risk cost
 = Value of unserved energy + \$120,000 / event.

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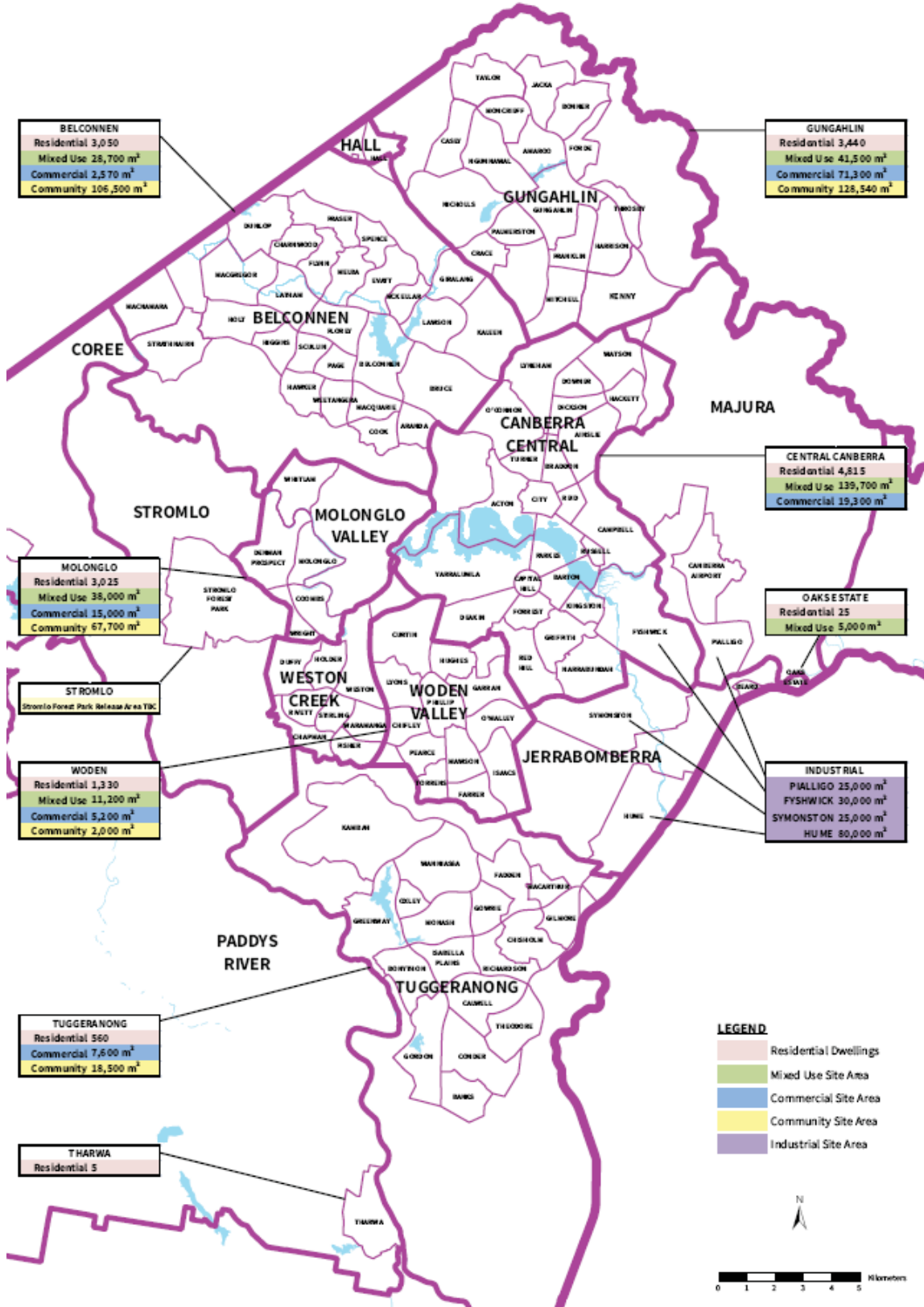
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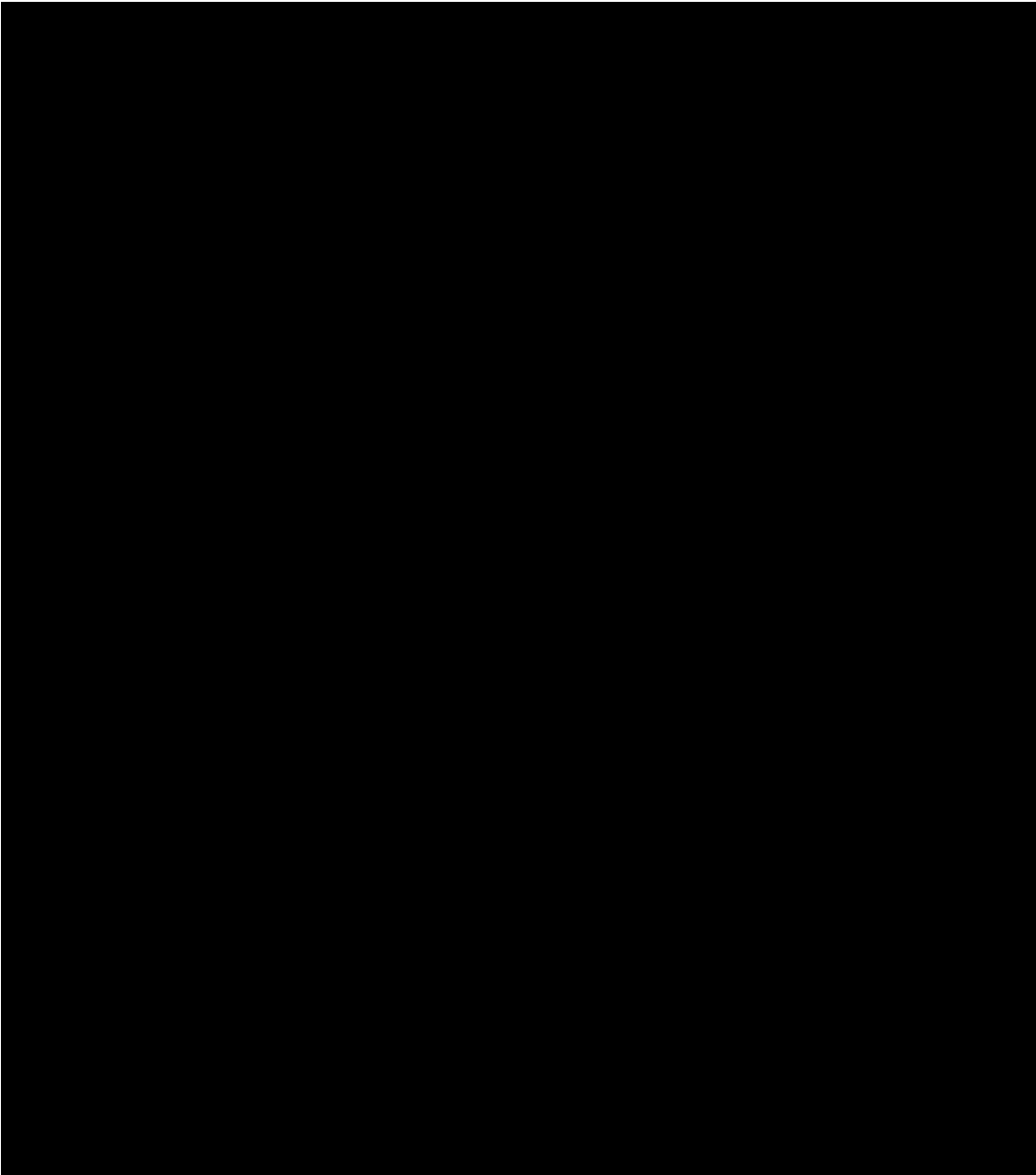
Proposed Developments – Gungahlin Town Centre	Attachment No
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Kenny Residential Estate (SLA)	2
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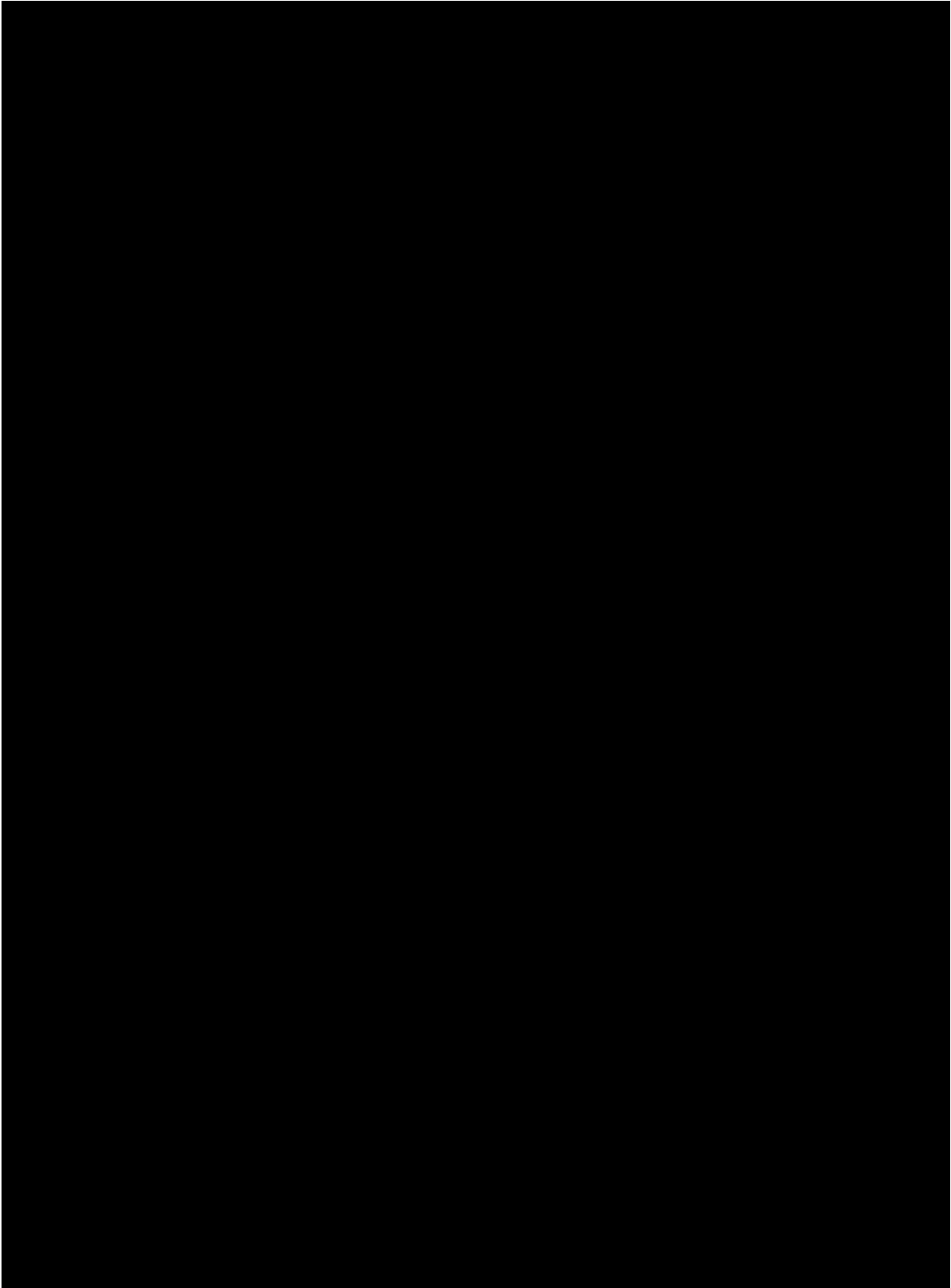
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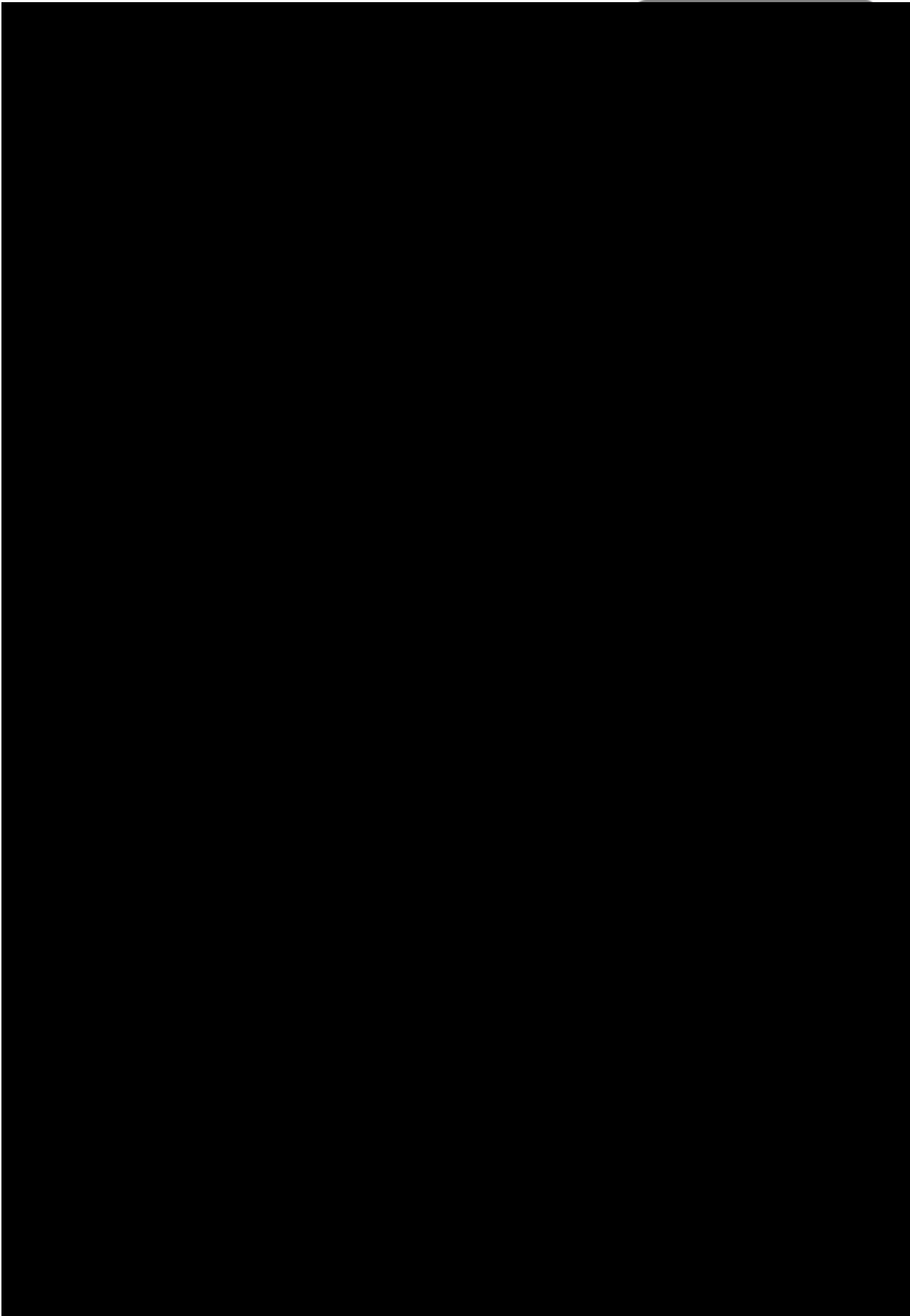
Throsby Estate – Refer ACT Government Indicative Land Release Program.
 Kenny Estate – Refer ACT Government Indicative Land Release Program.

