

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

UNITED STATES OF AMERICA

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V.

Criminal Case No. 05-386 (ESH)

ANTOINE JONES,

Defendant.

**DEFENDANT’S MOTION IN LIMINE TO EXCLUDE THE EXPERT TESTIMONY
AND CELLULAR ANALYSIS REPORT OF FBI SPECIAL AGENT SCOTT EICHER**

Defendant Antoine Jones, by and through undersigned counsel, respectfully moves to exclude the testimony and the “Historical Cellular Analysis” reports of FBI Special Agent Scott Eicher, a witness the government has proffered as an expert in the field of “cell site analysis.” For the reasons discussed below, the proposed expert testimony by and report of Agent Eicher should be excluded under Federal Rules of Evidence 702 and 403, because the Agent Eicher’s methodology is unreliable, irrelevant, and its probative value is substantially outweighed by the danger of unfair prejudice. *See Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 597 (1993). Mr. Jones requests a hearing on this matter.

FACTUAL BACKGROUND

Mr. Jones has been charged in a Superseding Indictment with Conspiracy to Distribute and Possess with Intent to Distribute Five Kilograms or More of Cocaine and Fifty Grams or More of Cocaine Base. The government alleges that Mr. Jones was part of a narcotics conspiracy from at least 2003 until October 24, 2005, which spanned from the District of Columbia, Maryland, Texas, North Carolina and elsewhere. In particular, the government alleges that Mr. Jones was the primary supplier of cocaine to members of the organization in the District of Columbia and Maryland.

During the course of the FBI investigation of Mr. Jones, law enforcement obtained cell site data for phones belonging to Mr. Jones, Carlos Reyna, and, Roel Bermea. Upon information and belief, now that the illegally obtained GPS data cannot be used as evidence in this case, the government will seek to introduce cell site data in its place in an attempt to demonstrate Mr. Jones's movements and whereabouts during relevant times.

The government will seek to introduce the cell site evidence and analysis through Special Agent Eicher.¹ The government subsequently produced Agent Eicher's draft cell site report which contains three parts – the analysis of cell sites used by Mr. Jones between September 3, 2005 and October 20, 2005; cell sites used by Mr. Reyna's phone between September 19, 2005 and October 1, 2005; and cell sites used by Mr. Bermea's phone between October 14, 2005 and October 22, 2005.² These materials indicate that the government, through Agent Eicher's testimony and report, will try to establish Mr. Jones's physical location and movements by identifying the cell tower with which his cell phone connects at the time of an incoming or outgoing call and then further narrowing down the location of the phone by drawing a circle to illustrate the tower coverage area and a pie slice shaped segment to illustrate the area the phone is located in at the time of the call.

Agent Eicher's draft reports do not describe the bases and reasons for his opinions. *See* Fed. R. Crim. P. 16(a)(1)(G). The reports merely plot the cell towers to which certain cell phones connected on a map and draw pie slice shaped segments presumably indicating that tower's coverage area. Regardless, Agent Eicher's analysis relies on the scientifically unsupported assumption that a cell phone connects to the closest cell tower. The government cannot

¹ *See* government's disclosure letter, pages 6-8, attached hereto as Exhibit A.

² The defense assumes that these charts constitute Agent Eicher's opinion on the estimated range of the towers. However, no methodology is provided to show how these estimates were reached. These charts are voluminous so defense has attached the first ten pages of the report on Mr. Jones's cell phone as an illustration.

legitimately assert that the use of a particular cell tower correlates with a cell phone's physical location, therefore to the extent Agent Eicher's testimony and report attempt to link a cell phone to a physical area, the proposed expert testimony should be excluded as unreliable and irrelevant.

ARGUMENT

The government's proposed cell-site expert testimony from Agent Eicher is insufficiently reliable to be admitted under Federal Rule of Evidence 702. Accordingly, this Court should exclude the testimony. Moreover, the testimony should be excluded pursuant to Rule 403 because its probative value is substantially outweighed by the danger of undue prejudice.

