

Miller Field Cultural Resources Investigations

ARPA Permit No. 2021.GATE.02

Investigations on Miller Field – Gateway National Recreation Area, Staten Island, NY – in Connection with the South Shore of Staten Island Coastal Storm Risk Management Project

Contract No. W912DS18D0007
Order No. W912DS21F0017

August 10, 2022

Prepared for:

U.S. Army Corps of Engineers – New York District



**US Army Corps
of Engineers®**

Prepared by:

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First Environment, Inc.**

REPORT ON INVESTIGATIONS AT MILLER FIELD
GATEWAY NATIONAL RECREATION AREA
STATEN ISLAND, NY
IN CONNECTION WITH THE
SOUTH SHORE OF STATEN ISLAND COASTAL STORM RISK
MANAGEMENT PROJECT



Shovel testing in progress near Hangar 38 and the Elm Tree Light, facing southeast (Image 0083: March 1, 2022).

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Under Contract to: U.S. Army Corps of Engineers
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August 10, 2022

Report Certification

The archeological report *Miller Field Cultural Resources Investigations in Connection with the South Shore of Staten Island Coastal Storm Risk Management Project* has been reviewed against the criteria contained in 43 CFR Part 7.18(a)(1) and upon recommendation of the Park Archeologist has been classified as "Available (deletions)."

**JENNIFER
NERSESIAN**

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Superintendent

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Classification Key Words:

"Available" - Making the report available to the public meets the criteria of 43 CFR 7.18 (a)(1).

"Available (deletions)" - Making the report available with selected information on site locations and/or site characteristics deleted meets the criteria of 43 CFR 7.18(a) (1). A list of pages, maps, paragraphs, etc. that must be deleted from each report in this category is attached.

"Not Available" - Making the report available does not meet the criteria of 43 CFR 7.18 (a) (1).

EXECUTIVE SUMMARY

This is a report on archaeological shovel test excavations and extant historic structures assessments associated with the Miller Field portion of the South Shore of Staten Island Coastal Storm Risk Management Project. This report is being prepared to comply with environmental review regulations and meets the standards of the New York State Office of Parks, Recreation and Historic Preservation (SHPO). The work was conducted for First Environment, Inc. under contract to the U.S. Army Corps of Engineers (USACE) by Linda Stone, RPA, Principal Investigator and David Berg, Historic Preservation Specialist of First Environment.

The project included a ground-penetrating radar (GPR) survey to identify the Seaplane Ramp, shovel testing a 12.3 acre area to look for any potentially significant archaeological resources, National Register of Historic Places eligibility assessment of the Fire Control Tower, and evaluating the Seaplane Ramp and Concrete Apron as contributing elements to the Miller Army Air Field Historic District.

The GPR survey identified a target assumed to be the Seaplane Ramp, buried at least 6 feet (183 cm) deep. It was not encountered in two shovel tests placed within its footprint. In fact, no potentially significant archaeological resources were encountered during shovel testing. Recommendations for additional field work were made to expose and evaluate the Seaplane Ramp using backhoe trenching.

The Miller Field Fire Control Tower should be retained, stabilized, included as a contributing element to the Miller Army Air Field Historic District, eventually restored and interpreted as part of a potential "Harbor Defenses of Southern New York Historic District." Understanding the significance of the Miller Field Fire Control Tower is dependent on a full understanding of the entire system and of what components of this system remain.

The Miller Field Historic District National Register registration form should be amended to include the Concrete Apron as a contributing resource. The feature should be stabilized and interpretive options considered.

Once accepted by the review agencies, copies of this report will be on file with USACE, the National Park Service and the New York State Office of Parks, Recreation and Historic Preservation.

SHPO MANAGEMENT SUMMARY FORM

SHPO Project Review Number (if available):

Involved State and Federal Agencies (DEC, CORPS, FHWA, etc): *U.S. Army Corps of Engineers,
National Park Service*

Phase of Survey: *IB*

Location Information

Location: *Miller Field, Gateway National Recreation Area, Staten Island, NY*

Minor Civil Division: *n/a*

County: *Richmond*

Survey Area (Metric & English) -

Length: *up to 1683 feet (513 m)*

Width: *up to 925 feet (119 m)*

Depth: (when appropriate): *3 feet (91 cm)*

Number of Acres Surveyed: *12.3*

Number of Square Meters & Feet Excavated (Phase II, Phase III only): *n/a*

Percentage of the Site Excavated (Phase II, Phase III only): *n/a*

USGS 7.5 Minute Quadrangle Map: *Jersey City, NJ - NY*

Archaeological Survey Overview

Number & Interval of Shovel Tests: *133 at 50 feet (15 m)*

Number & Size of Units: *n/a*

Width of Plowed Strips: *n/a*

Surface Survey Transect Interval: *n/a*

Results of Archaeological Survey

Number & name of prehistoric sites identified: *0*

Number & name of historic sites identified: *0*

Number & name of sites recommended for Phase II/Avoidance: *0*

Results of Architectural Survey

Number of buildings/structures/cemeteries within project area: *3*

Number of buildings/structures/cemeteries adjacent to project area: *n/a*

Number of previously determined NR listed or eligible buildings/structures/cemeteries/districts: *1*

Number of identified eligible buildings/structures/cemeteries/districts: *1*

Report Author(s): *Linda Stone, RPA (Principal Investigator), David Berg (Historic Preservation Specialist), Kelly M. Britt, RPA, Janine Billadello, M.Phil. and Hartgen Archaeological Associates, Inc.*

Date of Report: *August 10, 2022*

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INTRODUCTION

The New York District of the U.S. Army Corps of Engineers (USACE or Corps) is in the process of conducting the Preconstruction Engineering and Design (PED) phase of the South Shore of Staten Island Coastal Storm Risk Management Project (SSSI). Part of this work involves cultural resources studies at Miller Field which is part of Gateway National Recreation Area (see Figure 1). These studies contain three actionable tasks, and the reporting on them. The tasks are 1) archaeological shovel testing, 2) assessing National Register of Historic Places (NRHP) eligibility of the Fire Control Tower and 3) evaluating the Seaplane Ramp and Concrete Apron as contributing elements to the Miller Army Air Field Historic District.

The below ground SSSI project impacts are described by the Corps in their Scope of Work (SOW):

The project consists of the construction of a buried seawall along the southeastern shore of Staten Island to provide a first line of defense against coastal storms... Part of the project is on National Park Service (NPS) land, in Gateway National Recreation Area, on the Miller Field Unit. USACE has responsibilities under Section 106 of the National Historic Preservation Act to carry out the identification and evaluation of historic properties within the Area of Potential effect. This Scope of Work is to complete the identification and evaluation of historic properties on Miller Field.

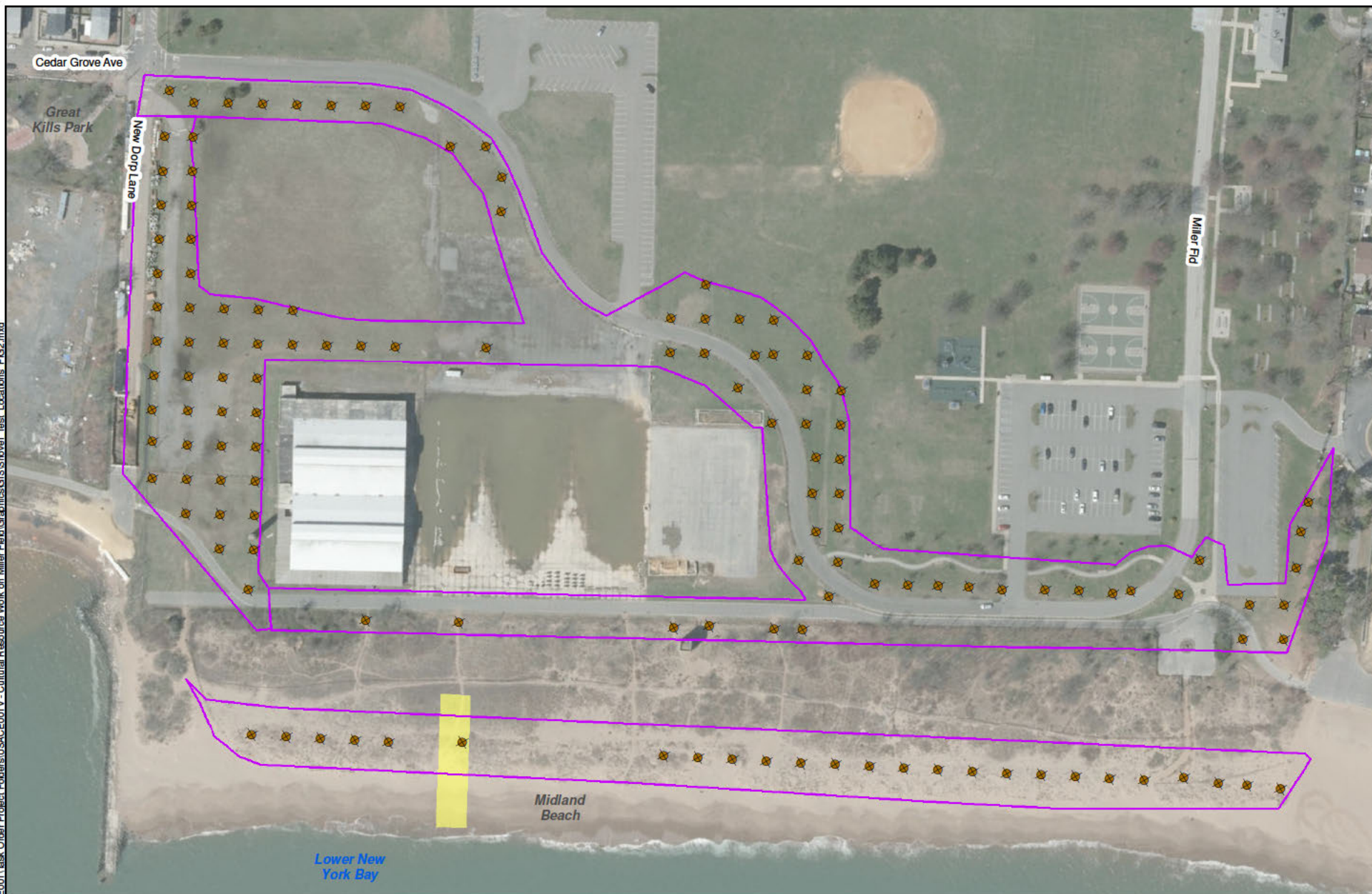
USACE obtained two permits for this project; an Archaeological Resources Protection Act (ARPA) permit and a Special Use Permit (SUP), both issued by NPS. The Corps developed the archaeological testing plan which included shovel testing the 12.3 acre area of potential effect (APE) with shovel tests at 50-foot (15 m) intervals. The project cultural resources team was concerned about the viability of this testing method to identify structural remains of the Seaplane Ramp which may remain buried beneath the dunes and beyond the reach of shovel testing, and worked with USACE to revise the SOW to also include a ground-penetrating radar (GPR) survey of that portion of the site. The shovel testing program did not identify any potentially significant archaeological resources. The GPR survey identified probable buried remains of the Seaplane Ramp (see Figure 2). However, the exposure of the Seaplane Ramp was not possible with shovel testing because of the expected depth and; therefore, it cannot be evaluated for NRHP eligibility at this time.

The NRHP assessment of the Fire Control Tower concluded it possesses integrity and should be stabilized and preserved, ultimately recommending its eligibility for listing on the NRHP under criteria A and C. The assessment goes on to suggest the structure be considered a contributing element to the Miller Army Air Field Historic District, and would best be interpreted as part of a potential future “Harbor Defenses of Southern New York Historic District” which would examine the entire regional system of which the Miller Field Fire Control Tower was one part. If implemented, a comprehensive regional survey of the documentation for this proposed district will need to be conducted. The Concrete Apron was evaluated as a contributing resource to the Miller Army Air Field Historic District and this report recommends the NRHP registration form be updated to reflect the addition, and in doing so it should also discuss the implications for future stabilization and treatment.

This report presents the findings of the GPR survey (conducted 1/26/2022), shovel testing (conducted 2/28-3/11/2022) and the assessments of the Fire Control Tower, the Seaplane Ramp and the Concrete Apron. The field work was performed by Linda Stone, RPA as principal investigator under contract to First Environment, Inc.. She also coordinated the preparation of this report. Ms. Stone was assisted by Kelly M. Britt, RPA as field supervisor and report contributor, Janine Billadello, M.Phil. as crew chief and report contributor, and Abigail Mendoza as field technician. The senior field team members were Stone, Britt and Billadello. The collections management tasks were completed by Hartgen Archaeological Associates, Inc (Hartgen) led by Matthew Kirk, Principal Investigator and Katarina Spero, Laboratory Director. The historic research and assessments were conducted by David Berg, Historic Preservation Specialist, of First Environment, who also provided the historic context. He was assisted with data collection by Jennifer Geraghty, Researcher, of Hartgen, and with Fire Control Tower photography by Allen Attenborough of First Environment. Hagar-Richter Geosciences, Inc. (H-RG) conducted the GPR survey. First Environment provided four field technicians to carry out the shovel test excavations; Shane

Dvorak, Joseph Pellrine, Daniel Perry and Jane Wong. The First Environment team included Devin DeMarco, CHMM, CPEA, CQM, Project Manager; Carrie Ross, Assistant Project Manager; Allen Attenborough, PG, LSRP, Associate, and GIS Specialists Lindsey Shanks and Casey Lindemuth.

G:\DATA\Project\USACE - USACE001\Task Order Project\Folders\USACE001 V - Cultural Resource Work on Miller Field\Graphics\GIS\Shovel Test Locations_FIG2.mxd



Legend

- Shovel Test Location
- Shovel Test Area
- GPR Target/Seaplane Ramp

0 50 100 200 Feet

1 inch = 200 feet



MILLER FIELD
CULTURAL RESOURCES WORK
STATEN ISLAND, NEW YORK
FIGURE 2
SSSI PROJECT BOUNDARY,
SHOVEL TEST LOCATIONS, AND GPR TARGET

Revised	Drawn	Checked	Approved	Date
	LS	CR	DPD	5/6/2022

Aerial Source: New York City 2020, NYS ITS GIS Orthos, 3/21/2020.

BACKGROUND RESEARCH

Historic Context

Previously owned by William H. Vanderbilt, son of Cornelius Vanderbilt, the land that was to become Miller Field was purchased by the United States in 1919 for the construction of an airfield. Of the seven air coast defense stations on the Atlantic Coast originally planned by the Army, only Miller Field was actually constructed. Completed in 1921, the field was named after Captain James Ely Miller, commander of the 95th Aero Squadron during World War I. Because it was completed after World War I, the airfield did not see much activity. It then became the station home of the New York National Guard, 102nd Observation Squadron from 1923 through the 1930s. Miller Field Army Air Station had 38 buildings and structures, including two double hangars numbered 33 and 38 at that time (Gaines 2009: 55; Panamerican Consultants Inc. 2005: 3-68). Hangar 38 was also known as the seaplane hangar. A concrete apron on the northeast side of Hangar 38 connected to a concrete ramp approximately 400 feet (122 m) long and 40 (12 m) feet wide that led in a southeastward direction into the waters of South Beach, extending out about 100 feet (30 m) beyond mean low tide (see Figure 3). Support structures at the field included married officer's residences, a repair shop, a dope house, a boiler house, a storehouse, a motor test house, an armorer's house, a pier and boat house, a gasoline pumping system, a water supply system, sewer system and permanent housing for around 200 men (Gaines 2009: 70; Greenwood and Torres-Reyes 1976: 7-1). An octagonal concrete navigation beacon known as the Elm Tree Light stood south of Hangar 38. It was constructed by the Coast Guard in 1939 to replace an earlier wooden tower (Greenwood and Torres-Reyes 1976: 7-2).

After World War II, Miller Field continued use as a military base and then a regional maintenance facility for missiles. It was ultimately deactivated in 1969 and was transferred to NPS in 1972 as part of Gateway National Recreation Area (Panamerican 2005: 3-76).

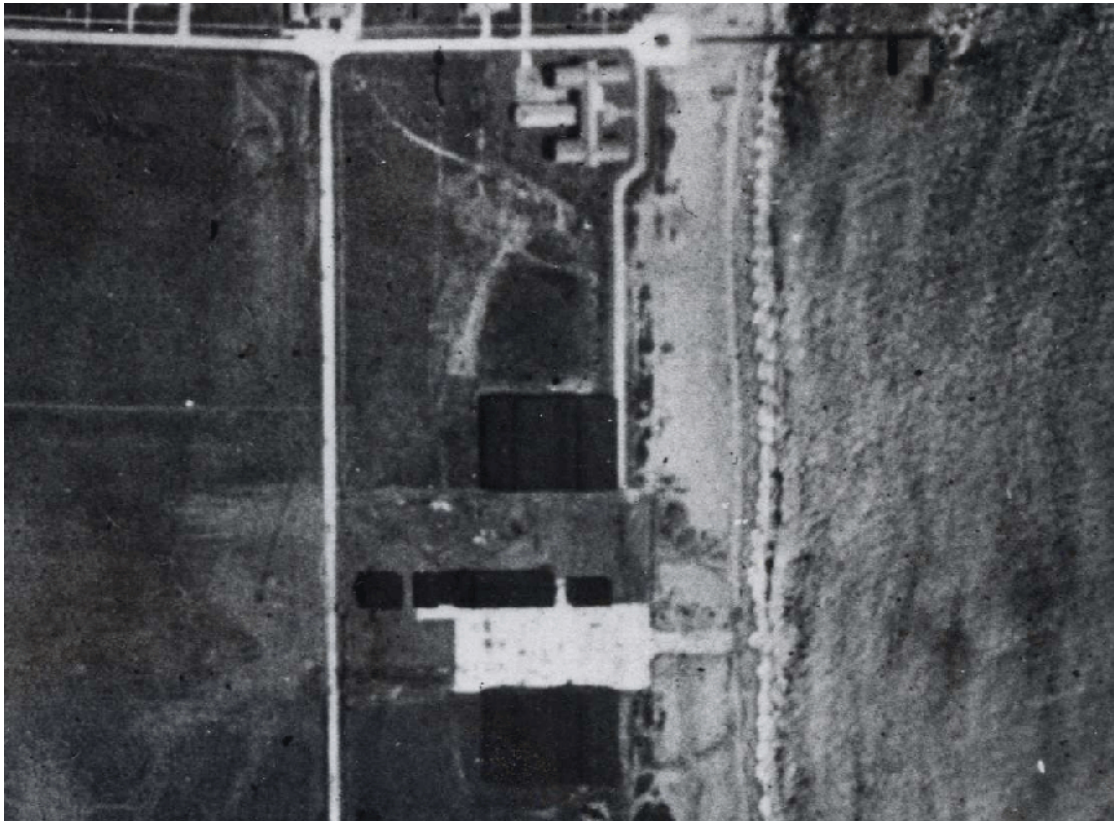


Figure 3 Ca. 1922 image showing Concrete Apron, Seaplane Ramp and buildings. Source: NPS, GATE, Fort Wadsworth, No. 29098.

Environmental Setting

The Miller Field APE for this project has an irregularly shaped footprint which encompasses part of the beach and dunes, and inland portions surrounding Hanger 38 and the Concrete Apron, continuing to Cedar Grove Avenue - a winding road that traverses this portion of Miller Field (see Figure 2). The beach portion contains two distinct environments; the portion of the beach covered in beach grass (see Figure 4) and the more built up dunes adjacent to a bike path (see Figure 5). This latter portion was overgrown with a variety of dense vegetation in places.

Figure 5 also shows part of the grass covered area that exists adjacent to Cedar Grove Avenue. In addition to the beach and manicured grass, the APE also contained some decaying pavement that was covered with tufts of grass between the cracks (see Figure 6). The area was generally well drained, except for the portions of the APE located on the southwestern and northwestern sides of Hangar 38 where pooling of rain water was present for days after the rain.



Figure 4 View of the Miller Field shovel test area in the beach grass at STP A10 with the Fire Control Tower in the background, facing northeast (Image 0158: March 8, 2022).

Review of Previous Studies

Several earlier cultural resources reports discuss the general history and site development of Miller Field, and a number also include archaeology. Among the most comprehensive historic/archaeological studies conducted of Miller Field are the 2005 Panamerican Consultants and the Liebeknecht archaeological reports as well as Hunter Research's 2020 geomorphological/archaeological study. All three of these reports looked at the historic development from Precontact time through the present. For the objectives of the current project, only the relevant archaeological findings are of concern. The broader history as it applies to the structures within the project APE is provided below in the Extant Historic Structures section prepared by David Berg for this report.

Archaeological Studies

A number of prior archaeological studies have been completed in and near Miller Field. Those reviewed for this report are summarized here and in Figure 7.

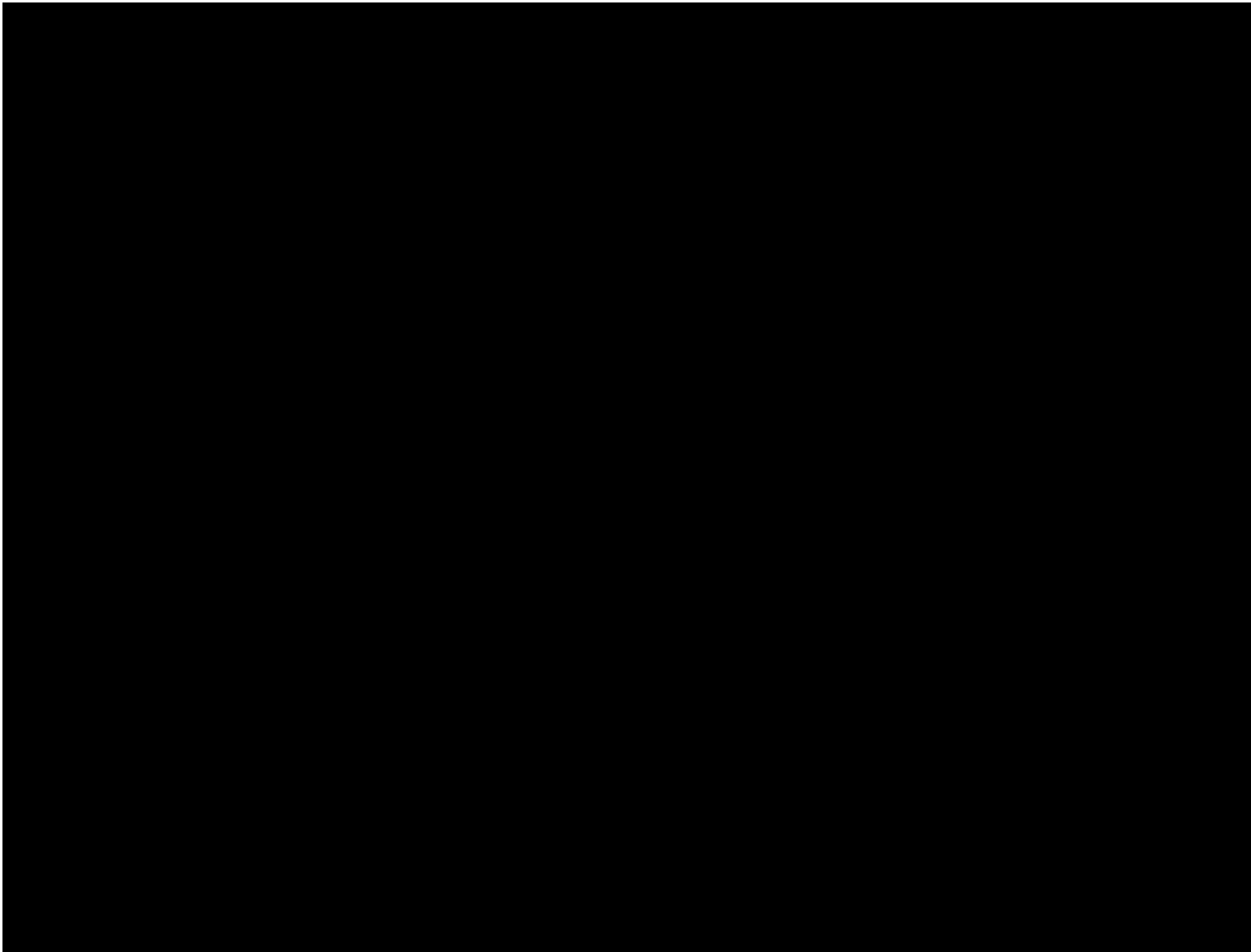
John Milner Associates (JMA) conducted a literature review, pedestrian survey with "minimal subsurface testing" and interviews with knowledgeable informants of the Gateway National Recreation Area, New



Figure 5 View of the dense varied vegetation on the built-up dunes adjacent to the bollard-demarcated bike path (background) showing shovel testing in progress at STPs D27 - D30 between Cedar Grove Avenue and the bench-lined pedestrian trail (right), with the Fire Control Tower and Hangar 38 in the background, facing southwest (Image 0149: March 8, 2022).



Figure 6 View of the portion of the Miller Field shovel test area between the Concrete Apron and Cedar Grove Avenue showing the decaying paving, facing northwest (Image 130802: March 2, 2022).



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RESEARCH DESIGN

Objectives

The goals and objectives of this project were established by USACE in conjunction with NPS. The objective of each of the three actionable tasks is described in the USACE SOW (Appendix A).

The Fire Control Tower NRHP assessment was needed because “neither USACE nor NPS have access to the [prior] research used to make this determination.” Two prior assessments had been conducted. The SOW states that the 2005 Panamerican report “briefly addressed” the Fire Control Tower and “indicated that due to the structure’s lack of integrity it was neither an individually eligible resource nor a contributing element to the historic district, however USACE and NPS agreed to further study this building” (Appendix A). The SOW also references a later survey of architectural waterfront resources in Staten Island which concluded “there is a similar Fire Control Tower in Cape May, NJ that is listed.” That report was also referenced in the SOW as indicating “that the Fire Control Tower is not eligible for the NR as an individual resource or as an addition to the existing historic district.” Seemingly because a similar tower is listed, and because details about the Miller Field Fire Control Tower assessments were not available, the agencies are looking to collect the information they need to be able to make the determination and asked that this current work “build a historical context within which the circumstances surrounding the construction and use of the Fire Control Tower can be objectively understood and an evaluation of its NRHP eligibility.”

The SOW also stated USACE is looking to determine if the Seaplane Ramp should be considered a contributing element to the Miller Field Historic District. The SOW cites two earlier reports with conflicting information. One is a 2015 letter that stated “Hangar 38 and infrastructure for Miller Field and the surrounding area was extensively updated by the mid 1930’s. This included the construction of the outfall at New Dorp Lane and removal of the seaplane ramp on the beach” (Moffatt & Nichol 2015:1). The other is the 2012 archaeological monitoring report of the Miller Field bike path where “edges” of the Seaplane Ramp may have been preserved (Dukes 2012: Figures 2 & 7). The objective for this task specified in the SOW is to (1) “conduct fieldwork to determine if any physical remains of the Seaplane Ramp remain *in situ*, and (2) if remains are extant, conduct documentary research to evaluate the Seaplane Ramp as a contributing element to the existing historic district.”

The Concrete Apron has not previously been evaluated to determine if it should be included as an element of the existing Miller Army Air Field Historic District. USACE and NPS would like to plan for the possible restoration of this feature and are looking for documentary research to guide future decision making.

The shovel testing program was intended to identify potentially significant archaeological resources. While the consultant team agrees that this is a valid project goal, we did not feel it would be able to adequately address more deeply buried cultural resources, most specifically the Seaplane Ramp. Therefore, the team worked with the Corps who engaged with NPS on this issue to conclude that a GPR survey could potentially provide some answers about the Seaplane Ramp.

Methods

Field Testing

The field testing included two components; a GPR survey and a shovel test survey. The GPR survey was conducted by H-RG (Appendix B). They completed both “time domain electromagnetic induction metal detection (EM) and ground penetrating radar (GPR)” so as to be able to detect both metal and non-metal objects. First Environment provided H-RG with limits of the study area for remote sensing which were wider than the suspected location of the Seaplane Ramp to maximize the possibility of identifying it. Once in the field, H-RG used GPS to establish a grid for the collection of data along transects running parallel to the shore and spaced at 10-foot (3 m) intervals through the area of interest. The equipment was then dragged along those lines for data collection. It is notable that H-RG was not able to traverse the entire footprint of the study area because of the dense vegetation that exists along the dune adjacent to the bike path, rendering that area inaccessible to the equipment.

The 12.3 acre, irregularly-shaped shovel testing area was defined by USACE and a drawing was included with the SOW. A shape file was provided to First Environment for use in conducting the work. Prior to shovel testing, a digital georeferenced grid was created to determine where best to place the shovel tests. Like the H-RG survey, the shovel test grid was established parallel to the shore; however, unlike the H-RG grid, the shovel test grid was at 50-foot (15-m) intervals. Lettered transects ran parallel to the shore and numbered transects ran perpendicular. For example, Transect A was parallel to and closest to the shore and Transect 1 was adjacent to New Dorp Lane heading inland. This allowed each location to have both a number and letter to identify the STP. The digital grid contained 187 possible STPs.

The coordinate data from the theoretical grid was entered into ArcGIS Collector application to facilitate mark-outs in the field. Once in the field, the Collector application was amplified with a Bad Elf GPS receiver to navigate to the grid points. Locations were marked with flags. Some locations fell within roadways and were either offset or eliminated, depending if there was or was not room within the irregularly-shaped shovel test area. Locations that were close to roadways were sometimes offset based on the perceived level of past roadside disturbance. The majority of the tests in this situation were located between Cedar Grove Avenue and a wave-shaped pedestrian trail that measures between 35 - 50 feet (11 - 15 m). In that area, part of Transect D (STPs D22 - D31) was shifted southeast to be midway between the road and the trail. The corresponding portion of Transect C (STPs C22 - C31) was eliminated. The contract prohibited the destruction of vegetation, and therefore the prevalence of dense vegetation on the dune in parts of Transect B resulted in elimination of a number of tests there. A small number of other proposed STP locations were eliminated based on the existence of overlying paving (see Figure 8). Ultimately, 133 STPs were excavated (see Figure 2). Any altered or added locations were logged in the Collector application. After the completion of fieldwork, the First Environment GIS department downloaded the data, updated the completed shovel test location map and compiled a table of shovel test coordinates (Appendix C). They also added the H-RG seaplane GPR target (see Figure 2).

The orientation of the lettered transects was southwest to northeast, thereby making it more cumbersome for the field crew to note directional information in the field than had the orientation simply been west to east. Therefore, for the purposes of brevity and clarity, and because the project is called “South Shore,” while in the field and on the field notes, the shore was considered to be “south” and inland north. All field forms and notes used those conventions. However, in this report, the described directions are the real world directions.

The SOW contained a provision to conduct radial testing around any positive shovel tests. Positive shovel tests triggering radial testing for this project were defined as those which had either Precontact period cultural material or sites, or tests which contain archaeological features. No such test locations were encountered and; therefore, no radial tests were conducted.

Shovel tests were excavated stratigraphically. Field data was recorded on shovel test forms, one for each test. Information recorded included the depth, Munsell soil color and soil texture descriptions, artifact inclusions, and any comments unique to the test. This data is provided here in Appendix C. Senior field team members took site photographs. Those photographs were logged with the digital identification number, date taken, direction and subject.

The identification of “fill” deposits was key because the SUP permit specifies “no artifact collections should be made in fill contexts.” Additionally, the SOW specified that certain artifact classes be weighed and sampled. The SOW defined these as “bulk materials such as fire cracked rock, glass, mortar, brick, and shell.” Therefore, field technicians were instructed to collect all cultural material from all contexts and the senior team members went through the field data and artifact bags to make the fill determinations and cull appropriately from those contexts in the field, as well as culling other garbage such as styrofoam, plastic wrap and other plastics. All culled artifacts were weighed, measured, logged on forms and photographed by context before discarding in the field. Although the field technicians were instructed to retain all cultural material from each test to be culled in the field by senior team members, there were a few instances in the first days of the project where technicians occasionally took it upon themselves to sample Stratum 1 material. In those cases, field forms clearly show what categories were sampled. None of those were critical to the outcome of the project, and would have been culled in the field regardless; however, they were not available to be weighed, measured or photographed prior to discarding. The only

other exception to the weigh, measure, photograph protocol was for STP A26 where the deposit from 0.5 - 1.0 feet (15 - 30 cm) below ground surface unearthed a hypodermic needle. That, along with other artifacts observed in that part of the stratum were photographed in the screen and immediately discarded. Separate spreadsheets were created for the discarded contexts and for the sampled contexts, and includes all cultural material the senior team members recorded (Appendix D). This spreadsheet and the remaining artifacts were shipped to Hartgen Archaeological Associates, Inc. for processing and cataloging.

Artifact Processing and Cataloging

Once culled in the field, the remaining collected materials were then transferred to the Hartgen Archaeological Associates, Inc. Laboratory, located at 1744 Washington Ave, Rensselaer, New York, for processing. Upon arrival, the artifact bags were additionally inventoried using the provided context list. Each individual artifact bag was assigned a tracking bag number. Bag numbers and the provenience information for all contexts were entered into a *Microsoft Access* database. Archeological materials were arranged in ascending provenience order by shovel test number and stratum. This order also determined the sequential cataloging order for the collection. The materials were removed from the bags for cleaning. Depending on the material type, artifacts were washed with brushes and water or just dry-brushed. Once cleaned, the artifacts were spread out on drying trays and each tray was labeled with the appropriate provenience information. The contents of each bag were subsequently inventoried in a draft table with the artifacts' material class, count, and description (see Appendix D).

Consultation with NPS determined the appropriateness of long-term curation of these materials based on diagnostic properties. Of the 586 artifacts that were collected, 36 were identified and approved by NPS personnel for curation in a final inventory table; the remaining 550 artifacts were culled. During the culling process, the weight in grams was also taken and added to the previously recorded data (material class, count, and description) for each artifact entry in a separate cull table. All artifact tables are included in Appendix D.

In accordance with NPS standards, a range of catalog numbers (58871-58907) was then assigned to the collection's accession number (GATE-02121). Artifacts from each provenience were "lot cataloged," and each catalog lot was assigned a unique catalog number. The NPS artifact database (Re: Discovery ICMS Version 8.20) was used to catalog the artifacts. To ensure that proper terminology and cataloging order was followed during the cataloging process, the following resources were routinely referenced: *Northeast Region Archeology Program's Cataloging Guidelines* (NPS 2009b), and NPS Cataloging Flow Chart (NPS 2021). Additionally, both Holly Staggs (Archeologist & Section 106 Coordinator, GATE) and Gail Frace (Archeologist, National Park Service, Interior Region 1) performed a virtual inspection of the ICMS records. The appropriate edits were made to the data, and the catalog was finalized.

The collection is stored using archival quality materials. Grouped by catalog lot, artifacts are enclosed in white-block 4mil polyethylene zip-top bags together with an archival artifact tag/paper label that is generated by an ANCS+/ICMS version 8.20 database report. In addition, artifacts are directly and indirectly labeled according to criteria established by NPS and placed in archival boxes. Detailed container lists, box labels, and a final catalog were also generated. After the final report is accepted, the artifacts and associated documentation will be transferred to NPS for permanent storage.

Archeological laboratory methods were carried out in accordance with Department of Interior, NPS, Northeast Region (NER) Archeology Program standards. Specifically, Hartgen followed the procedures outlined in *The Northeast Region Archeology Program's ANCS+/ICMS v. 8.1 Starter's Guide* (NPS 2009a) and *Northeast Region Archeology Program's Cataloging Guidelines* (NPS 2009b).

Structures Assessments

The methodology for evaluating NRHP eligibility of the Miller Field Concrete Apron, Seaplane Ramp and Fire Control Tower began with documentary research in order to properly evaluate each resource within its historical and architectural/engineering context. Researched documents included historic maps, aerial photographs and written materials. Obtaining necessary primary source information was difficult due to closures associated with the COVID-19 shutdowns. Record groups at the National Archives and Records Administration (NARA) were closed as were GATE records at Fort Wadsworth, Staten Island, New York, although the records at Fort Wadsworth later became available. Filling this gap, Mr. Mark

Berhow of The Coast Defense Study Group, Inc. furnished his primary research from NARA as well as his book entitled: *American Seacoast Defenses, A Reference Guide*. Prior historical and archaeological studies as well as planning documents were obtained from NPS GATE. Measured drawings and additional historical information on Miller Field and the Fire Control Tower were found in the Historic American Buildings Survey collection available online and housed within the Library of Congress Prints and Photographs Division Washington, D.C. Additional historical information on Miller Field as well as general information on fire control systems were found online. Army manuals for fire control were located within the Internet Archive at <https://archive.org>. Research also involved reaching out to military historical organizations of which the Army Ground Forces Association proved especially helpful. Detailed information on individual sources may be found in the annotated bibliography.

Evaluation of historic structures conformed to National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation. During the course of historical research, a field reconnaissance was performed on March 3, 2021 to photograph and inspect Miller Field, the Concrete Apron and Fire Control Tower as well as to investigate the possible location of the Seaplane Ramp and other structures noted on historical documents. Later, during field testing, the team observed the protective metal plate covering the entrance of the Fire Control Tower had been removed. This allowed access to the interior for photography. That photography was conducted by Allen Attenborough of First Environment.

FIELD TESTING RESULTS

Prior to implementing the shovel testing program, a GPR survey was conducted. It revealed a target in the footprint of the Seaplane Ramp with an estimated width of approximately 40 feet (12 m) and a depth of 6 - 13 feet (2 - 4 m) (Appendix B). Once identified, USACE was consulted regarding the best way to proceed with shovel testing in that area since the estimated depth was below that of the capability of shovel testing, the amount of cover would be considered fill, and the SUP permit did not permit artifact collection from fill contexts. It was concluded that the two tests planned within the footprint of the GPR target would be completed to confirm the feature could not be reached. However, the remaining footprint of the GPR surveyed area (400 feet/122 m wide) is larger than the actual target and could be eliminated from shovel testing. This decision eliminated ten tests. One-hundred-thirty-three (133) shovel tests were ultimately excavated (see Figure 2). Nothing triggering radial testing was unearthed and no potentially significant archaeological resources were encountered.

The diameter of each STP was approximately 1.4 feet (43 cm) and each was excavated to approximately 3 feet (90 cm) below ground surface (BGS). Figure 8 depicts the completed STP locations and highlights those that were obstructed and did not reach the full depth. The majority of obstructions were between Hangar 38 and New Dorp Lane where excavation at eleven tests released a noxious odor and the tests were stopped at an average depth of 2 feet (61 cm) for safety reasons. Six additional tests in that area were stopped for other reasons and it is possible they too would have released the same odor had those STPs continued deeper. Of note regarding this odor, Dukes also found what he described as a “strong chemical smell” in two of the augur holes located in the same section of the site, closest to the F transect of the current project (Dukes 2012: 3).

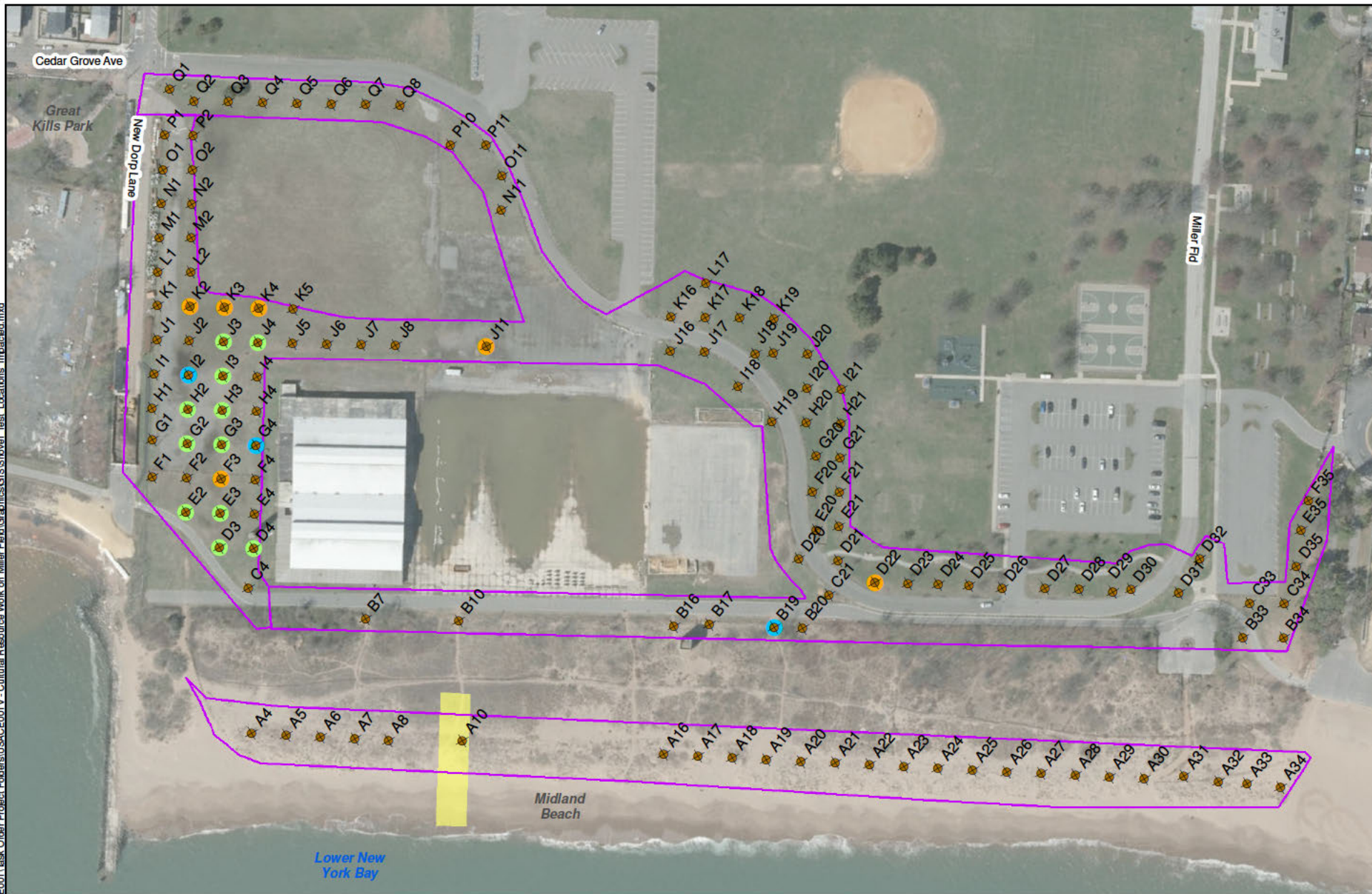
STP J11, located just inland of the Concrete Apron, was obstructed by a buried asphalt surface at only 1.5 inches (4 cm). In fact, the entire portion of the shovel test area between the Concrete Apron and Cedar Grove Avenue was ultimately eliminated from shovel testing because of visible paved surfaces. The contract specified avoiding paved areas so these planned tests were eliminated. Some of the planned tests were covered with gravel, like J11, and others had tufts of grass growing out of cracks in the former asphalt surface (see Figure 6). Liebeknecht et al. reproduced an aerial photo from 1970 which shows the extent of paving in that area at that time (see Figure 9) (Liebeknecht, et al. 2005: Plate 4.5). The extent of deteriorating paving today is likely what is depicted on the aerial photo. It shows a similar situation between Hangar 38 and New Dorp Lane, where shovel test excavation encountered compacted deposits with a large amount of crushed asphalt and gravel also seen in the report cover photo.

The final two obstructions were more localized. One was STP B19 which encountered an Orangeburg-type utility pipe at 1.3 feet (40 cm) BGS, and the test was relocated 2 feet (61 cm) to the southeast where it reached successful completion. The other was STP D22 where concrete was encountered at 2.3 feet (71 cm) BGS. This test was near a storm drainage ditch and culvert, and was therefore not relocated.

The shovel test data is provided in Appendix C. It is a transcription of the details from the field records of each STP. Patterns of the various deposits encountered within each part of the site were sought. One of the obvious areas of similarity is the aforementioned area between Hangar 38 and New Dorp Lane where both a noxious odor and a profuse amount of crushed asphalt and gravel were documented. These tests were in Transects 2 - 4 from Transects D - K. Deposits described in the field as crushed asphalt, asphalt with gravel, gravel or gravelly were typically encountered in Stratum 2 at depths averaging 0.6 feet (19 cm) BGS. However, they were encountered as shallow as 0.1 feet (3 cm) or as deep as 2 feet (63 cm) BGS in places. These paving related deposits continued to an average depth of 1.4 feet (42 cm) BGS. The underlying deposits, when present, were most often described as compacted.

The cover photo and the background image on Figures 2, 7 and 8 depict Transect 1 situated between New Dorp Lane and a gravel path, although the path was not clearly visible throughout the site. This transect also contained many tests with deposits described as crushed asphalt, gravel, etc., although here most were within Stratum 1. One distinction between Transect 1 and the adjacent numbered transects is that

G:\DATA\Project\USACE - USACE001\Task Order Project\Folders\USACE001 V - Cultural Resource Work on Miller Field\Graphics\GIS\Shovel Test Locations Impacted.mxd



Legend

- Shovel Test Location
- Stopped due to noxious odor
- Shovel Test Area
- Stopped due to debris
- GPR Target/Seaplane Ramp
- Stopped due to water seepage or pipe obstruction

0 50 100 200 Feet

1 inch = 200 feet



MILLER FIELD CULTURAL RESOURCES WORK STATEN ISLAND, NEW YORK FIGURE 8 MILLER FIELD COMPLETED SHOVEL TESTS SHOWING THOSE STOPPED PRIOR TO REACHING THE DESIRED DEPTH OF 3 FEET (90 CM)				
Revised	Drawn	Checked	Approved	Date
	LS	CR	DPD	5/6/2022

Aerial Source: New York City 2020, NYS ITS GIS Orthos, 3/21/2020.

many of these tests contained a culturally sterile subsoil layer. This, however, could be a result of many tests in Transects 2 - 4 being prematurely aborted. Subsoil was encountered in Transect 1 between 1.9 - 2.8 feet (57 - 86 cm) BGS and averaged 2.4 feet (73 cm) BGS. It is notable that the overlying deposits were generally not mottled or mixed with this subsoil, perhaps an indication that all of the overlying material was redeposited or fill material.



Figure 9 Liebeknecht et al. 2005: Plate 4.5. “Aerial photograph of Miller Field 1970 (source: NPS, Gateway National Recreation Area, Fort Wadsworth)” showing the paved area inland of the Concrete Apron.

Transect Q runs parallel to Cedar Grove Avenue in the grass on its southeast side, at the western side of the shovel test area. It contained culturally sterile subsoil at a similar depth as Transect 1, averaging 1.6 - 3 feet (48 - 92 cm) BGS, in all tests except STPs Q3 - Q5 (see Figure 10). Linck (1999: 7) excavated a series of tests along the same transect, offset slightly to the north of Transect Q, but those were only dug to 1.5 feet (46 cm), above the level at which culturally sterile subsoil was encountered here. In contrast, Transect Q was excavated to 3.0 feet (91 cm) and artifacts were no longer encountered in the basal stratum. The exceptions, STPs Q3 - Q5, yielded a large quantity of mixed pebbles and gravel starting in Stratum 3 and continued to the base of excavation at approximately 3 feet (90 cm), indicating a localized deposit that had been introduced. Most of the Transect Q tests yielded varying quantities of brick and fragmented red stone in their upper strata.

The area directly to the northeast of Transect Q was more disturbed. All tests contained gravel or asphalt fragments. These were found through the base of excavation in three of those four tests; O11, P10 and P11. Although not clear in Figure 9, it seems likely this area may have been paved in 1970.

Moving away from the historically paved area, northeastward, testing was conducted on either side of Cedar Grove Avenue. The deposits were distinct on each side, perhaps because the east side is closer to the demolished Hangar 33 and a large fenced-in concrete rectangle-shaped container (see Figures 2, 7 & 8). There the upper two strata were identical and extended to an average of 1.3 feet (40 cm) BGS. However, more variability was present at deeper levels. H19, directly to the north of the concrete feature,

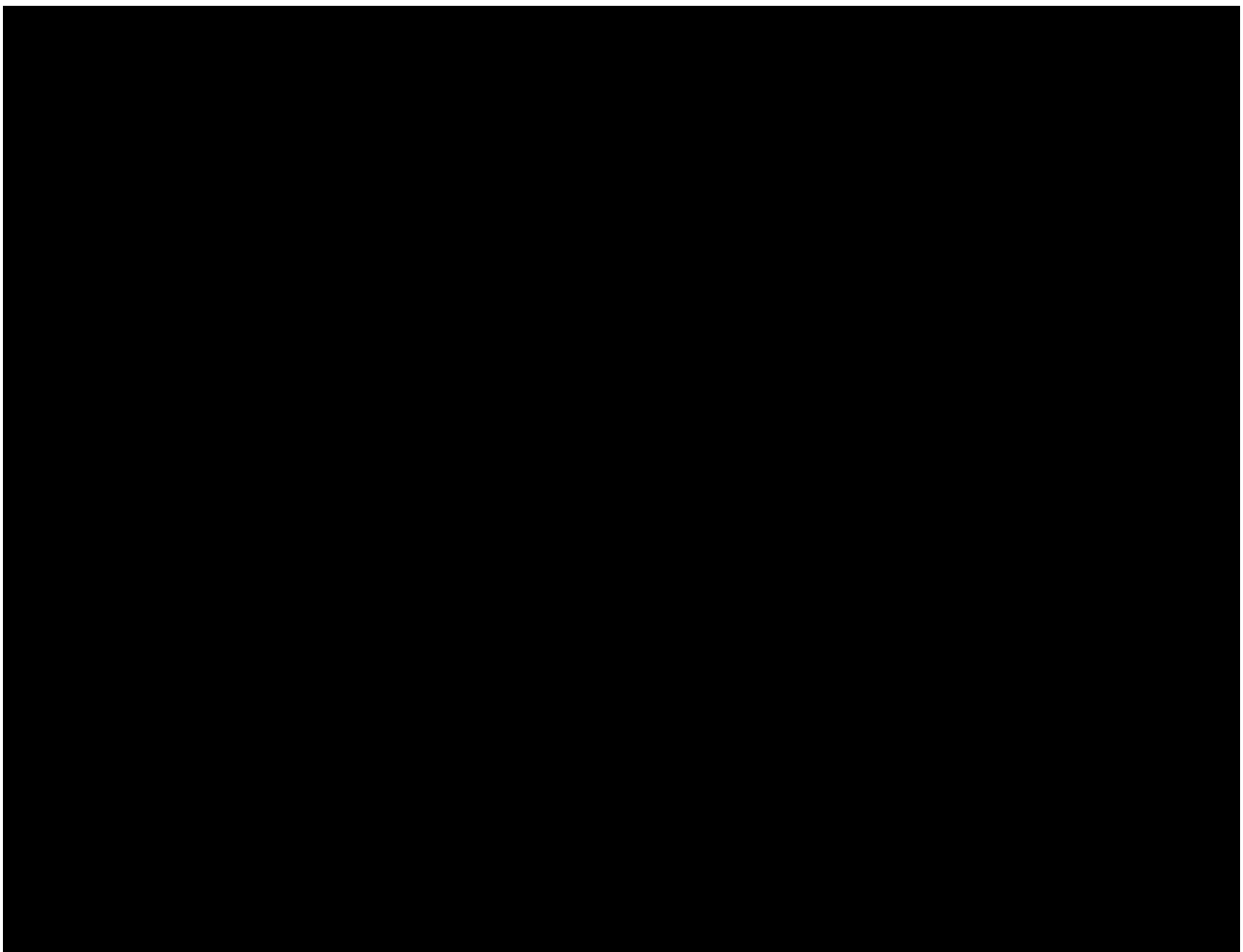


Figure 10 Soil profile of Transect Q.

contained disturbance through the base of excavation, possibly due to the construction of the adjacent feature. I18, the test on the other side of that feature, was noted as containing different deposits from the remaining two tests on that side of the road. The other two tests on that side of the road were also unique in the lower strata, but the soil descriptions at the base of excavation were the same; dark yellowish brown silty clay and devoid of cultural material.

The tests on the inland side of Cedar Grove Avenue exhibited more uniformity. Most of those tests contained three strata with a culturally sterile subsoil at the bottom. This was strong brown or dark brown sandy silt. Upper levels of those tests were less compacted than those seen in the tests to the southwest.

Transects 20 and 21 extend eastward along the portion of Cedar Grove Avenue adjacent to the former location of Hangar 33. These transects are located on either side of a drainage ditch. The drainage ditch leads to a culvert between D21 and E21. The ditch extends from Transects E to I where the depression peters out and the topography is relatively level (see Figure 11). Across Cedar Grove Avenue, C21 is at the intersection with the bike path and was shifted to avoid the large manhole associated with the culvert and drainage ditch. Transect 21 was approximately 10 feet (3 m) to the north of the ditch. It was initially thought this transect may exhibit more uniform soil profiles because of its distance from the road and the ditch, in an otherwise open field. Figure 12 is the soil profile of Transect 21 showing that, indeed, once past the manhole and culvert, the deposits were generally uniform from E21 through I21, as were the Transect 20 tests, although there they contained a slightly larger sand component.

More variety of deposits was documented along Transect D (see Figure 13). Transect D extends along the western side of Cedar Grove Avenue in the northern part of the shovel test area. D20 is separated from the rest of the transect by Cedar Grove Avenue and the culvert. Although the upper strata within Transect D were more or less the same soil type, brown or dark brown with a loam component, the underlying



Figure 11 View of the culvert, drainage ditch and STP E20, facing east (Image 0145: March 7, 2022).

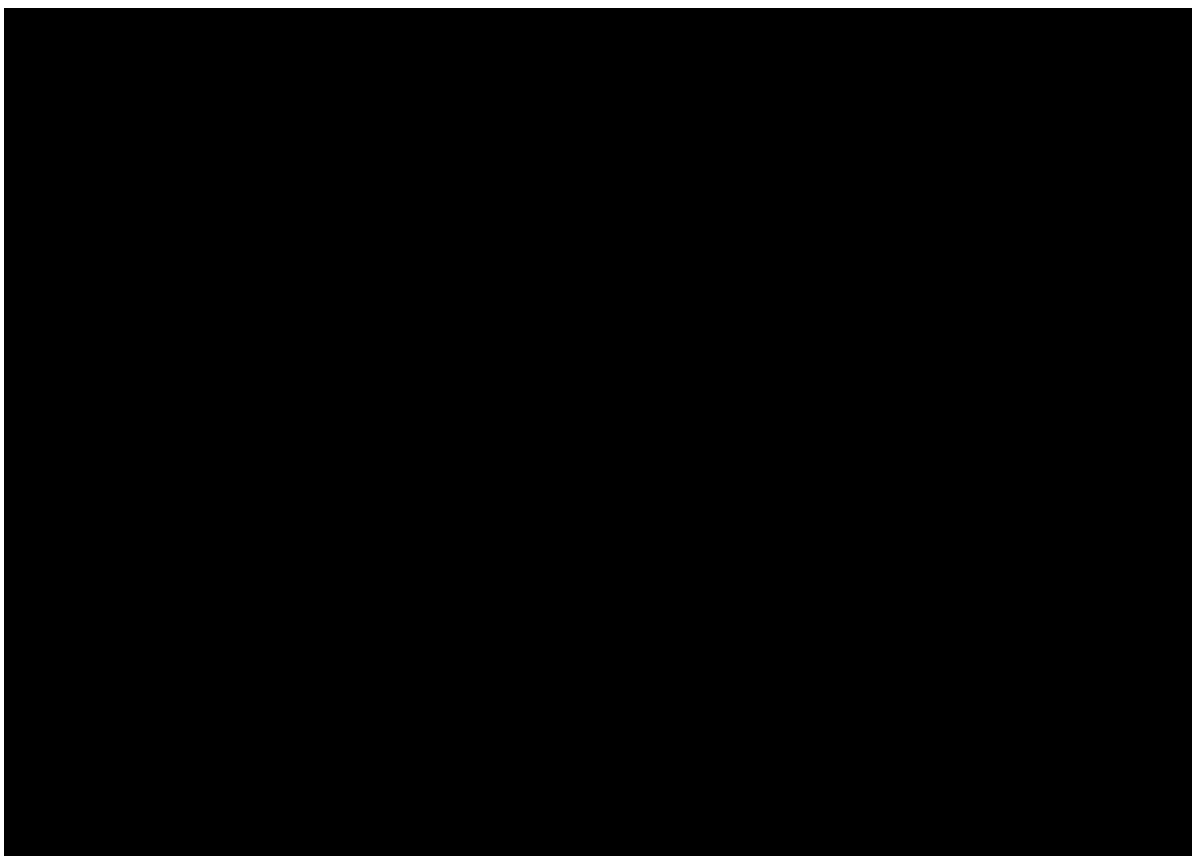


Figure 12 Soil profile of Transect 21.

deposits were not as uniform. Furthermore, although most of the basal strata were devoid of cultural material, these deposits were often extremely compacted and soil types varied, some containing gravel, a possible indication of the area having been churned and/or exposed. Liebeknecht et al. tested the same area in 2005 and found some natural deposits had been overlain by late-1950s era topsoil “following demolition of buildings.” However, only four specific tests out of fifty they completed along the pedestrian path were called out as locations of demolished structures, and depths of the underlying natural deposits are not described in the text, but based on the testing records appendix, the depths averaged 2.6 feet (80 cm) (Liebeknecht et al. 2005: 5-5, Appdx. A).

