NOVEMBER 1, 2005 CONFERENCE CALL SUMMARY
REGARDING FALL 2005 STEAM GENERATOR INSPECTIONS

DUKE ENERGY NUCLEAR, LLC
OCONEE UNIT 2
DOCKET NO. 50-270

Introduction and Background

On November 1, 2005, the Nuclear Regulatory Commission (NRC) staff participated in a conference call with Duke Energy Nuclear, LLC (the licensee) to discuss the scope, results, and status of steam generator tube inspections being conducted at that time at Oconee Unit 2 (Fall 2005 Refueling Outage).

Oconee Unit 2 is a two loop pressurized water reactor with once through steam generators (OTSGs) manufactured by Babcock & Wilcox, Canada. The Oconee Unit 2 OTSGs are replacement OTSGs installed during the previous refueling outage (Spring 2004). The ongoing inspections at Oconee Unit 2 are the first inservice inspections of the replacement OTSGs.

A major point of interest to the staff, going into the call, was the state of tube wear at Oconee Unit 2. The first inservice inspection of identical replacement OTSGs at Oconee Unit 1, in Spring 2005, revealed unexpected, widespread wear degradation of the tubing at tube support plate locations.

Call Summary

During the call, the licensee addressed each of a number of discussion points (Enclosure 2) prepared by the staff in advance of the call, as summarized below.

No primary to secondary leakage was observed during the first operating cycle with the replacement OTSGs. Thus, no secondary side pressure test was performed.

The OTSG tube inspections were performed in accordance with the applicable EPRI guidelines, without exception.

The scope of inspection was 100% of the tubes in both OTSGs over their full length using a combination X-probe/bobbin probe. For most tubes, only the bobbin data was analyzed. The X-probe data was analyzed for 630 special interest tubes in OTSG A and 926 tubes in OTSG B. Special interest tubes are those with bobbin indications of various sorts, including flaw indications or artifact signals (e.g., dents). These inspections identified a total of 539 indications in 498 tubes in OTSG A and 753 indications in 699 tubes in OTSG B. The affected tubes represent about 4.1% of the total tube population. All of the indications were at tube support plate locations and were dispositioned as wear flaws. These wear indications were located predominantly at tube support plates (TSP) 10 through 14. The measured depth of the indications (in terms of percent throughwall (% TW)) break down as follows:

ENCLOSURE 1

OTSG A:	0 - 9%	408 indications
	10 -19%	118
	20 - 29%	3 (measuring 22%, 22%, 20% TW)
	>29%	0
OTSG B:	0 - 9%	546
	10 -19%	199
	20 - 29%	6
	30 - 39%	2 (both measuring 32% TW)
	>39%	0

All indications found were less than the technical specification plugging limit of 40% TW. However, the licensee has elected to plug three tubes with the largest indications (i.e., those with depths exceeding 26% TW) to ensure that all tubes remaining in service will maintain acceptable structural margins until the next scheduled inspection.

Subsequent to the call, the licensee provided a table summarizing the scope and results of the inspection, which is enclosed (Enclosure 3).

The licensee plans no in-situ pressure testing during this outage. However, the licensee is planning to remove specimens from two tubes containing wear indications during this outage. These specimens will be evaluated in the laboratory as part of the licensee's effort to evaluate contributing factors to the unexpectedly high wear activity at the Oconee units. The laboratory evaluation will take around three months.

The licensee is also pursuing other actions of a diagnostic nature during this outage to evaluate the contributing factors. The licensee is using eddy current to map exactly which tube support plate lands are associated with 200 of the observed wear indications. A magnetic marker (in the form of a parked eddy current probe) will be placed in tubes adjacent to 200 tubes with wear indications to assist in this process. Subsequent to the call, the licensee provided maps showing the affected lands for each of the 200 indications in the study. These maps are enclosed (Enclosure 4). In addition, acoustical techniques are being employed to measure tube preloads. Also, the licensee is installing pressure transducers at several elevations within the secondary side, and installing accelerometers at various locations around the steam generator. The instrumentation is intended to gather data on acoustical effects and/or external excitation of the SGs (e.g., from the steam lines, primary piping) which may be contributing to the problem.

The licensee saw no evidence of loose parts or foreign objects during the eddy current inspection and does not plan to perform visual examinations from the secondary side.

Regarding Framatome's notification of the effect of tubesheet hole dilation on the service life of B&W welded plugs, the licensee stated that this is not an issue for Oconee Unit 2 since their plugs are qualified for this effect.

Finally, the licensee stated the severed plugged tube issue discussed in NRC Information Notice (IN) 2002-02 and IN 2002-02, Supplement 1 is not applicable to the types of plugs in use at Oconee Unit 2.

STEAM GENERATOR TUBE INSPECTION DISCUSSION POINTS

PREPARED BY THE OFFICE OF NUCLEAR REACTOR REGULATION

DUKE ENERGY NUCLEAR COMPANY, LLC

OCONEE NUCLEAR STATION, UNIT 2

DOCKET NO. 50-270

The following discussion points have been prepared to facilitate the phone conference arranged with Duke Energy Nuclear Company (licensee) to discuss the results of the SG tube inspections to be conducted during the upcoming Oconee Nuclear Station, Unit 2 refueling outage. This phone call is scheduled to occur towards the end of the planned SG tube inspection interval, but before the unit completes the inspections and repairs.

The staff plans to document a brief summary of the conference call as well as any material that is provided in support of the call.

1. Discuss any trends in the amount of primary-to-secondary leakage observed during the recently completed cycle.

2. Discuss whether any secondary side pressure tests were performed during the outage and the associated results.

3. Discuss any exceptions taken to the industry guidelines.

4. For each steam generator, provide a description of the inspections performed including the areas examined and the probes used (e.g., dents/dings, sleeves, expansion-transition, U-bends with a rotating probe), the scope of the inspection (e.g., 100% of dents/dings greater than 5 volts and a 20% sample between 2 and 5 volts), and the expansion criteria. Also, discuss the extent of the rotating probe inspections performed in the portion of tube below the expansion transition region (reference NRC Generic Letter 2004-01, "Requirements for Steam Generator Tube Inspections").

5. For each area examined (e.g., tube supports, dent/dings, sleeves, etc), provide a summary of the number of indications identified to-date of each degradation mode (e.g., number of circumferential primary water stress corrosion cracking indications at the expansion transition). For the most significant indications in each area, provide an estimate of the severity of the indication (e.g., provide the voltage, depth, and length of the indication). In particular, address whether tube integrity (structural and accident induced leakage integrity) was maintained during the previous operating cycle. In addition, discuss whether any location exhibited a degradation mode that had not previously been observed at this location at this unit (e.g., observed circumferential primary water stress corrosion cracking at the expansion transition for the first time at this unit).

ENCLOSURE 2

6. Describe repair/plugging plans.

7. Describe in-situ pressure test and tube pull plans and results (as applicable and if available).

8. Provide the schedule for steam generator-related activities during the remainder of the current outage.

9. Discuss the following regarding loose parts:
   - what inspections are performed to detect loose parts
   - a description of any loose parts detected and their location within the SG
   - if the loose parts were removed from the SG
   - indications of tube damage associated with the loose parts
   - the source or nature of the loose parts if known

10. Once Through Steam Generators - if you have Babcock and Wilcox (B&W) welded plugs installed in the steam generators, be prepared to discuss the actions taken in response to Framatome's notification of the effect of tubesheet hole dilation on the service life of B&W welded plugs.

11. Once Through Steam Generators - discuss any actions taken in response to the severed tube issue during the outage (NRC Information Notice (IN) 2002-02 and IN 2002-02, Supplement 1). If actions are complete, please indicate so.