A. The Evidence Should be Excluded Under Rule 702

Federal Rule of Evidence 702 provides that a witness who is qualified as an expert may testify in the form of an opinion when

(1) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue; (2) the testimony is based on sufficient facts or data; (3) the testimony is the product of reliable principles and methods; and (4) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. To assess the reliability of an expert's methodology, the Supreme Court has set out four factors to consider: (1) whether the theory is based on scientific or other specialized knowledge that has been or can be tested; (2) whether the theory has been subjected to peer review; (3) the known or potential rate of error and the existence of standards controlling the theory's operation; and (4) the extent to which the theory is generally accepted in the relevant community. *Daubert*, 509 U.S. at 593–94. This Court must make a preliminary assessment of “whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts at issue.” *Id.* at 592–93. The proponent of the testimony bears the burden of proving that the proffered testimony

meets these requirements. Here, the government has failed to meet that burden with Agent Eicher's proposed expert testimony.

1. Agent Eicher's Methodology is Not Scientifically Valid and Therefore Not Reliable

An expert witness may offer "expert testimony only if the trial judge finds that the witness's qualifications and methods make his opinion 'reliable.'" *United States v. Smith*, 640 F.3d 358, 365 (D.C. Cir. 2011). Here, the proposed expert testimony and report are not reliable.

Agent Eicher's report is based upon a theory called "Granulization" and is based upon the faulty assumption that a cell phone connects to the closest cell tower at the time a call is placed.³ *See Exhibit C, Declaration of Lawrence Daniel*⁴ at 5.

The theory is based upon the idea that an "expert" can demonstrate the area covered by a cell phone by drawing circles or pie shapes on a map where the circles represent the approximate coverage area of a cell tower and that the cell phone will connect to the closest tower nearly one hundred percent of the time. *Id.* at 2. The basis for the theory is that cell towers are sectorized, meaning that a cell tower has more than one antenna, that each of the antennas points in a compass direction defined in degrees, and that the analyst can determine how far those signals reach based on comparing the locations of the adjacent cellular towers. *Id.*

One of the many fundamental flaws in this theory is that it relies on the premise that a cell phone always connects to the cell tower that is closest and this is simply not true. *Id.* Cell phones attempt to connect with the tower emitting the strongest signal at a given moment, not the closest. *Id.* Agent Eicher's proposed testimony seems to rely on this faulty assumption that a cell phone connects to the nearest cell tower. *Id.* at 13. However, the actual determination of which

³ The government and Agent Eicher do not specifically use the term "granulization," however, Lawrence Daniel, the defense expert in this matter had identified the theory.

⁴ Lawrence Daniel is a defense expert in this matter. He specializes in the area of computer, cell phone, and GPS forensics, and his *Curriculum Vitae* is attached as Exhibit D.

cell tower is used is complex and hinges on a multitude of factors that are not memorialized in the call detail records. *Id.* at 6-7. There is no data provided to determine why that particular tower was used for the call. *Id.* at 7. The question of how a signal is transmitted by a cell phone is selected by a particular cell tower is purely a question of science and engineering. *Id.* Many factors come into play in the selection of a tower to handle a cellular phone call, and these factors are specific to the moment in time when the call is connected. *Id.* Such factors include:

- a. the loading of the towers in the area, which means, which tower has the available capacity at that moment in time to handle the call
- b. the health of the towers in the area at the moment in time, which means, are all towers fully functioning at the time of the call
- c. line of sight to the tower from the cellular phone itself
- d. radio signal interference from current weather conditions that can cause fade of the signal (attenuation)
- e. the condition, make and model of the particular cell phone being used
- f. the amount of interference in the area from other towers
- g. multi-pathing which is a function of the terrain as well as both natural and man-made clutter in the area such as trees, hills, buildings and signs that cause radio waves to be either reflected or absorbed, also referred to as Rayleigh fading.
- h. The strength and quality of signal from the towers around the cell phone
- i. Whether the phone is inside a building or outside at the time the call was recorded, where structural materials may block the signal from one tower, forcing the cell phone to select a different tower than one it would be able to connect with if it were outdoors.