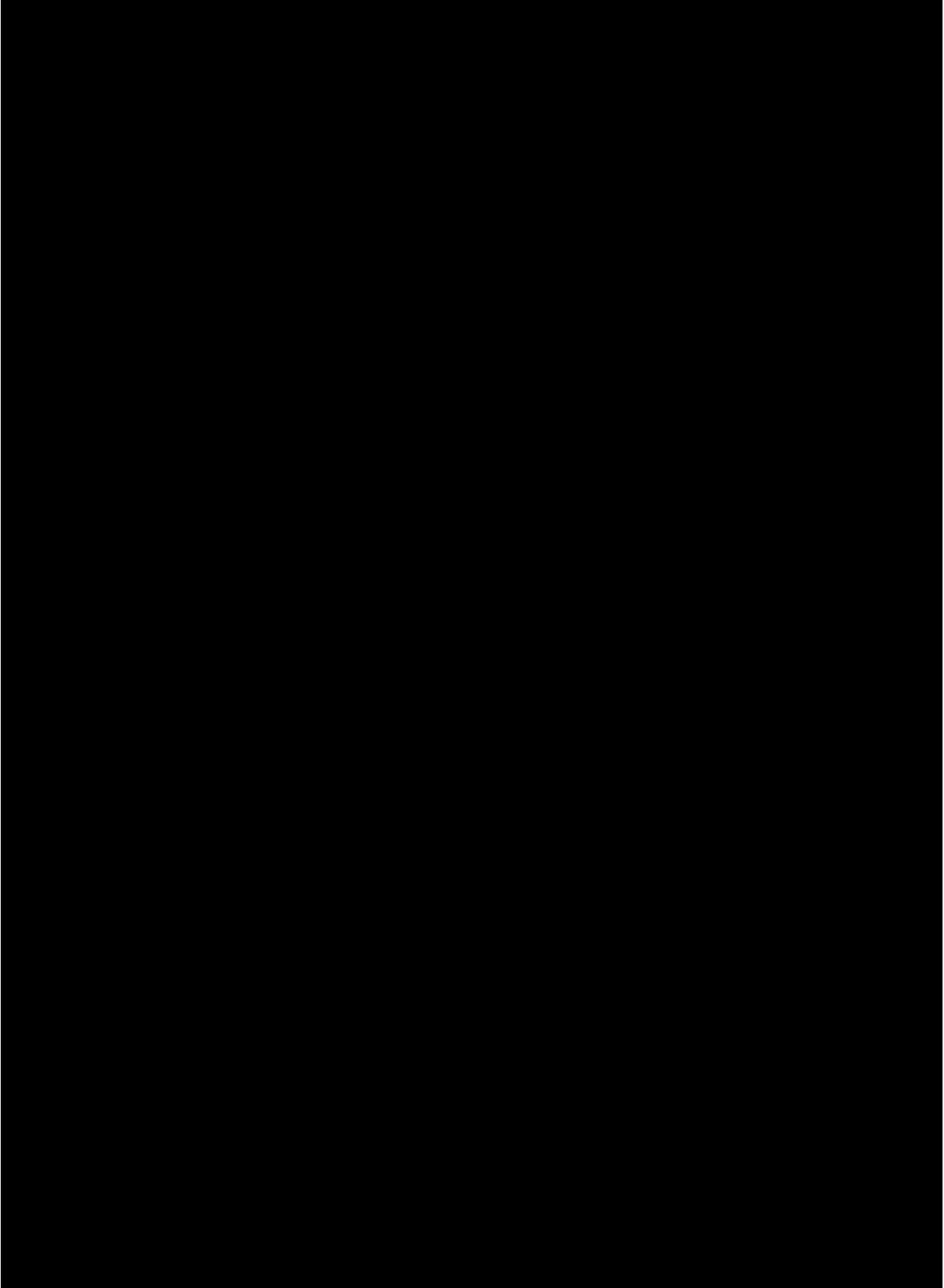
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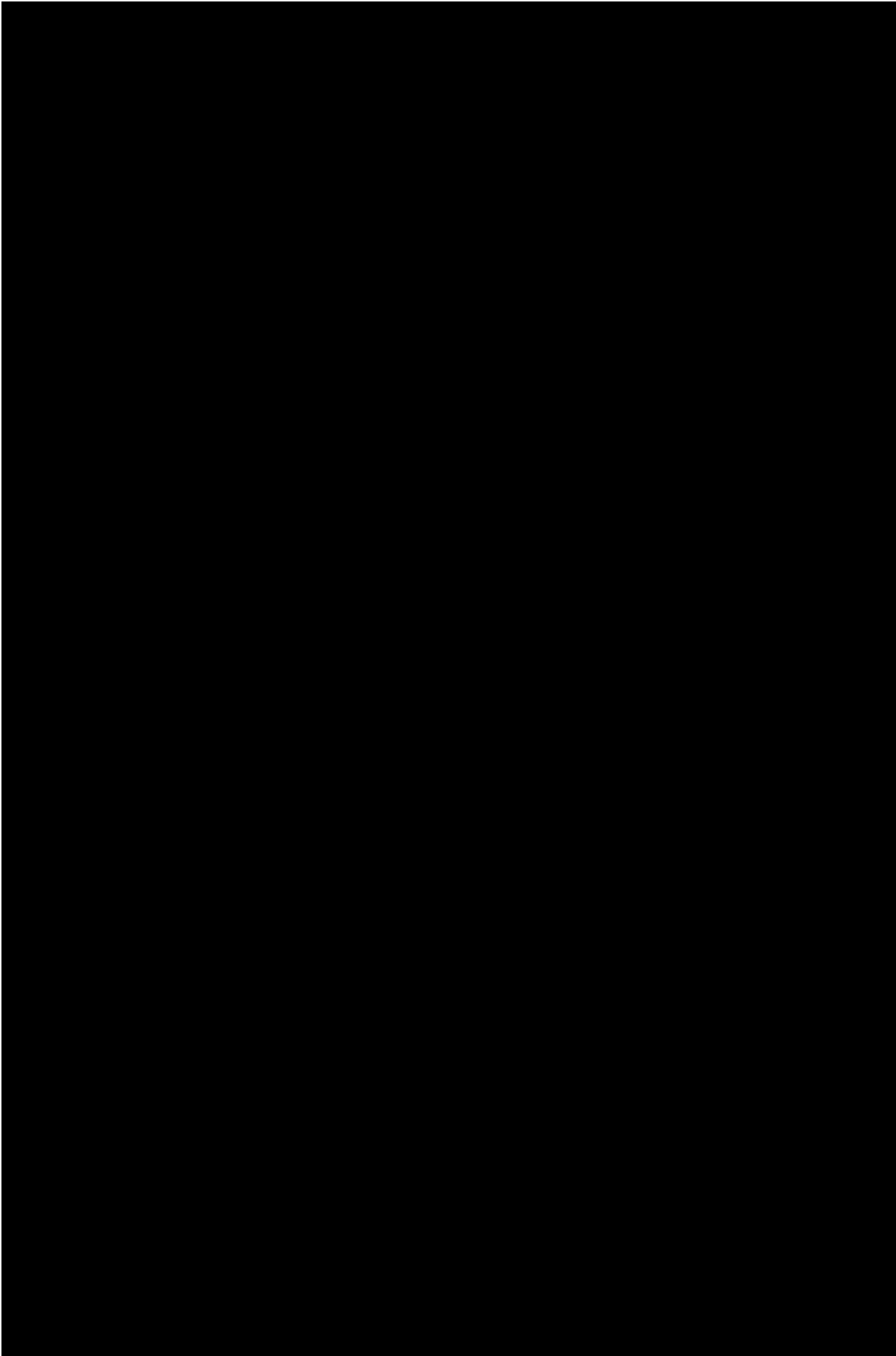