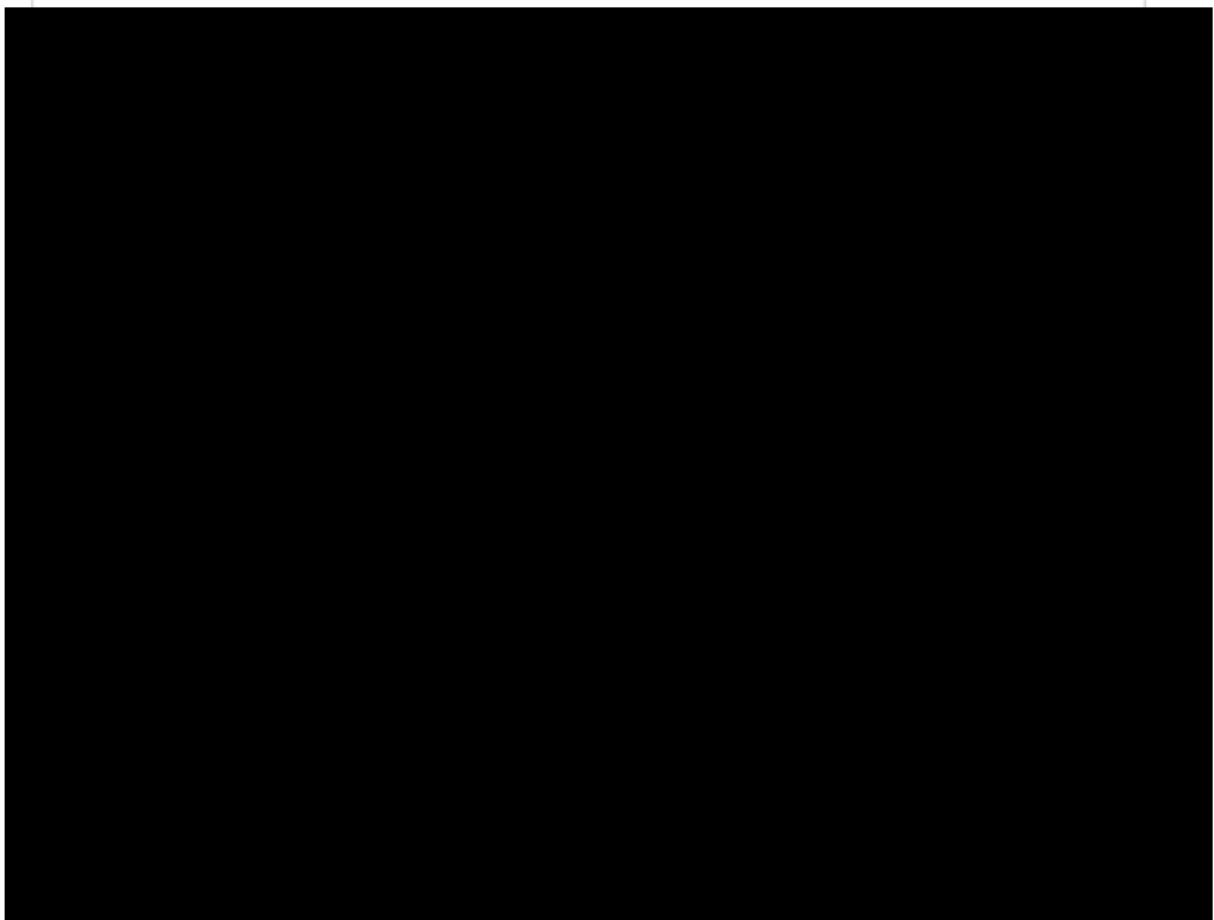


Figure 13 Soil profile of Transect D.

A single transect of STPs was placed at the northern end of the shovel test area, adjacent to a stand of planted trees separating Miller Field from a baseball diamond. The terrain was an open grass field, similar to Transect 21. The shovel test profiles were also similar with three strata; topsoil/landscape material, brown or strong brown silty sand and then a strong brown or dark brown sandier stratum at the base of excavation.

Two transects were placed in the dunes and beach; Transects A and B. Transect B was the more inland of the two and adjacent to a bike path in a built up dune covered with a large amount of dense vegetation. As previously mentioned, a number of the tests in that transect were eliminated because of the vegetation. Figure 14 depicts the conditions at one of these locations.

The GPR survey had been conducted in part of Transect A where it identified a target consistent with the Seaplane Ramp. The dense vegetation prevented access by the equipment in Transect B, but the target is assumed to continue beneath the dune to the Concrete Apron. STP A10 was placed within the target and B10 was placed in the assumed corresponding spot on Transect B. The Seaplane Ramp was not encountered in either shovel test. Had the amount of cover been shallower, the Seaplane Ramp may have

been encountered. The GPR survey results indicated the target depth was likely over 6 feet (182 cm) BGS. Therefore, all of the material excavated from A10 and B10 was fill. The deposit was dark yellowish brown or strong brown sand for the entire depth of excavation which extended to 3.3 and 3 feet (102 & 92 cm) respectively. A10 contained a number of artifacts, including plastic and a bottle glass sherd which could have been manufactured between 1969 - 1996 (Appendix D). B10 was devoid of artifacts.



Figure 14 The Principal Investigator standing at the planned location of B6 (Image 313: March 10, 2022).

The remainder of the tests in both Transects A and B were similar. Most had just one stratum of sand, generally strong brown and contained modern debris in the upper levels. Several, like B10, were devoid of any cultural material.

INTERPRETATIONS

None of the shovel tests encountered any archaeological features, nor did they unearth any Precontact cultural material.

The entire southern part of the shovel test area¹ was material which was either part of earlier paving or fill placed above that surface once it had been milled or removed sometime after 1970. No intact surfaces were encountered there and there seems little likelihood they could be present any deeper. The most reasonable interpretation of the field findings in the southern test area is that the construction of that portion of Miller Field destroyed any potentially intact surfaces and that subsequent grooming and landscaping have further altered any pre-existing original ground surface.

The tests between the bike path and the shore were also likely all fill material, based on both the GPR survey suggesting the Seaplane Ramp target was buried at least 6 feet (183 cm) deep, and on the recent debris documented in those tests. However, based on the GPR survey findings, it is reasonable to assume deeper excavation will uncover an intact surface at the level of the Seaplane Ramp.

The northern portions² of the shovel test area similarly contained disturbed or redeposited material. Although some of those tests, particularly along part of Transects 20 and 21 and from C34 to F 35, may have preserved surfaces near the base of the shovel tests, none produced any findings that would suggest further archaeological work would lead to the identification of potentially significant resources. In fact, it is quite possible the construction of the drainage ditch between Transects 20 and 21 and the ball field adjacent to C34 to F35 had altered the landscape to such an extent that no intact surfaces remain there either.

All artifacts documented were quite fragmentary, as is typical of material that has been churned up multiple times. Very few artifacts encountered deeper than Stratum 1 exceeded 2 inches (5 cm) in diameter. Very few non-modern temporally diagnostic artifacts were encountered at all during shovel testing. These include the bottle glass sherd recovered from A10 and another bottle glass sherd recovered from A6, both not manufactured before the mid-20th century (Appendix D). A10 is a fill context above the Seaplane Ramp and A6 is a likely fill context based on the GPR results combined with the shovel test results.

The only portion of the shovel test area warranting further subsurface testing is the area of the Seaplane Ramp.

¹ This includes the area between Hangar 38, the Concrete Apron, New Dorp Lane and Cedar Grove Avenue and encompasses Transects 1 - 4 from Transects C - Q. It also includes Transect J through J11 and Transect K through K5.

² This includes the area due north of Cedar Grove Avenue as it heads towards the shore and then parallel to Cedar Grove Avenue and includes Transects 19 - 35 from Transects C - K.

EXTANT HISTORIC STRUCTURES ASSESSMENTS

Structures Historic Contexts

Concrete Apron and Seaplane Ramp

Little documentation survives regarding the Concrete Apron and Seaplane Ramp. The Concrete Apron for the double seaplane hangar was apparently completed in mid-1921 along with the Seaplane Ramp and hangar. Although the area northeast of the seaplane hangar was paved with concrete and connected to the concrete Seaplane Ramp, the apron southwest of the land plane hangar (Hangar 33) was paved with cinders (Unrau and Powell 1981: 32). The seaplane hangar stood at the southwest end of the Concrete Apron and a row of buildings that included storage, aero repair and motor test shops stood at the northeast side end of the apron. The cinder paved apron began northeast of the shops and extended to Hangar 33 (Figures 3, 15 and 16). Scaled measurements of early photographs find the original Concrete Apron to have measured approximately 300 feet southeast to northwest and 150 feet northeast to southwest.



Figure 15 Aerial Photograph from 1924 Showing Hangar 38, Concrete Apron and Seaplane Ramp.
Source: NYPL Lionel Pincus and Princess Firyal Map Division 1924.

According to the NRHP nomination for the Miller Field Historic District, the Concrete Apron on the northeast side of Hangar 38 connected to a concrete Seaplane Ramp approximately 400 feet long and 40 feet wide extending about 100 feet beyond mean low tide (Greenwood and Torres-Reyes 1976: 7-1). Early aerial photographs clearly show the Concrete Apron with the Seaplane Ramp leading from the east side of the apron to the shore (see Figures 3, 15 and 16).

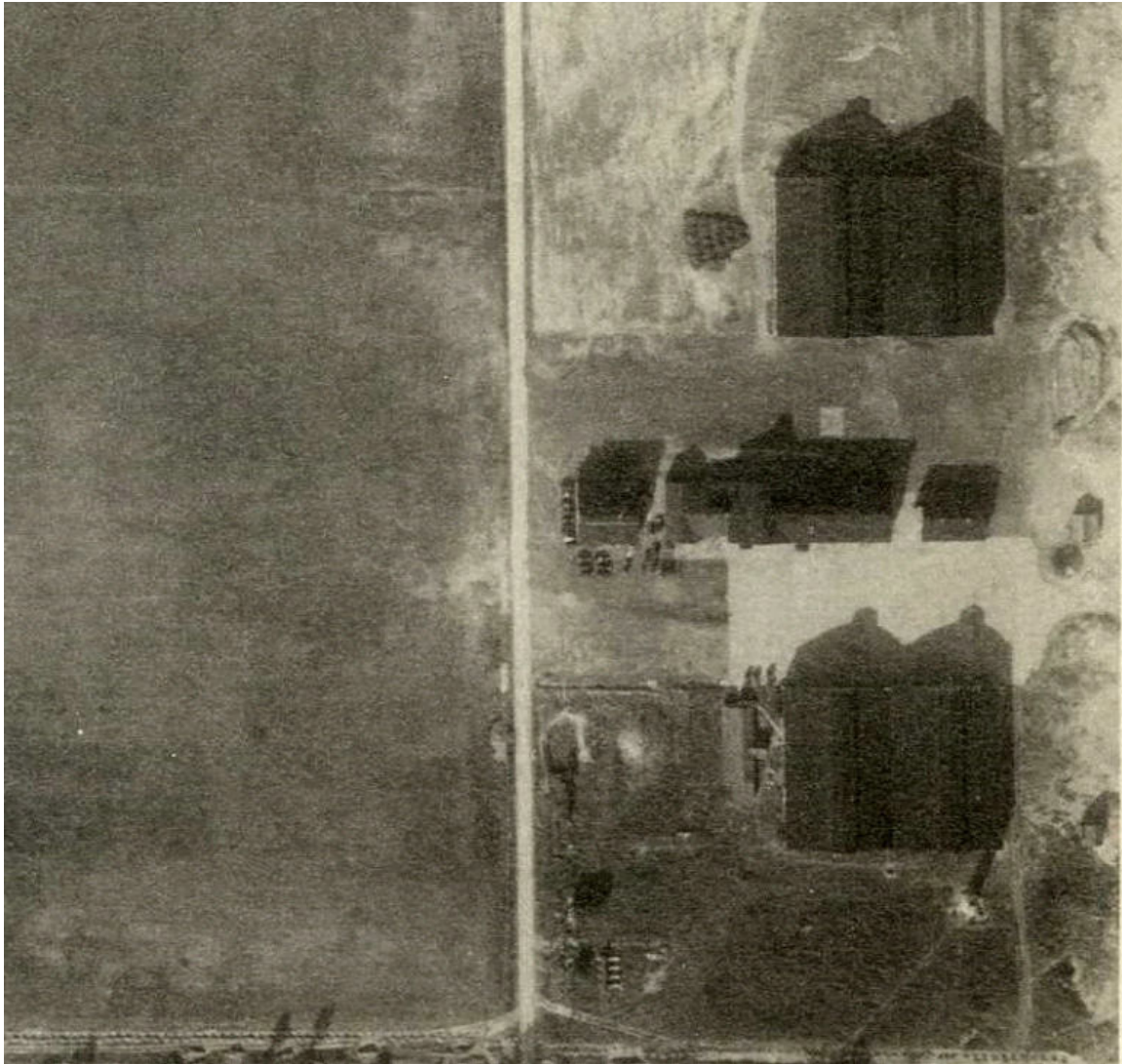


Figure 16 1925 Image Showing Concrete Apron, Seaplane Ramp and Buildings. Source: NPS, GATE, Fort Wadsworth, No. 19255.

Construction details for both the Concrete Apron and the Seaplane Ramp are sparse. The contract for construction of the airfield was awarded to the firm of Smith, Hauser and MacIsaac, Inc., at 18 East 41st Street in New York City on November 6, 1919 (Unrau and Powell 1981: 23). Herbert M. Hale prepared the engineering studies and designs. North, Allison and Ettlinger made the surveys of the new airfield (Unrau and Powell 1981: 24). As for materials, crushed stone for concrete was provided by Joseph Johnson's Sons of West New Brighton, Staten Island; joint filler for the concrete by Philip Carey Company of 114 Liberty Street in New York City; and reinforcing steel from the Carnegie Steel Company of 30 Church Street in New York City and the Concrete Steel Company at 42 Broadway. Rip rap for the Seaplane Ramp was also supplied by Joseph Johnson's Sons (Unrau and Powell 1981: 73-75). Workers appear to have mostly come from Staten Island, but some also came from the Boroughs of Manhattan, Queens, and Brooklyn. Funds for construction were appropriated to the War Department by Public Law No. 189, "An Act Making Appropriations for Fortifications and Other Works of Defense . . ." passed by Congress on July 8, 1918 (Unrau and Powell 1981: 7). Initially, the B & O Railroad carried freight via the railroad line just north of the property, however, after a national railroad strike in 1920 began, contractors had to truck cement from mills at Easton, Pennsylvania and Plainfield, New Jersey (Unrau and Powell 1981: 26). On July 20, 1921, the Constructing Quartermaster turned Miller Field over to the Army Air Service under the command of Major Henry Abby, Jr., the Commanding Officer of Mitchel Field on Long Island (Unrau and Powell 1981: 30).

The completion inspection of Miller Field in January of 1922 noted significant problems of poor workmanship and quality of materials. The report criticized the grade of the hangar group of buildings as being so low as to be constantly susceptible to high tide flooding and stated that the Seaplane Ramp had been graded so low that it acted as a conduit for flood waters to enter the Concrete Apron and buildings. The apron did not have the proper slope to carry storm water away from the hangars into the storm drains. A recent flood in January of 1922 had already caused the buildings to be overcome with six inches of seawater. Additionally, the report noted that the concrete used on the floors (and presumably the apron) of the hangar group was so poor that it formed a white powder that "seeps off". The inspection report found no practical remedy for the flooding and the temporary solution of grading beach sand over the Seaplane Ramp to keep sea water out was adopted (Unrau and Powell 1981: 35-36).

The Works Progress Administration (WPA) made improvements between 1934 and 1936 when it extended the Concrete Apron between the hangars, installed new canopy doors on the seaplane hangar that opened by electric motor and made other building improvements (Unrau and Powell 1981: 41). These improvements also included the demolition of the shops between the seaplane and land plane hangars thus enlarging the Concrete Apron to the northeast but it is unclear if changes were made to the northwest side of the apron as it does not appear to be paved with concrete in later aerial photographs. The proposed plans for enlarging the Concrete Apron are depicted on an undated photo-simulation (Figure 17). These improvements did not seem to include replacement or raising of any sections of the original Concrete Apron to avoid flooding. The presently existing Concrete Apron appears consistent with original photographs and water still collects at low points on parts of what appear to be the original apron area (see Figure 18).

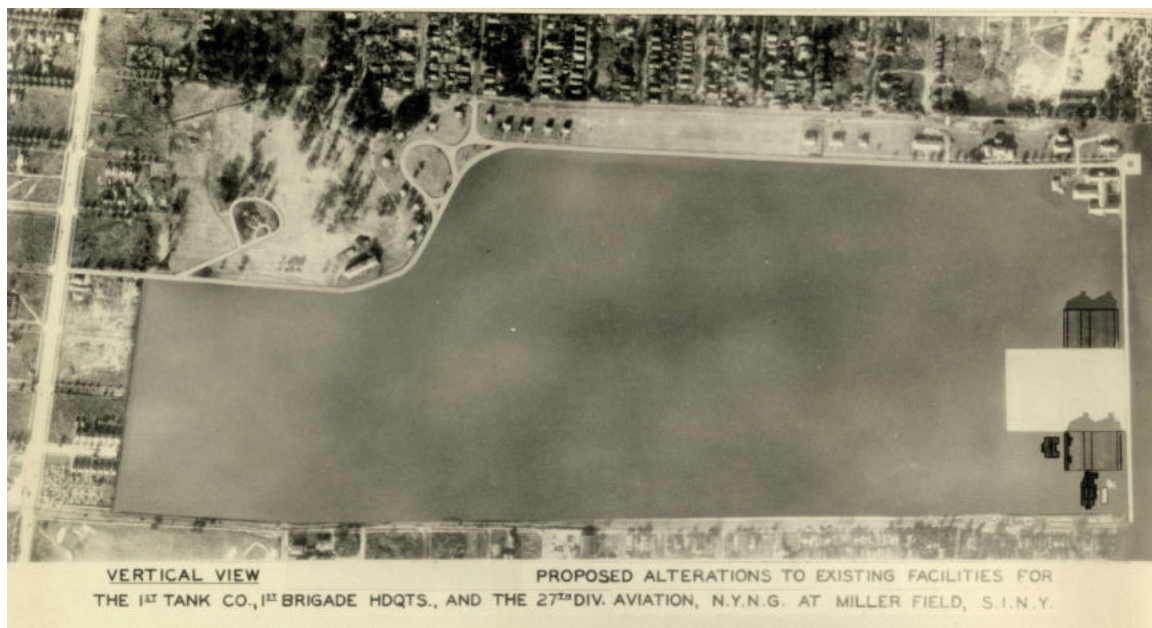


Figure 17 Ca. 1936 photo-simulation image showing proposed improvements to the Concrete Apron. Source: NPS, GATE, Fort Wadsworth, No. 20740.

While the specific uses of the Concrete Apron and Seaplane Ramp are not noted, testing and construction of at least several seaplanes took place at the field during the 1920s, but by the 1930s, use of the Seaplane Ramp apparently diminished or ceased altogether. Aerial photographs depict the ramp almost completely covered with beach sand sometime in the early to mid-1930s.

Miller Field and the Harbor Defenses of New York (HDNY)

Miller Field housed many tenants both before and after World War II, including the Army Air Service (renamed the Army Air Corps in 1926), the Howitzer Company of the 22nd Infantry, the First Tank Company, the First Ordnance Company and the 102nd Observation Squadron of the New York National Guard Air Service. With the arrival of the Howitzer Company, the field became a sub-post of Fort Wadsworth (Unrau and Powell 1981: 38). During World War II, the U.S. Army used Miller Field as a



Figure 18 Concrete Apron and Seaplane Hangar 38, Facing Southwest (Stone 2022).

supply depot as well as the site for a new harbor defense gun battery and a fire control tower site. This new Anti-Motor Torpedo Boat (AMTB) battery was part of a comprehensive harbor defense system consisting of gun emplacements and fire control stations positioned at carefully surveyed and measured locations. AMTB batteries were intended for surface ships and enemy aircraft rather than submarines. In 1942, Fort Hancock at Sandy Hook, New Jersey, became the Headquarters Harbor Defenses of New York (HDNY) heading up all defenses in lower New York Harbor including Fort Hancock, Fort Tilden, Fort Hamilton and Fort Wadsworth ("Fort Hancock Defenses 1907-1945 - Gateway National Recreation Area" nps.gov).

Beginning in January of 1943 the Army installed the first 90 mm guns of AMTB Battery 7 at Fort Hancock followed by batteries at Fort Tilden in Rockaway Point, New York (AMTB 20, AMTB 21). AMTB Battery 19 at Norton Point in Brooklyn was completed in March of 1943 followed by AMTB Battery 11 at Miller Field in April of 1943. At Fort Wadsworth, also on Staten Island, a battery known simply as Battery Construction Number (BCN) 218 was built but never armed with guns. By August of 1943, two M1 90 mm guns had also been placed on Swinburne Island (AMTB Battery 12) east of Miller Field and off of South Beach, Staten Island (Gaines 2009: 75-76). Hoffman Island, directly north of Swinburne Island, had a fire control tower and harbor defense guns as well as being an anchorage point for anti-submarine nets. It was also used by the Merchant Marine as a training school for merchant seamen. Fire control stations for sighting and ranging of targets were found at most of these sites ("Hoffman and Swinburne Islands - Gateway National Recreation Area" available at nps.gov). Battery Livingston at Fort Hamilton in Brooklyn, had two 6-inch guns that were first installed during World War I but were updated in 1941 (Berhow 2021: 209; Gaines 2009: 49).

The harbor defenses at Miller Field consisted of four guns and a fire control tower. The control tower served as the primary base station for Battery Livingston and BCN 218. Typical of AMTB batteries, Miller Field AMTB Battery 11 had four M1 90 mm guns. Two of the guns rested on fixed M3 (originally called T-3) mounts consisting of concrete platforms supported by pilings with a shield to protect the gun and crew. The other two guns rested on mobile M1A1 carriages. The guns could rotate through a full 360 degrees, elevate from -8 to 80 degrees, had a range of 8,000 yards and could be used against both sea and air targets (Gaines 2009: 75-76; Figures 19 - 22). A crew of 15 men manned each gun. In addition, each AMTB battery had a pair of 37 mm automatic weapons that the Army later replaced with 40 mm weapons (Gaines 2009: 75-76). The Army quickly decommissioned the AMTB batteries after the war, eliminating the guns at Miller Field, Swinburne Island, Norton Point, Battery Livingston and abandoning the unfinished BCN 218 in April 1945 (Gaines 2009: 82-83). The guns at Miller Field never saw action against an enemy target. Although it is possible that the concrete gun mounts still lie beneath the sand, their exact location is not known. While the design and construction of the tower is of architectural and

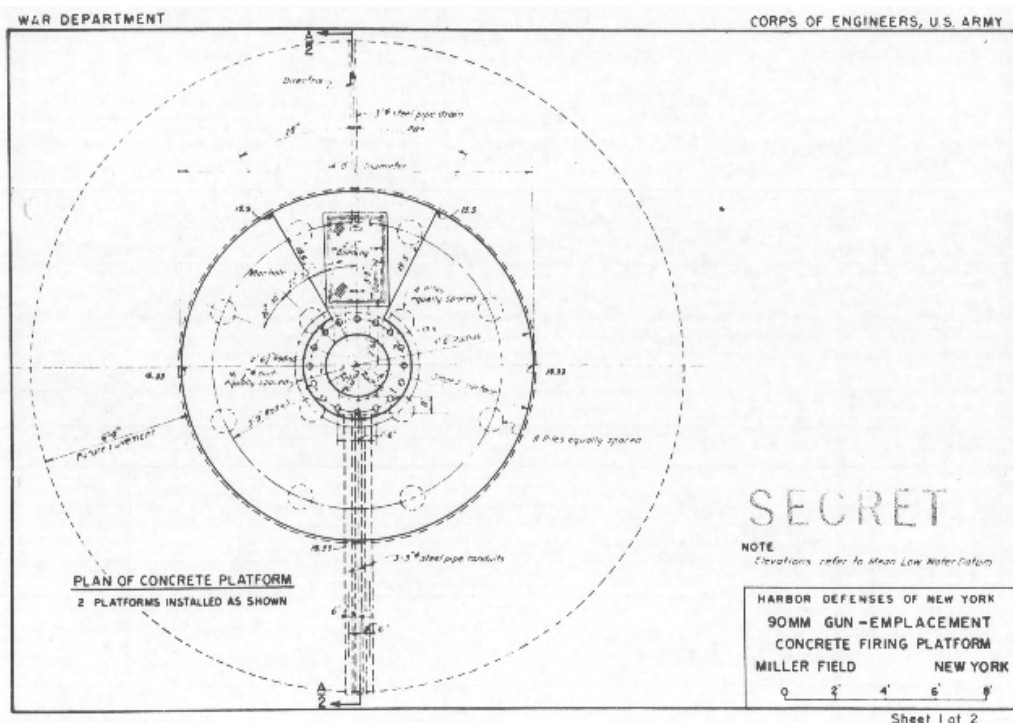


Figure 19 Plan Sheet of Miller Field 90mm Gun Firing Platform. Source, NARA, Report of Completed Works, Other, courtesy of Mark Berhow.

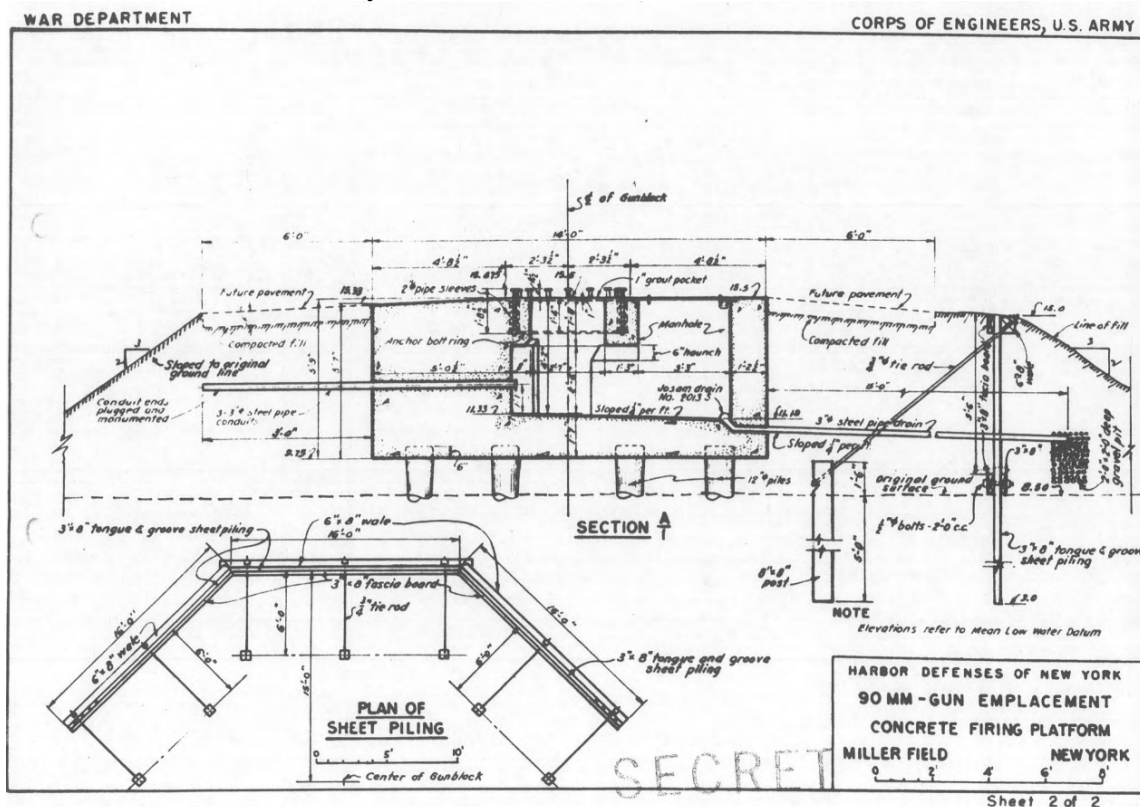


Figure 20 Section Plan of Miller Field 90mm Gun Firing Platform. Source, NARA, Report of Completed Works, Other, courtesy of Mark Berhow.

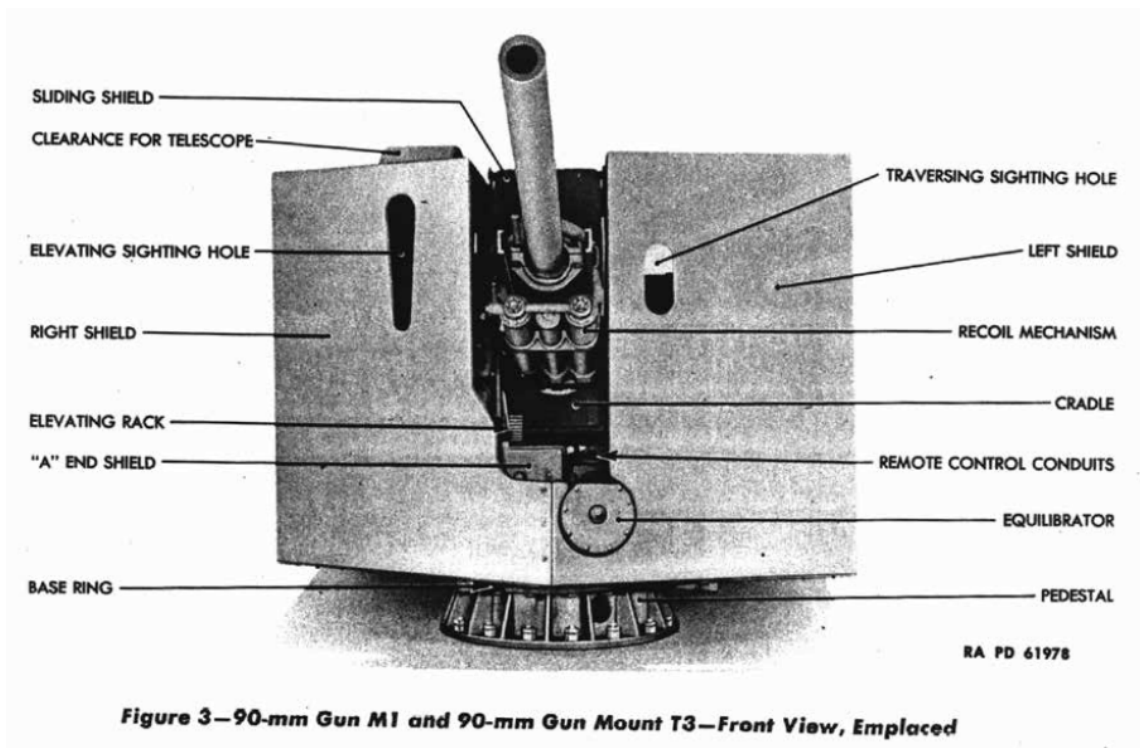


Figure 21 Rendering of the M1 90mm (Fixed) Gun Components. Source: Berhow 2021: 259.

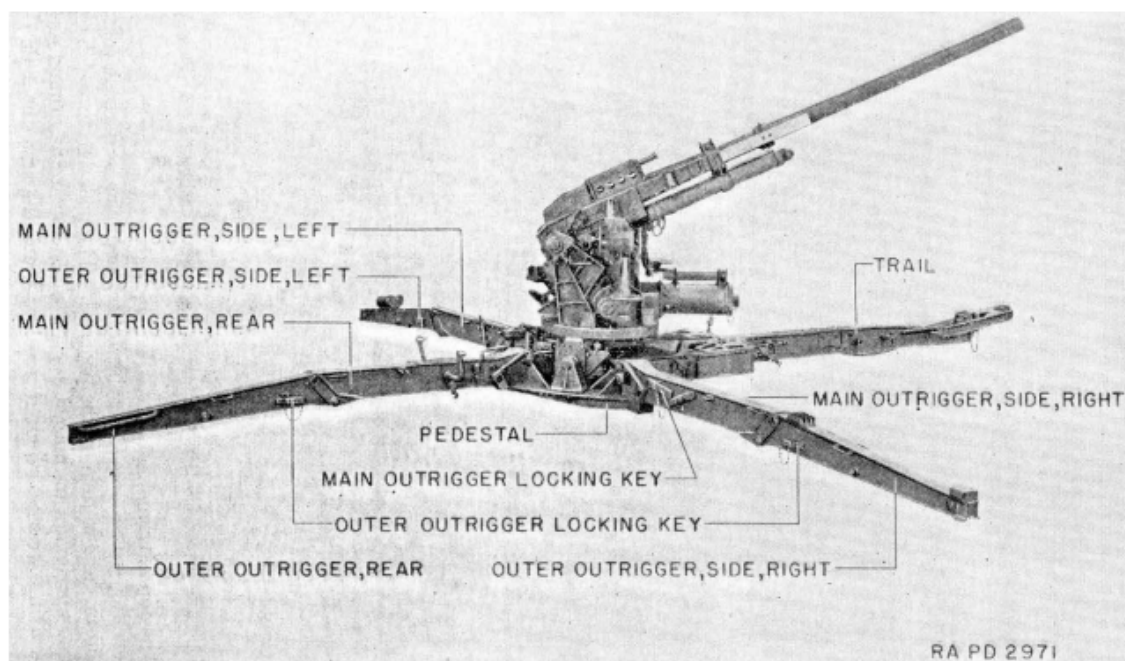


Figure 22 Rendering of the M1A1 90mm (Mobile) Gun Components. Source: Berhow 2021: 257.

engineering significance, its historical significance is best viewed as a contributing resource within the greater context of the New York harbor defense system.

After World War II, Miller Field housed four radar-controlled 120 mm anti-aircraft guns until they became obsolete, replaced by the new Nike Missiles at Fort Hancock and Fort Tilden in the mid-1950s. Miller Field became a maintenance facility for the missile system until 1960. The Army closed Miller Field as an air field in 1969 and transferred the property to NPS as part of GATE in 1973 (Historic Miller Field 2007).

Fire Control Stations

With the use of fire control base end stations, the Army accomplished the sighting and targeting of enemy vessels for the gun batteries of the coastal defense system. Station design varied from tall towers to one-story or partially buried bunkers. Some were even disguised as houses and others as every day structures. Prior to radar, all fire control used triangulation to calculate distance and angle to a target. With the length of one side and two angles known, the remaining angle and the length of the other two sides of the triangle could be calculated. Either vertical or horizontal triangles could be utilized. With vertical triangles, the height of the vertical (height of tower) and the base angle was known. Once the angle at which the instrument was pointed down from a vertical height to see the target was measured, the range to the target could be calculated. Vertical triangles required either an elevated observing instrument or depression position finder (DPF). The depression angle method relied on solving for the range to a target using the known effective height of the observation instrument as the base length and the angle of the hypotenuse (angle of measuring instrument to target) from the horizontal (aka depression angle). A variant of this method used a self-contained base system but a separate range finder called a coincidence range finder (CRF). Vertical-base systems also had to allow for changes of tides and refraction of sight lines due to the atmosphere and small angles being measured (Berhow 2021: 265).

Horizontal triangulation used two separate stations with a carefully measured distance between them. Both stations measured the angle between the base line and the target as well as the azimuth (angle from north) to calculate the distance to the target (Berhow 2021: 265). Each horizontal base station had an instrument for measuring azimuths, a plotting room with plotting board and communication lines between stations and gun positions. Most batteries had multiple possible baselines (alternate base stations). Horizontal base stations with sufficient height, such as the tower at Miller Field, usually had both azimuth instruments and DPFs (Berhow 2021: 272). Base stations that were low to the ground or partially buried, such as the one associated with BCN 218 had only an azimuth instrument ("B.C. Station Battery No. 218 Fort Wadsworth, SI, sheet 2 of 3" NARA, Report of Completed Works, Wadsworth, courtesy of Mark Berhow).

Advantages of the horizontal-base method included the decreased cost of azimuth measuring instruments as opposed to DPFs and the more accurate measurements associated with longer baselines. However, DPFs could locate a target by themselves, if necessary, without the need of a second station, and often became the primary instruments if the station was high enough to have one. Vertical base stations became less practical as longer-range guns developed after World War I (Berhow 2021: 265-267; Figure 23).

With either system, targeting an enemy vessel was a complicated process that involved the following:

- Correctly identify the target.
- Determine the speed and direction of the target.
- Determine the true range of the target from the directing point of the battery at any instant.
- Predict the position of the target at any instant in advance of its present position.
- Make ballistic corrections due to atmospheric or other conditions existing at the moment of firing.
- Make corrections due to range difference between directing point and location of the gun.
- Make adjustments to place center of impact of fire from guns on target.
- Determine deflection to be set on gun so that when fired, it will allow for the travel of the target during the time of flight of the projectile, and effect of wind and drift on the flight

of the projectile. In summary, to furnish accurate ranges and azimuths at which the guns of the battery were to be laid to insure hitting the target upon firing (Berhow 2021: 267).

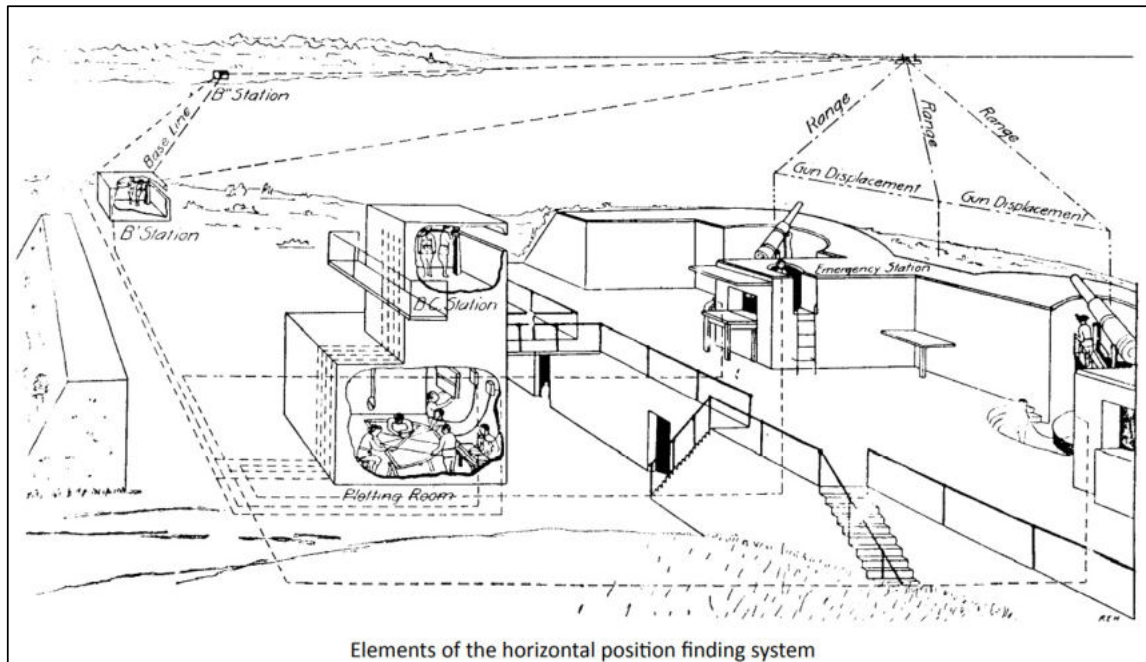


Figure 23 Elements of the Horizontal Position Finding System. Source: Berhow, 2009: 267.

Miller Field Fire Control Tower

Completed on September 22, 1943, the Miller Field Fire Control Tower served as the primary base station for Battery Livingston and BCN 218. A five-level structure, the tower had two instrument observation levels. The uppermost was the base end station for Battery Livingston while the lower instrument level was for BCN 218 (Gaines, 2015: 79). Funded under the U.S. Government's coastal defense war budget and costing \$16,784.80, the building, including walls and ceiling, were made of "splinterproof concrete". "Splinterproof" construction meant that a structure's design protected against the "splinter" effects of large bombs, shrapnel and other debris from a blast as well as from small projectiles during an attack. Original Army drawings for the tower show the structure as 16 feet (4.88 m) square with reinforced concrete walls that were 1-foot (31 cm) thick and a roof that was 6 inches (15.24 cm) thick. Army drawings depicted the heights of the various structure levels in terms of above mean low water level. As such, the drawings give the height of the tower to the top of the parapet as 54.5 feet (16.61 m) above mean low water level. The first instrument elevation was at 38.75 feet (11.81 m) and the second at 47.25 feet (14.40 m). The entire structure sat on 15-ton pilings, each driven 25 feet (7.62 m) into the earth. A steel ladder within a shaft at the rear of the tower provided access to the upper levels of the tower. The first two levels of the tower had air shafts. Documentation for the Historic American Buildings Survey (HABS) in 1978 gives measurements in terms of above ground level (agl). HABS measurements gave the overall height of the tower as 40.5 feet (12.34 m) agl (NARA, Report of Completed Works, Fire Control Station, Miller Field 1943; Behrens and Lewis 1979).

The structure had no toilet or washing facilities. Electricity came from the commercial electrical grid and heat was supplied by coal fired stove. There was a chimney shaft at the rear of the structure and a fresh air shaft on the front. Army records do not list the contractor, labor force or any of the materials suppliers and it is likely that Army engineers produced the plans for all fire control towers due to their classified nature. The tower had both Azimuth and DPF observing instruments but no plotting board and data transmission was via telephone (NARA, Report of Completed Works, Fire Control Station, Miller Field 1943; Figure 24).

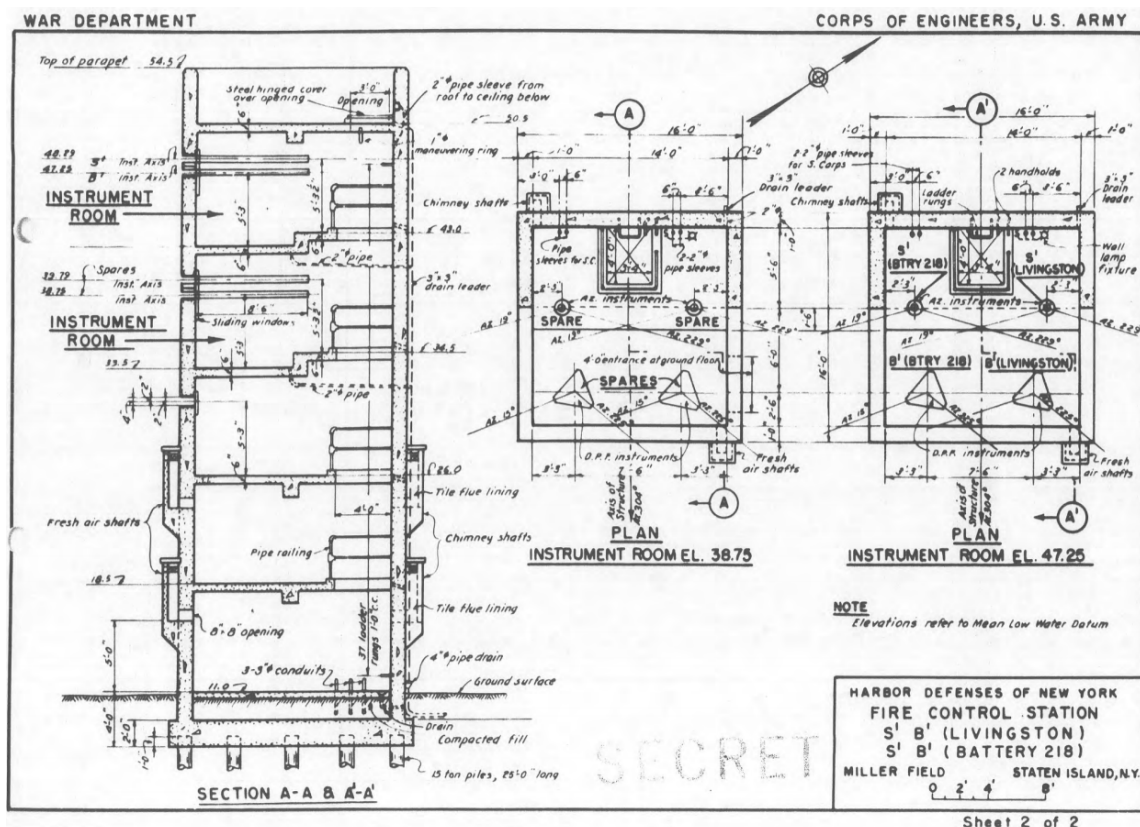


Figure 24 Plans and Section of Fire Control Station, Miller Field. Source: NARA, Report of Completed Works, Fire Control Station, Miller Field 1943, courtesy of Mark Berhow.

The site was partially dictated by the need for a base end station close enough to the stations at Fort Wadsworth and Fort Tilden to be within visual range of a target at the same time while being far enough to obtain accurate measurements. The fact that the Army already owned the property at Miller Field made the site choice obvious.

In 1944, the Army constructed a 100-foot structural-steel tower housing the new SCR-296A (short-range Surface Craft Detection Radar) fire control system for Battery Livingston and BCN 218 at Miller Field 20' southwest of the concrete Fire Control Tower (NARA Supplement to The Harbor Defense Project of New York (HDNY-AN-44) September 1, 1944, courtesy of Mark Berhow). The tower was disguised to resemble a water tower. Related equipment included two electrical generator buildings, equipment and transmitter buildings as well as related fuel tanks and a timber platform with ramp for a 60-inch portable searchlight (Gaines 2009: 7) (Figures 25 - 30).

National Register Evaluations

At the time of its incorporation into the GATE in 1969, about 24 buildings and structures remained at Miller Field. Most of the military structures, including Hangar 33, were removed by 1976 and replaced with a variety of ball playing fields. Although Hangar 38 appeared to be undergoing some renovations during field visits in 2021, its Concrete Apron and the original Fire Control Tower remain unused today. In 1980, the Miller Field Historic District was listed on the NRHP. Contributing elements included only the "Seaplane Hangar No. 38 and the [ca. 1939] Elm Tree Light and their immediate surroundings" (Greenwood and Torres-Reyes, 1976: 7-2; Historic Miller Field 2007). Elements that were not discussed and evidently not considered during the 1976 NRHP evaluation include the Fire Control Tower, Seaplane Ramp and other elements that may or may not have survived the years. The original sites of the AMTB Battery 11, gun emplacement locations are not known, however the site of the base flagpole is still extant about 700 feet northeast of the tower and the remains of pilings for the dock and boathouse can still be seen in the water. Other remnants may exist within the overgrowth northeast of the airfield. As the Miller Army Air Field and outlying structures were part of a system of sea and aerial coastal defense

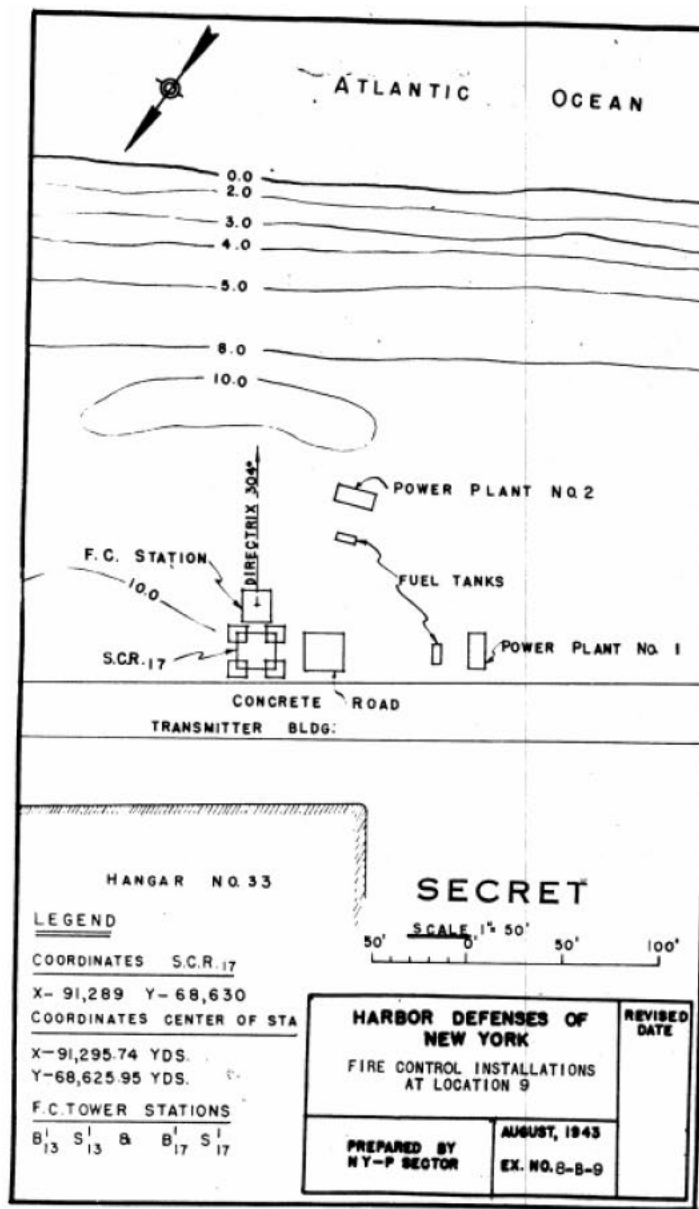


Figure 25 1943 Plan of Miller Field Fire Control SCR-296A radar with early layout of power plant and tanks. This layout was never implemented. Source: NARA, Supplement to the Harbor Defense Project of New York, courtesy of Mark Berhow.

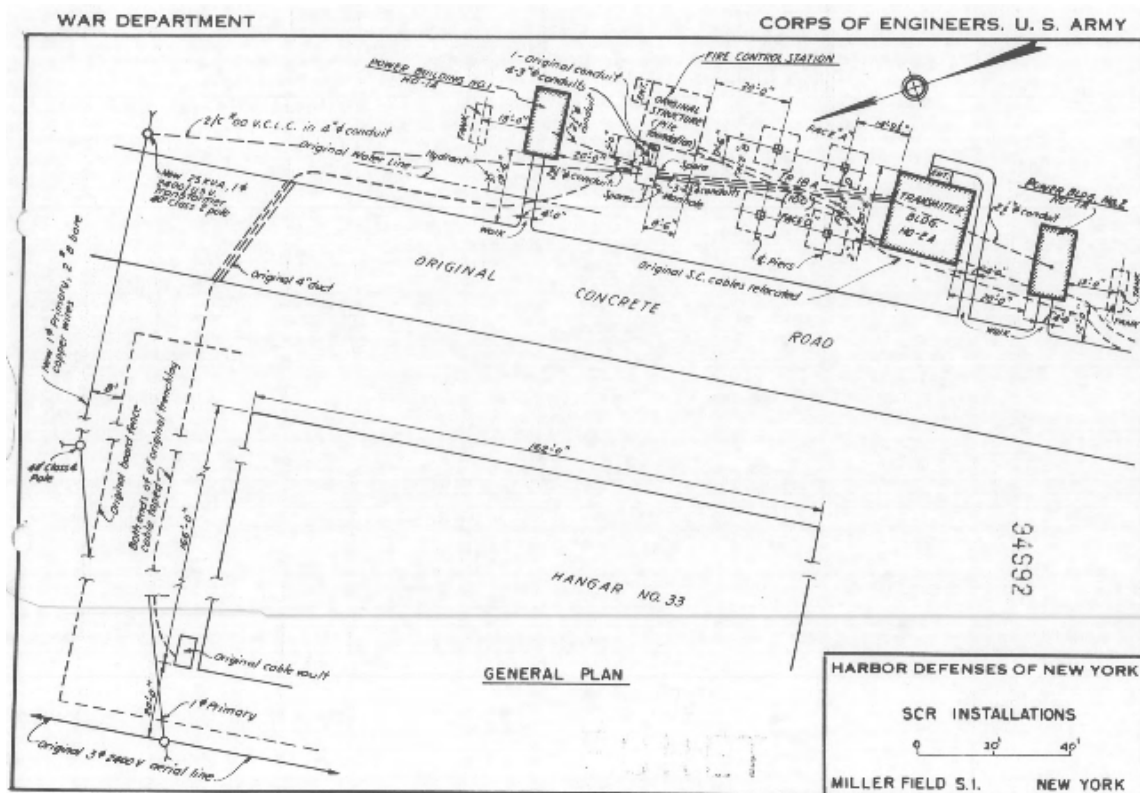


Figure 26 Plan of Miller Field Fire Control showing locations of original Fire control tower and final location of radar equipment installed in 1944. Source: NARA, Report of Completed Works, Other, courtesy of Mark Berhow.

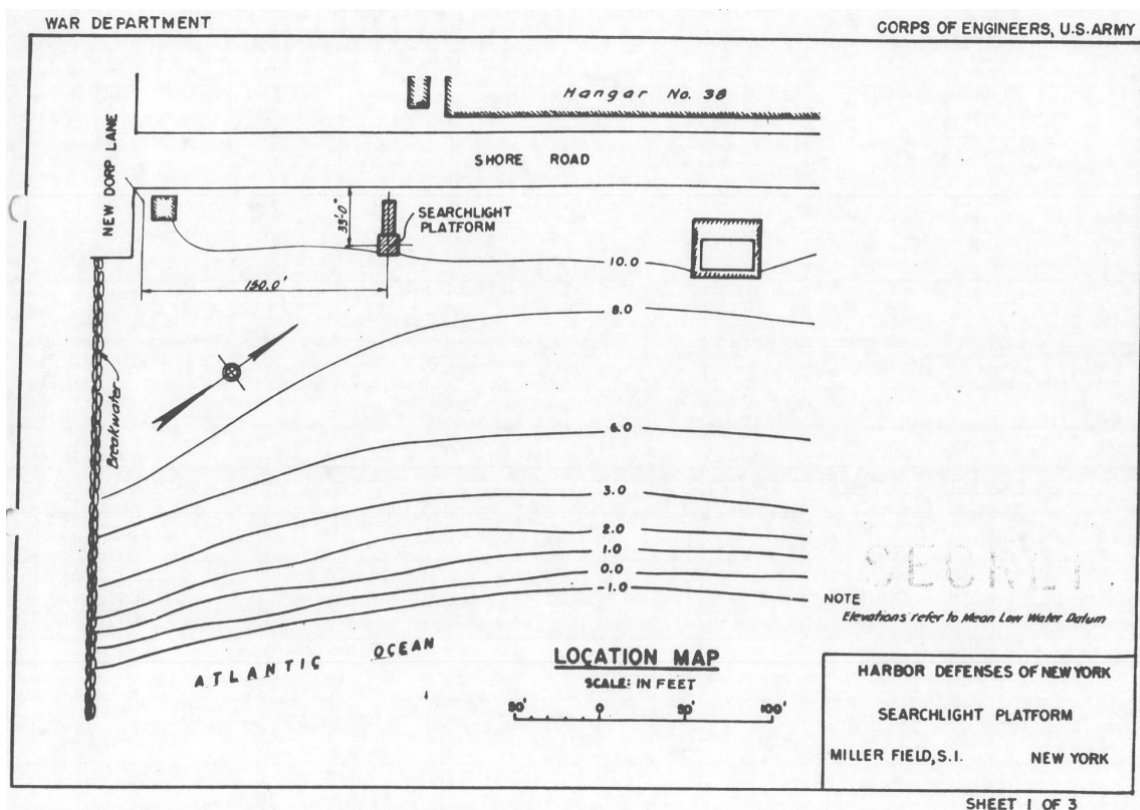


Figure 27 Plan of Miller Field Fire Control showing location of searchlight and other unnamed structures constructed in 1944. Source: NARA, Report of Completed Works, Other, courtesy of Mark Berhow.

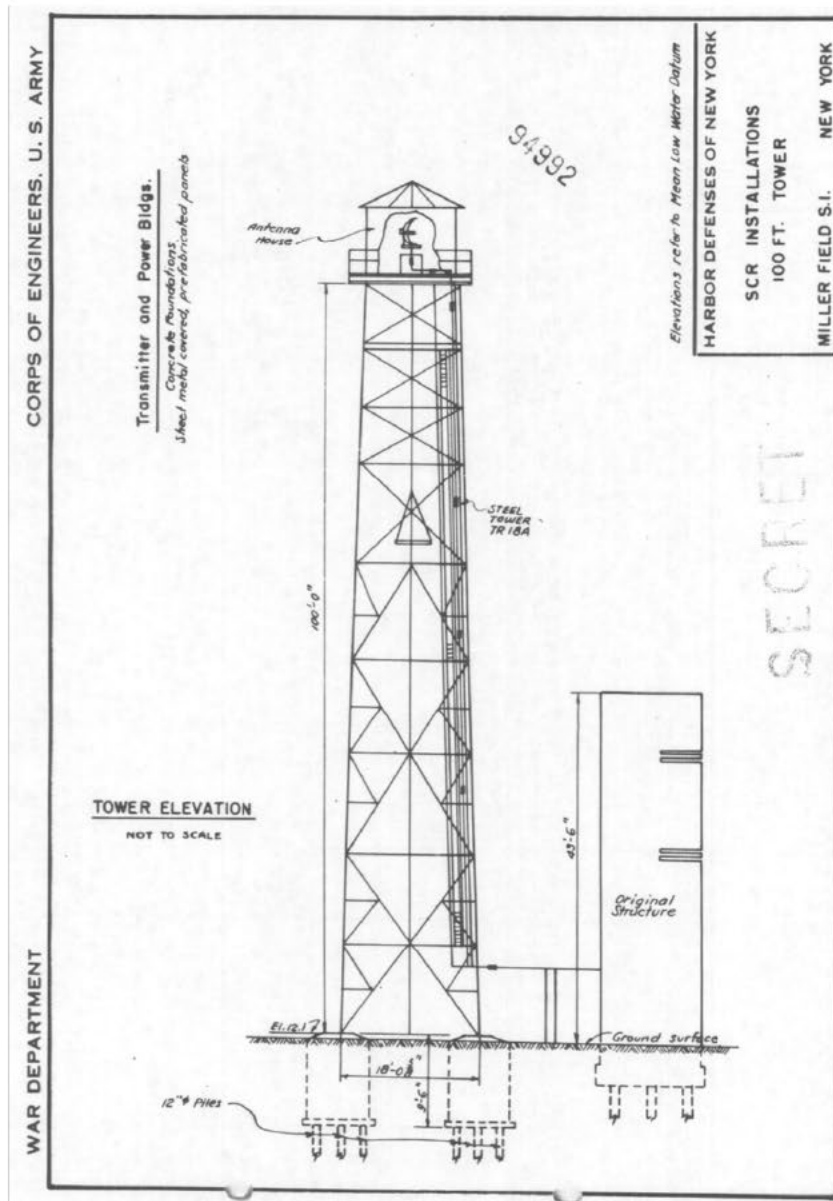


Figure 28 Elevation View of Miller Field Fire control tower and Radar Equipment Installed in 1944.
Source: NARA, Report of Completed Works, Other, courtesy of Mark Berhow.