Id. At any point in time, a cell phone may “see” up to seven towers and can pick any of those seven towers to connect a call. *See* Matthew Tart, Iain Brodie, Nicholas Gleed, James Matthews, Historic cell site analysis – Overview of principles and survey methodologies, *Journal of Digital Investigations*, Volume 8 (185-193), October 2012.

Under the granulization theory, there are four ways to determine the approximate coverage area of a cell tower antenna sector:

- a. Using a standard radius of 1 mile or 3 miles project from the tower to the edge of the coverage area.

- b. Drawing the circles on the map after plotting the locations of cell towers where the circles are drawn to overlap each other based on the distance between the cell towers.
- c. The compass direction of the tower antenna used for a phone call.
- d. The beamwidth of the radio signal projected by the sector antenna.

See Declaration of Lawrence Daniel at 8. This theory fails to meet the reliability standard under *Daubert* because there is no accepted scientific methodology used in this process, there is no method for calculating known error, there is no recognized community of peers that accepts this method as being a scientific method or even a forensic science, there are no peer reviewed articles in scientific or engineering journals that support this method, there is no empirical data to support such analysis, and there are no standards set by any governing body that establishes a method or standardization of this type of analysis. *See Id.* at 11.

Agent Eicher's proposed testimony and report does not meet the four requirements defined in Rule 702. First, the testimony is not based upon sufficient facts or data. There is no fact basis for drawing coverage circles or pie shapes on a map and the cellular company does not provide such data to experts in cases. *See Id.* at 7. The physical location of the cell towers is factual in basis because cellular carriers maintain the geo-location (GPS) coordinates of cell towers and provide those GPS locations to the expert for use in his plotting of the locations of the towers. *Id.* at 8. However, data regarding the actual coverage area of the any tower at the time of the incident is *not* provided by the cellular carrier and there is no method that can be used to determine the coverage of a cell tower at the time of the incident based on historical call detail records. *Id.* at 7. It is simply not possible to reliably determine the coverage area of a cell tower antenna as it relates to a particular cell phone at the time of call. *See Id.* at 6.

Second, the testimony is not the product of reliable principles and methods. There are no published set of principles or methods governing the estimation of cell tower coverage based on

simply drawing circles on a map where the circles overlap and or the size of the circles are determined by the distance between cell towers. *Id.* at 7. In fact, the distance between cell towers on a map have no real bearing on the coverage area of the cell tower at all for the following reasons:

- a. Cell towers are placed based on anticipated load, which is the maximum number of cell phone calls anticipated at peak load times for the cell tower. Thus the expected coverage area can vary widely between cell towers.
- b. Cell towers are not always configured to provide the same amount of antenna power output, which determines the maximum range of the signal produced by the antennas.
- c. Cell towers are placed to cover specific areas by either mechanically or electronically tilting the antennas toward the ground and are not configured to cover an area shown as a perfect circle on a map.
- d. Not all tower antennas have the same beamwidth. Beamwidth is the width of the antenna signal defined in degrees. The most widely used analogy to describe beamwidth is to think of the antenna as projecting a beam of light, in the same way that a flashlight beam projects. As the beam exits the flashlight it spreads out in a pattern. In the same way that some flashlights can adjust the width of the beam of light to become wider or narrower, the antennas on a cell tower can be adjusted to project a wider or narrower beam of radio signals.
- e. Each cell tower that contains sector antennas can have 2 or more of these antennas pointing in different compass directions. Each of the antennas can be configured independent of the other antennas to suit the coverage need for that particular tower. In other words, the antennas can each have a different down tilt, beamwidth and a specified direction for the antenna. While the azimuth, which is the direction the antenna points, may be provided in the tower locations records, the actual coverage area of the sector antenna can vary widely even between sector antennas on the same tower mast.
- f. In today's cellular system environment, many cell towers contain more than a single set of antennas for a carrier, making it even more difficult to use the standard three sector antenna idea to estimate the coverage area.