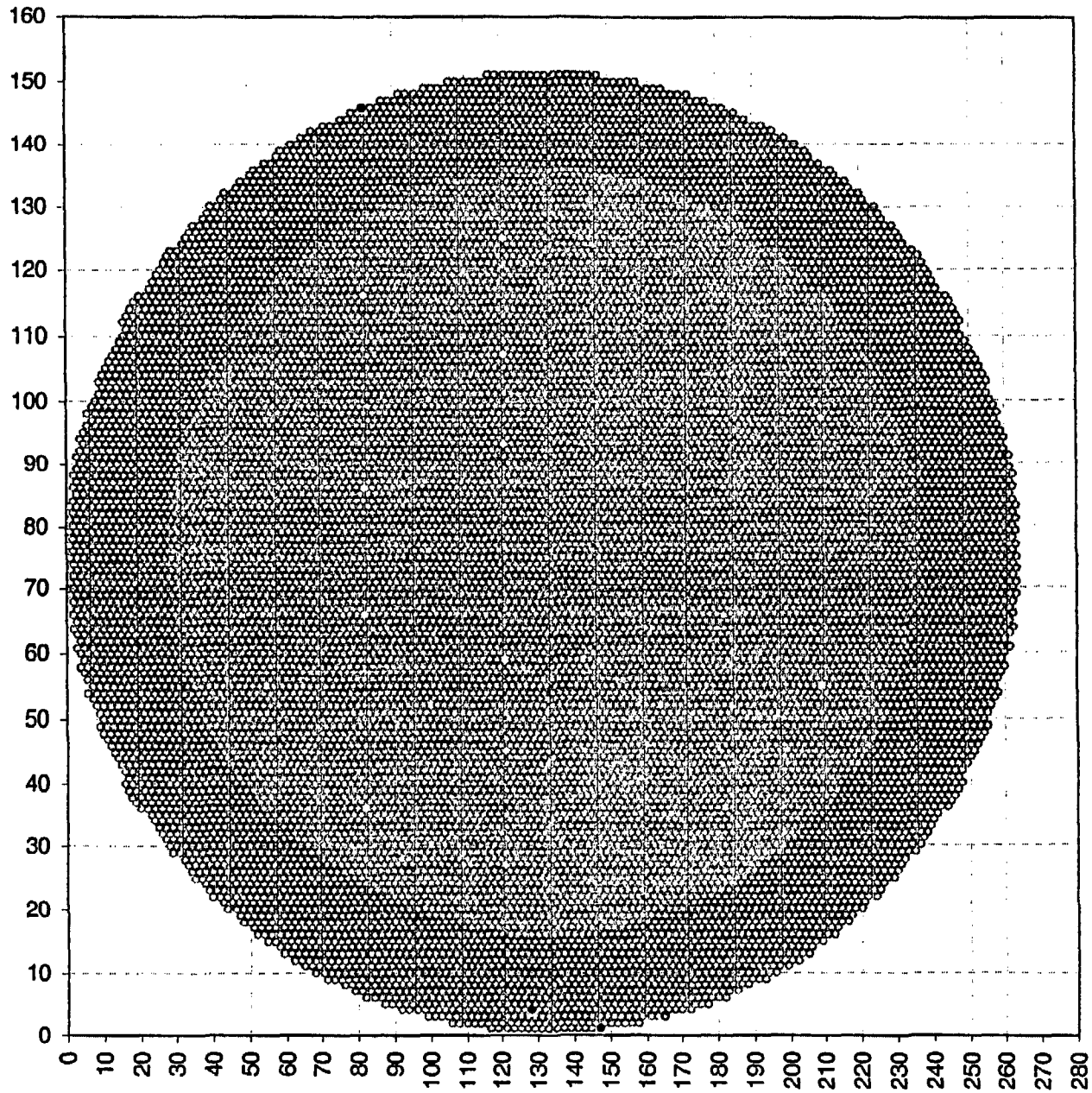
AREVA

Duke Power Oconee Unit 2 EOC21 ECT Examination Status Report

SCOPE DESCRIPTION			S/G A				S/G B			
Leg	Exam Description	Extents	Acquired	Analyzed	Scope	% Completed	Acquired	Analyzed	Scope	% Completed
Both	100% Bobbin	UTE-LTE	15,627	15,627	15,627		15,630	15,630	15,630	
Both	Special Interest Array Bobbin	Various	N/A	630	630		N/A	926	926	
Both	Special Interest MULC Bobbin	Various	0	0	0	0.0%	0	0	0	0.0%

Tubes with Wear Indications			498				699			
Tubes with Wear Indications by Support			015	4	007	9	015	3	007	55
			014	63	006	5	014	119	006	33
			013	169	005	15	013	75	005	1
			012	103	004	18	012	313	004	13
			011	65	003	23	011	70	003	14
			010	45	002	19	010	79	002	12
			009	9	001	18	009	46	001	11
			008	34			008	11		
Tubes with Wear Indications by Size			0 - 9%	408			0 - 9%	546		
			10 - 19%	118			10 - 19%	199		
			20 - 29%	3			20 - 29%	6		
			30 - 39%	0			30 - 39%	2		
			>=40%	0			>=40%	0		

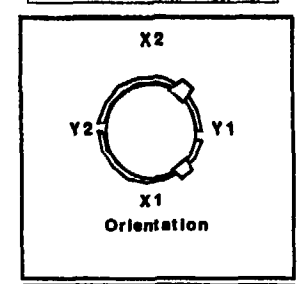
ENCLOSURE 3

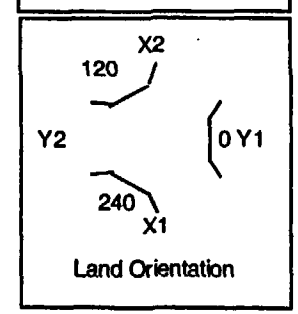


ONS2-A Magnet Orientation
11-04-05

TSP 15

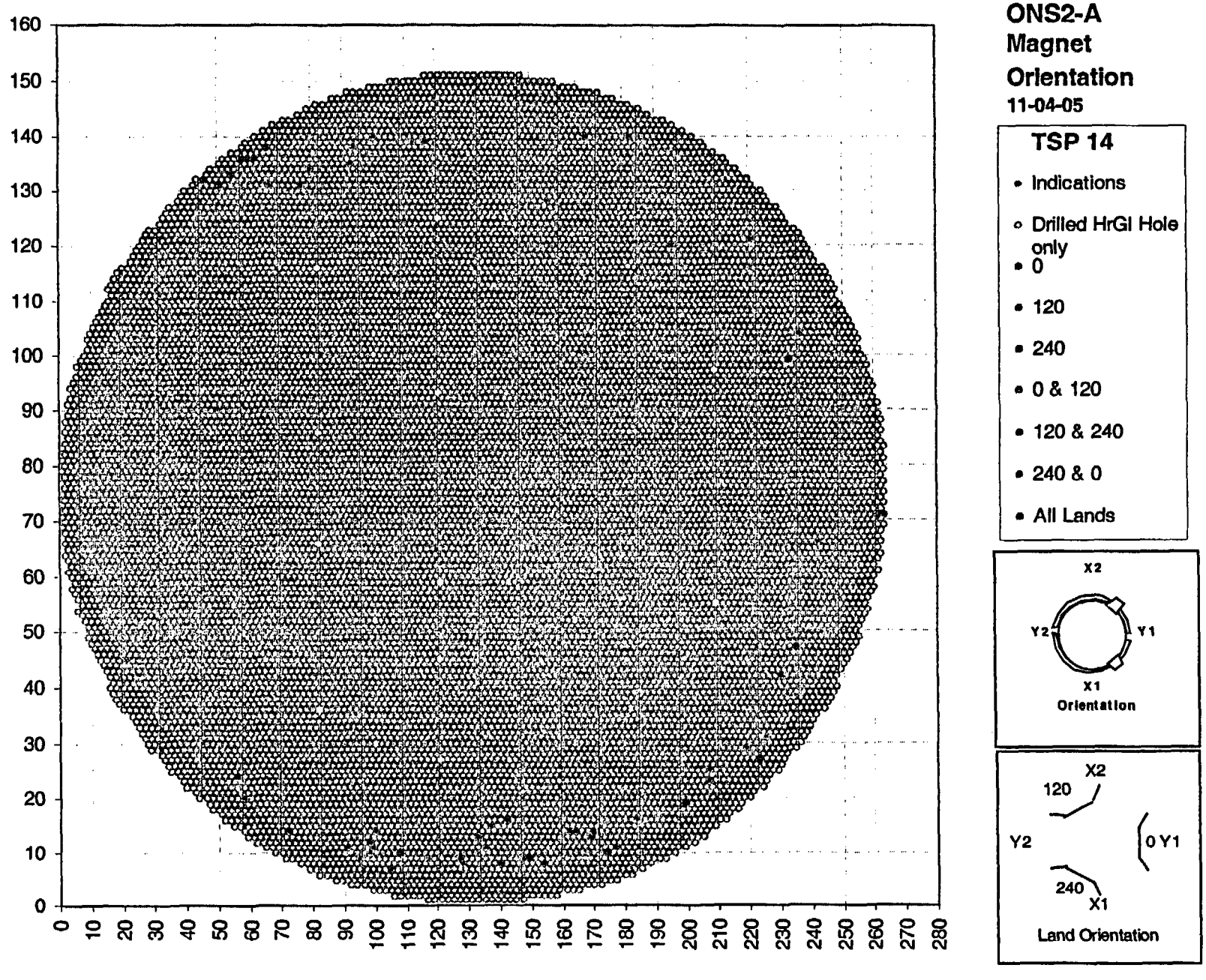
- Indications
- HrGI on B of TSP only
- 0
- 120
- 240
- 0 & 120
- 120 & 240
- 240 & 0
- All Lands