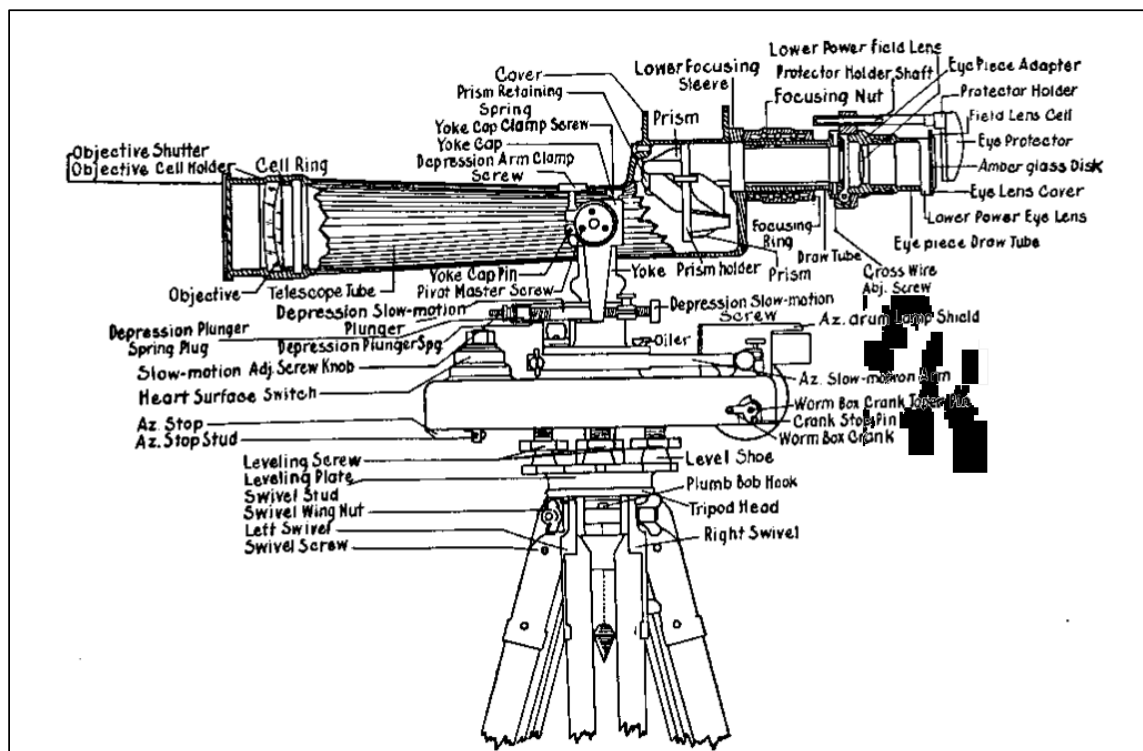


Figure 29 Azimuth Instrument M1910. Source: U.S. War Department 1943: 45.

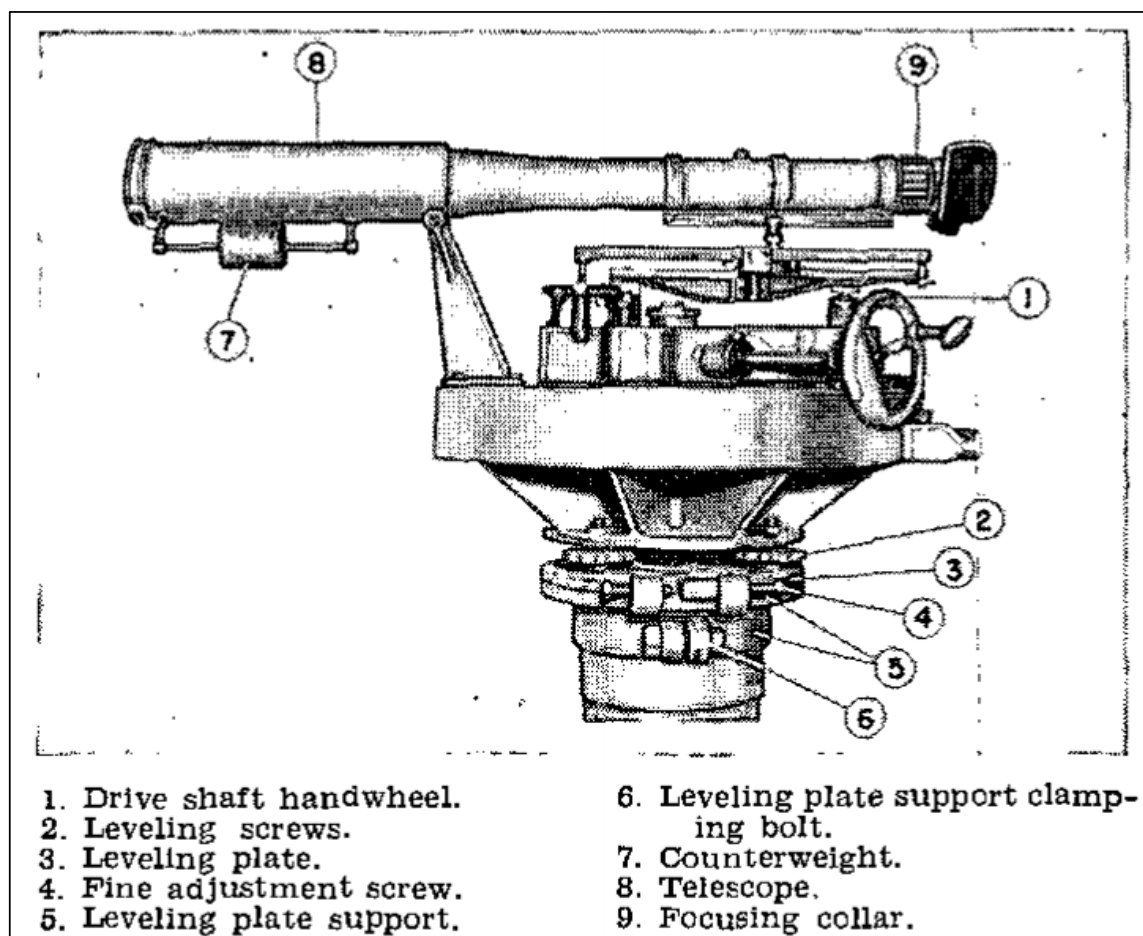


Figure 30 Depression Position Finder M1. Source U.S. War Department 1943: 52.

stations, any extant resources should be given due consideration as to whether they contribute both to the Miller Field historic district and/or to the greater Harbor Defenses of Southern New York.

Description and Present Condition

Concrete Apron

The size and materials of the existing Concrete Apron are consistent with the WPA apron expansion and comparison with historic aerial photographs show deterioration consistent with its age. Comparison of present-day condition with HABS photographs and historic aerials show that as the original joint sealer has deteriorated, there has been significant soil deposited within the joints and cracks causing vegetation to grow, accelerating spalling. The original poor grading of the apron is still very much evident as water continues to collect in the low areas. The Concrete Apron, as a whole is remarkably intact given its age and assuming that the greater Miller Army Air Field Historic District still possesses adequate integrity to be listed on the NRHP, the Concrete Apron still possesses adequate integrity to contribute to the history and interpretation of the air field and should be considered a contributing resource (Figures 18 & 31).



Figure 31 Concrete Apron and Seaplane Hangar 38 From Fire Control Tower, Facing West (Attenborough 2022).

Seaplane Ramp

Although previous research concluded that the Seaplane Ramp was likely removed in the 1930s, NPS discovered evidence that the Seaplane Ramp may still exist beneath the Concrete Apron with drill holes indicating a layer over 18 inches thick under the concrete ramp (Dukes 2012). A review of historic aerial photographs shows that sand has been constantly added to New Dorp Beach for the past 100 years. Records show that the original ramp was 400 feet long and extended approximately 100 feet into the water at mean low tide and it appears that between 80 and 100 feet of beach have been added since 1920. Thus, if the ramp still exists, it is buried under a significant amount of sand. The present distance from the Concrete Apron to mean low tide is approximately 380 feet.

The January 1922 inspection of the completed works at Miller Field suggested that alleviating the flooding problem might be solved by grading the beach sand over the ramp high enough to keep out the sea water (Unrau and Powell 1981:34-36). Although there is no evidence that this was done, a photograph taken sometime between the field's completion and 1938 shows a large berm of sand on the Seaplane Ramp that extends along the beach. This may have been intentional in order to keep the tide waters from entering the buildings at the field (Figure 32).

In March of 1924, the Seaplane Ramp sustained heavy damage from a storm as heavy timbers washed ashore and pounded the concrete. By May, completion of a new stone jetty had already added significant

sand to New Dorp Beach, helping to protect the ramp and concrete of the hangars and apron (Unrau and Powell 1981: 40). Despite this jetty, given the ramp's vulnerability, it is possible that the ramp has sustained damage on numerous occasions within the past 100 years.



Figure 32 Ca. 1930 Image Showing Miller Field, Original Configuration of Concrete Apron and Seaplane Ramp. Source: NPS, GATE, Fort Wadsworth, No. 19337.

Fire Control Tower

The Fire Control Tower at Miller Field is located on the southeast side of an asphalt paved drive between the Concrete Apron and New Dorp Beach near the northeast corner of the property and originally sat east of former Hangar 33. The original description can be gleaned from as-built drawings and Historic American Buildings Survey (HABS) measured drawings. It is square in plan, measuring 16 feet (4.88 m) by 16 feet (4.88 m), being five-stories high with a total height from foundation to top of parapet of approximately 40.5 feet (12.34 m) according to both actual field investigations and HABS drawings (Behrens and Lewis 1979). The original as-built drawings give the height of the tower as 54.5 feet (16.61 m) above mean low water level. The tower has a concrete slab foundation 2.0 feet (61 cm) thick that was supported by 25-foot (7.62 m) wood piles. Walls are 1-foot (31 cm) thick reinforced concrete and the roof is 6-inch (15.24 cm) thick concrete.

The entrance to the structure is from a 4-foot (1.22 m) wide door opening on the northeast side that has a small cast concrete pent roof above. While this entrance was blocked by a large steel plate during the 2021 field visit, during archaeological investigations in March of 2022, this plate was found to be removed, providing access to the interior. The first two stories have fresh air shafts on the southeast side and chimney shafts on the northwest sides of the structure. Ceiling heights of each floor are approximately 8 feet (2.44 m) high. Various metal electrical equipment boxes and electrical conduits are still present largely on the first level, but also present on other levels. Metal ladder rungs embedded in the concrete on the northwest interior walls lead to upper levels and the ladder openings at each level still possess their steel pipe railings. The third level has a 4-inch (10.16 cm) rectangular slit opening clad with a steel plate on the southeast side facing the ocean. Fourth and fifth levels have double viewing slits for azimuth and DPF instruments facing the shore. The slit surfaces are clad with steel plating. Slits on both floors wrap around slightly more than half the width of the southwest and northeast sides. Steel bars placed vertically within the slits support the concrete walls. Both fourth and fifth floors had two azimuth and two DPF instrument mounts which are still extant on the floor. A steel hinged hatch that covered the opening to the roof level is no longer extant.

The roof level is protected by an approximately 4-foot (1.22 m) concrete parapet. There are presently four sections of galvanized 6-inch (15.24 cm) flue pipe connected to the south side of the structure at the fourth and fifth levels. Electricity came from the commercial grid via pole until 1944 when power was fed from a pole at the north corner of the structure through conduit to a manhole situated 5 feet northwest between the tower and the original concrete road. Emergency generators were also installed at this time to serve the new SCR (Radar) tower to the southwest of the Fire Control Tower.

The exterior concrete walls show significant spalling, especially on the fourth and fifth floors of the southwest side. Much less exterior deterioration exists on the southeast and northwest sides, and very little on the northeast side. Although the spalling exposes the reinforcing mesh and reinforcing bars that are very close to the surface of the concrete, none of this damage could be considered structural since it is so close to the surface of walls that are 1' thick. No major stress cracks were noted, but the lower concrete vent structure has been damaged by vandalism and significant graffiti is present on the first level of the exterior and all interior levels (Figures 33 - 44).



Figure 33 Miller Field Fire Control Tower, Northwest and Southwest Façades, Facing East (Attenborough 2022).



Figure 34 Miller Field Fire Control Tower, Northeast and Southeast Façades, Facing West (Attenborough 2022).



Figure 35 Miller Field Fire Control Tower, Detail of Southeast Façade, Facing Northwest (Attenborough 2022).



Figure 36 Miller Field Fire Control Tower, Southwest Façade, Facing Northeast (Attenborough 2022).



Figure 37 Miller Field Fire Control Tower, Detail of Northeast Façade Entrance and Damaged Ventilation Inlet, Facing Southwest (Attenborough 2022).



Figure 38 Interior, Miller Field Fire Control Tower, View of Ladder, Facing Northwest (Attenborough 2022).



Figure 39 Interior, Miller Field Fire Control Tower, Third Level Showing Single Observation Slit, Facing Southeast (Attenborough 2022).



Figure 40 Interior, Miller Field Fire Control Tower, Fourth Level Showing Azimuth Instrument Base Connection (Four Bolts Above Rule), Facing Northwest (Attenborough 2022).



Figure 41 Interior, Miller Field Fire Control Tower, Fifth Level Instrument Observation Slits, Facing Northeast (Attenborough 2022).



Figure 42 Interior, Miller Field Fire Control Tower, Fifth Level Showing Azimuth Instrument Base Connection (Circular Object, Lower Left), Facing Northwest (Attenborough 2022).



Figure 43 Interior, Miller Field Fire Control Tower, Fifth Level Showing DPF Instrument Base Connection, Facing Northwest (Attenborough 2022).



Figure 44 Miller Field Fire Control Tower, Parapet Level, Facing West (Attenborough 2022).

National Register Analysis

Concrete Apron

The present configuration of the Concrete Apron is consistent with the 1934-1936 WPA expansion and appears to be the original material - including design flaws - from the construction of the airfield in 1921 and expansion in the 1930s. Although not stated in the original Miller Field Historic District National Register registration form, it is assumed that the district, and thus the Concrete Apron, are both eligible under Criterion A for its history as well as Criterion C for its design. The period of significance, also not specified, would logically span the period of 1919 through 1969 when the airfield was closed.

Despite cracking and spalling of the Concrete Apron, preventive maintenance can keep further deterioration to a minimum. Given that the apron is now 100 years old, it has held up remarkably well. The Concrete Apron is significant as a contributing resource to the Miller Field Historic District as it was

an integral part of the "hangar group of buildings" and integral to the original design of the airfield. The expansion illustrates the changing needs and role of the airfield due to the changes in aircraft design and use during the early days of aviation.

Integrity

The Concrete Apron retains integrity of location, design, materials, workmanship with some loss of setting, feeling and association due to multiple demolitions and changes over the years. However, the inclusion of the apron to this NRHP listed historic district only strengthens the sense of importance of this historic property.

Seaplane Ramp

GPR investigations performed by H-RG on January 22, 2022 indicated that the Seaplane Ramp appears to be extant (Appendix B). However, it is likely buried by over 6 feet of sand and archaeological STPs consequently did not encounter evidence of the ramp. As such, a definitive evaluation of its integrity and NRHP eligibility cannot be ascertained at this time.

Fire Control Tower

Although within the confines of the Army Air Field property, the Fire Control Tower at Miller Field is more closely associated with the HDNY than it is with the airfield. Despite the decision to locate a fire control base station at Miller Field, the station would have been located somewhere on the south shore of Staten Island regardless of the existence of Miller Field due to distance requirements between base stations. An analysis of the facility performed by the Army in 1944 concluded that the site was needed for its AMTB Battery but that the airfield was no longer necessary for harbor defense (NARA, Harbor Defenses of New York, 1944, courtesy of Mark Berhow). Earlier assessments performed in the late 1920s had already determined that the property was of little use to the government and plans to have it sold off or developed had been considered (Gaines 2009: 55). After World War II, all coastal artillery guns were scrapped. However, the casemates, fire control base stations and towers as well as auxiliary structures were usually abandoned in place and so a reasonable quantity and quality of elements of the HDNY survive today to potentially form a discontinuous historic district.

The Miller Field Fire Control Tower served as a base end observation station for Battery 218 at Fort Wadsworth and Battery Livingston at Fort Hamilton as well as a secondary station in concert with Breezy Point Lighthouse (a disguised fire control tower at Rockaway, Queens). The tower had nothing to do with the everyday workings of the little-needed air field but was an integral part of the HDNY and therefore it would be more logically evaluated individually and as a contributing resource to a Harbor Defenses of New York historic district than as a contributing element to the Miller Field historic district. It could possibly be argued, however that Miller Field should be also considered a contributing resource to a potential HDNY historic district as its original justification for construction was as an Air Coast Defense Station.

Existing Elements of the HDNY

The HDNY was a complex system of fire control stations, command posts, plotting rooms, batteries, mine stations and various support structures that are often adjacent to or even integral with structures that date from the Colonial era through the advent of Radar at the end of World War II. Some sites also contain remnants of later defense developments including Nike missile sites. Remains and conditions vary widely at each location.

Fire control stations constructed for coastal defense during World War II from 1939 through 1941 had a surprisingly diverse spectrum of design, varying in shape and height by region and topographical conditions. Some were in small brick or frame buildings or even houses while others were more utilitarian looking concrete structures. At coastal locations along the Gulf and South Atlantic Coasts with low elevations relative to the coast, base end stations had to be elevated. Most of these stations consisted of a one, two or three-floor house atop or otherwise integrated into a wood, metal, or concrete tower (Berhow 2021: 273). In New England, stations often resembled common "Cape Cod cottages," while other stations appeared to be lighthouses, water towers, or church steeples, and especially around the flat

beaches of Southern California, some resembled oil derricks. A few stations were built on or in the tops of existing structures, such as hotels, office buildings, and bridge towers (Berhow 2021: 275).

New York area towers tended to be square while those in southern New Jersey (Cape May), the Chesapeake and Delaware tended to be round. Most of the World War II stations were single or multi-station towers of reinforced concrete, either round or square in section. In addition to the DPFs, most 1940s stations normally contained azimuth instruments, and some concrete towers contained as many as nine observation instruments (Berhow 2021: 275). The Miller Field Fire Control Tower was a square, two-station structure of five stories constructed of reinforced concrete (splinterproof) with a concrete foundation. The roof was also of reinforced concrete and was conspicuous at 4,000 yards according to the Army's Report of Completed Works (RCW) for Miller Field.

The following cursory comparison with other extant fire control towers and defenses of the HDNY system indicates that the tower at Miller Field is the only extant one of its particular design. A similar tower once standing on North Beach on Sandy Hook, New Jersey was demolished by NPS in the 1980s, but it appears that this tower was one story shorter than the Miller Field tower. Many of the fire control towers within the HDNY have been demolished and the square, five-story design of Miller Field is now unique.

Fort Tilden, Queens, New York

The Fort Tilden Historic District was listed on the NRHP in 1984. A number of gun platforms, casemates and fire control station structures still remain today. These include the bombproof fire control and plotting room (now Building 413) and gun casemates for Battery Harris as well as concrete gun platforms and battery commander's station for Battery 220. Although the structures of Battery Kessler apparently exist, they have been concealed by shifting sands and vegetation. Other structures such as the mine casemate and plotting room and some support structures remain as well. All remains of Battery Fergusson appear to be gone. The roads and railroads that connected the different areas are intact, but the railroad is now covered by sand. Additional fire control towers were once located east of Fort Tilden at Seaside, Arverne, Atlantic Beach, Long Beach, Shore Beach and Zach's Bay. None of these towers remain today (Selvek 2013). Also within Fort Tilden are Nike missile radar and launch areas. Although many Nike buildings remain, the site is used as an NPS maintenance yard and three of the four launch magazines have been capped with concrete.

Rockaway peninsula harbor defenses not within Fort Tilden included AMTB 20 and AMTB 21 as well as a fire control tower known as "the lighthouse". Remnants of AMTB 20 including a CRF building and concrete gun mounts are still extant near the southwest tip of Breezy Point and remains of AMTB 21 appear to be visible west of Beach 222nd Street on the bay side of Breezy Point. The fire control tower, completed in July of 1943 and disguised as a lighthouse still stands on the Jamaica Bay side of the peninsula. This tower has two levels and was used both as a mine spotting station for part of the Ambrose Channel leading into New York harbor as well as a base end and spotting station gun batteries including Battery Kessler at Fort Tilden. This tower is now listing to one side due to the erosion of sand and the entrance is cemented shut (https://www.oocities.org/fort_tilden/). Neither the Fort Tilden Historic District NRHP nomination nor any previous research mentions the Breezy Point batteries or the fire control tower. This is possibly due to the fact that they are outside the Fort Tilden Gateway National Park boundaries and over a mile to the west. However, they are a significant and integral part of the HDNY. The fire control towers were an interconnected network and the Breezy Point tower served as a base end station for BCN 218 at Fort Wadsworth along with the Miller Field fire control station.

Norton Point, Brooklyn, New York

The buildings and gun emplacements at Norton Point are not visible today and are likely buried. Visitors from the Coastal Defense Study Group (CDSG) discovered gun blocks for a 90mm AMTB and another emplacement in the sand in 1997 (CDSG 1997: 7-8; Berhow 2021: 210).

Hoffman and Swinburne Islands

No standing structures remain on Hoffman Island. Outlines of barracks and batteries can be seen and remnants of pilings that once supported piers are all that remain. The fire control tower has been demolished. A brick chimney, remains of piers and building ruins are all that is left on Swinburne Island today. The two islands became part of Gateway National Recreation Area in 1972 and serve as sanctuaries for birds and seals (Hoffman and Swinburne Islands - Gateway National Recreation Area (U.S. NPS) (nps.gov).

Fort Hamilton, Brooklyn, New York

Nearly all remnants of the batteries and fire control stations at Fort Hamilton are either destroyed or buried, although some Endicott period fire control stations still remain. Fort Lafayette, in the water at the Narrows, was destroyed during the construction of the Verrazano Narrows Bridge (CDSG 1997: 7, Berhow, 2021: 209).

Fort Wadsworth, Staten Island, New York

Many gun emplacements remain at Fort Wadsworth but are partially buried. Battery 218 is extant but sealed off and "a large number" of the fire control structures once behind the batteries have been demolished (CDSG 1997: 5-6; Berhow, 2021: 209).

Fort Schuyler, Throgs Neck, New York

Fort Schuyler and the SUNY Maritime College Campus at Throgs Neck, New York has lost most of its old buildings, batteries and fire control structures. Defensive works still exist at the tip of the peninsula. One Endicott period battery remains. (CDSG 1997: 7).

Fort Hancock, Sandy Hook New Jersey

Fort Hancock has some of the most well preserved and interpretive harbor defense structures of the HDNY system. Many gun emplacements from World War I and earlier remain as well as World War II interpretive gun emplacements operated by NPS including Battery Gunnison (renamed New Battery Peck in 1943). Casemates for AMTB Batteries Hancock and Peck remain as well as most other World War II gun emplacements. One fire control station, perhaps the closest in design to the Miller Field structure, formerly on North Beach was demolished in the 1980s (Figure 45). Another fire control base station from the Endicott period remains and is used in interpretive re-enactments (AGFA 2015).

National Register Criteria Evaluation

Criterion A

The Miller Field Fire Control Tower is associated with events that have made a significant contribution to the broad patterns of our history. It represents the history of harbor defense during World War II and the evolution of coastal defenses in the United States. It is therefore eligible for the NRHP under Criterion A both at the state/regional level and at the national level.

Criterion B

The Miller Field Fire Control Tower does not appear to be associated with persons significant in our past and is therefore not eligible for the NRHP under Criterion B.

Criterion C

The Miller Field Fire Control Tower is a noteworthy example of its type, period and method of construction. Despite exterior spalling, the concrete has not suffered structural damage. Original drawings are on hand to aid in restoration. The tower is both a typical representation of its type but it is also unique. The design of the fire control base stations varied greatly depending on location and geography. The Miller Field tower appears to be the only square, five-story tower having three observation levels in existence. A similar three-story tower once extant at North Beach in Sandy Hook, New Jersey is now gone. The Miller Field Fire Control Tower is also highly representative of its type. Although the outward appearance is unique, basic interior design needs for base stations remained constant and the Miller Field tower typifies these requirements. The technical needs for azimuth and DPF equipment remained constant with all towers and the spartan nature of the tower with few creature



Figure 45 Image Showing Fire Control Tower at North Beach, Sandy Hook, New Jersey in 1960. Source: NPS GATE. Courtesy of Shawn Welch of AGFA.

comforts for Army personnel was typical. Although none of the extant fire control towers in the HDNY system retain their observation and measuring equipment, these could easily be added if interpretation was desired.

The Miller Field Fire Control Tower should be considered a contributing resource to the Miller Army Air Field Historic District. Both the airfield and the Fire Control Tower with its associated armaments were originally constructed as harbor defenses and the location of the tower was at least in part chosen due to the existing military presence at the site.

Of greater significance, however, is the importance that the Miller Field Fire Control Tower played in the overall HDNY system. Individual elements of the Harbor Defenses of New York were like cogs in a much larger machine, each dependent on the other. The tower is part of a complex coastal defense system that evolved beginning in the early-nineteenth century to reach its zenith during World War II at which time radar took over enemy vessel observation and targeting tasks. As such, the Miller Field Fire Control Tower should be evaluated within this larger context.

The Miller Field Fire Control Tower should therefore also be considered significant as a component of a wider potential Harbor Defenses of Southern New York Historic District that includes the extant harbor defenses of Miller Field, Fort Wadsworth, Fort Hamilton, Fort Tilden and the Rockaway Peninsula, Fort Totten, Fort Hancock, Hoffman and Swinburne Islands, Fort Schuyler and Norton Point. Further study is needed to fully ascertain the full extent and integrity of this potential historic district. The Miller Field Fire Control Tower is therefore recommended as eligible under Criterion C.

Criterion D

Although the Miller Field Fire Control Tower itself is not eligible under Criterion D because it is not likely to yield information important in history, other extant foundations for supporting structures for the tower

and batteries remain buried in the sand and may contribute to the eventual interpretation of the AMTB 11 batteries and control tower.

Integrity

The Miller Field Fire Control Tower possesses integrity of location. It possesses a reasonably high degree of immediate setting as New Dorp Beach is still much the same as it was since World War II without any modern structures, also preserving the isolated feeling of the setting. The Fire Control Tower also possesses a good degree of design, materials and workmanship as the tower is structurally intact with only exterior spalling at present. Integrity of association is diminished by the loss of supporting structures but all or most of the foundations appear to remain. The AMTB gun battery foundations may yet remain under the sand as is the case with the Seaplane Ramp. Additionally, it is important to note that the integrity of association with the larger HDNY system remains.

RECOMMENDATIONS

Concrete Apron

An addendum to the Miller Field Historic District National Register registration form should add the Concrete Apron as a contributing resource to the district. A specific period of significance for the district should be added to this addendum as well as specifying applicable NRHP criteria. The Apron should be evaluated to determine necessary stabilization and preservation actions including cleaning, sealing of joints and drainage of standing water. Options for interpretation of the hangar, Concrete Apron and field should be considered.

Seaplane Ramp

GPR identified a target assumed to be the Seaplane Ramp. The data indicates it is likely buried at least 6 feet (183 cm) beneath the beach. Two shovel tests were placed within the target footprint and neither reached the feature. Backhoe trenching is recommended to identify and expose the Seaplane Ramp. Once exposed, its integrity and extent can be evaluated to determine if the Seaplane Ramp should be considered a contributing resource to the Miller Field Historic District.

Fire Control Tower

The Miller Field Fire Control Tower should be retained, stabilized, included as a contributing element to the existing Miller Field Historic District, eventually restored and interpreted with strict adherence to the Secretary of the Interior's Standards for Historic Preservation. The remaining supporting structure foundations along New Dorp Beach should be cleared of brush and excess sand and stabilized as part of the interpretive framework. If interpretation is not possible, an adaptive use for the structure should be found. Cleaning of the beach of brush and stabilization of the remaining foundations would go a long way towards this goal.

Because proper understanding and interpretation of the Miller Field Fire Control Tower as part of a potential "Harbor Defenses of Southern New York Historic District" is dependent on a full understanding of the entire system and a full understanding of what components of this system remain, this evaluation recommends that a comprehensive survey of all surviving components of the various eras of the entire system be undertaken. This study should include the extant harbor defenses of Miller Field, Fort Wadsworth, Fort Hamilton, Fort Tilden and the Rockaway Peninsula, Fort Totten, Fort Hancock, Hoffman and Swinburne Islands, Fort Schuyler and Norton Point. Each element at each location should be cataloged, and evaluated for its contributing status to this larger potential historic district as well as its integrity. A comprehensive study of all harbor defense systems would be a daunting task, involving existing elements dating from the colonial period through the Cold War era. Therefore, it is recommended that this study focus on the period from World War II through the Cold War for a period of significance of approximately 1940 through 1990. Additional studies could later focus on earlier defenses. There are numerous private and non-profit groups that could aid in a concerted effort to achieve this goal in a manageable way. These include the Coast Defense Study Group and the Army Ground Forces Association.

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Ca. 1922 image showing Concrete Apron, Seaplane Ramp and buildings. Source: NPS, GATE, Fort Wadsworth, No. 29098.

1925 Image Showing Concrete Apron, Seaplane Ramp and Buildings. Source: NPS, GATE, Fort Wadsworth, No. 19255.

Ca. 1936 photo-simulation image showing proposed improvements to Concrete Apron. Source: NPS, GATE, Fort Wadsworth, No. 20740.

Ca. 1930 image showing Miller Field. Source: NPS, GATE, Fort Wadsworth, No. 19337

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Liebeknecht, William, Nadine Sergejeff and Benjamin Harris. Archaeological Investigations for Proposed Roadway Improvements at Miller Field, Gateway National Recreation Area Richmond County, Staten Island, New York. Prepared for Potomac-Hudson Environmental, Inc. 2005.

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Appendix A

Scope of Work and Modification

**Scope of Work for Investigations
on Miller Field
Gateway National Recreation Area
Staten Island, NY
in connection with the
South Shore of Staten Island Coastal Storm Risk Management Project**

I. Introduction

The New York District, Army Corps of Engineers (Corps) is currently in the Preconstruction Engineering and Design (PED) phase of the South Shore of Staten Island Coastal Storm Risk Management Project (SSSI). The project consists of the construction of a buried seawall along the southeastern shore of Staten Island to provide a first line of defense against coastal storms (Enclosure 1). Part of the project is on National Park Service (NPS) land, in Gateway National Recreation Area, on the Miller field Unit. USACE has responsibilities under Section 106 of the National Historic Preservation Act to carry out the identification and evaluation of historic properties within the Area of Potential effect. This Scope of Work is to complete the identification and evaluation of historic properties on Miller Field.

USACE has corresponded with NPS to determine the work that is required to take place before construction. A geoarchaeological investigation has already been carried out (under ARPA permit 2017.GATE.01) to assess the potential for deeply buried cultural resources along the line of protection. Pursuant to the correspondence the work that needs to occur is 1) carryout the recommendation from the geoarchaeological investigation to excavate one backhoe trench on Miller Field to look for deeply buried cultural resources 2) conduct a shovel testing survey of all areas that will be impacted by construction, 3) evaluate the seaplane ramp and concrete apron as potential contributing elements to the existing Miller Army Air Field National Register Listed Historic District, and 4) evaluate the Fire Control Tower as an individual resource for the National Register and as a contributing element to the existing Miller Army Airfield Historic District.

This work will require an ARPA permit. USACE will apply for the ARPA permit, but this contract will need to be executed before USACE can submit the application because the CVs of the Field Director and Principal Investigator are needed to apply for the ARPA permit. Once the contract is executed, the contractor can prepare the health and safety plan, and background research, but fieldwork cannot commence until USACE receives the ARPA permit.

All of these investigations (backhoe trench, shovel testing, National Register evaluation of Seaplane Ramp and Concrete Apron, and National Register evaluation of the Fire Control Tower) will be conducted and written up into one draft report that will be received by USACE within eight weeks of the completion of fieldwork. USACE will solicit comments on the report from NPS, New York State Historic Preservation Office (NY SHPO), and New York City Landmarks Preservation Commission (NYCLPC). All comments will be compiled and returned to the contractor to address in the final report.

II. Contractor Services and Required Investigations

- A. The general services to be provided under this contract are those required to conduct cultural resources investigations, recordation, and preparation of reports within the timetable described below.
- B. The Contractor shall be responsible for conducting, in the manner prescribed, the work detailed below. Failure to fully meet the requirements of this scope of work may be cause for termination of work for default of the contract, or for an evaluation of unsatisfactory upon completion of the project.
- C. This scope of work requires the completion of the following tasks described below.

Task 1 – Health and Safety Plan

Prior to initiation of fieldwork the contractor shall prepare a “Health and Safety Plan” (HASP). The Health and Safety Plan shall serve as a safety plan and research strategy for all work. The HASP and all work will comply with Engineering Manual EM 385-1-1, "Safety and Health Requirements Manual" dated 30 November 2014 and all other applicable regulations and guidelines. The manual is available from NAN.

Task 2 – Backhoe Trench on Miller Field for Deeply Buried Sites

The recommendations from the Geoarchaeology investigation (Hunter Research and John Stiteler 2020) will be executed. The recommendations state:

“Tests along the section of the project alignment from the southwestern end of Cedar Grove Beach to the southeastern corner of Miller Field (DH-11-GP8) encountered intermittent evidence of a buried A horizon and a thin but relatively stable soil profile at depths ranging from one to 6.5 feet below the surface (Figures 7.2 and 7.3). This stretch of shoreline forms part of a setting that includes the former headwaters of Bass Creek and the upland zone traversed by New Dorp Lane. The soil conditions offer some prospect that prehistoric archaeological resources could survive, although their examination will be hampered considerably by the high water table, which typically is above the level of the A horizon.”

The area that needs to be investigated is mostly off of NPS property, but part of the sensitive area extends onto Miller Field. The geoarchaeology report recommends work off of Miller Field (which is being carried out in a separate SOW) and excavating one 100-foot-long backhoe trench on Miller Field. The recommendations continue:

“To address both the prehistoric and historic archaeological potential of this area, site-specific background research and mechanically-assisted excavation is recommended in the form of a series of four 100-foot-long trenches, or their linear equivalent, positioned perpendicular to the shoreline. Three trenches are suggested for the area southwest of New Dorp Lane and a single trench to the northeast. The excavation team should include both a qualified

geoarchaeologist with expertise in Middle Atlantic coastal prehistory and an historical archaeologist with knowledge of Staten Island history.”

This task includes using the 2020 geoarchaeology report as background, researching the project area, excavating the backhoe trench, having a geomorphologist examine the exposed stratigraphy to assess if there are any buried soils present that have the potential to contain cultural materials, and writing the findings up and making recommendations in the draft report.

References

Hunter Research and John Stiteler

2020 Geomorphological/Archaeological Study South Shore of Staten Island Coastal Storm Reduction Project Borough of Staten Island, Richmond County, New York. Prepared for Princeton Hydro, Ringoes, NJ. Under contract to US Army Corps of Engineers, New York District.

Task 3 – Shovel Testing Survey of Areas within Construction Limits

A portion of this project’s Area of Potential Effect (APE) has already been surveyed. In 2005, a survey was carried out by Panamerican Consultants, Inc. of the project APE at that time. Now, the project is being designed for construction and the APE of the undertaking has changed significantly and many additional areas need to be surveyed.

The area to be shovel tested in this SOW is 12.3 acres in size (Enclosure 2). ArcGIS shapefiles for the survey locations will be provided to the consultant and to NPS by the Corps. Shovel test pits will be spaced every 15 meters. This work will be conducted following the *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State*. If a shovel test contains an artifact, eight radial shovel tests will be excavated in the cardinal directions every 1-3 meters from the initial positive shovel test to determine if the find is part of a site or an isolated find. Any sites and isolated finds will be recorded to New York state standards and submitted as attachments to the report resulting from this investigation. Interim, draft, and final reports will be submitted to the Corps for review and comment.

As background research, the contractor is to review the previous 2005 report that was prepared for this project. It provides the Phase IA literature search background for the work proposed in the SOW. The citation is provided below and this report will also be supplied by the Corps.

Panamerican Consultants, Inc.

2005 Phase I Combined Erosion Control and Storm Damage Reduction Protection Feasibility Study, South Shore of Staten Island, Richmond County, New York. Prepared for Northern Ecological Associates, Inc. Under Contract to U.S. Army Corps of Engineers.

Task 4 – Collection Management

Bulk materials such as fire cracked rock, glass, mortar, brick, and shell will be sampled, weighed, and discarded in the field with only a representative sample retained. A representative sample will be placed within one (1) 8x10 bag. In the event that limited amounts of these materials

are discovered they will be retained. Discard of these materials will only be made following NPS approval. All diagnostic material will be collected separately. Prior to accessioning, the Consultant shall prepare a spreadsheet detailing all recovered artifacts (including counts) and provide the list to NPS for review. This review is in order to identify materials that do not need to be accessioned into the park's permanent collection and in turn cut down on the Consultants time spent accessioning the artifacts into ICMS. Soil samples from all features encountered during the project will be collected and handled appropriately for processing and analysis. No soil samples will be cataloged.

Artifacts collected during field investigations and determined by NPS to be retained will be cataloged using the Interior's Collection Management System (ICMS) or its successor Museum Collection Management System (MCMS), according to standards and terminology used by NPS archaeology and collection standards. After the acceptance of the Final Report, all artifacts and the artifact catalog will be returned to Gateway National Recreation Area's Chief of Cultural Resources at 210 NY Avenue, Staten Island, NY.

Task 5 - NR Eligibility Assessment of the Fire Control Tower

The buried seawall traverses the beachfront at Miller Field, in front of the Miller Army Air Field National Register (NR) Listed Historic District. This historic district is a former Army air base established in 1919-1921 after WWI as part of a system of aerial coast defense stations supplementing existing coast defenses. The Fire Control Tower is adjacent to, but not included in, the Miller Army Airfield Historic District (Enclosures 3 and 4). The buried seawall design directly intersects with the Fire Control Tower. For the project to move forward, the Fire Control Tower will need to be demolished. The Fire Control Tower was built in 1943 to serve as a "base end station" which aided location of offshore targets through triangulation and worked in concert with stations at Fort Wadsworth on Staten Island and Fort Hamilton in Brooklyn (Panamerican Consultants, Inc. 2005). This structure is owned by the NPS but was not addressed in their April 2014 Final General Management Plan/Environmental Impact Statement (GMP/EIS). This structure was not included as a contributing element to the Miller Army Airfield Historic District in the NRHP Nomination Form (Greenwood and Torres-Reyes 1977). This structure was briefly addressed in the 2005 Panamerican Consultants, Inc. report titled *Phase I Combined Erosion and Storm Damage Protection Feasibility Study, South Shore of Staten Island, Richmond County, New York*. The report indicated that due to the structure's lack of integrity it was neither an individually eligible resource nor a contributing element to the historic district, however USACE and NPS agreed to further study this building. There is a similar Fire Control Tower in Cape May, NJ that is listed on the NR. Later, in 2019 the Fire Control Tower was assessed for NR eligibility by AKRF as part of the Hurricane Sandy Survey they were contracted to do by NYOPRHP. The findings of this work were that the Fire Control Tower is not eligible for the NR as an individual resource or as an addition to the existing historic district. The research and justification for this determination are not available to the public. Since neither USACE nor NPS have access to the research used to make this determination, this NR evaluation is being conducted to produce results that are available to the USACE, NPS, and the public.

This task is to assess the Fire Control Tower for National Register eligibility as both an individual historic property in its own right, and as an addition to the existing Miller Army Air Field Historic District. The contractor shall conduct research at local and online repositories. Copies of documents and plans shall be obtained, as practicable, through photography or photocopy. An

annotated list of all relevant historic documents shall be generated and shall include information on the extent and location of the resources encountered.

Information concerning the designing, planning, construction and modification to the structure shall be solicited from various sources, such as the following:

-
- New York State Historic Preservation Office (NYSHPO);
- National Park Service, Gateway National Recreation Area;
- University Libraries;
- Local libraries and archives;
- Local historical societies

The information gathered during archival research shall be synthesized and used to build a historical context within which the circumstances surrounding the construction and use of the Fire Control Tower can be objectively understood and an evaluation of its NRHP eligibility can be determined. The Fire Control Tower will be evaluated for the NRHP as both an individual historic property and as a contributing element to the existing Miller Army Air Field Historic District. This evaluation will be done with archival research and examining the exterior of the Fire Control Tower. Access to the interior of the Fire Control Tower cannot be guaranteed.

References (available from USACE NAN):

AKRF

2019 Architectural Resources Survey Summary Historic Resources Survey of Selected Waterfront Communities: Staten Island, New York.

Panamerican Consultants, Inc.

2005 Phase I Combined Erosion Control and Storm Damage Reduction Protection Feasibility Study, South Shore of Staten Island, Richmond County, New York. Prepared for Northern Ecological Associates, Inc. Under Contract to U.S. Army Corps of Engineers.

Task 6 – Evaluation of Seaplane Ramp and Concrete Apron as Contributing Elements to the Miller Army Air Field Historic District

The buried seawall will also traverse the area where a seaplane ramp was once located. Originally, there was a seaplane ramp that brought seaplanes from Hanger 38 and the concrete apron down to the water of the Lower Bay (Enclosures 3 and 4). Previous research suggested that the seaplane ramp was removed in the 1930s (Pirrello 2015). In 2012 the NPS was conducting monitoring for the installation of a bike path near this area. During this monitoring, NPS located what could be the edges of the old seaplane ramp preserved beneath the Concrete Apron (Dukes 2012). This report is available from New York District and the citation is provided below. This task is to (1) conduct fieldwork to determine if any physical remains of the Seaplane Ramp remain en situ, and (2) if remains are extant, conduct documentary research to and evaluate the Seaplane Ramp as a contributing element to the existing historic district.

Additionally, the Concrete Apron is associated with Hanger 38 (Enclosures 3 and 4), but it itself has never been evaluated as a contributing element of the Historic District. USACE and NPS

plan to conduct repair of the concrete apron as mitigation for the impact the South Shore of Staten Island project will have to the setting of the Miller Army Air Field Historic District. The research performed in this task will be used in the future to support the restoration project. For this task, conduct documentary research and a field site visit to evaluate the Concrete Apron as a contributing element to the existing Historic District.

The eligibility of the structures to be evaluated shall be discussed with reference to appropriate eligibility criteria. The contractor may wish to consult the National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation.

The report shall provide a description of each building/structure to be evaluated and may include:

- General and specific design elements;
- Dimensions, materials, and sources;
- Equipment or innovative technologies used during construction;
- Use and operation

The documentation shall provide a historical background to the construction and use of the Fire Control Tower, Seaplane Ramp, and Concrete Apron utilizing appropriate contextual and site-specific information. Such information may include, but not be limited to:

- Dates of construction, operation, alteration and additions;
- Information about engineers, architects, planners, manufacturers, contractors, foremen, suppliers, operators, etc. associated with construction;
- Source of labor force;
- Significant events or figures in the structure's history;
- The economic, transportation, natural resource, power source, topographic and other considerations in the selection of the building site;
- Sources of funds for construction;
- Governmental, corporate, etc. involvement in construction;
- Comparisons of the structure to other properties of its era and type in the region.
- Associated environmental features

The Fire Control Tower, Seaplane Ramp, and Concrete Apron shall be clearly delimited on a United States Geological Survey (USGS) map as per *Bulletin 16A*. Copies of historic maps and plans shall be included as an appendix to the document.

Each of the structures will be evaluated separately for eligibility to the NRHP. There will be a Recommendations section in the report that states the finding of this evaluation for each building/structure separately.

References

Dukes, Joel

2012 Archaeological Monitoring Overlay and Expansion of Bike Path on Miller Field. PEPC
35299, NRAP GATE 2012 A.

Task 7 - Report Preparation

The contractor will analyze the background research, field data, and historical research conducted and write a report that explains the methodology and results of the work along with any recommendations for future work. Any isolates or sites recorded during the fieldwork phase will be written up as site and isolate forms and attached to the report. If a site(s) is recorded, a recommendation will be made on their National Register of Historic Places (NRHP) eligibility or if future work is required to determine their NRHP eligibility. The USACE Project Archaeologist will be responsible for submitting any site or isolate forms as well as the draft and final reports to the NYSHPO through the Cultural Resources Information System (CRIS) as PDFs. All draft reports and forms to be submitted to NPS for review prior to submission to NYSHPO. The Contractor shall prepare draft and final reports. The final report will incorporate all comments received from the Corps and other reviewing agencies.

The reports produced by a cultural resource investigation is of potential value not only for its specific recommendations but also as a reference document. To this end, the report must be a scholarly statement that can be used as a basis for any future cultural resources work. It must meet both the requirements for cultural resource protection and scientific standards of current research as defined in 36 CFR Part 800 and the Councils Handbook.

1. Three printed copies, one digital PDF version, and one digital word document of the draft report will be prepared and submitted to the Contracting Office according to the schedule established in Section VI "Project Schedule", below. The draft report will be reviewed by the Corps, NPS, NYSHPO, NYCLPC and possibly other agencies. The USACE Project Archaeologist will be responsible for soliciting all comments on the draft report, including uploading A PDF of the draft report to CRIS for the NYSHPO to review. All comments from the reviewing agencies will be transmitted to the Contractor via the Corps Project Archaeologist.

2. Six bound paper copies of the final report shall be submitted to the Contracting Office according to the schedule established below in Section VI "Project Schedule". Each paper copy shall have a labeled CD containing one copy of the report in PDF format, one copy in word format, and all spatial data in an ArcGIS desktop Map Package. The final report shall address all comments made on the draft report. The USACE Archaeologist will be responsible for uploading the final report to CRIS as a PDF.

Draft Report:

The work described in the tasks above shall result in a report that includes a discussion and synthesis of all data gathered to analyze the backhoe trench for buried soils, conduct 12.3 acres of shovel testing, and evaluate the NRHP eligibility of the Seaplane Ramp, Concrete Apron, and Fire Control Tower. Digital photographs will be inserted into the report.

Final Report:

The final report shall address all comments received from the Corps, NYSHPO, NPS, and NYCLPC. Six (6) printed and bound copies of the final report shall be submitted to the Corps. In the back of each report, there will be a CD that contains one (1) digital PDF copy of the report, one (1) digital word file of the report, and one (1) ArcGIS Map Package containing all of the spatial data used in the report.

Task 8 – ARPA Permit Fulfillment

The contractor's Field Director and Principal Investigator will be on the ARPA permit. During the application process, these individuals will need to submit their CVs to USACE to submit to NPS with the ARPA permit application. The contractor is responsible for fulfilling the terms of the ARPA permit, including but not limited to: producing a draft report of the investigation, making edits to the report based on reviewer comments, cataloging all artifacts and samples collected during the fieldwork in ICMS, getting acceptance from NPS on the ICMS records, returning the artifacts and samples to NPS, and responding to requests for information from NPS to close the ARPA permit.

Task 9 - Project Management

The contractor shall ensure that all requirements of this Scope are fulfilled, and that there is a timely submission of all reports.

III. Project Records

A. All original notes, forms, and maps will be retained and curated as provided by 36 CFR Part 79.

IV. Report Format and Content

A. The draft and final reports shall have the following **CHARACTERISTICS**:

1. The draft and final copies of the report shall reflect and report on the work outlined in Section II (Contractor Services and Required Investigations) above. They shall be suitable for publication and be prepared in a format reflecting contemporary organizational and illustrative standards of professional archaeological journals. The draft report will be revised to address all review comments.
2. The report produced by a cultural resources investigation is of potential value not only for its specific recommendations, but also as a reference document. To this end, the report must be a scholarly statement that can be used as a basis for any future cultural resources evaluation. It must meet both job requirements for cultural resources protection and scientific standards as defined in 36 CFR Part 800 and in the "The Treatment of Archeological Properties: A Handbook" (1980) published by the Advisory Council on Historic Preservation.
3. All interim, draft and final copies of the report shall reflect and report on the work required by this scope.

B. **PAGE SIZE AND FORMAT.** Each report shall be produced on 8 1/2" x 11" archival stable paper, single spaced with double spacing between paragraphs. The printing of the text should be letter quality. All text pages, including figures, tables, plates and appendices must be consecutively numbered.

C. Six final copies of the report, with digital photographs, shall be submitted in a hard-covered binder suitable for shelving.

D. The **TITLE PAGE** of the report shall include the municipalities and counties incorporated by the project area, the author(s) including any contributor(s). The Principal Investigator should be identified and is required to sign the original copies of the report. If the report has been written by someone other than the contract Principal Investigator, then the cover of the publishable report must bear the inscription "*Prepared Under the Supervision of (NAME), Principal Investigator*". The Principal Investigator in this case must also sign the original copies of the report.

E. A **MANAGEMENT SUMMARY** or **ABSTRACT** shall appear before the **TABLE OF CONTENTS** and **LIST OF FIGURES**. It should include a brief project description including the location and size of the project area, the methods of data collection, the results of the study, evaluations and identification of impacts and recommendations. It should also include the location of where copies of the report are on file.

F. The **TABLE OF CONTENTS** will include a list of all figures, plates and tables presented in the report.

G. The **INTRODUCTION** will state the project's purpose and goals as defined by the scope of work and will include the applicable regulations for conducting this work and will contain a general statement of the work conducted and the recommendations proposed.

H. The **BACKGROUND RESEARCH** must be sufficient to provide a detailed description and evaluation of the historic research of the project area. This section should include a summary of the existence of historic properties and a description of previous work conducted in the area. The following information should be presented and discussed:

1. The **ENVIRONMENTAL SETTING**

2. **PAST AND PRESENT LAND USES** and current conditions.

3. A **REVIEW** of known historic properties, previous investigations, and research in the project area and vicinity.

I. A **RESEARCH DESIGN** will outline the purpose of the investigation, basic assumptions about the location and type of cultural resources within the project area. The following shall also be included:

1. **RESEARCH OBJECTIVES**

2. **METHODS** to be employed to address the research objectives.

J. RESULTS and INTERPRETATIONS A discussion of the results of the investigation and interpretations of the data.

K. RECOMMENDATIONS each building/structure will be addressed separately for eligibility for inclusion in the National Register first as an individual property, and then as an additional contributing element to the existing NR listed Miller Army Air Field Historic District.

L. A REFERENCES CITED section will list all references and citations located within the text, including all figures, maps, and within any appendices. All sources (persons consulted, maps, archival documentation, etc.) maybe listed together. This list must be in a format used by professional archaeological journals, such as *American Antiquity*.

M. APPENDICES shall include, but not be limited to:

1. The **QUALIFICATIONS** of the Principal Investigator and any other key personnel used.
2. The final **SCOPE OF WORK**.

O. PHOTOGRAPHS Digital images should be used in the report. The images should be counted as "Figures" in a single running series of illustrations. Photograph captions for site overviews must include direction or orientation. Photographs of features should include a scale. The figure caption will describe what the photograph is showing, the orientation of the shot, photographer, and the date it was taken.

P. GRAPHIC PRESENTATION OF THE RESULTS.

1. All pages, including graphic presentations, will be numbered sequentially.
2. All graphic presentations, including maps and diagrams, shall be referred to as "Figures". All figures must be sequentially numbered and cited by number within the body of the text. All tables will be referred to as "Tables" and have their own numbering sequence.
3. All figures and tables should be incorporated into the text following their internal citation.
4. All tables shall have a number, title, appropriate explanatory notes and a reference where the data came from if not produced by this investigation.
5. All figures shall have a figure caption containing their description.

6. All maps, including reproductions of historic maps, must include a north arrow, accurate bar scale, delineation of the project area, legend, map title and year of publication.

7. The report must include the project area(s) accurately delineated on a U.S.G.S. 7.5' topographic map.

V. Project Schedule

A. The Contractor shall commence work under this Delivery Order upon receipt of notice-to-proceed. All reports should be submitted in a timely manner as stipulated below:

1. The draft reports will be submitted to the Corps eight (8) weeks after the completion of fieldwork. The Corps will negotiate the review of the draft report by the NPS, SHPO, and NYCLPC. The Corps will return the comments to the Contractor. The final reports will address all comments provided on the draft report.
2. All final reports will be submitted to the Corps four (4) weeks after the Contractor receives the draft report with comments.

B. Scheduled completion date for the work specified in this scope is September 30, 2021.

Table 1. Deliverable Schedule (Best case scenario)

Task	Deliverable Start Date	Deliverable Due Date
Obtain ARPA Permit – USACE Responsibility	Any notice to proceed is issued (October 1, 2020)	12 months later (January 1, 2021)
Task 1 – Health and Safety Plan	Any notice to proceed is issued (October 1, 2020)	8 weeks later (October 15, 2020)
Task 2 – Backhoe Trench and Geomorphology	Any ARPA permit is received (January 1, 2021)	8 weeks later (January 15, 2021)
Task 3 – Shovel test 12.3 acres	Any ARPA permit is received (January 1, 2021)	8 weeks later (January 25, 2021)
Task 4 – ICMS Records	Completion of Tasks 2, 3, 5, and 6 (January 25, 2021)	8 weeks later (February 8, 2021)
Task 5 – Fire Control Tower NR Evaluation	Any notice to proceed is issued (October 1, 2020)	8 weeks later (October 25, 2020)
Task 6 – Seaplane Ramp and Concrete Apron NR Evaluation	Search can begin the day notice to proceed is issued (October 1, 2020), but field visit requires ARPA permit (January 1, 2021)	8 weeks for research, 1 week for field recordation (January 8, 2021)
Task 7.1 – Draft Report Production	Completion of Tasks 2, 3, 5, and 6 (January 25, 2021)	8 weeks later (March 22, 2021)

sk 7.2 – Final Report Production	When all comments are received from reviewers (April 22, 2021)	Four weeks later (May 20, 2021)
sk 8 – ARPA Permit Fulfillment	Completion of Tasks 2, 3, 4, 5, 6, and 7 (May 20, 2021)	Two weeks (June 3, 2021)
sk 9 – Project Management	Throughout Tasks 1, 2, 3, 4, 5, 6, 7, and 8 (October 1, 2020)	Completion of all tasks (June 3, 2021)

VI. Additional Contract Requirements

- A. Agencies, institutions, corporations, associations or individuals will be considered qualified when they meet the minimum criteria given below. As part of the supplemental documentation, a contract proposal and appendices to the draft and final report must include vitae for the PRINCIPAL INVESTIGATOR and MAIN SUPERVISORY PERSONNEL in support of their academic and experiential qualifications for the research. Key personnel must have experience in the Military archaeology and/or history of the northeast. Personnel must meet the minimum professional standards stated below:

1. Archaeological Principal Investigator (PI). Persons in charge of an archaeological project or research investigation contract, in addition to meeting the Secretary of the Interior's Qualification for Archaeology, must have a doctorate or equivalent level of professional experience as evidenced by a publication record that demonstrates experience in project formulation, execution, and technical monograph reporting. Suitable professional references may also be made available to obtain estimates regarding the adequacy of prior work. If prior projects were of a sort not ordinarily resulting in a publishable report, a narrative should be included detailing the proposed project director's previous experience along with references suitable for to obtain opinions regarding the adequacy of this earlier work.
2. Architectural Historian. The Architectural historian should meet the Secretary of Interior's Professional Qualifications Standards (48 FR 44738-9). The minimum professional qualifications in architectural history are also defined in Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines (1983). These are a graduate degree in architectural history; art history; historic preservation; or a closely related field plus one of the following: At least two years of full-time experience in research, writing, or teaching in American architectural history or restoration architecture with an academic institution, historical organization or agency, museum, or other professional institution, or; substantial contribution through research and publication to the body of scholarly research in the field of American architectural history. For this project, experience should include detailed investigations of historic and military structures and preparation of historic structures research reports. This person should have prior experience in preparing National Register of Historic Places Nomination Forms and should be familiar with the appropriate guidelines such as *National Register Bulletin 15: How to Apply the National Register Criteria for*

Evaluation and National Register Bulletin 16A: How to Complete the National Register Nomination Form.

3. Geomorphologist. Personnel hired for their special knowledge and expertise in geomorphology should have a Master's degree or better and experience and a publication record demonstrating a substantial contribution to the field through research. For this project, the individual must have experience in the interpretation of sediments on the coastal plain, particularly with regard to the potential for archaeological resources. The individual should also ideally be able to interpret seismic data.

4. Archaeologist. The minimum formal qualifications for individuals practicing archaeology as a profession are a B.A. or B.S. degree from an accredited college or university, followed by two years of graduate study with concentration in anthropology and specialization in archaeology during one of these programs, and at least two summer field schools or their equivalent under the supervision of an archaeologist of recognized competence. A Master's thesis or its equivalent in research and publications is highly recommended, as is the PhD degree. Individuals lacking such formal qualifications may present evidence of a publication record and references from archaeologists who do meet these references. In addition, the archaeologist should also have experience in the prehistoric archaeology of the southern New York - northern New Jersey area.

5. Standards for Consultants. Personnel hired or subcontracted for their special knowledge and expertise must carry academic and experiential qualifications in their own fields of competence. Such qualifications are to be documented by means of vitae attachments to the proposal.

B. Institutional or Corporation Qualifications. Any institution, organization, etc., obtaining this contract, and sponsoring the Principal Investigator or project director meeting the previously given requirements, must also provide, or demonstrate access to adequate field and laboratory equipment necessary to conduct the operations defined in the Scope of Work, as pursuant to 36 CFR Part 79 and Corps Regulation No. 1130-2-433.