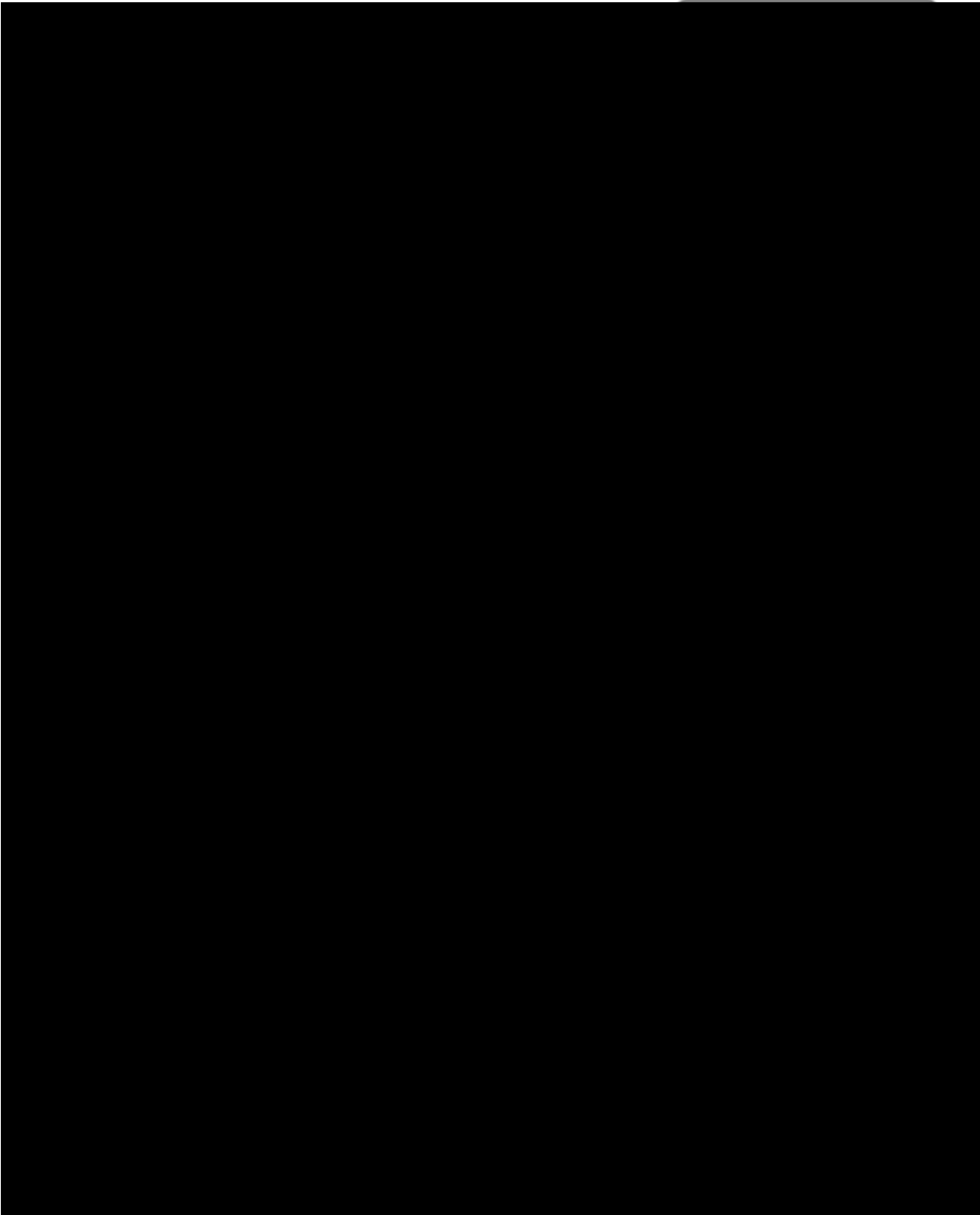


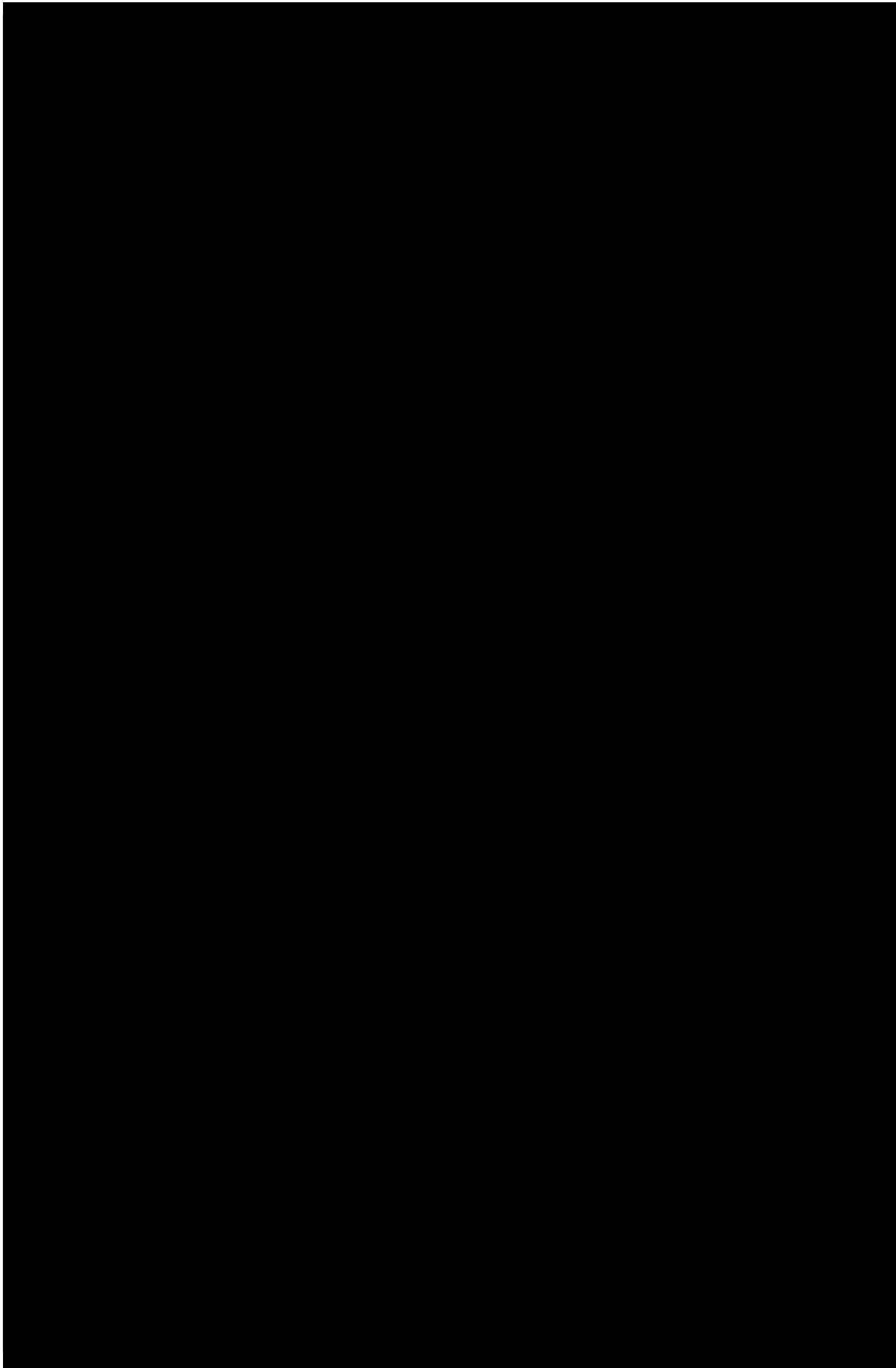


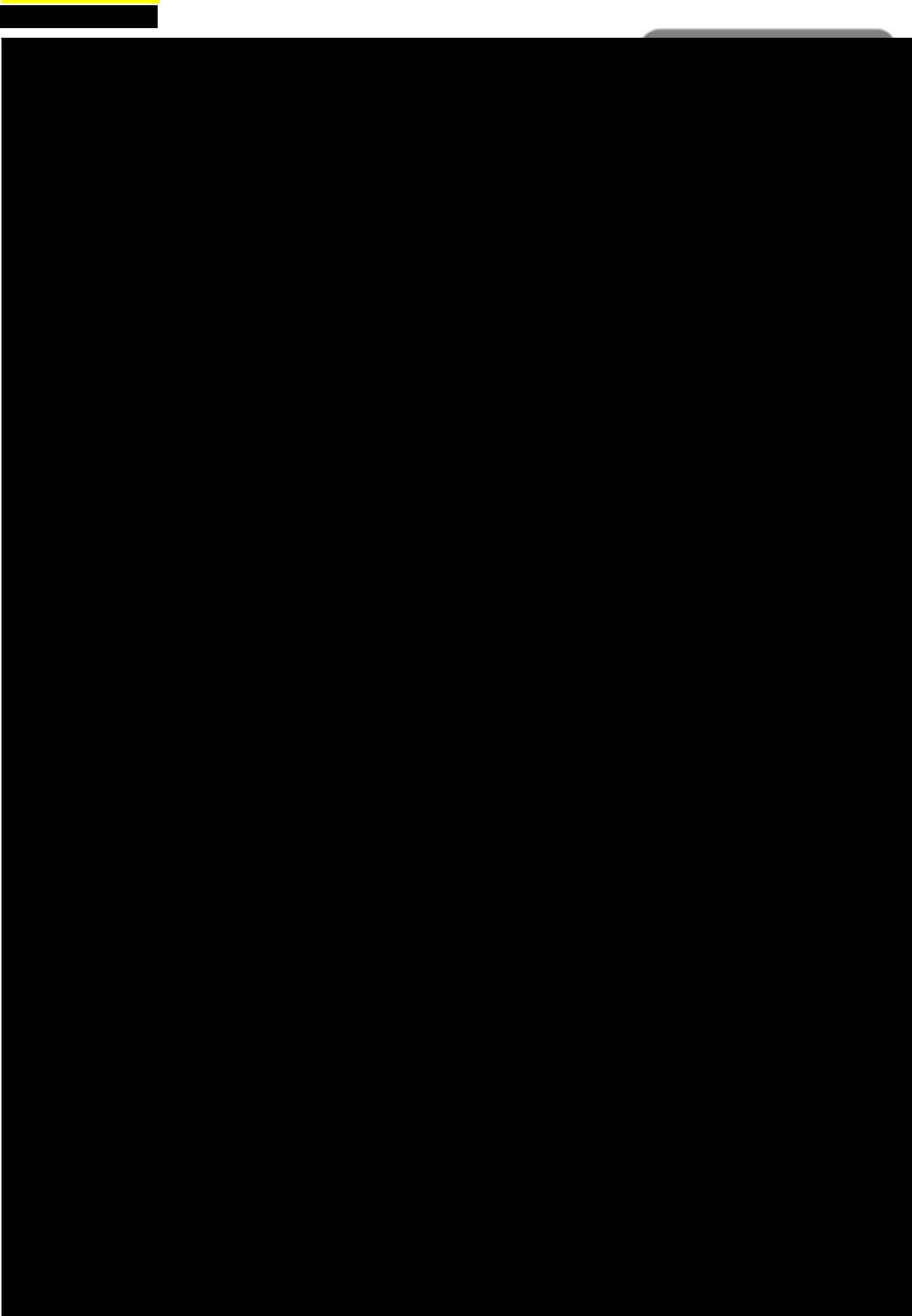


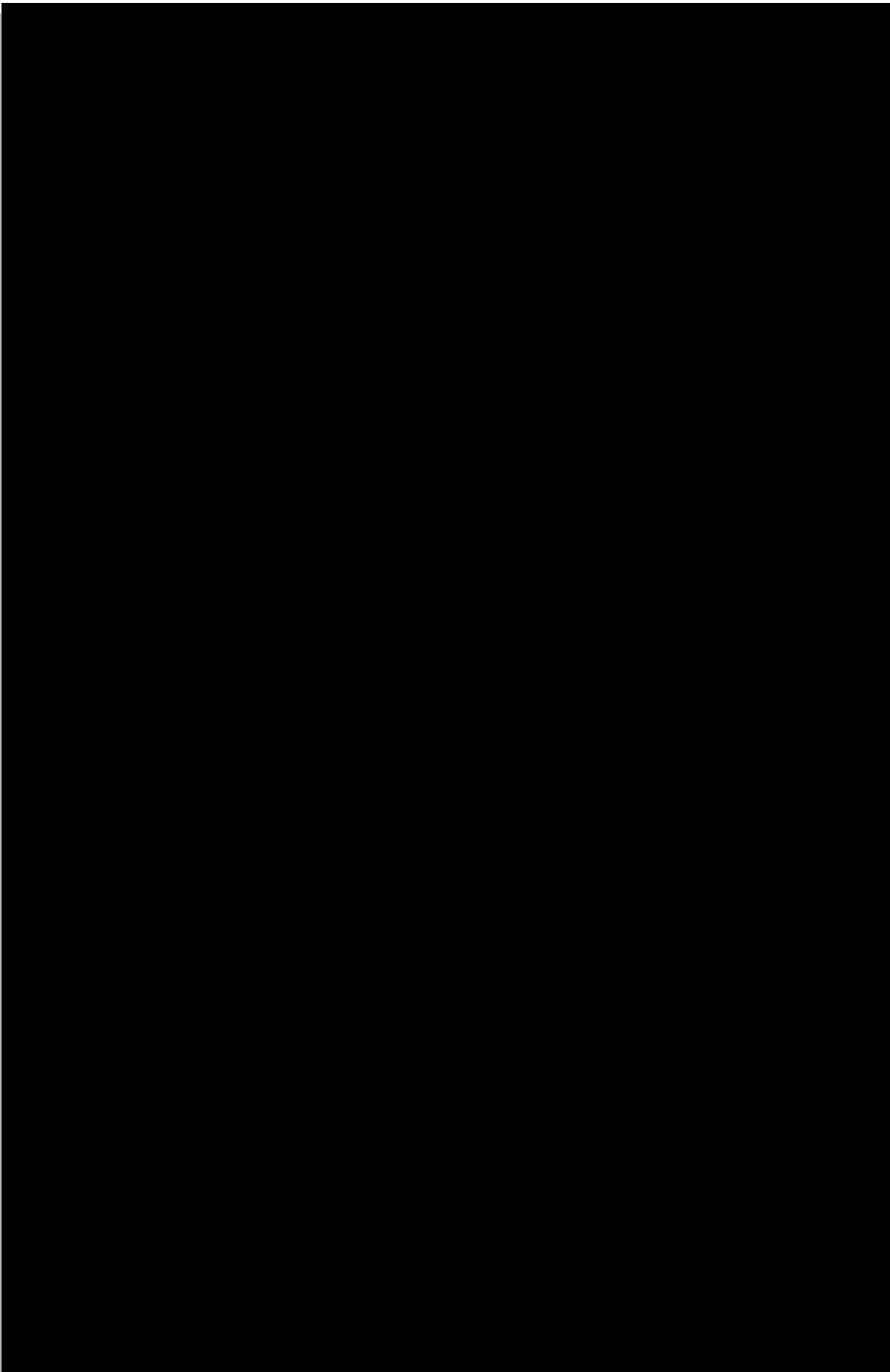


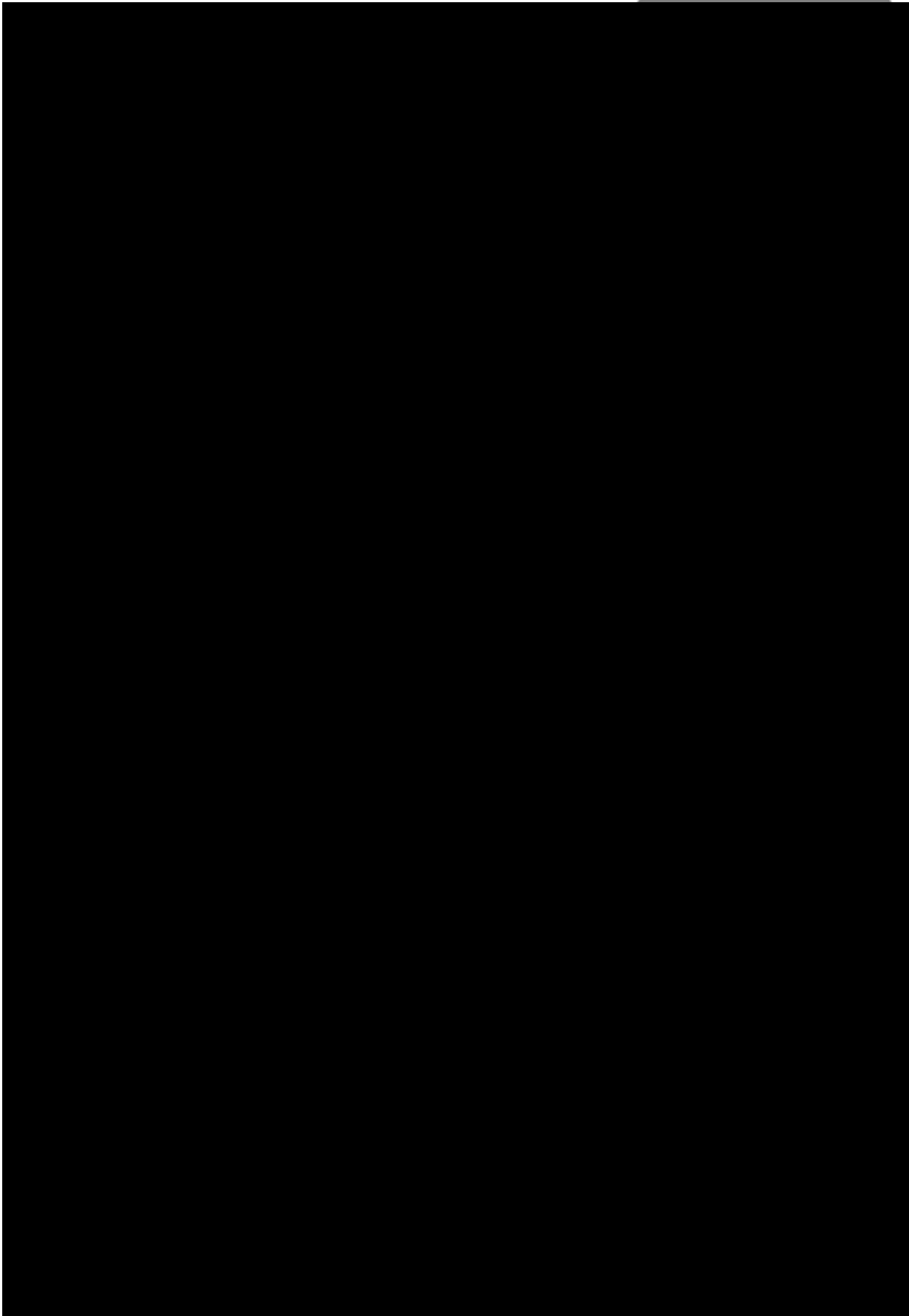


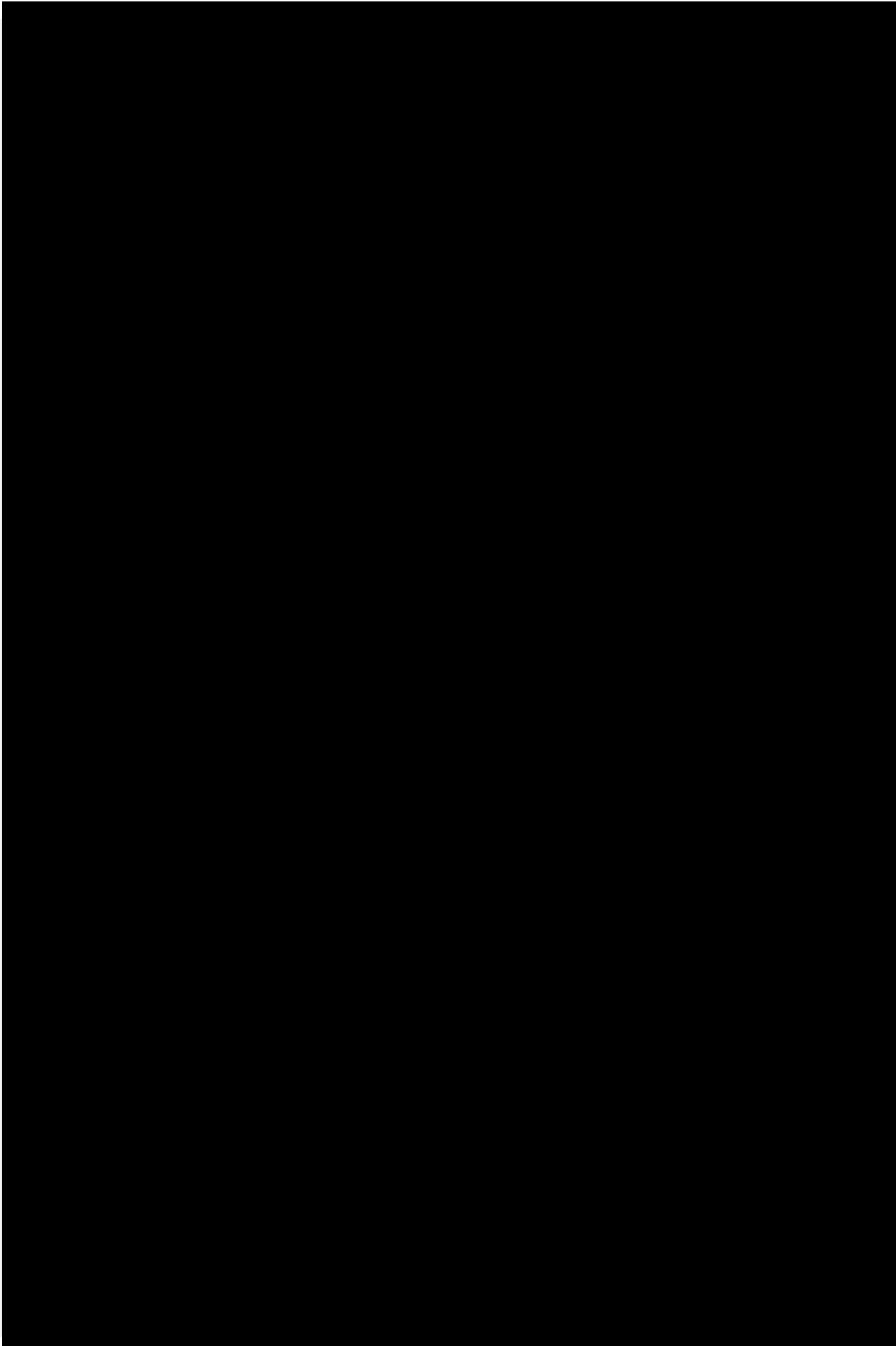


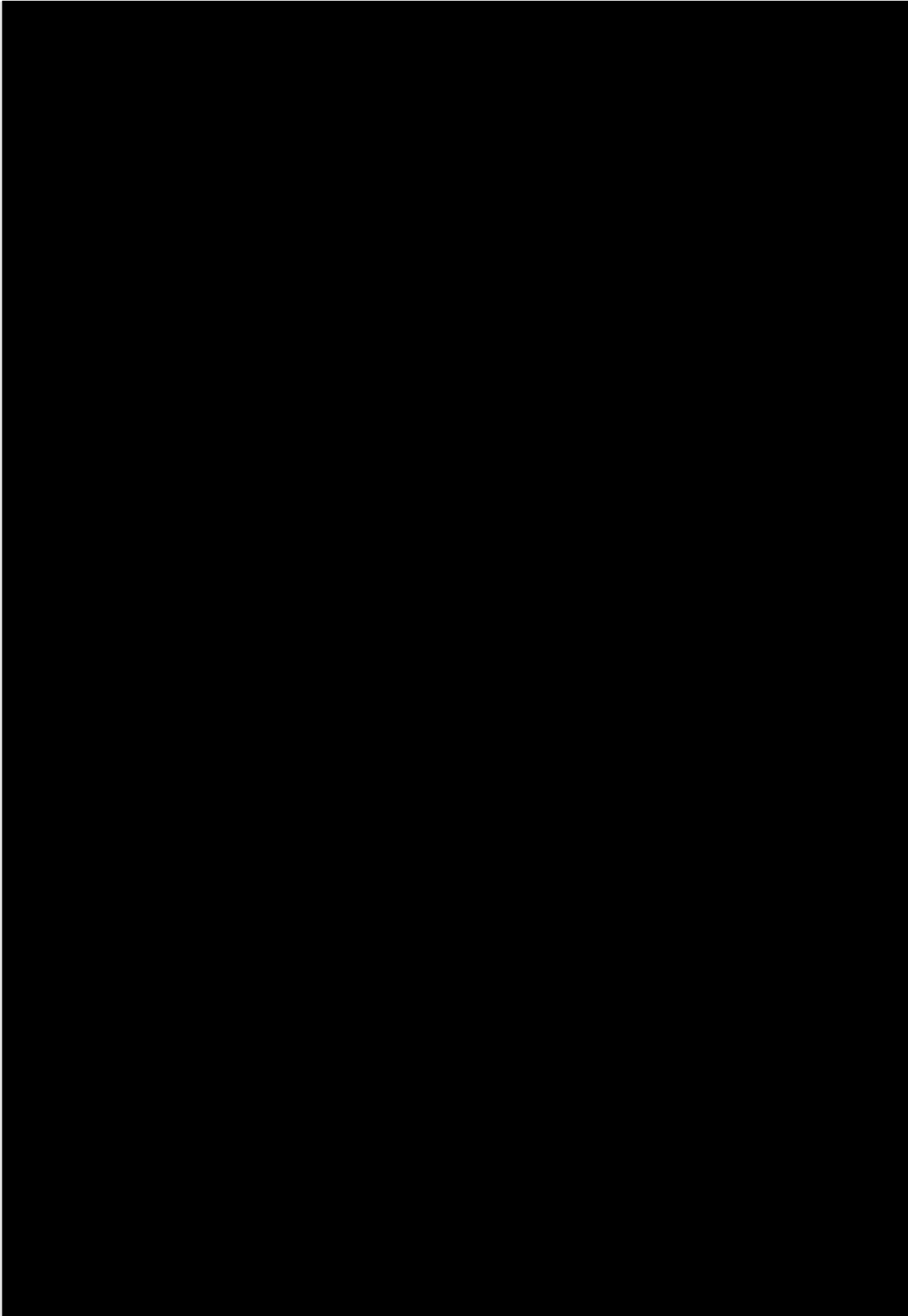


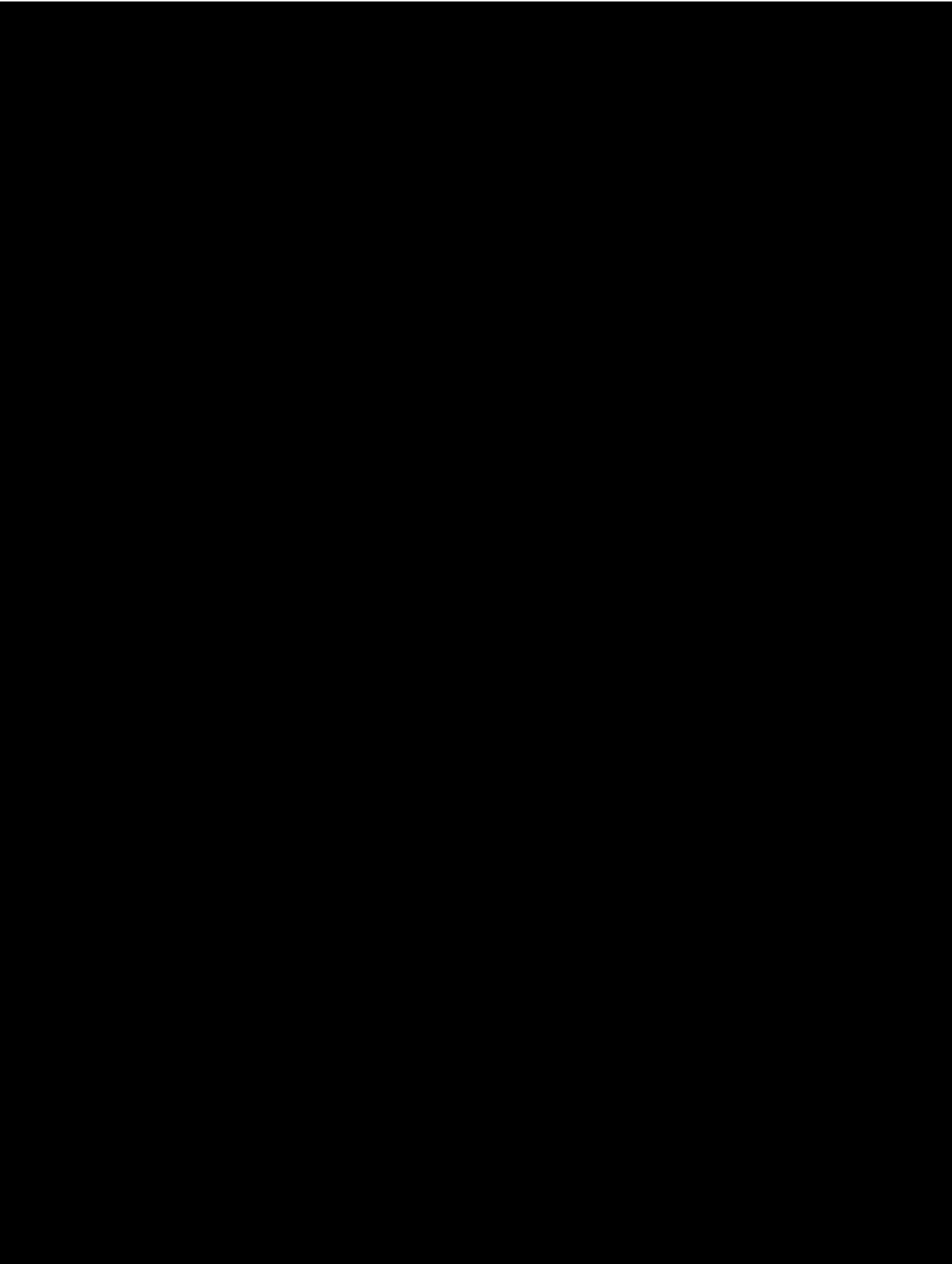


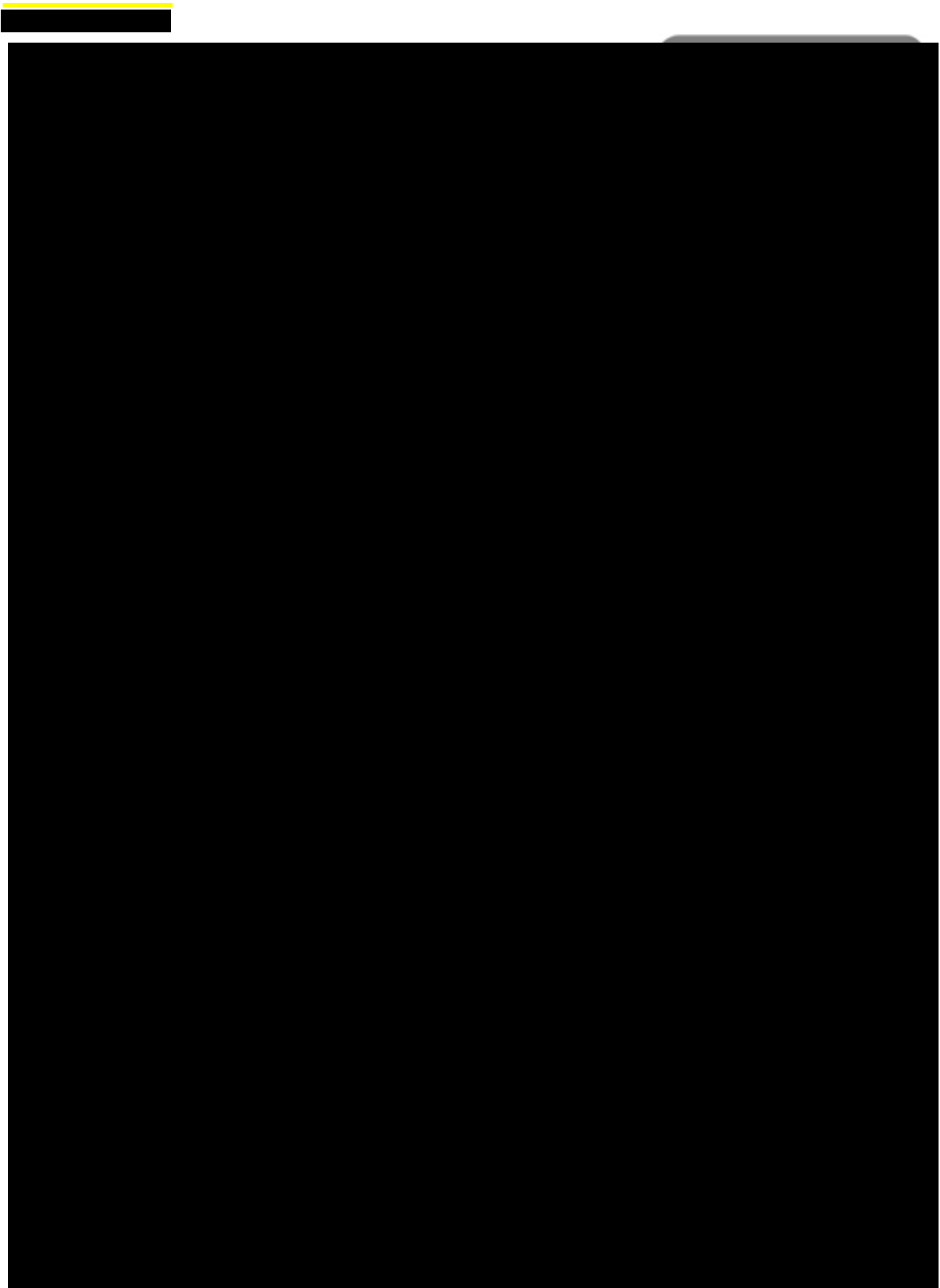


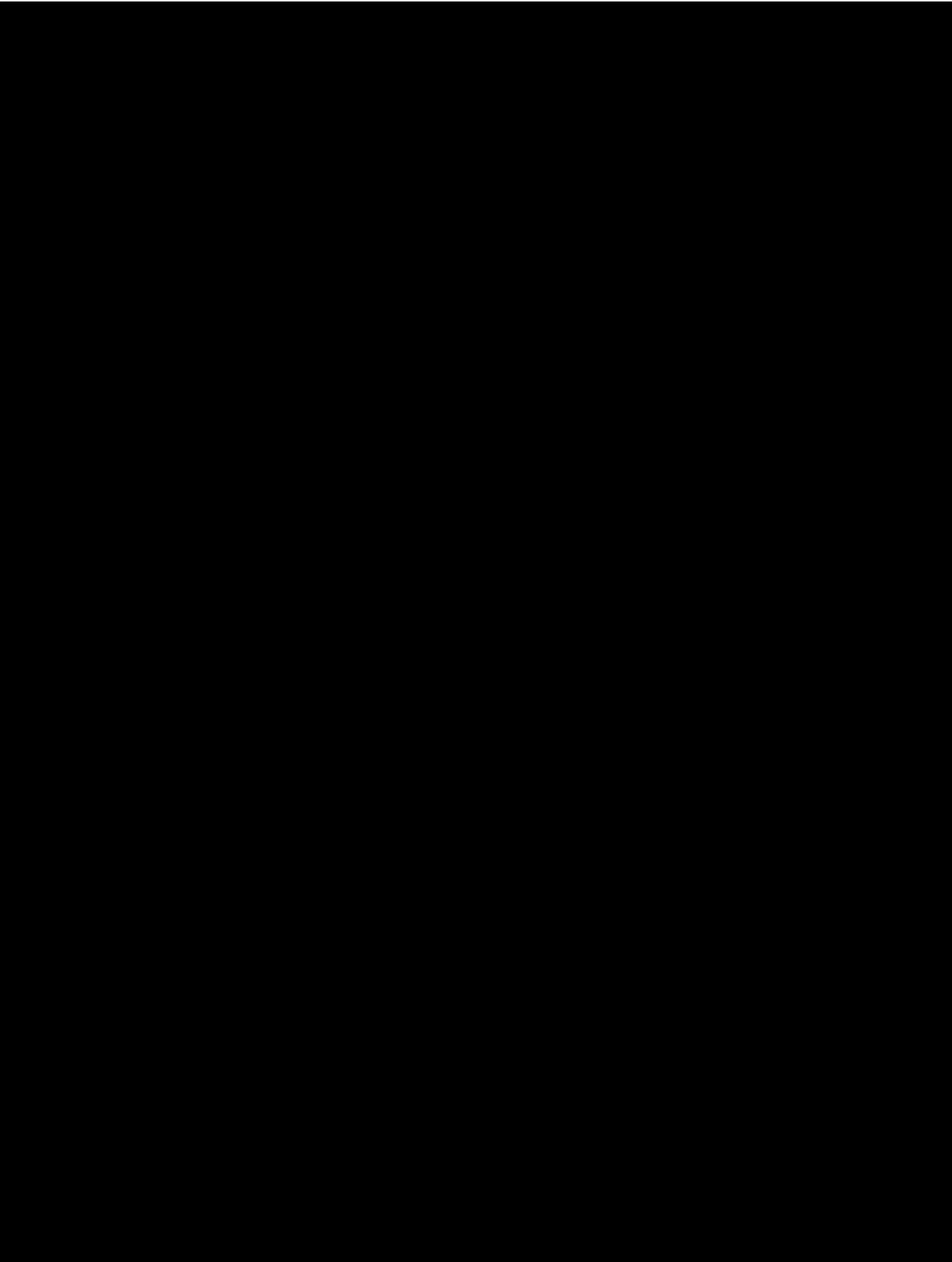


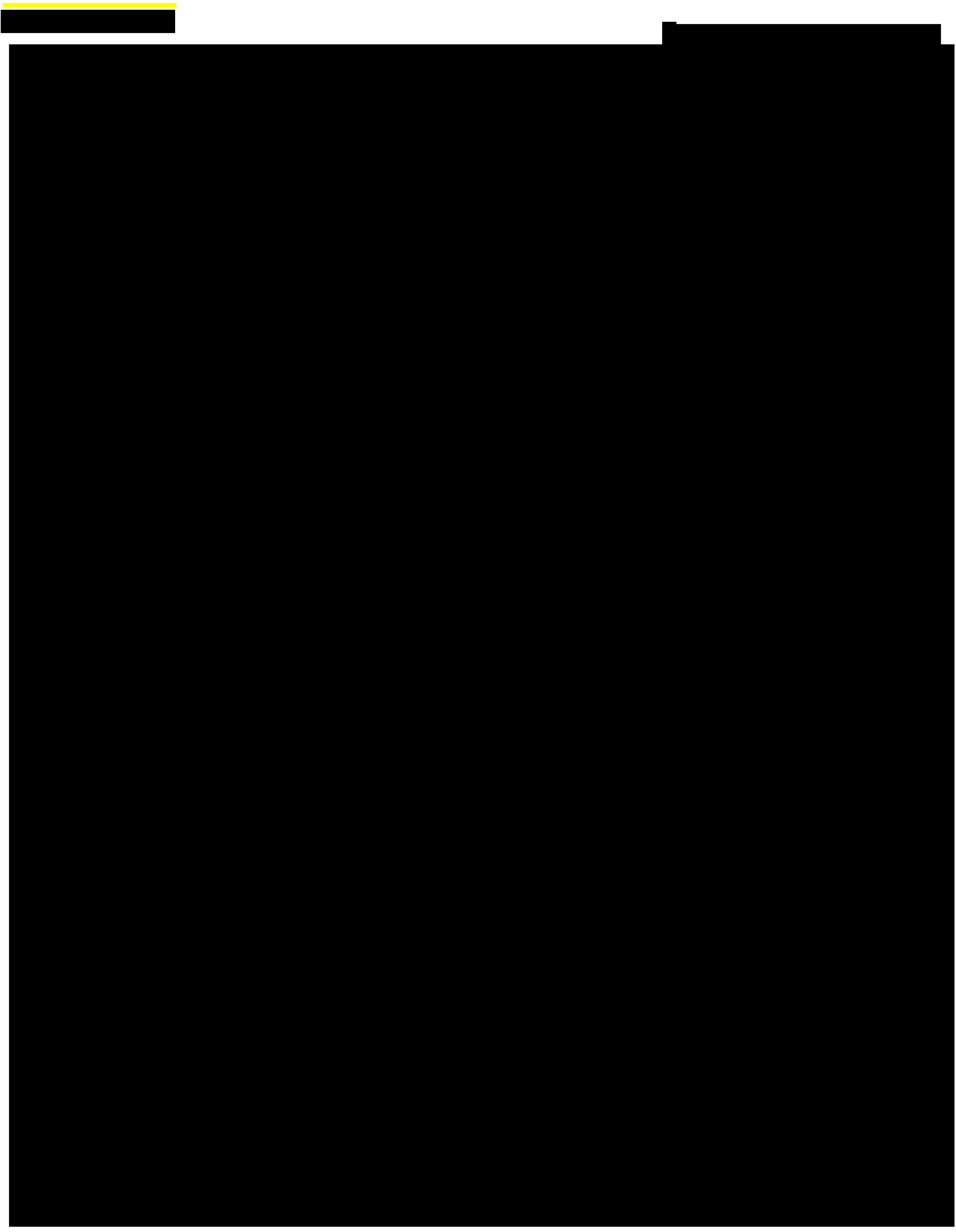


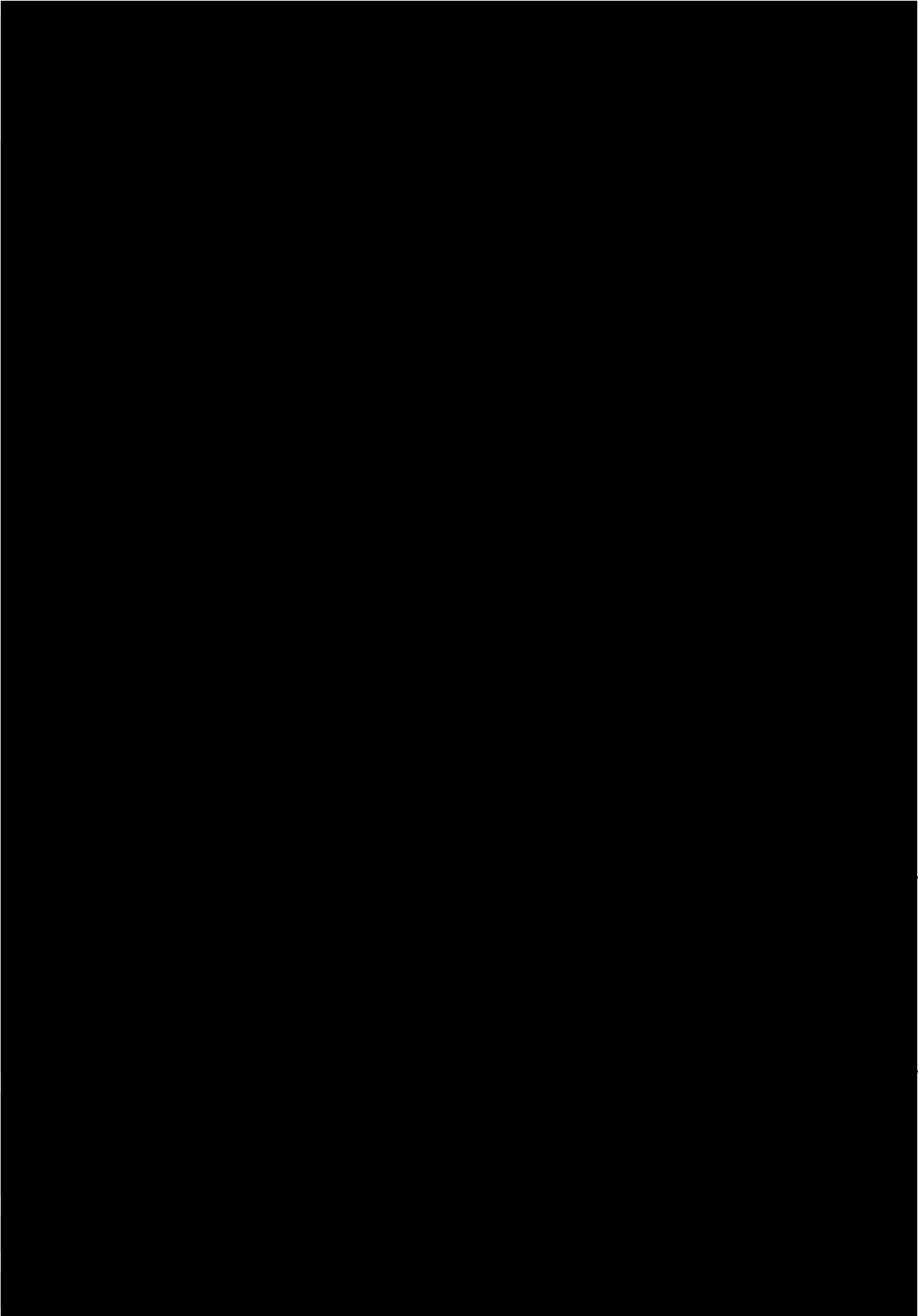


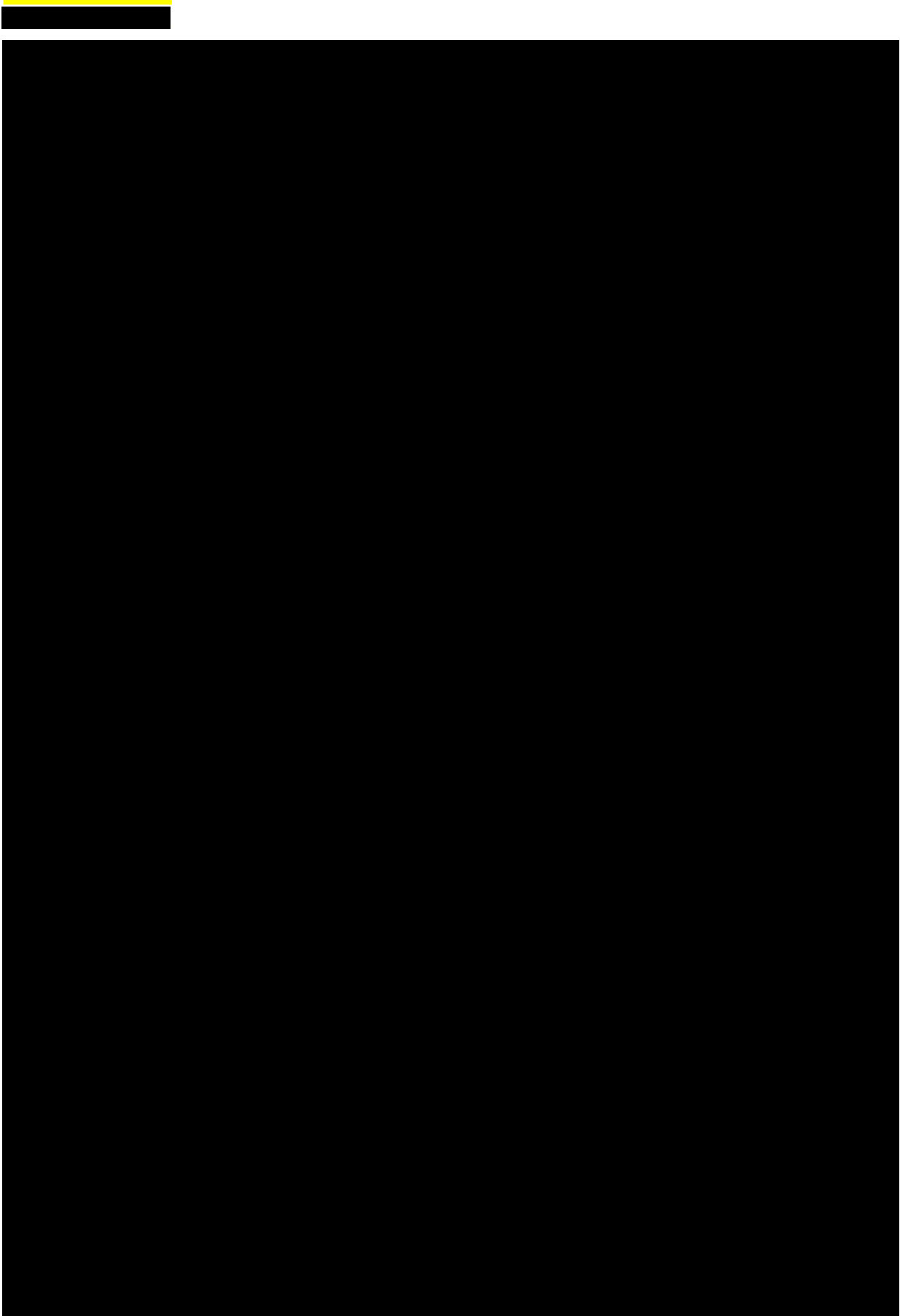


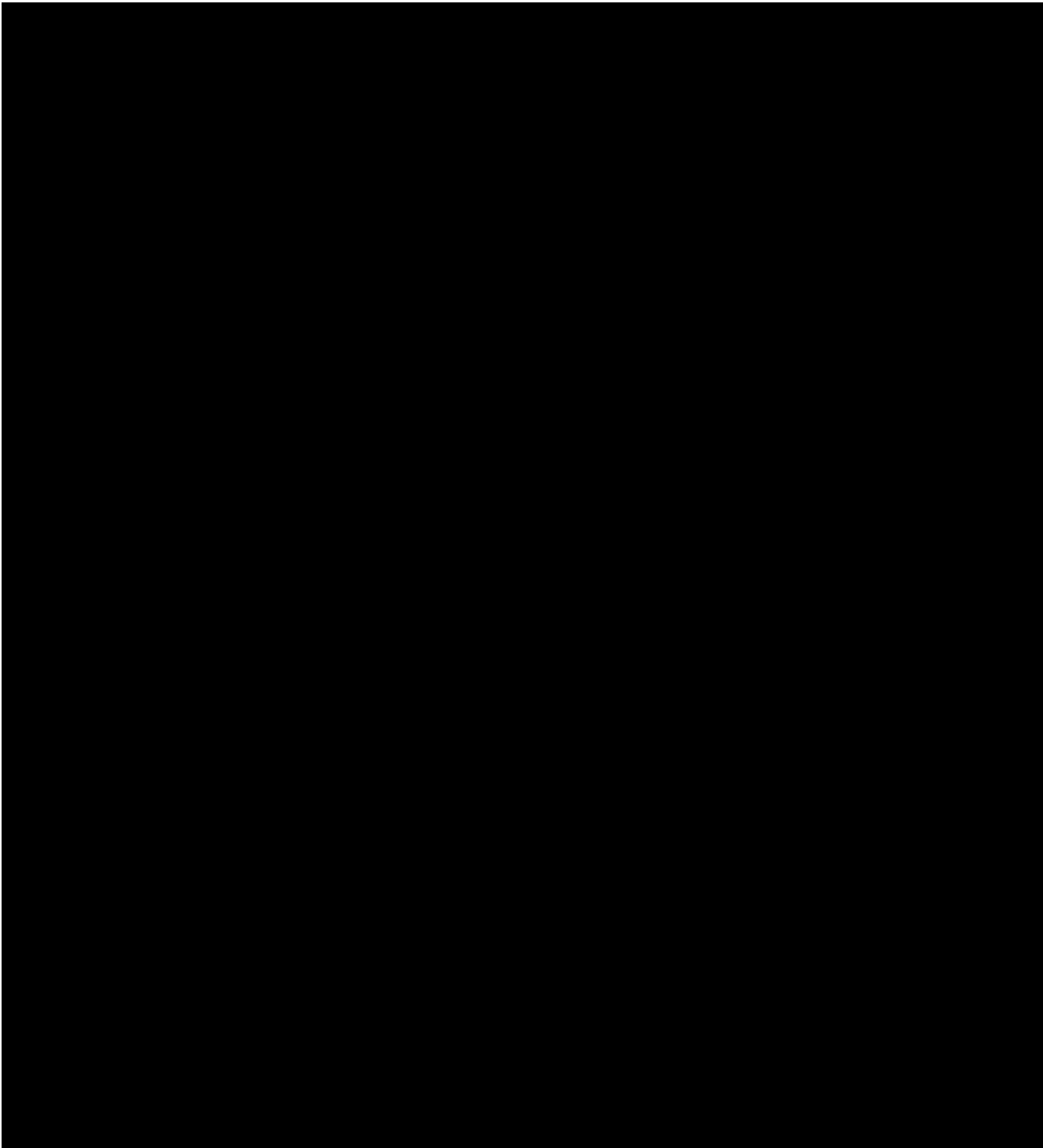


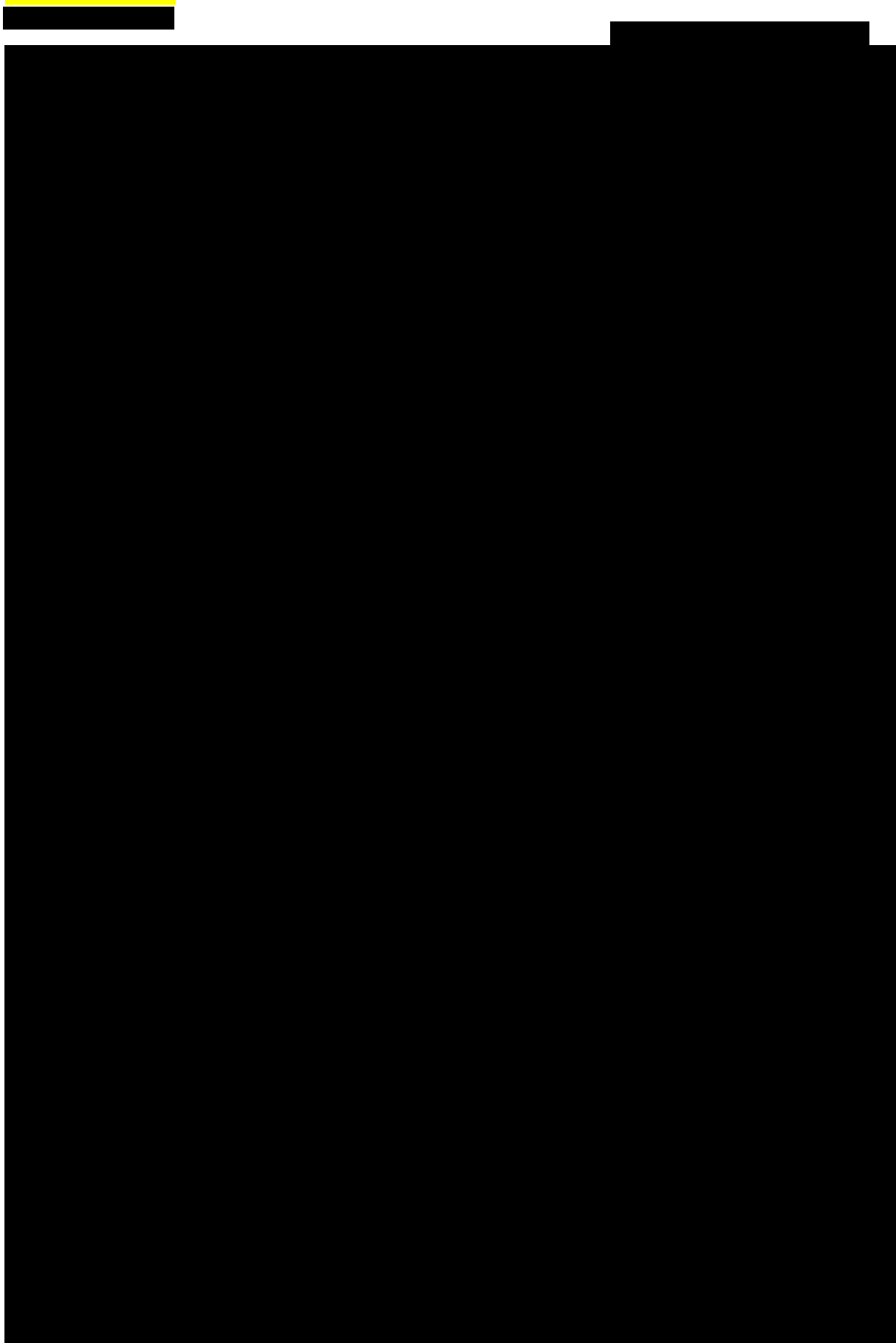


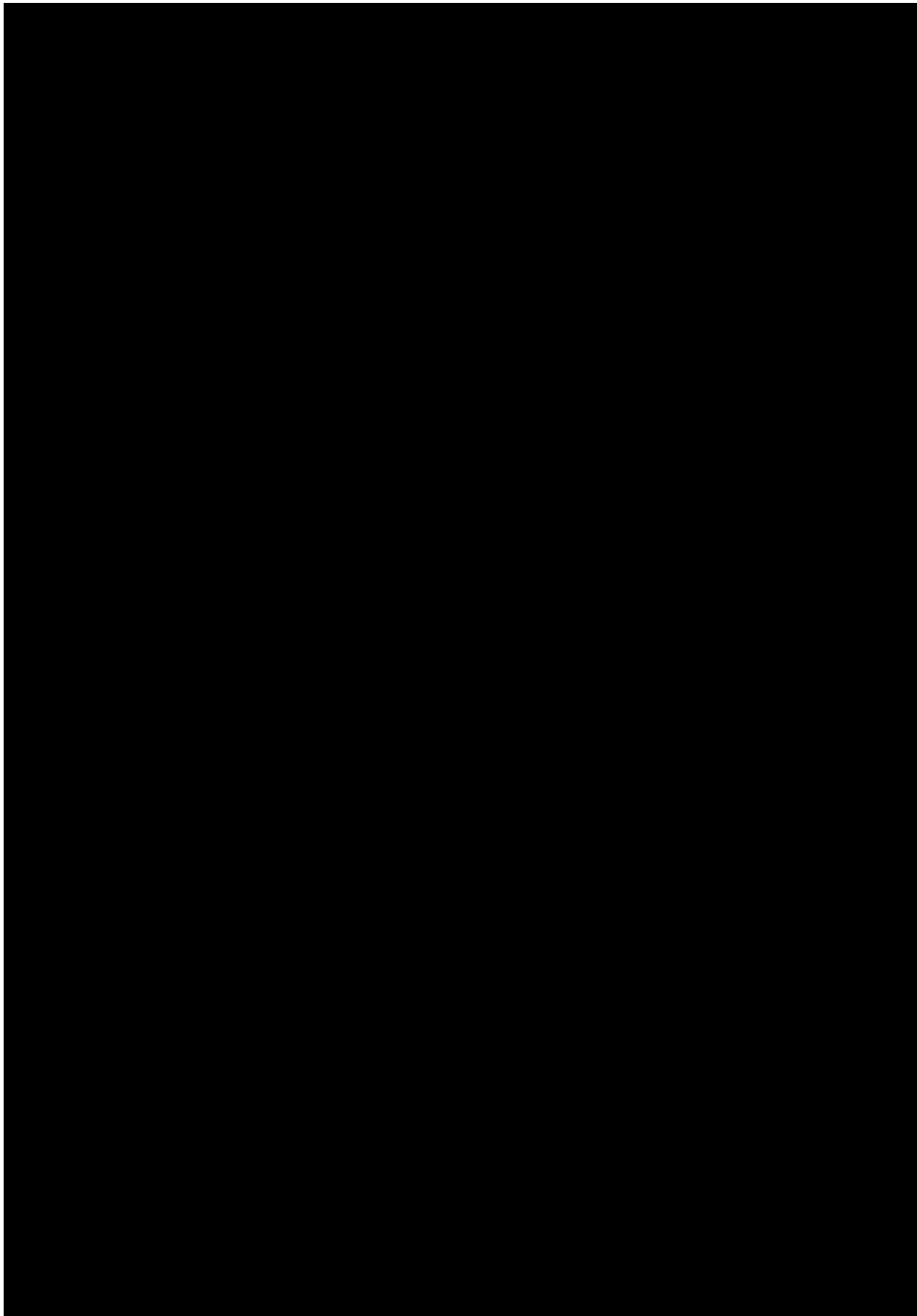




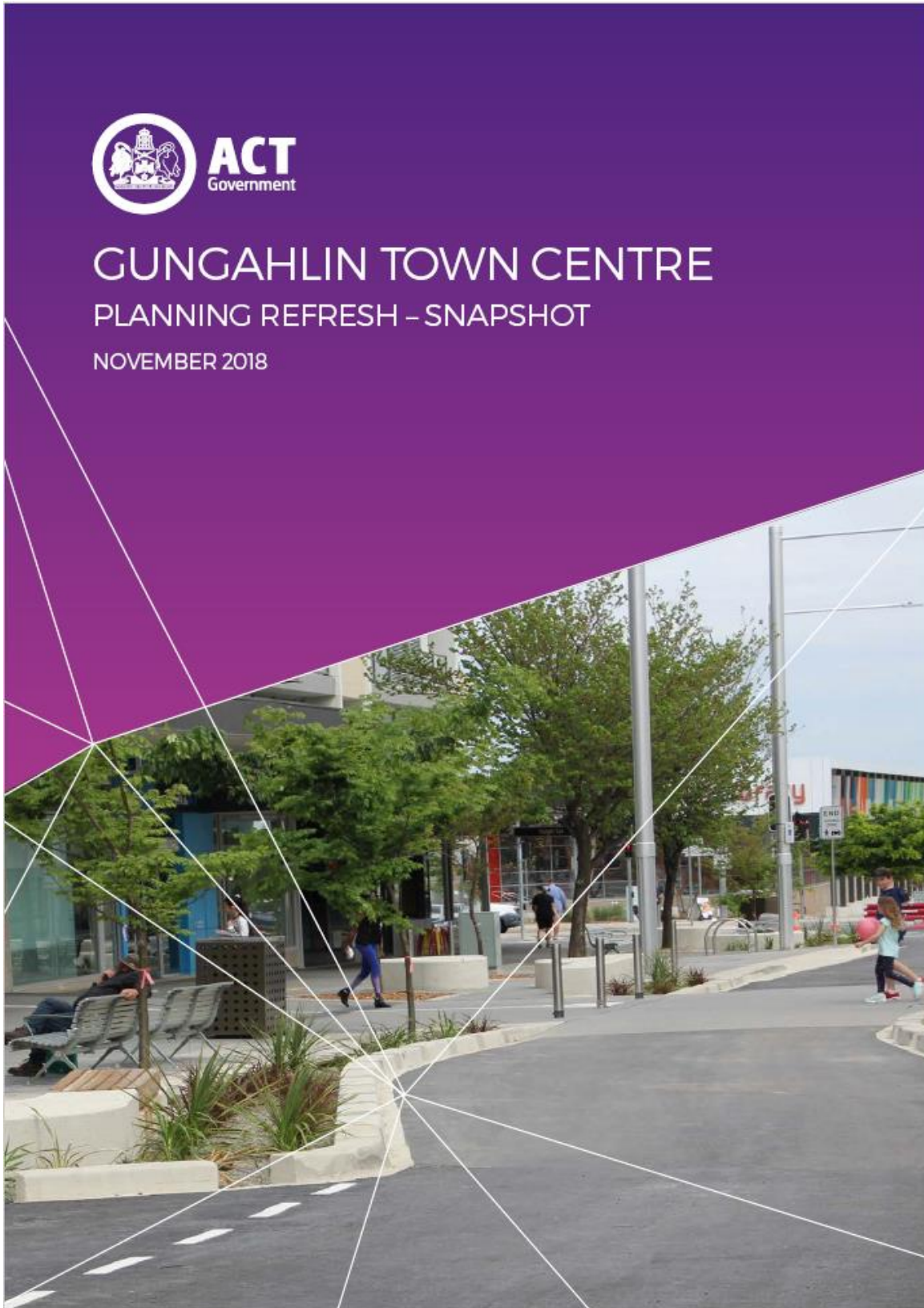








Attachment 14: Refer https://www.planning.act.gov.au/__data/assets/pdf_file/0009/1277955/Gungahlin-Town-Centre-Refresh-Snapshot.pdf





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iv GUNGAHLIN TOWN CENTRE PLANNING REFRESH SNAPSHOT

INTRODUCTION

The Gungahlin Town Centre Planning Refresh Snapshot package has been prepared as a summary of work to date and to document recommendations for the future planning and development of the Gungahlin town centre. The Snapshot package includes two documents: the Snapshot (this document); and a Concept Variation to the Territory Plan's Gungahlin Precinct Map and Code that documents the Snapshot's recommendations and how they might translate into the Territory Plan.