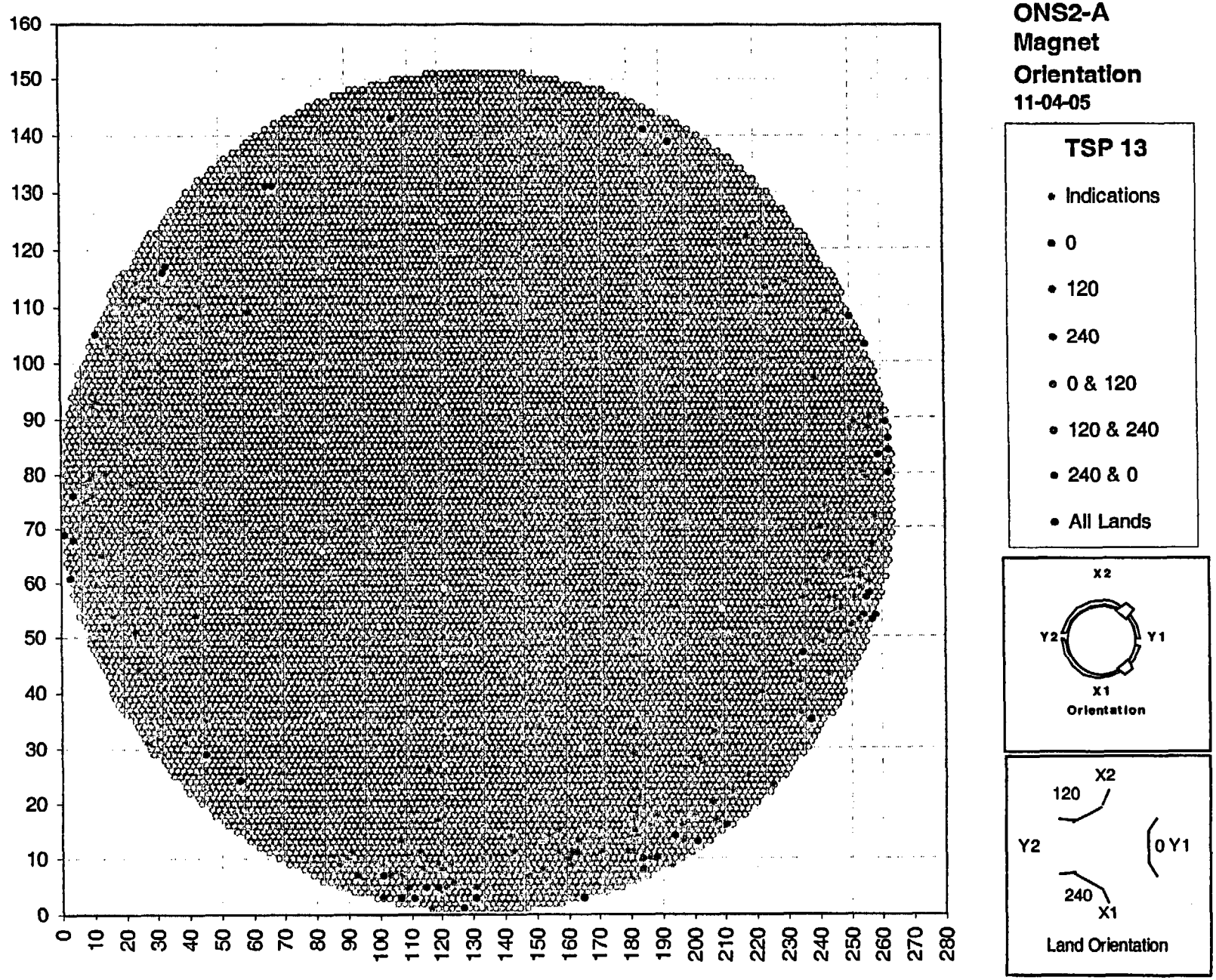


ENCLOSURE 4

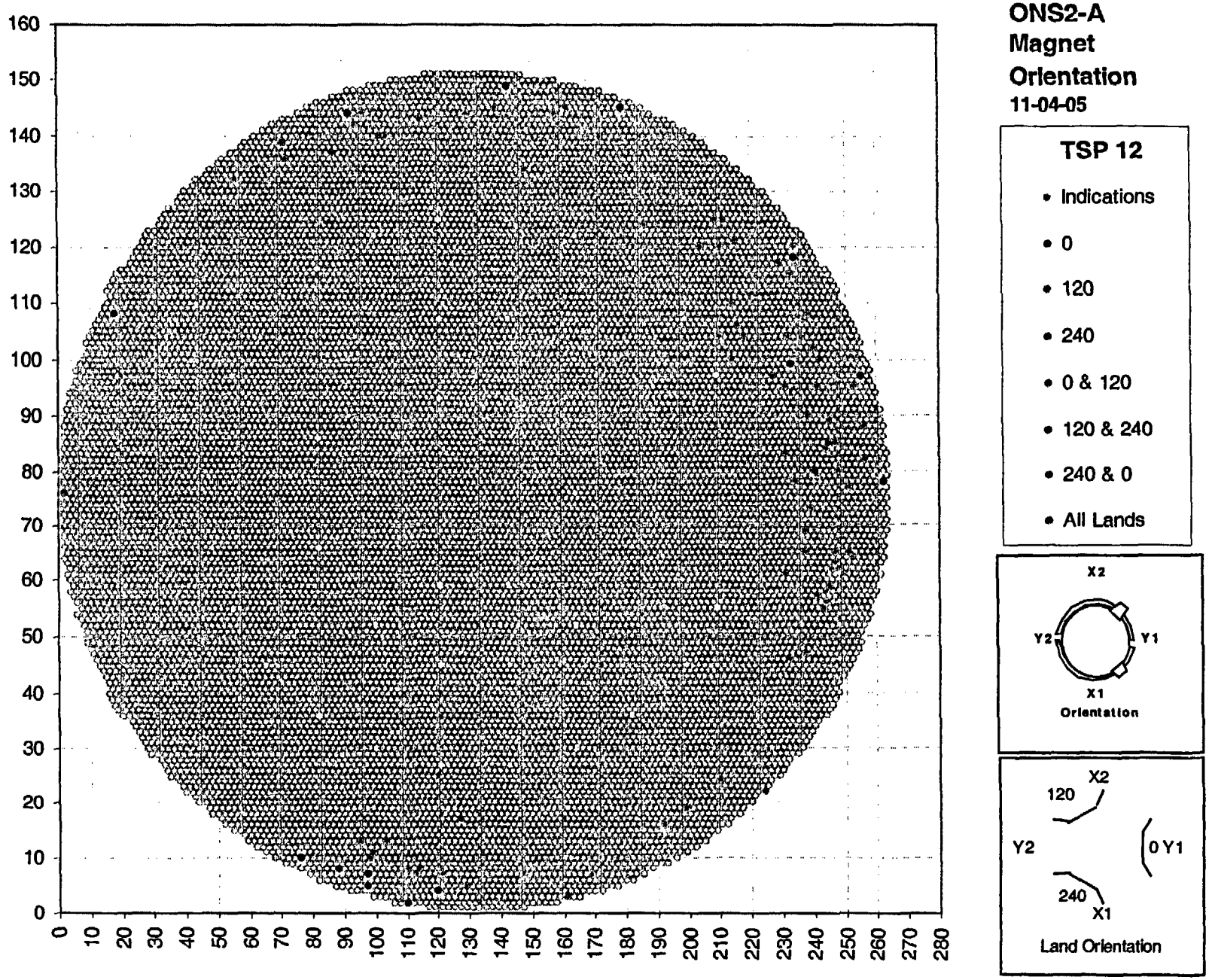
ONS2-A Indication Orientation Maps (By Magnet)



ONS2-A Indication Orientation Maps (By Magnet)



ONS2-A Indication Orientation Maps (By Magnet)