Id. Third, Agent Eicher has not applied the principles and methods reliably to the facts of the case. As there are no principles or methods to determine the coverage area of a cell tower or cell tower sector based simply on the location of cell towers without applying complex engineering formulae to known parameters for each cell tower sector antenna, it is not possible for anyone to reliably determine the particular coverage area of a cell tower or cell tower antenna after the fact based solely on historical cell tower location data or historical call detail records.

Id. at 10. Even if such mathematical formulae were used to “predict” the coverage area, it is well known that these prediction maps are not perfect, and that they are used only to “estimate” where a cell phone would receive a signal if all of the conditions in the mathematical model are perfectly aligned to the actual conditions at the time of the call being made. *Id.*

While in some cases, law enforcement agents may perform a “drive test” to show the coverage area of cell tower antenna sectors, these drive tests are not reliable.⁵ *Id.* at 12. Drive tests are not performed close to the actual time that any of the cell phone calls were recorded in the historical call detail records. *Id.* The drive testing equipment and methods are not designed or used for the purpose of forensically determining the coverage area of cell towers and, unless the exact same conditions are present at the time of the drive test to match the conditions at the time a phone call was recorded, it is impossible to say that there is a 1 to 1 correlation to the shape of the tower coverage at the time of the drive test and the time of any particular phone call record. *Id.* Moreover, due to the dynamic nature of conditions surrounding any particular cell tower at the time of a drive test, unless multiple drive tests are performed and the data analyzed in an empirical fashion, it is not a reliable method for determining the tower antenna coverage at the time of a particular phone call. *Id.* Finally, drive testing technology is not designed for the

⁵ The government expert notice indicates that Agent Eicher is trained to conduct such tests, but defense does not know whether such tests were performed here.

purpose of analyzing historical events, but is designed for measuring the coverage and health of a cellular tower equipment at the time the drive test is conducted and has no relevance to the coverage and health of cellular tower equipment that was present at some point in the past. *Id.*

In *U.S. v. Antonio Evans*, --- F.Supp.2d ----, 2012 WL 3779302, N.D.Ill.,2012. August 29, 2012 Case No. 10 CR 747-3, United States District Court, Judge Joan H. Lefkow, the Government filed a motion *in limine* to admit cell site evidence and analysis though the testimony of FBI Special Agent Joseph Raschke.

After conducting an evidentiary hearing pursuant to Federal Rule of Evidence 702 and *Daubert*, to determine whether the government's proposed evidence and analysis were admissible, the court held that the portions of the proposed expert could testify about the maps he created indicating the location of cell towers used by the defendant's phone. However, Judge Lefkow found that the granulization theory is unreliable. The court noted that

Estimating the coverage area of radio frequency waves requires more than just training and experience, however, it requires scientific calculations that take into account factors that can affect coverage. Although the call data records upon which he relied are undisputed, the link between those records and his conclusions are deficient.

U.S. v. Antonio Evans, --- F.Supp.2d ---- (p 11). Here, Agent Eicher's proposed testimony and report are also unreliable and deficient. The evidence and methodology purported by the government and used to substantiate the conclusion that the cell tower used to transmit a call is indicative of the defendant's location is faulty and misleading. To permit its admission would be a clear violation of the defendant's constitutional rights. Defendant Jones respectfully requests that they be excluded.

B. The Cell Site Evidence Should be Excluded Under Rule 403

1. The Cell Site Evidence Should be Excluded Because it is not Relevant

The government's cell tower tracking evidence also fails to satisfy the threshold of relevance. "Rule 702 further requires that the evidence or testimony assist the trier of fact to understand the evidence or to determine a fact in issue. This condition goes primarily to relevance." *Daubert*, 509 U.S. at 591. This relevance inquiry is guided by the Federal Rules which instruct that "[r]elevant evidence" is "evidence having any tendency to make the existence of any fact that is of consequence to the determination of action more probable or less probable than it would be without the evidence." Fed. R. Evid. 401 (2009).