C. Principal Investigators shall be responsible for the validity of the material presented in their reports. In the event of a controversy or court challenge, Principal Investigators shall be required to testify on behalf of the government in support of findings presented in their reports.

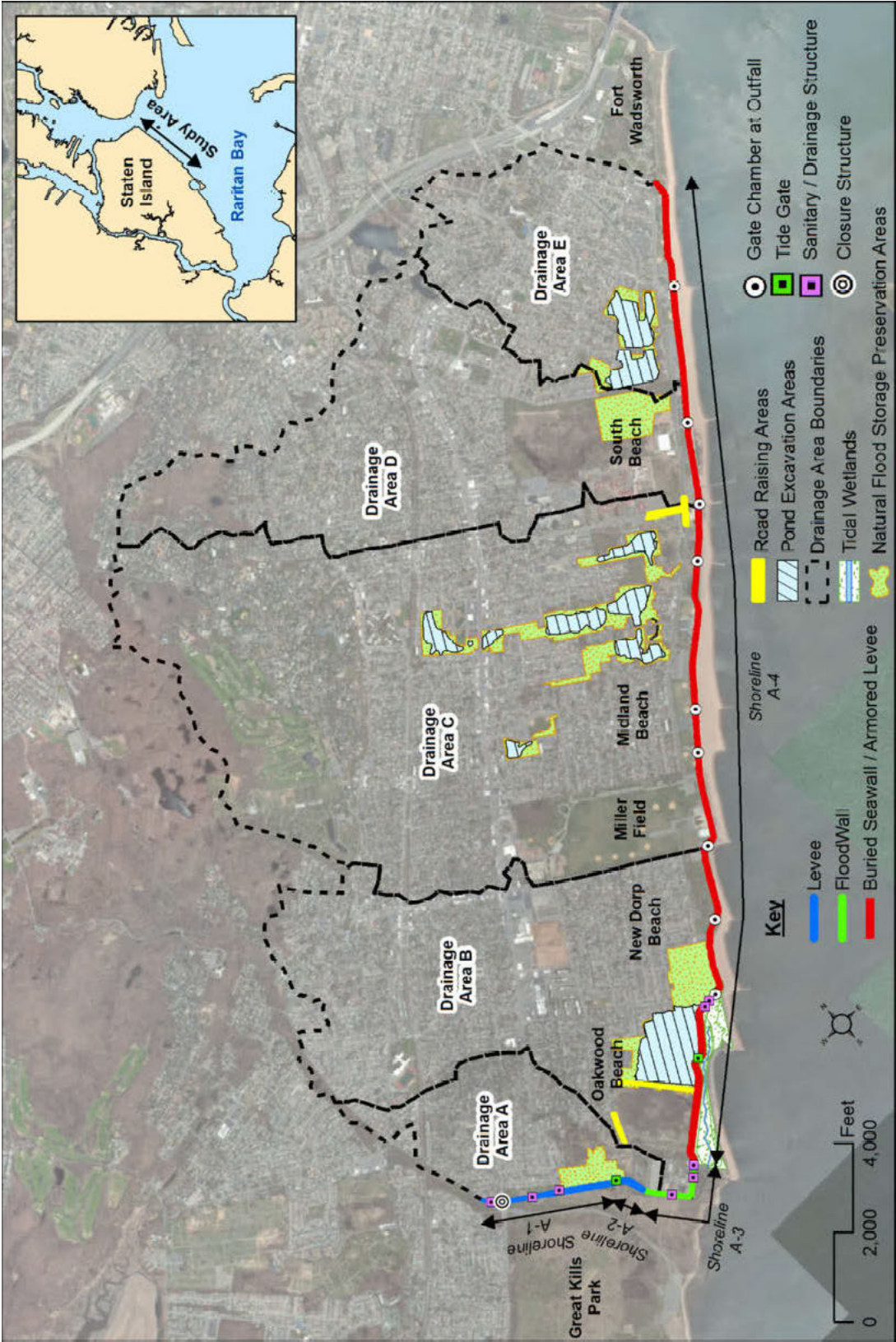
D. Neither the Contractor nor their representatives shall release any sketch, photograph, report or other data, or material of any nature obtained or prepared under this contract without the specific written approval of the Contracting Officer prior to the time of final acceptance by the government.

E. The Contractor shall furnish all labor, transportation, instruments, survey equipment, and other associated materials to perform the work required by this Scope of Work.

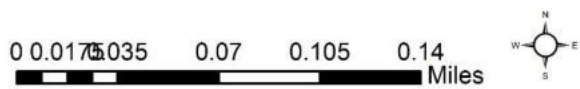
VII. Fiscal Arrangements

- A. Partial payments of the total amount allocated will be dispersed upon the receipt of invoices. Invoices will be submitted monthly from the Notice to Proceed and will reflect the amount expended during the month. The total amount of all monthly invoices shall not total more than 90% of the agreed work order amount. The remaining 10% of the agreed work order amount shall be paid upon the receipt and acceptance of the final reports, the reports provided by the Corps, etc. and receipt of the **final** invoice.
- B. Invoice payments will be made pursuant to the “Prompt Payment” and “Progress Payment” clauses of the contract.

Enclosure 1. Overview of SSSI project features.



Enclosure 2. 12.3 acre area to be shovel tested on Miller Field.



Areas on NPS Lands to be Shovel Tested
South Shore of Staten Island

Enclosure 3. Location of Fire Control Tower, Seaplane Ramp, Concrete Apron, Elm Tree Light and Hangar 38 on Miller Field in the Gateway National Recreation Area.



Enclosure 4. Close up of Historic Features on Miller Field.



0 40 80 160 240 320
Feet



**Location of Historic
Features on Miller Field**

MODIFICATION

**Scope of Work for Investigations
on Miller Field
Gateway National Recreation Area
Staten Island, NY
in connection with the
South Shore of Staten Island Coastal Storm Risk Management Project**

I. Introduction

This Scope of Work is for the modification to Delivery Order #W912DS21F0017 of the First Environment Contract #W912DS18D0007 to add geophysical survey techniques to the approved methodologies on National Park Service (NPS) land, in Gateway National Recreation Area, on the Miller field Unit. USACE has responsibilities under Section 106 of the National Historic Preservation Act to carry out the identification and evaluation of historic properties within the Area of Potential effect. This Scope of Work is to complete the identification and evaluation of historic properties on Miller Field.

USACE has corresponded with NPS to determine the work that is required to take place before construction. A geoarchaeological investigation has already been carried out (under ARPA permit 2017.GATE.01) to assess the potential for deeply buried cultural resources along the line of protection. Pursuant to the correspondence the work that needs to occur is 1) carryout the recommendation from the geoarchaeological investigation to excavate one backhoe trench on Miller Field to look for deeply buried cultural resources 2) conduct a shovel testing survey of all areas that will be impacted by construction, 3) evaluate the seaplane ramp and concrete apron as potential contributing elements to the existing Miller Army Air Field National Register Listed Historic District, and 4) evaluate the Fire Control Tower as an individual resource for the National Register and as a contributing element to the existing Miller Army Airfield Historic District.

II. Contractor Services and Required Investigations

A. The general services to be provided under this modification to the contract are those required to conduct cultural resources investigations, recordation, and preparation of reports within the timetable described below.

B. The Contractor shall be responsible for conducting, in the manner prescribed, the additional work detailed below. Failure to fully meet the requirements of this scope of work may be cause for termination of work for default of the contract, or for an evaluation of unsatisfactory upon completion of the project.

C. This scope of work requires the completion of the following tasks described below.

Task 1 – Health and Safety Plan

Prior to initiation of fieldwork the contractor shall ensure the “Health and Safety Plan” (HASP) is updated. The Health and Safety Plan shall serve as a safety plan and research strategy for all additional work under this modification. The HASP and all work will comply with Engineering Manual EM 385-1-1, "Safety and Health Requirements Manual" dated 30 November 2014 and all other applicable regulations and guidelines. The manual is available from NAN.

Task 2 – Backhoe Trench on Miller Field for Deeply Buried Sites

No Modification

Task 3 – Shovel Testing Survey of Areas within Construction Limits

No Modification

Task 4 – Collection Management

No Modification

Task 5 - NR Eligibility Assessment of the Fire Control Tower

No Modification

Task 6 – Evaluation of Seaplane Ramp and Concrete Apron as Contributing Elements to the Miller Army Air Field Historic District

The buried seawall traverses the area where a seaplane ramp was once located. Originally, there was a seaplane ramp that brought seaplanes from Hanger 38 and the concrete apron down to the water of the Lower Bay (Enclosures 3 and 4). Previous research suggested that the seaplane ramp was removed in the 1930s, however, in 2012 the NPS was conducting monitoring for the installation of a bike path near this area and located what could be the edges of the old seaplane ramp preserved beneath the Concrete Apron. This task is to (1) conduct fieldwork to determine if any physical remains of the Seaplane Ramp remain in situ, and (2) if remains are extant, conduct documentary research to evaluate the Seaplane Ramp as a contributing element to the existing historic district. The evaluation of the Seaplane Ramp may include the inclusion of appropriate remote sensing methodologies including but not limited to ground penetrating radar, magnetometers, or electromagnetic induction metal detectors.

Ground penetrating radar data collection will occur within an approximately two acre area between the seaplane hangar and the shoreline, in spatially-referenced grids, with maximum transect spacing of 0.5 meters. The spatial controls during data collection will be appropriate for the creation of gridded time-slice or amplitude maps. Data collection will use sufficient range to capture the base of the ramp, appropriate gain to prevent data clipping, and no unnecessary filters. Standardized field notes should record transect locations, surface conditions, observations, and collection settings.

The antenna will be of an appropriate frequency to sufficiently document the ramp, anticipated to be approximately 8 feet deep. Post-processed data should include refinement of the dielectric constant for depth estimation, use of filters to better define potential archaeological deposits and zones of sediment, and production of radargrams and amplitude maps. Reflections consistent with different fills or archaeological materials, features, and voids or areas of potential erosion through the ramp should be identified. The Contractor will develop a survey methodology in consultation with the COR prior to conducting the fieldwork. Due to the location of the APE on the beach and the near shore area, the cultural survey must be conducted during the appropriate tidal window and water surface conditions and must be tailored to the environment.

The GPR data will be delivered in raw and final processed form, with a log of the processing steps and settings. A log will accompany the data with the field settings, spatial reference information for each file, and field observations. Radargrams and amplitude maps should also be provided as images and data files, with relevant ancillary data.

Task 7 - Report Preparation

The contractor will include all associated plans and/or drawings showing the geophysical survey, data interpretations and methodology discussions within the report produced by the cultural resource investigations. No additional deliverable is expected. The final report will incorporate all comments received from the Corps and other reviewing agencies.

Task 8 – ARPA Permit Fulfillment

No Modification

Task 9 - Project Management

No Modification

III. Project Records

A. All original notes, forms, and maps will be retained and curated as provided by 36 CFR Part 79.

IV. Report Format and Content

No Modification

V. Project Schedule

- A. The Contractor shall commence work under this modification to the Delivery Order upon receipt of notice-to-proceed. All reports should be submitted in a timely manner as previously stipulated and will have no additional impact to the schedule. For additional information regarding deliverables, refer to the original Delivery Order.

VI. Additional Contract Requirements

No modification

5. Standards for Consultants. Personnel hired or subcontracted for their special knowledge and expertise must carry academic and experiential qualifications in their own fields of competence. Such qualifications are to be documented by means of vitae attachments to the proposal.

B. Institutional or Corporation Qualifications. Any institution, organization, etc., obtaining this contract, and sponsoring the Principal Investigator or project director meeting the previously given requirements, must also provide, or demonstrate access to adequate field and laboratory equipment necessary to conduct the operations defined in the Scope of Work, as pursuant to 36 CFR Part 79 and Corps Regulation No. 1130-2-433.

C. Principal Investigators shall be responsible for the validity of the material presented in their reports. In the event of a controversy or court challenge, Principal Investigators shall be required to testify on behalf of the government in support of findings presented in their reports.

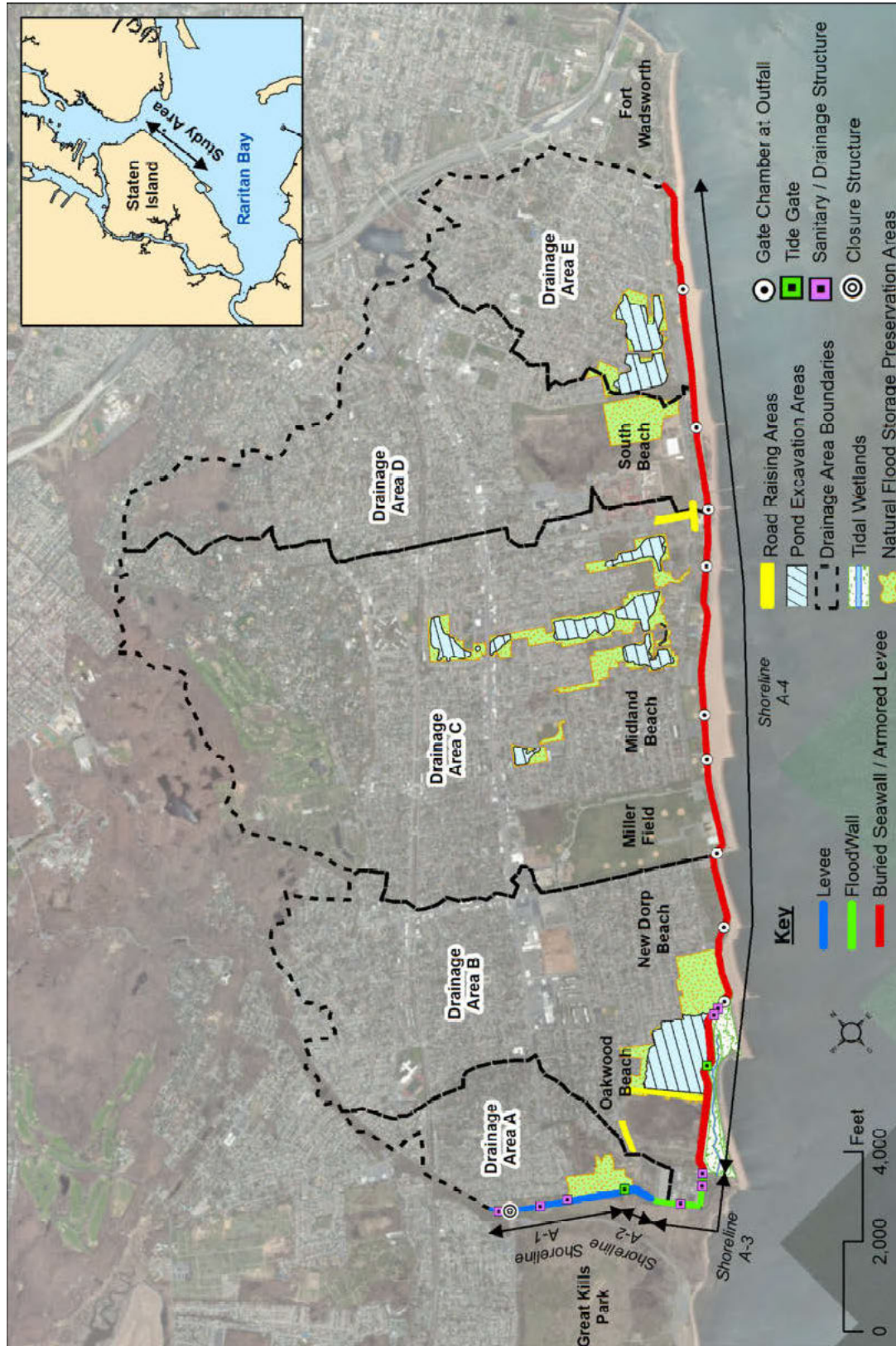
D. Neither the Contractor nor their representatives shall release any sketch, photograph, report or other data, or material of any nature obtained or prepared under this contract without the specific written approval of the Contracting Officer prior to the time of final acceptance by the government.

E. The Contractor shall furnish all labor, transportation, instruments, survey equipment, and other associated materials to perform the work required by this Scope of Work.

VII. Fiscal Arrangements

Payments for this work shall follow the same procedures and schedule as is described in the DO.

Enclosure 1. Overview of SSSI project features.



Enclosure 2. 12.3 acre area to be shovel tested on Miller Field.



Enclosure 3. Location of Fire Control Tower, Seaplane Ramp, Concrete Apron, Elm Tree Light and Hangar 38 on Miller Field in the Gateway National Recreation Area.



Enclosure 4. Close up of Historic Features on Miller Field.



Appendix B
Hagar-Richter Geosciences, Inc. Geophysical Survey

**GEOPHYSICAL SURVEY
MILLER FIELD
STATEN ISLAND, NEW YORK**

Prepared for:

First Environment
10 Park Place, Bldg 1A, Suite 504
Butler, New Jersey 07405

Prepared by:

Hager-Richter Geoscience, Inc.
dba HR Geological Services in New York
846 Main Street
Fords, New Jersey 08863

File 21JCC22
February 2022

HAGER-RICHTER GEOSCIENCE, INC.

GEOPHYSICS FOR THE ENGINEERING COMMUNITY
SALEM, NEW HAMPSHIRE
Tel: 603.893.9944
FORDS, NEW JERSEY
Tel: 732.661.0555

February 9, 2022
File 21JCC22

Carrie Ross
Associate
First Environment, Inc.
10 Park Place, Bldg. 1A, Suite 504
Butler, NJ 07405

Cell: 360.334.2616
Email: cross@firstenvironment.com

RE: Geophysical Survey
Miller Field
Staten Island, New York

Dear Ms. Ross:

In this report, we summarize the results of a geophysical survey conducted by Hager-Richter Geoscience, Inc., dba HR Geological Services in NY (HRGS) at the above referenced site in Staten Island, New York in January 2022. The scope of the survey and area of interest were specified by First Environment (FI).

INTRODUCTION

The site is identified as Miller Field, a recreational area located along New Dorp Lane on a former Army Air Corps base, in Staten Island, New York. The general location of the site is shown in Figure 1. According to the provided Scope of Work, *“The buried seawall traverses the area where a seaplane ramp was once located. Originally, there was a seaplane ramp that brought seaplanes from Hanger 38 and the concrete apron down to the water of the Lower Bay (Enclosures 3 and 4). Previous research suggested that the seaplane ramp was removed in the 1930s, however, in 2012 the NPS was conducting monitoring for the installation of a bike path near this area and located what could be the edges of the old seaplane ramp preserved beneath the Concrete Apron.”* FI requested a geophysical survey to determine the location of the concrete seaplane ramp. FI specified an area of interest (AOI) approximately 2 acres in size, between the seaplane hangar and the shoreline.

OBJECTIVE

The objective of the geophysical survey was to locate a concrete seaplane ramp within an area of interest that measures approximately 2 acres in size.

THE SURVEY

Amanda Fabian, P.G., Justin Covert and Timothy Williams, of HRGS, conducted the geophysical survey on January 26, 2022. The project was coordinated with Ms. Carrie Ross, Associate of FI. Ms. Linda Stone, RPA, of Linda Stone Archaeological Consulting, was present for the duration of the field survey and specified the area of interest.

The geophysical survey was conducted using two complementary methods: time domain electromagnetic induction metal detection (EM) and ground penetrating radar (GPR). The EM data were acquired at approximately 8-inch intervals along lines spaced 5 feet apart across the accessible portions of the specified areas of interest. The EM survey detects buried metal such as possible reinforcement associated with concrete structures. However, the EM method cannot provide information on the type of objects causing an EM anomaly.

GPR data were acquired along traverses oriented parallel to the shoreline, with lines spaced no more than 10 feet apart across the accessible portions of the area of interest. The GPR method can detect both metal and nonmetal objects.

The locations of geophysical survey grids were surveyed by HRGS using a Geo7X CM GPS system utilizing a Zephyr-2 external antenna.

EQUIPMENT

EM61. The EM survey was conducted using a Geonics EM61-MK2 time domain electromagnetic induction metal detector. The EM61-MK2 instrument was designed specifically for detecting buried metal objects such as utilities, underground storage tanks (USTs), and drums. An air-cored transmitter coil generates a pulsed primary magnetic field in the earth, thereby inducing eddy currents in nearby metal objects. The eddy current produces a secondary magnetic field that is sensed by two receiver coils, one coincident with the transmitter and one positioned 40 cm above the main coil. By measuring the secondary magnetic field after the current in the ground has dissipated but before the current in metal objects has dissipated, the instrument responds only to the secondary magnetic field produced by metal objects. Four channels of secondary response are measured in mV and are recorded on a digital data logger. The system is generally operated by pushing the coils configured as a wagon with an odometer mounted on the axle to trigger the data logger automatically at approximately 8-inch intervals.

GPR. The GPR survey was conducted using a Geophysical Survey Systems, Inc. UtilityScan Hyper Stacking digital GPR system using both 350 MHz antenna with 77 ns time window. GPR uses a high-frequency electromagnetic pulse (referred to herein as “radar signal”) transmitted from a radar antenna to probe the subsurface. The transmitted radar signals are reflected from subsurface interfaces of materials with contrasting electrical properties. Travel times of the radar signal can be converted to approximate depth below the surface by correlation with targets of known depths and by a curve matching routine. We monitor the acquisition of

GPR data in the field and record the GPR data digitally for subsequent processing. Interpretation of the records is based on the nature and intensity of the reflected signals and on the resulting patterns. Data from the GPR survey were processed using RADAN 7.4 GPR processing software from Geophysical Survey Systems, Inc. We reviewed profile images of the GPR data. Interpretation of the records is based on the nature and intensity of the reflected signals and on the resulting patterns.

LIMITATIONS OF THE METHODS

HRGS MAKES NO GUARANTEE THAT ALL TARGETS WERE DETECTED IN THIS SURVEY. HRGS IS NOT RESPONSIBLE FOR DETECTING TARGETS THAT CANNOT BE DETECTED BY THE METHODS EMPLOYED OR BECAUSE OF SITE CONDITIONS. GPR SIGNAL PENETRATION MIGHT NOT BE SUFFICIENT TO DETECT ALL TARGETS.

EM61. The EM61 cannot detect non-metallic objects. The data from an EM61 survey are adversely affected by surface metal. The EM61 has a depth sensitivity limited to about 12 feet. The instrument is relatively cumbersome and works best where the transmit and receive coils can be hand pushed in a small wagon.

Detection and identification should be clearly differentiated. Detection is the recognition of the presence of a metal object, and the electromagnetic method is excellent for such purposes. Identification, on the other hand, is determination of the nature of the causative body (i.e., what is the body -- a cache of drums, UST, automobile, white goods, etc.?). Although the EM data cannot be used to identify all buried metal objects, they provide excellent guides to the identification of some objects. For example, buried metal utilities produce anomalies with lengths many times their widths.

GPR. There are limitations of the GPR technique as used to detect and/or locate targets such as those of the objectives of this survey. Limitations include: (1) surface conditions, (2) electrical conductivity of the ground, (3) contrast of the electrical properties of the target and the surrounding soil, and (4) spacing of the traverses. Of these restrictions, only the last is controllable by us.

The condition of the ground surface can affect the quality of the GPR data and the depth of penetration of the GPR signal. Sites covered with snow piles, high grass, bushes, landscape structures, debris, obstacles, soil mounds, etc. limit the survey access and the coupling of the GPR antenna with the ground. In many cases, the GPR signal will not penetrate below concrete pavement, especially inside buildings, and a target may not be detectable. The GPR method also commonly does not provide useful data under canopies found at some facilities.

The electrical conductivity of the ground determines the attenuation of the GPR signal and thereby limits the maximum depth of exploration. For example, the GPR signal does not penetrate clay-rich soils, and targets buried in clay might not be detected.

A definite contrast in the electrical conductivities of the surrounding ground and the target material is required to obtain a reflection of the GPR signal. If the contrast is too small, possibly due to construction details or deeply corroded metal in the target, then the reflection may be too weak to recognize, and the target can be missed.

Spacing of the traverses is limited by access at many sites, but where flexibility of traverse spacing is possible, the spacing is adjusted to the size of the target. The GPR operator controls the spacing between lines, and the design of the survey is based on the dimensions of the smallest feature of interest. Targets with dimensions smaller than the spacing between GPR survey lines can be missed.

RESULTS

General. The geophysical survey was conducted using the EM61 and GPR methods across the accessible portions of the area of interest specified by FI. The left side of Figure 2 shows a color contour plot of the EM61 response, and the right side of Figure 2 shows the locations of the GPR traverses and the integrated interpretation of the geophysical data.

EM61. The EM61 data were acquired at approximately 8-inch intervals along survey lines spaced 5 feet apart across the accessible portions of the areas of interest. As indicated above, the results of the EM61 survey are shown in color contour form in the left panel of Figure 2. Interpretation of EM61 data is based on the relative response of the instrument in millivolts to local conditions. The instrument is not calibrated to provide an absolute measure of a particular property, such as the conductivity of the soil or the strength of the earth's magnetic field. Subsurface metal objects produce sharply defined positive anomalies when the EM61 is positioned directly over them. Acquiring data at short intervals along closely spaced lines, as was done at the subject site, provides high spatial resolution of the location and footprint of the targets. Thus, buried metal is recognized in contour plots of EM61 data by positive anomalies with spatial dimensions roughly corresponding to the dimensions of the buried metal.

A broad, linear EM anomaly trending east-west across the AOI was detected near the center of the survey area. The anomaly is at the approximate anticipated location of the former sea ramp structure. The anomaly may be attributed to reinforced concrete or remnant metals associated with the former ramp. Numerous low amplitude EM61 anomalies not associated with surface metal were detected at the site and are interpreted as areas of buried metal. The GPR records acquired at the locations of the EM anomalies were carefully examined to determine the cause. When no specific cause can be determined, the EM anomaly is simply attributed to buried metal and their locations are shown on the right side of Figure 2 as red-hatched areas.

GPR Survey and Integrated Interpretation. The locations of the GPR traverses and the integrated interpretation of the geophysical data are shown on the right side of Figure 2. Apparent GPR signal penetration was very good for most of the AOI, with reflections received for about 50 - 105 nanoseconds. Based on velocity matching calibrations made for the areas of interest, the GPR signal penetration is estimated to have been no more than about 6 - 13 feet. The apparent GPR signal penetration along a 50-foot swath of the eastern portion of the AOI is significantly much poorer, estimated to have been no more than 1 foot due to saltwater saturation near surface.

The GPR records were carefully examined at the location of the broad EM anomaly. An approximate 40-foot-wide portion of the GPR traverses, mostly in the western section of the AOI, exhibit a planar reflector and strong attenuation of the GPR signal below the reflector, consistent with the location of the EM anomaly. The location of the interpreted anomaly, attributed to possible remnants of the former sea plane ramp, is shown on the right side of Figure 2 as a dark-blue hatched area. GPS coordinates in reference to the US State Plane, NJ NAD83 in US Survey feet for the corners of the anomaly are provided in Table 1 below.

Corner of Sea Ramp Anomaly	X (ft)	Y (ft)
NE	605109.9764	630653.3566
NW	604943.9172	630755.3955
SW	604920.1508	630718.7233
SE	605085.9610	630616.1310

CONCLUSIONS

Based upon the geophysical survey conducted by HRGS at the Miller Field Site in Staten Island New York, in January 2022, we conclude:

- A possible sea ramp structure was detected across the area of interest
- Unidentified buried metal was detected

LIMITATIONS ON USE OF THIS REPORT

This letter report was prepared for the exclusive use of First Environment, Inc. (Client). No other party shall be entitled to rely on this Report, or any information, documents, records, data, interpretations, advice, or opinions given to Client by Hager-Richter Geoscience, Inc. (HRGS) in the performance of its work. The Report relates solely to the specific project for which HRGS has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project, or any other purpose without the express written permission of HRGS. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to HRGS.

HRGS has used reasonable care, skill, competence and judgment in the performance of its services for this project consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by HRGS should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, HRGS makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed. If you have any questions or comments on this letter report, please contact us at your convenience. It has been a pleasure to work with Advanced Environmental Interface, Inc. on this project. We look forward to working with you again in the future.

Sincerely,
HAGER-RICHTER GEOSCIENCE, INC.



José Carlos Cambero Calzada, P.G. (NY 000899)
Senior Geophysicist

Attachments: Figures 1 - 2



APPROXIMATE SCALE (feet)
 0 1000 2000



LOCATION

NOTE:

Modified from Google Earth Pro aerial photograph.

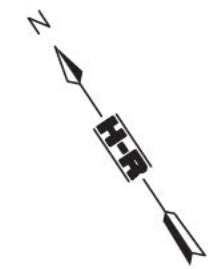
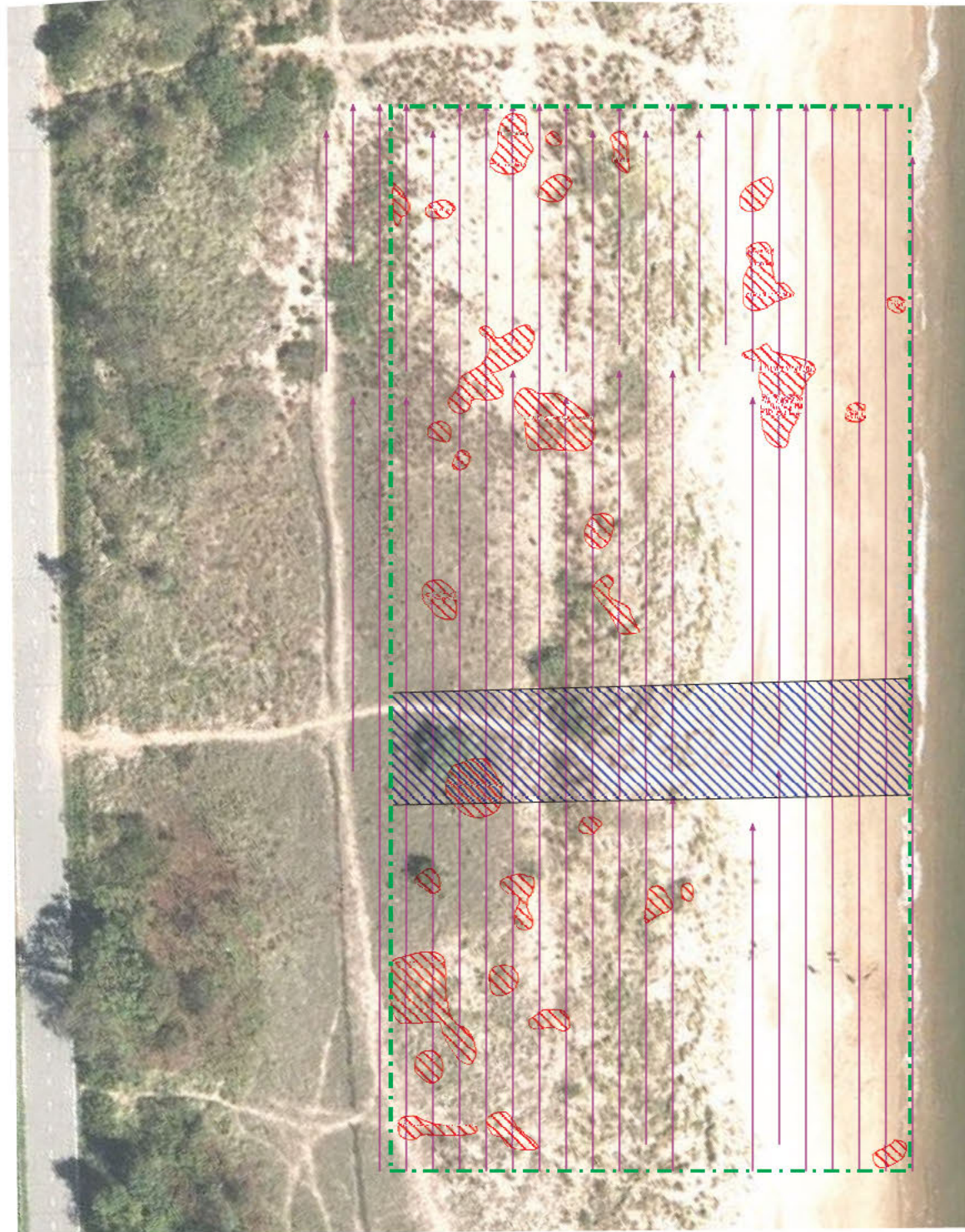
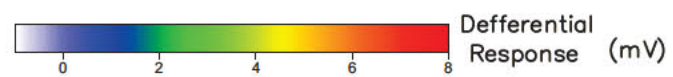
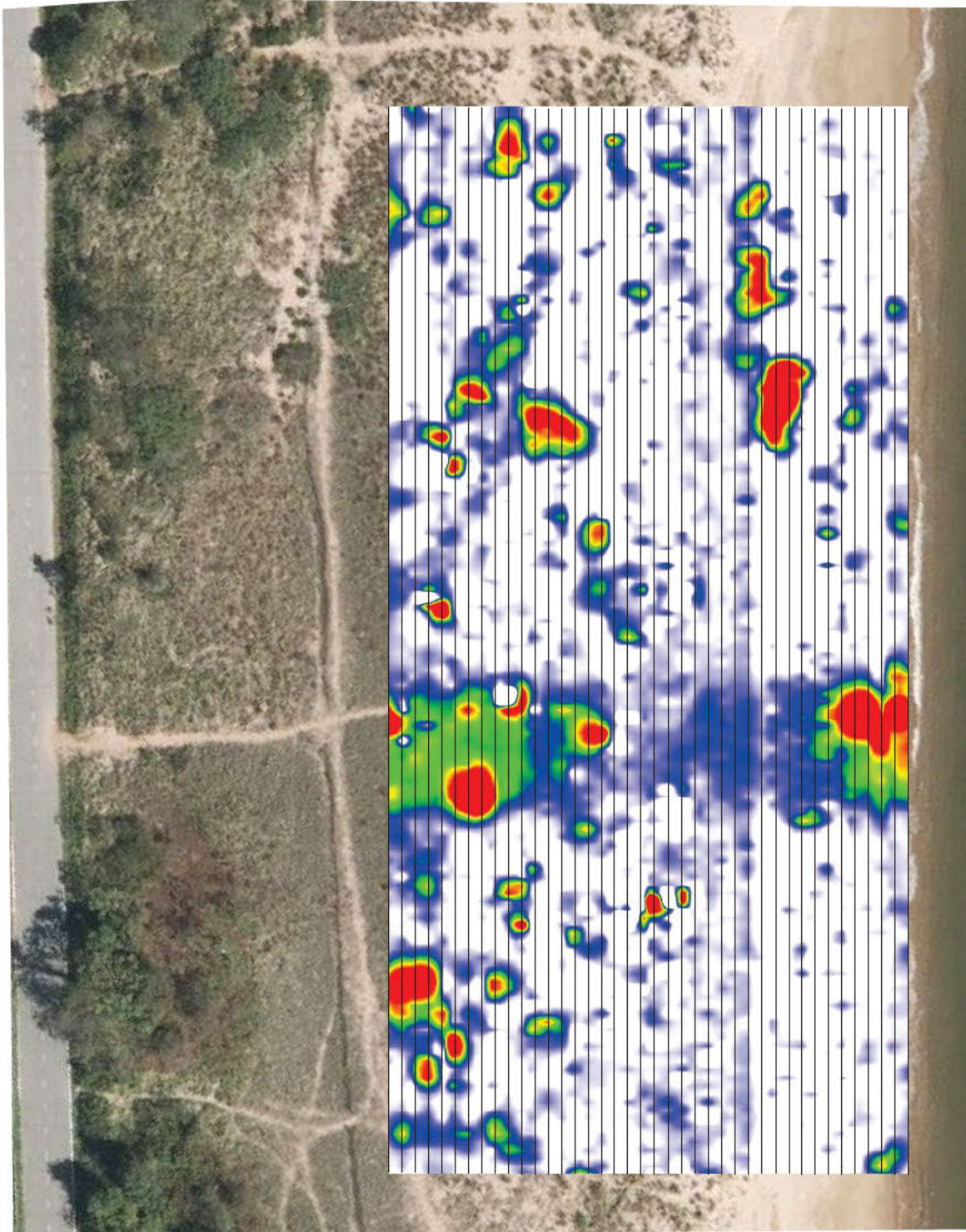
* DBA HR Geological Services in New York

Figure 1
 General Site Location
 Miller Field
 Staten Island, New York

File 21JCC22

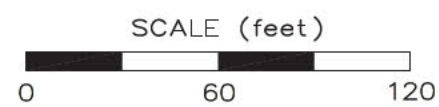
February 2022

HAGER-RICHTER*
 Salem, NH | Fords, NJ



LEGEND

-  GPR Traverse
-  Possible Airplane ramp
-  Area of possible buried metal
-  Approximate limits of EM61 survey area
-  EM61 data Stations



NOTE:
Modified from Google Earth Pro aerial photograph.

* DBA HR Geological Services in New York

Figure 2 Site Plan and Integrated Interpretation Miller Field Staten Island, New York	
File 21JCC22	February 2022
HAGER-RICHTER* Salem, NH Fords, NJ	

Appendix C
Shovel Test Coordinates
Shovel Test Records

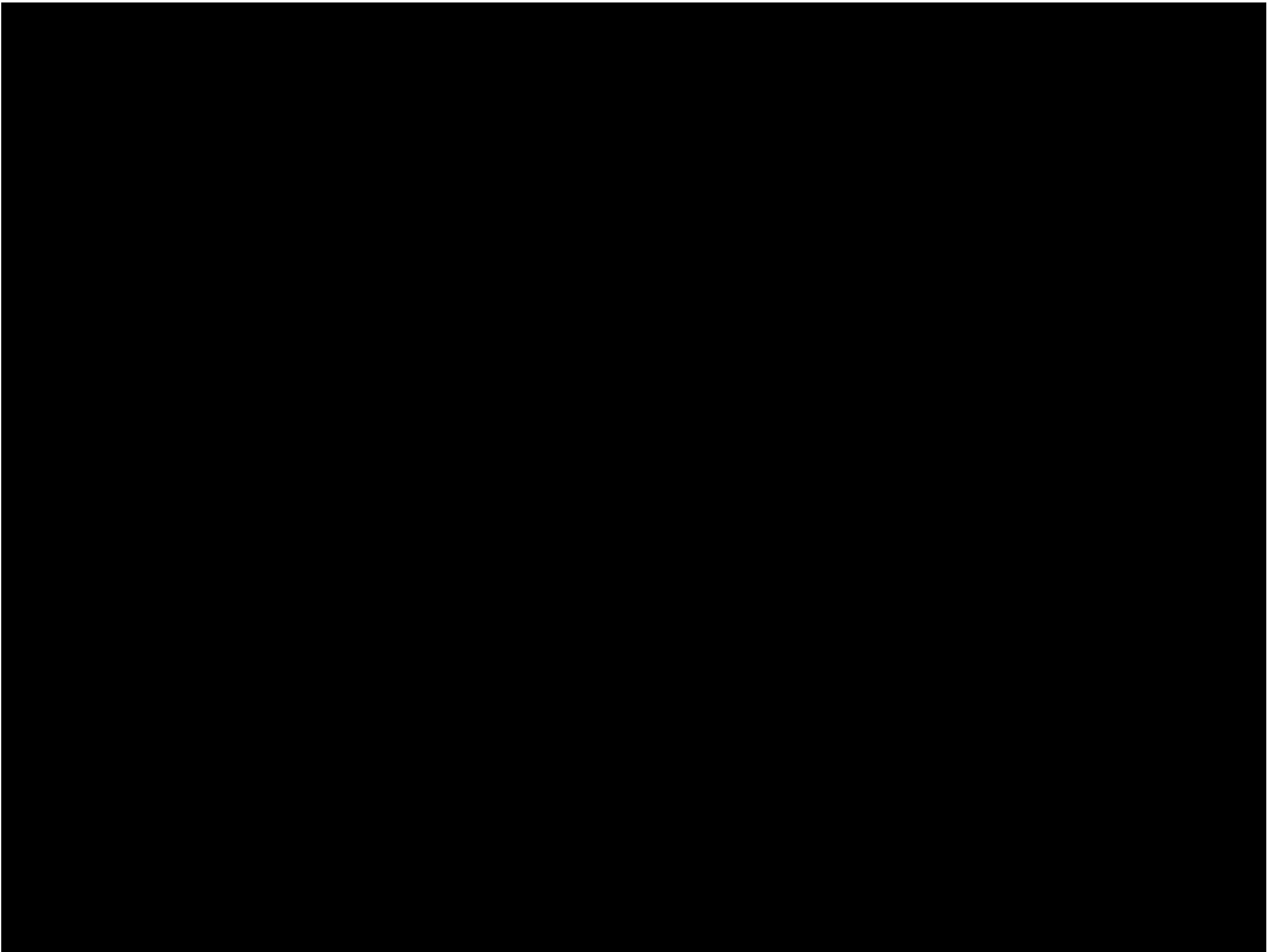
MILLER FIELD - SOUTH SHORE STATEN ISLAND COASTAL STORM RISK MANAGEMENT
SHOVEL TEST COORDINATES - STATE PLANE NY LONG ISLAND (FEET)

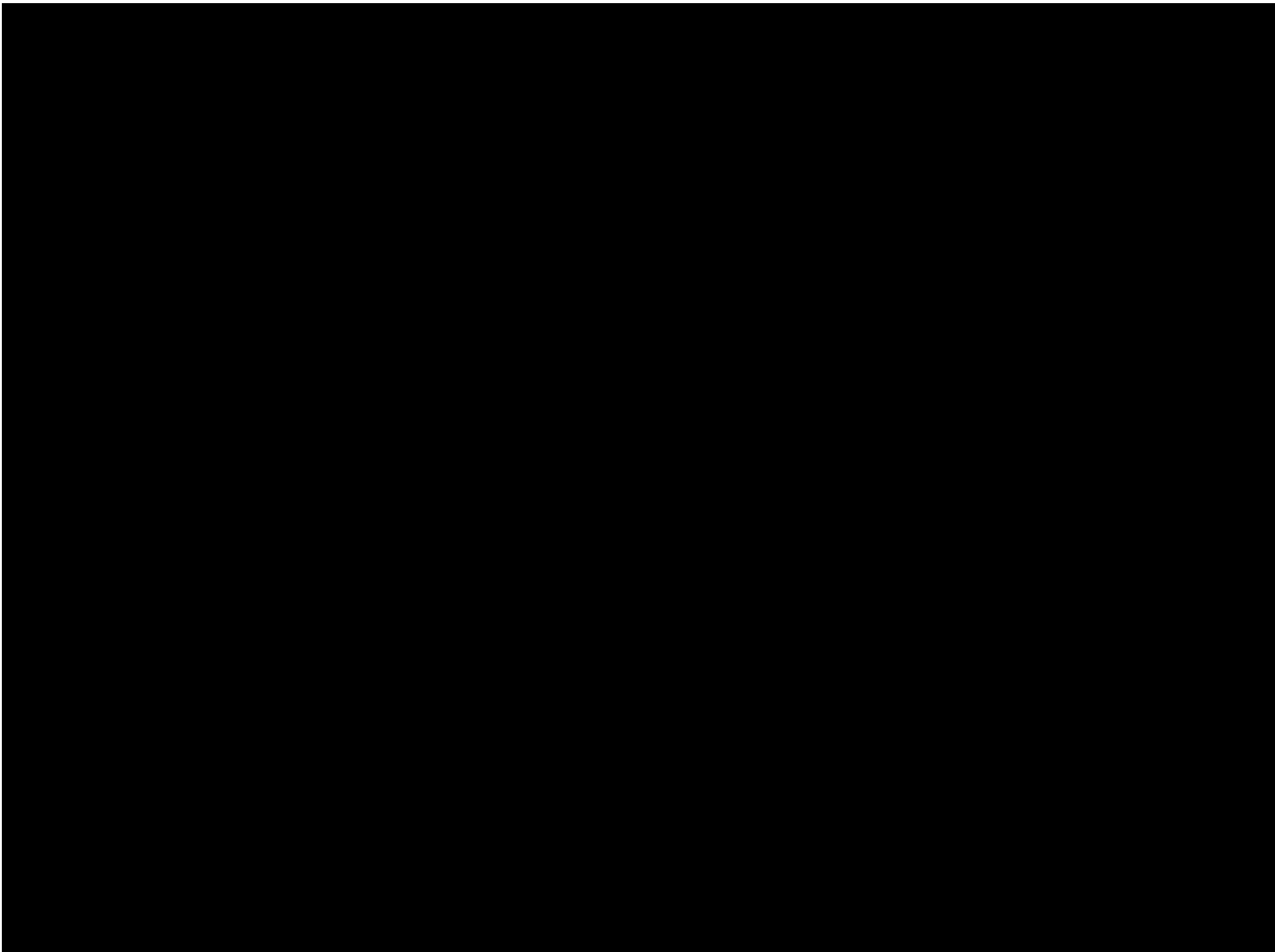
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A7	958130.7	144724.7
A8	958157.3	144766.0
A10	958211.7	144858.5
A15	958348.0	145060.6
A16	958375.1	145102.6
A17	958402.3	145144.6
A18	958429.4	145186.5
A19	958456.6	145228.5
A20	958483.8	145270.5
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A22	958538.1	145354.5
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A25	958619.6	145480.4
A26	958646.7	145522.4
A27	958673.9	145564.4
A28	958701.0	145606.3
A29	958728.2	145648.3
A30	958755.4	145690.3
A31	958781.5	145742.2
A32	958813.9	145781.6
A33	958836.8	145816.3
A34	958865.1	145856.1
B7	957988.1	144825.8
B10	958057.9	144941.8
B16	958220.7	145209.1
B17	958244.3	145255.2
B19	958295.7	145334.2
B20	958316.9	145369.5
B33	958649.1	145918.0
B34	958679.5	145968.3

ID	X	Y
C4	957863.2	144700.8
C21	958294.4	145426.8
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D3	957791.0	144694.1
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D26	958411.7	145650.2
D27	958443.2	145704.2
D28	958468.8	145746.8
D29	958496.7	145787.1
D30	958507.1	145811.6
D31	958546.3	145869.5
D32	958518.4	145920.8
D35	958597.9	146037.1
E2	957722.2	144677.2
E3	957748.1	144719.9
E4	957774.0	144762.7
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E21	958214.4	145489.8
E35	958556.1	146068.8
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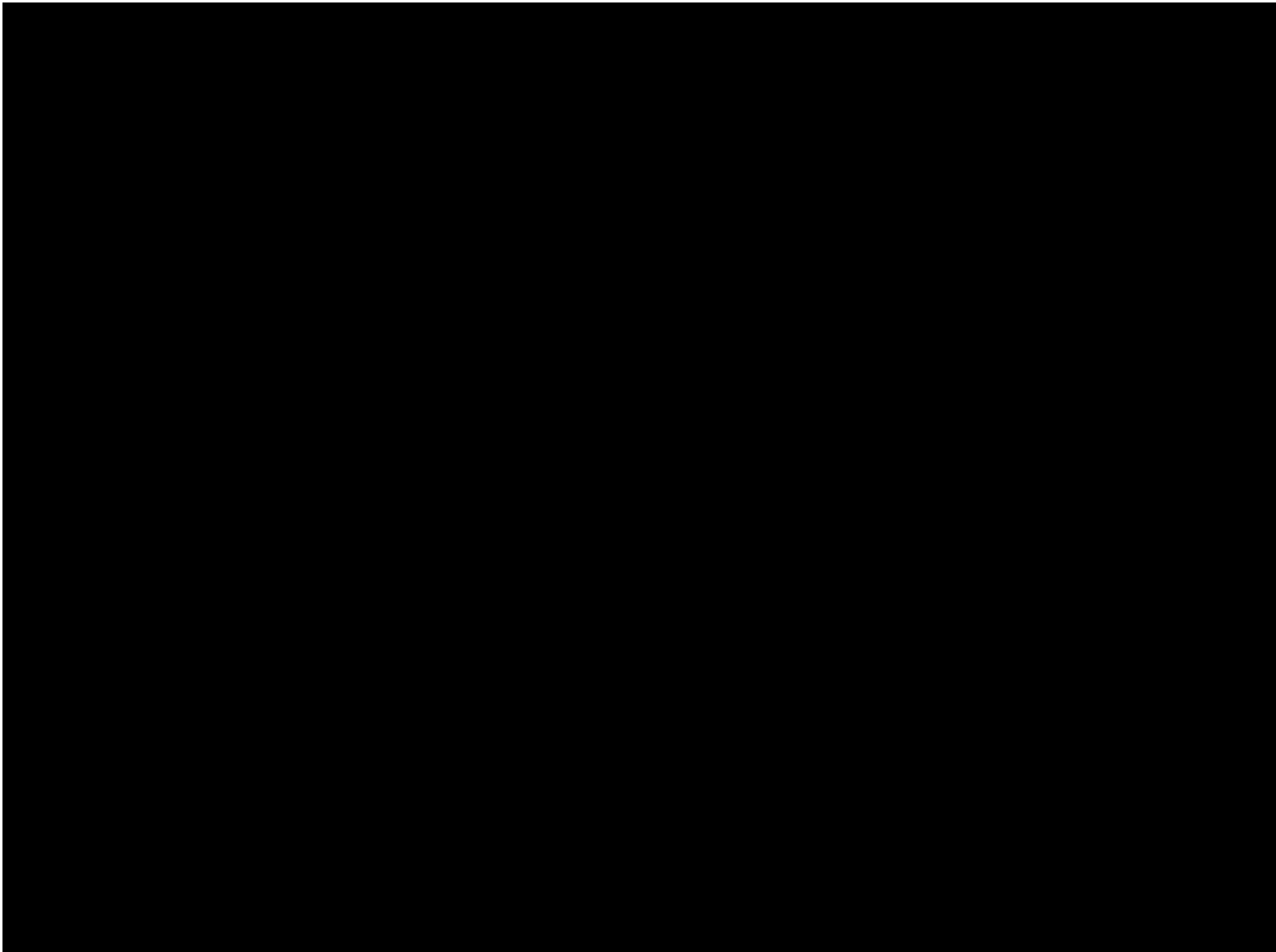
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G21	958128.7	145541.4
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H4	957645.6	144840.2
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I3	957576.9	144823.2
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I18	957965.4	145464.8
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J8	957663.6	145062.9
J11	957731.5	145176.2
J16	957870.8	145405.0
J17	957896.7	145447.8
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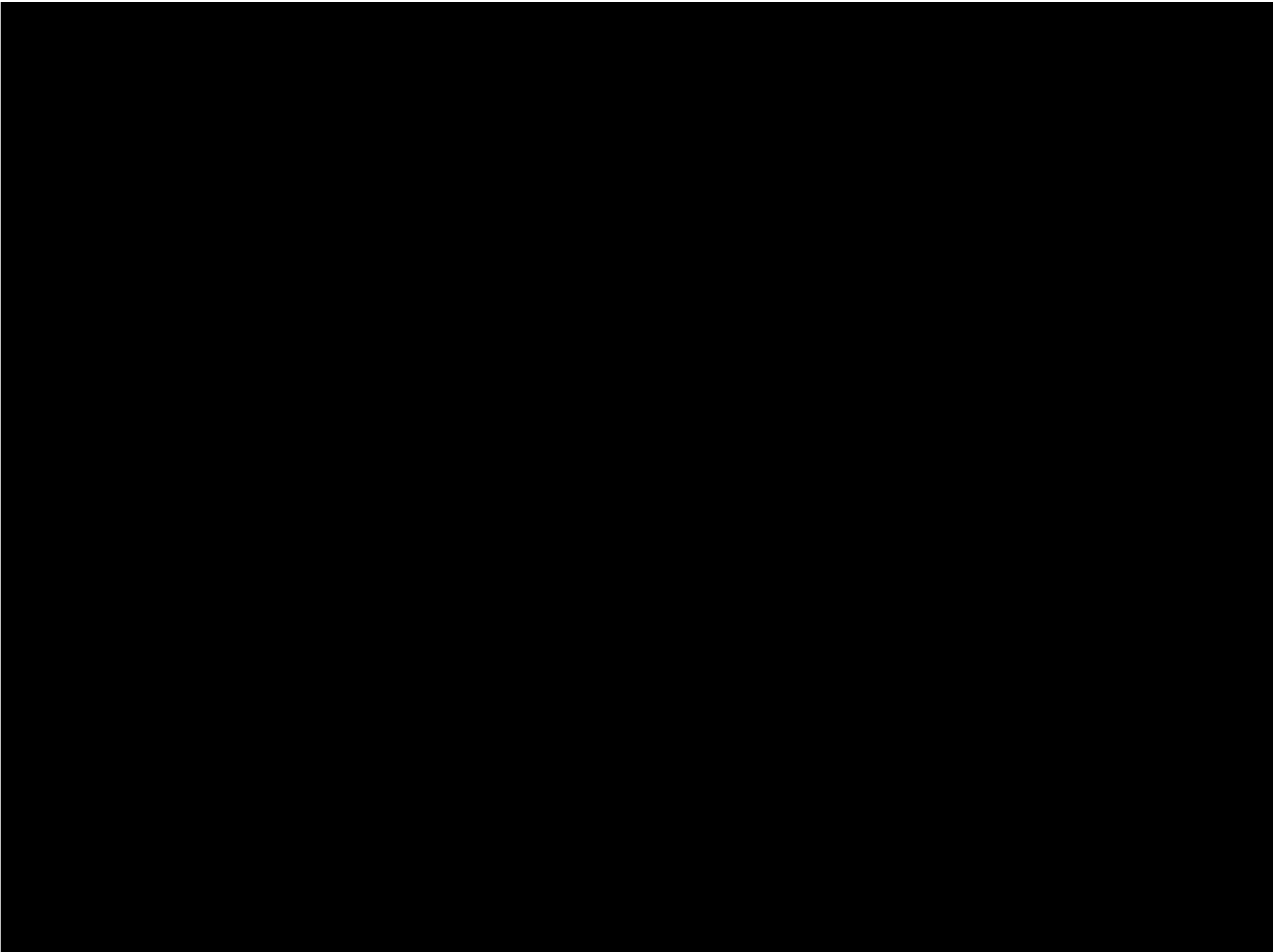
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K19	957905.7	145559.2
L1	957398.2	144816.8
L2	957422.5	144857.9
L17	957811.1	145499.5
M1	957356.2	144843.8
M2	957379.7	144883.8
N1	957314.0	144871.1
N2	957336.9	144909.6
N11	957570.0	145294.5
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O2	957294.1	144935.4
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P10	957450.5	145278.2
P11	957476.2	145323.3
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Q2	957208.5	144987.1
Q3	957234.4	145029.8
Q4	957260.3	145072.6
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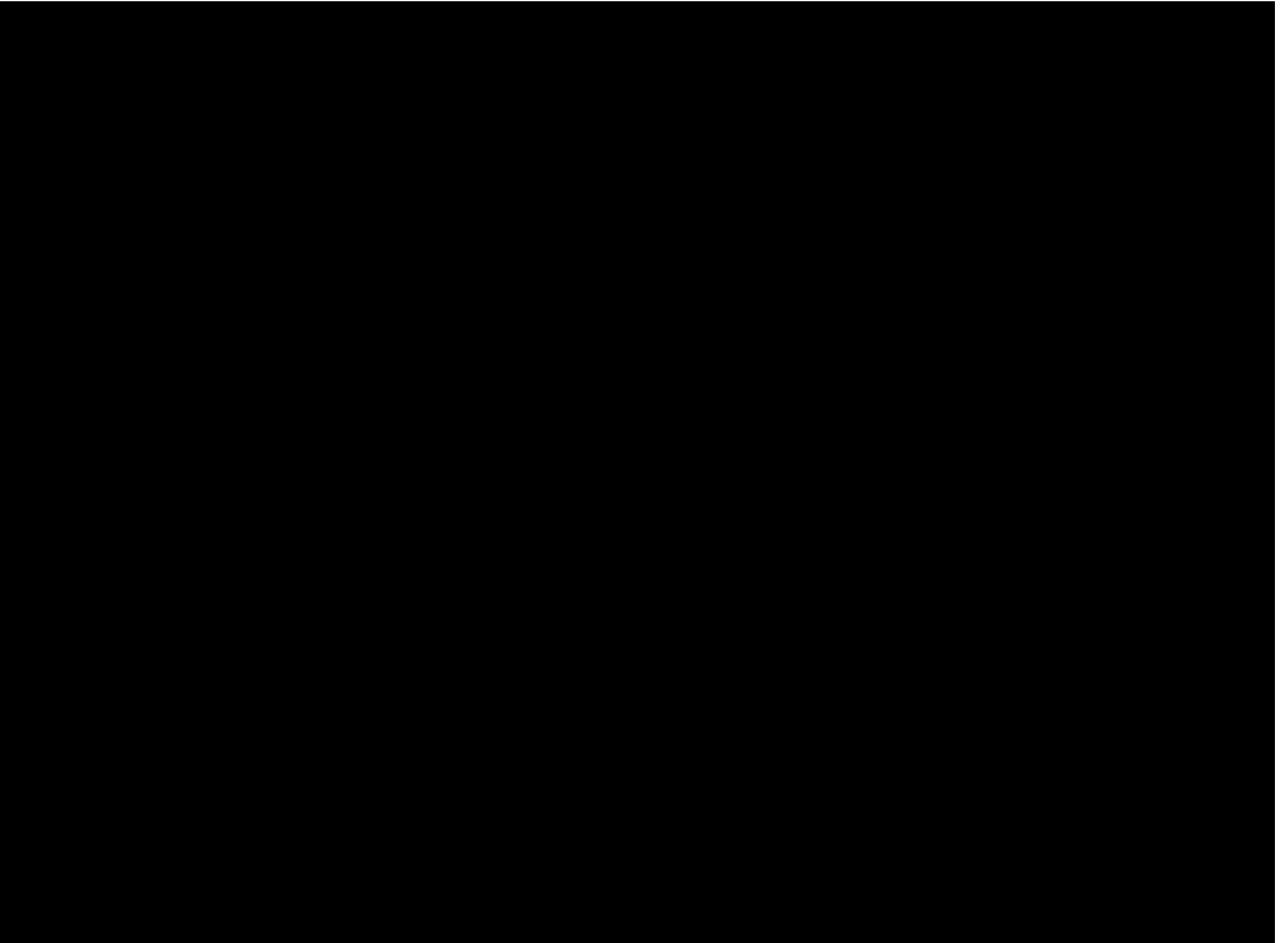