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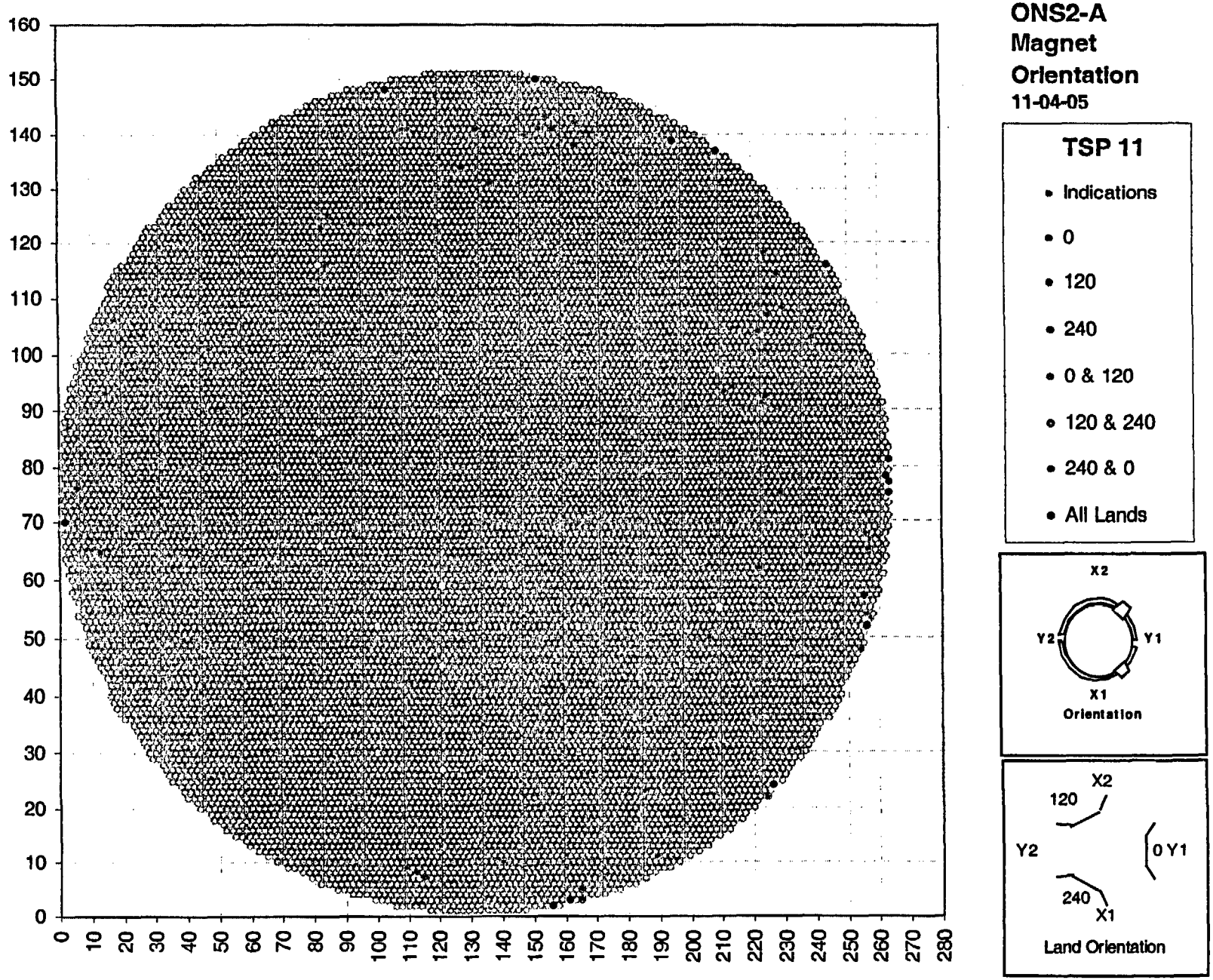

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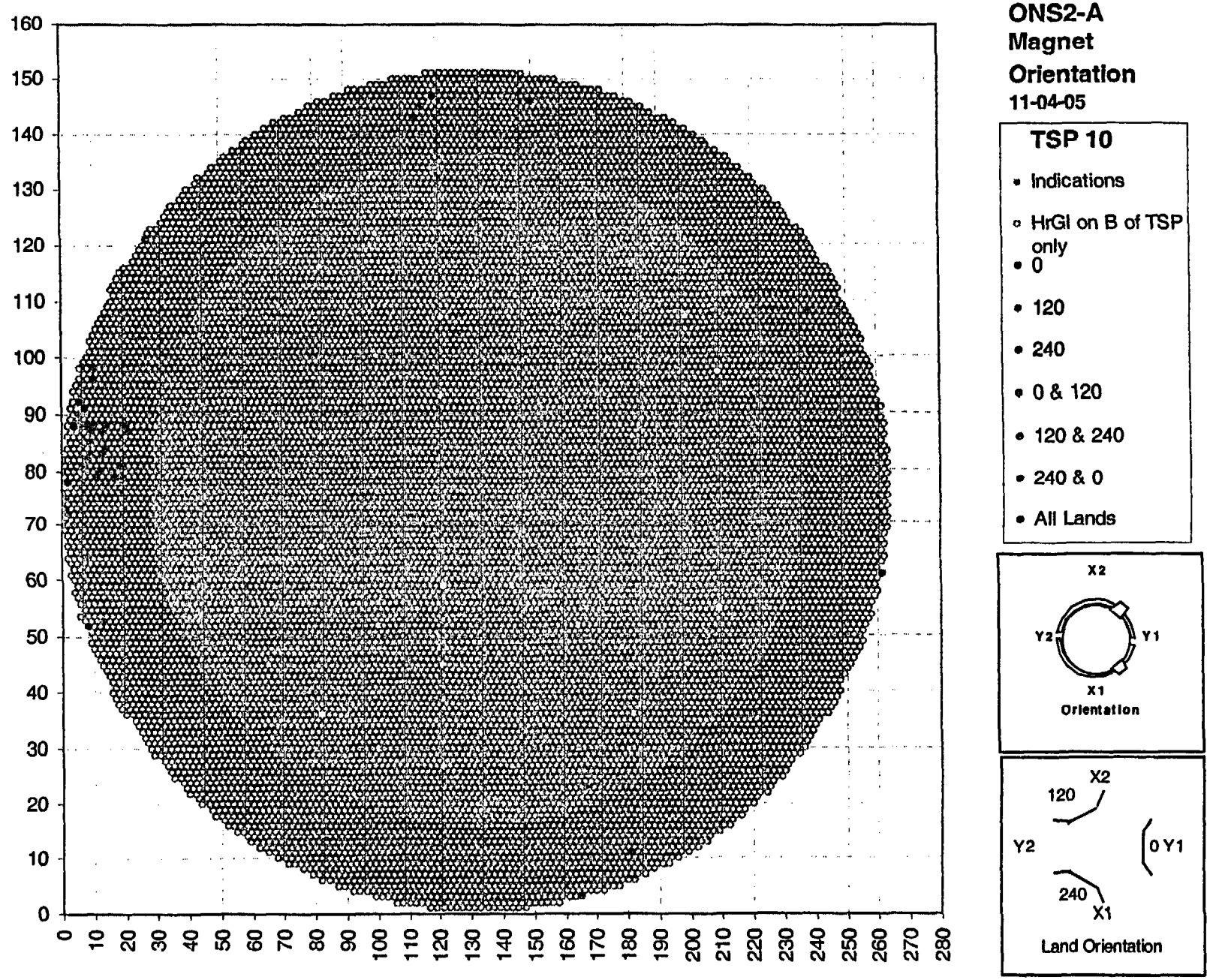

