Emergency Management Plan - Distribution Network

Part of the Energy Queensland Group

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Version

Version	Date	Description	Reviewed By	Approved by
1.0	7/9/18	Development of Energy Qld Limited Distribution Emergency Management Plan incorporating both Ergon Energy Network and Energex Network plans	[redacted]	
1.0	21/9/18	Approved for Publishing		[redacted]
8.0	2/10/18	Published joint document as Ver 8 to maintain document history and audit traceability.		
8.1	30/9/19	Updated general contents, amended structure diagram, and amended checklists following 2018-19 season	[redacted]	
8.1		Approved for Publishing		[redacted]
9.0	30/9/20	Retitled, updated general content, removed governance components	[redacted]	
10.0	30/9/21	Updated general content, include level 2 structures and references, changes to reflect new corporate systems and amended Quick Response Guides	[redacted]	
11.0	30/9/22	Updated general content, quick response guides	[redacted]	
12.0	30/9/23	Updated general content, ECELT/CMT, Executive naming, key contacts	[redacted]	
13.0	30/7/24	Updated general content, risk and hazards information and timeframes, Natural Disaster Working arrangements, recovery, event sequence flow charts, Emergency Managers, structure change (P&I) and updated role statements	[redacted]	

ABOUT ERGON ENERGY NETWORK

Ergon Energy Network Corporation Limited (Ergon Energy Network) is part of the Energy Queensland (EQL) Group and manages an electricity distribution network supplying electricity to more than 746,000 customers. The vast operating area covers over one million square kilometres – around 97% of the state of Queensland – from the coastal and rural population centres to the remote communities of the Torres Strait.

The electricity network consists of approximately 160,000 kilometres of powerlines and one million power poles, along with associated infrastructure such as major substations and power transformers.

Ergon Energy Network also own and operate 33 stand-alone power stations that provide supply to isolated communities across Queensland which are not connected to the main electricity grid.

ABOUT ENERGEX NETWORK

Energex Limited (Energex) is part of the EQL Group and manages an electricity distribution network delivering services to the South-East Queensland region across an area of 25,000 square kilometres.

The area extends from the NSW border in the south to Gympie in the north. This includes the areas of Brisbane, Gold and Sunshine Coasts, Ipswich, Redlands, Logan, and Moreton Bay.

Energex provide distribution services to over 1.4 million domestic and business connections delivering electricity to a population base of around 3.4 million people via 54,000km of overhead and underground network 288 substations and 50,000 distribution transformers.

Contents

1. PURPOSE AND SCOPE

3. REFERENCES

[redacted]

External

AS ISO 31000:2018 Risk Management - Guidelines

Electricity Act 1994 (Qld) Electricity Regulation 2006 (Qld)

Electrical Safety Act 2002 (Qld)

Electrical Safety Regulation 2013 (Qld)

Disaster Management Act 2003 (Qld)

Emergency Management Assurance Framework (QLD)

Queensland Disaster Management Arrangements

Queensland State Disaster Management Plan 2018

2021/22 State Disaster Risk Report

Queensland State Natural Hazards Risk Assessment 2017

Queensland State Heatwave Risk Assessment 2019

Queensland State Earthquake Risk Assessment 2019

Queensland State Heatwave Risk Assessment 2019

Tsunami Guide for Queensland 2019

Severe Wind Hazard Assessment for Queensland 2021

Queensland State Government Pathways to a climate resilient Queensland, Queensland Climate Adaption Strategy 2017-2030

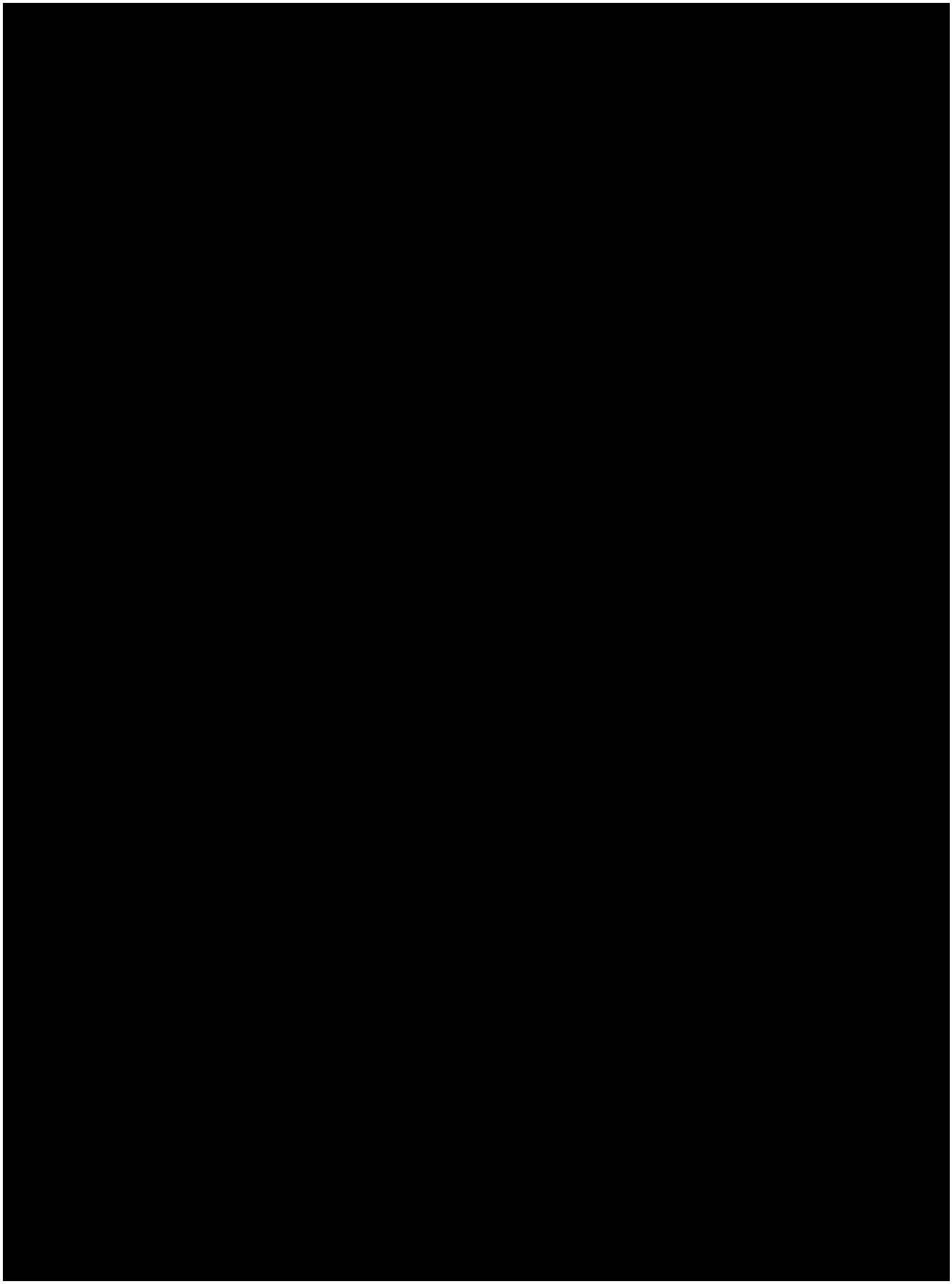
Queensland State Bushfire Plan 2020

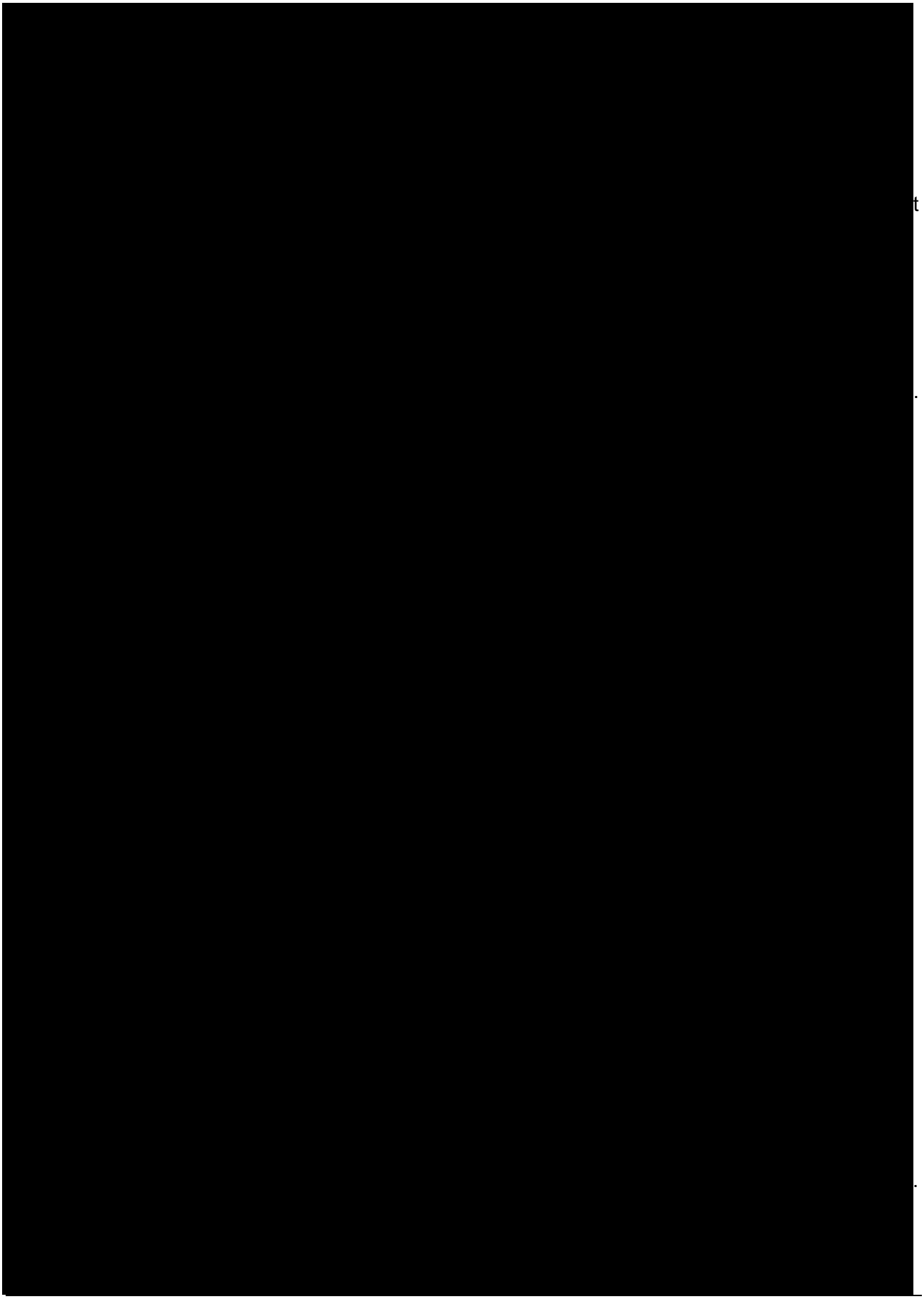
NSW Legislation obligations under the Electricity Supply (Safety and Network Management) Regulation 2014 (NSW) under section 7(2)(b)

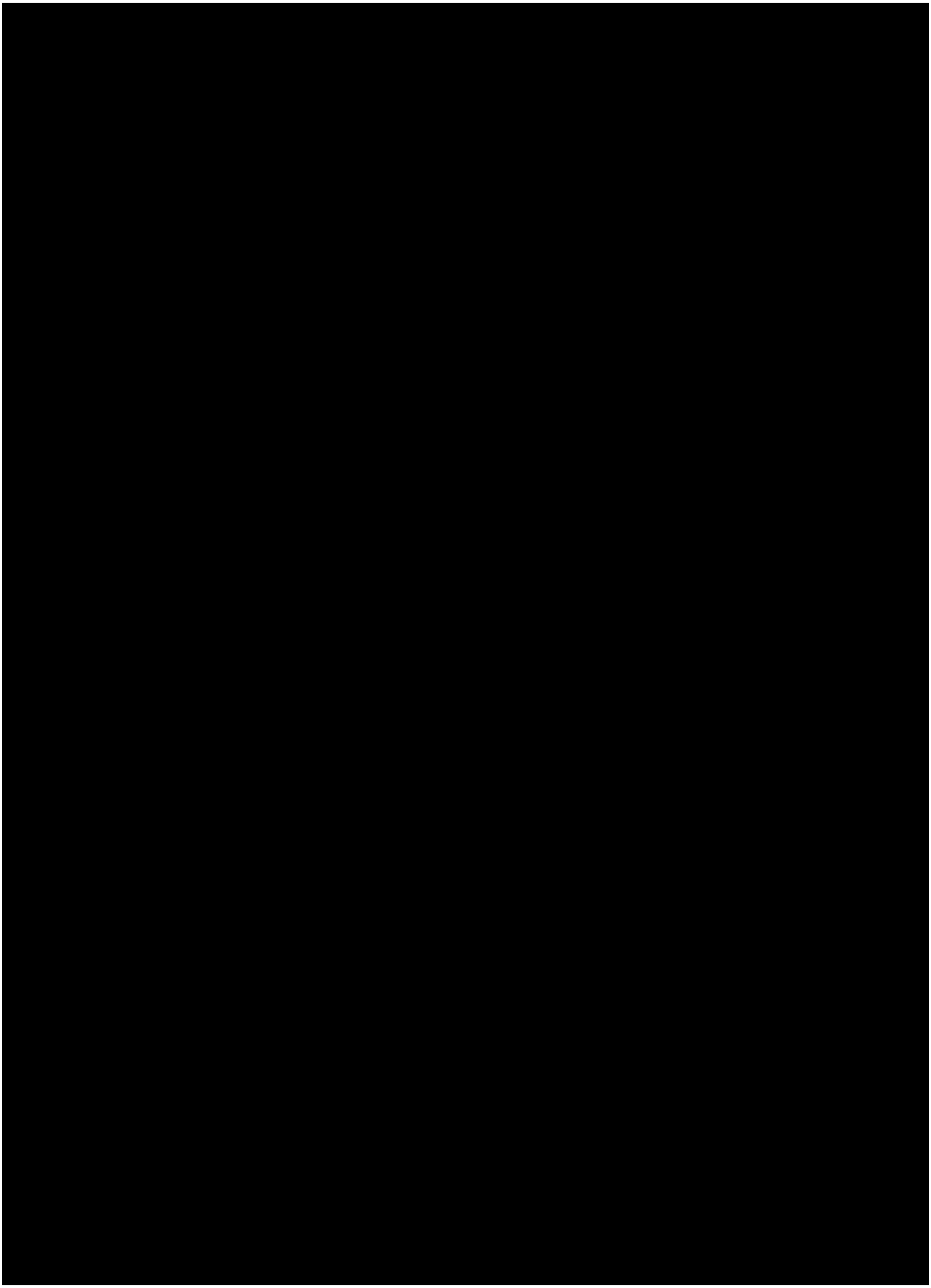
ISSC 33 Guideline for network configuration during high bushfire risk days

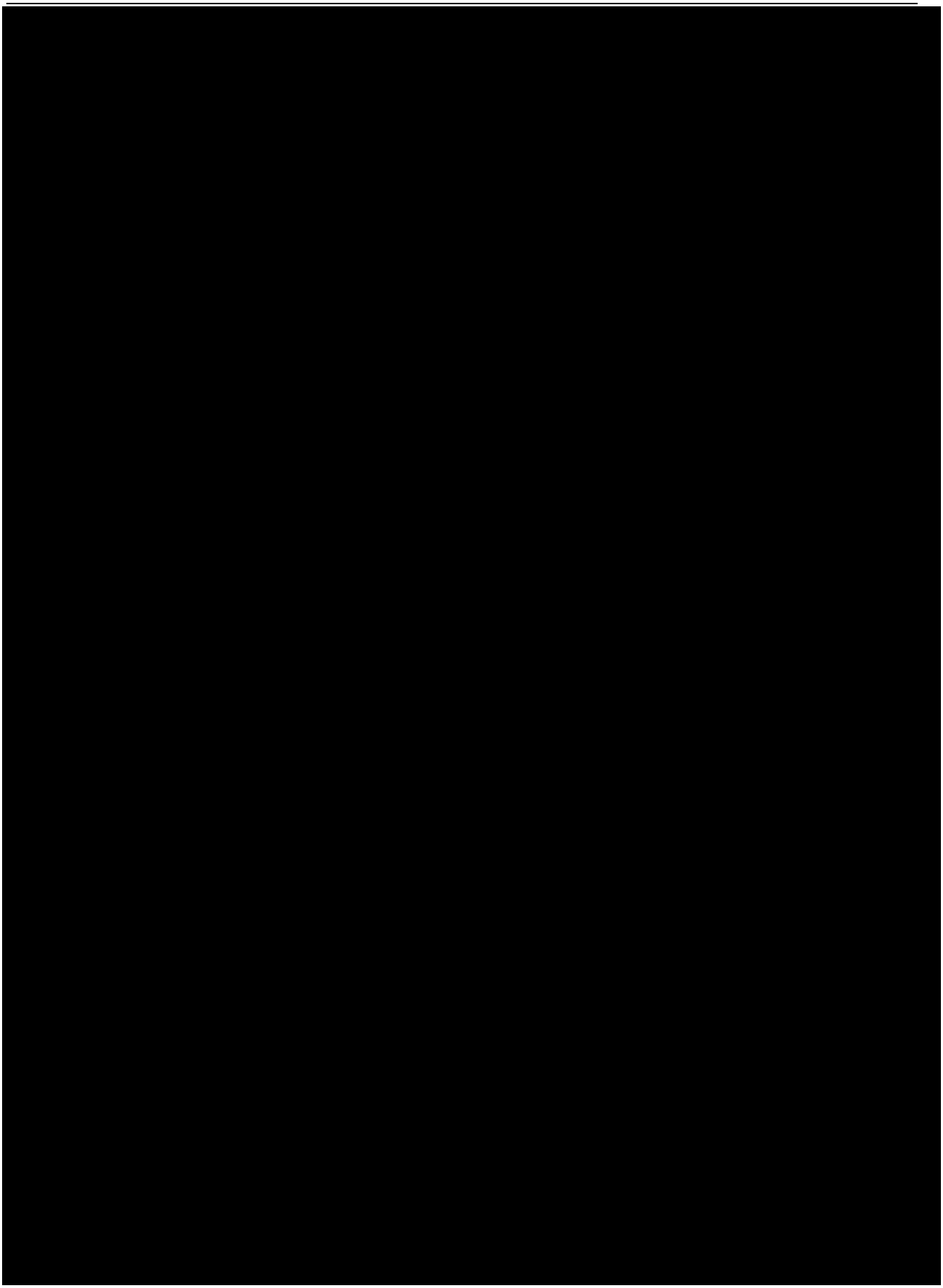
ISSC 31 Guideline for the management of private overhead lines