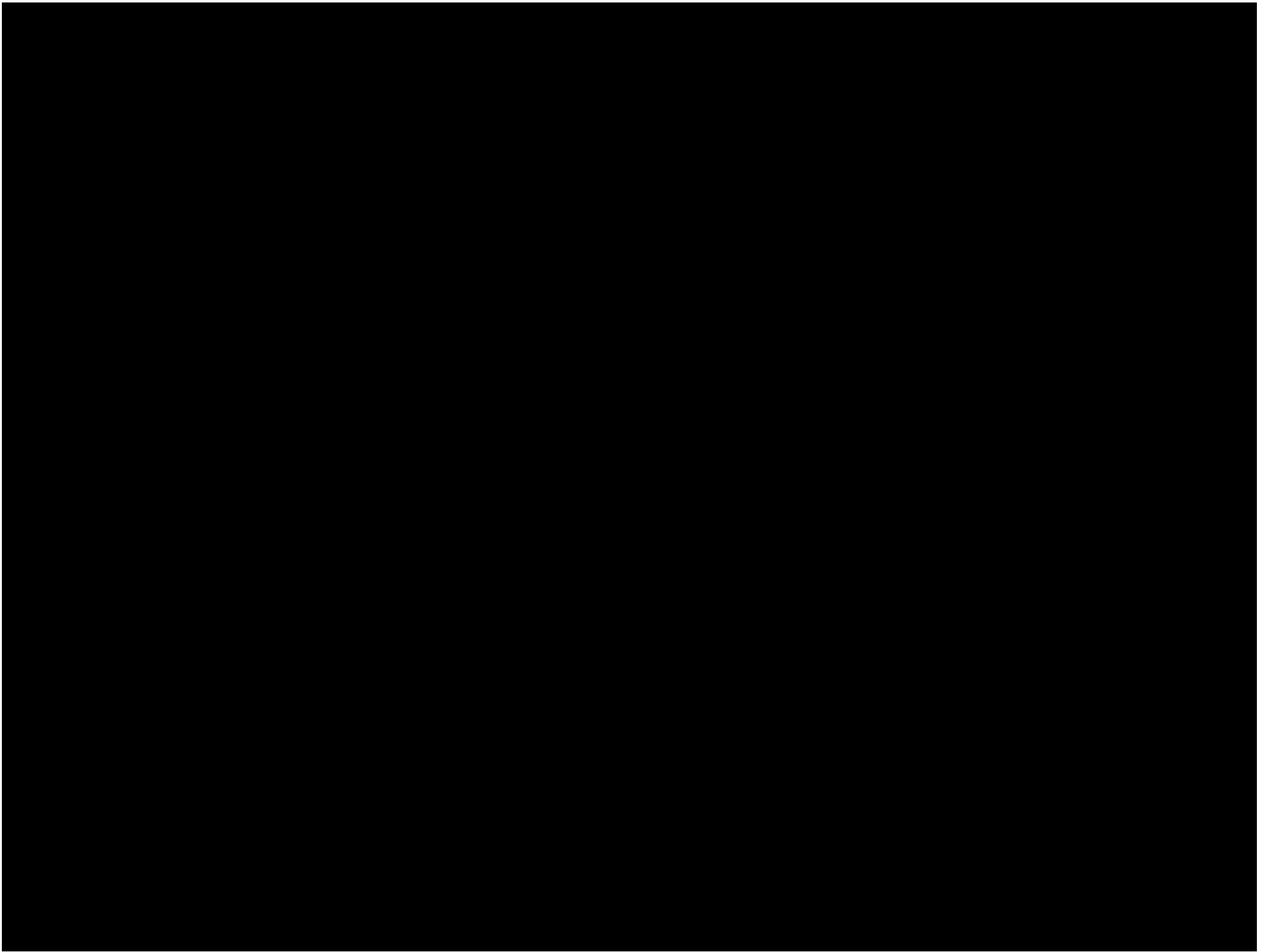


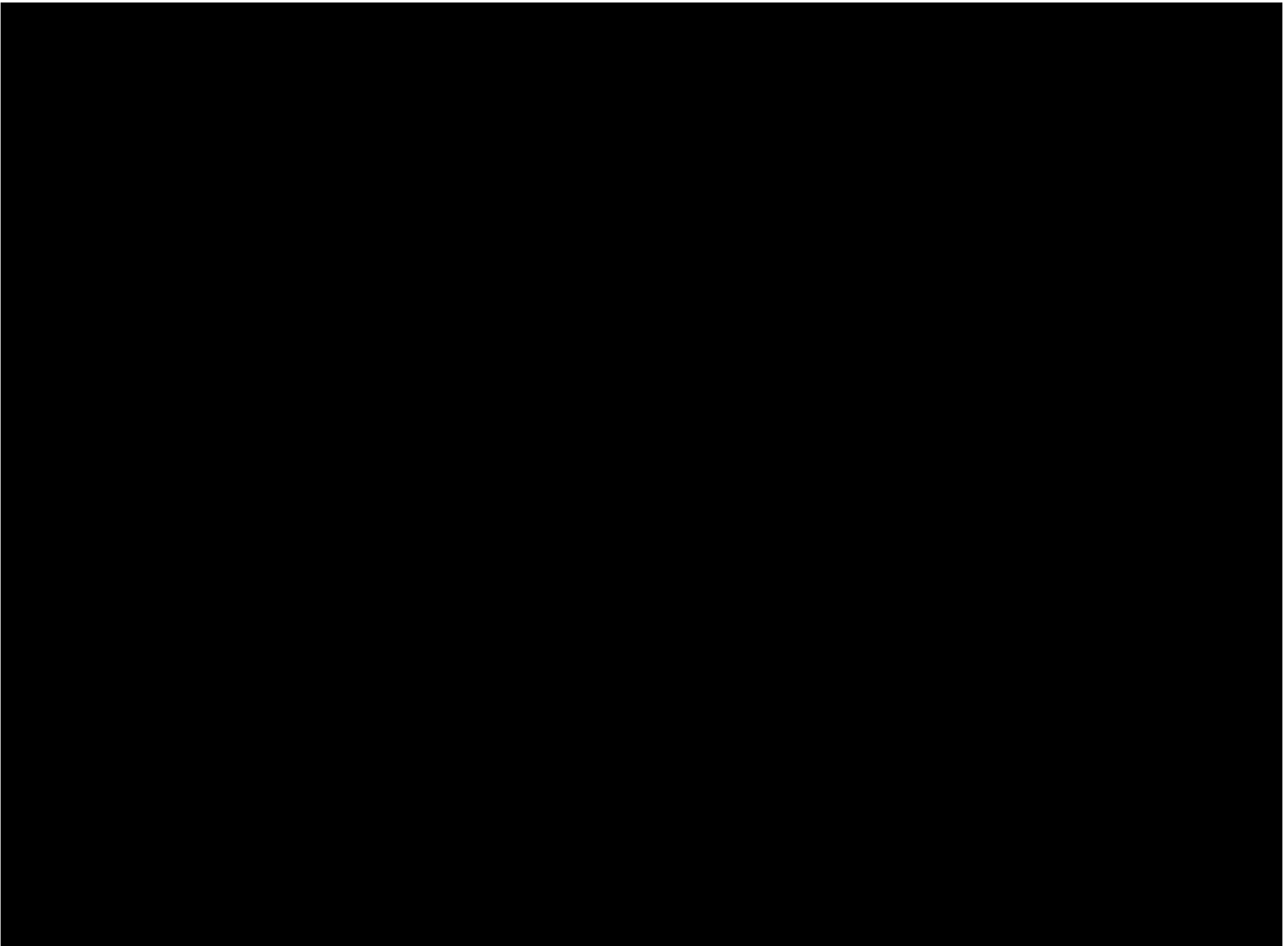


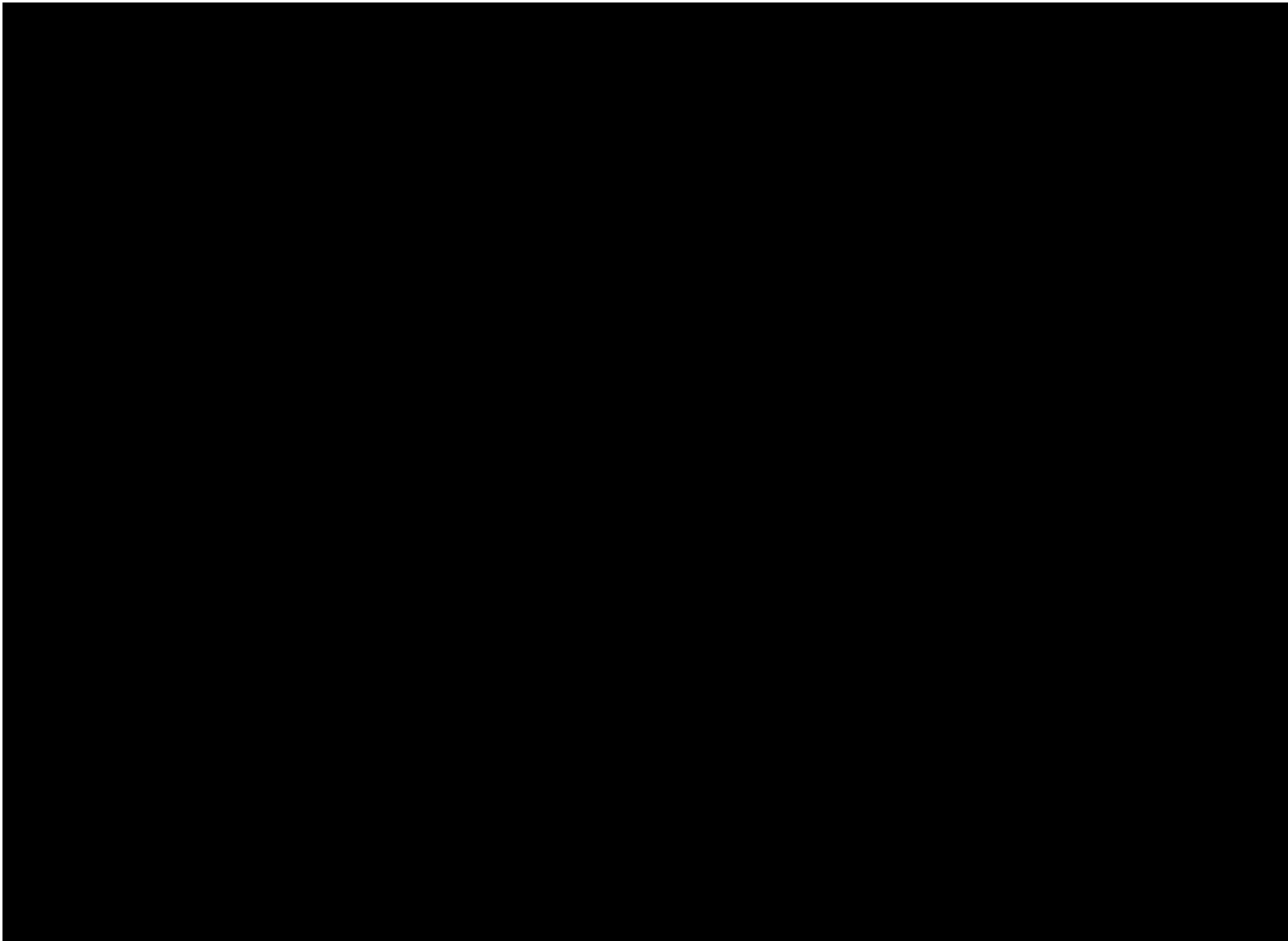


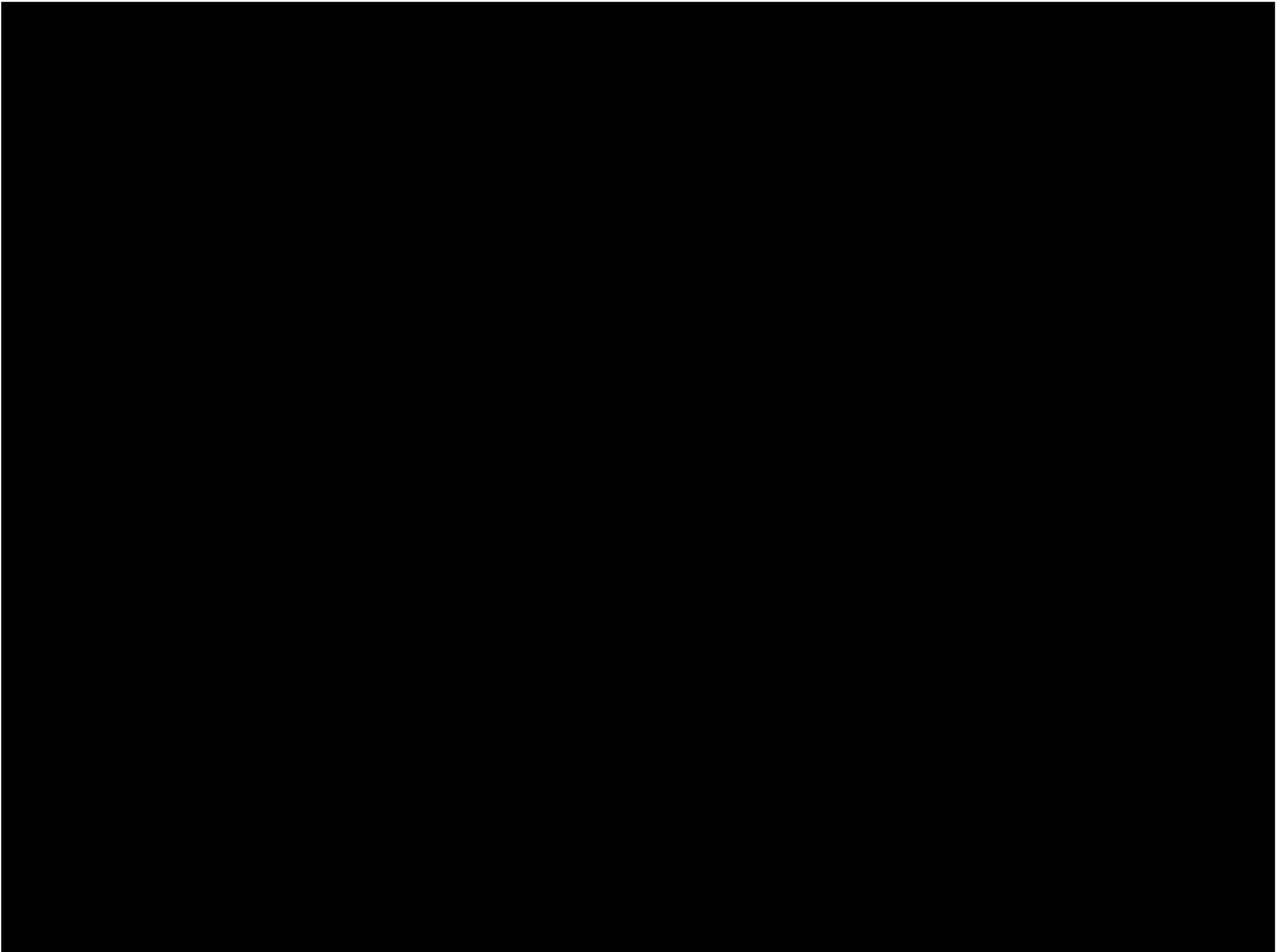


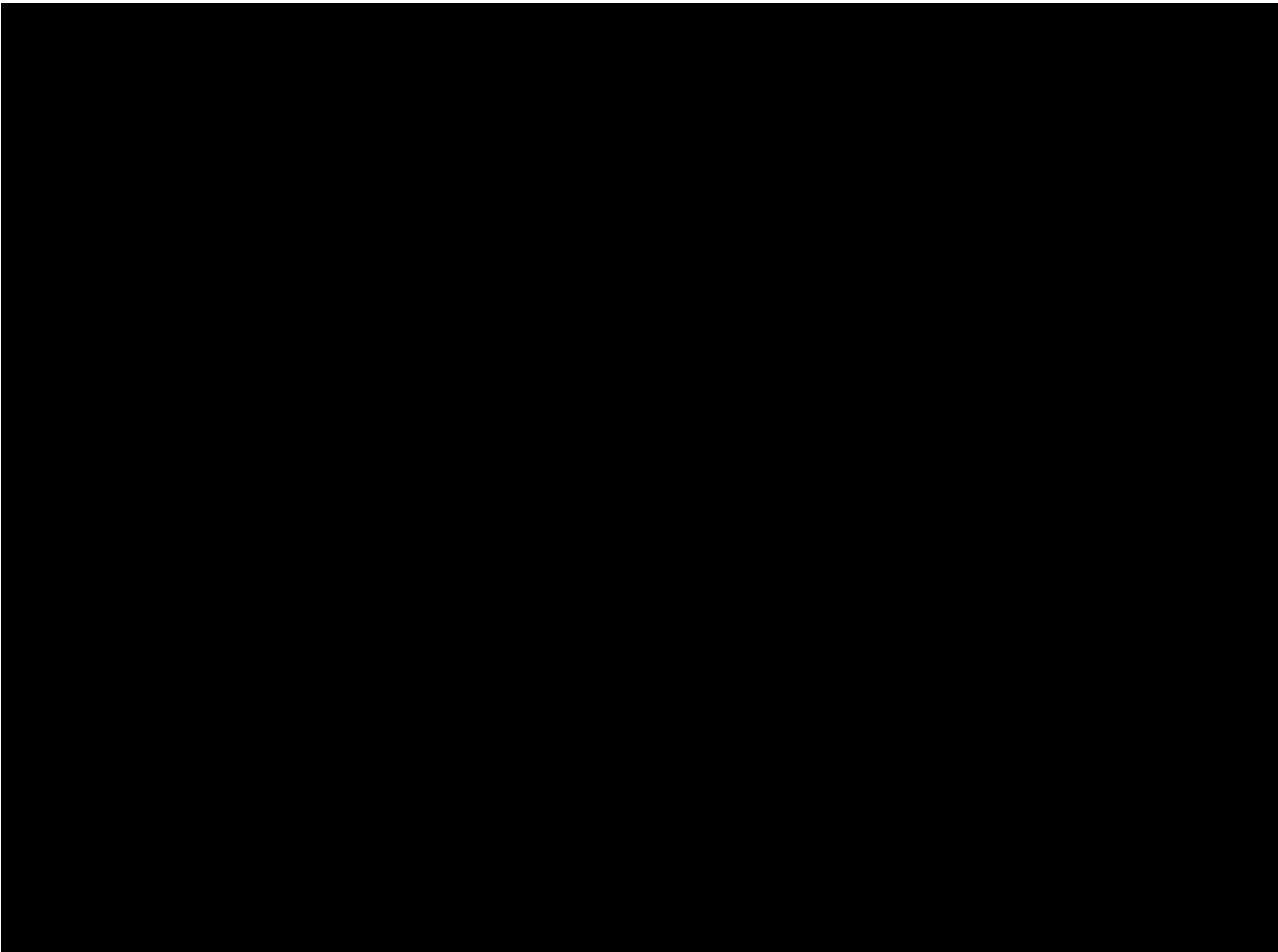


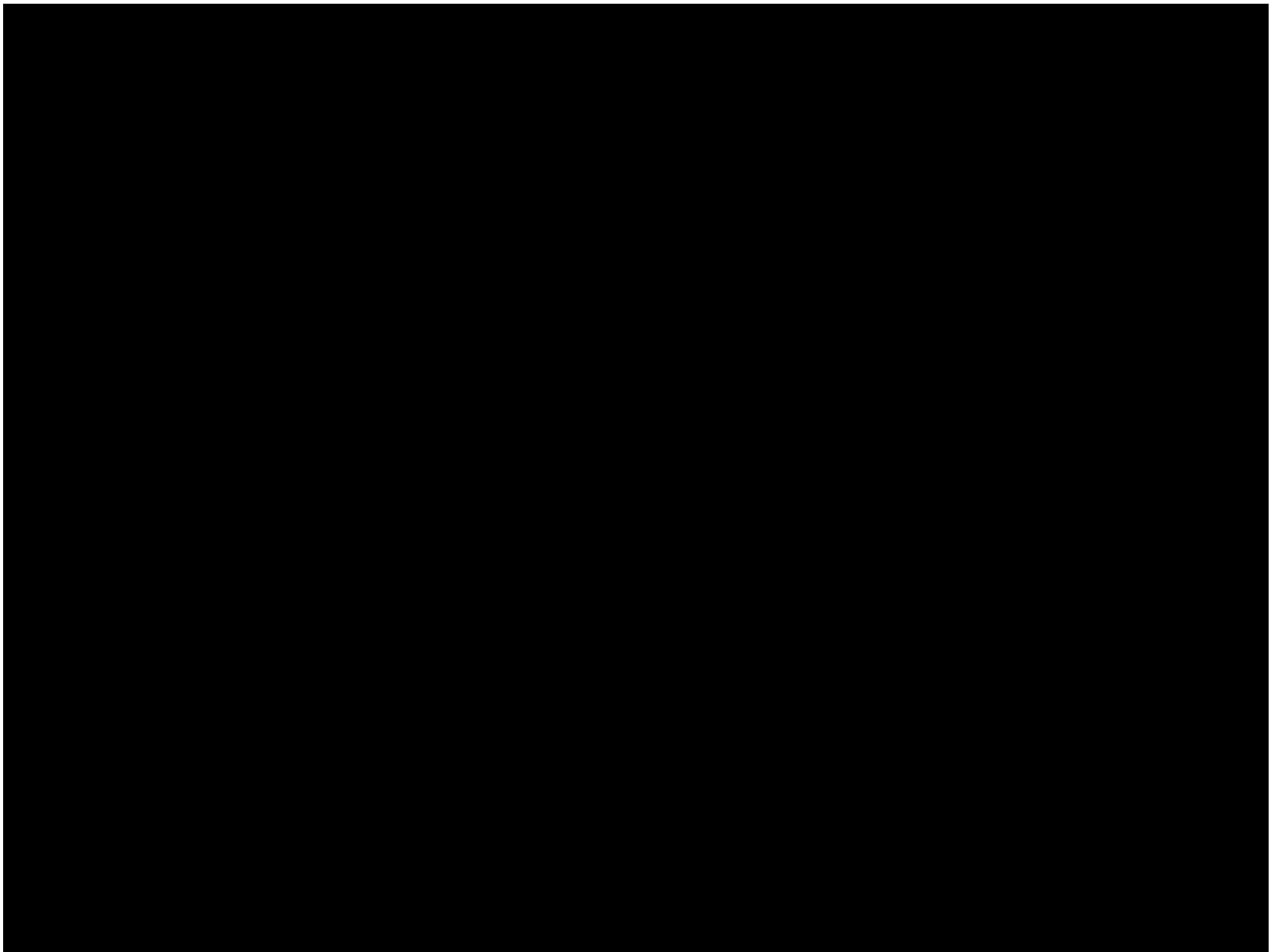


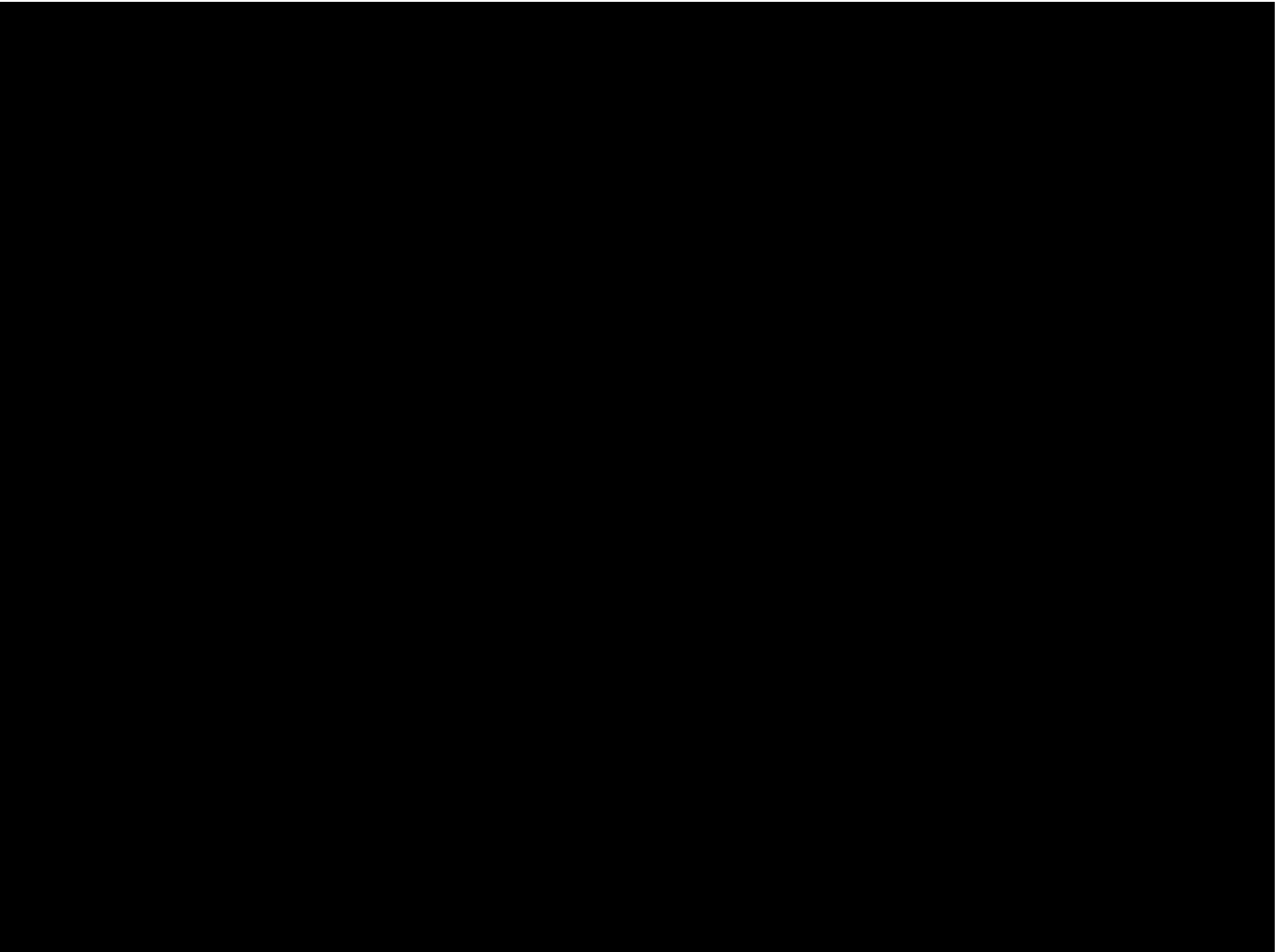


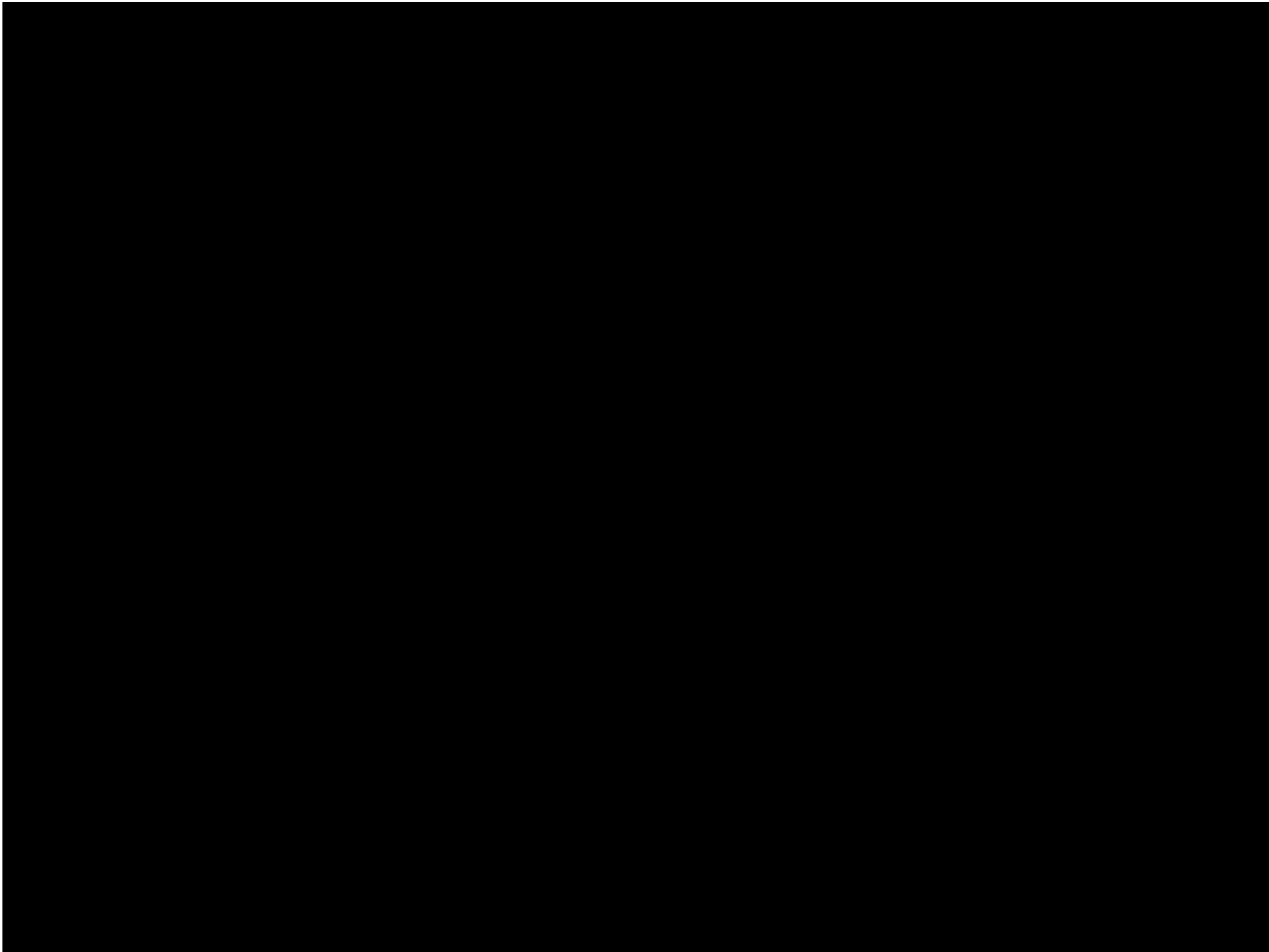


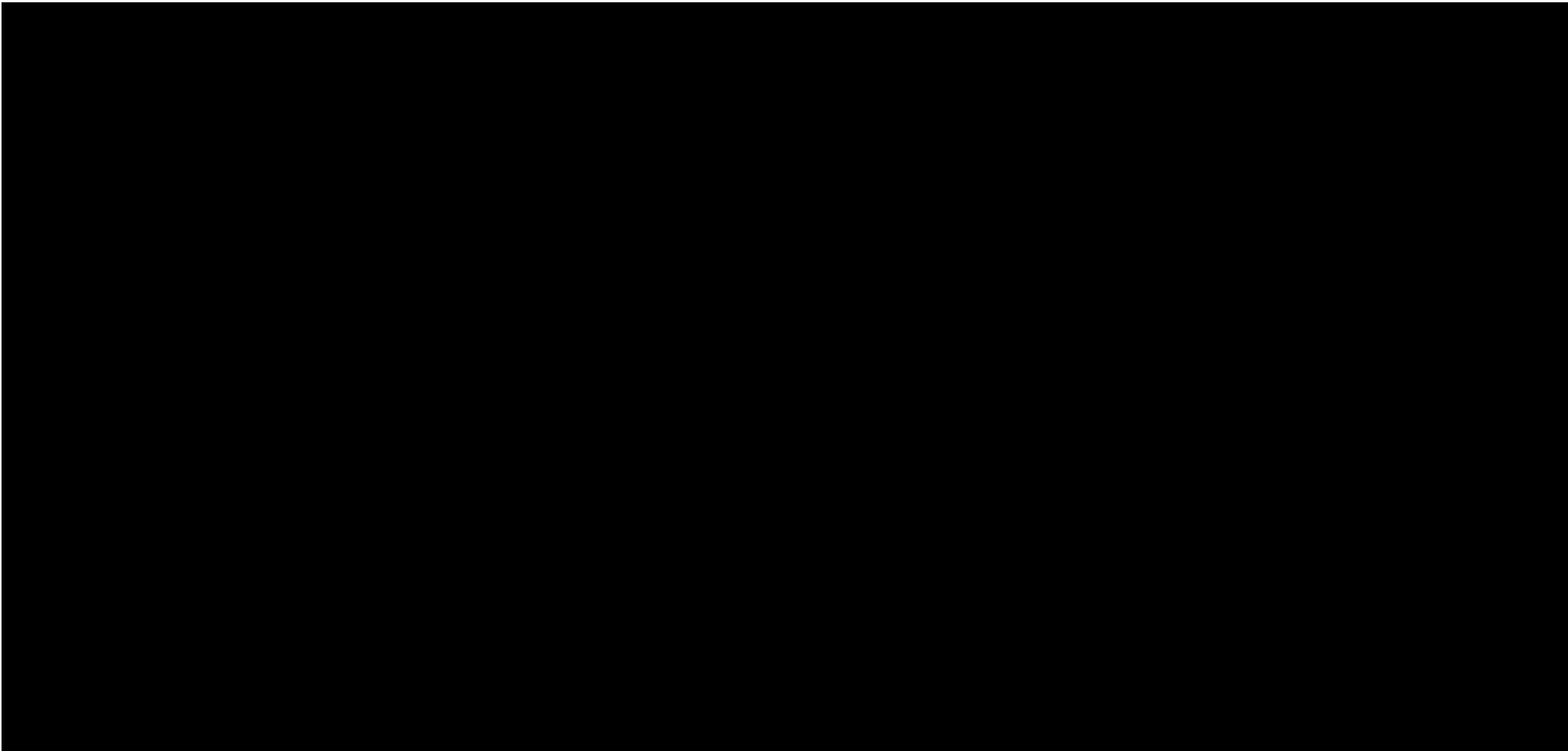




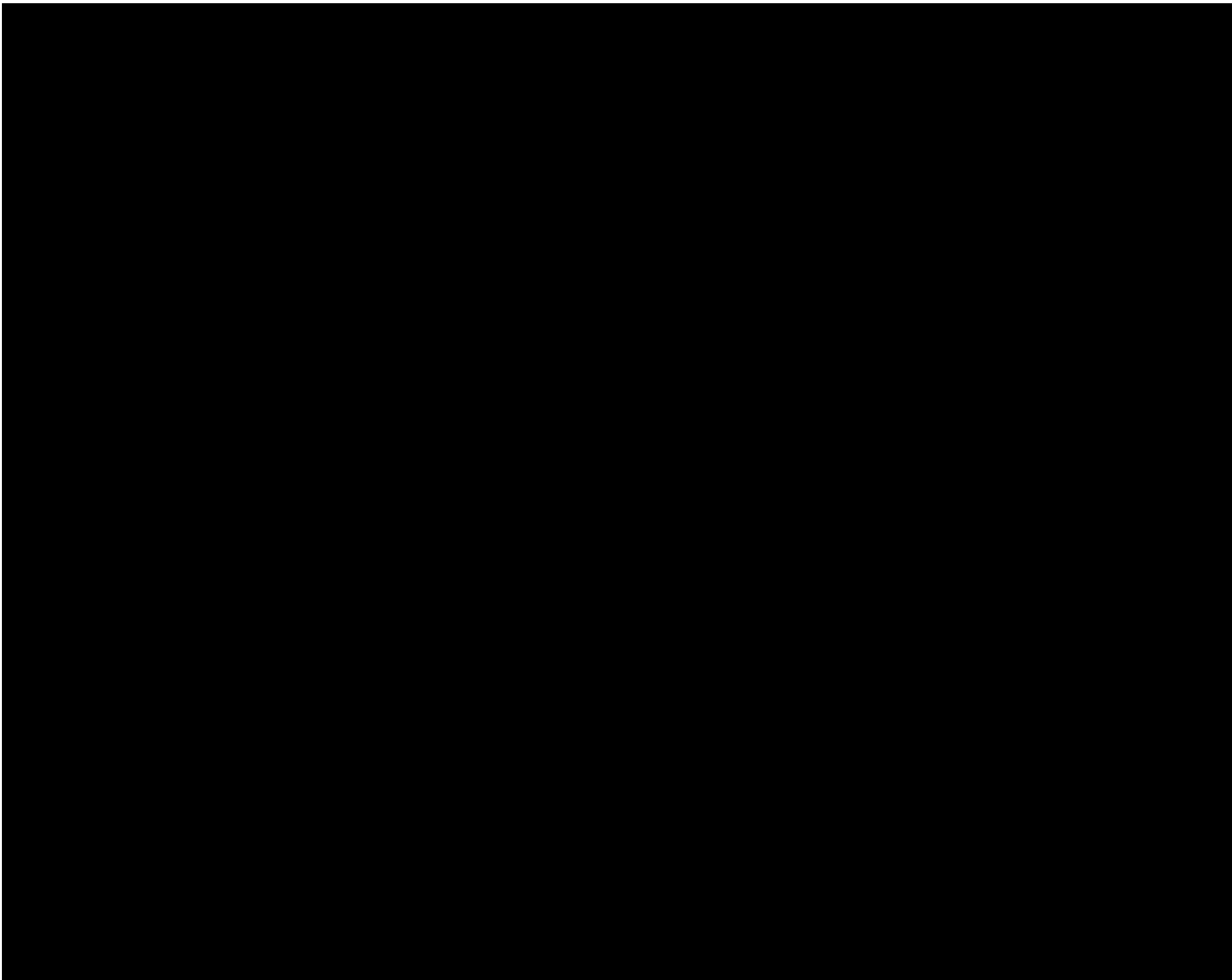


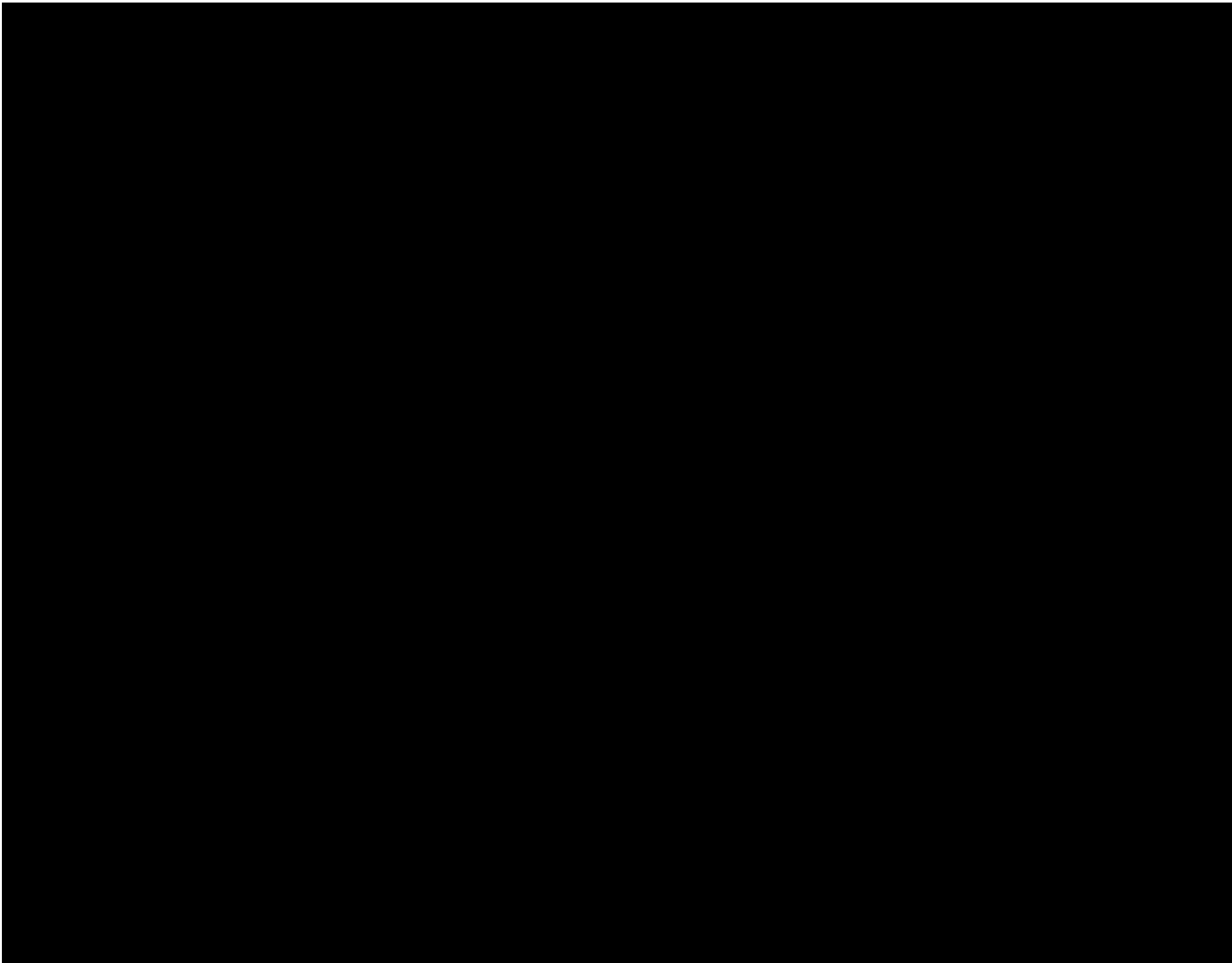


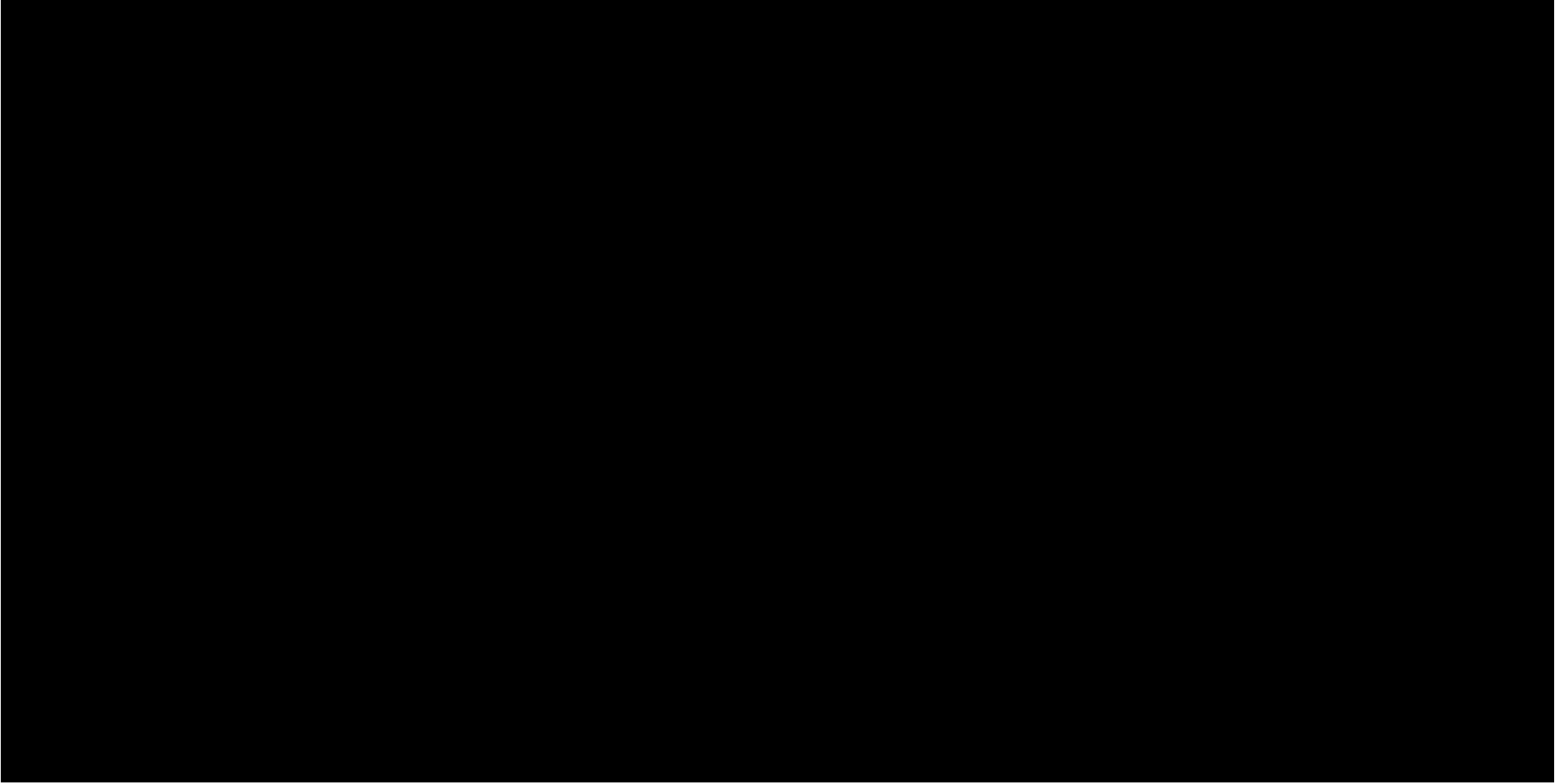


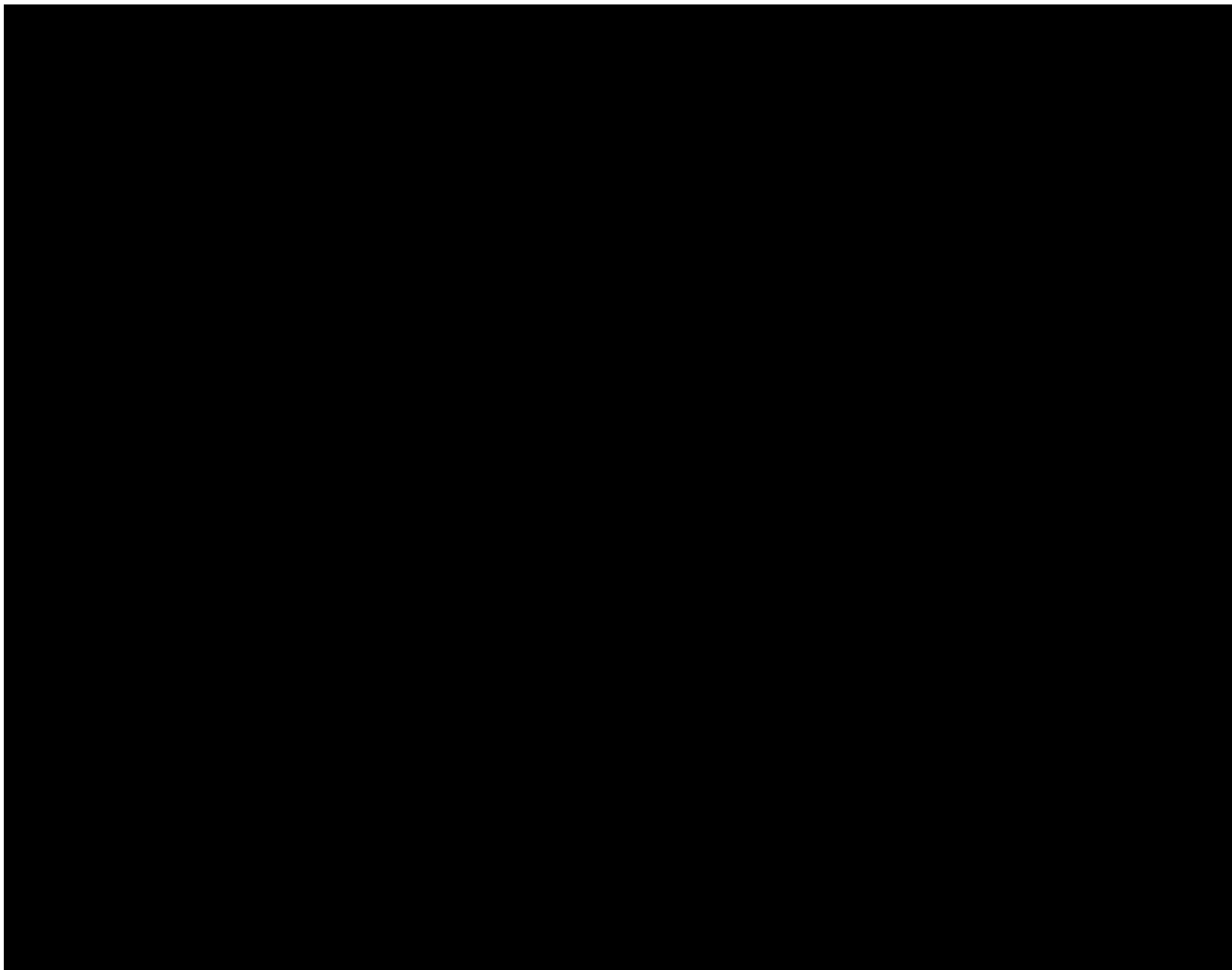


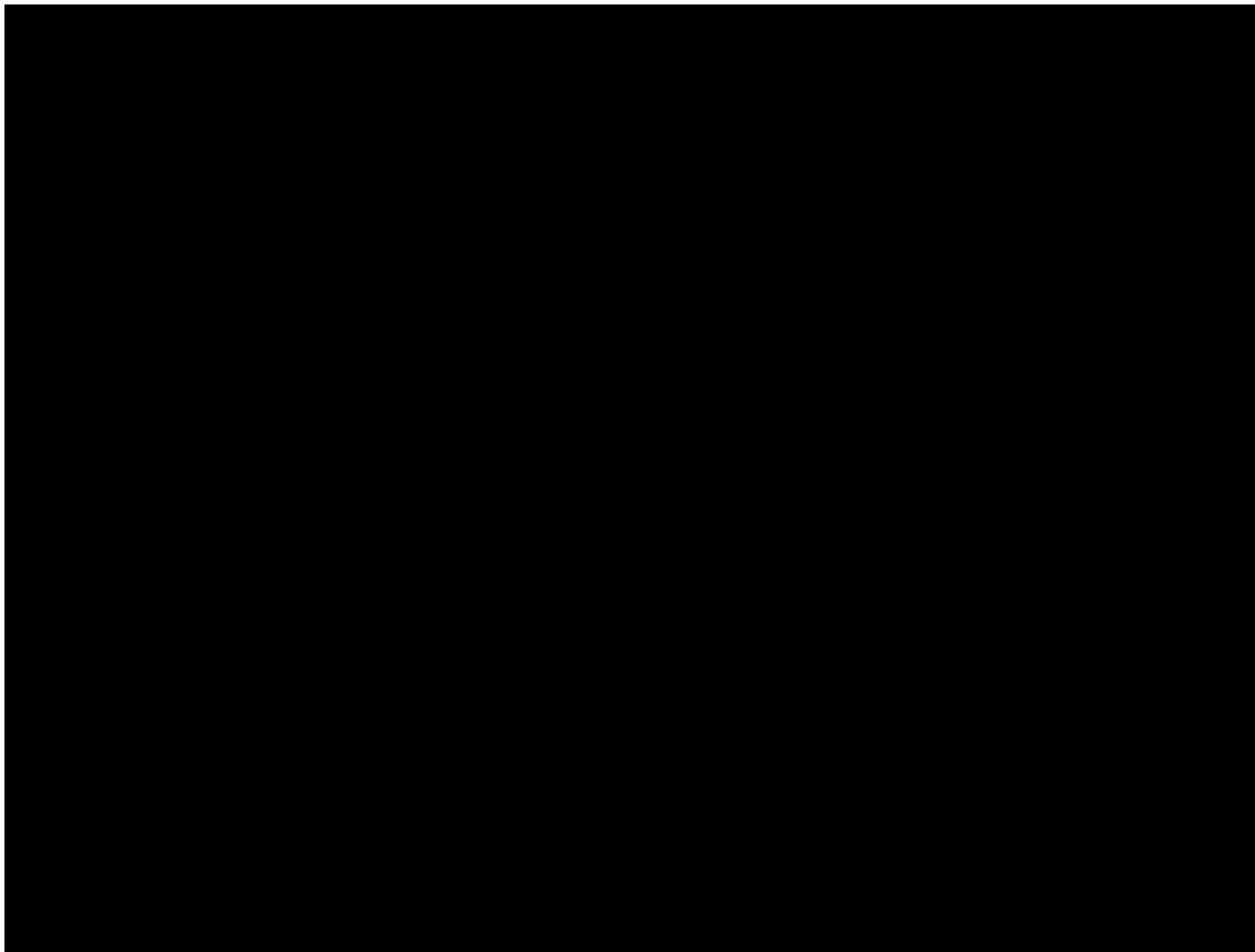
Appendix D
Artifact Tables
Hartgen Final Catalog
Hartgen Final Inventory
Hartgen Cull List
Preliminary Inventory of Retained Artifacts
Artifacts Not Retained from the Field
Artifacts Sampled in the Field