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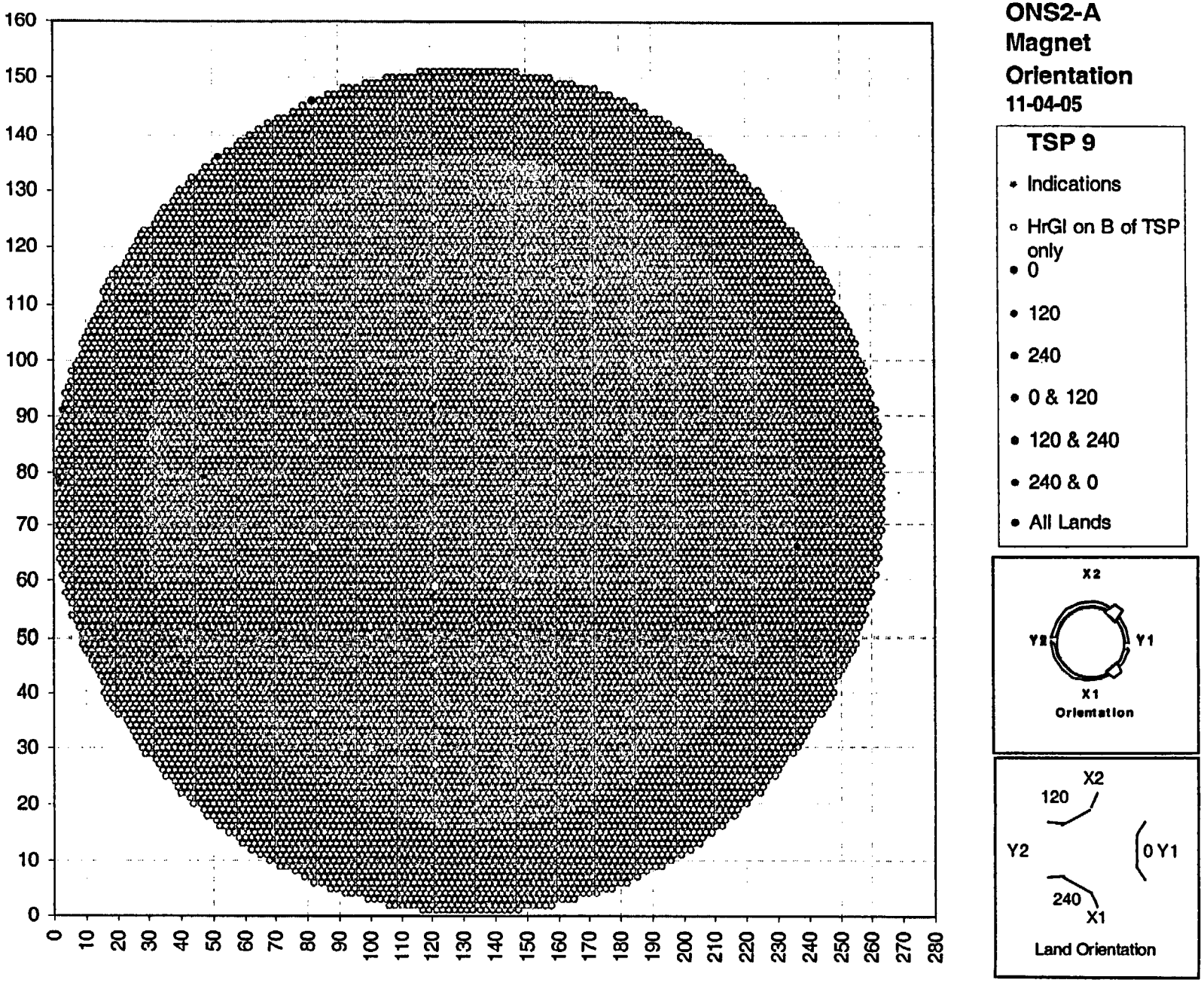

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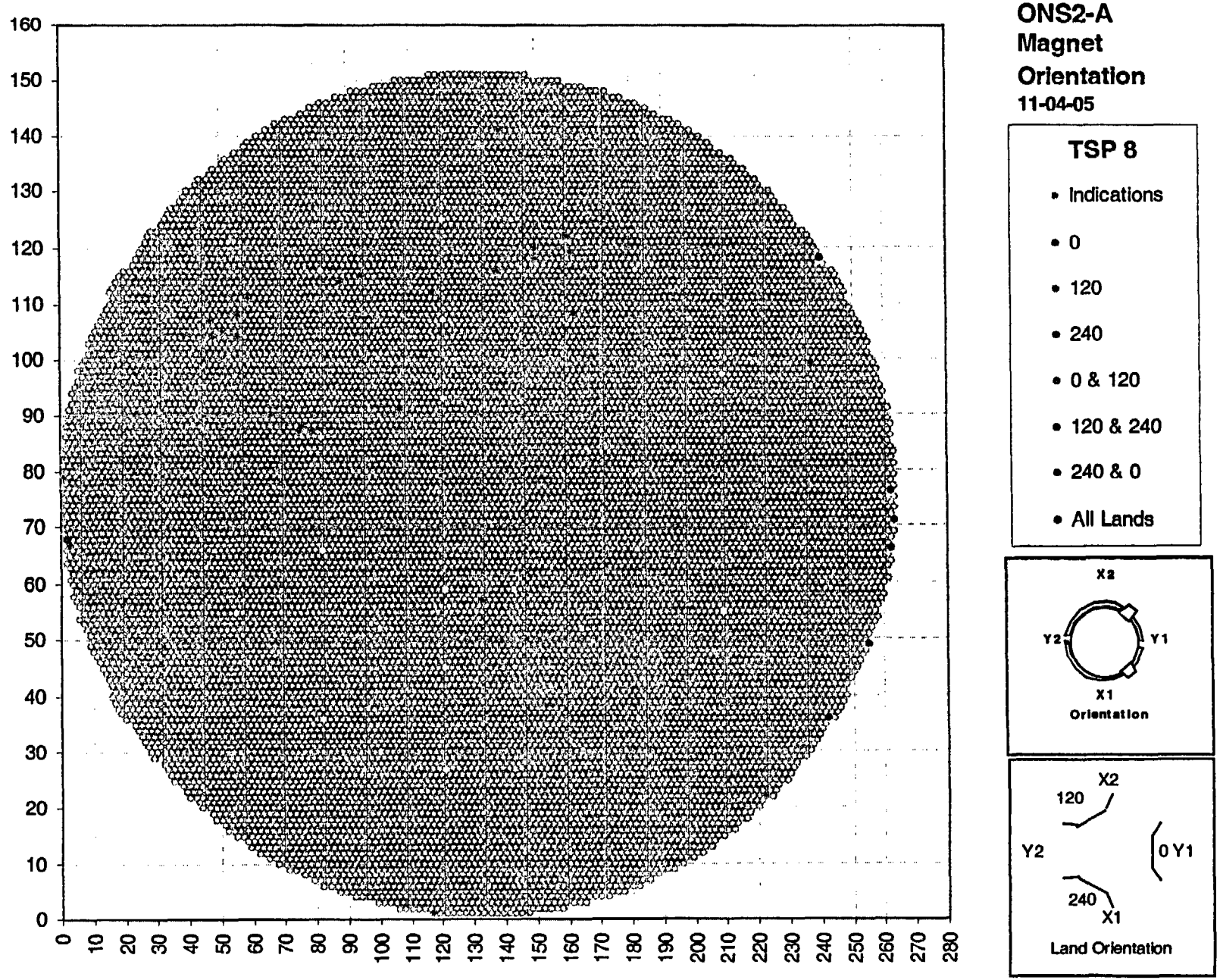