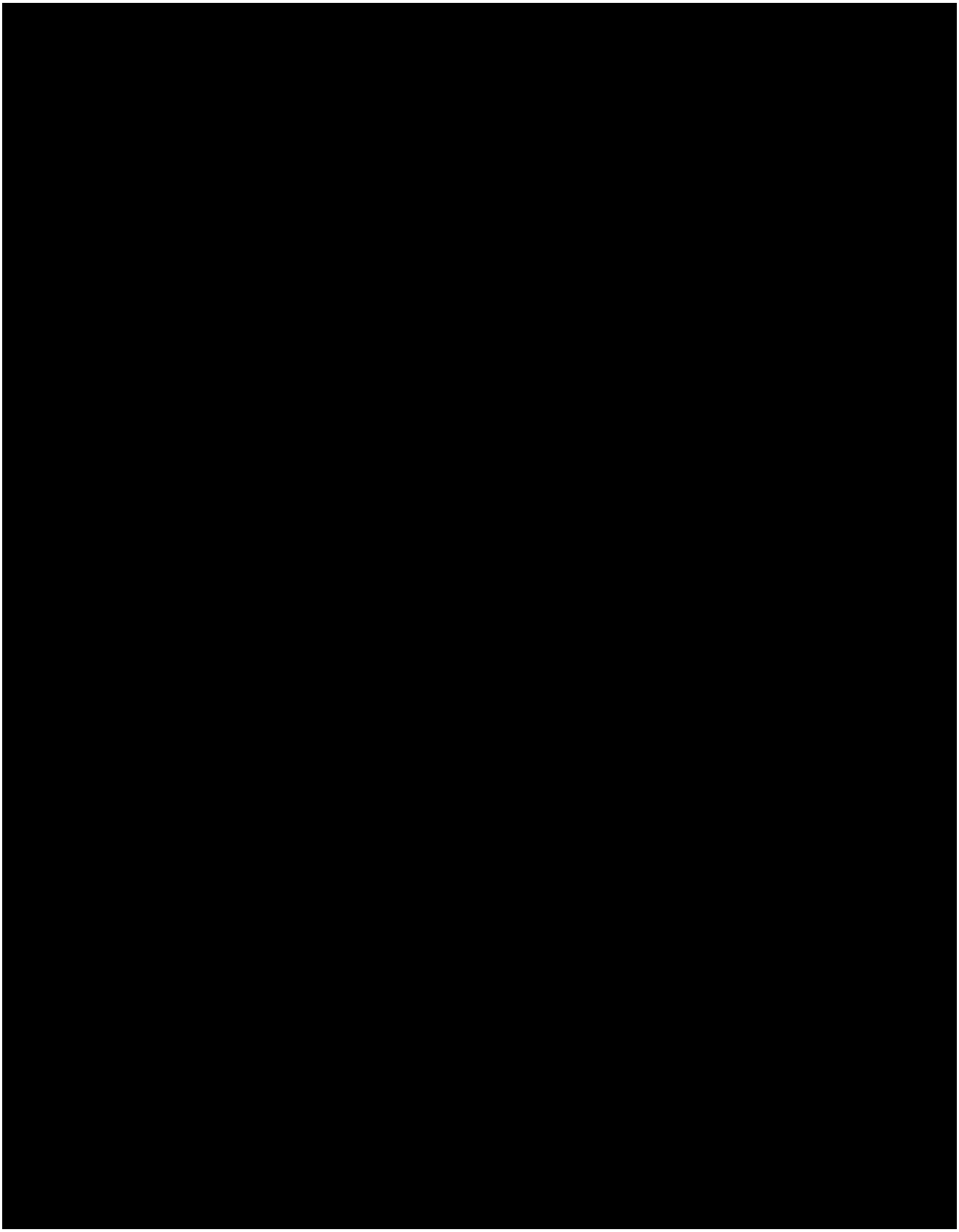
4. EMERGENCY FRAMEWORK











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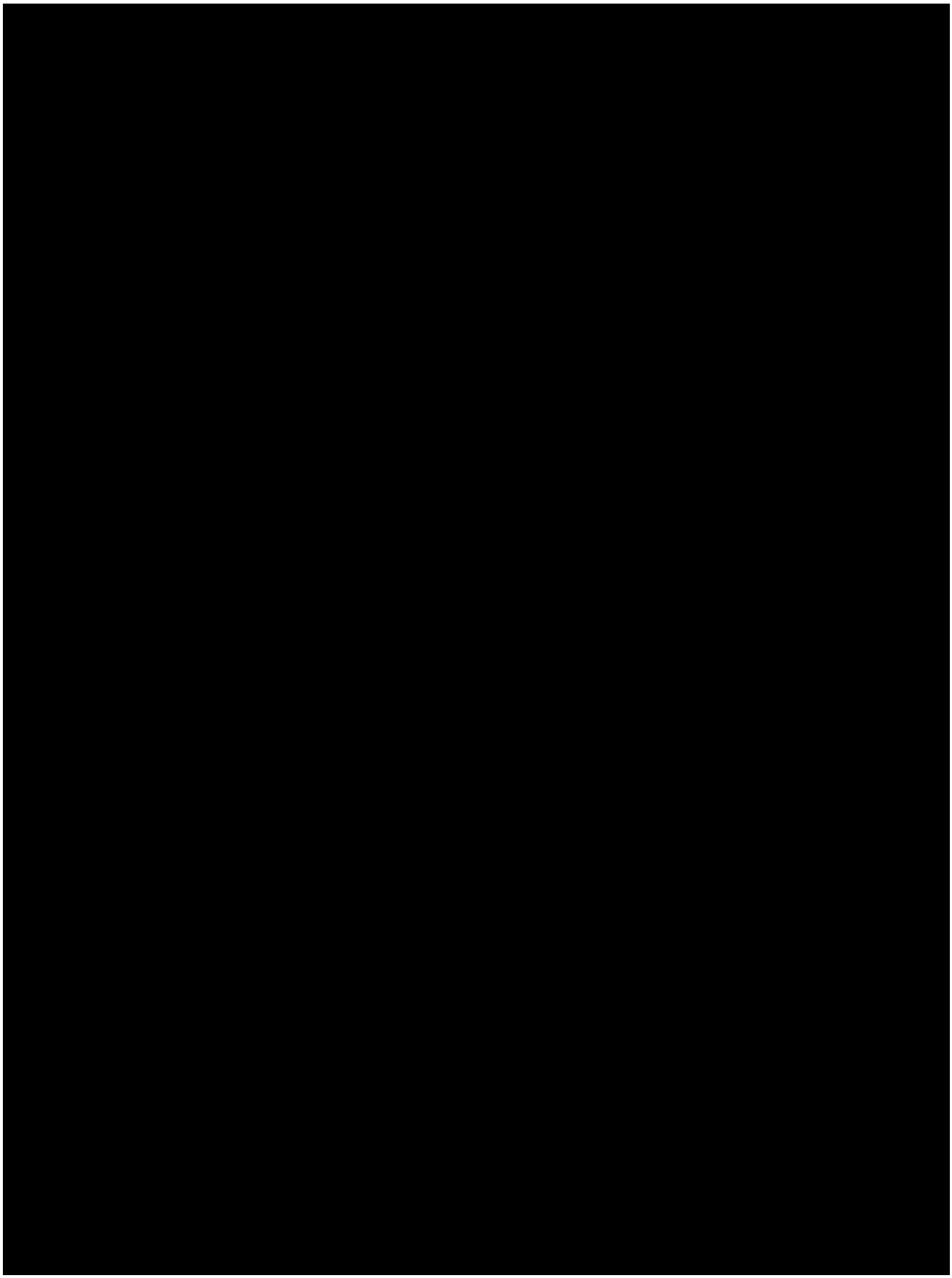