The Gungahlin town centre has grown substantially in recent years, attracting new residents, businesses and investment, and importantly has the introduction of light rail. With this growth set to continue into the future, the Planning Refresh is timely to set a planning framework that appropriately responds to and directs this growth and change.

This document (the Snapshot) provides a summary of the analysis and community input from the Gungahlin Town Centre Planning Refresh work undertaken over the last 12-18 months and provides recommendations. The Planning Refresh work has focused on the following three key themes which also respond to key community comments:

- building height and character
- upgrading and enhancing public spaces
- walking, cycling and road transport

The Concept Variation to the Territory Plan's Gungahlin Precinct Map and Code document that forms part of this package, is for information and consideration and provides an indication of how the recommendations could be translated into the Territory Plan. A formal Territory Plan variation process will follow in 2019. This will provide the community with an opportunity to provide further comment on the planning for the town centre.

The study area of the Gungahlin town centre planning refresh is shown in Map 1. The town centre forms part of the suburb of Gungahlin.

Map 1. Study Area



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BACKGROUND AND ANALYSIS

The original planning vision for the Gungahlin town centre in the mid 1990s was for a low scale urban village with maximum 4 storey buildings across the centre.

In 2010, the Gungahlin Town Centre Planning Report documented considerations of whether planning was producing the desired outcomes for the town centre and the community. The key recommendations of this 2010 Planning Report that informed the Variation to the Territory Plan No. 300 (2011) were:

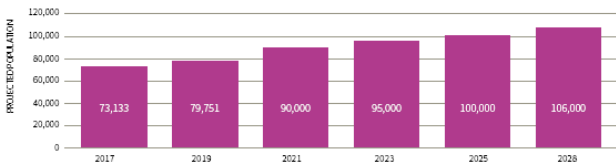
- Maintaining Gungahlin town centre's distinctive 'urban village' character.
- Identifying two office precincts; an office park in the north-west, and office core in the east of the town centre with large sites and flexible planning provisions to attract government departments.
- Prohibit residential uses and serviced apartments in the office core.
- Increasing building heights and introducing building envelopes to minimise overshadowing, bulk and scale in the office core precinct.

- Increasing building heights and introducing building height criteria for the office park precinct.
- Reserving 200,000m² for commercial office floor space distributed in two separate precincts (Office park and Office core) to accommodate 10,000 jobs to encourage more employment in Gungahlin.