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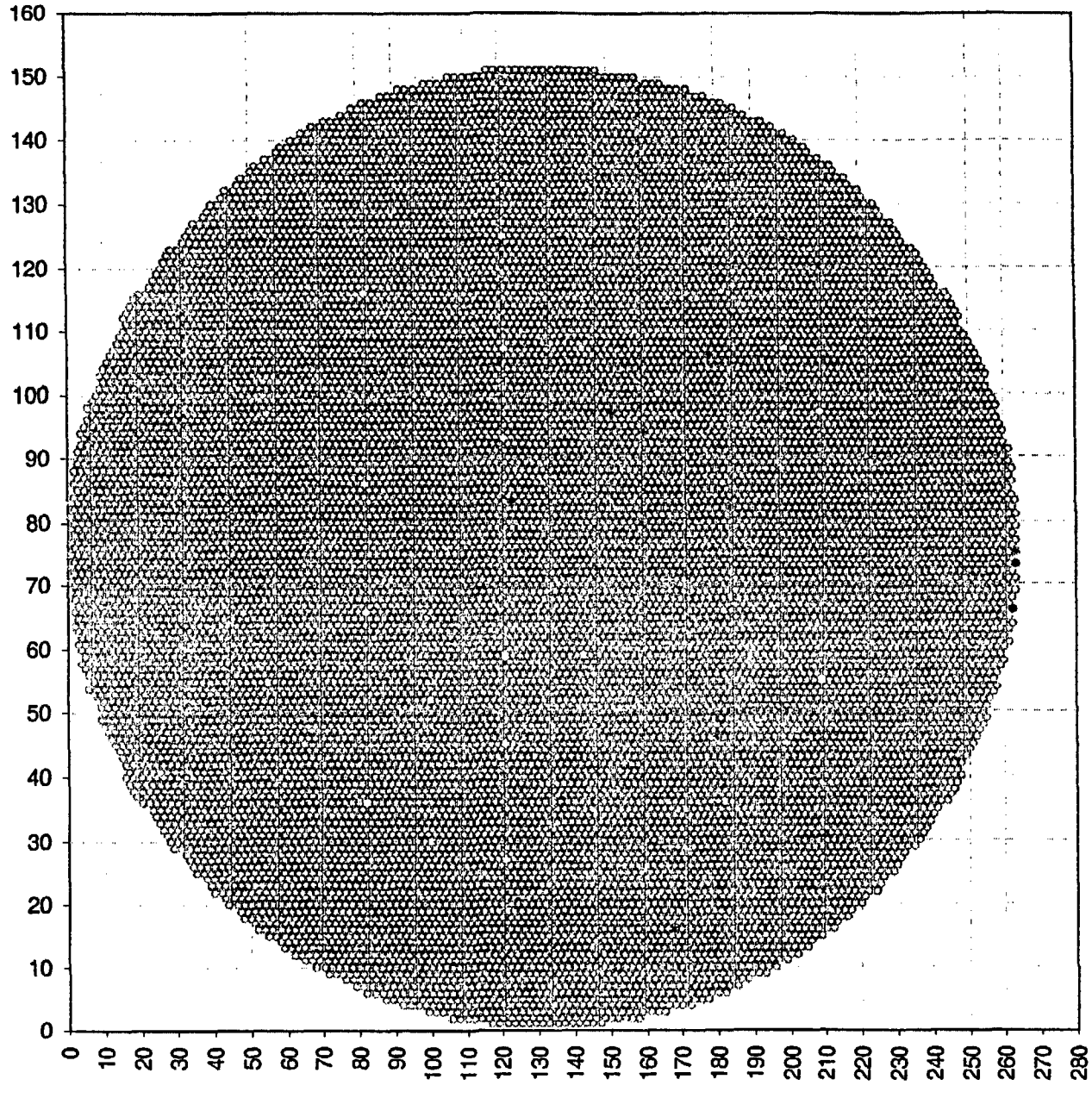
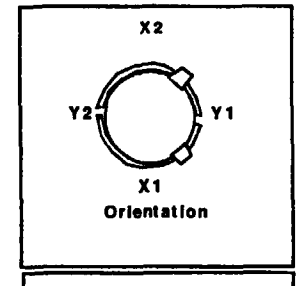
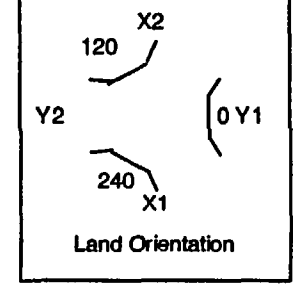


ONS2-A Magnet Orientation
11-04-05

TSP 7

- Indications
- 0
- 120
- 240
- 0 & 120
- 120 & 240
- 240 & 0
- All Lands





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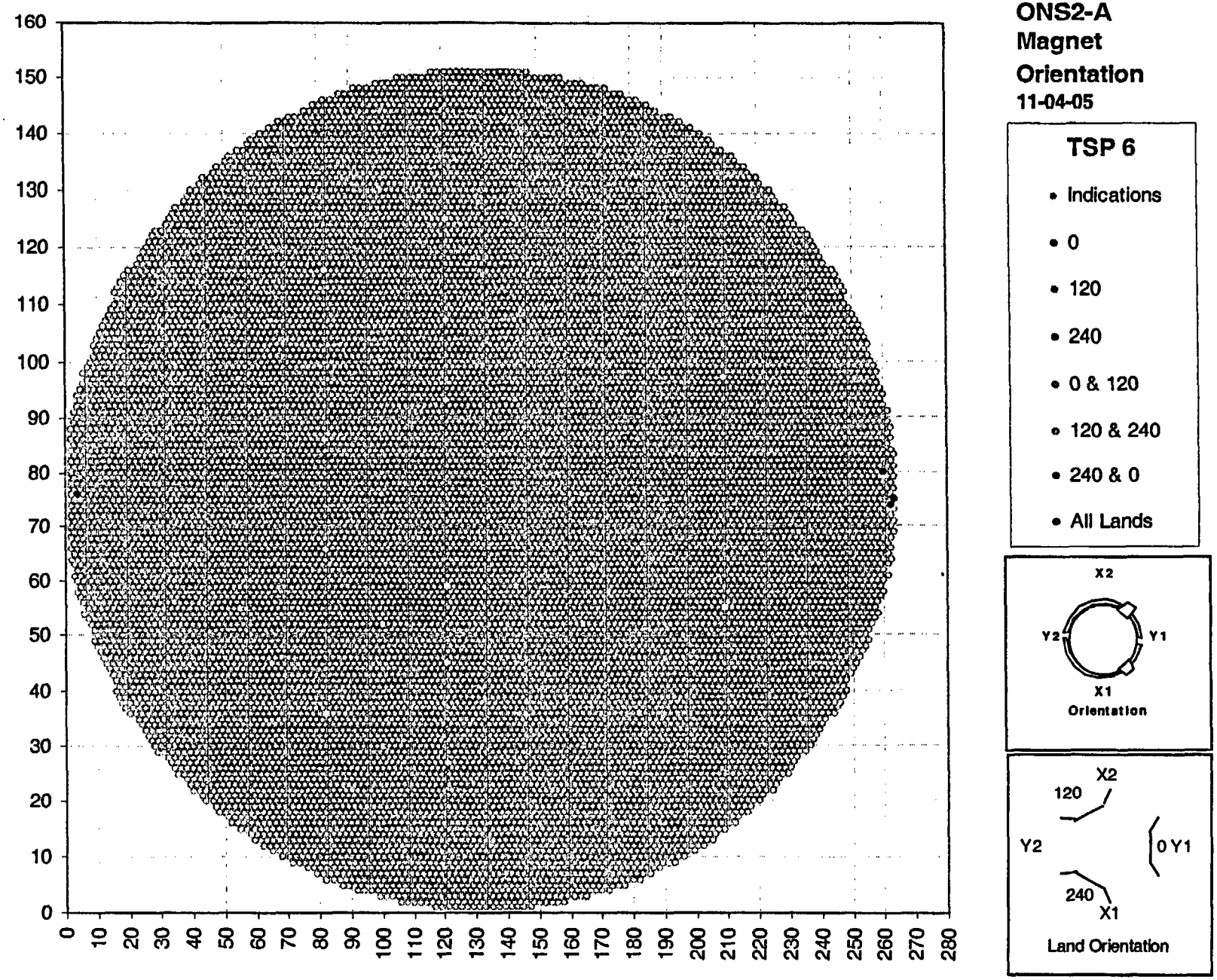

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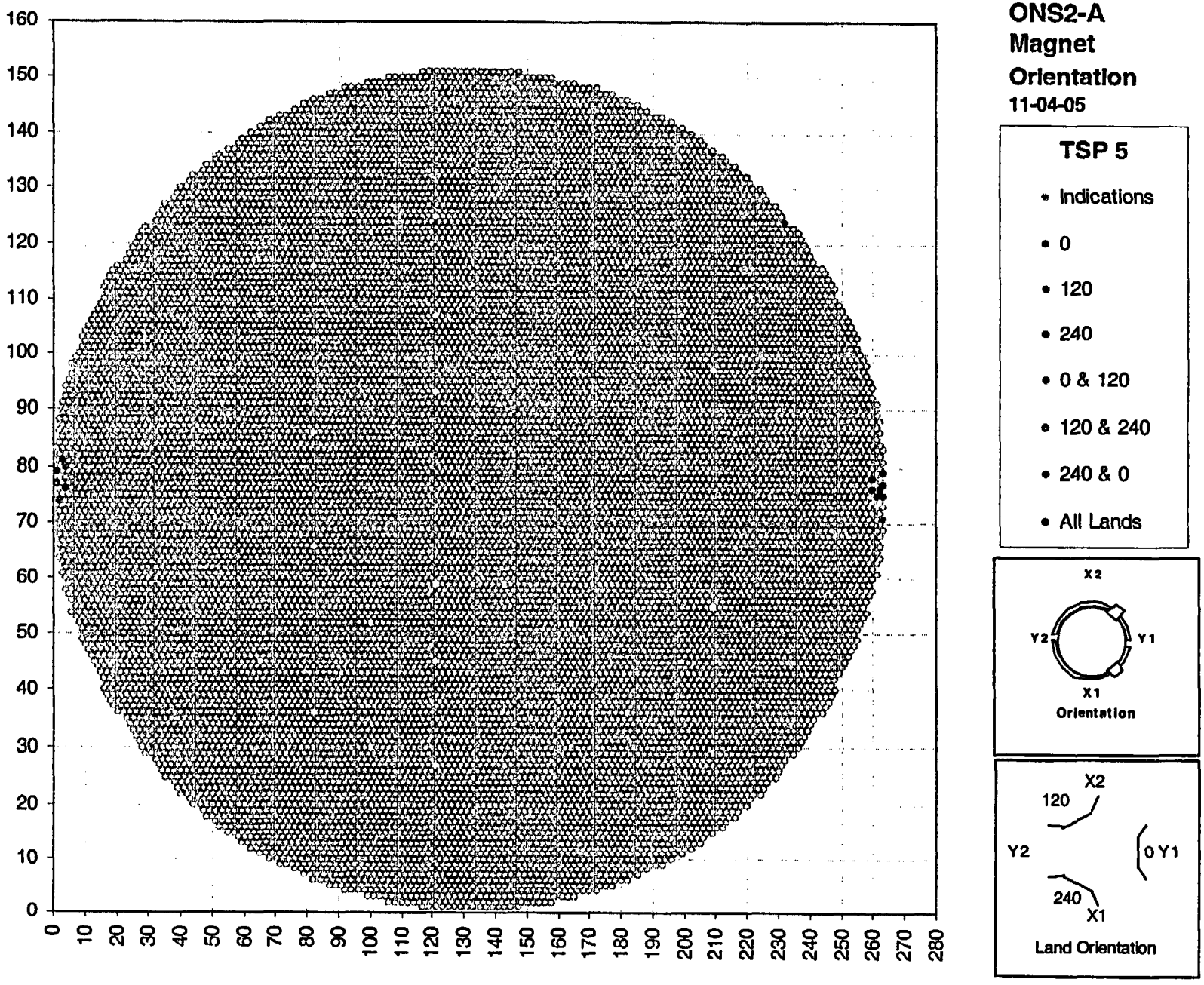