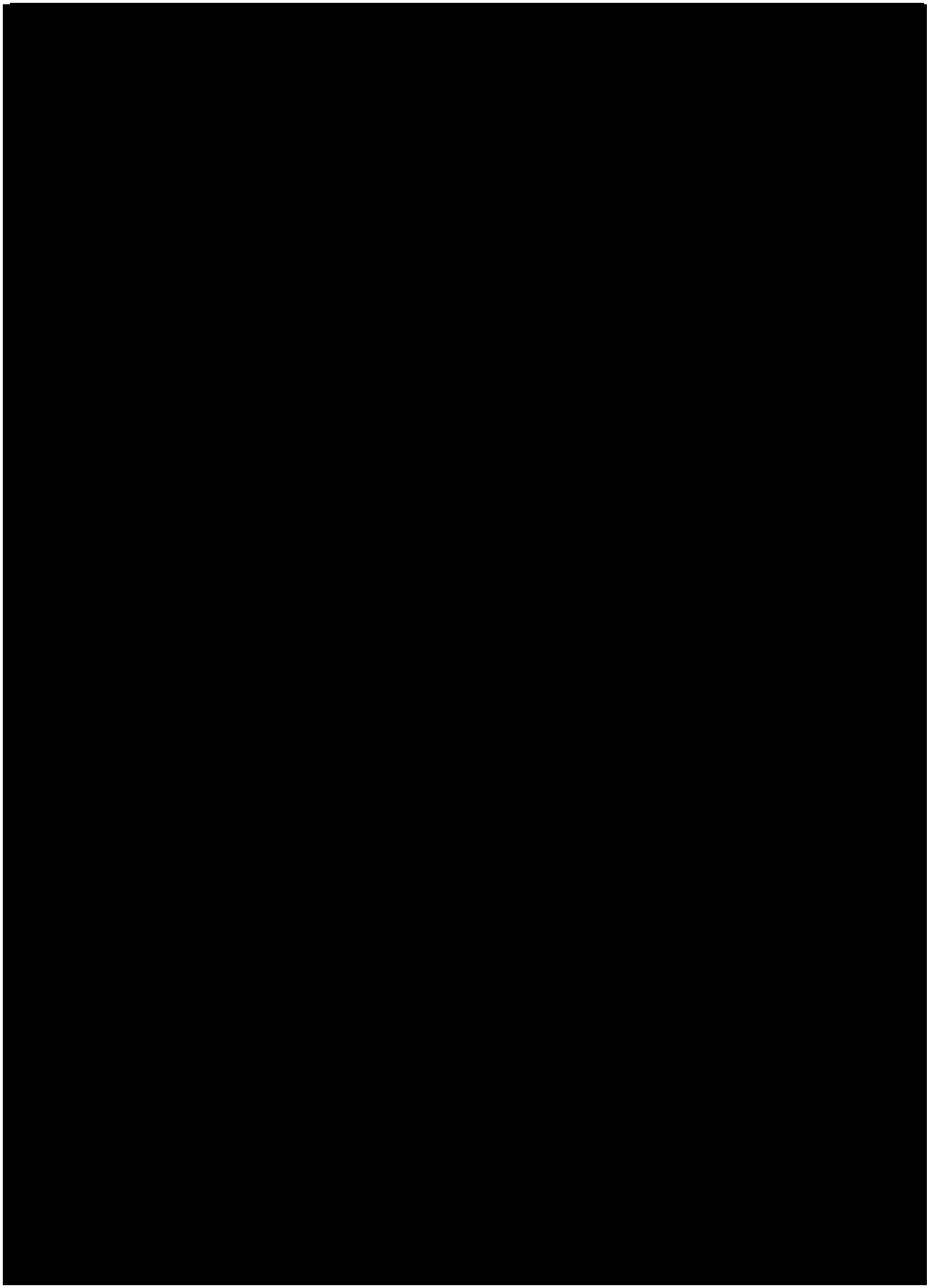

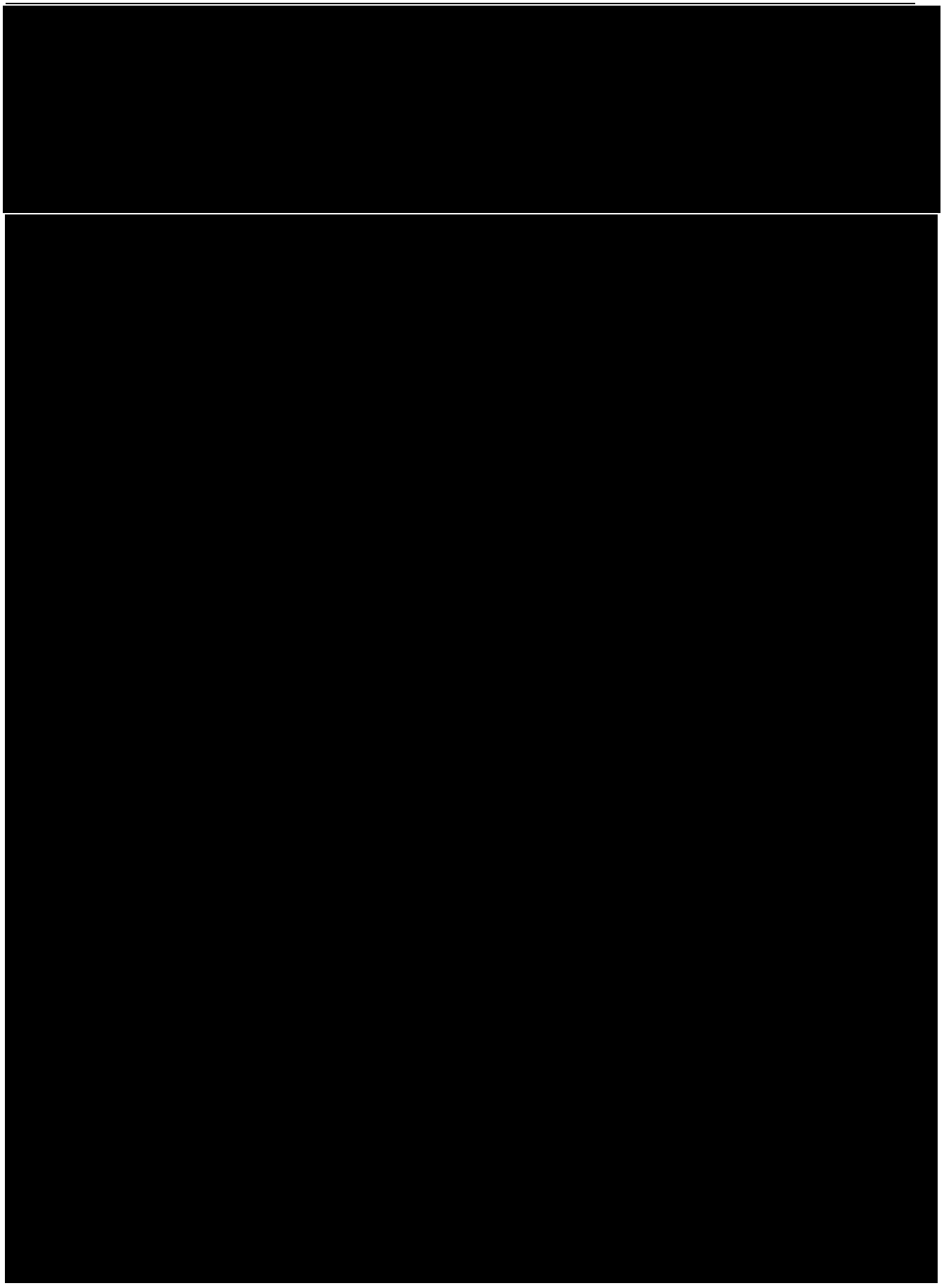

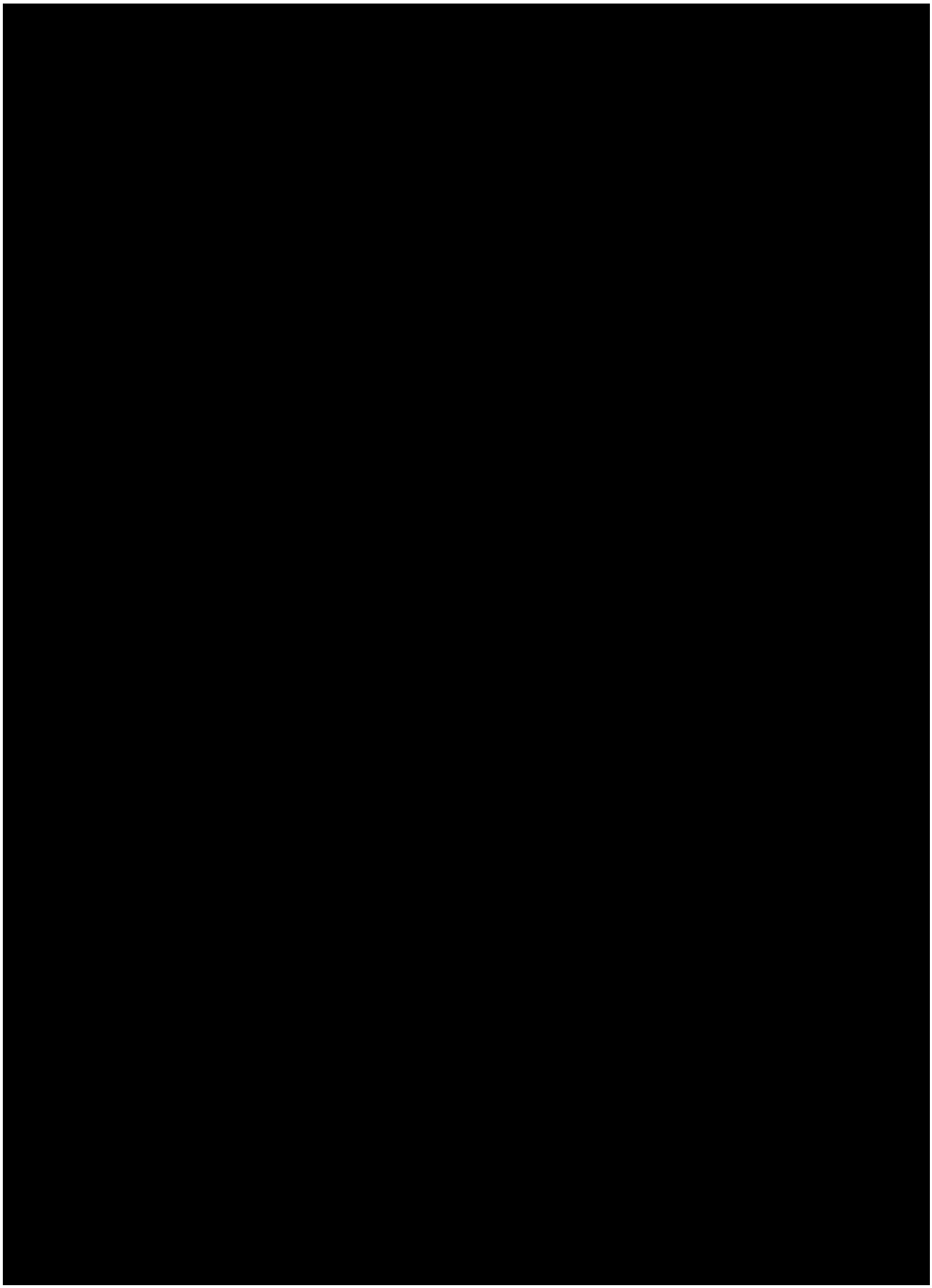

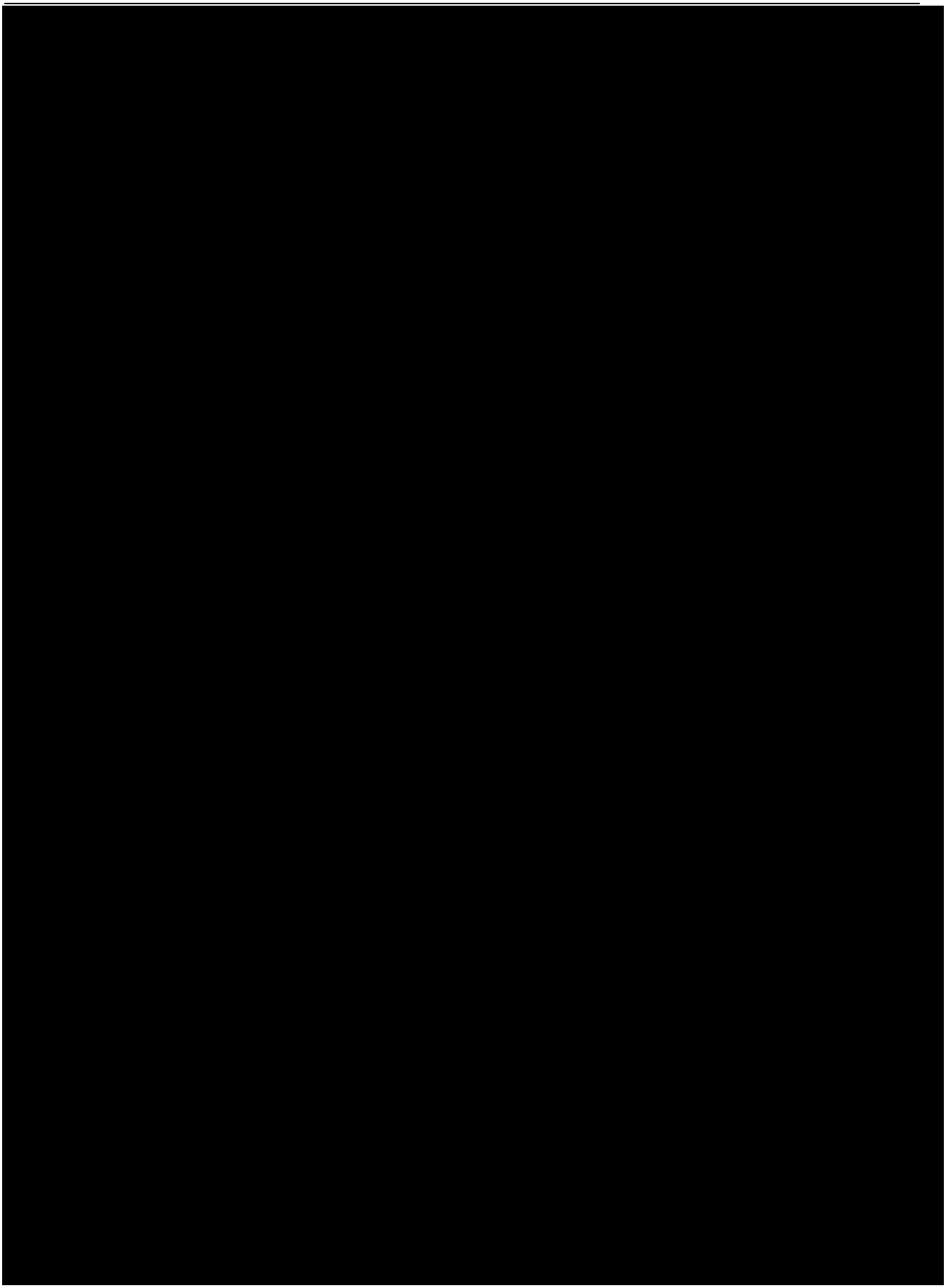

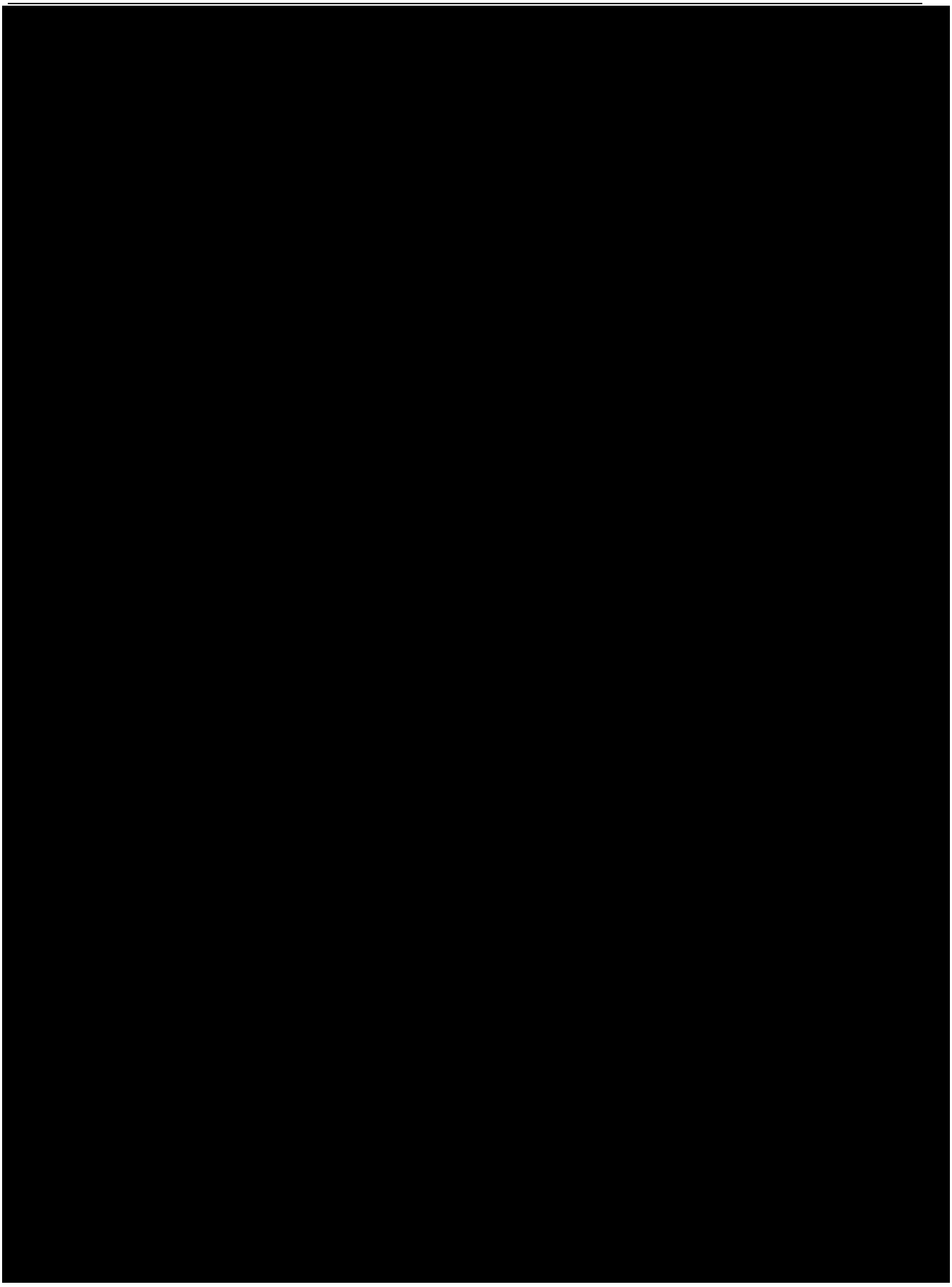

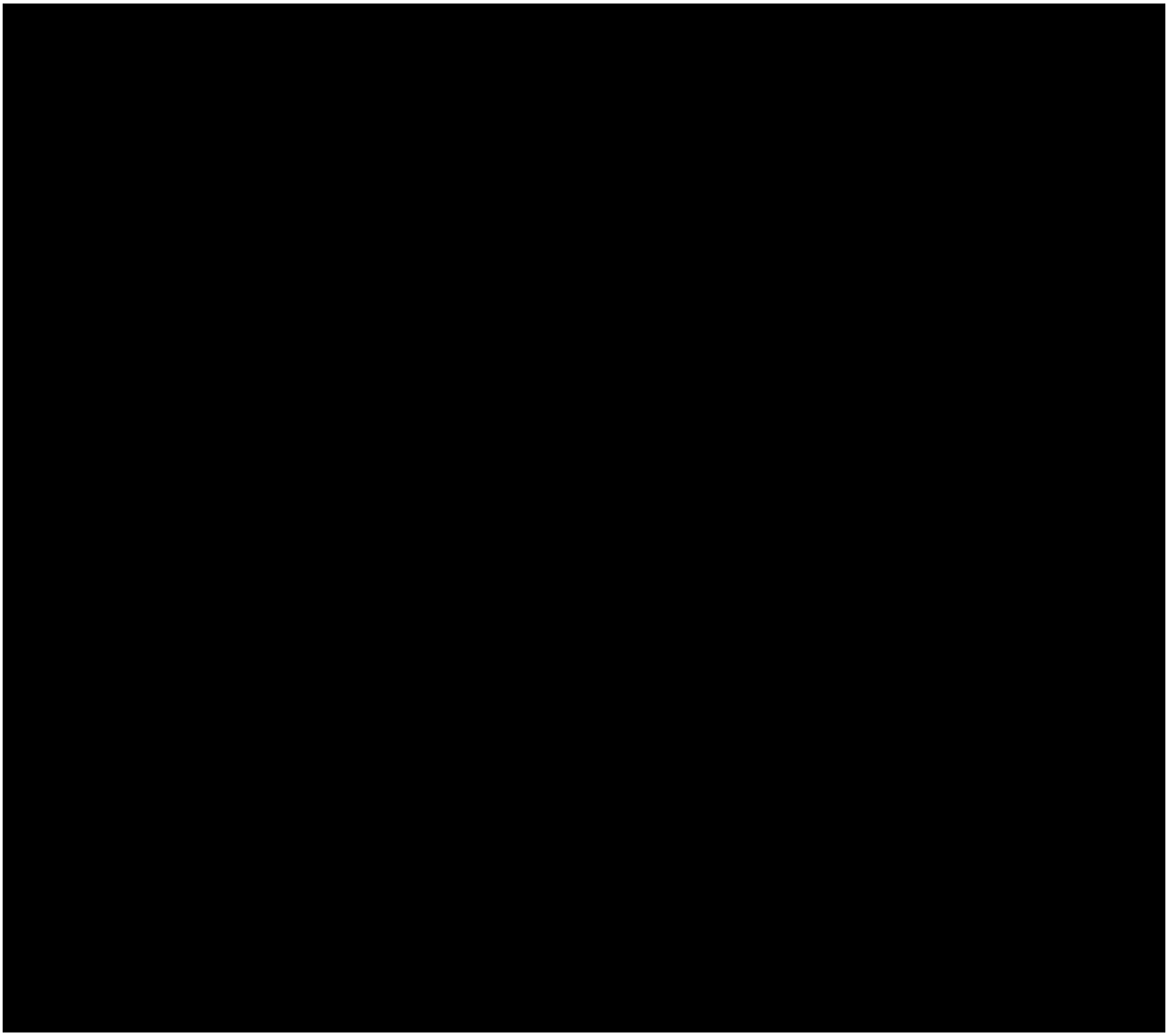

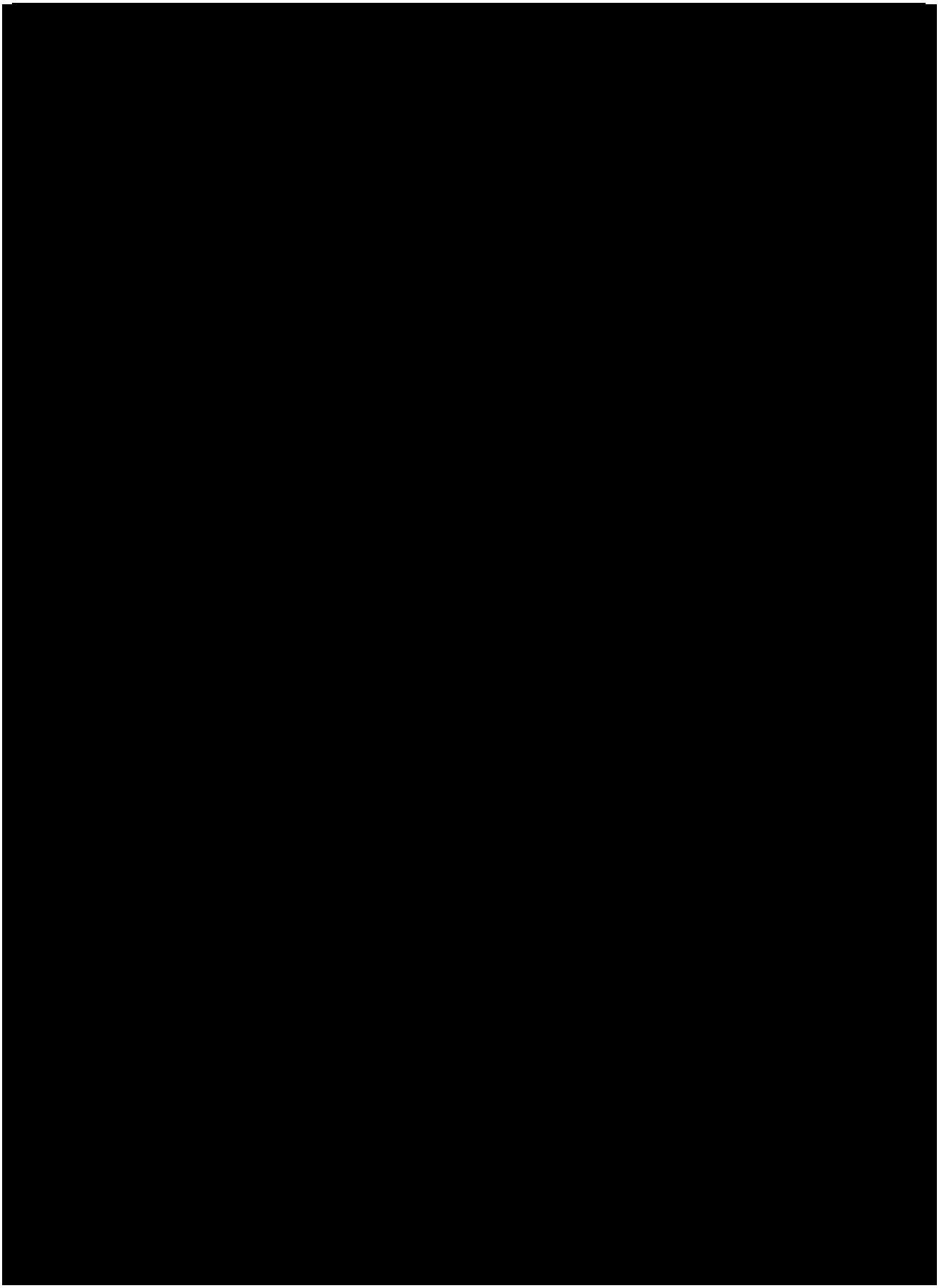

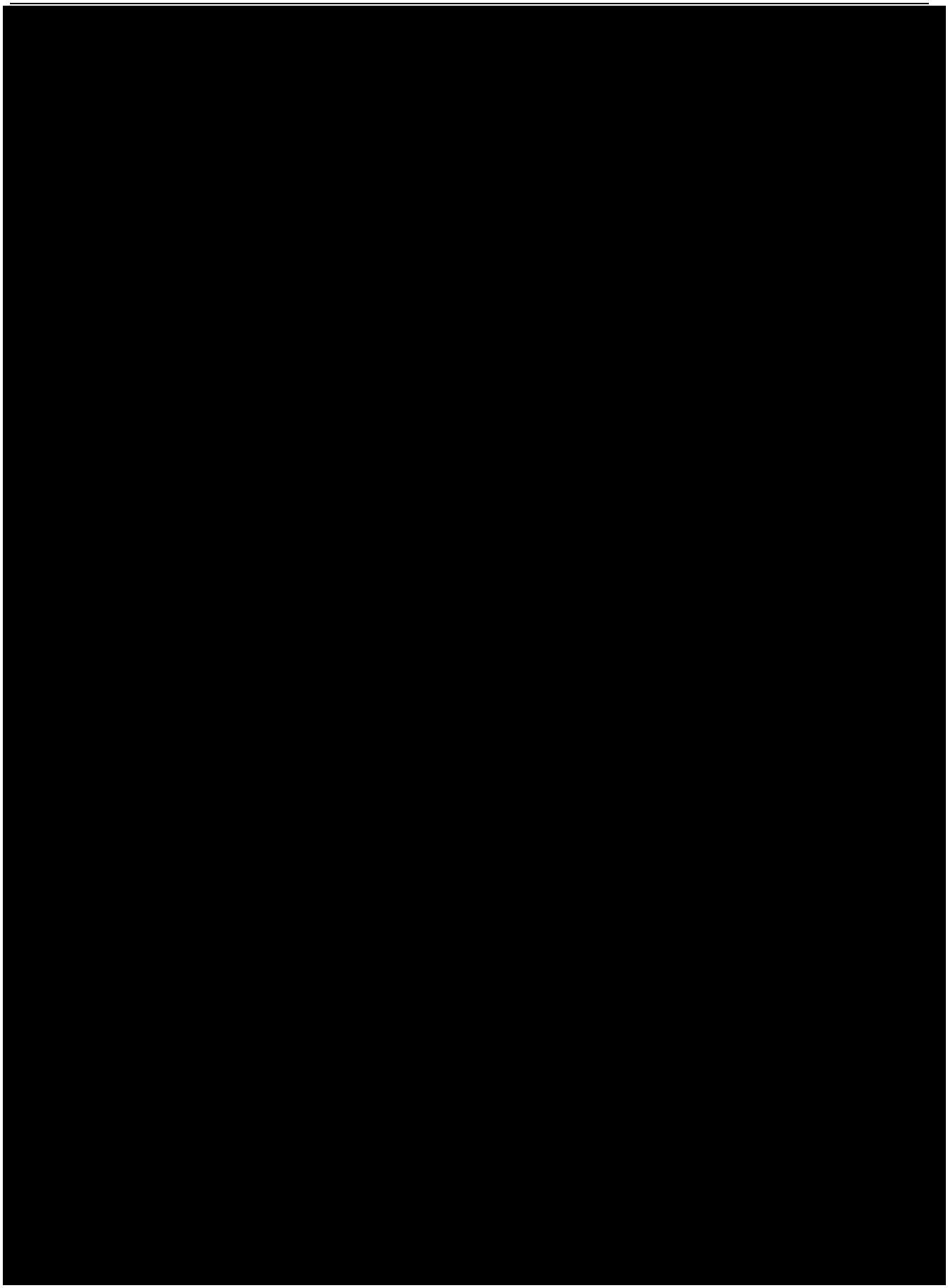

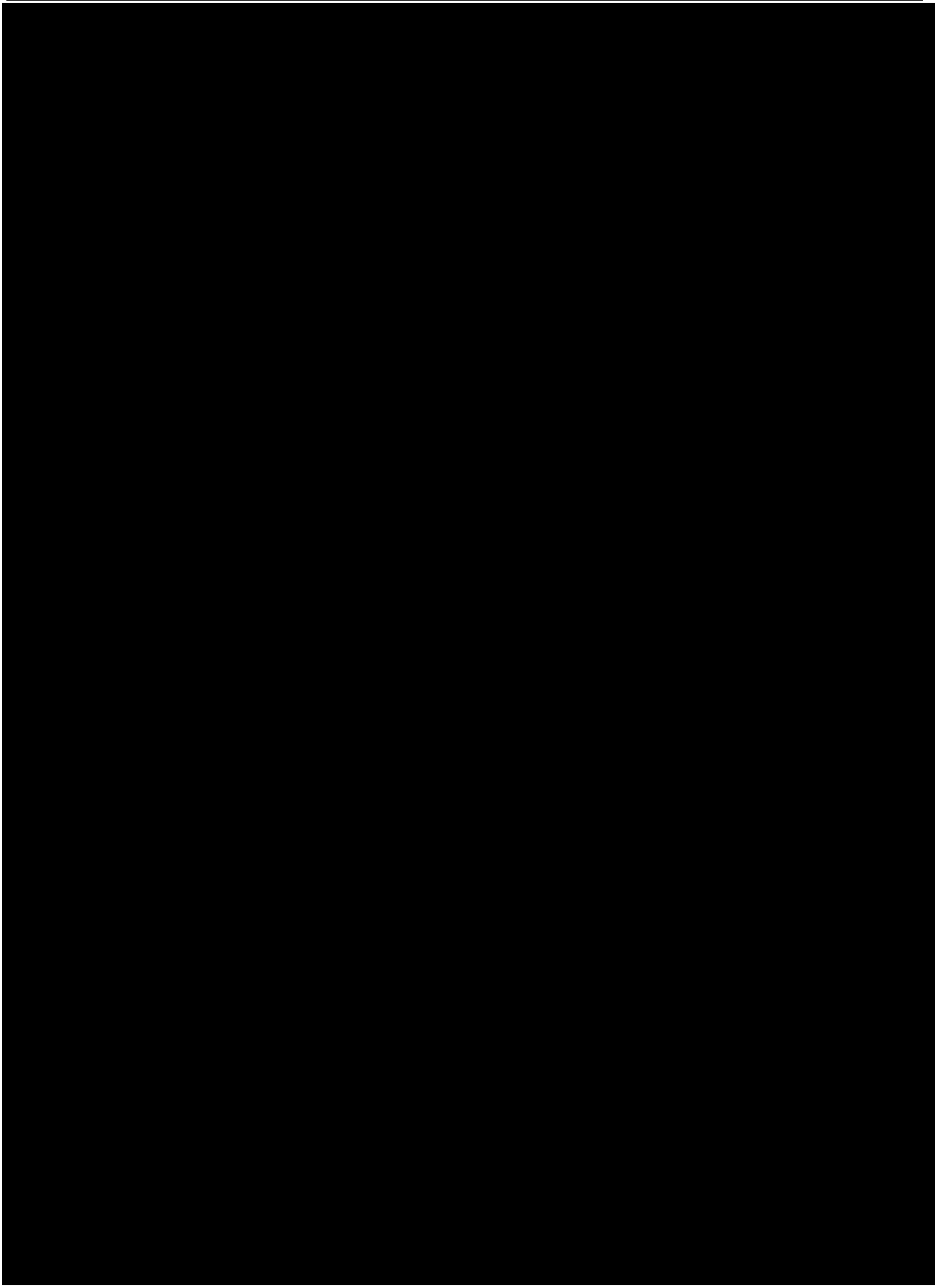