Since 2010, the Gungahlin town centre has continued to grow and evolve. There has been higher demand and growth for residential development within the town centre, compared to commercial development. Much of this residential growth has occurred in the office park precinct in the northwest of the town centre, as the Territory Plan's Commercial C22 Business zoning allows residential uses, along with commercial uses.

Based on projections by ACT Government in 2017, by 2028, the residential population of the Gungahlin District is expected to be around 106,000 (Graph 1).

Graph 1: Gungahlin District Resident Population Projection (excluding Hall)
Source: ACT Government, 2017



In 2016, the suburb of Gungahlin had a population of 6,330 people and employed 4,100 people (Table 1).

Table 1: Gungahlin population and employment (excluding Hall)

	1991	1996	2001	2006	2011	2016
Gungahlin District (population)	100	12,295	24,180	32,385	48,000	72,130
Gungahlin Suburb (population)	0	0	0	3,460	5,865	6,330
Gungahlin Suburb (all employment)	0	0	750	1,650	2,650	4,100
Gungahlin District (all employment)	2,520	4,470	5,810	6,750	12,720	14,800

Source: Australian Bureau of Statistics (ABS) census data
Note: Gungahlin Suburb contains the Gungahlin Town Centre and surrounding residential areas and is bounded by Horse Park Drive, Gundaroo Drive, Anthony Rolfe Avenue and Gungahlin Drive. The suburb also includes part of Yerrabi Pond and Mulanggai Grassland Nature Reserve