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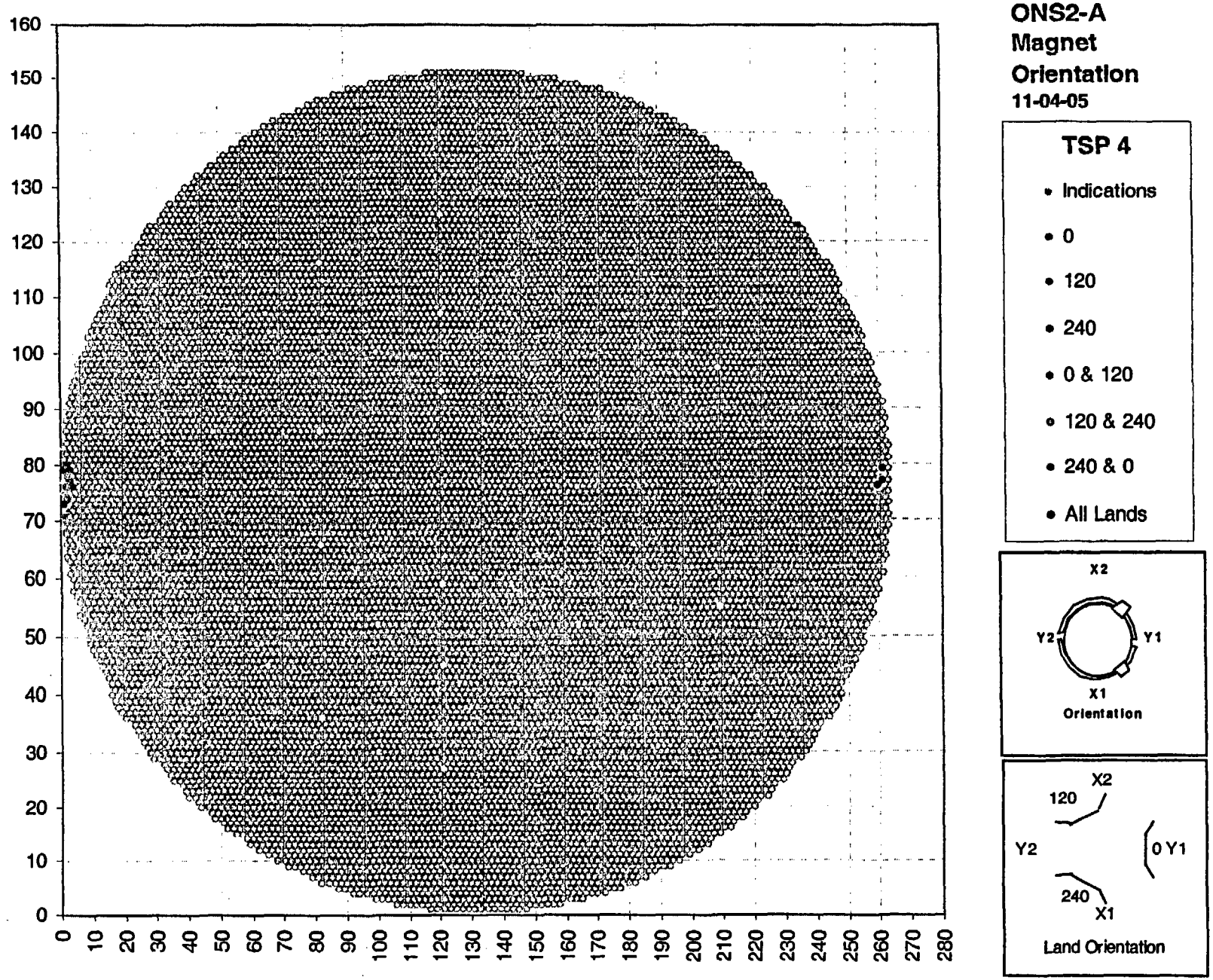

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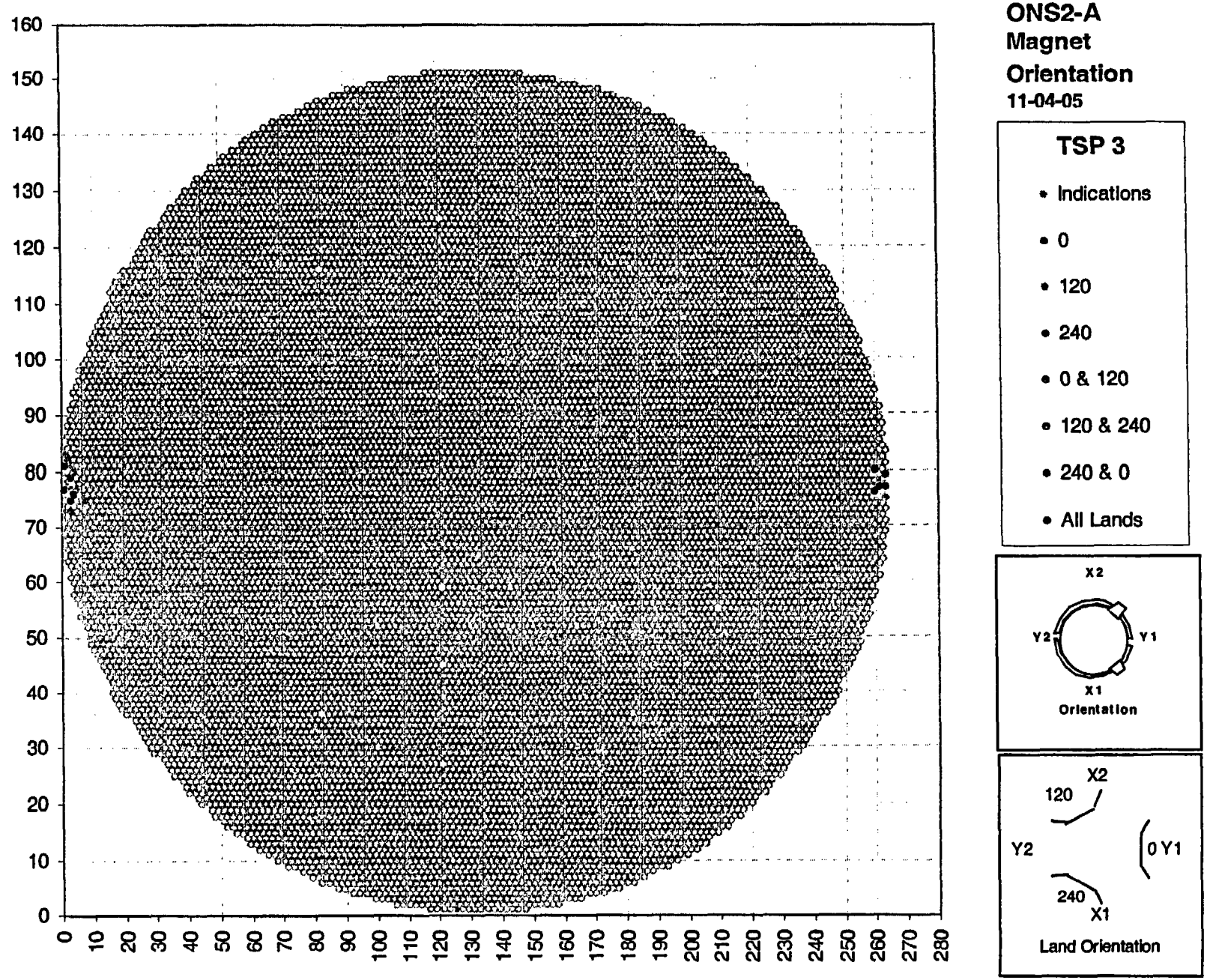