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7. RECOVERY

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8. COMMUNICATIONS

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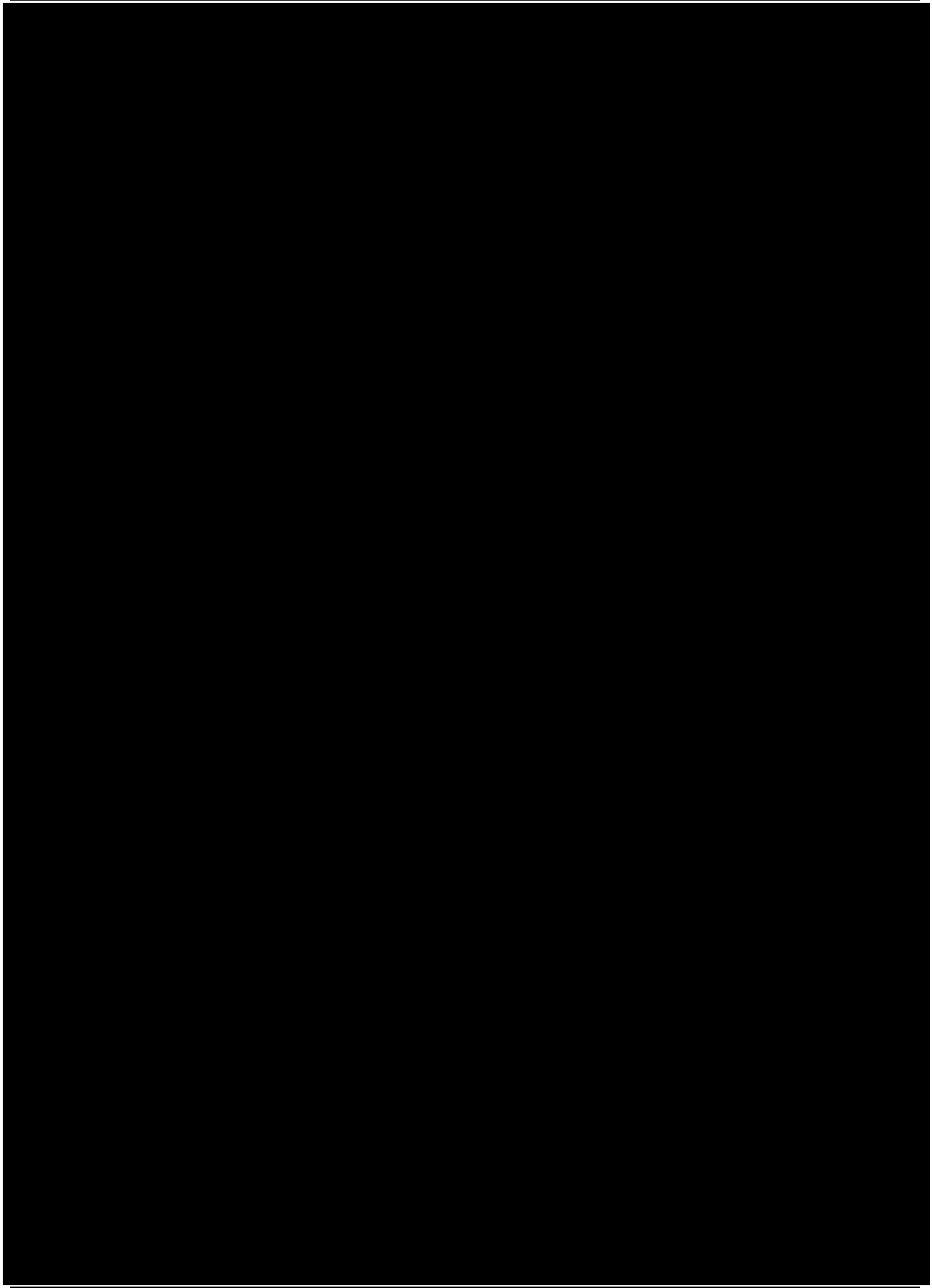
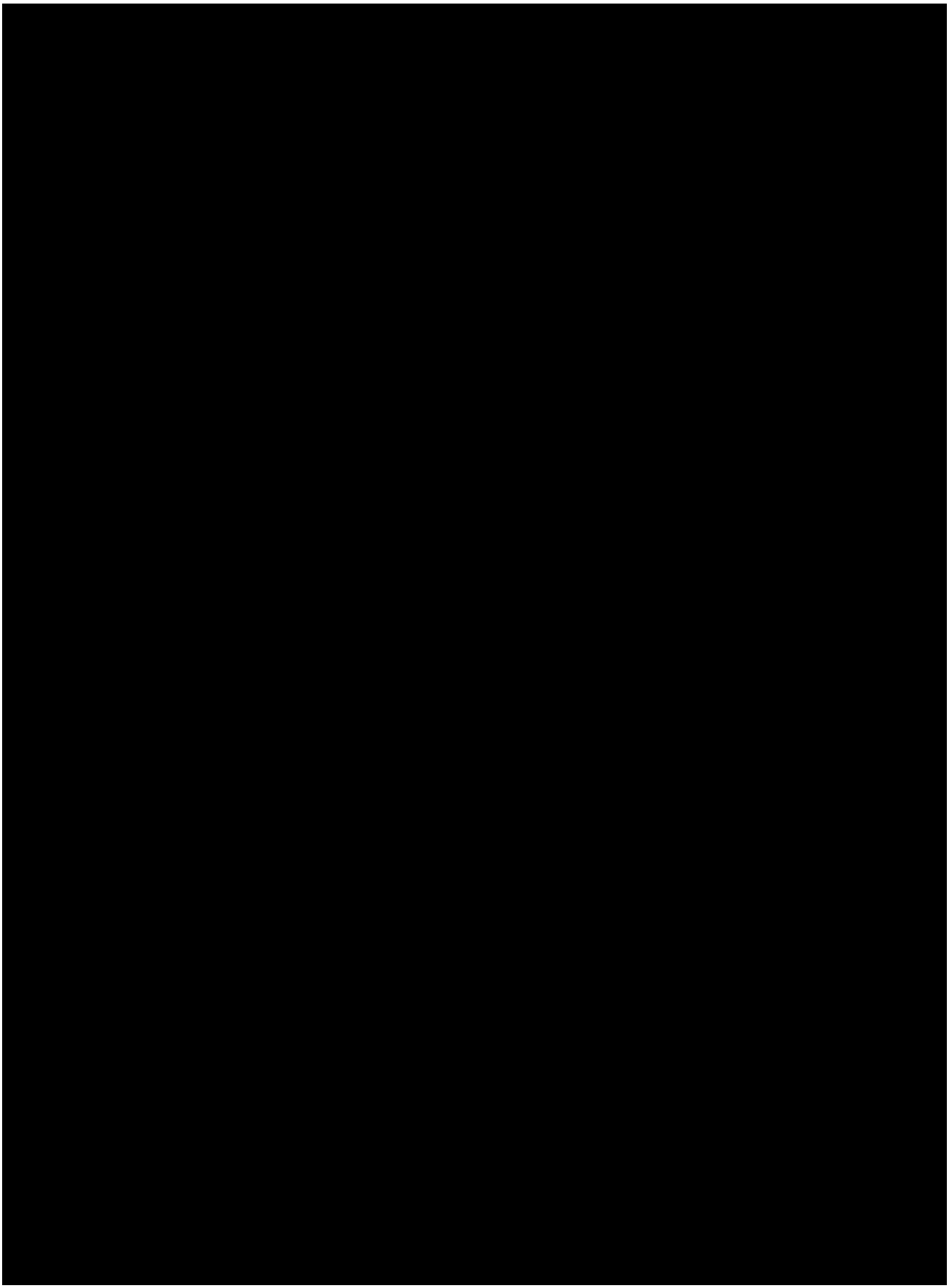
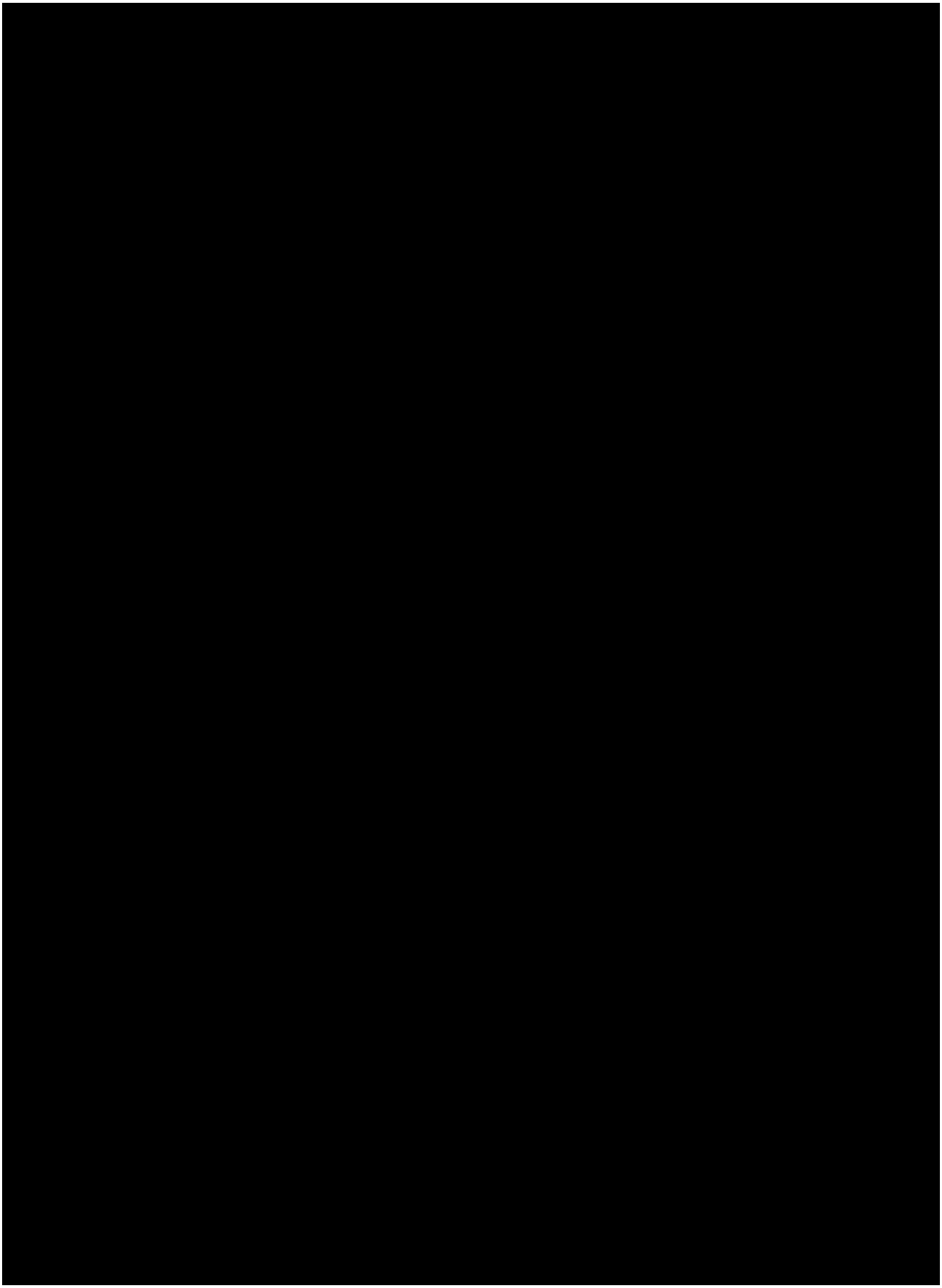
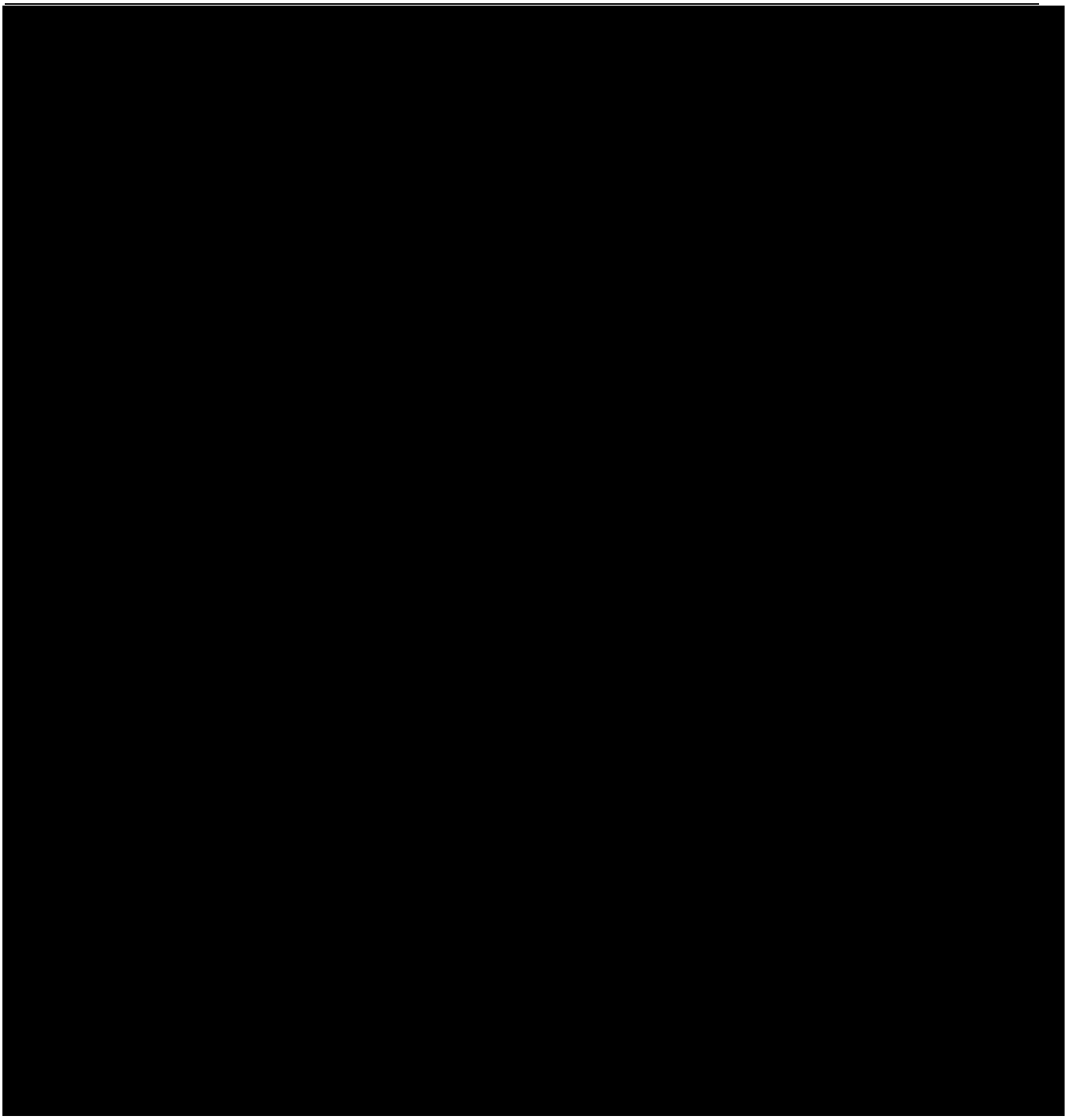