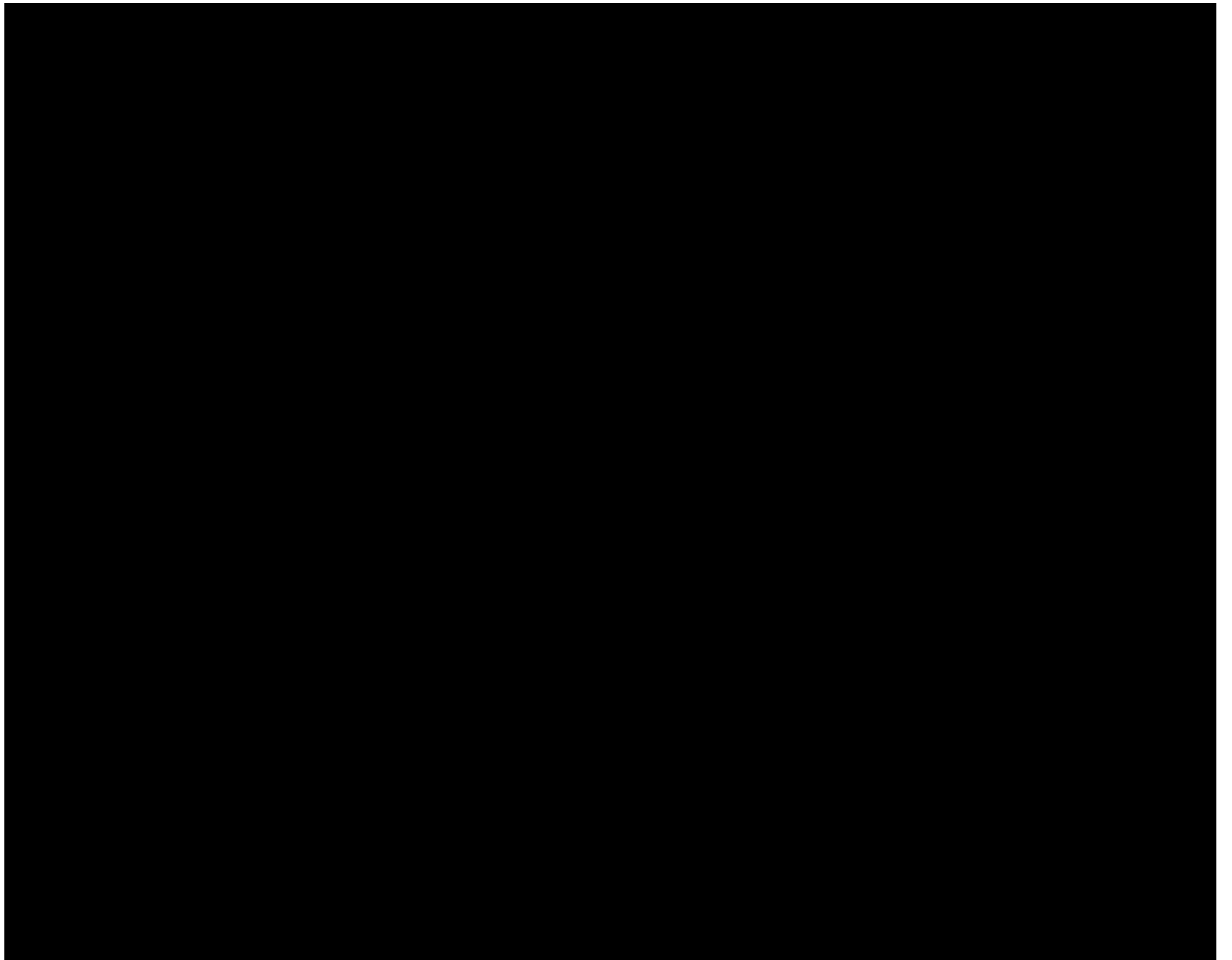


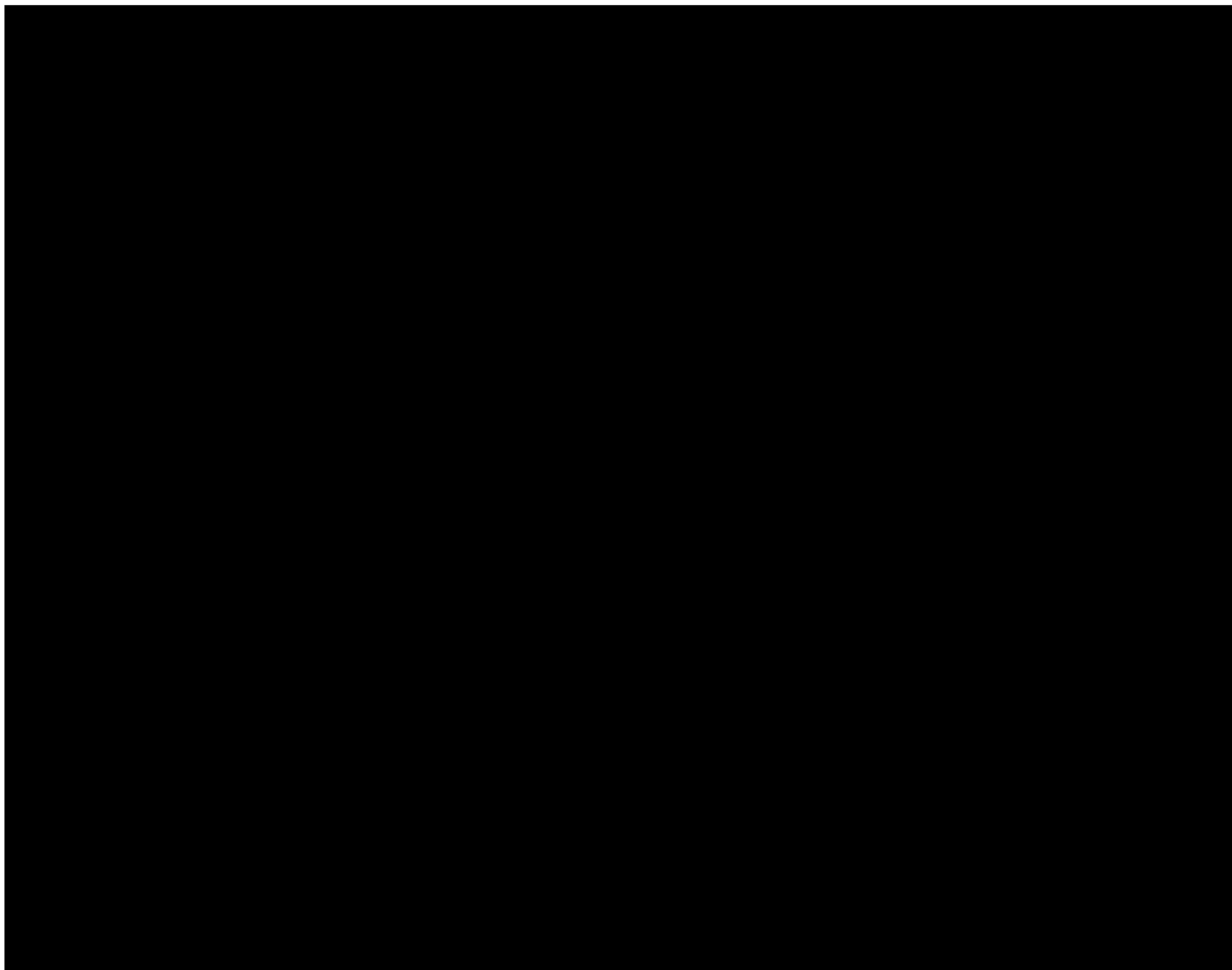


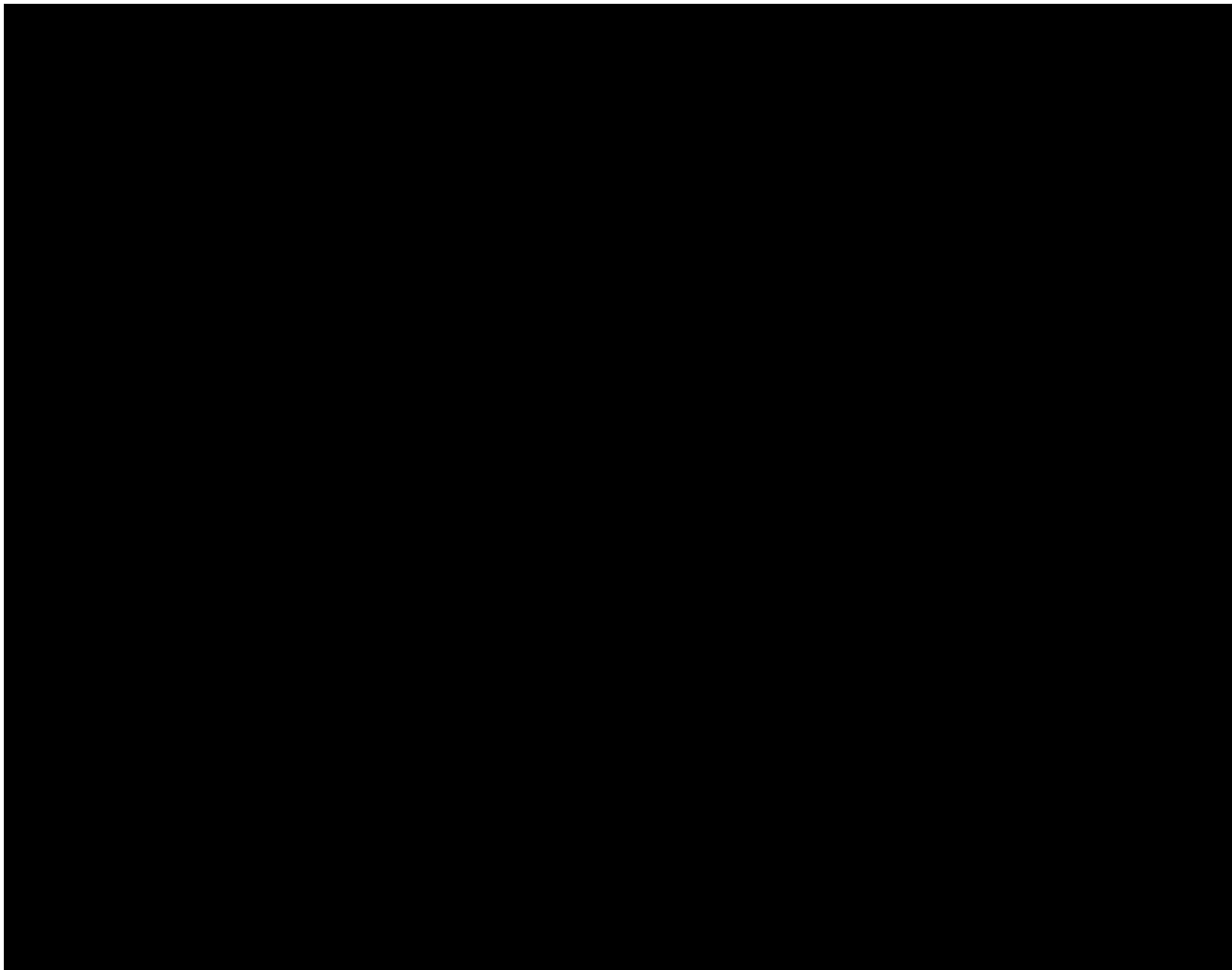


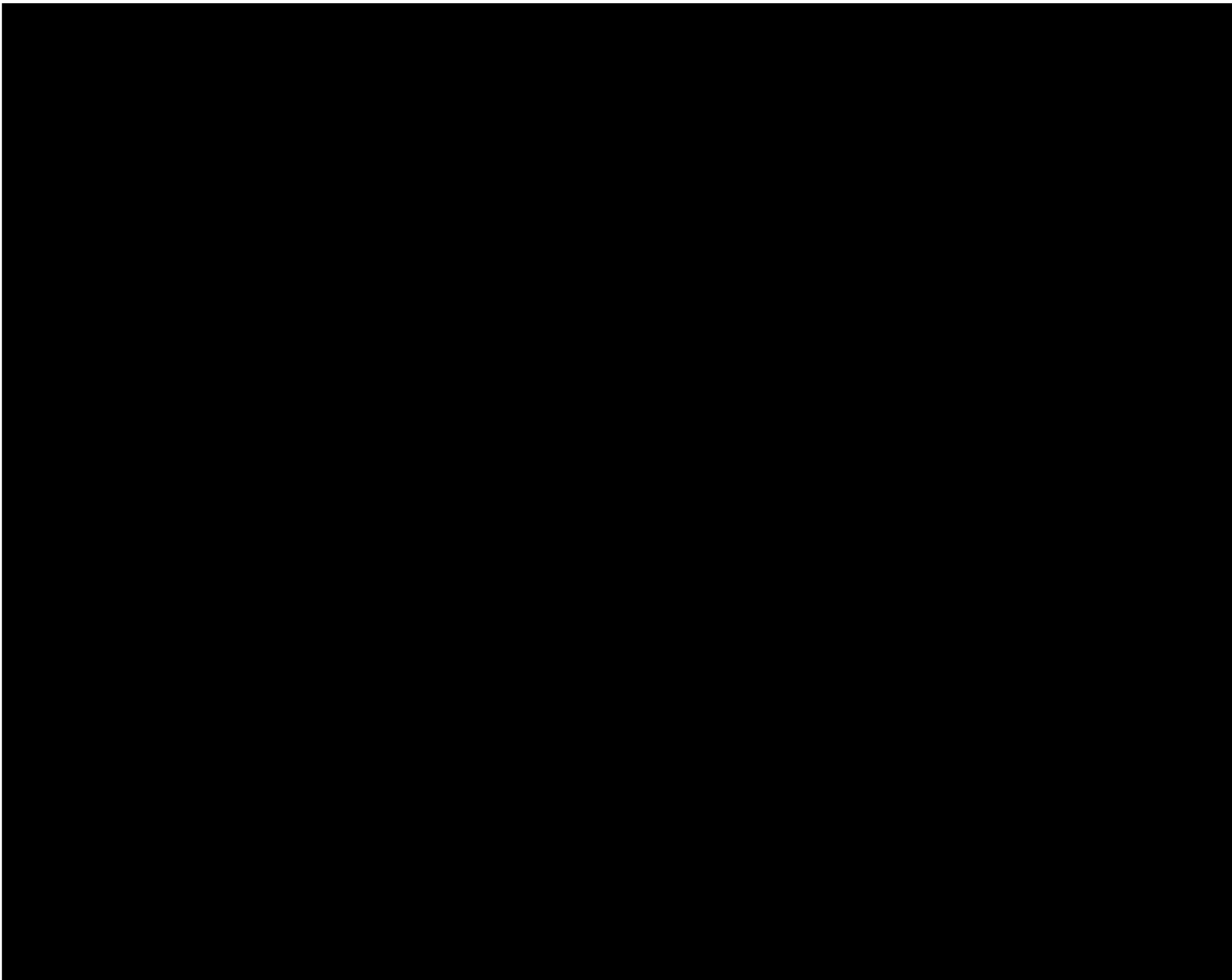


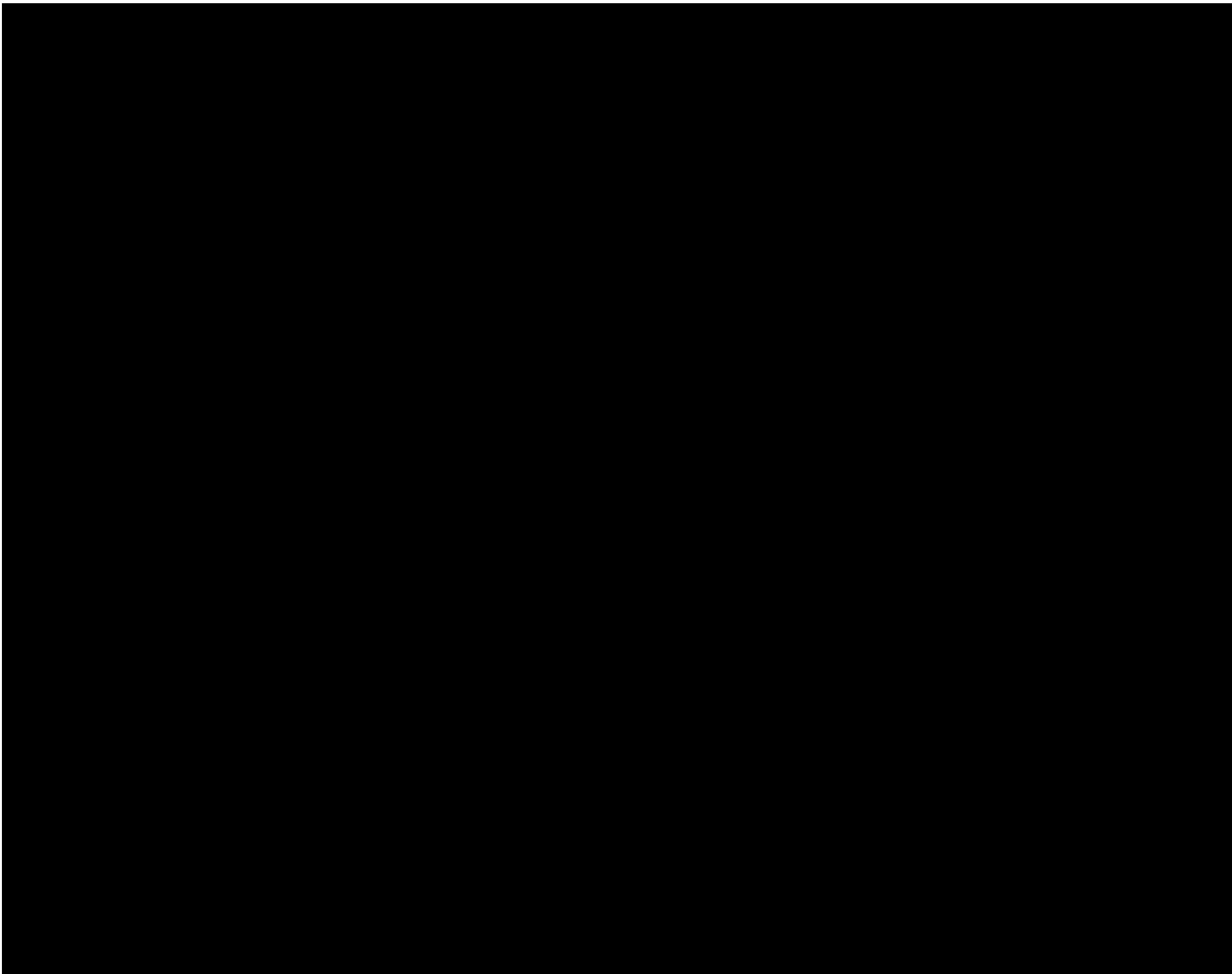


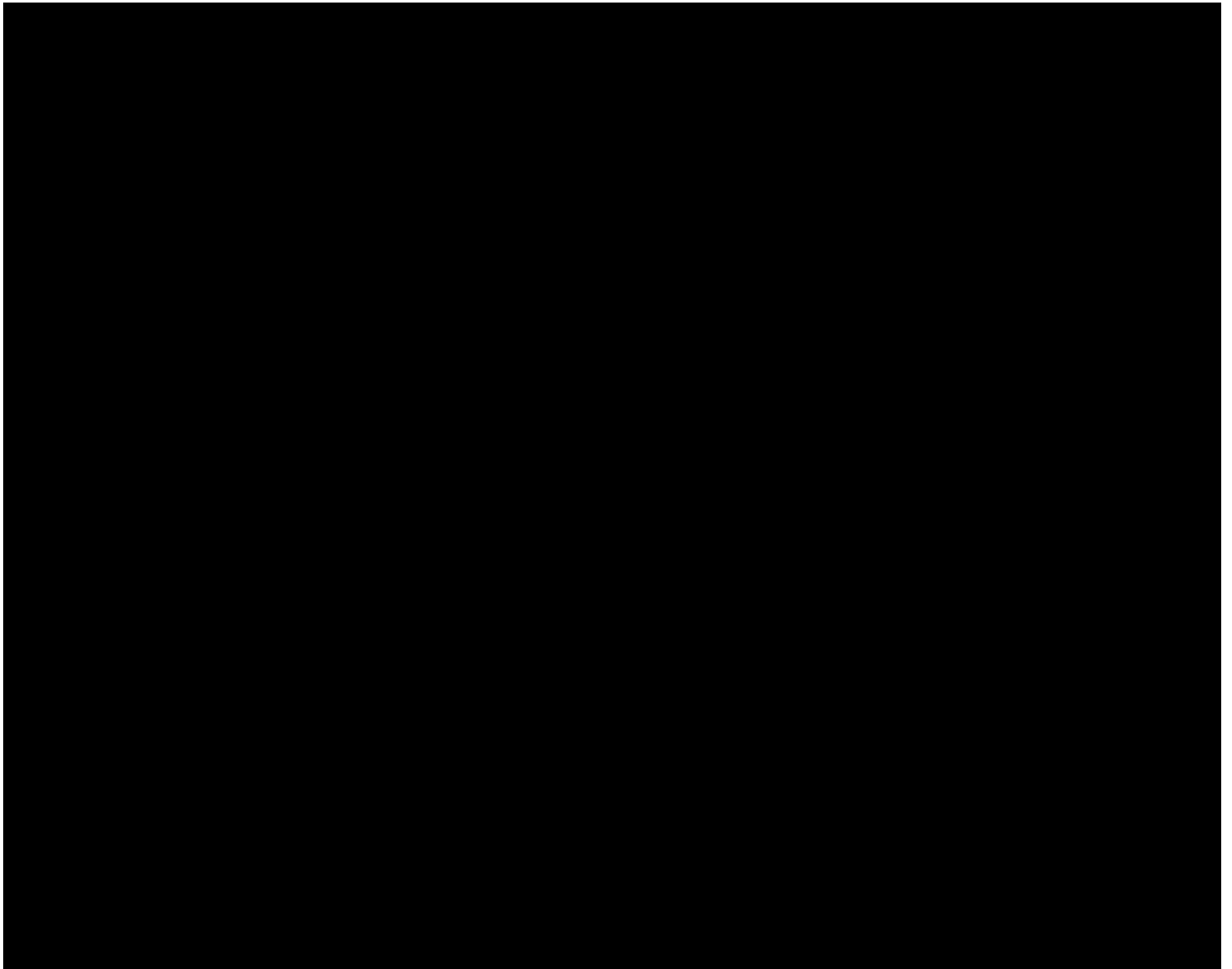


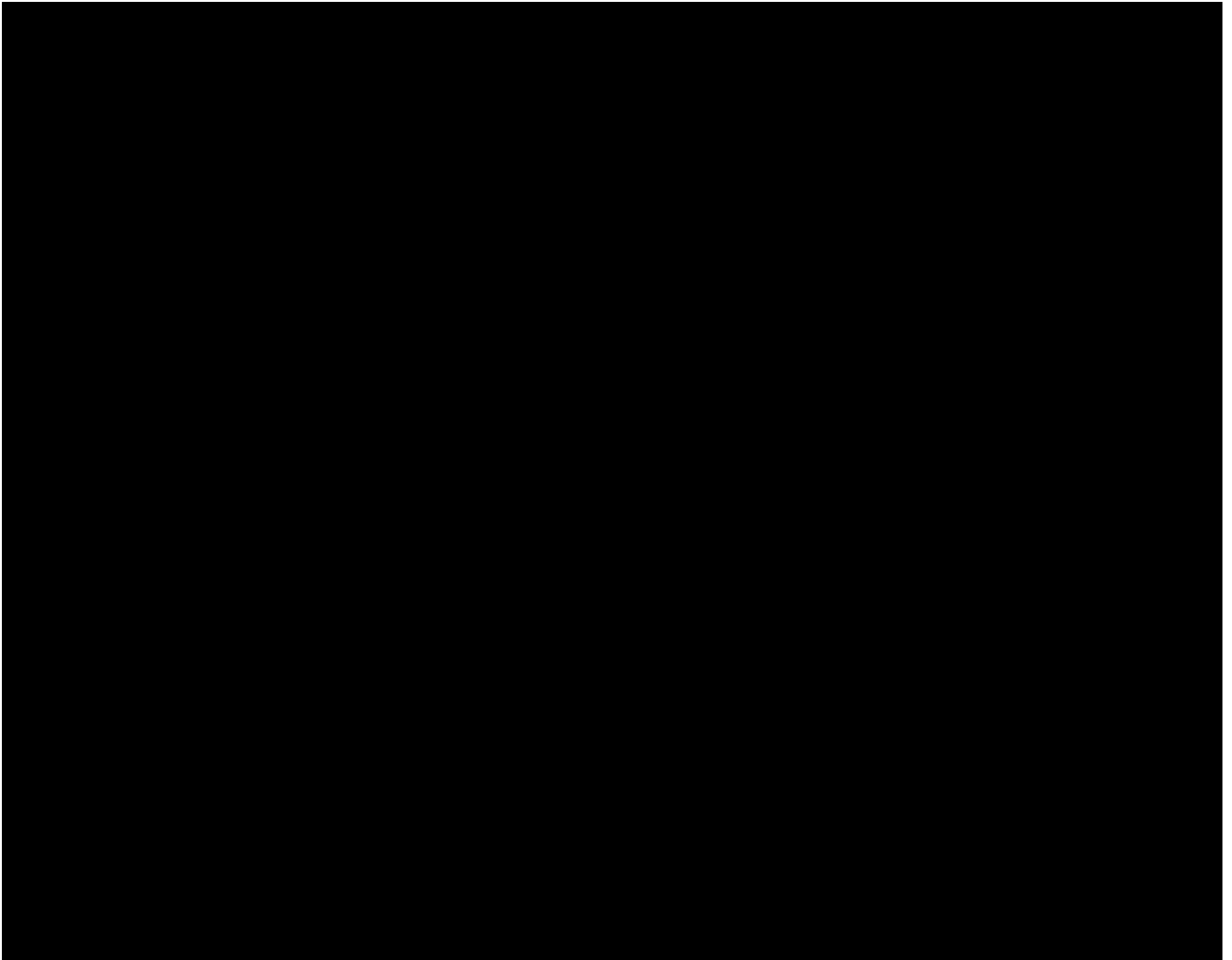


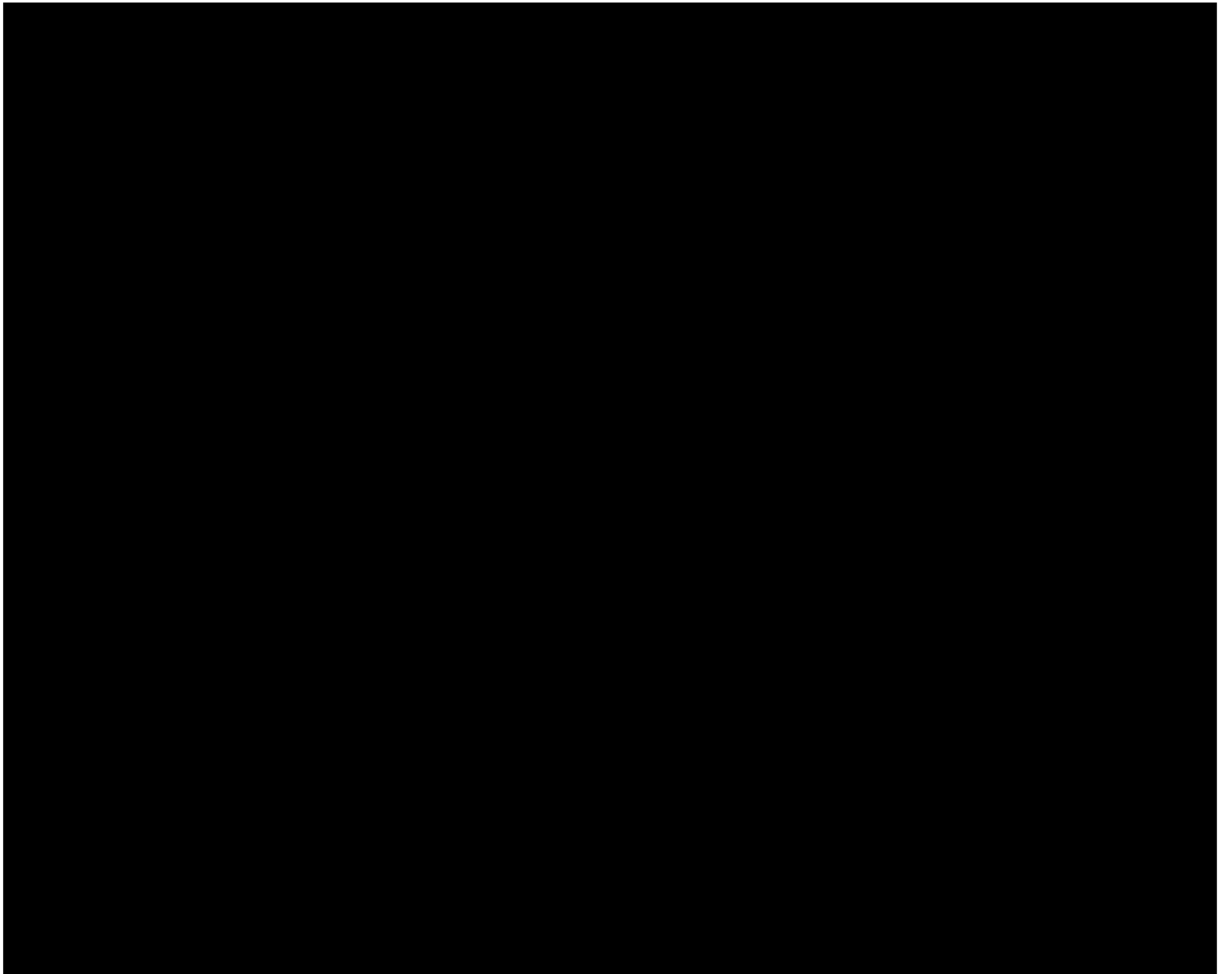


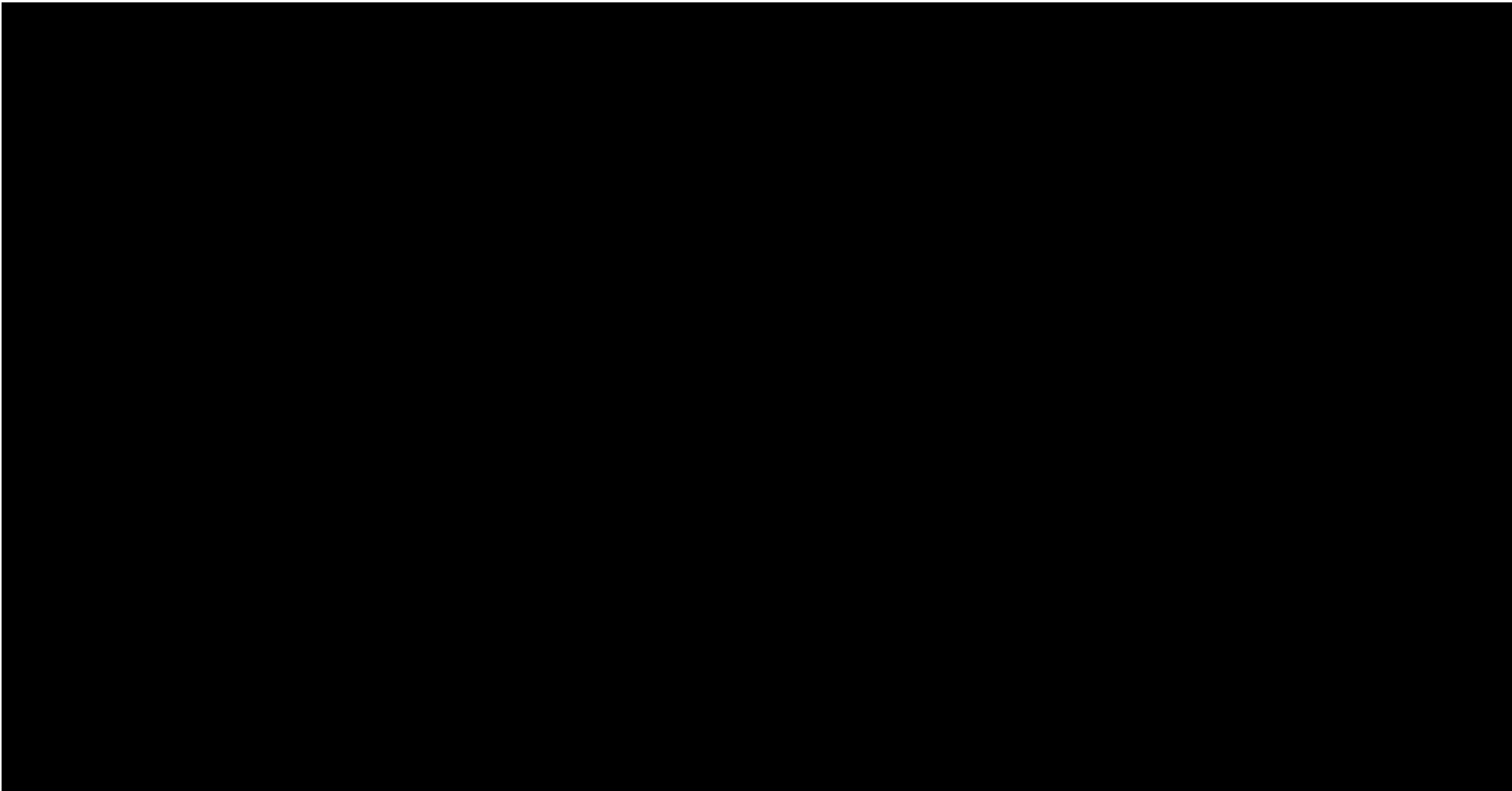


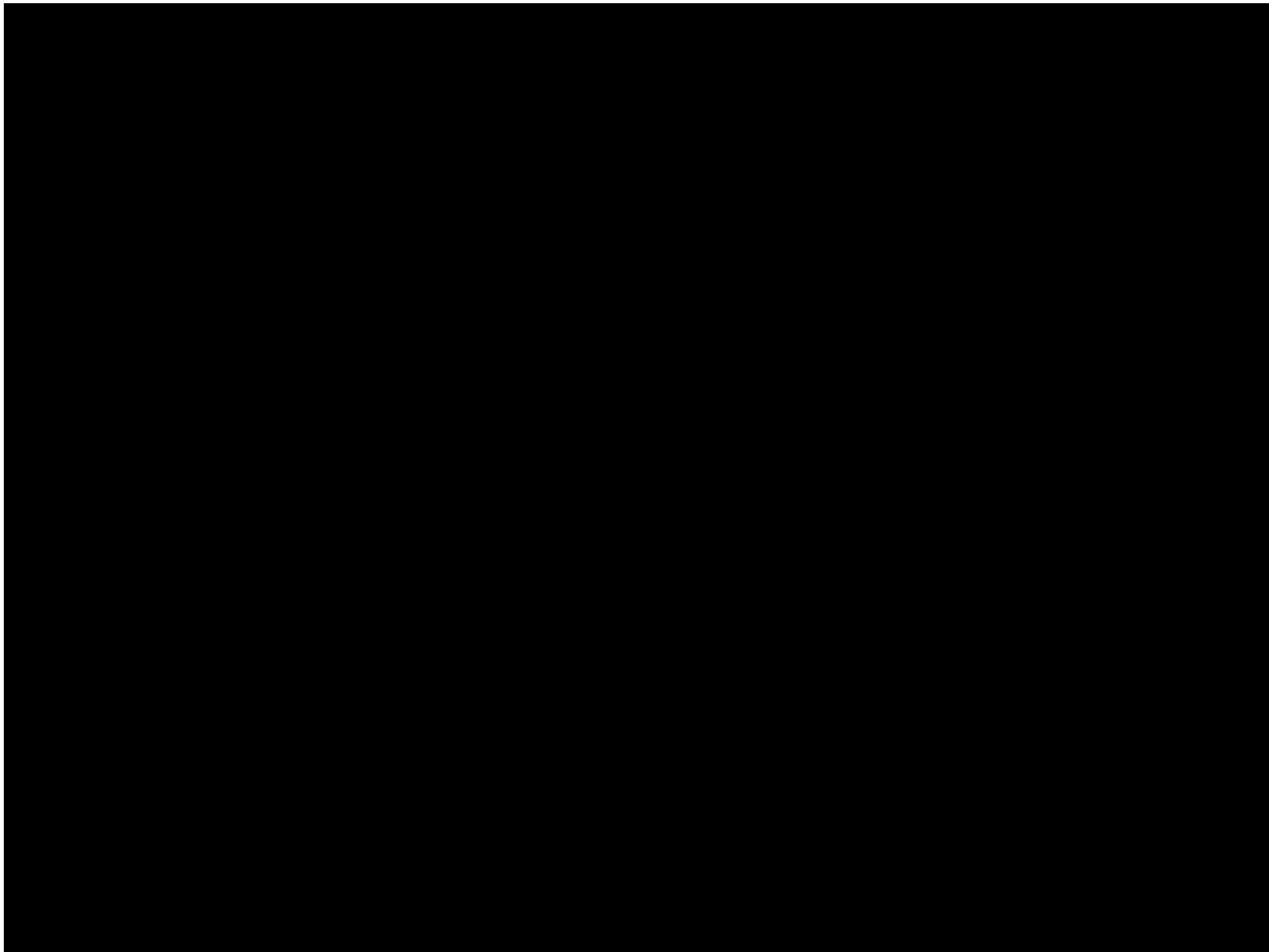


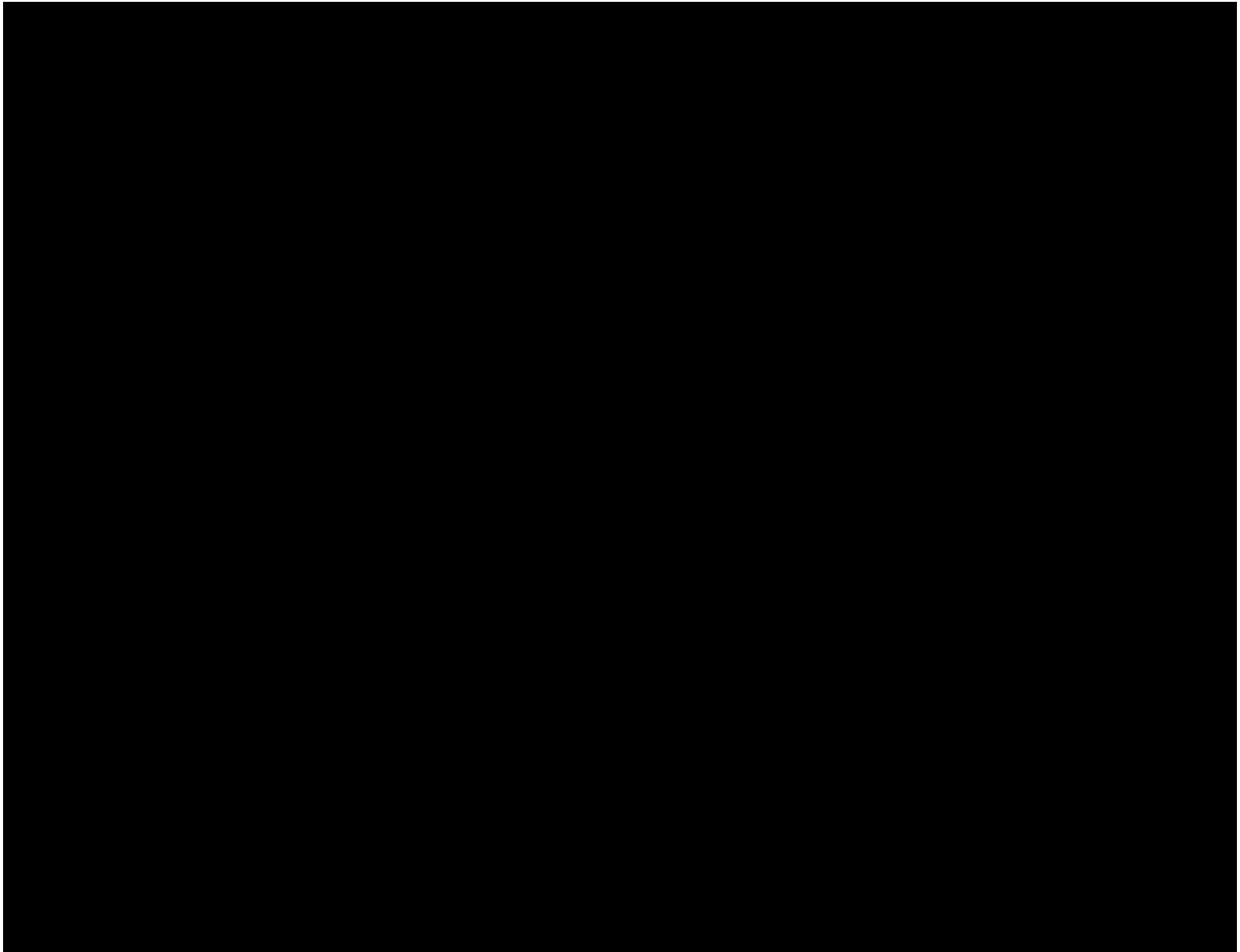


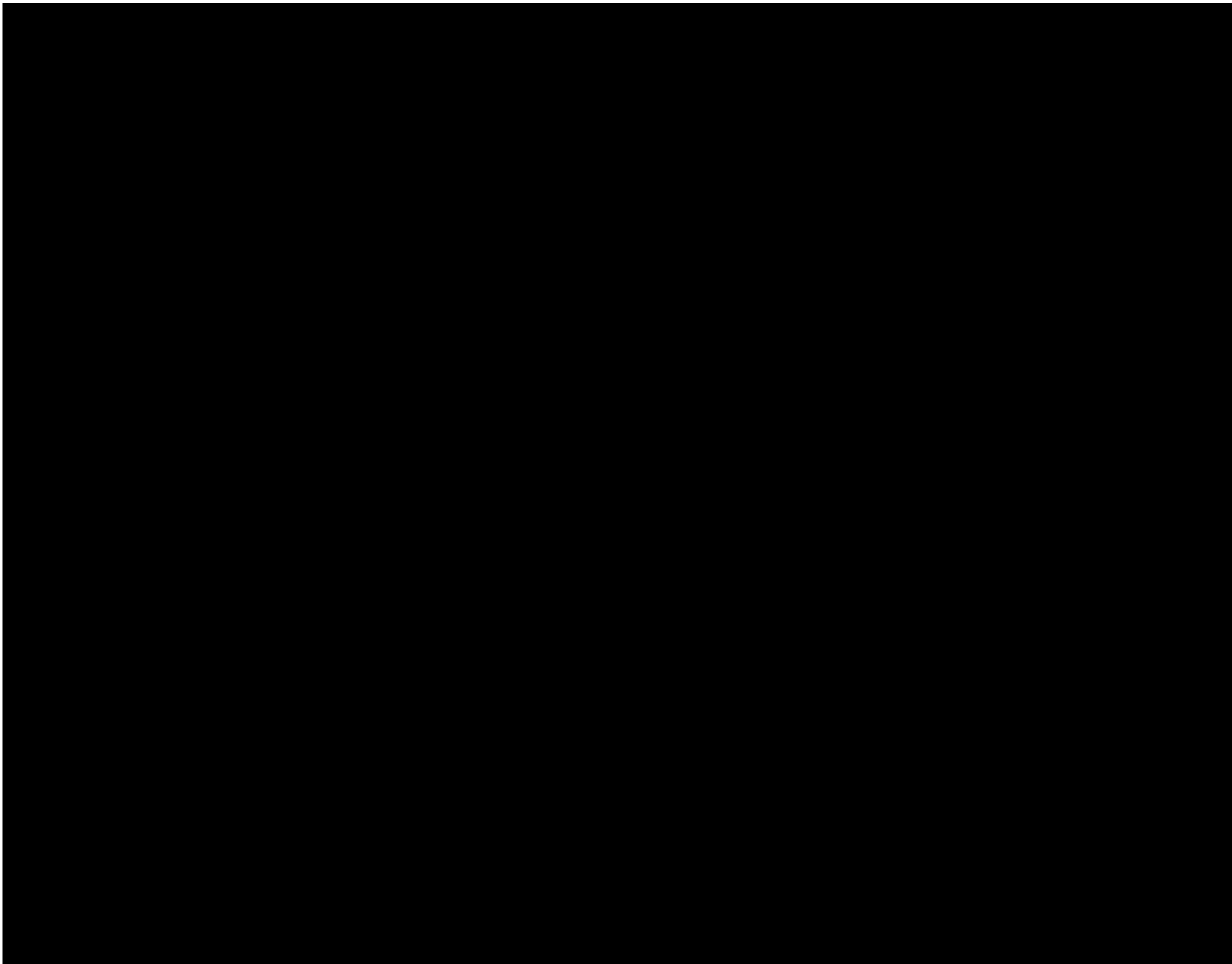


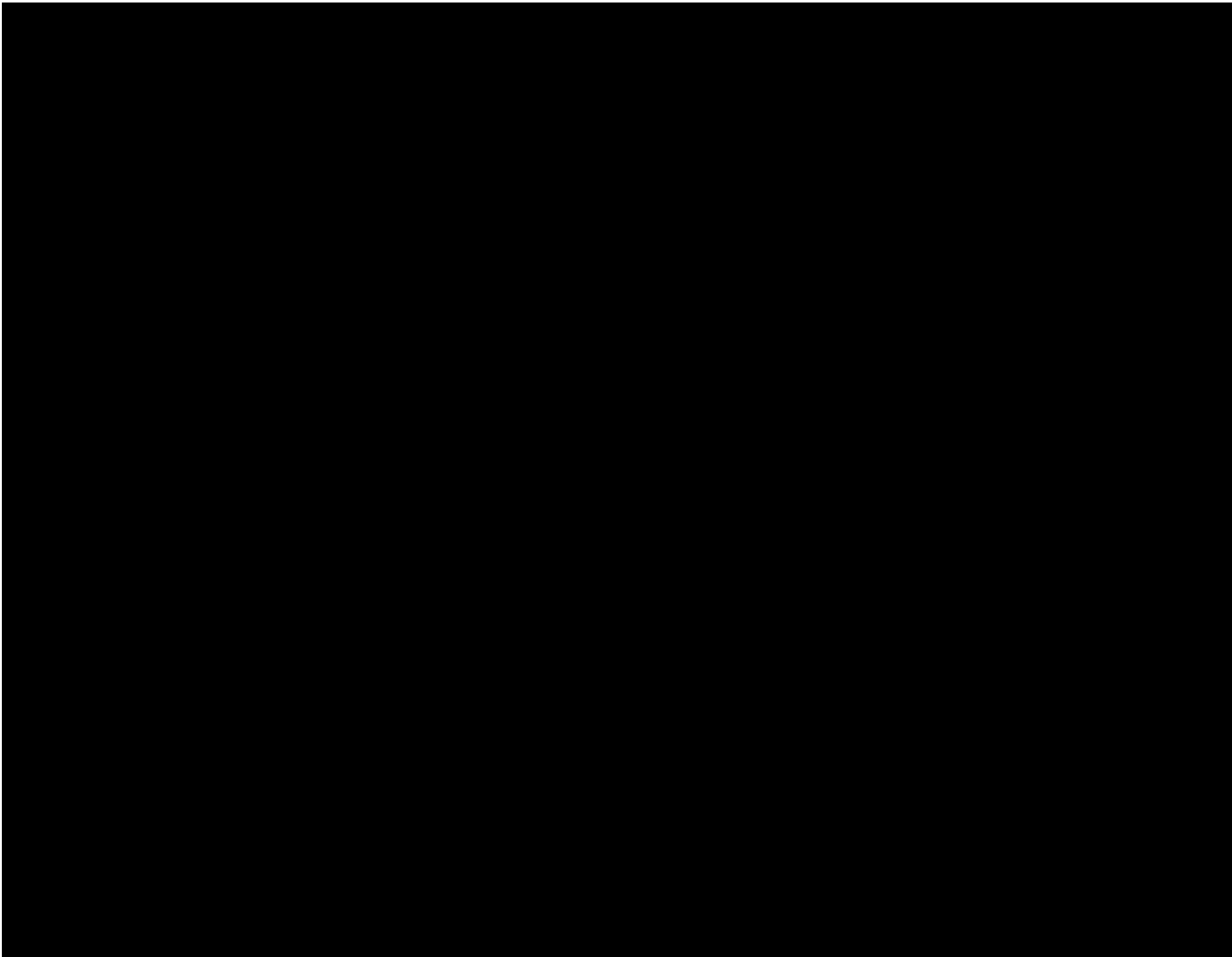


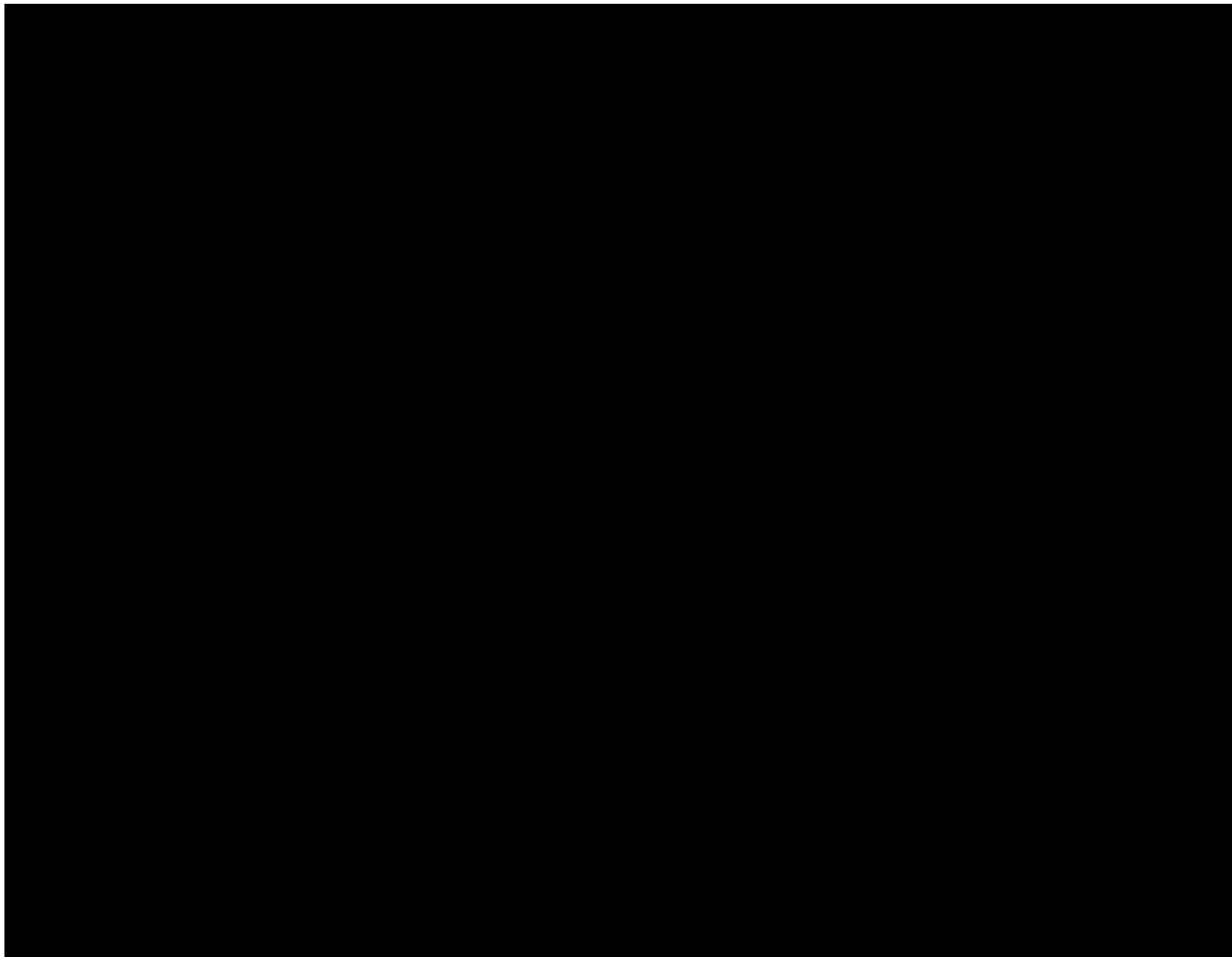


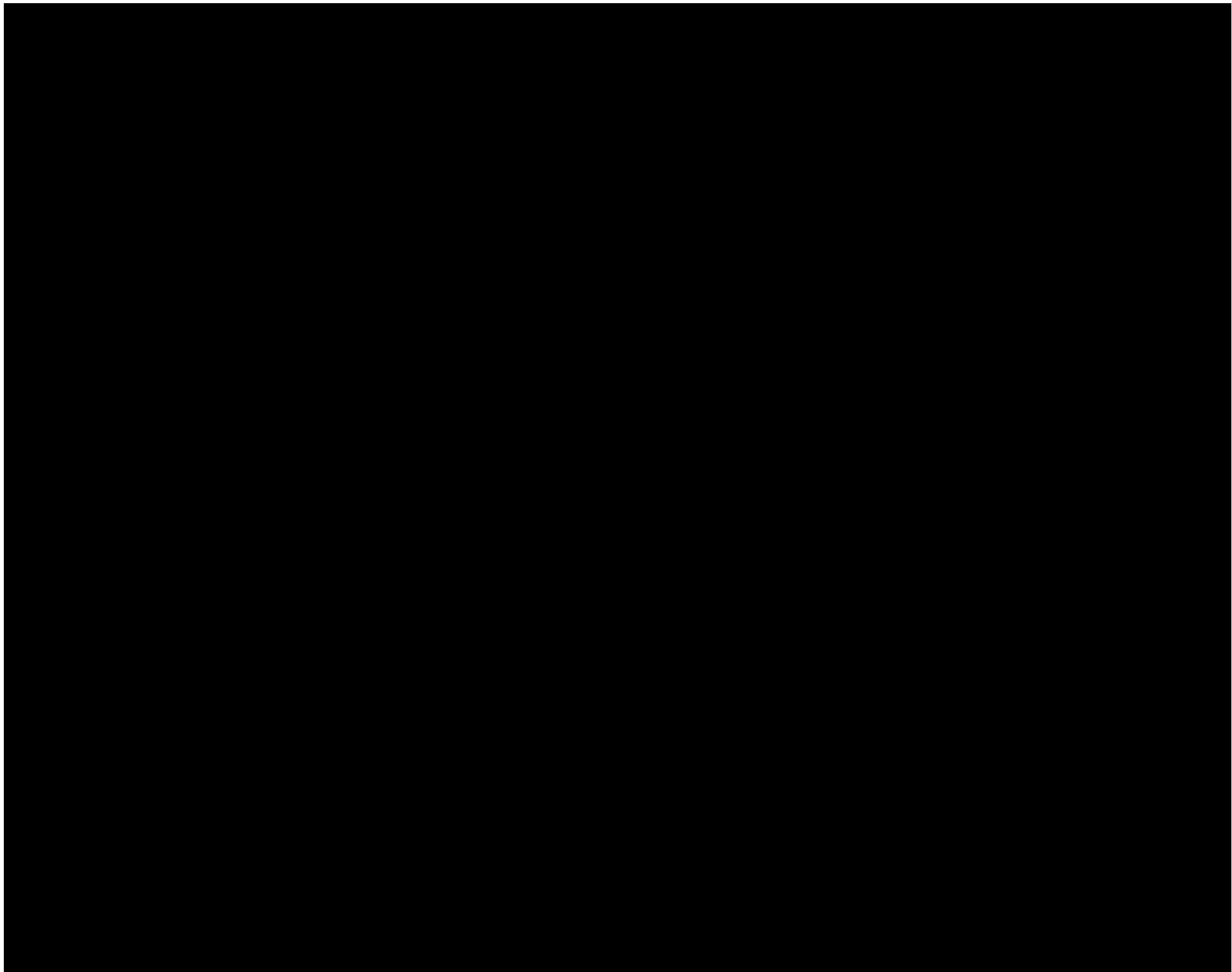


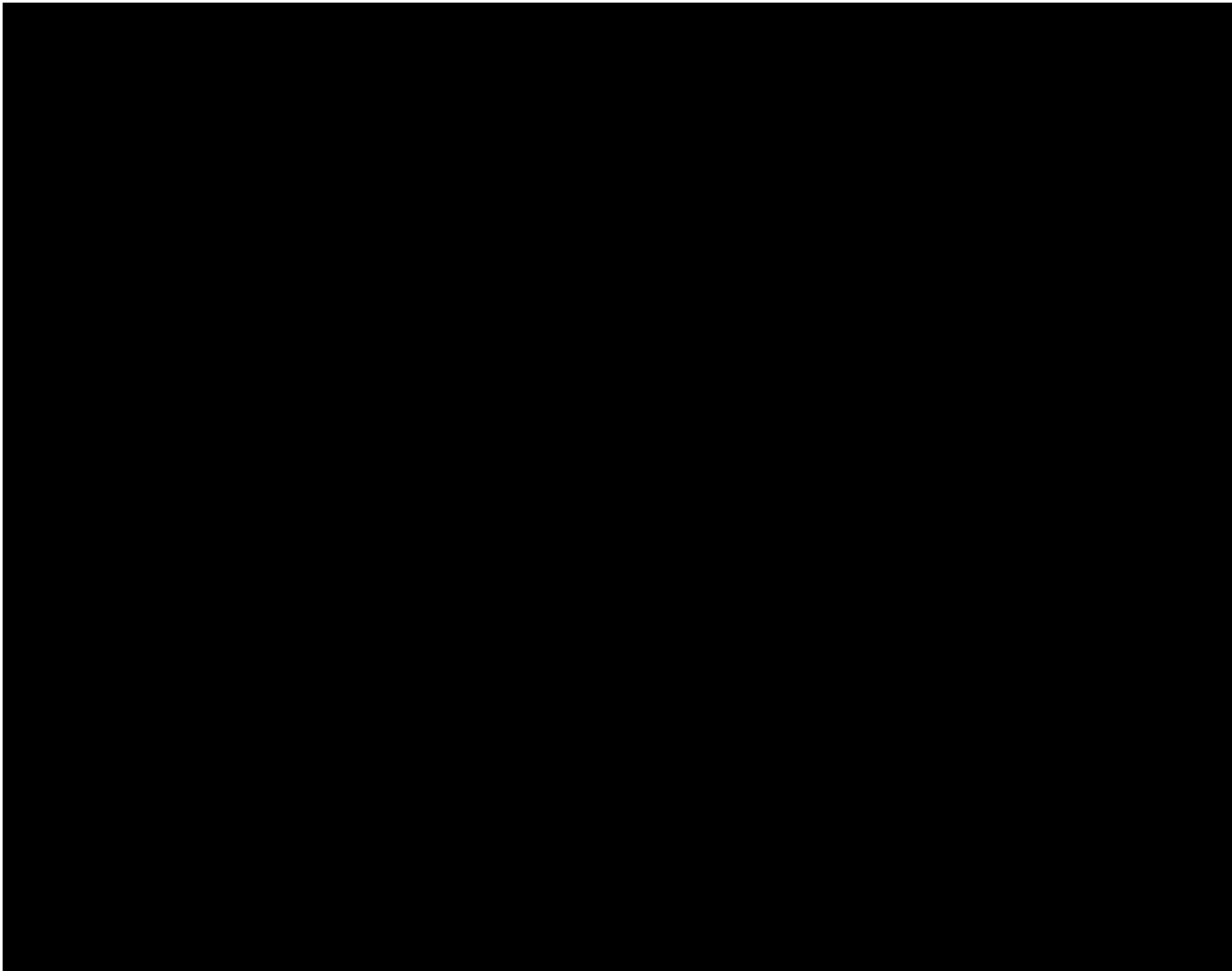


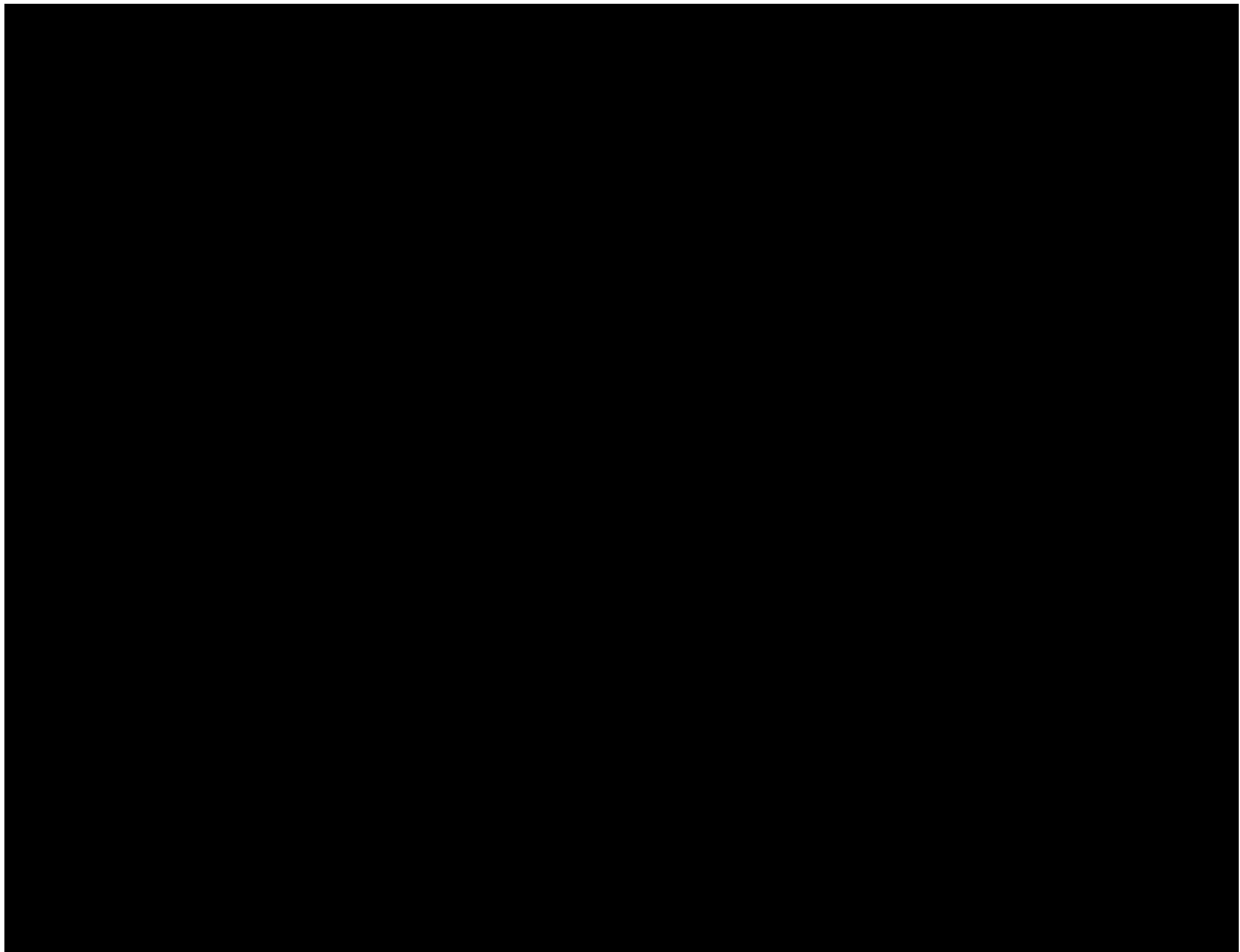


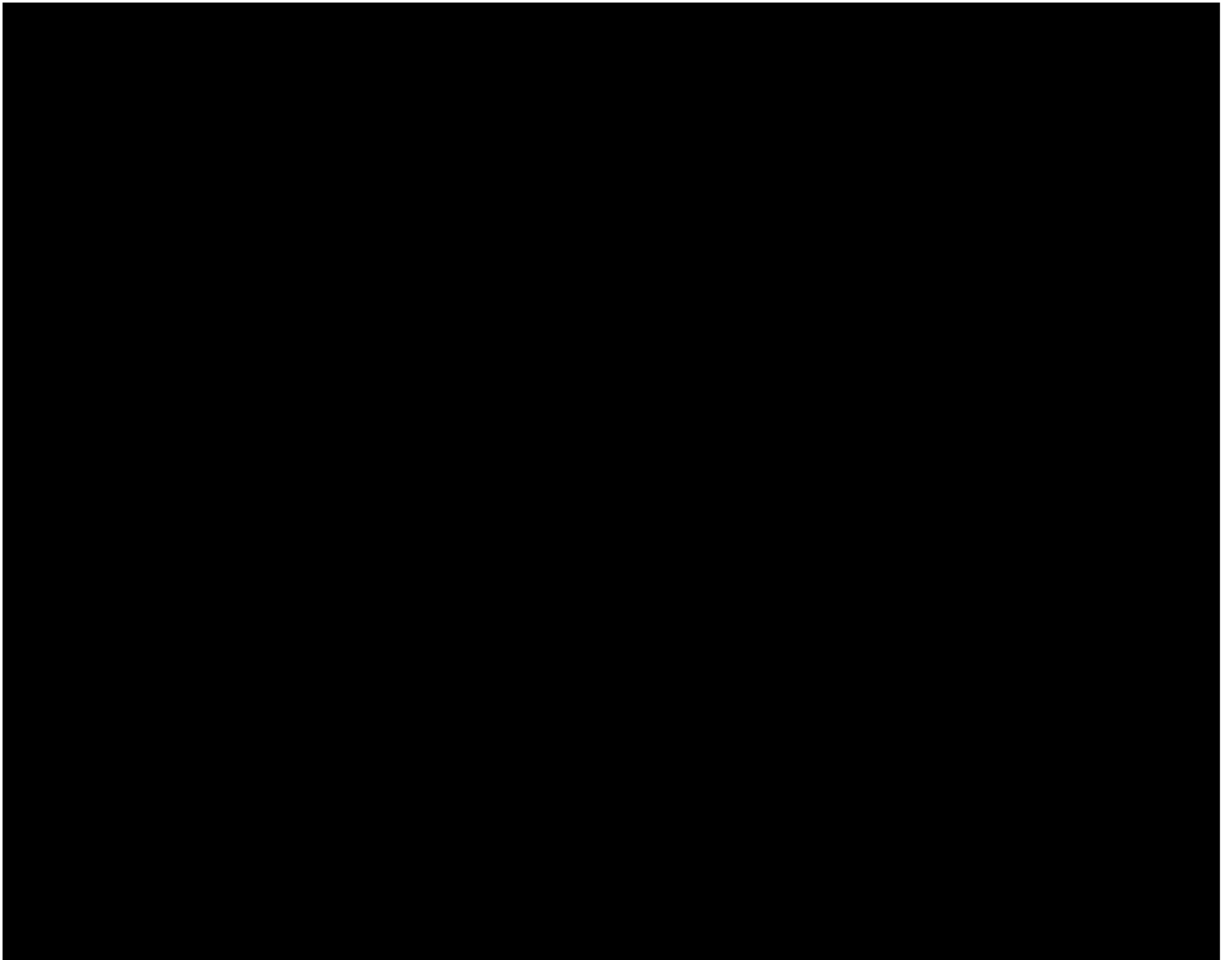


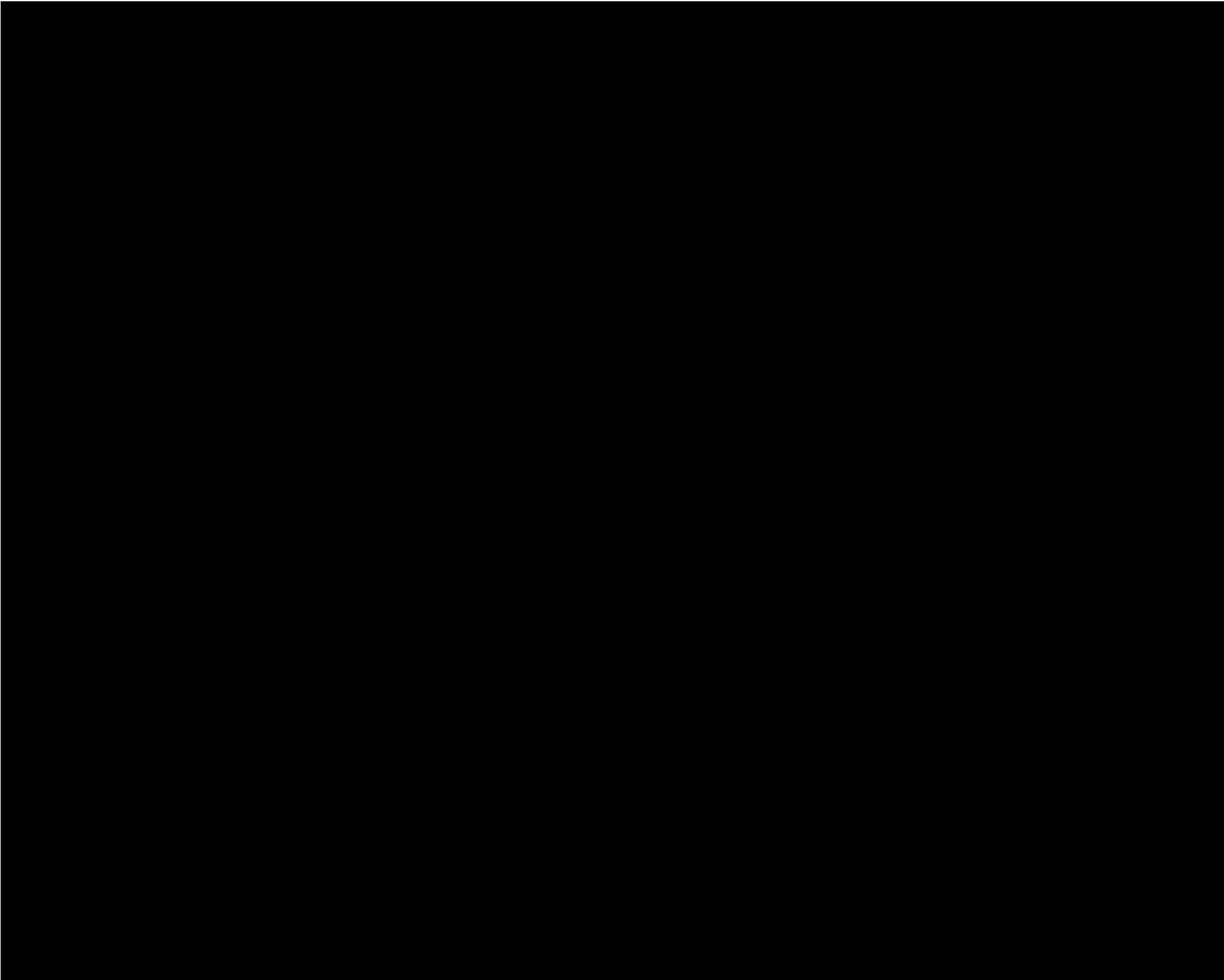


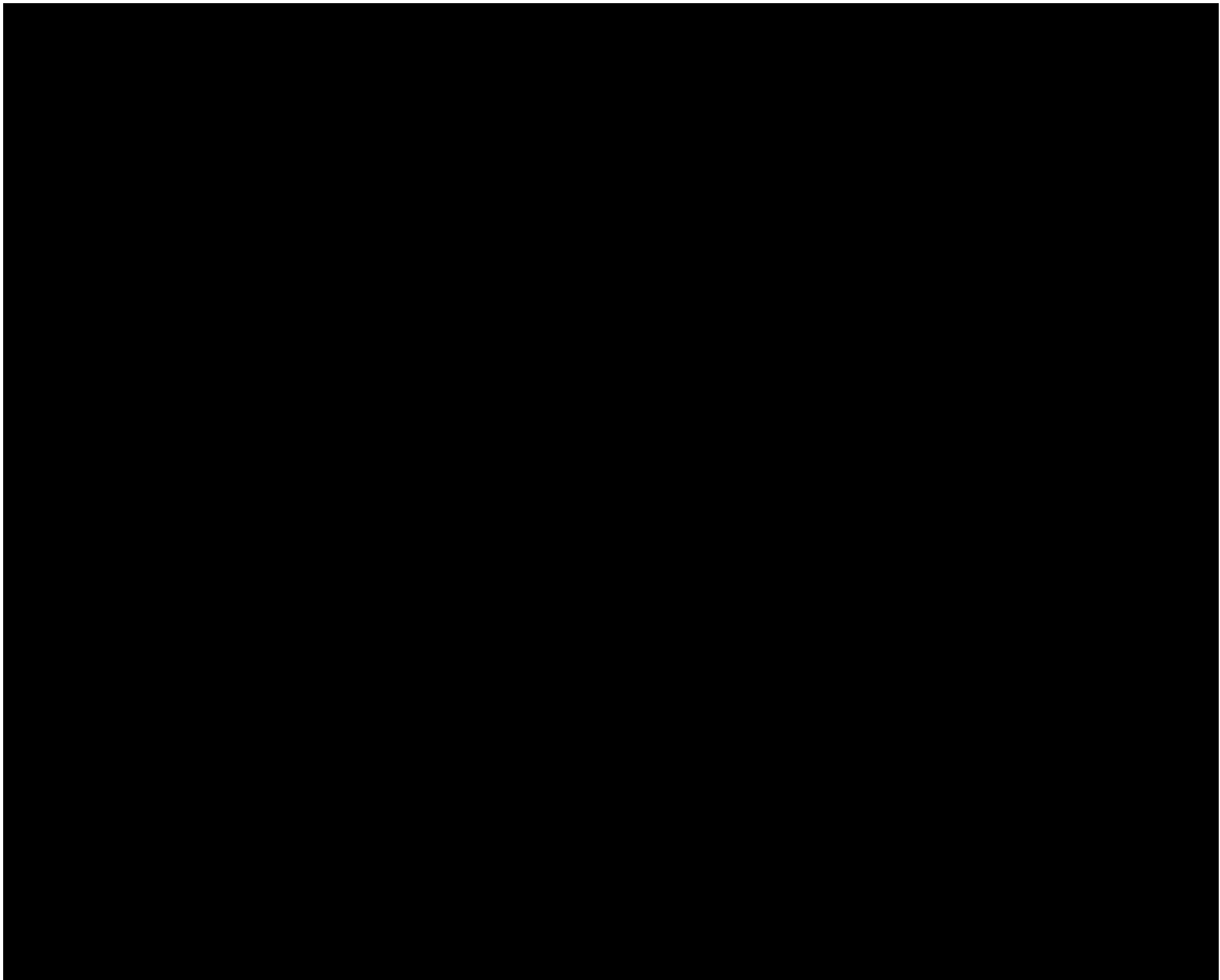


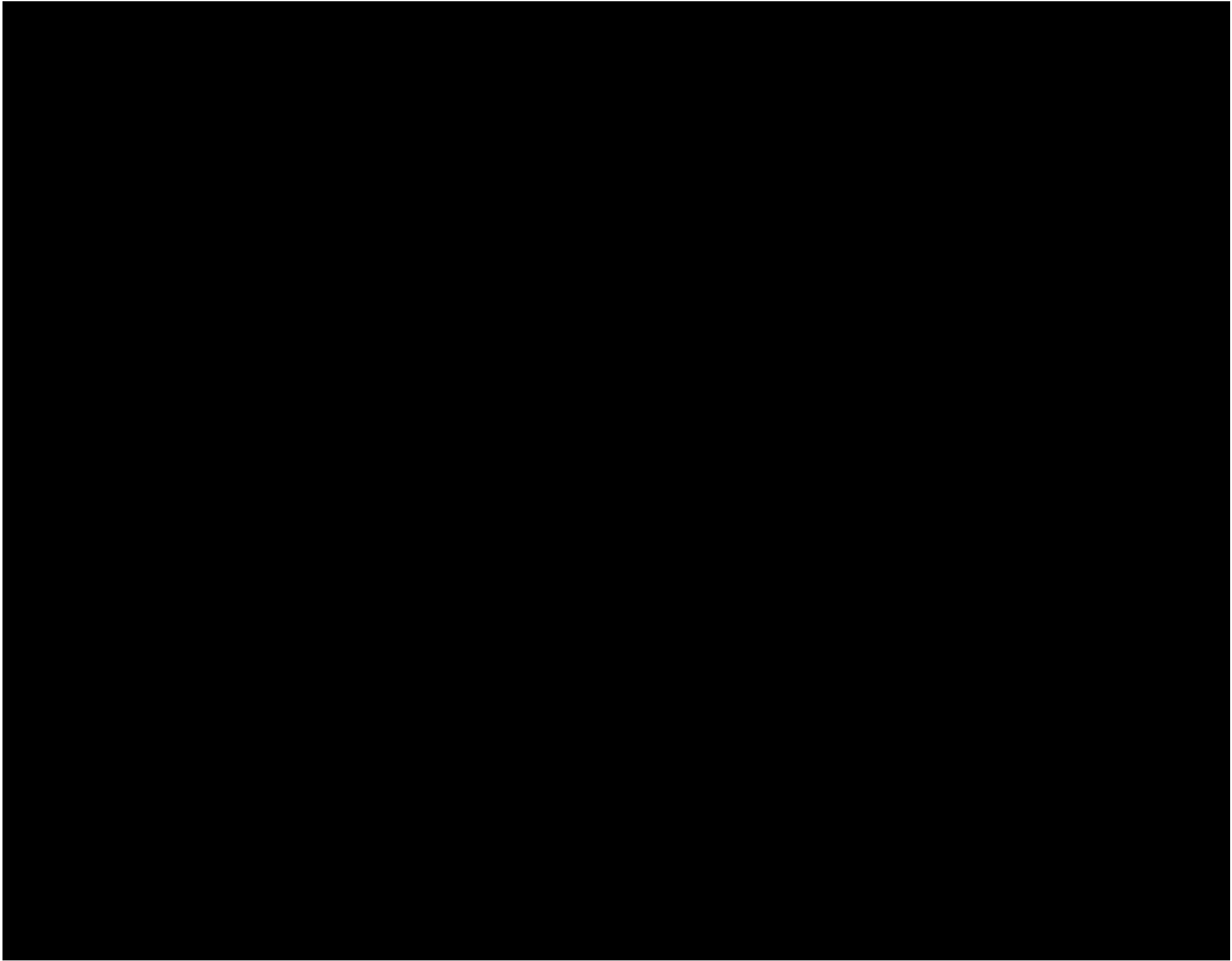


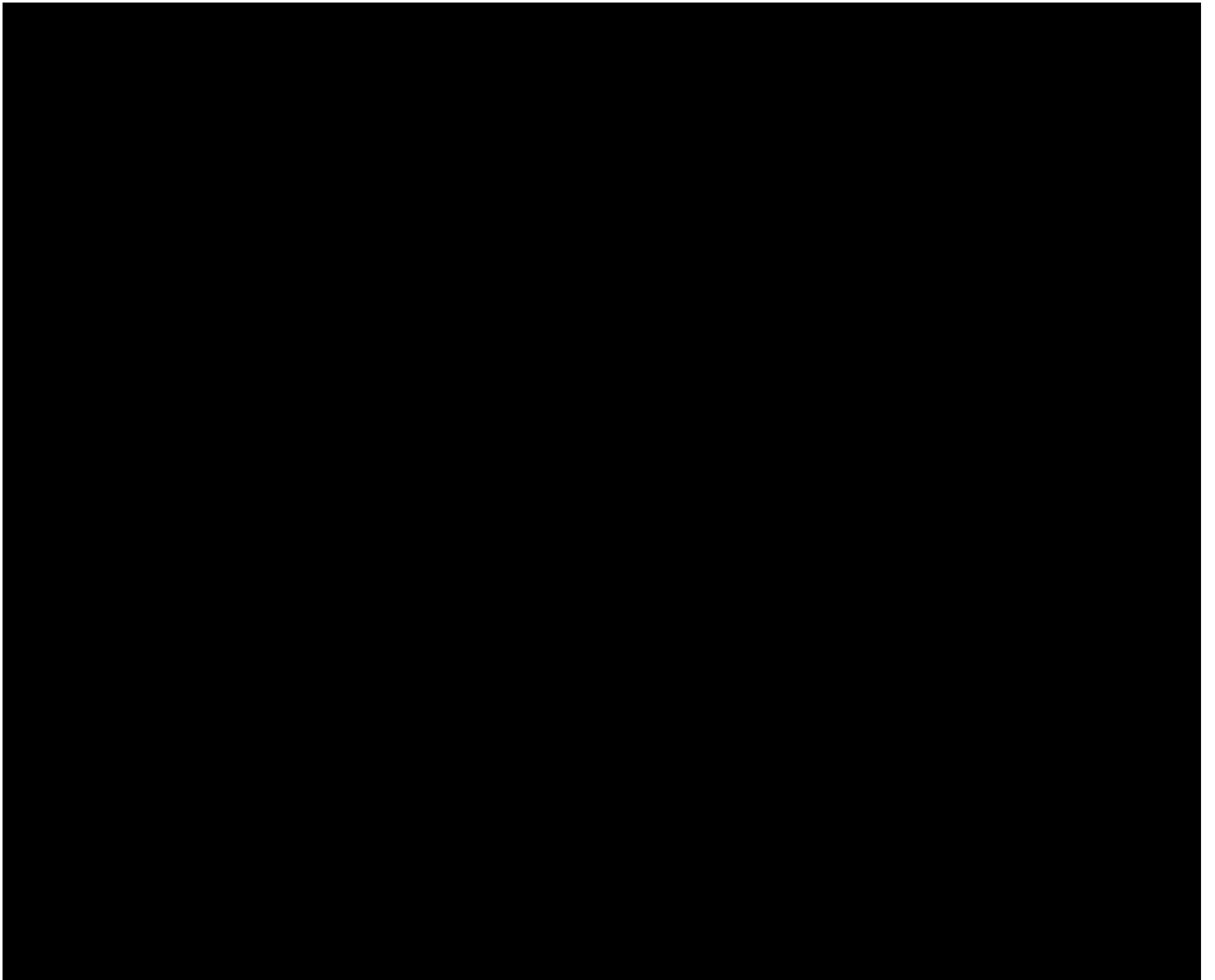




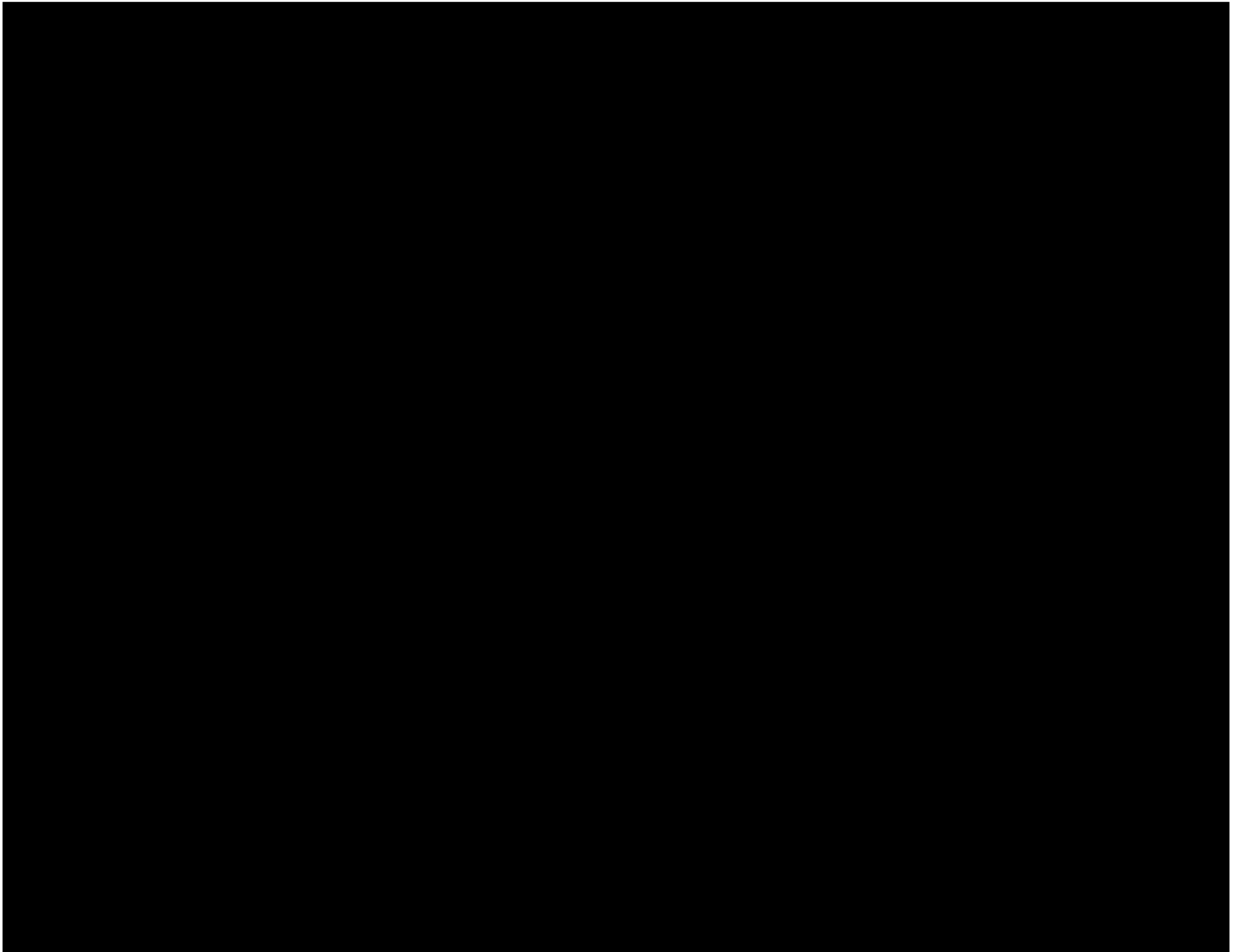


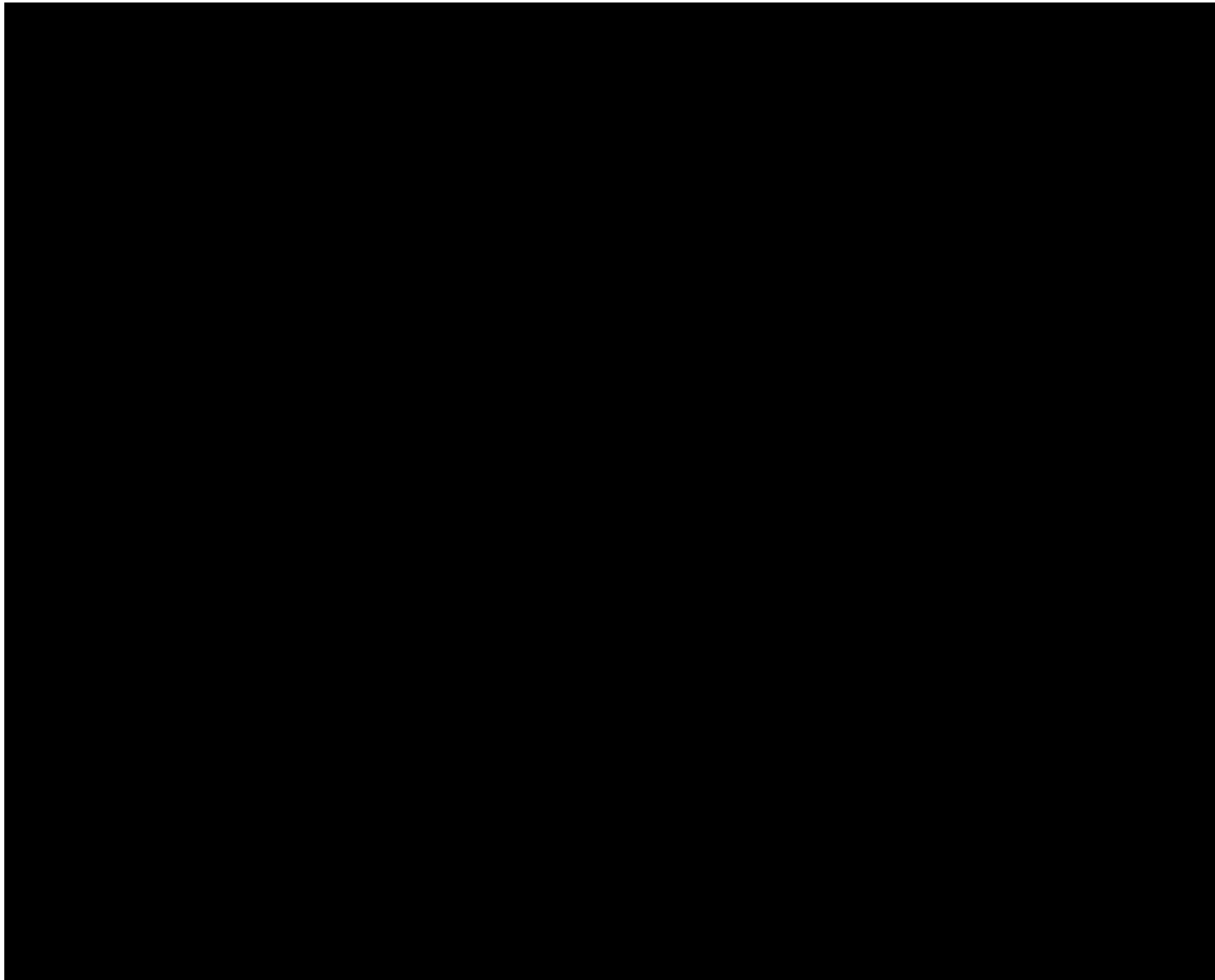


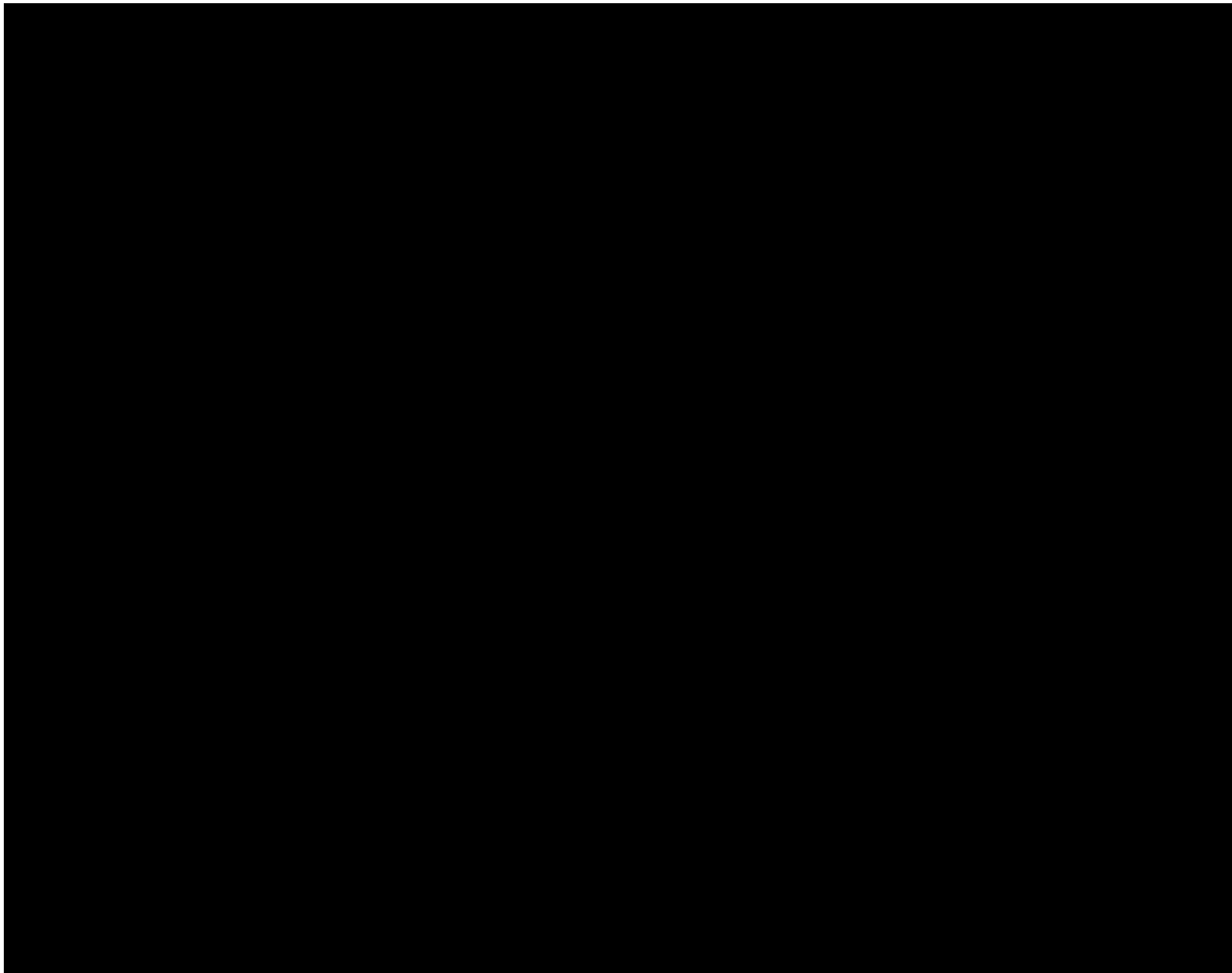


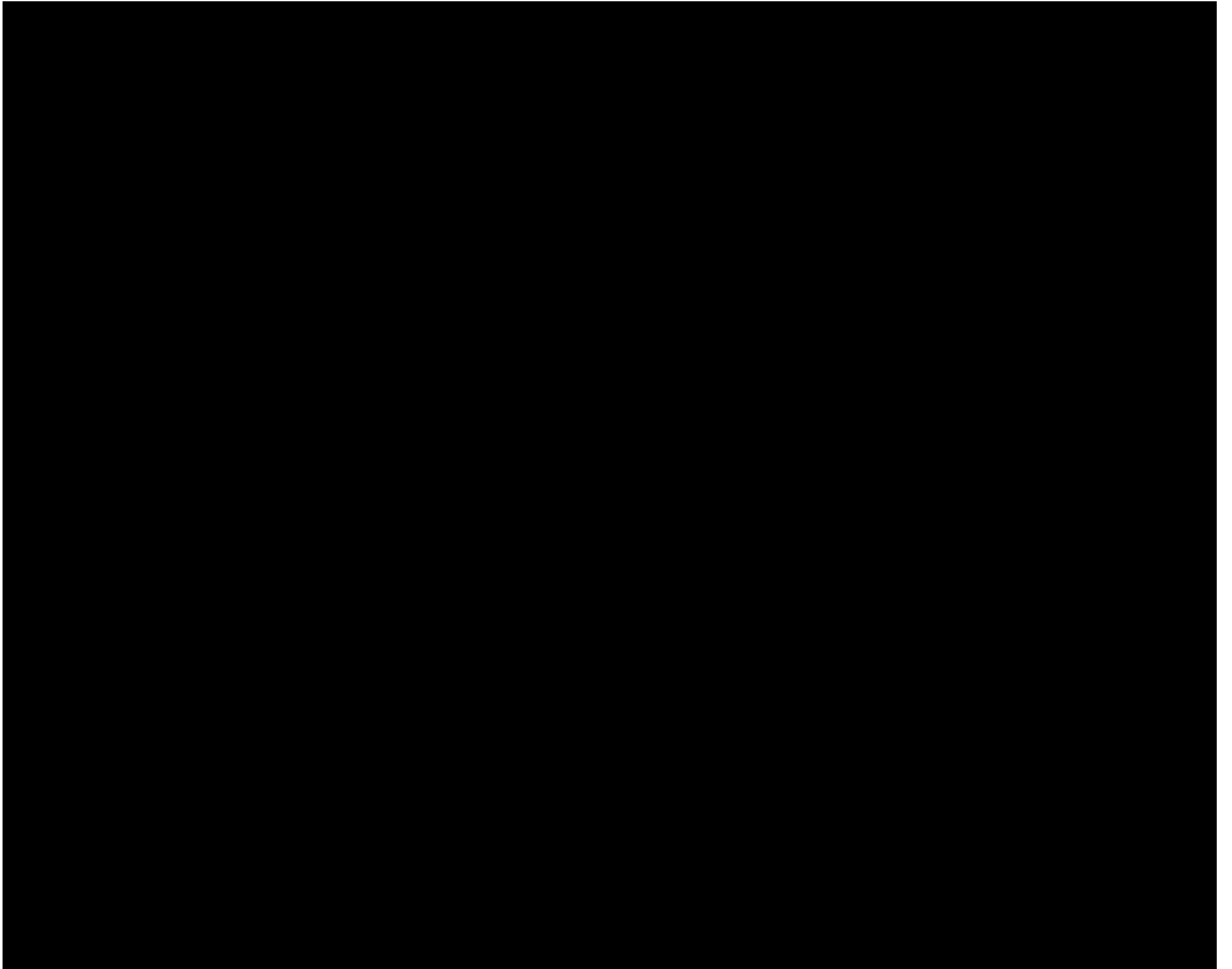


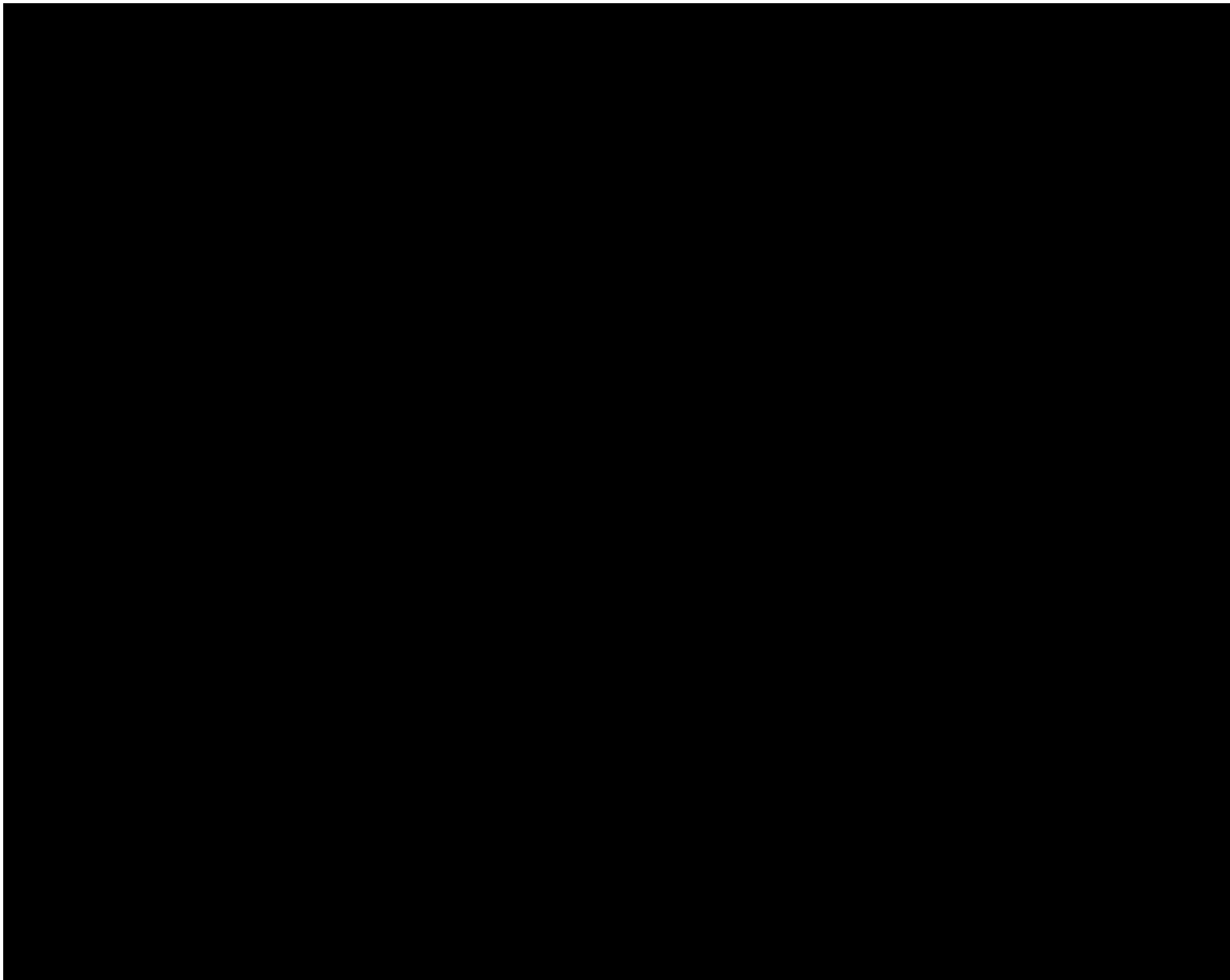


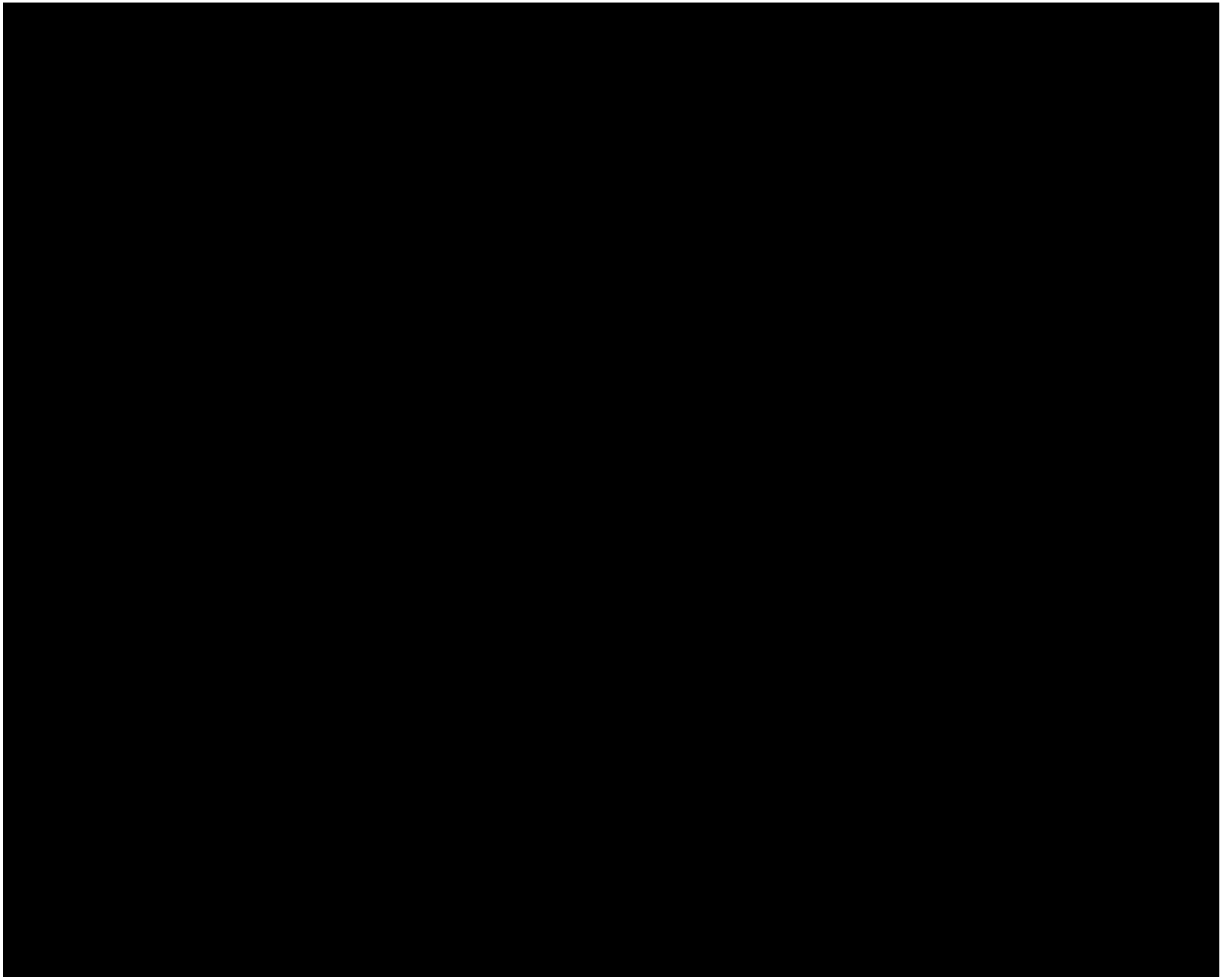


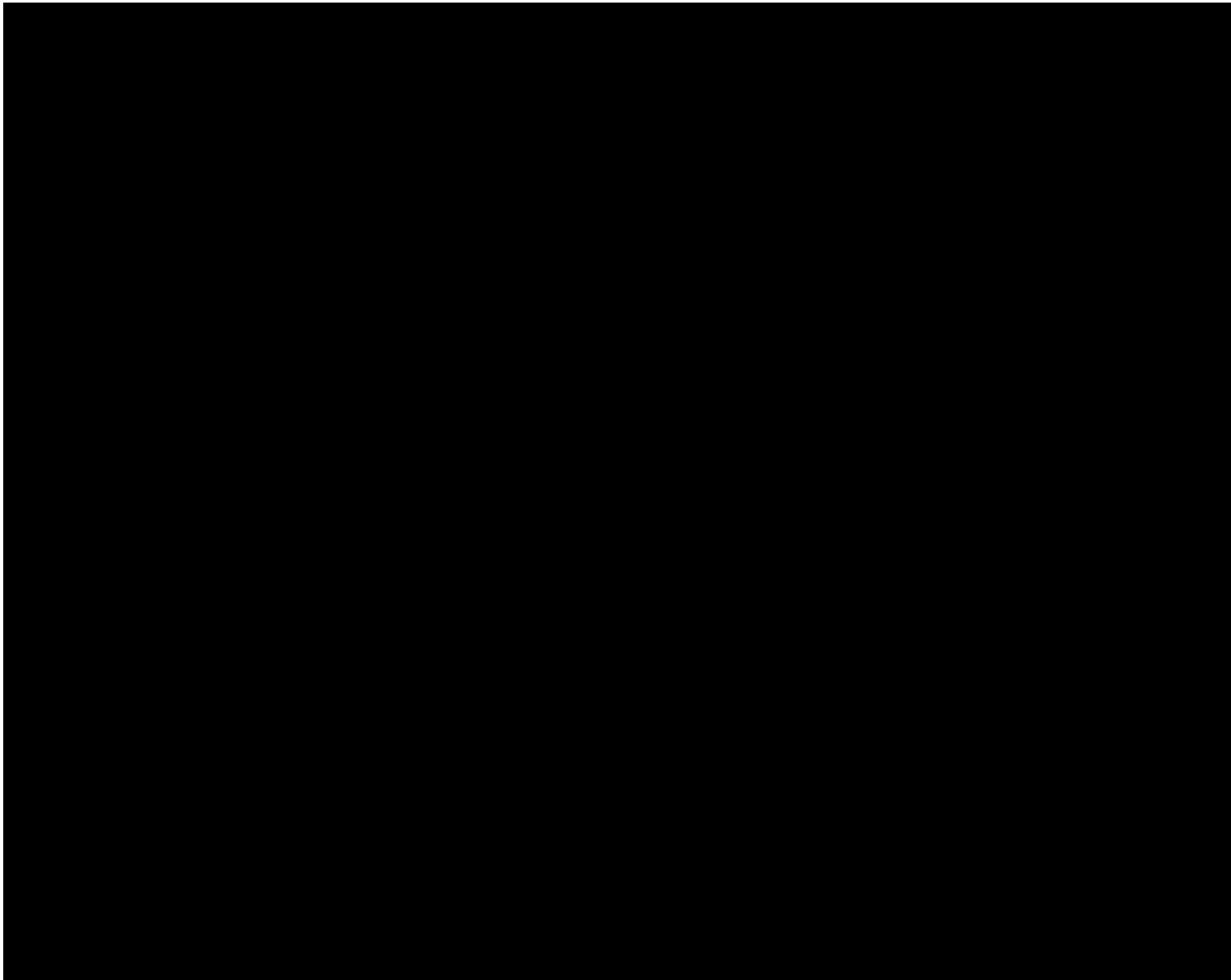


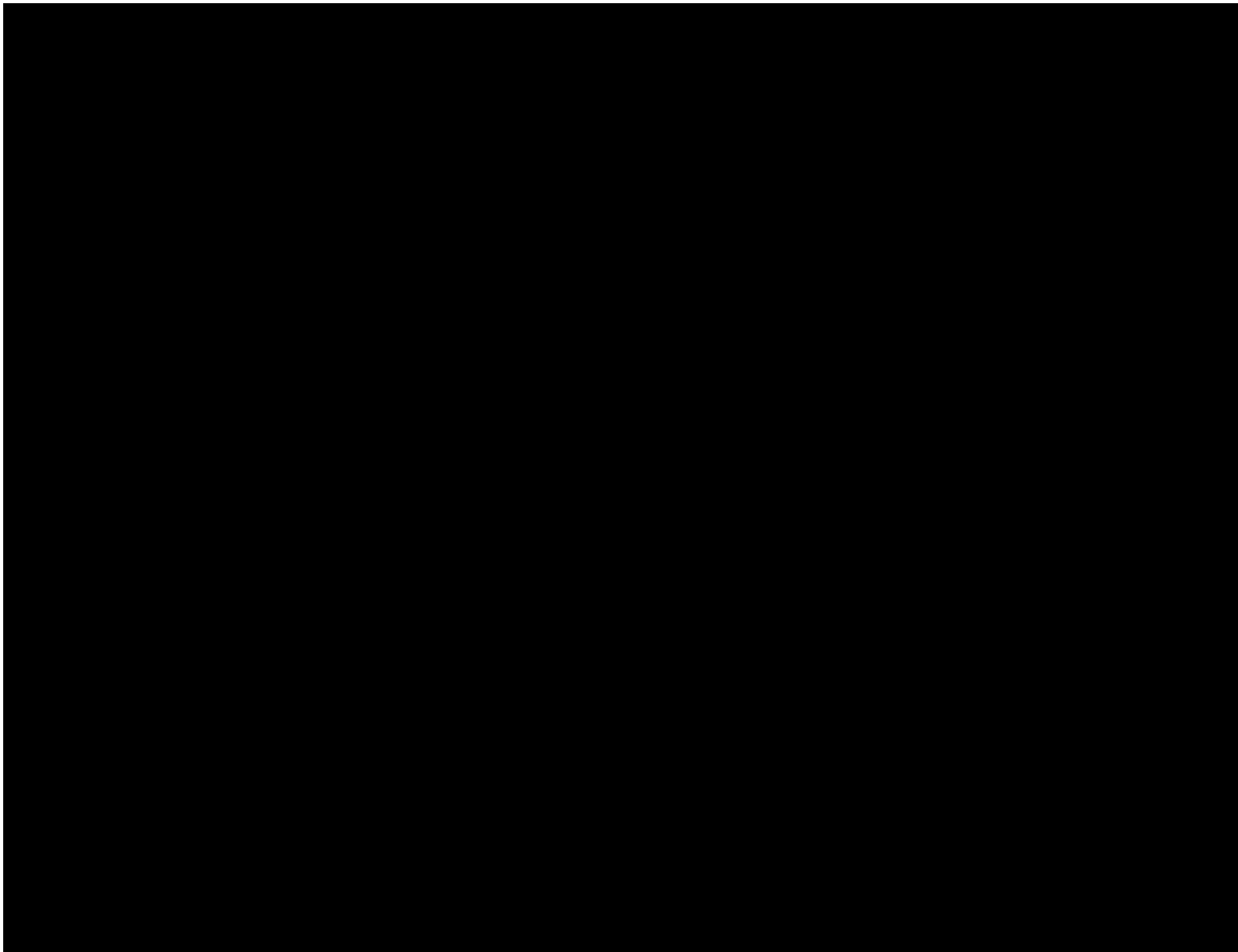


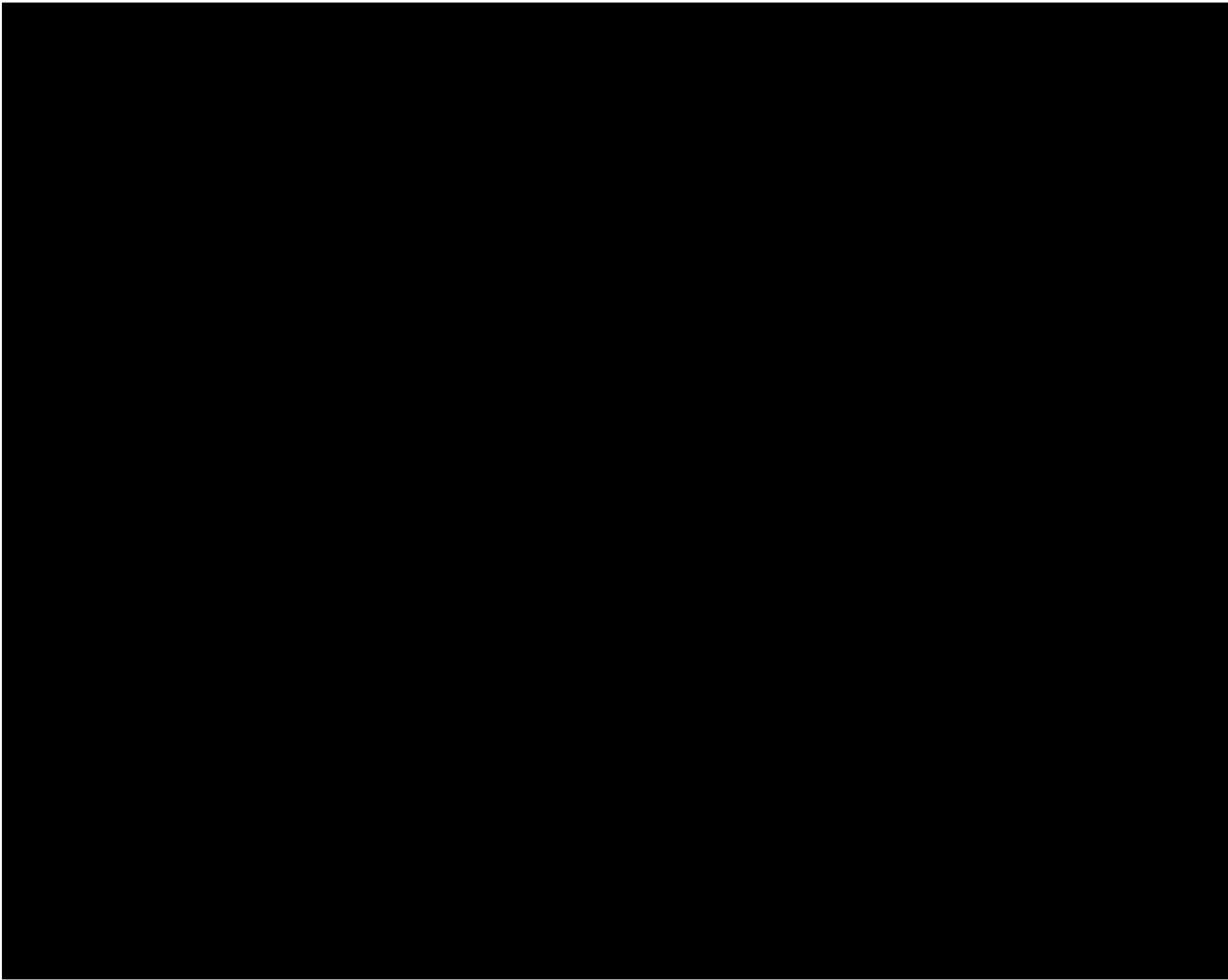


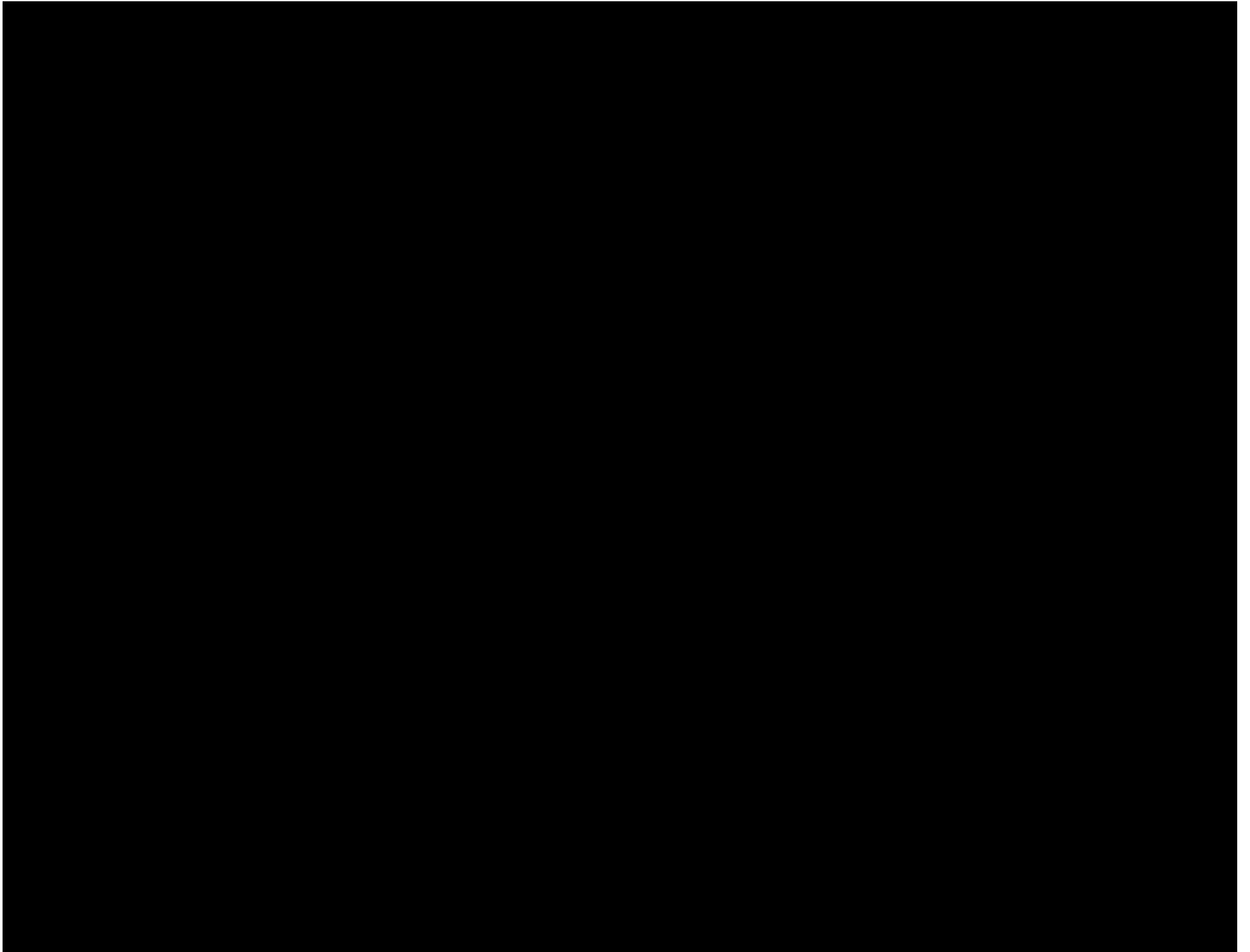


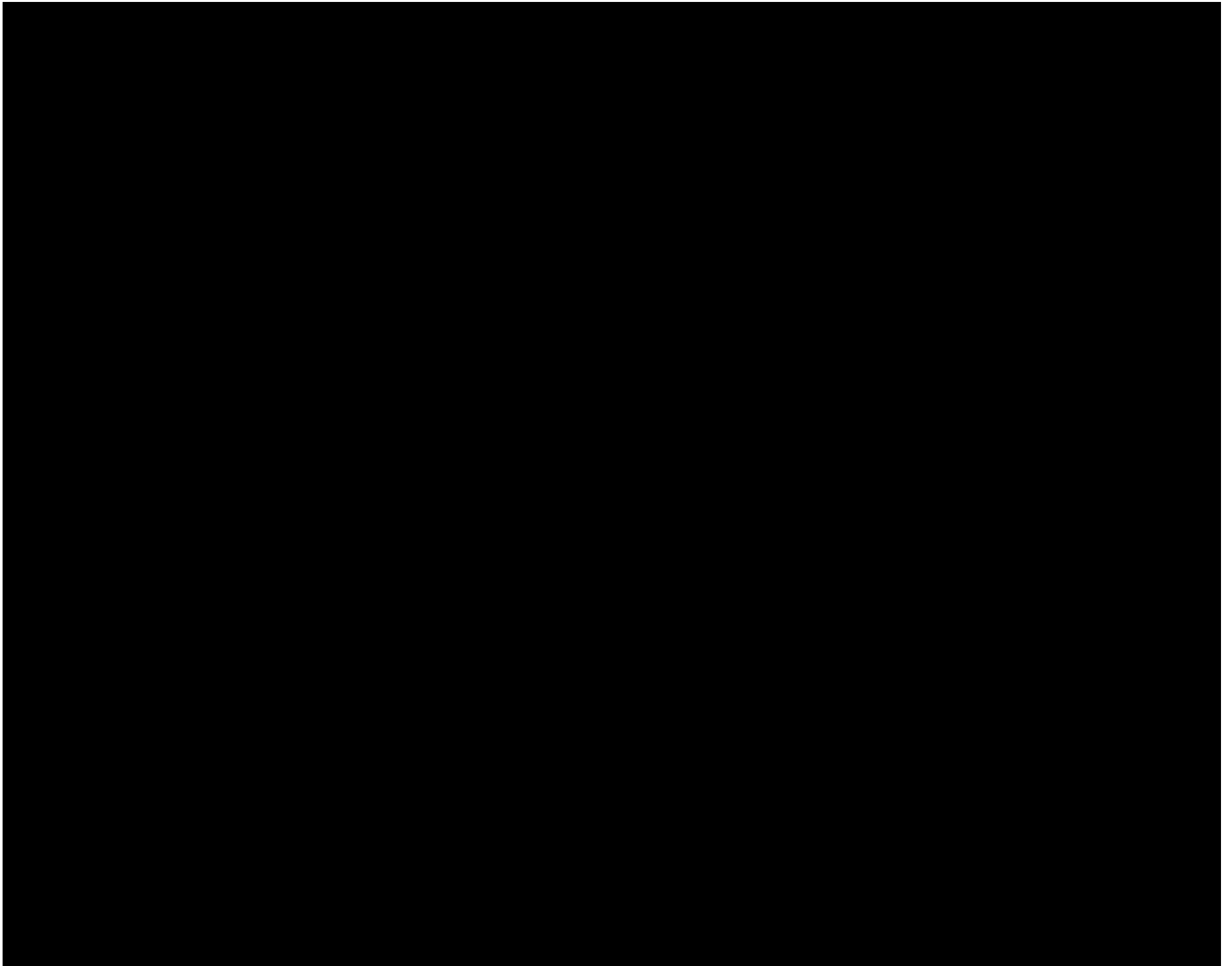


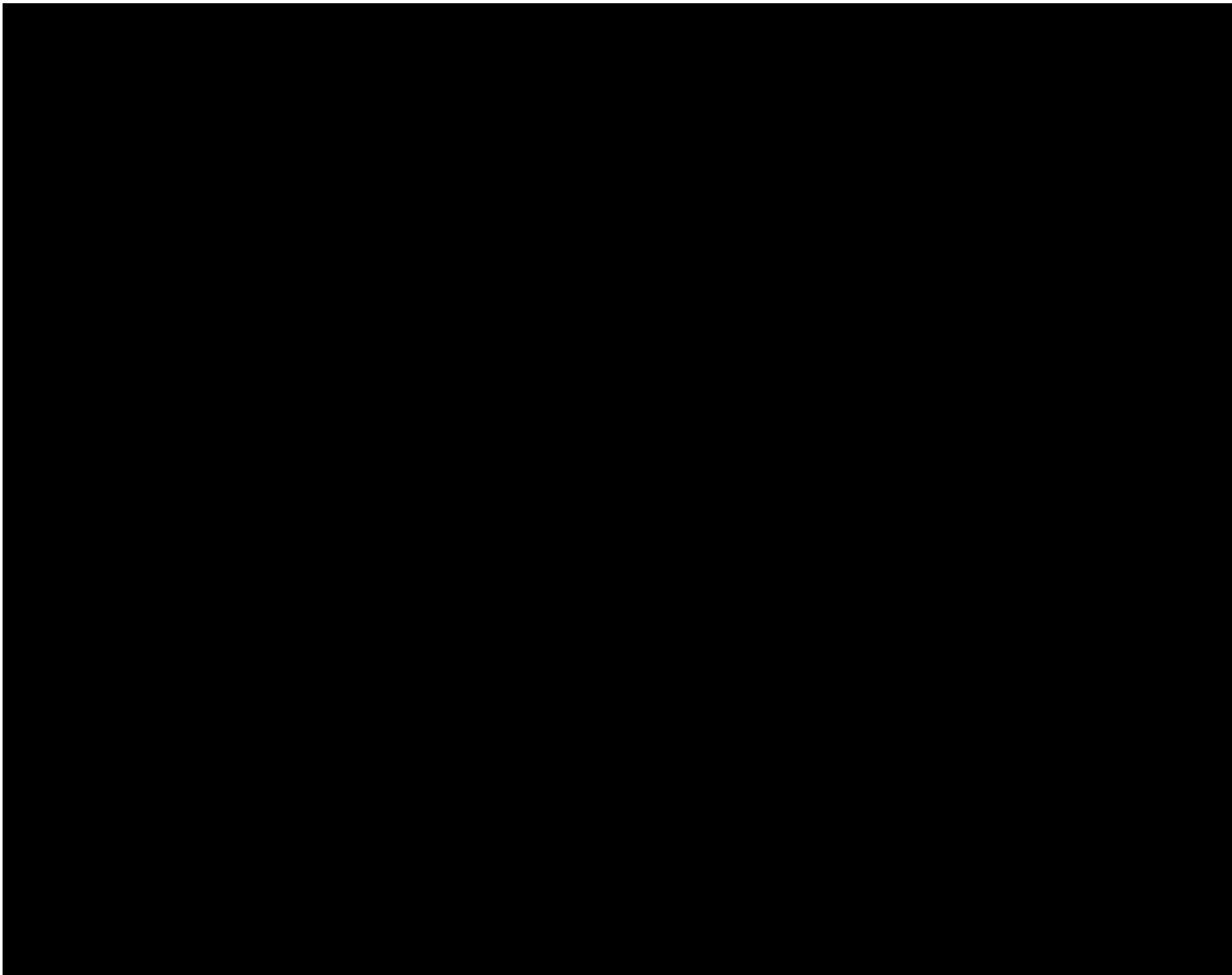


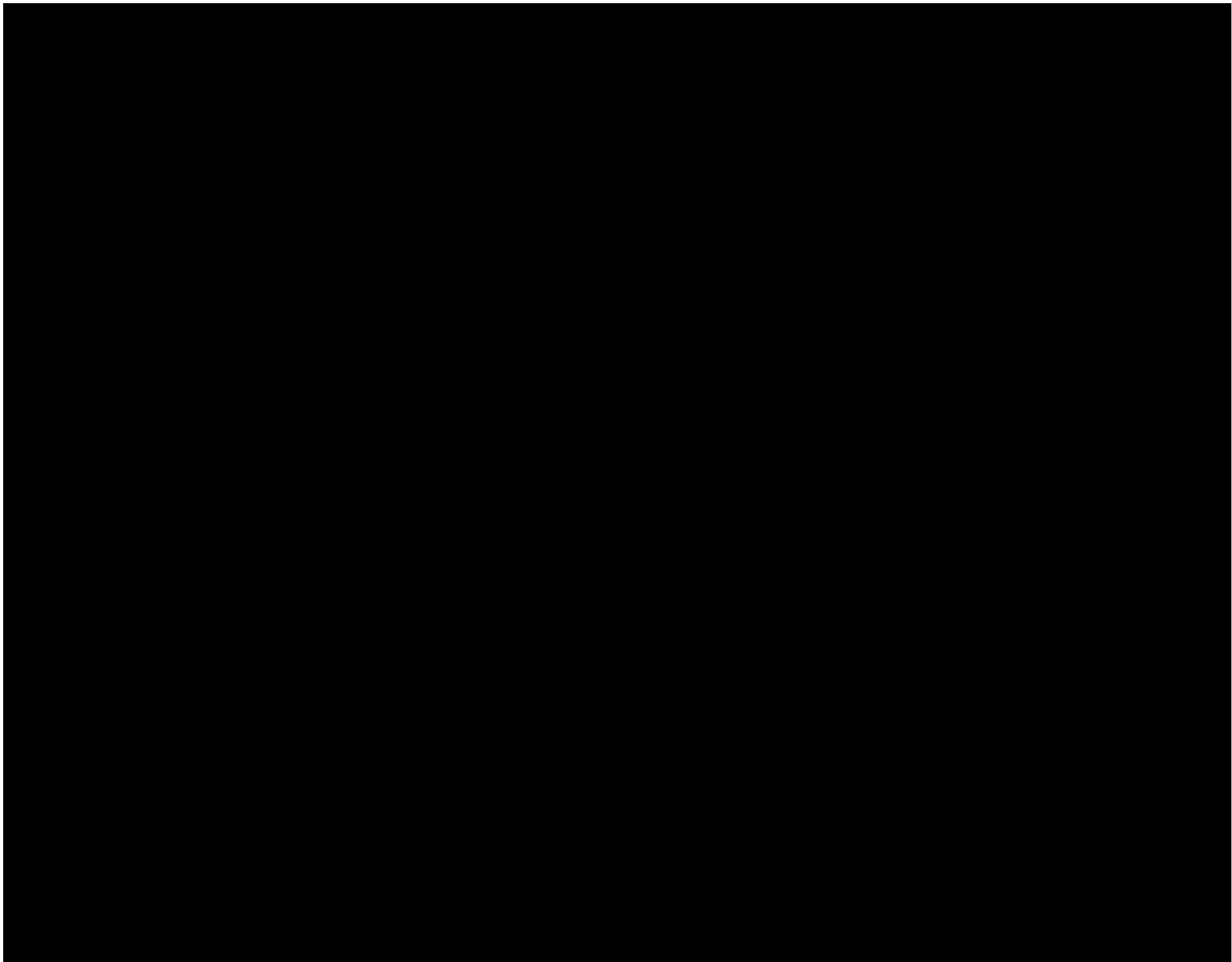


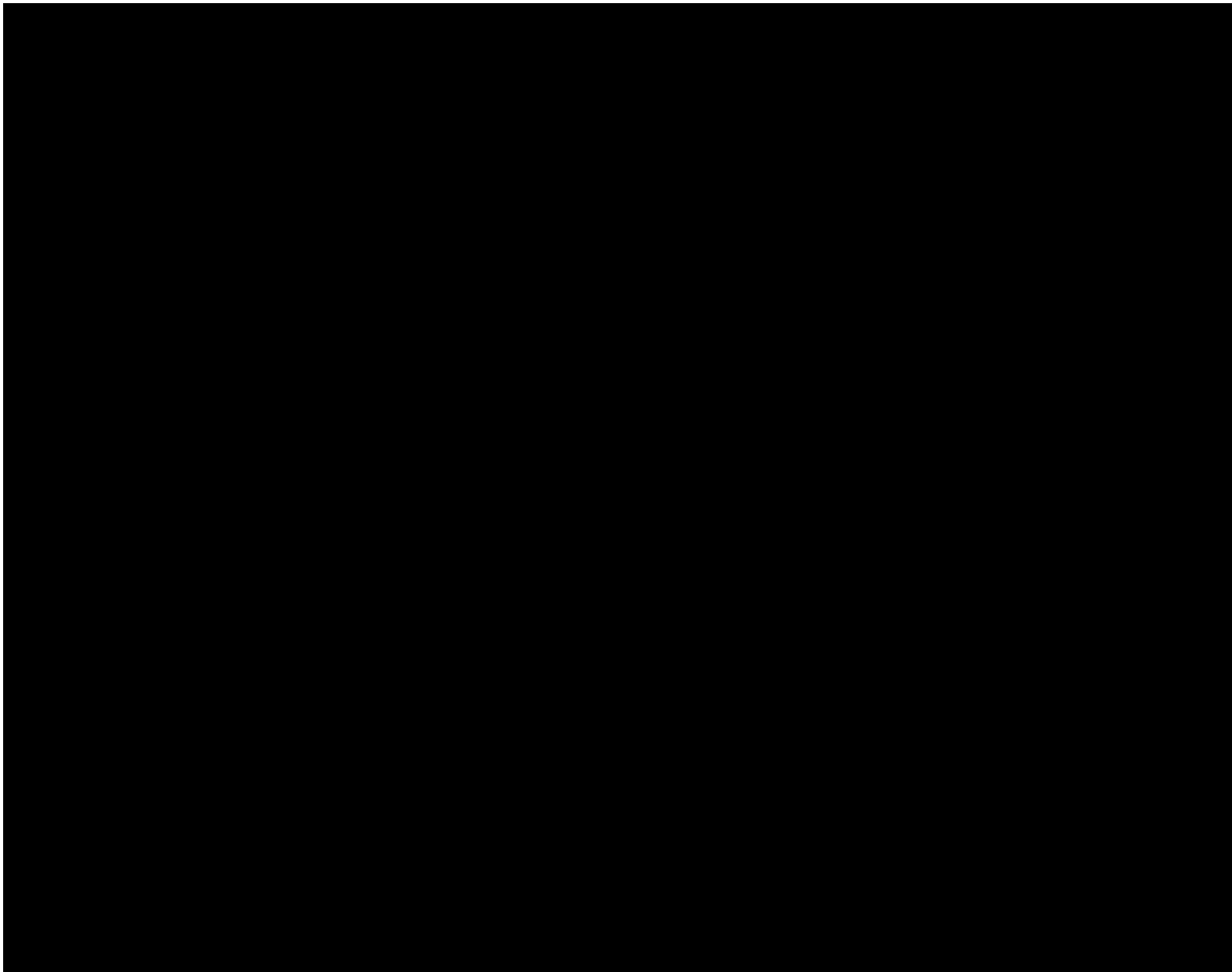


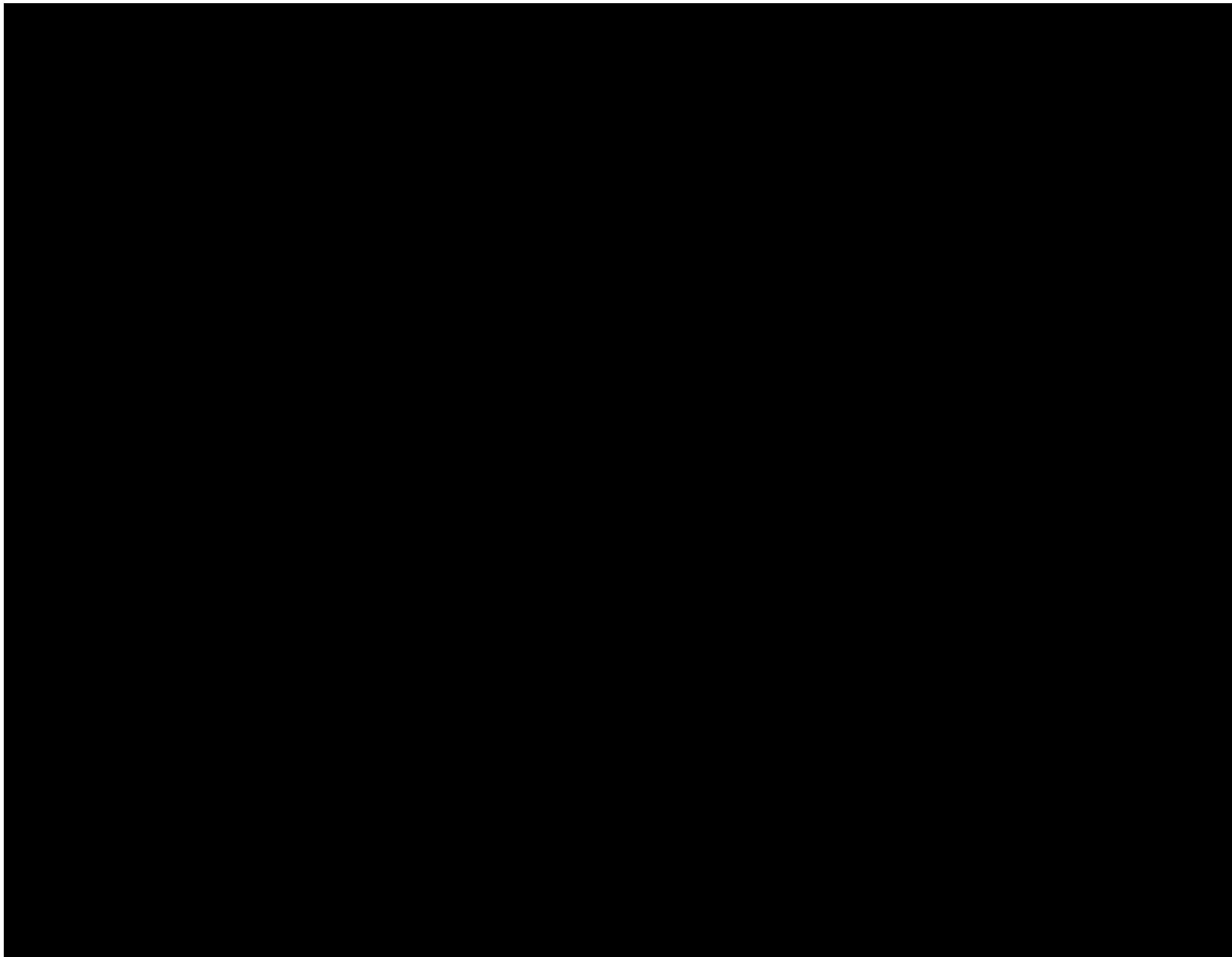


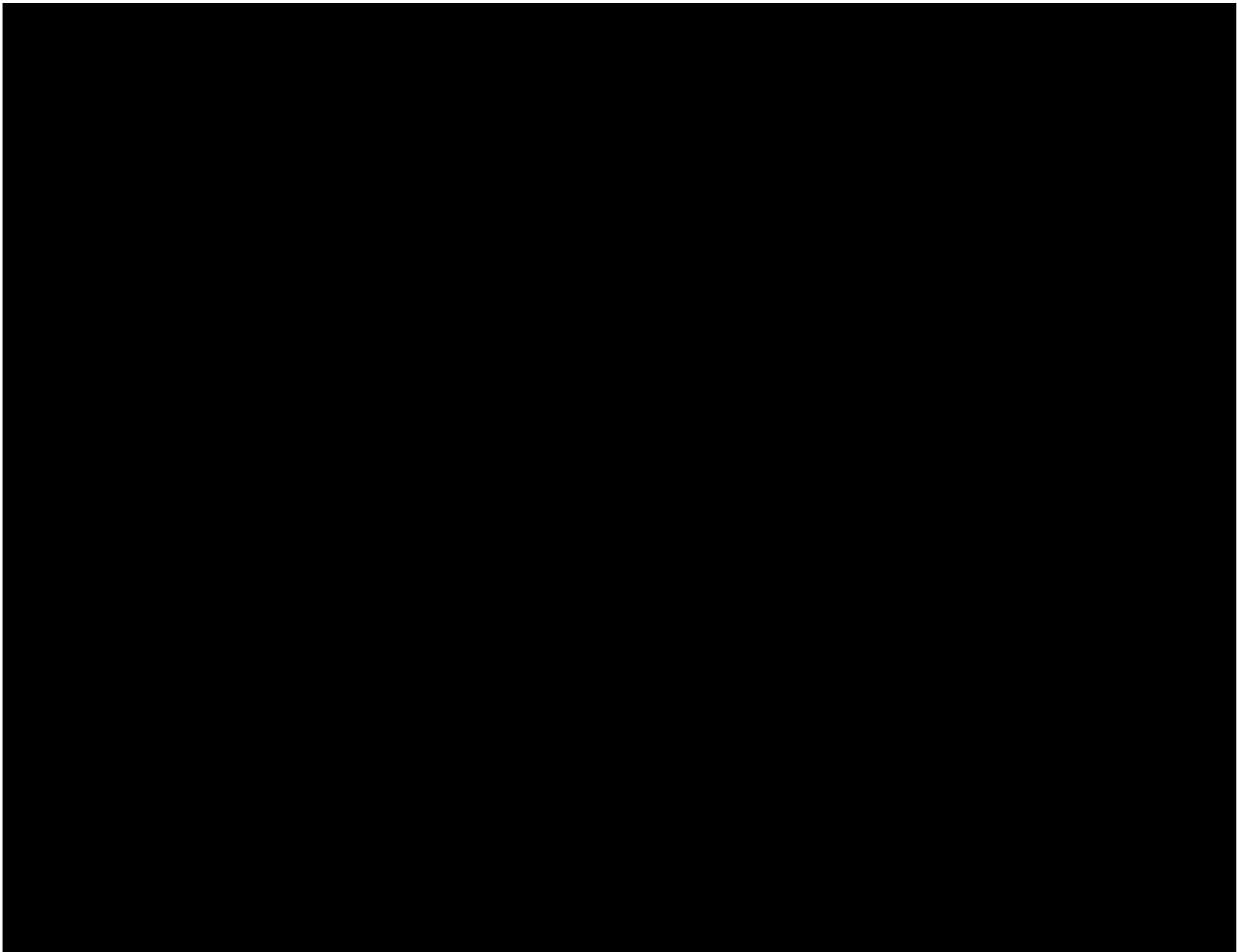


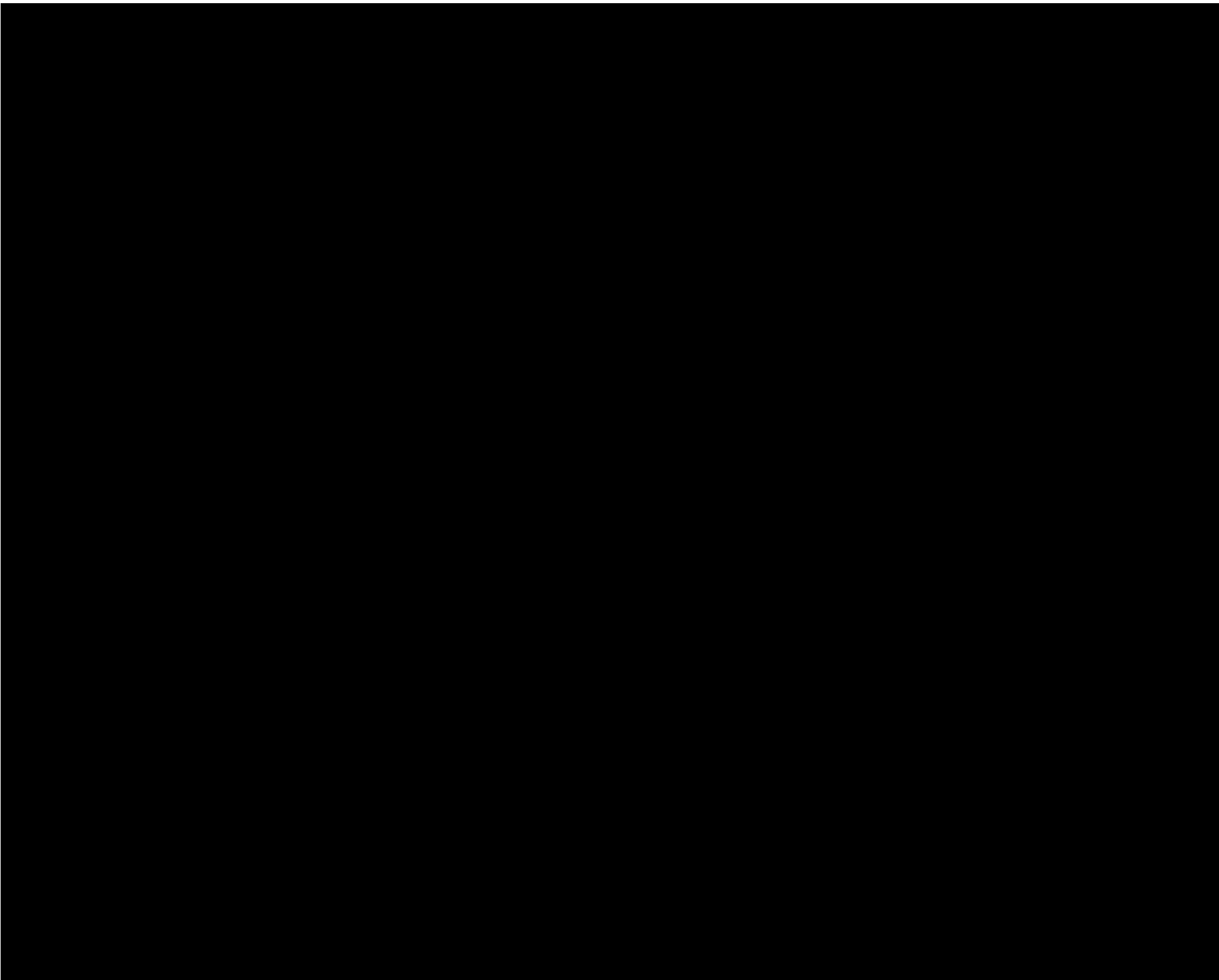


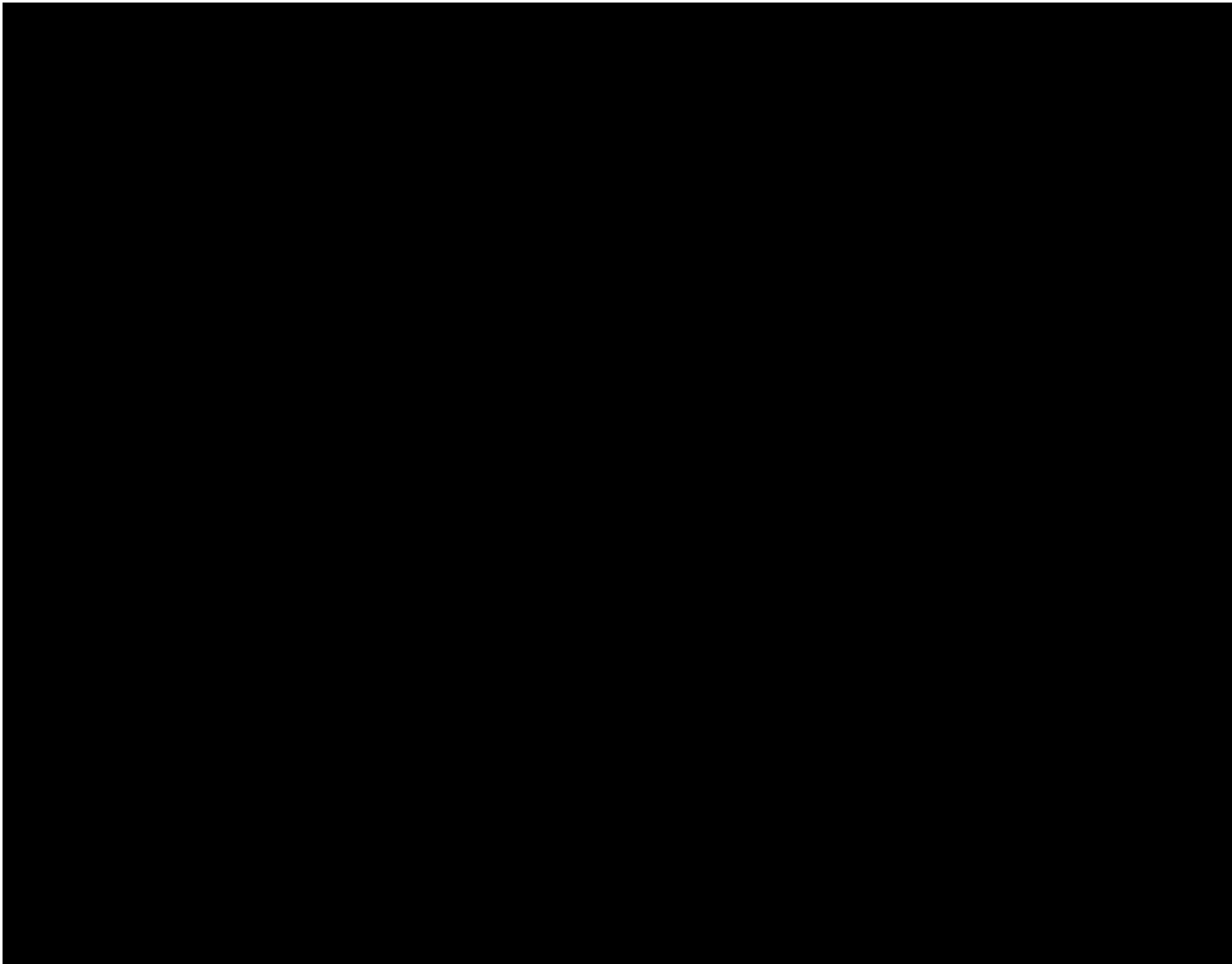


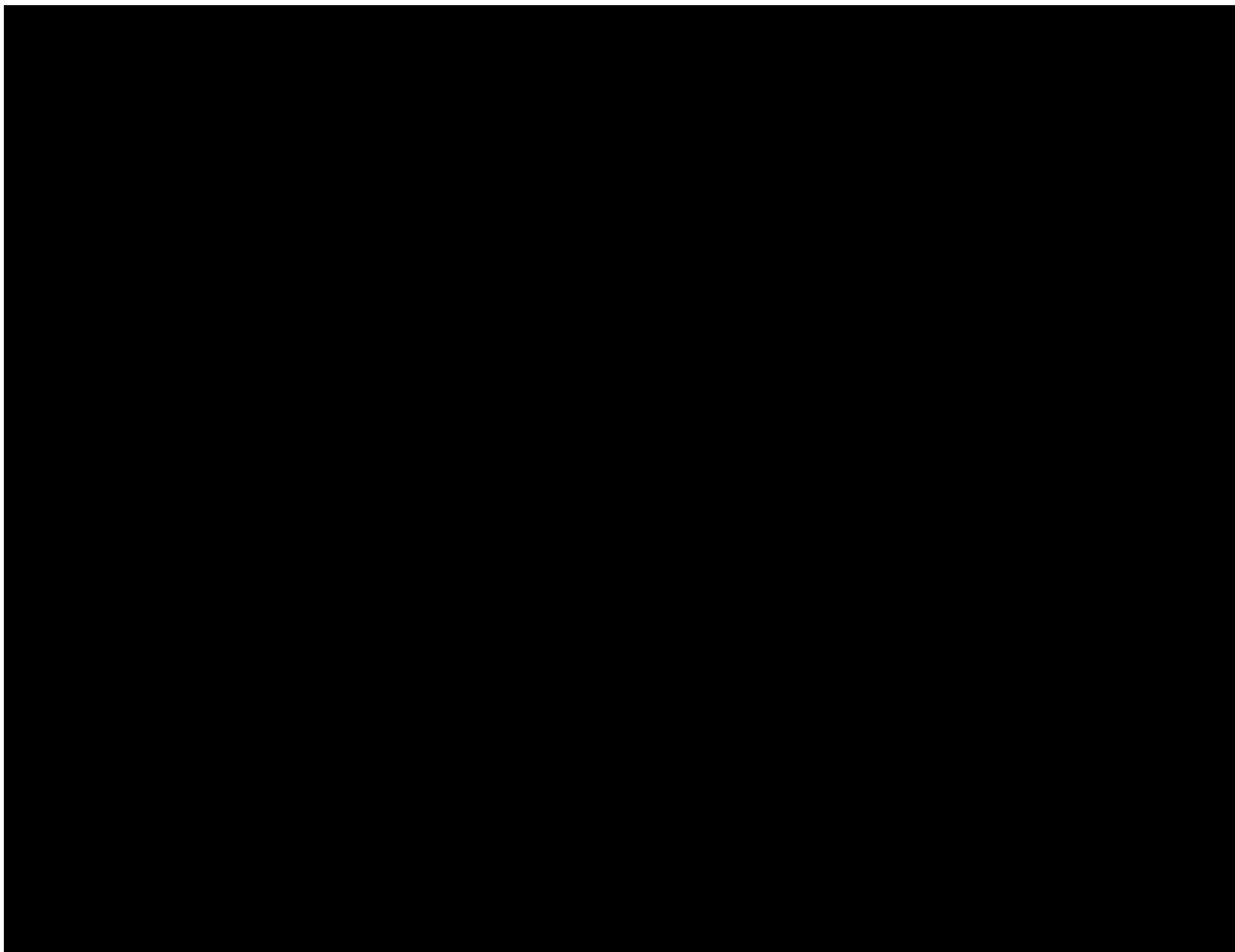


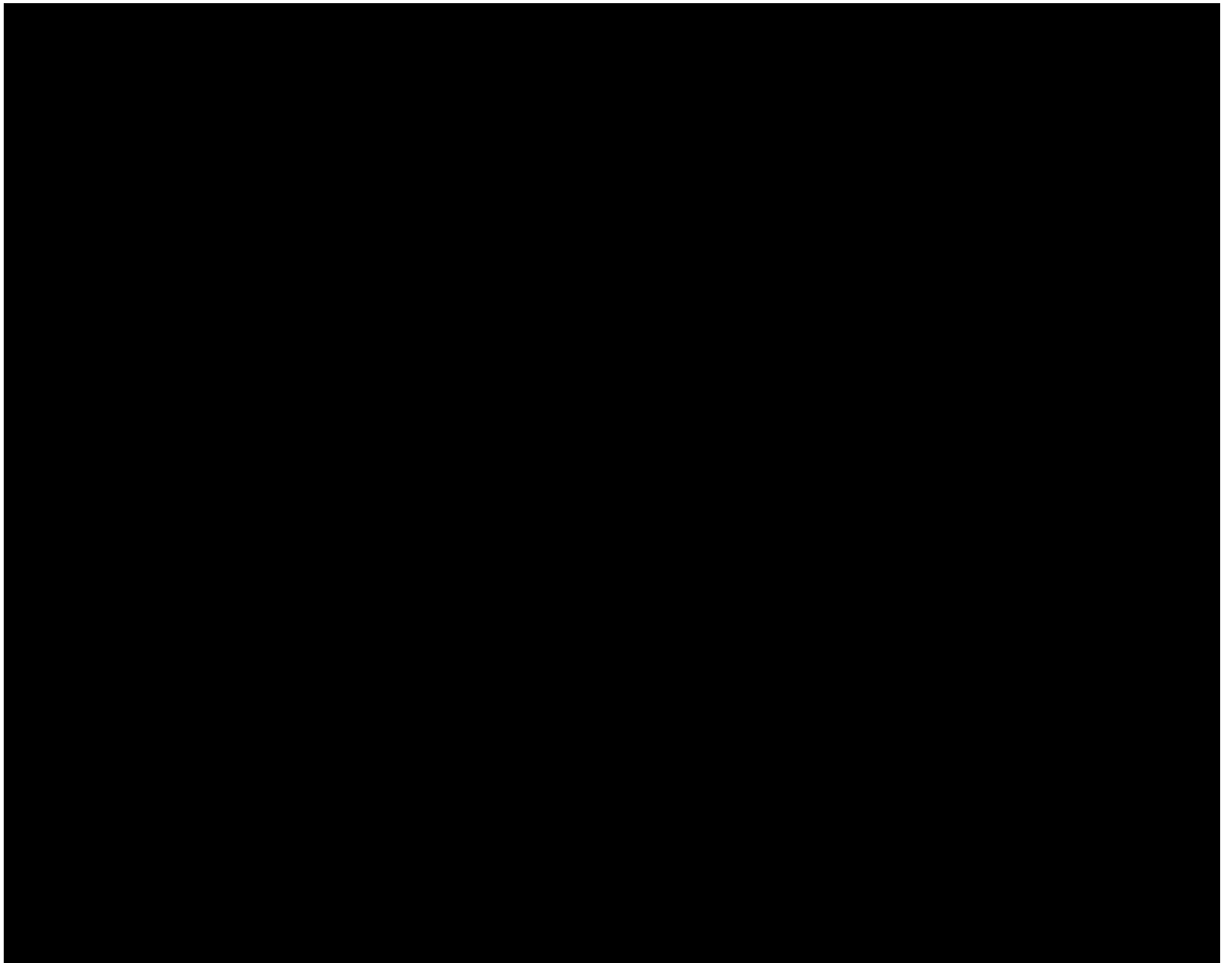


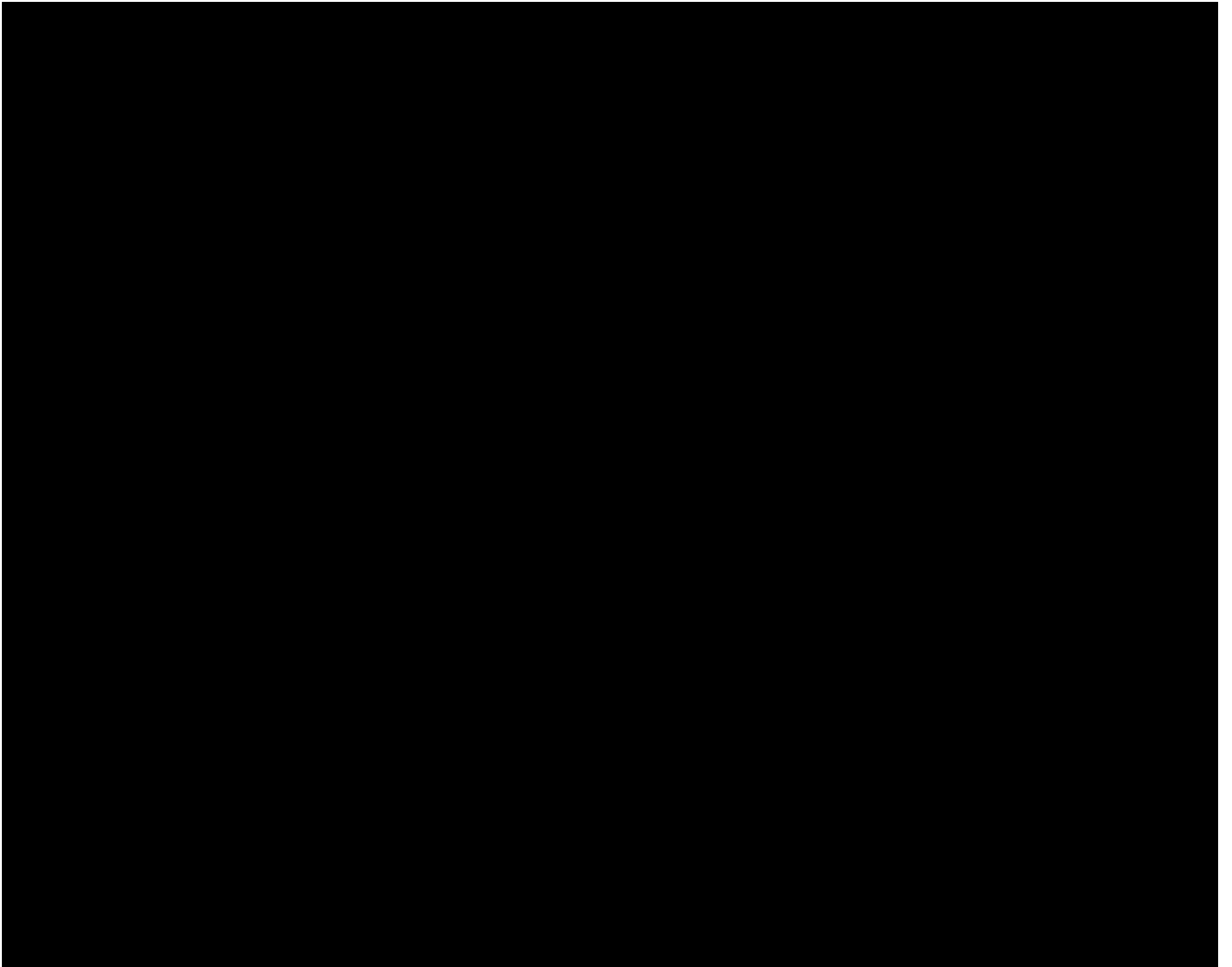


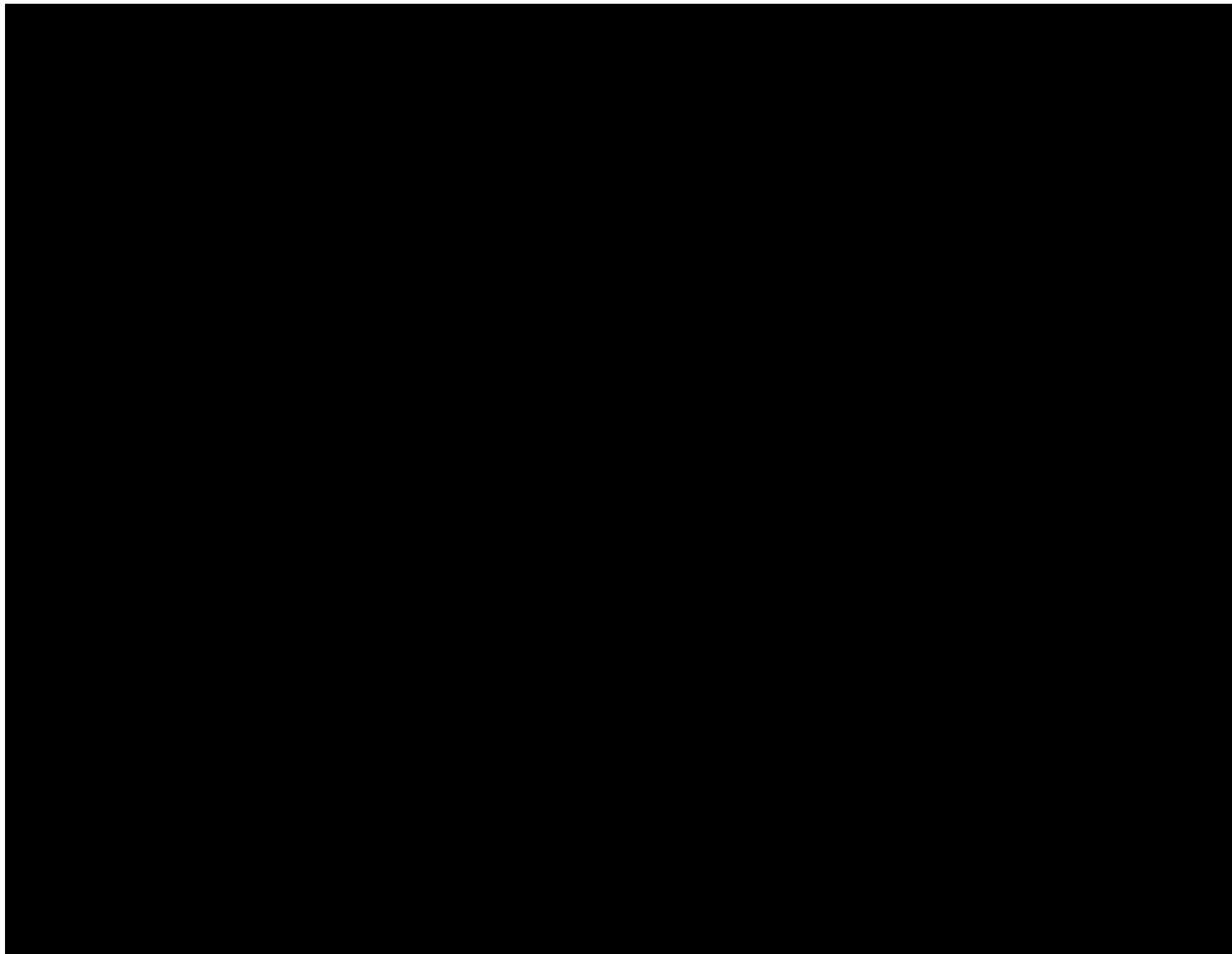


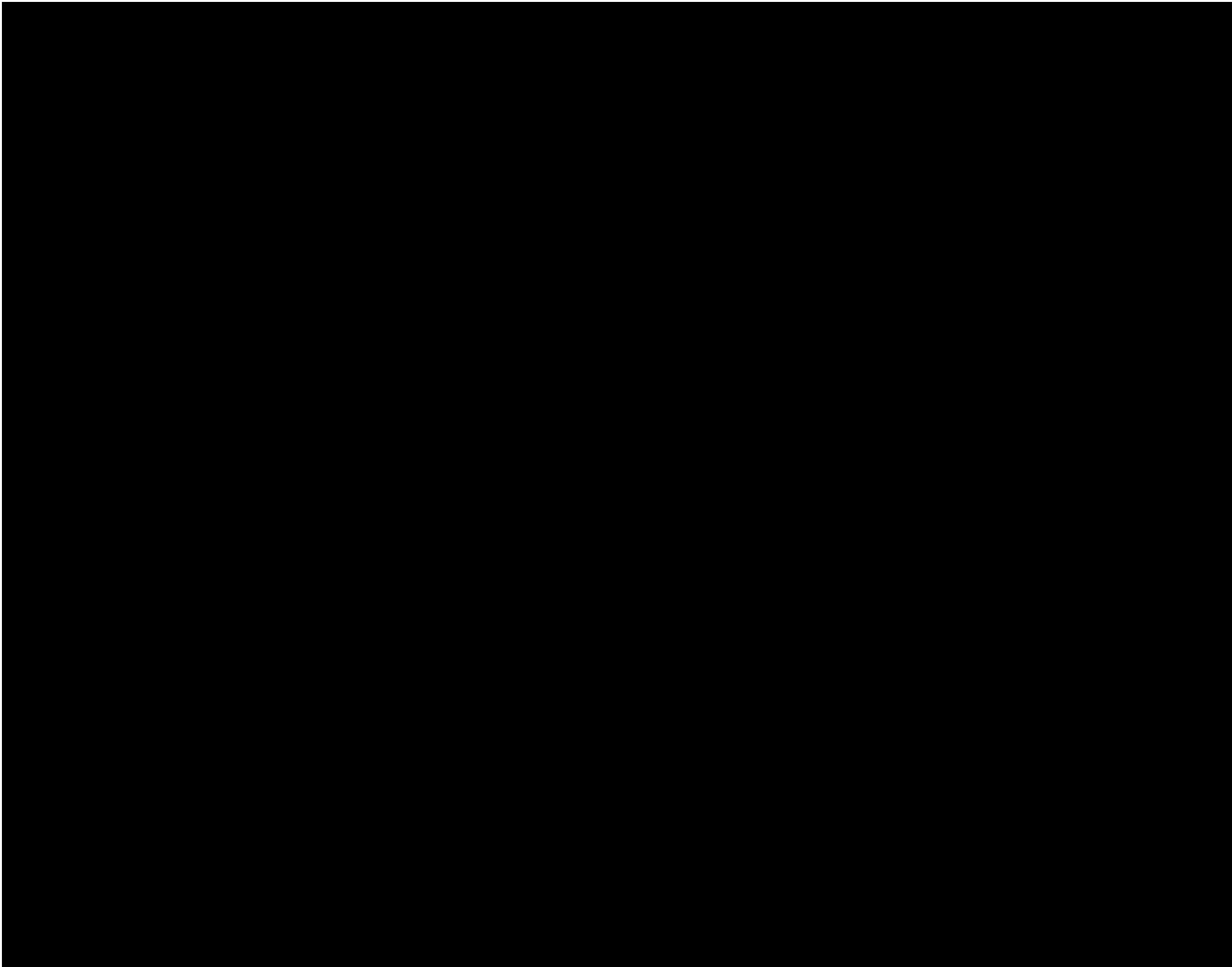


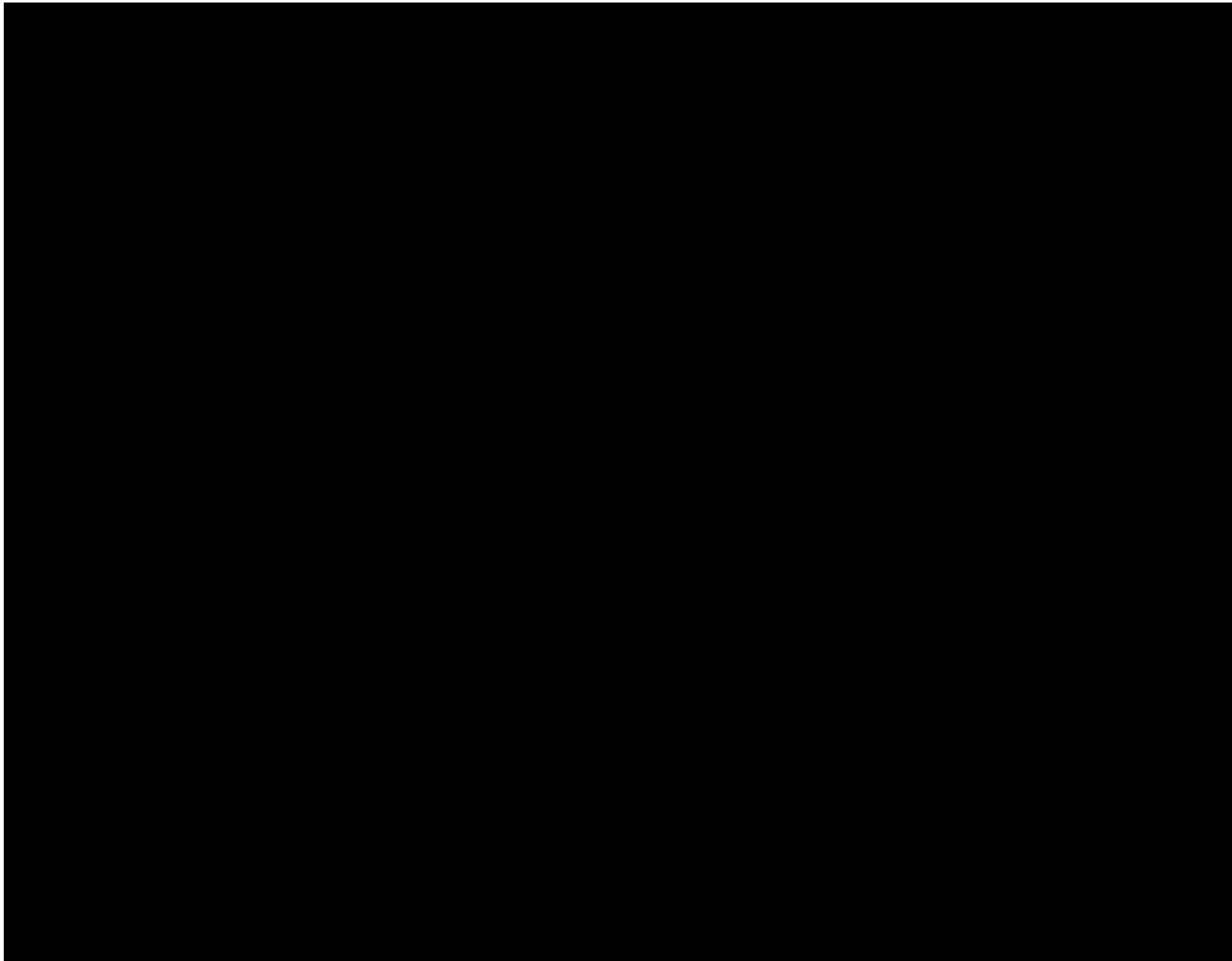












Appendix E

Linda Stone, Principal Investigator

David C. Berg, Historic Preservation Specialist

LINDA STONE, MA, RPA
Archaeological Consulting

249 East 48th Street, #12B
New York, New York 10017
(212) 888-3130

www.LindaStoneRPA.com
lindastone@juno.com

EDUCATION:

Master of Arts in
Anthropology
Hunter College of the City
University of New York

Linda Stone has over twenty-five years of experience in cultural resources management within the New York City metropolitan area. She is certified as a registered professional archaeologist (RPA), a requirement to conduct archaeological work in New York City. She is also a certified DBE and WBE with city and state agencies.

**PROFESSIONAL
CERTIFICATIONS:**

RPA (Register of
Professional
Archaeologists)

As an archaeological consultant, Ms. Stone's primary activity is in the preparation of phased archaeological evaluations done to comply with environmental review regulations. Her services include assessing project archaeological needs, preparing work plans, interfacing with state and local review agencies, directing and conducting archival and field research and preparing final reports for agency approval pursuant to SEQR, CEQR and Section 106. Ms. Stone's has done an extensive amount of compliance work in the New York City metropolitan area. Clients include environmental firms, architects, engineers, construction contractors and, occasionally, the agencies themselves. Some of those agencies' undertakings are detailed below.