Historically, Gungahlin town centre has experienced a limited demand of commercial office space. By way of comparison, commercial floor space per district population and documented in Table 2, Gungahlin has the lowest commercial floor space ratio of 0.2655m² per resident.

Table 2: Office Floor Space and Employment - ACT 2016

DISTRICT	GUNGAHLIN (INC. MITCHELL)	TUGGERANONG	BELCONNEN	WODEN VALLEY	ACT
Resident Population (1)	72,132	85,968	97,830	35,377	403,486
Employment (2) (people)	14,800	19,920	30,215	24,530	235,000
Commercial office floor space m ² (3)	19,152	148,874	196,980	183,941	2,371,460
Commercial office m ² /resident (Net Lettable Area)(3)	0.2655	1.7317	2.0135	5.1995	5.8777

Source: (1) Estimated resident population, Australian Bureau of Statistics data, (2) Australian Bureau of Statistics and ACT Government data (3) Property Council of Australia (PCA), 2016 data
Note: Commercial office floor space excludes space used for retail, service, industrial and trade.

Whilst the Gungahlin Town Centre Planning Report (2010) predicted 200,000m² of commercial office floor space would be required over the long term, by 2016 approximately 13,500m² of commercial office floor space in the suburb of Gungahlin, with an additional 5,500m² elsewhere in Gungahlin district including Mitchell had been taken up. This is predominately small scale offices. As a consequence, the prediction made in 2010 for the town centre has not been realised.

Employment and commercial office space will continue to grow and be distributed throughout Gungahlin district into the future. However, for the purposes of the Planning Refresh, a number of assumptions and projections have been made including nominally allocating all the district's future commercial office space to the Gungahlin town centre.

It is now expected that employment in commercial (small scale) office uses in the town centre will increase by an additional 16,000m² to reach 35,000m² by 2028.

On the basis of the above district commercial office spaces per resident ratios, the Planning Refresh recommends a more informed total commercial office floor space target in the town centre of 100,000m² over the long term. This target takes into account the opportunities that light rail will present and the amount of undeveloped land available in the town centre.

The 100,000m² target equates to approximately 1m² of commercial office space per resident in Gungahlin district.

As such, 65,000m² is now targeted for large scale office development (e.g. public administration). This development should be located in close proximity of the light rail. The Planning Refresh also recommends the floor space target be monitored and reviewed after five years.