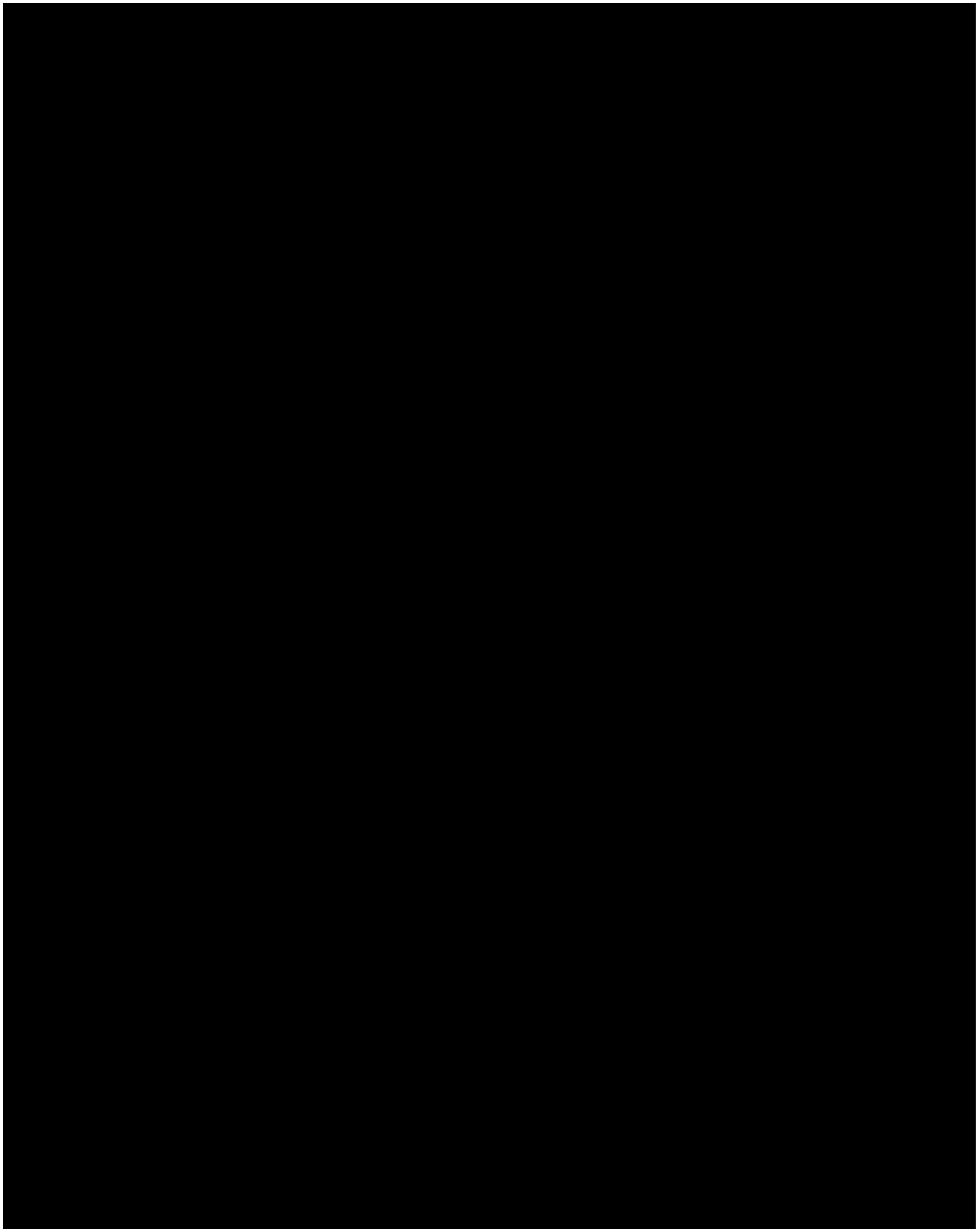


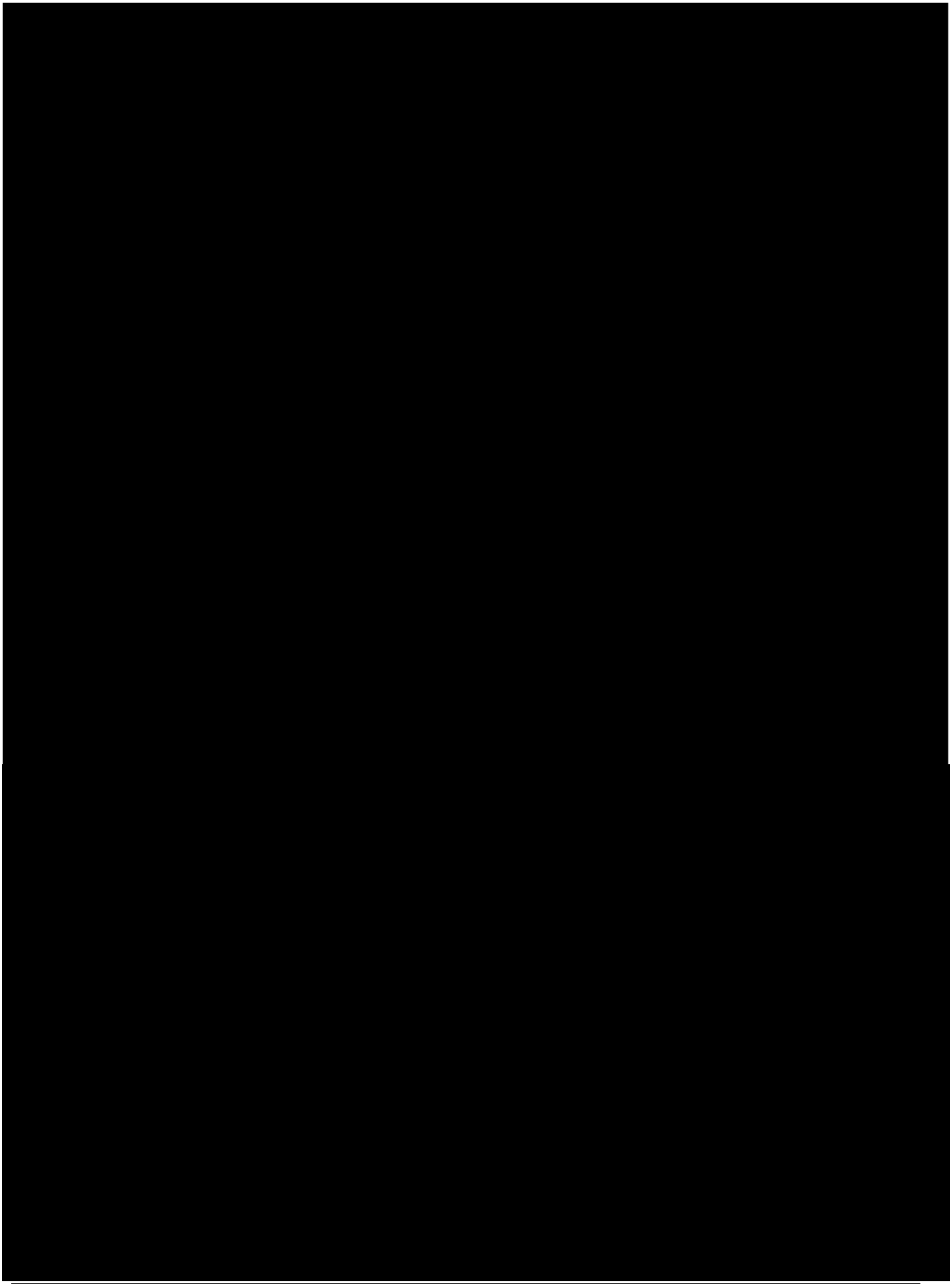




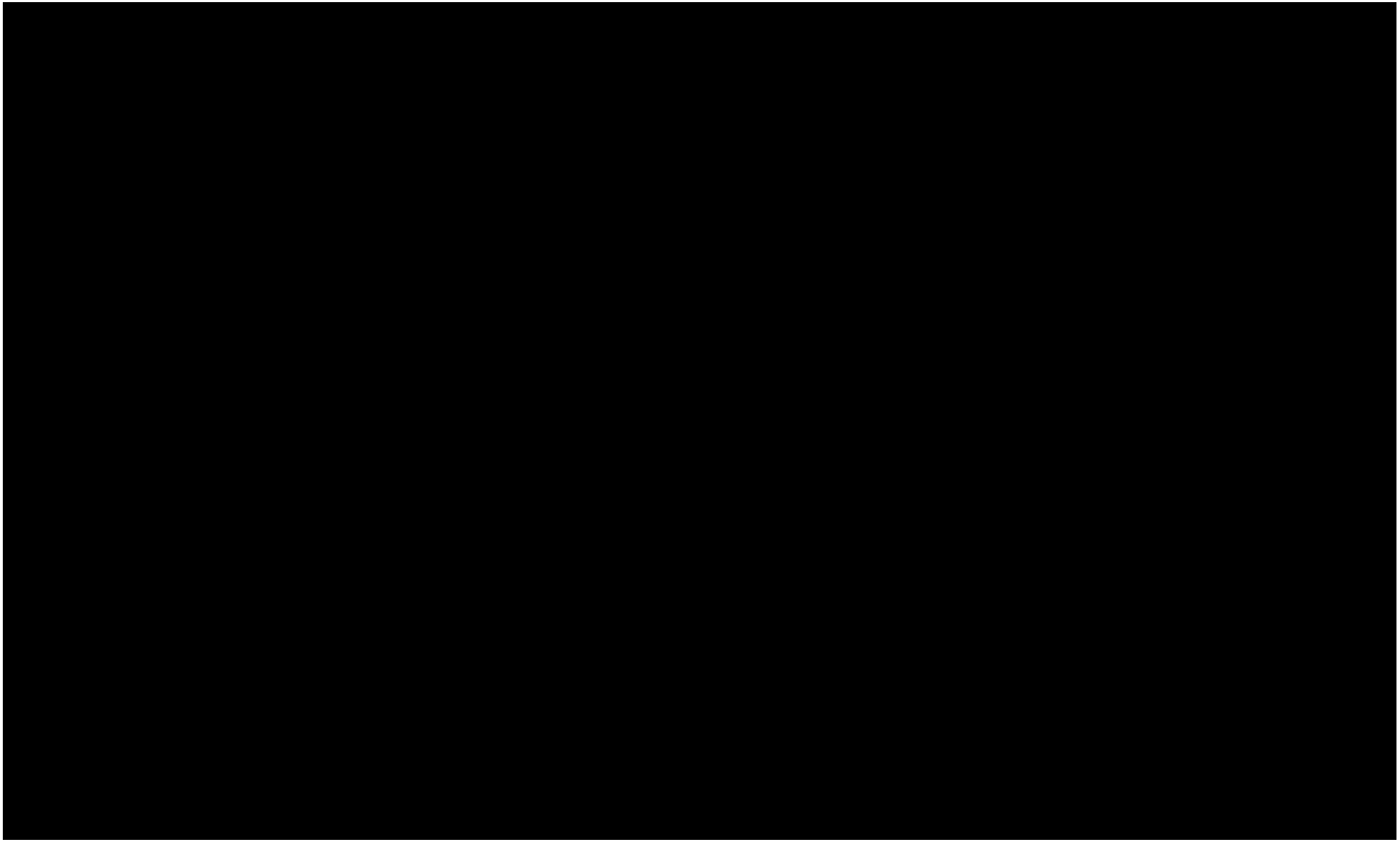
9. EMERGENCY EVENT REVIEW

10. TECHNOLOGY AND INTELLIGENCE

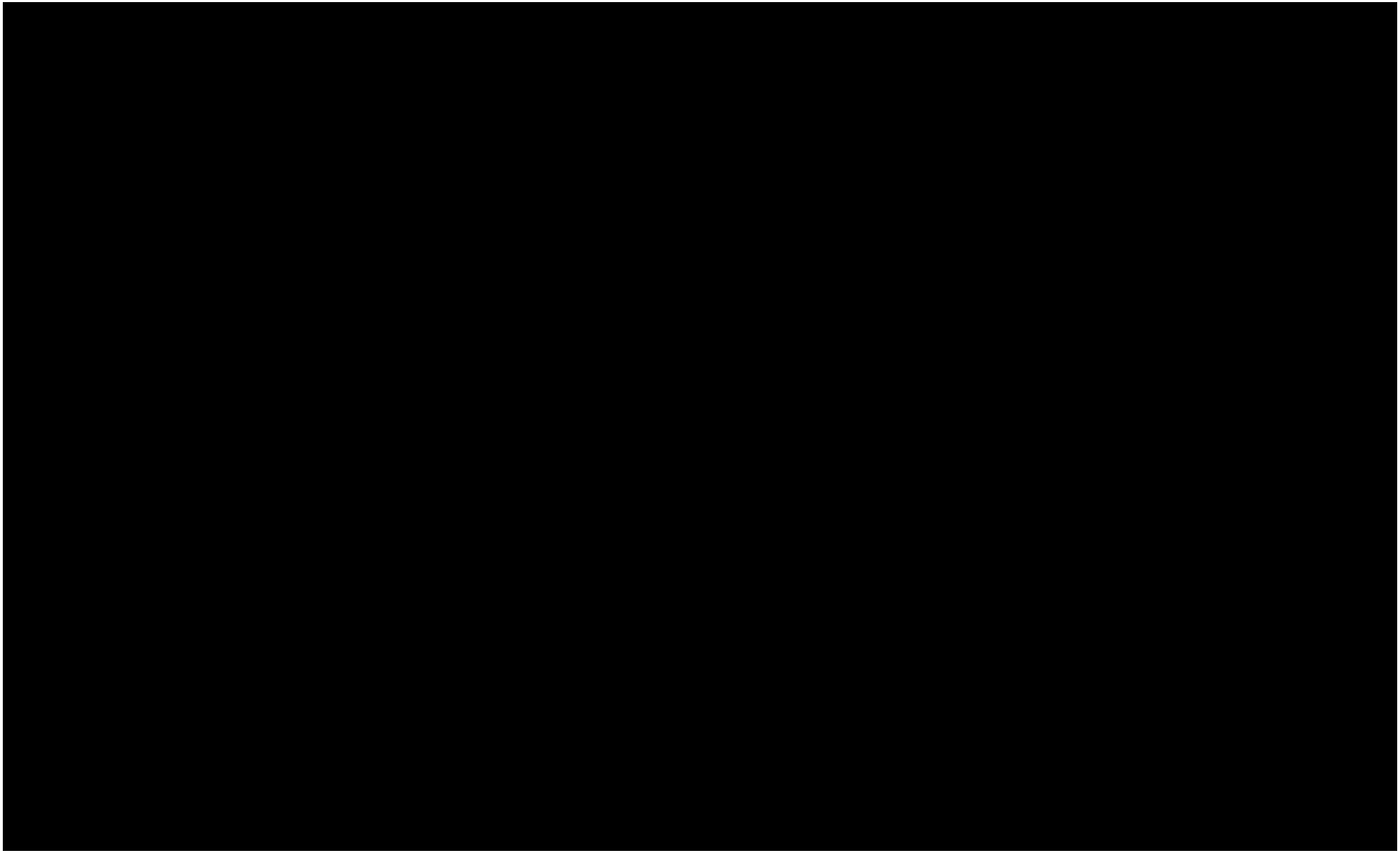




Appendix A: Operational Documents Guide



Appendix B: Emergency Management Team Contact List



Appendix C: Level 3 Emergency Framework Structure

Appendix D: Level 2 Emergency Response Structure

Level 2 Structure - South East Region

Appendix E: Emergency Management Team Role Statements

Emergency Event Role Statement

[redacted]