**PROFESSIONAL
MEMBERSHIPS:**

New York Archaeological
Council (Executive Board
1999-2017)

Project Descriptions

The Trust for Governors Island and the National Park Service - Governors Island, Manhattan - Archaeologist

Professional Archaeologists
of New York City
(President-Elect 2020-22,
President 2014-15, 2008-
09, 2003-04 and 1994-95,
Board member 1994-2011,
2014-present)

Ms. Stone has conducted many archaeological projects on Governors Island since it was sold by the U.S. Coast Guard to New York in 2003. These include work in both the Governors Island National Historic Monument (managed by the National Park Service) and the Governors Island Historic District (administered by the Trust for Governors Island). For three capital projects and numerous small projects on the Island, Ms. Stone has completed site specific research, as well as Phase 1B field testing and Phase 2 site evaluation excavations and Phase 3 data recoveries.

Society for Historical
Archaeology (Board of
Directors 2015-18)

Metropolitan Transportation Authority - South Ferry Station/Battery Park, Manhattan - Archaeologist

Metropolitan Chapter of
the New York State
Archaeological Association
(President
1995-97)

Ms. Stone was the Principal Archaeologist for the excavations for the new South Ferry Subway station in lower Manhattan. The property was described at the time by the MTA Chief of Environment and Sustainability as "the most important archaeological site in North America." Ms. Stone spent the entire year and a half of contractor excavations leading the team of archaeologists on site in one of the largest archaeological monitoring projects ever conducted in New York City.

Council For Northeast
Historical Archaeology

New York City Parks Department - Rufus King Park, Queens - Archaeologist

Ms. Stone has conducted archaeological excavations and monitored construction excavations during improvements made to the Park in the area of the Rufus King Manor House, a National Register site and a New York City Landmark, dating to prior to 1726. Contrary to prior interpretations, Ms. Stone's archaeological excavations revealed King's original summer kitchen burned and was reconstructed by one of his descendants during the second half of the 19th century. This provided the client with important new information that has, and continues to be, shared with the public at the King Manor Museum.

New York City Department of Environmental Protection - Historic Richmond Town, Staten Island - Archaeologist

Ms. Stone completed an archaeological documentary study (Phase 1A), field testing (Phase 1B) and archaeological data recovery excavations (Phase 3) at the New York City Landmarked Historic Richmond Town on Staten Island. The work was conducted in several areas where a new storm sewer and drainage lines were to be installed.

DAVID C. BERG
Historic Preservation Specialist / Architectural Historian / Architectural Photographer
4215 Brushville Road
Susquehanna, PA 18847
570-465-2614

EDUCATION

M.A. Cert. / 1993 / Historic Preservation / University of Maryland