As the proponent of the cell tower tracking evidence, the government must prove the preliminary fact that a connection of a cell phone to a particular tower is relevant. In order to inculcate Mr. Jones by offering the connections of various cell phones with various towers as circumstantial evidence of his and other individual's locations, the government must prove the preliminary fact that there is a repeatable nearly 1:1 causal correlation of the cell phones signals being routed to the geographically nearest tower. Otherwise, what tower connects with the cellular phone call is irrelevant, and the use of a cell tower connection to prove Mr. Jones or any other person's location would be grossly and dangerously misleading to the trier of fact. The jury necessarily would speculate on whether a cell phone always connects with the closest cell tower, or whether a cell phone may connect for a myriad of technical reason with another cell tower. To allow such speculation violates the Due Process Clause of the United States Constitution.

As discussed above, the science involved does not support the proposition that a cell phone repeatedly connects to the nearest tower with any scientific level of accuracy or reliability. Moreover, the manner in which Agent Eicher draws pie wedge and circle shapes on a map pursuant to the granulation theory is not scientifically valid. Evidence that a particular cell phone connected with a particular tower makes no "fact that is of consequence to the

determination of the action more probable or less probable” and therefore fails to satisfy the threshold relevance inquiry and should not be submitted to the jury for its consideration. Fed. R. Evid. 401 (2009).

2. The Cell Site Evidence’s Probative Value is Substantially Outweighed by the Danger of Unfair Prejudice.

Rule 403 excludes an expert’s testimony if “its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.” Fed. R. Evid 403. Expert testimony carries risks of violating Rule 403 because it can be powerful and misleading, and thus difficult to evaluate. *Daubert*, 509 U.S. at 595. Due to this risk, it is important for this Court to carefully weigh the probative value of Agent Eicher’s proposed testimony under Rule 403. *Id.* at 595. This raises an important question of admissibility, not just one of weight.

In the government’s Opposition to Motion to Suppress Cell Site Data, the government admitted that the cell-site information is not precise. (Dkt # 648, Gov Opp’n 14). Under one of the government’s arguments regarding Mr. Jones’s Fourth Amendment rights as it relates to this data, the cell-site tracking’s lack of precision is the reason he has no constitutional privacy interests in it. *Id.* at 13. The government argued, in part, that Mr. Jones had no reasonable expectation of privacy in cell-site location information conveyed to his wireless carrier because the information is too imprecise to constitute an intrusion of privacy. *Id.* at 5. Yet, here the government is seeking to introduce expert testimony that uses the cell site data to place him near certain locations such as his home, the homes of others, and the alleged stash house. If the data is too imprecise to violate an individual’s privacy rights, how can the government also put forth

this information through an expert and offer that “[t]he use of cell site and sector information to determine the location of a cellular phone has proven to be consistently accurate.” Exhibit A at 6.

Here, the government has put forth draft reports with precise pie wedge shapes drawn in a compelling manor to try to prove Mr. Jones’s phone was in certain key locations at specific times. However, the actual methodology (or lack thereof) behind these plotted maps does not support that conclusion. There is a serious danger of unfair prejudice that far outweighs their probative value and they should be excluded.

CONCLUSION

For all the reasons set forth in this motion, Mr. Jones respectfully requests that this Court exclude any and all testimony of Scott Eicher regarding the cellular analysis conducted in this matter and associated reports of Agent Eicher. Mr. Jones further requests a hearing on this matter so that he may have the opportunity to demonstrate to the Court that Agent Eicher’s conclusions are not reliable or relevant to the case before it.

Respectfully submitted,

_____/S/_____
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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this the 3rd day of January 2013, a copy of the foregoing was filed electronically. Notice of the filing will be sent by e-mail to all parties by operation of the court's electronic filing system.

_____/s/_____
Jeffrey B. O'Toole

The question of how a signal transmitted by a cell phone is selected by a particular cell tower is purely a question of science and engineering. However, it is not something so pedestrian that we take its daily use for granted and know how it works.