Emergency Event Role Statement

[redacted]

Emergency Event Role Statement

[redacted]

Emergency Event Role
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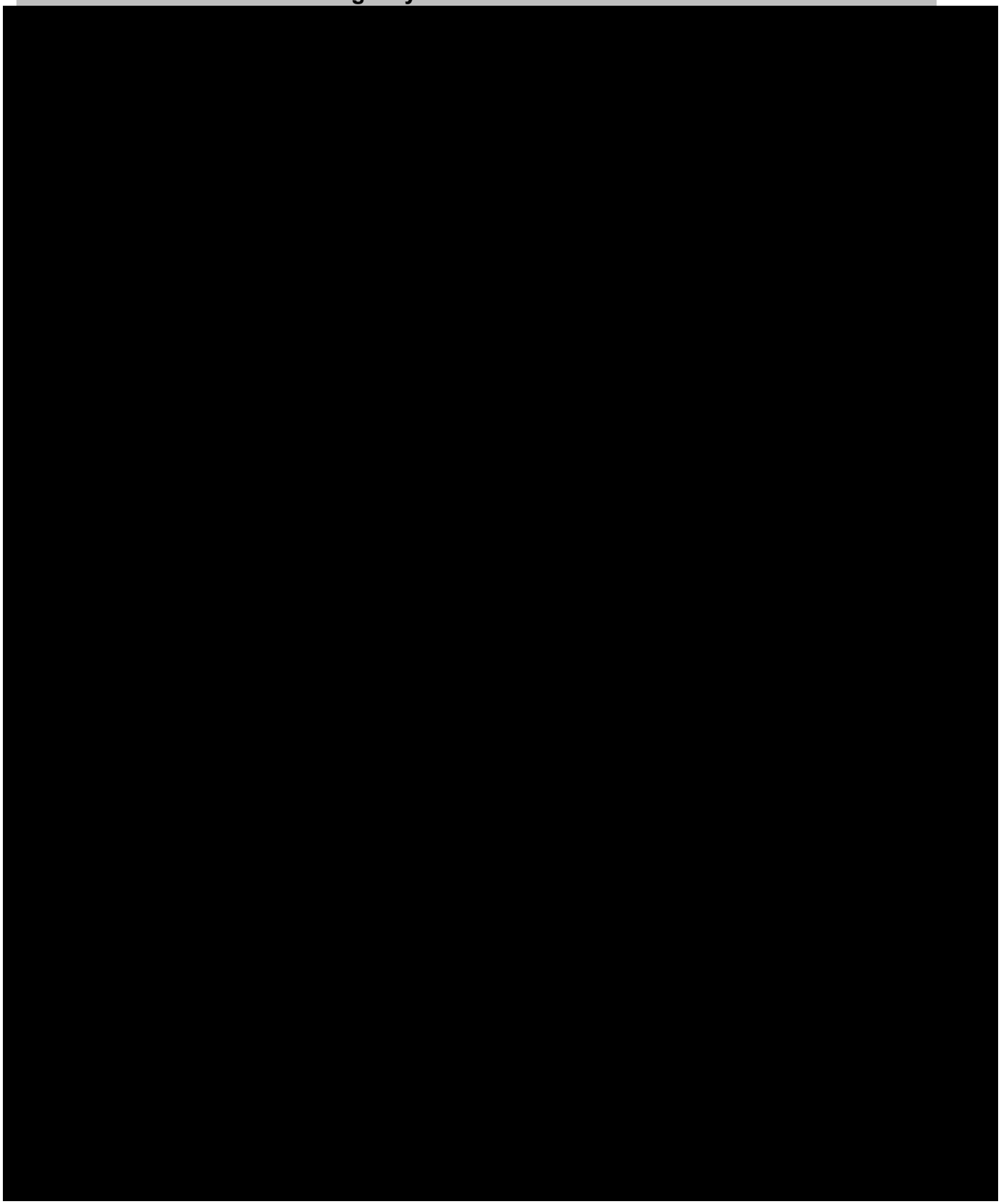
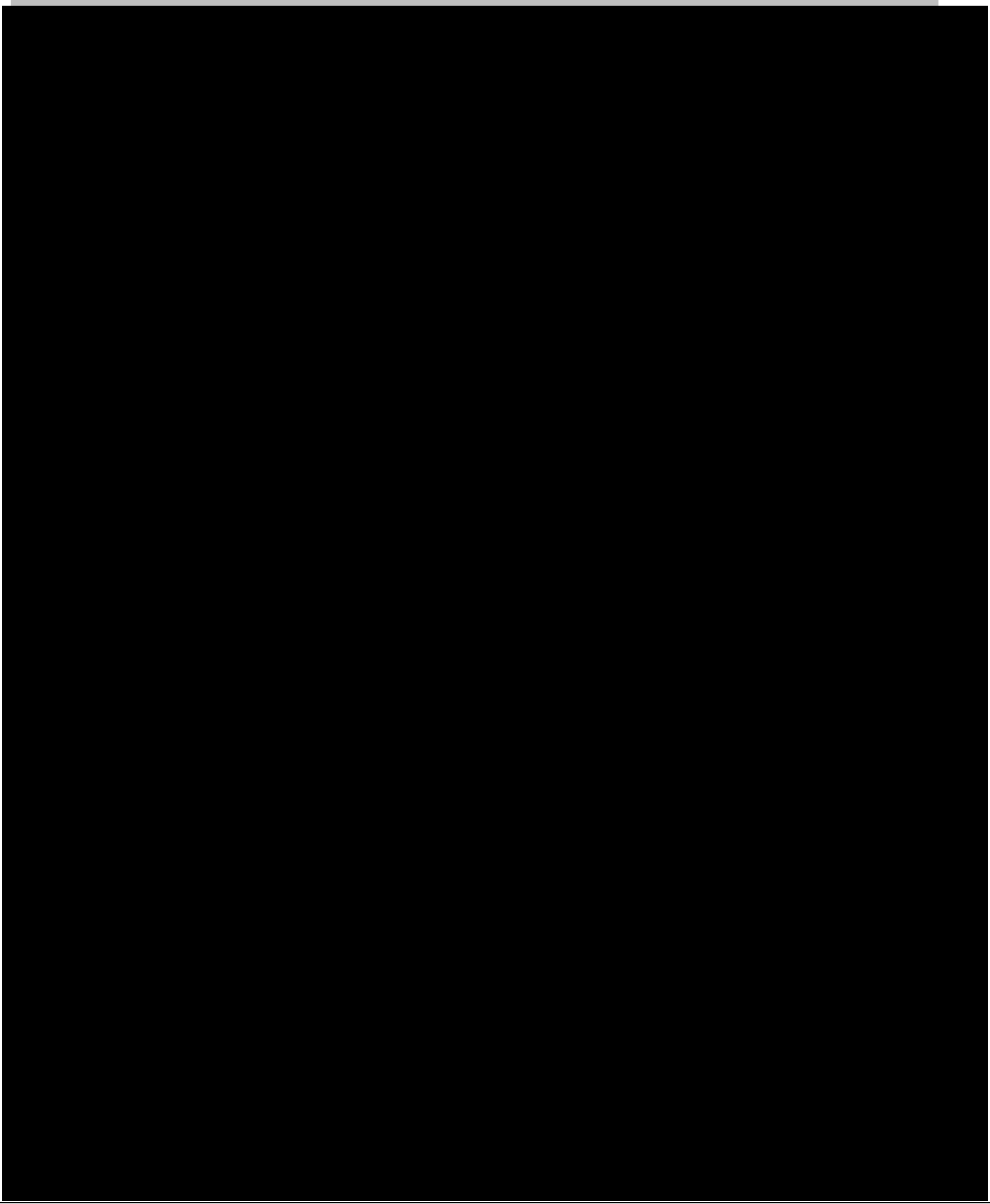
Emergency Event Role Statement



Emergency Event Role Statement



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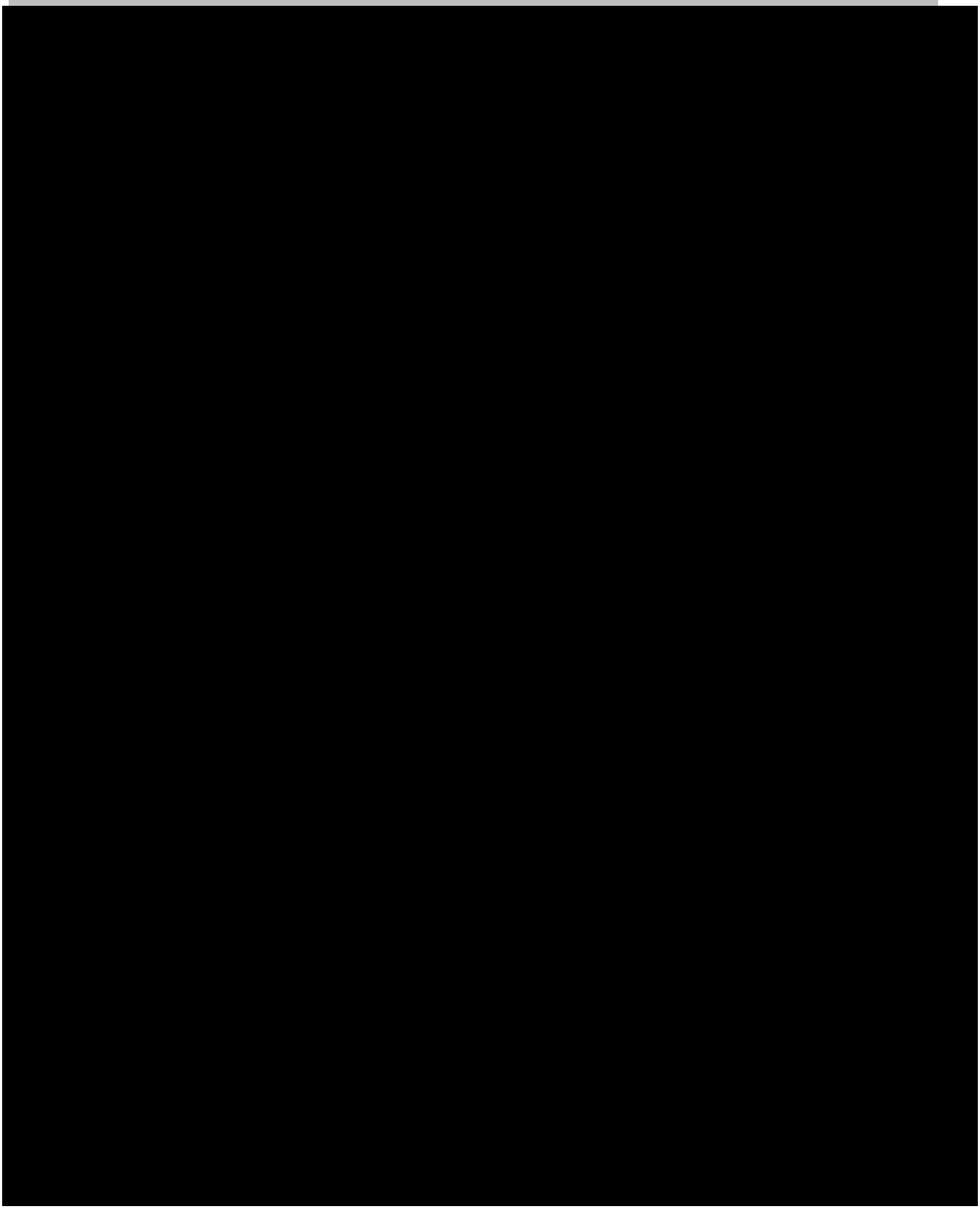

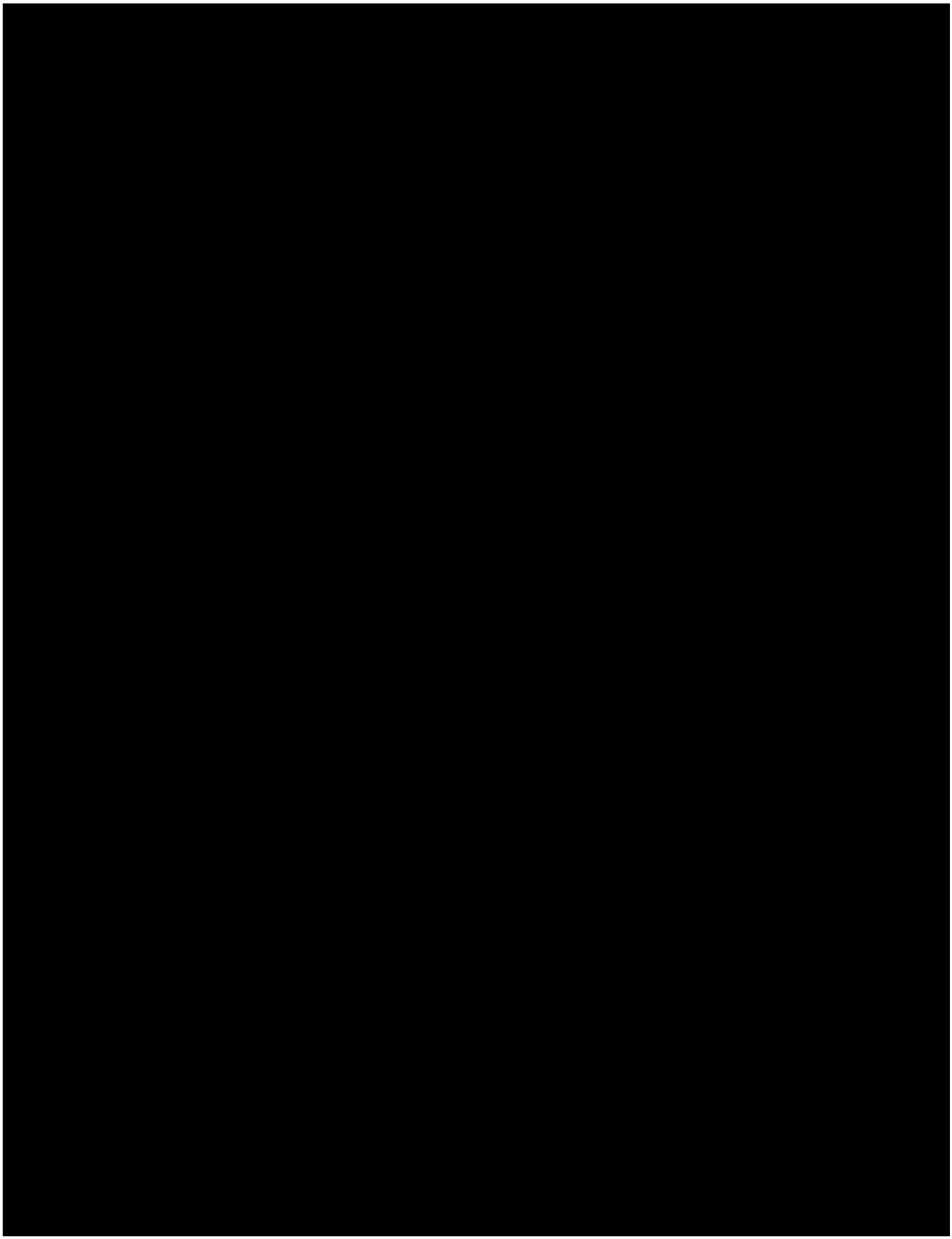

Emergency Event Role Statement
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Appendix F: Natural Hazards

Storms

EQL is exposed to and experiences storms of varying intensity across the state in all its depots and areas of responsibility.

While severe storms are predominantly seasonal, storms may occur at any time throughout the year. They can be unpredictable and occur with little warning to prepare.

The main exposure risk timeframe is the summer season commencing in October in Southeast Queensland and November in regional Queensland, through to March.