M.A. / 1990 / U.S. History / University of Maryland
B.A. / 1984 / History/ Wheaton College

EXPERIENCE

Mr. Berg is an Architectural Historian, Historic Preservation Specialist and Photographer with 30 years of professional experience managing historic preservation projects. He has prepared National Register of Historic Places Nomination Forms, cultural resource reports identifying historic sites and documenting National Register of Historic Places eligibility, and Section 106 reports evaluating potential effects to historic architectural properties in and adjacent to proposed project areas. Mr. Berg has prepared plans for the protection and maintenance of historic properties and has conducted mitigation efforts for buildings and structures, including written histories, the delineation of measured drawings and large-format photography in accordance with HABS-HAER-HALS standards.

RECENT PROJECT EXPERIENCE

Telecommunications Infrastructure and Tower Review, Nationwide. For Advantage Environmental Consultants, LLC of Severn, Maryland, performing Section 106 Review and coordination for FCC infrastructure and tower projects in 18 states in accordance with FCC Programmatic Agreements and state-specific requirements.

Section 110 Eligibility Assessment of Cold War Era Resources – Aberdeen Proving Ground (APG), Aberdeen, Maryland. Under contract to the Department of the Army, conducting an architectural resource survey and study (eligibility assessment) of certain Cold War-Era (CWE) facilities at APG. A total of 650 facilities are being evaluated.

Determination of Eligibility, 2100 Guilford Avenue, Baltimore, Maryland. For the Maryland Department of Motor Vehicles, prepared a formal Determination of Eligibility (DOE) for former Maryland Motor Vehicle Commission Offices at 2100 Guilford Avenue in Baltimore, Maryland. The building was found to be eligible for the National Register of Historic Places and at the State level for its role in the early history of the automobile age and the development of the Maryland Department of Transportation's Motor Vehicle Administration as well as the early history of the Maryland State Police.

HABS Level II Documentation, U.S. Coast Guard Station, Eatons Neck, New York. For the US Coast Guard, prepared photographic, graphic and written documentation of the historic Pump House at this Coast Guard facility.

HABS Level II Documentation, U.S. Naval Academy, Annapolis, Maryland. For the U.S. Naval Academy Alumni Association, prepared HABS Level II photographic, graphic and written documentation of three early twentieth century buildings at the U.S. Naval Academy in Annapolis. Buildings included the Gardener's Cottage, Stable Keepers Cottage and the Stable building.

Section 110 Eligibility Assessment of Cold War Era Resources – Joint Base McGuire-Dix-Lakehurst (JB-MDL). Under contract to the Department of the Army, Fort Worth District, Corps of Engineers, conducted an architectural resource survey and study (eligibility assessment) of certain Cold War-Era (CWE) facilities at JB-MDL in New Jersey. A total of 1,111 facilities were evaluated. Of these, 396 facilities were documented on NJ HPO survey forms either individually or combined on single forms in logical groups.