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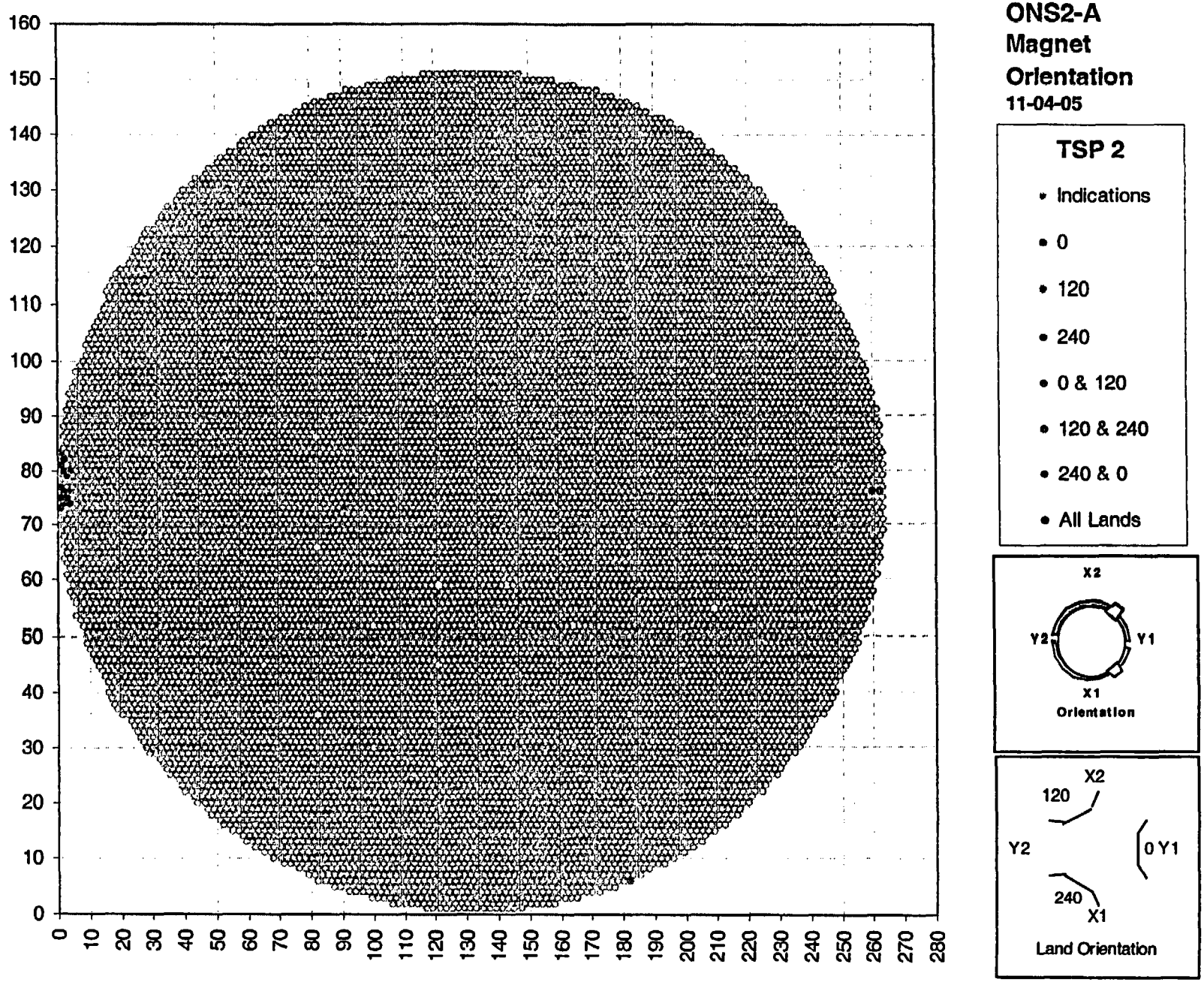

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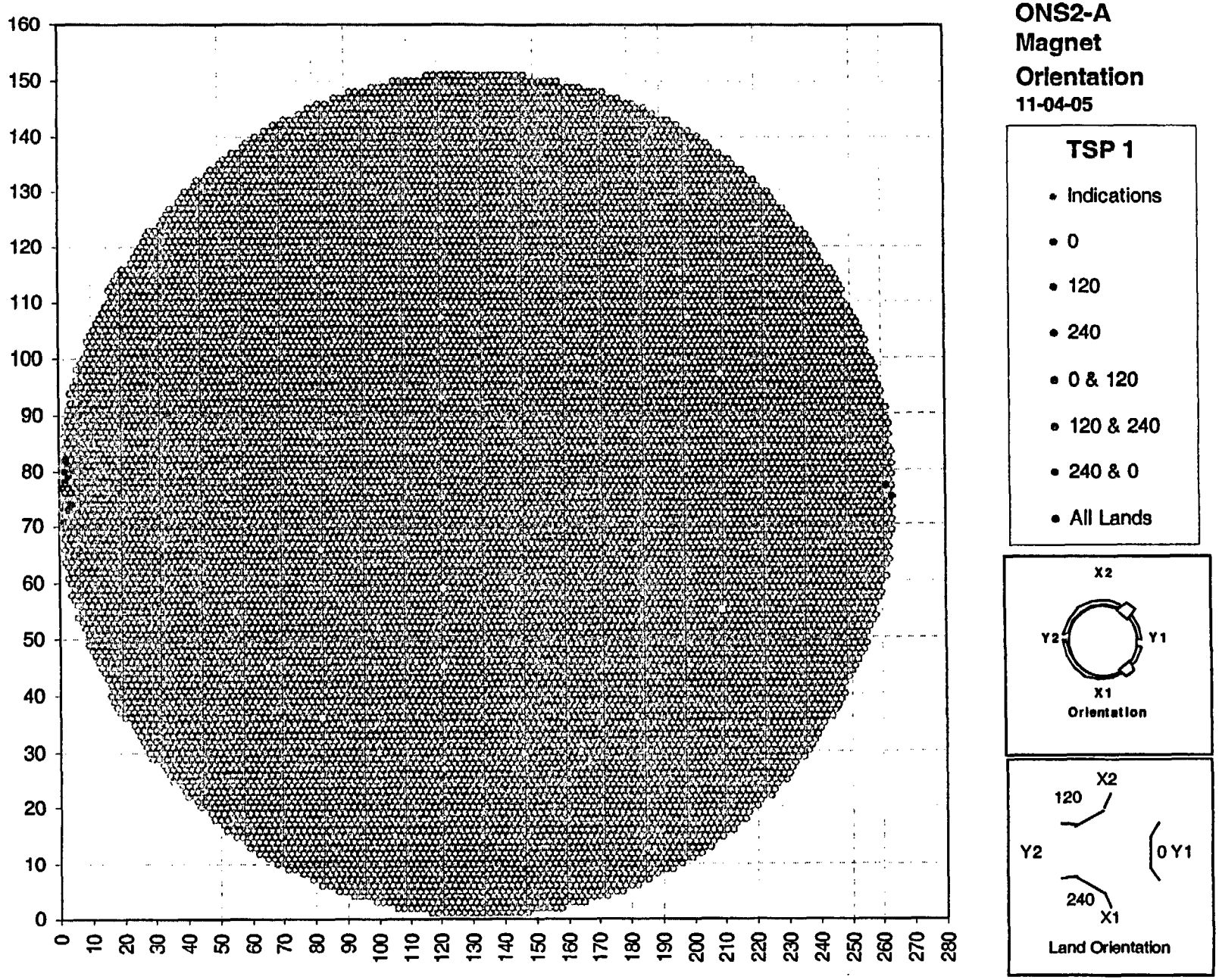

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