The exposure of overhead assets and poles and wires to these storms may result in

- clashing conductors,
- catastrophic failure due to lightning strike
- vegetation falling across wires, poles and/or assets
- inundation of lower lying areas and assets.

While there are established and maintained clearance zones to minimise vegetation impacts on assets, the risk of vegetation falling into clearance zones is still present.

The Bureau of Meteorology describes the following types of Thunderstorms and associated events all of which are experienced in Queensland and can impact on the electrical network and require emergency response activities to be implemented [2]:

Thunderstorms

These are described as storms that are likely to produce:

- large hail measuring more than 2cm in diameter
- wind speeds of more than 90 km an hour, and
- heavy rainfall conducive to flash flooding.

A severe storm warning will only be issued by the BOM for storms that are likely to produce all three elements.

Where the thunderstorm is more intense, the BOM describes it as a 'microburst' or 'an intense thunderstorm downdraught concentrated on a small area'.

Tornadoes

The BOM describes tornadoes as being at the 'weaker end of the scale in terms of a hazard, but even so, can leave a trail of damage to trees and buildings' and to EQL assets and infrastructure.

Pulse Storms

A pulse storm is also referred to single or multicell thunderstorm and has a brief lifecycle - typically under an hour.

Squall Lines

Squall lines are described as 'long lines of thunderstorm cells, sometimes several hundred kilometres in extent, that share common precipitation cores or cloud mass. Squall lines can last for hours or even days, with new storm cells continually forming along the leading edge of the line. They form in conditions with moist air near the ground and larger vertical wind shear, with the winds near the surface being very different from the winds higher up'.

Supercells

Supercells are among the most violent storms and can sometimes be accompanied by strong tornadoes and huge hail. Supercells are rarely found within tropical regions except in the vicinity of tropical lows and tropical cyclones which supply wind shear for the development of such storms.

Tropical Monsoon and East Coast Lows

Monsoonal weather is seasonal in the Far North, while also experienced further south to Townsville and inland areas.

East coast lows are intense low-pressure systems which occur on average several times each year off the eastern coast of Australia, in particular southern Queensland, New South Wales and eastern Victoria. East coast lows will often rapidly intensify overnight making them one of the more dangerous weather systems to affect the

[2] http://www.bom.gov.au/weather-services/severe-weather-knowledge-centre/tropicalsevere.shtml

south-east Australian coast.

These monsoonal troughs generally lead to flash flooding both localised and riverine and when combined with winds may also cause coastal erosion.

Storm Alerts and Warnings are provided for these through BOM.

[redacted]

Tropical Cyclone

EQL is exposed to tropical cyclones due to the extensive electricity network that is constructed as overhead poles and wires. In addition, the associated rainfall, storm surge and inundation also impact on the underground electricity network.

High winds, rain and flooding potentially causes damage to the electricity network including:

- destabilising poles and overhead wires
- damage from debris contacting the electricity network assets including vegetation and community infrastructure
- movement of assets foundation due to movement and flooding.

The cyclone season traditionally commences on 1 November through to 30 April each year[3].

Cyclones can be described as powerful weather systems that can cause significant damage to the built and natural environments. These develop from low pressure systems that develop over warm oceans in the tropics, and generally intensify over several days, generating severe winds, heavy rain and flooding. Cyclones produce very strong and potentially destructive winds that rotate clockwise around a calm centre (the 'eye')[4].

Tropical Cyclone Outlooks

EQL utilises the tropical cyclone outlooks provided by the BOM in October each year as the official prediction of the upcoming season.

During the season, three-day forecasts provided by the BOM are also utilised to assist in planning and monitoring.

Alerts and Warnings

When cyclones enter Australian waters, the BOM will issue a cyclone tracking map. Depending on the severity, direction it may also issue cyclone warnings and advice to ensure preparations can be made.

The BOM will issue information and technical bulletins, and warnings and alerts when a tropical cyclone is likely to cause winds in excess of 62 km/h (gale force) within 48 hours. The BOM will issue either of the following:

- A Tropical Cyclone Watch is issued for coastal communities when the onset of gales is expected within 48 hours, but not within 24 hours
- A Tropical Cyclone Warning is issued for coastal communities when the onset of gales is expected within 24 hours or are already occurring.

A Tropical Cyclone Advice will be issued every six hours, increasing to every three hours when cyclone warnings are required. In some circumstances, when a cyclone approaching the coast is under radar surveillance, the advices may be issued hourly.

[redacted]

Bushfire

The fire season in Queensland normally commences in the Gulf Country and Cape York Peninsula during July. It progresses south into the central inland and coastal areas during spring and south to the NSW border in early summer. The

[3] http://www.bom.gov.au/cyclone/tropical-cyclone-knowledge-centre/warnings/

[4] https://www.getready.qld.gov.au/understand-your-risk/types-natural-disasters/cyclone-and-storm-surge

season extends into February for the southern part and for south west Queensland.

These timeframes can vary significantly from year to year due to fuel availability and condition, long term climate conditions and variations on short-term weather conditions in each area. Dependant on seasonal predictions and local weather forecasts, QFS may declare a fire danger period or declare local fire ban or state of fire emergency.

Bushfires are an inherent part of the Queensland environment. The vastness of the land, community centres and the resulting electricity network increases the risk of potential impact to the network. Failure of components of an overhead electricity reticulation system may also present a potential source of ignition and combined with unfavourable environmental conditions may increase the risk of a bushfire.

The Queensland Bushfire Plan 2020 states that 'In future years, climate change is expected to result in more severe fire weather days, more intense fires and decreased opportunities to rely on fire conditions easing overnight in Queensland'[5] This is already evident during recent years with more intense fire conditions, longer seasons and risk exposure.

EQL is committed to best practice asset management strategies, and whilst ever evolving and changing, we will continue to adapt both strategically and operationally to ensure the safe and reliable operation of our network.

[redacted]

Bushfire Specific Mapping

Under the state planning policy, QFD identifies bushfire hazard areas or land that is likely to support a significant bushfire and could be subject to resulting damage.

[redacted]

Aside from the impact of bushfires, many areas of Queensland are subject to land management activities including the use of fire to reduce fuel load to mitigate the impact of significant bushfires, to manage primary production systems or to maintain or restore ecological process for conservation. QFS coordinates an annual bushfire mitigation period during which landholders, land management agencies and the Rural Fire Service (RFS) plan and conduct a range of prescribed burning activities across the state.

All bushfires and prescribed burning activities can potentially impact Ergon Energy Network and Energex assets.

[redacted]

[5] Queensland Bushfire Management Plan 2020

[redacted]

Bushfire Alerts and Warnings

QFR and RFS provide an automated email system to communicate the declaration of fire bans or fire weather warnings during high bushfire danger conditions. As part of the Bushfire Risk Management Plan, the Rural Fire Service in each region are contacted by key Energex and Ergon Energy Network operational employees to update contact details.

This contact list is updated annually prior to the commencement of the fire season to ensure that the appropriate people receive fire weather information in time to make any necessary operational arrangements or responses.

[redacted]

Restrictions on Field Activities

A communications advice will be distributed to Operational Managers during a High Fire Danger period, a Local Fire Ban or State of Fire Emergency declaration or to advise of any restrictions to process and practices that must be adopted during the gazetted fire danger period. The communications notice may also outline precautions to take while performing field work activities deemed to have high potential to start fires.

[redacted]

[redacted]

[redacted]

Small Engines and Hot Equipment

In areas where there is a high fire risk or there are work activities with potential to start fires with equipment such as generators, chainsaws, brush cutters, metal cutting or welding, precautions must be taken to isolate fuel from the possible ignition source.

The potential for “hot work” and other activities to ignite fires, particularly during a Local Fire Ban or State of Fire Emergency periods is to be considered in risk assessments conducted as part of a formal risk assessment.

During State of Fire Emergency declarations certain activities such as hot work and other activities may be prohibited or restricted. These restrictions will be listed in the declaration.

Copper Chrome Arsenate (CCA) Burnt Poles

Ergon Energy Network and Energex have processes that outline the requirement for inspection and management of fire damaged or burning copper chrome arsenate (CCA) burnt poles, based on the ENA guidelines.

[redacted]

[redacted]

Fire Safety and Awareness

Employees are not expected to participate in firefighting activities; however, an awareness of safety precautions is essential if responding to events. A Bushfire Awareness & Safety Presentation is delivered to field staff annually.

Heatwave

Queensland is exposed to varying climatic conditions including prolonged heat. As EQL has employees and assets across the state, heatwave is a major consideration in the summer months.

The State Heatwave Risk Assessment 2019, indicates that Queensland is projected to become increasingly hotter, with increases in mean daily maximum and mean overnight maximum temperatures. Parts of Queensland are also expected to become significantly drier.

Queensland health define a heatwave as 'any long period of very hot weather, usually ranging from 37°C to 42°C' [6].

Heatwaves are calculated using the forecast maximum and minimum temperatures over the upcoming three days and is compared to actual temperatures over the previous 30 days, and the 'normal' temperatures expected for the location at the time[7].

Heatwave conditions can have an impact on both employees and the electricity network.

For employees there is an increased risk of heat-related illnesses, in particular for field bases employees.

The impact on the electricity network can range from increased demand for electricity by customers due to the use of air conditioners and equipment and also the direct heat onto the network assets (e.g. wires sagging and some equipment overheating).

EQL has procedures in place to monitor and manage both its employees and the electricity network during heatwave conditions.

Preparing for Heatwave

The Bureau of Meteorology maintains a Heatwave Knowledge centre and during the summer season, the BOM activate a Heatwave Service to provide current assessments on heatwaves, including the lead up conditions and a detailed forecast with predictions. It also provides assessment maps with colour coding and text to advise of the different heatwave intensities.

Hot Weather Response Technical Committee

A Hot Weather Response Technical Committee is convened to discuss any warnings and advice from the BOM to gauge the potential impact on the electricity network and identify appropriate actions to implement proactively or in response to heatwave conditions.

The Hot Weather Response Technical Committee is chaired by Network Operations and has a membership which includes engineers, network managers, operations managers and communications staff. This committee is tasked with identifying and implementing suitable strategies to minimise thermal related damage to electrical infrastructure assets and enacting relevant actions to restore supply for instances where failure of network assets has occurred.

[redacted]

Heatwave Alerts and Warnings

Based on specialist weather advice relating to high temperature forecasts and correlation with pre-defined temperature limits, the hot weather technical committee is formed. A key outcome of the hot weather technical committee is the early and regular messaging to all staff, management and stakeholders.

As the temperatures achieve forecast levels, pre-defined escalation messages and actions are deployed following the established escalation model. Based on experience, the response to a single hot weather day is different to a sustained period of hot weather, and the Hot Weather Technical Committee has the flexibility to prepare and respond based on the forecasts and organisation policy.

Heat Stress Safety

[redacted] Consideration of heat in the planning of work can have a significant impact. In the long term, where possible, higher heat risk work can be scheduled in the cooler months and other controls such as scheduling increased crew numbers implemented. In the near real time upcoming weather forecasts can be used to modify or reschedule work such as change the time of day

6 https://www.qld.gov.au/emergency/dealing-disasters/disaster-types/heatwave

7 http://www.bom.gov.au/australia/heatwave/knowledge-centre/heatwave-service.shtml

the work is completed, schedule increased crew numbers and/or allow an increased window of time to facilitate self-pacing. [redacted] Better awareness of signs and symptoms of heat stress allow workers to better interpret early signs of heat strain in themselves and others. This combined with a work culture that understands heat stress and is accepting of individuals raising their hand when they are struggling in the heat can help prevent heat illness no matter when an individual may experience it. In the event of a serious heat illness having access to highly effective field-based cooling methods as part of the first aid response is imperative. EQL has rolled out Heat Stress Kits and deployed appropriate Field Workwear across the business to reduce the impacts of heat stress.

Flood – Riverine and Coastal

Many Queensland towns and cities are located within catchment areas, along major waterways and the east coast areas.

Queensland has many climatic zones across the state and as such experiences a range of storms, tropical lows and cyclones. The increase in rainfall and run off from these systems may have an immediate or delayed flood impact on population centres or electrical assets.

Flood Planning

Flood Planning data is collected to assist in the mitigation, planning and response to potential flood events. A consolidated mapping system utilising internal collated data relating to asset impact in previous events and externally sourced information from government organisations assists to improve our knowledge, planning and response activities.

Flood data is reviewed annually and details the approach and key activities to manage flood events and improve flood resilience to the network assets. This incorporates learnings from major flood events across Queensland which have the greatest impact on the electricity network and continuity of electricity supply to customers.

Flood Specific Mitigation

Planning and design consider potential installation of mitigation measures including permanent or temporary bunding, barriers around key substation equipment, sealing wall and floor penetrations in substation buildings to withstand a major flood event, raising ground pad mounted transformers on plinths or the relocation of critical substation assets above flood levels.

Mitigation works include HV and LV isolation points to assist in isolating impacted areas as flood waters rise or where rising flood waters breach regulated line clearances. Sufficient isolation points were created so the isolation areas were kept to a minimum. Regions have flood levels available in our geospatial systems to identify plant that needs to be de-energised at specific flood heights.

Isolation for Safety

In some circumstances, supply is required to be isolated to areas which are not inundated but flood waters impact neighbouring areas supplied by the same system. This has caused considerable concerns for these customers. For these areas, where feasible, alternate supplies have been constructed to maintain supply or as above more isolation points have been installed to reduce the outage footprint.

Liaison officers work with the Local and/or District Disaster Management Group to implement any proactive or reactive isolation required.

Flood Mapping

To identify major and moderate flood risk areas, we utilise information from a variety of sources in addition to our own network and asset data. These sources provide critical information to assist in planning, preparation and response activities in key areas.

Current flood modelling practices rely on the data and information collected from previous flood events to determine and develop Defined Flood Levels (DFLs). These DFL's and associated modelling then form the basis of town planning, emergency response and business continuity planning. The models are reviewed and DFL's revised based on the information available from subsequent events.

The information is essential and can be shared and utilised within the business to assist in the planning, preparation and subsequent response to events. It

is important to recognise that due to changing infrastructure and urban development, water courses, run off and drainage changes, the flow of water may also alter and affect previous data validity.

[redacted]

Flood data layers and plans have been recorded for major river systems across parts of Queensland and information from the regional councils assist to document local flood levels.

Storm surge and inundation information collected during flooding across Queensland depot areas is integrated into our network flood mapping and modelling. Information sources include:

- Localised experience
- Independent assessments
- Open source interactive mapping for use by the public from:
  - Local Councils
  - Queensland State Government agencies
  - Department of Natural Resources, Mines and Energy.

[redacted]

[redacted]

Earthquake

Queensland is fortunate to be positioned away from the edge of tectonic plates and seismic fault lines and has not had any major earthquakes in recent years.

It has experienced minor earthquakes and tremors recording 10 earthquakes in the past 5 years[8] although none of these have resulted in any significant property or infrastructure damage.

The Australian government utilises Geoscience Australia to display and detail any previous and recent earthquakes.
https://earthquakes.ga.gov.au/

Earthquakes can trigger secondary events such as landslides, tsunamis and fires caused by downed power lines and ruptured gas mains.

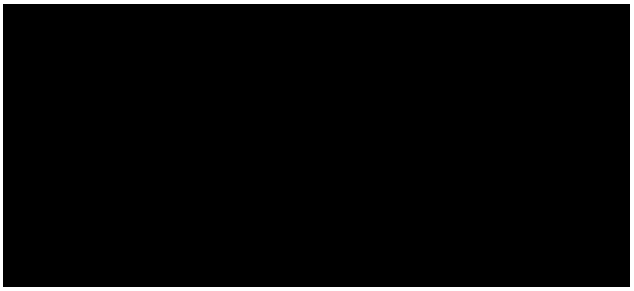
In addition, direct damage to the electricity network from the earth's movement may include but not limited to:

- damaged wire conductors due to clashing due to pole movement
- fallen powerlines due from disturbed foundations
- twisted/snapped power poles (metal and wood)
- ruptured underground electricity cables
- damage to electricity substations – e.g. buildings and equipment structures or

[8] https://earthquaketrack.com/p/australia/queensland/recent

foundations and fixed electrical switching equipment.

Where required and the impact is significant to either employee's safety, EQL property and facilities or the electricity network, the emergency management framework will be utilised to coordinate a larger emergency response.



Further information can be found in the State Earthquake Risk Assessment:

https://www.disaster.qld.gov.au/qermf/Documents/QFES-State-Earthquake-Risk-Assessment.pdf

https://www.disaster.qld.gov.au/qermf/Documents/QFES-State-Earthquake-Risk-Assessment-Executive-Summary.pdf

Tsunami

The threat of tsunami may have a direct impact on the Ergon Energy Network and/or Energex electricity network due to our location along coastal areas. Similar to coastal flood inundation, flood mapping and inundation data mapping is available to assist in any response to a tsunami threat.

The safety of our employees is the priority and providing advice to move to a safe place is a higher priority over assets and equipment.

Tsunami Alerts and Warnings

The Joint Australian Tsunami Warning Centre (JATWC operated by the Bureau of Meteorology and Geoscience Australia) monitors and provides warnings for Tsunami threats with the following escalation levels:

- No Threat
- Watch
- Marine Warning
- Land Warning
- Cancellation.

http://www.bom.gov.au/tsunami/

The JATWC provides warnings through announcements on local radio and TV. Other information on warnings is available through **1300 TSUNAMI (1300 878 6264)** for latest warning information.

Where there is a risk to electrical assets and time permits, EQL may de-energise and isolate its assets for safety. Automatic safety protections devices are also installed on the network.

The Queensland Tsunami Notification Guidelines (Guidelines) were developed by Emergency Management Queensland, Department of Community Safety, in accordance with the Disaster Management Act 2003 and these provide the guidance for EQL mitigation and response.

According to a recent tsunami modelling study by Queensland Government's Department of Environment and Science, the following regions having been identified as having the highest tsunami hazard risk (in descending order)[9]:

- Gold Coast
- Ocean side of Bribie, Moreton and Stradbroke islands
- Sunshine Coast
- Fraser Island
- Bundaberg
- Flying Fish Point
- Capricorn Coast
- Agnes Water
- Hervey Bay.

Further information can be found in the Tsunami Guide for Queensland.

https://www.disaster.qld.gov.au/qermf/Documents/Tsunami-Guide-For-Queensland.pdf

Landslide

A subsequent hazard for EQL is landslide. Landslide may occur as a secondary hazard from either storms, cyclones, earthquakes, flooding or infrastructure failure such as water mains. The damage is therefore normally more isolated to the

[9] https://www.getready.qld.gov.au/understand-your-risk/types-natural-disasters/tsunami

landslide area rather than widespread damage.

The Ergon Energy Network and Energex network traverses' hills and mountains, follows escarpments and also follows low areas along rivers and creeks, roads, drainage systems and beach fronts.

Landslides and the movement of the earth may impact both overhead and underground assets.

The Queensland Government defines a landslide as the movement of large amounts of earth, rock, sand or mud, or any combination of these. Landslides can be sudden and fast moving, moving millions of tonnes of debris[10]. It also lists the major type of landslides as:

- **Rockfall** - typical settings where rockfalls may occur include cliffs in coastal zones, mountain sides, gorges, road cuttings or quarry faces.
- **Deep-seated landslide** - deep-seated landslides typically occur in steep terrain.
- **Debris flow** - debris flows can originate on slopes in the range of approximately 16 to 40 degrees, where loose rock and soil materials are subjected to high intensity rainfalls. Where water content is high, debris flows can travel at rapid velocities with considerable destructive potential. Houses and other structures may be situated on or near the source area or run-out path of such features.
- **Shallow landslide** - shallow landslides occur in areas with a shallow layer of weak material and are often triggered by brief episodes of intense rainfall. They tend to occur on the edge of embankments and on steep natural slopes of 30 degrees or more. The infrastructure most commonly affected is roads and railway lines, although shallow landslides occasionally damage houses and other private property. Numerous shallow landslides occur during the wet season.

Pandemic

EQL has developed a Pandemic, Epidemic or Outbreak Event Plan for the management of an actual or potential pandemic or epidemic event, or outbreak of a communicable disease that impacts EQL employees. The plan includes actions and activities for incident, emergency and business continuity management and response.

The purpose of the plan is to outline the strategic and tactical arrangements, activities and actions required when managing an actual or potential pandemic or epidemic event, or outbreak of a communicable disease that impacts EQL.

It can be used for the management of any contagious disease that has caused (or the potential to) harm to EQL employees and/or our ability to continue our critical business function. For the purpose of this plan the term 'pandemic' will be used generically to describe the event. Where required, the individual event types will be referred to in context e.g. pandemic, epidemic or outbreak of communicable disease.

The objectives of this plan are to:

- Provide a practical, scalable and risk - based approach to the management of a pandemic event
- Establishment of command, control and coordination arrangements
- Clarify roles and responsibilities of EQL, including relationships with State and National arrangements
- Describe the context within which the Australian and State Governments and EQL will function during an event
- Describe the mechanisms through which a pandemic, epidemic or communicable disease incident of national interest (CDNI) is declared, how this plan will be escalated and stood down
- Describe the preparedness and response measures that may be taken by EQL and/or State and National Departments in anticipation of or during an event.

Space Weather

Space Weather relates to changes that may occur between Earth and the Sun in the space

[10] https://www.getready.qld.gov.au/understand-your-risk/types-natural-disasters/landslide

environment. Natural occurrences and changes in the Sun cause solar anomalies generating solar winds that are directed towards the earth. The earth's atmosphere in many cases deflects these solar winds, however if significant enough the release of magnetic energy from the Sun (solar Flare) may causes changes in the earth's atmospheric conditions. This burst of magnetic energy may affect the various technological systems.

The Ergon Energy Network and Energex electricity networks are vulnerable to geomagnetic storms which can occur at any time.

Space Weather Alerts and Warnings

The Bureau of Meteorology provide space weather forecasts and warnings for HF Radio, satellite and geophysical operations.
http://www.sws.bom.gov.au/

Appendix G: Quick Response Guides

1. Natural Hazards

Urgent notifications
• Establish liaison with State Disaster Coordination Group / Emergency Services, as required • Review impact / inundation mapping / fire maps / heatwave maps • Urgently advise employees in risk areas / relevant Area Managers • Evacuate/lockdown locations as needed • Advise control centres • Advise CE, CMT and relevant business units as needed • Consider emergency level - event level (1,2, or 3) and establish EMT • Initiate Alert to issue (broadcast radio message/ SMS / FFA) • Deliver safety brief / information as needed • Initiate Major event reporting
Employees / contractor considerations
• Monitor staffing in all locations and arrange for further support as required and as resources allow • Assess the impact / damage to operating sites and offices • Deploy employees to key installations (e.g. unmanned depots, warehouses) as required • Take reasonably practicable steps to ensure safety of field employees and contractors, including reinforcing safe working requirements • Check on safety and welfare of employees
Operational considerations
• Determine impact on customer and network • Assess the potential disruptions to supply • Review checklists and considerations for the specific event type • Review policies for specific event type – eg flood de-energisation, heat illness. • Confirm impact mapping (actual or potential) to determine • Assess the extent of any damage, outages, and any potential failure points • Assess means of dealing with outages and disruptions to restore supply • Liaise with Emergency Services (storm) or State Disaster Management Group (disaster) on requirements and operational constraints • Assess overall priorities for repair and restoration • Assess time, costs, requirements for repair and restoration • Assess difficulties in repair or restoration caused by the storm / disaster • Monitor crews – take reasonably practicable steps to ensure they are regularly rested and/or rotated during prolonged operations • Monitor EMT - take reasonably practicable steps to ensure they are regularly rested and/or rotated during prolonged operations • Provide support resources and equipment as directed • Liaise with State and Local Disaster Management and District Disaster Groups, and Queensland Fire and Emergency Service as is necessary. • Resource and liaise with the Control Room. • Ensure safety information is communicated to employees in impact area (eg evacuation of areas, lockdown, heat related issues) • Ensure communication lines are in place between EMT, Corporate Communications, Network Operations, and depots.

- Communicate with Network Operations on the state of the network belonging to the impact area.
- Consider positioning generators to pre-determined connection points, including fuel and associated logistics such as security services
- Consider sourcing additional staffing from other regions to assist with response or fatigue rotation (incl staging areas)
- Ensure all items on Flood Operational Plans are being carried out and the resources are available to deal with the threat of flood.
- Arrange external resources such as contractors, helicopters, boats etc.
- Monitor river heights using data from BOM and forecast future resource requirements.
- Arrange for vehicles and equipment to be positioned to suit anticipated river levels.
- Consider street patrols to identify areas of disconnection if energised circuits are within required clearances to flood waters.
- In conjunction with the EMT, Restoration Planner, Network Operations and Customer and Market Operations, ensure that premises are isolated in a timely manner before water reaches wiring or switchboards.
- In conjunction with the EMT, Restoration Planner, Network Operations and Customer and Market Operations, arrange for disconnects and reconnects and removal of meters.
- Review Flood Operational Plans for impact and switching areas.
- Review Heatwave maps, EQL Heat index
- Monitor river heights using data from BOM and forecast future resource requirements.
- Arrange for vehicles and equipment to be positioned to suit flood levels.
- If possible, in conjunction with Network Operations and Customer and Market Operations, ensure that premises are isolated in a timely manner before water reaches wiring or switchboards.
- If possible, in conjunction with Network Operations and Customer and Market Operations, arrange for disconnects and reconnects and removal of meters.
- Consider street patrols to identify areas of disconnection if energised circuits are within required clearances to flood waters.

Corporate considerations

- Assess any direct media interest in business and mobilise to meet that interest where appropriate
- Assess any potential issues which could damage corporate image
- Assess the costs of repair / restoration / compensation / clean up
- Assess probable impact on cash flows, revenues, and profitability
- Assess potential insurance implications and claims
- Assess possible litigation against the Company; directly or indirectly
- Monitor records and confirm that accurate record keeping is occurring and that personnel are following established processes that trap records. This includes switching sheet items times; FFA jobs are being accepted and closed correctly by field employees, etc.

2. Major Quality/Loss of Supply (Damage / LOR 3 / UFLS)

Urgent notifications
• Arrange for notification of affected parties (e.g. due to voltage dips) and high-level liaison as required • Arrange for responsible officers to be notified as appropriate • Advise CE, CMT and relevant business units as needed • Consider escalation of emergency level - Level (1,2, or 3) and establish EMT • Initiate liaison with Treasury, DNRME and other departments as required • Initiate Major event reporting • Establish contact with Powerlink for any load related actions (eg Lack of Reserve [LOR 3], load shedding)
Public considerations
• Consider threat to public safety (if any) and treat as a top priority
Employees / contractor considerations
• Monitor staffing in key locations (e.g. control room) and arrange for further support as required and as resources allow • Take reasonably practicable steps to ensure safety of field employees and contractors, including reinforcing safe working requirements • Provide updated information to all employees regarding the emergency as appropriate
Operational considerations
• Determine impact on customer and network • Assess the potential disruptions to supply • Identify cause of supply problems • Review checklists for specific event type • Review policies for specific event type – eg LOR processes, UFLS • Assess need for public warnings to be issued and by whom • Assess means of restoring supply to within specifications • Assess the impact on operating sites and other operators • Liaise with regulators and other participants on best course of action • Review Load Schedules • Assess time, costs, requirements for repair and restoration • Review and minimise impact on customers if there is a concurrent weather emergency
Corporate considerations
• Assess media interest and mobilise resources to satisfy that interest where appropriate • Assess the community reaction; locally, regionally, and nationally • Assess any potential damage to corporate image • Assess impact to market share and potential for consumer backlash • Assess the costs of repair / restoration / compensation / clean up • Assess probable impact on cash flows, revenues, and profitability • Assess potential insurance implications and claims • Assess possible litigation against the Company; directly or indirectly • Assess any liabilities on Directors, officers and/or employees • Review Retail impacts
Regulatory considerations
• Assess any breaches of licence conditions or potential charges or fines • Assess any potential impact on future regulatory conditions

3. Major Network Emergencies - Other

Urgent notifications
• Arrange for notification of affected participants and high-level liaison as required • Arrange for responsible officers to be notified as appropriate • Advise CE, CMT and relevant business units as needed • Initiate liaison with Treasury, DNRME and other departments as required • Initiate Major event reporting • Establish liaison with State Disaster Coordination Group / Emergency Services, as required • Consider emergency level - event level (1,2, or 3) and establish EMT • Confirm Lead roles based on event type – eg Asset Failure (engineering), Cyber/Systems (Digital), Pandemic (HSE), Facilities (Services) • Initiate Alert to issue (broadcast radio message/ SMS / FFA)
Employees / contractor considerations
• Monitor staffing in key locations (e.g. control room, Customer Operations) and arrange for further support as required and as resources allow • Take reasonably practicable steps to ensure safety of field employees and contractors, including reinforcing safe working requirements • Provide updated information to all employees regarding the emergency as appropriate • Consider fatigue impacts
Operational considerations
• Determine impact on customer and network • Assess the potential disruptions to supply • Identify cause of supply problems • Review checklists for specific event type • Review policies for specific event type – eg cyber, pandemic • Assess the extent of any outages and further potential disruptions to supply • Assess means of dealing with outages and disruptions • Assess the impact on Network operating sites and other industry participants, life support, major customers • Assess time, costs, requirements for repair and restoration • Liaise with AEMO and other participants on best course of action to restore supply
Corporate considerations
• Assess media interest and mobilise resources to satisfy that interest where appropriate • Assess the community reaction; locally, regionally, and nationally • Assess any potential damage to corporate image • Assess impact on key customers and potential for consumer backlash • Assess the costs of repair / restoration / compensation / clean up • Assess probable impact on cash flows, revenues, and profitability • Assess potential insurance implications and claims • Assess possible litigation against the Company; directly or indirectly • Assess any liabilities on Directors, officers and/or employee
Regulatory considerations
• Assess any breaches of licence conditions or potential charges or fines • Assess any potential impact on future regulatory conditions

Appendix H: DEFINITIONS, ABBREVIATIONS AND ACRONYMS

AIIMS	Australasian Inter-Service Incident Management System. AIIMS is based on the principles of management by objectives, functional management, and span of control. It is a nationally recognised system of incident management for the nation's fire and emergency service agencies.
AM	Area Manager – Field Leadership role responsible for geographical areas within Northern, Southern & South East regions
Assessment	Survey of a real or potential disaster, to estimate actual or expected damages, and to recommend prevention, preparedness, and response measures.
BAU	Business As Usual – resources and effort are focused on the planned and budgeted work required to operate and maintain electricity infrastructure, its operational functions, and capabilities.
Damage Assessment	Field activity whereby crews visually inspect network and record defects needing rectification.
DDMG	District Disaster Management Group
Disaster	A disaster is a serious disruption in a community, caused by the impact of an event, that requires a significant coordinated response by the State and other entities to help the community recover from the disruption (*definition: Disaster Management Act 2003, Section 13*). NOTE: a disaster can only be declared by a Disaster District or the State Government with the specific approval of the responsible Minister.
Disaster Management	Disaster management means arrangements about managing the potential adverse effects of an event, including, for example, arrangements for mitigating, preventing, preparing for, responding to, and recovering from a disaster (*definition: Disaster Management Act 2003*.
Disruption Events	Events that disrupt the normal functions of businesses, the economy and/or communities and include those that are man-made (e.g. terrorist attack, bomb threat) and natural (e.g. storm, cyclone, fire, flood, network or non-network asset failure, influenza pandemic).
Division	A Division is a geographical area under the control of one Division Coordinator in the response and recovery effort following a disruptive event. A Division might be a relatively small geographic area if the event has resulted in significant asset damage or it might be a large geographic area if the damage is lesser but more widespread. The determination of Division and boundaries will be made by the Emergency Manager and will consider the employees required to recover assets and services. A Division may have multiple Sectors to allocate the restoration activities to field crews (See Sector).
Emergency	A sudden and unexpected event that disrupts the normal operating functions, capabilities, resource and/or people of the organisation and requires an immediate response to prevent escalation of its scale or severity. For example, but not restricted to: • Localised electricity network damage, or potential damage, due to fire, flood, storm, or accident etc.

- Loss of operating facilities and/ or resources.
- Loss of ICT operating systems.

EMT	Emergency Management Team
ESP	Emergency Support Plan - gives guidance to how business units will provide support for the restoration of capabilities
FFA	Field Force Automation – handheld devices used by field crews for the receipt of tasks and completion of work/forms and access to reference materials
Flooding-Major	In addition to the criteria for moderate flooding, extensive rural areas and/or urban areas are inundated. Properties and towns are likely to be isolated and major traffic routes likely to be closed. Evacuation of people from flood affected areas may be required
Flooding-Minor	Causes inconvenience. Low-lying areas next to watercourses are inundated which may require the removal of stock and equipment. Minor roads may be closed, and low-level bridges submerged.
Flooding-Moderate	In addition to the criteria for minor flooding, the evacuation of some houses may be required. Main traffic routes may be covered. The area of inundation is substantial in rural areas requiring the removal of stock.
Flooding-Q100	Refers to a flood level or peak that has a one in a hundred, or 1%, chance of being equaled or exceeded in any year (also referred to as annual exceedance probability)
GeoConOps	ESRI based application giving situational awareness for restoration planning, Damage assessment packaging and a current state Dashboard
Hazard	An event, object or scenario that has the potential to cause harm to people and/or cause damage to property or assets.
LDMG	Local Disaster Management Group
Level 1 Event	Events are routine incidents that are managed as part of normal business operations and are not managed through emergency, crisis, or business continuity management arrangements.
Level 2 Event	These events are the first level of non-routine events. They are more complex either in size, resources, or risk; and are events that are beyond the capability of normal business operations and require specific command and control arrangements. E.g. Impacts to EQL's normal operations may be substantial but may be relatively foreseeable and contained.
Level 3 Event	These events are the most significant. They require substantial effort and resources across different regions / areas of EQL and have the potential to substantially disrupt business operations or significantly harm EQL's reputation. These emergencies require specific command and control arrangements and resourcing to a much greater degree than a level 2 event.
LiDAR	Light Detection and Ranging, is a remote sensing method that uses light in the form of a pulsed laser to measure ranges.
MATES	Mates is an automated employees call out system to efficiently call in employees in

	response to a Level 2 Emergency Event in the South East
NOMAD	Mobile substation capable of injecting high voltage to large areas of the network.
ODIN	Outage Disaster Initiation on Network - The ODIN is a disaster response tracking and management automation system to facilitate logistical management of resources during and after the deployments of employees in response to a disaster event.
OCC	Operations Control Centre – Located in Brisbane, Rockhampton, and Townsville
Pegasus	Mobile generator capable of injecting high voltage into a select area of the network
PowerOn	The network monitoring system (NMS) /database
Resources	Includes employees, any vehicle, vessel, aircraft, plant, apparatus, implement, earthmoving, construction or other equipment of any kind or any means of supplying want or need.
Restoration plan	Prioritised feeder section plan to restore the network
Risk	Potential impact on objectives (either losses or opportunities) due to a particular event, hazard, or scenario. Risk is the product of likelihood and consequence.
SDCC	State Disaster Coordination Centre
SDMG	State Disaster Management Group
Sector	A Sector is an allocated area within a Division. This may be assigned to a specific field crew to perform restoration activities. Eg a Distribution feeder, feeder section or a Substation.
Significant Incident	Any occurrence affecting an EQL response and the community – including severe injury or loss of life involving EQL employees or the public, loss or damage affecting EQL or community property, and related matters involving EQL which are likely to attract media or public response.
Summer Preparedness Working Party	A group established to outwork a detailed action plan to prepare the business for the Summer Storm Season. Includes representation from across EQL.

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